PROPOSED

MITIGATED NEGATIVE DECLARATION AND INITIAL STUDY

FOR THE

SERAPHINA (TTM 37290) PROJECT

JANUARY 2018

Prepared for:

City of Temecula
Planning Department
4100 Main Street
Temecula, CA 92590

Prepared by:

De Novo Planning Group
1020 Suncast Lane, Suite 106
El Dorado Hills, CA 95762
(916) 580-9818

De Novo Planning Group

A Land Use Planning, Design, and Environmental Firm

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Proposed Mitigated Negative Declaration for the Seraphina (TTM 37290) Project

Lead Agency: City of Temecula
Planning Department
4100 Main Street
Temecula, CA 92590

Project Title: Seraphina (TTM 37290)

Project Location: The Seraphina (TTM 37290) Project site (project site) is located north of Nicolas Road, east of Joseph Road in Temecula, California. The project site totals approximately 30.18 acres and is currently undeveloped. A portion of Santa Gertrudis Creek is located in the southern portion of the project site. The Assessor's Parcel Numbers (APNs) for the project site are 957-080-014-4 and 957-080-019-9. The elevation of the site ranges from approximately 1,155 feet above mean sea level (MSL) in the northeast corner to 1,138 feet above MSL on the southwest side, with gently rolling topography. A California Aqueduct easement and a Municipal Water District of Southern California pipeline easement are located on the east side of the site. The property is immediately adjacent to the unincorporated Riverside County community of Murrieta Hot Springs, which is part of the City of Temecula's Sphere of Influence (SOI).

Project Description: The proposed project includes development of 49 single-family dwelling units, two parks, and two detention basins on the 30.18-acre site. Lot sizes would range from 7,202 square feet (sf) to 14,336 sf, with an average lot size of 7,884 sf. The project consists of 54 lots, of which five are designated for the following open space facilities: two water quality basins (one lot), active community amenities (two lots), a proposed low flow channel, and the Santa Gertrudis Creek.

The two water quality basins would be located within Lot C near the western portion of the site (see Lot C). Site runoff would run through the proposed streets before being intercepted by the two basins and conveyed through proposed local storm drain systems that discharge to a water quality basin and drainage channel. The two basins are designed to mitigate for the 10- and 100-year storm events.

Santa Gertrudis Creek is the main drainage occurring on-site and will be widened and realigned as part of the project. The Creek will be realigned on the east side of the project site to allow room for the widening of Nicolas Road, as required by the City. The northern and southern banks of the Creek channel will be reinforced with riprap. The Nicolas Road widening, which is not part of the proposed project, will require substantial fill, pavement, and a riprap slope extending across Santa Gertrudis Creek.

The proposed project would connect to existing City infrastructure to provide water, sewer, and storm drainage utilities. Eastern Municipal Water District (EMWD) would provide water and sewer service to the project, and the Riverside County Flood Control and Water Conservation District (RCFC & WCD) would maintain the San Gertrudis Creek flood channel (Lot E). Electricity will be provided by Southern California Edison and natural gas will be provided by the Southern California Gas Company.

Findings:

In accordance with the California Environmental Quality Act, the City of Temecula has prepared an Initial Study to determine whether the proposed project may have a significant adverse effect on the environment. The Initial Study and Proposed Mitigated Negative Declaration reflect the independent judgment of City of Temecula staff. On the basis of the Initial Study, the City of Temecula hereby finds:

> *Although the proposed project could have a significant adverse effect on the environment, there will not be a significant adverse effect in this case because the project has incorporated specific provisions to reduce impacts to a less than significant level and/or the mitigation measures described herein have been added to the project. A Mitigated Negative Declaration has thus been prepared.*

The Initial Study, which provides the basis and reasons for this determination, is attached and/or referenced herein and is hereby made a part of this document.

_____ _____

Signature Date

Proposed Mitigation Measures:

The following Mitigation Measures are extracted from the Initial Study. These measures are designed to avoid or minimize potentially significant impacts, and thereby reduce them to an insignificant level. A Mitigation Monitoring and Reporting Program (MMRP) is an integral part of project implementation to ensure that mitigation is properly implemented by the City of Temecula and the implementing agencies. The MMRP will describe actions required to implement the appropriate mitigation for each CEQA category including identifying the responsible agency, program timing, and program monitoring requirements. Based on the analysis and conclusions of the Initial Study, the impacts of proposed project would be mitigated to less-than-significant levels with the implementation of the mitigation measures presented below.

BIOLOGICAL RESOURCES

Mitigation Measure Bio-1: *Prior to any permit issuance for grubbing, grading, or tree trimming/removal, fencing shall be installed in order to protect all environmentally sensitive area. The environmentally sensitive areas shall include all areas not required to be disturbed, and shall specifically include the utility right of way and San Gertrudis Creek. No vehicular or construction equipment shall be allowed into the environmentally sensitive areas.*

Mitigation Measure Bio-2: *Within 30 days of any ground-disturbing activities, the project applicant shall retain the services of a qualified biologist to conduct a survey of the construction zone. The City will require the developer to submit a copy of the executed contract for such services prior to the issuance of any grading permits. The survey shall occur not more than seven days prior to the initiation of those construction activities. If the biologist detects any occupied burrows of burrowing owls within the construction zone or in close proximity, they shall be mapped on construction plans and the project applicant will either perform owl evictions in conformance with the CDFW requirements, or fence off the area(s) supporting burrows with temporary construction fencing, providing a minimum buffer of 200 feet between the burrows and limits of construction. If the biologist detects any occupied nests of birds within the construction zone or in close proximity to, they shall be mapped on construction plans and the project applicant will fence off the area(s) supporting bird nests with temporary construction fencing, providing a minimum buffer of 200 feet between the nest and limits of construction. (This buffer zone shall be at least 500 feet for raptors until the young have fledged, are no longer being fed by the parents, have left the nest, and will no longer be impacted by the project.). The construction crew will be instructed to avoid any activities in the zone until the bird burrow(s)/nest(s) is/are no longer occupied, per a subsequent survey by the qualified biologist.*

Mitigation Measure Bio-3: *Prior to any construction activities that would disturb protected wetlands and/or jurisdictional areas on the project site, the appropriate state and federal authorizations (Streambed Alteration Agreement, Section 404 permit, Section 401 water quality certification) shall be obtained. All requirements of these authorizations shall be adhered to throughout the construction phase.*

Mitigation Measure Bio-4: *The project proponent shall compensate for any authorized disturbance to protected wetlands and/or jurisdictional areas at a minimum of 1:1 establishment or re-establishment to ensure no net loss of habitat functions and values, pursuant to the Habitat Mitigation and Monitoring Plan (Helix Environmental Planning, 2017). Compensation ratios shall be based on site-specific information and determined through coordination with state, federal, and local agencies as part of the permitting process for the project. The regulatory/permitting agency shall determine the actual ratio of restored, created, and/or preserved for protected wetlands and/or jurisdictional areas disturbed. Compensation may comprise onsite restoration/creation, off-site restoration, preservation, or mitigation credits (or a combination of these elements) if approved by the regulatory/permitting agency.*

CULTURAL RESOURCES

Mitigation Measure Cul-1: *A Riverside County qualified/City of Temecula approved professional archaeological monitor shall be retained by the project applicant and present to monitor all ground-disturbing activities associated with the project. The archaeological monitor shall work under the direct supervision of a Cultural Resources Professional that meets the Secretary of the Interior's Professional Qualification Standards for Archaeology (U.S. Department of Interior, 2012) and as approved by the City of Temecula to provide archaeological expertise in carrying out all mitigation measures related to archaeological resources (Mitigation Measures Cul-2, Cul-3, and Cul-5).*

Mitigation Measure Cul-2: *The qualified archaeologist, or an archaeologist working under the direction of the qualified archaeologist, along with a representative of the Pechanga Tribe, shall conduct pre-construction cultural resources worker sensitivity training to inform construction personnel of the types of cultural resources that may be encountered, and to bring awareness to personnel of actions to be taken in the event of a cultural resources discovery. The City shall ensure that construction personnel are made available for and attend the training and shall retain documentation demonstrating attendance.*

Mitigation Measure Cul-3: *Prior to the start of ground-disturbing activities, the qualified archaeologist shall designate an archaeological monitor to observe ground-disturbing activities, including but not limited to, brush clearance and grubbing, grading, trenching, excavation, and the construction of fencing and access roads, in consultation with the Pechanga tribal monitor. If ground-disturbing activities occur simultaneously in two or more areas located more than 500 feet apart, additional archaeological monitors may be required. Any newly discovered cultural resource deposits shall be subject to a cultural resources evaluation (see Mitigation Measure Cul-8). The archaeological monitor's authority to stop and redirect grading shall be exercised in consultation with the Pechanga Tribe in order to evaluate the significance of any potential resources discovered on the project site. The archaeological monitor shall keep daily logs. After monitoring is complete, the qualified archaeologist shall prepare a monitoring report that details the results of monitoring activities, which shall be submitted to the City, Pechanga Tribe, and the EIC at the University of California, Riverside.*

Mitigation Measure Cul-4: *At least 30 days and no more than 60 days prior to the issuance of a grading permit, the City shall contact and coordinate with the Pechanga Tribe to develop a Cultural Resources Treatment and Monitoring Agreement (Agreement). The agreement shall be in place prior to issuance of a grading permit. The Agreement shall address the treatment and disposition of known cultural resources; the designation, responsibilities, and participation of professional Pechanga Tribal monitors during grading, excavation, and all 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.*

The Pechanga Tribal monitor shall have the limited authority to stop and redirect grading activities should an inadvertent cultural resource be identified. The Pechanga monitor's authority to stop and redirect grading shall be exercised in consultation with the project archaeologist in order to evaluate the significance of any potential resources discovered on the project site. The Pechanga Tribal monitor shall be allowed to observe ground-disturbing activities, including but not limited to, brush clearance and grubbing, grading, trenching, excavation, and the construction of fencing and access roads, in consultation with the archaeological monitor. If ground-disturbing activities occur simultaneously in two or more areas located more than 500 feet apart, additional archaeological monitors may be required. The Pechanga Tribal monitor shall keep daily logs. If ground-disturbing activities occur simultaneously in two or more locations, additional Pechanga Tribal monitors may be required.

Mitigation Measure Cul-5: *If inadvertent discoveries of subsurface archaeological/cultural resources are made during ground-disturbing activities, the applicant, the qualified archaeologist, and the Pechanga Tribe shall assess the significance of such resources and shall meet and confer regarding the mitigation for such resources. Pursuant to Public Resources Code (PRC) Section 21083.2(b), avoidance is the preferred method of preservation for archaeological resources. PRC Section 21084.3 further requires that agencies shall avoid damaging effects to tribal cultural resources, if feasible. If the City, the qualified archaeologist, and the Pechanga Tribe cannot agree on the significance or the mitigation for such resources, these issues will be presented to the City Community Development Director for decision. The City Community Development Director shall make the determination based on the provisions of the CEQA with respect to archaeological resources and shall take into account the religious beliefs, customs, and practices of the Pechanga Tribe. Notwithstanding any other rights available under law, the decision of the City Community Development Director shall be appealable to the City Planning Commission and/or City Council.*

Mitigation Measure Cul-6: *The following shall be included in the "Notes" section of the proposed project Grading Plan: "The City (and/or landowner) shall agree to relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts that are recovered as a result of project implementation, to the Pechanga Tribe for proper treatment and disposition as outlined in the Cultural Resources Treatment and Monitoring Agreement (Agreement)" (as required by Mitigation Measure Cul-4).*

Mitigation Measure Cul-7: *The following shall be included in the "Notes" section of the proposed project Grading Plan: "All sacred sites, should they be encountered within the project area, shall be avoided and preserved as the preferred mitigation, if feasible."*

Mitigation Measure Cul-8: *The following shall be included in the "Notes" section of the proposed project Grading Plan:*

- *"If at any time during excavation/construction of the site, archaeological/cultural resources, or any artifacts or other objects which reasonably appears to be evidence of cultural or archaeological resource are discovered, the property owner shall immediately advise the City of such and the City shall cause all further excavation or other disturbance of the affected area to immediately cease. The Director of Community Development at his/her sole discretion may require the property owner to deposit a sum of money it deems reasonably necessary to allow the City to consult and/or authorize an independent, fully qualified specialist to inspect the site at no cost to the City, in order to assess the significance of the find.*

Upon determining that the discovery is not an archaeological/ cultural resource, the Community Development Director shall notify the property owner of such determination and shall authorize the resumption of work. Upon determining that the discovery is an archaeological/cultural resource, the Community Development Director shall notify the property owner that no further excavation or development may take place until a mitigation plan or other corrective measures have been approved by the Community Development Director."

- *"If cultural resources are discovered during the project construction (inadvertent discoveries), all work in the area of the find shall cease, and the qualified archaeologist and the Pechanga monitor shall investigate the find, and make recommendations as to treatment."*
- *"A qualified archaeological monitor shall be present and shall have the authority to stop and redirect grading activities, in consultation with the Pechanga Tribe and their designated monitors, to evaluate the significance of any potential resources discovered on the project site."*
- *"A Pechanga Tribal monitor shall be present and shall have the authority to stop and redirect grading activities, in consultation with the project archaeologist and their designated monitors, to evaluate the significance of any potential resources discovered on the project site."*

Mitigation Measure Cul-9: *Consistent with State CEQA Guidelines Section 15064.5, Subdivision (e), in the event of an accidental discovery or recognition of any human remains, the Riverside County Coroner shall be notified and construction activities at the affected work site shall be halted. Further, pursuant to PRC Section 5079.98(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 Riverside County Coroner shall notify the NAHC within 24 hours. The NAHC must immediately notify the "most likely descendant(s)" under PRC Section 5097.98, and the descendants must make recommendations or state their preference for treatment within 48 hours of being granted access as identified in the Agreement described in Mitigation Measure Cul-4.*

GEOLOGY AND SOILS

Mitigation Measure Geo-1: *The project applicant shall submit a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) to the RWQCB in accordance with the NPDES General Construction Permit requirements. The SWPPP shall be designed to control pollutant discharges utilizing Best Management Practices (BMPs) and technology to reduce erosion and sediments. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater runoff from the project site. Measures shall include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) that will be employed to control erosion from disturbed areas. Final selection of BMPs will be subject to approval by the City and the RWQCB. The SWPPP will be kept on site during construction activity and will be made available upon request to representatives of the RWQCB and City.*

Mitigation Measure Geo-2: *Prior to earthmoving activities for the project, a certified geotechnical engineer, or equivalent, shall be retained to perform a final geotechnical evaluation of the soils at a design-level as required by the requirements of the California Building Code Title 24, Part 2, Chapter 18, Section 1803.1.1.2. The evaluation shall be prepared in accordance with the standards and requirements outlined in California Building Code, Title 24, Part 2, Chapter 16, Chapter 17, and Chapter 18, which addresses structural design, tests and inspections, and soils and foundation standards. The final geotechnical evaluation shall include design recommendations to ensure that soil conditions do not pose a threat to the health and safety of people or structures. The grading and improvement plans shall be designed in accordance with the recommendations provided in the final geotechnical evaluation.*

HAZARDS AND HAZARDOUS MATERIALS

Mitigation Measure Haz-1: *A deed notification shall be recorded for residential land uses within Compatibility Zones D and E and an airport proximity disclosure shall be provided for residential land uses within Compatibility Zones D and E.*

HYDROLOGY AND WATER QUALITY

Mitigation Measure Hyd-1: *Prior to issuance of a grading permit, the project proponent shall obtain a Letter of Map Revision (LOMR) from FEMA ensuring that no construction will occur within a designated 100-year floodplain.*

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INITIAL STUDY CHECKLIST

PROJECT TITLE

Seraphina (TTM 37290) Project

LEAD AGENCY NAME AND ADDRESS

City of Temecula
Planning Department
4100 Main Street
Temecula, CA 92590

CONTACT PERSON AND PHONE NUMBER

Scott Cooper, Associate Planner
City of Temecula
Planning Department
4100 Main Street
Temecula, CA 92590
Scott.Cooper@TemeculaCA.gov
(951) 506-5137

PROJECT SPONSOR'S NAME AND ADDRESS

David Arnold
Hillcrest Homes
355 W. 2nd Street
Tustin, CA 92780

PROJECT LOCATION AND SETTING

The Seraphina (TTM 37290) Project site (project site) is located north of Nicolas Road, east of Joseph Road in Temecula, California (Figure 1 and 2). The project site totals approximately 30.18 acres and is currently undeveloped. A portion of Santa Gertrudis Creek is located in the southern portion of the project site (Figure 3). The Assessor's Parcel Numbers (APNs) for the project site are 957-080-014-4 and 957-080-019-9. The elevation of the site ranges from approximately 1,155 feet above mean sea level (MSL) in the northeast corner to 1,138 feet above MSL on the southwest side, with gently rolling topography. A California Aqueduct easement and a Municipal Water District of Southern California pipeline easement are located on the east side of the site. The property is immediately adjacent to the unincorporated Riverside County community of Murrieta Hot Springs, which is part of the City of Temecula's Sphere of Influence (SOI).

PROJECT BACKGROUND

The project site is the general location of the previously-approved TTM 32346 Seraphina Tract Project, which proposed development of 72 single-family lots. The City review process for TTM 32346 began in 2004, which included preparation of an Initial Study Checklist, Negative Declaration, and other supplemental technical studies. The Initial Study and Negative Declaration were finalized in 2005, and the City approved the previously-proposed TTM 32346 Seraphina Tract Project in 2005. Since the time TTM 32346 was approved, the project has been redesigned to accommodate the development of 49 single-family lots, a reduction of 23 single-

family lots versus the previously approved TTM. Due to the age of the previous studies, analysis, and findings prepared for TTM 32346, and change to the project design and description, the City of Temecula has determined that a Mitigated Negative Declaration shall be prepared for the proposed project.

PROJECT DESCRIPTION

The proposed project includes development of 49 single-family dwelling units, two parks, and two detention basins on the 30.18-acre site. Lot sizes would range from 7,202 square feet (sf) to 14,336 sf, with an average lot size of 7,884 sf. The project consists of 54 lots, of which five are designated for the following open space facilities: two water quality basins (one lot), active community amenities (two lots), a proposed low flow channel, and the Santa Gertrudis Creek.

The two water quality basins would be located within Lot C near the western portion of the site (see Lot C, Figure 4). Site runoff would run through the proposed streets before being intercepted by the two basins and conveyed through proposed local storm drain systems that discharge to a water quality basin and drainage channel. The two basins are designed to mitigate for the 10- and 100-year storm events.

Santa Gertrudis Creek is the main drainage occurring on-site and will be widened and realigned as part of the project. The Creek will be realigned on the east side of the project site to allow room for the widening of Nicolas Road, as required by the City. The northern and southern banks of the Creek channel will be reinforced with riprap. The Nicolas Road widening, which is not part of the proposed project, will require substantial fill, pavement, and a riprap slope extending across Santa Gertrudis Creek.

The project includes road improvements along Rita Way, Joseph Road, and Nicolas Road. The California Aqueduct easement on the east side of the site would be avoided except for an aqueduct access road to be built per Metropolitan Water District requirements over the realigned Santa Gertrudis Creek.

One 0.43-acre park would be developed at the northeastern corner of the Nicolas Road and Joseph Road intersection in the southwestern corner of the project site (Lot B). This park would contain an open turf play area, exercise station, benches, picnic tables, internal walkway, and a trail along the Creek. A park monument sign and street light would also be provided at the southwestern corner of the park. Another 0.47-acre park would be constructed in the central portion of the site (Lot A). This park would contain a tot-lot, benches, picnic tables, game tables, and an internal walkway. Landscaping is proposed throughout the site, including within the residential areas and proposed park areas.

Access to the project site would be provided at two locations: via an extension of Rita Way, and via a new roadway off of Joseph Road. Lots would be served by interior streets and cul-de-sacs. As part of the project, Nicolas Road and Joseph Road will be improved, with the addition of sidewalk, curb and gutter, and for Nicolas Road, a median island.

The proposed project would connect to existing City infrastructure to provide water, sewer, and storm drainage utilities. Eastern Municipal Water District (EMWD) would provide water and sewer service to the project, and the Riverside County Flood Control and Water Conservation District (RCFC & WCD) would maintain the San Gertrudis Creek flood channel (Lot E). The two water quality basins (Lot C) would be maintained by the Homeowner's Association (HOA). One of the two proposed parks (Lot A) would also be maintained by the HOA, while the other park

(Lot B) would be maintained by the City of Temecula. Both park areas would be available for public use.

Police protection service would be provided by the Temecula Police Department (TPD). The Riverside County Fire Department (RCFD) would provide fire protection service. School services would be provided by the Temecula Valley Unified School District (TVUSD). Electricity will be provided by Southern California Edison and natural gas will be provided by the Southern California Gas Company.

GENERAL PLAN AND ZONING

The project site has a Low Medium Density Residential (LM) General Plan Land Use Designation (Figure 4) and Low Medium Density Residential (LM) Zoning Designation (Figure 5).

REQUESTED ENTITLEMENTS AND OTHER APPROVALS

The City of Temecula is the Lead Agency for the proposed project, pursuant to the State Guidelines for Implementation of CEQA, Section 15050.

This document will be used by the City of Temecula to take the following actions:

- Adoption of the Mitigated Negative Declaration (MND);
- Adoption of the Mitigation Monitoring and Reporting Program (MMRP); and
- Vesting Tentative Subdivision Map Approval.

The following agencies may be required to issue permits or approve certain aspects of the proposed project:

- California Department of Fish and Wildlife (CDFW) – Streambed Alteration Agreement pursuant to Section 1602 of the California Fish and Game Code;
- Regional Water Quality Control Board (RWQCB) – Construction activities would be required to be covered under the National Pollution Discharge Elimination System (NPDES);
- Regional Water Quality Control Board (RWQCB) – Water quality certification pursuant to Section 401 of the Clean Water Act;
- Regional Water Quality Control Board (RWQCB) – Permitting of State jurisdictional areas, including isolated wetlands pursuant to the Porter-Cologne Water Quality Act;
- Regional Water Quality Control Board (RWQCB) - Storm Water Pollution Prevention Plan (SWPPP) approval prior to construction activities pursuant to the Clean Water Act;
- Riverside County Airport Land Use Commission - Review the proposed project for compatibility with the French Valley Airport compatibility zones; and
- United States Army Corps Of Engineers (USACE) – Permitting of federal jurisdictional areas pursuant to Section 404 of the Clean Water Act.

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Sources: CalAtlas. Map date: September 26, 2017.

SERAPHINA (TTM37290)

Figure 1. Regional Location Map

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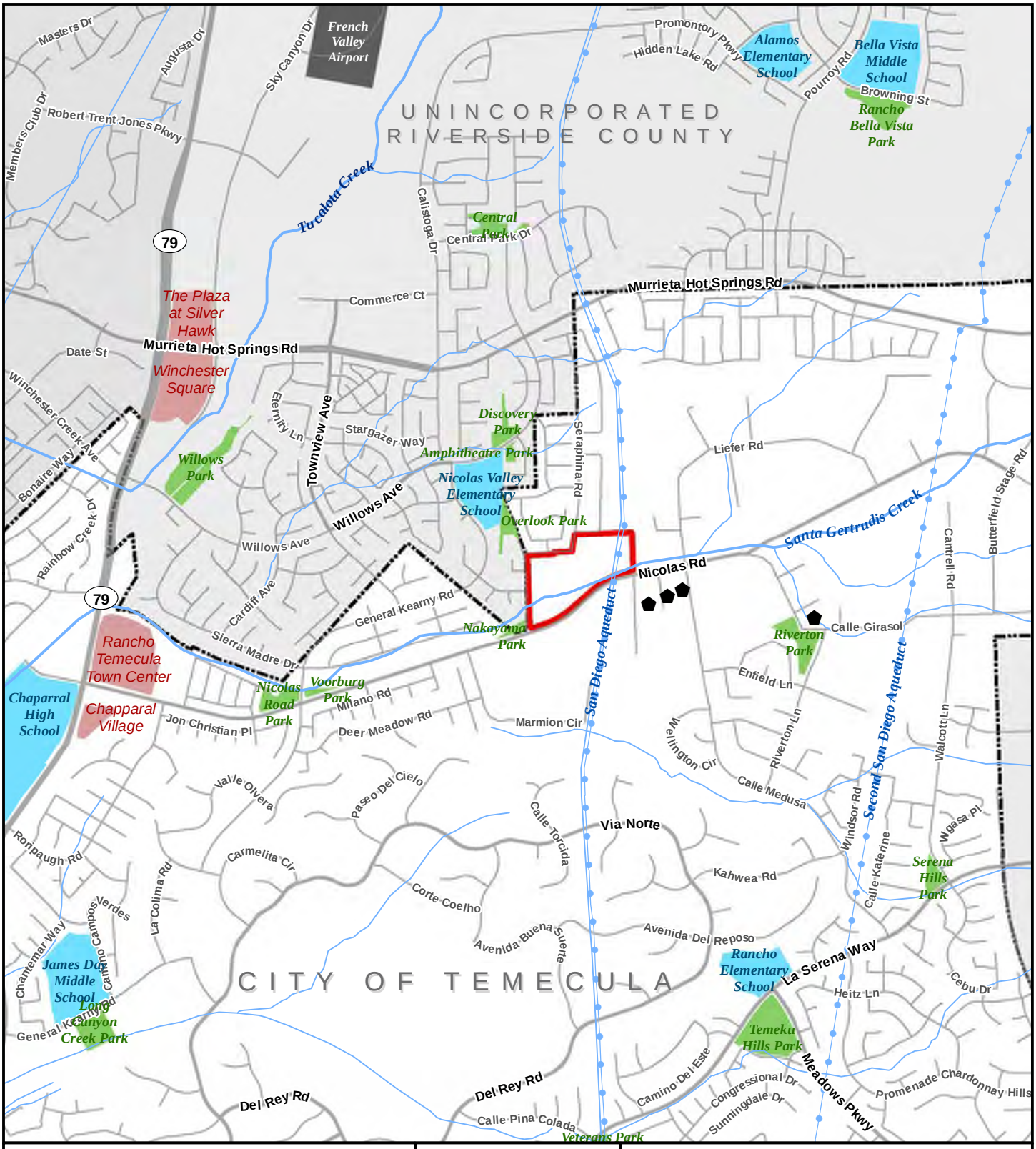

Legend

- Project Boundary
- Park
- School
- Commercial Center
- Airport
- City of Temecula
- Unincorporated Riverside County
- Place of Worship

Sources: Riverside County; Google Earth. Map date: September 26, 2017.

N

0 500 1,000
Feet

SERAPHINA (TTM37290)

Figure 2. Vicinity Map

Dr Nero Planning Group

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Legend

Project Boundary

Temecula City Boundary

N

0 250 500

Feet

Sources: Riverside County; ArcGIS Online World Imagery Map Service. Map date: October 2, 2017.

SERAPHINA (TTM37290)

Figure 3. Aerial View of Project Site

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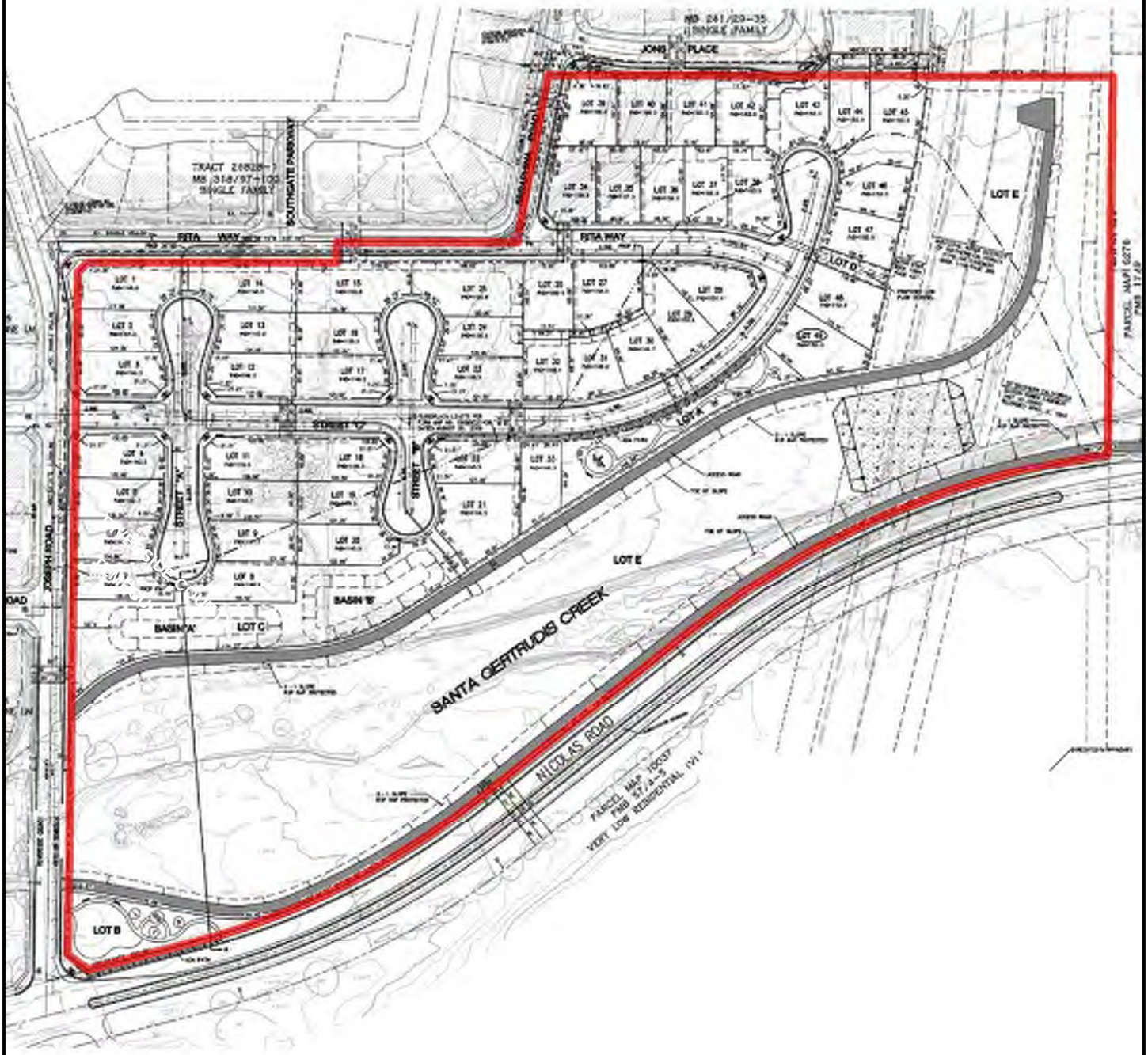

Legend

Project Boundary

0 125 250

Feet

Sources: City of Temecula/Michael Baker International, 1/23/2017; Riverside County; Map date: October 5, 2017.

SERAPHINA (TTM37290)

Figure 4. Site Plan

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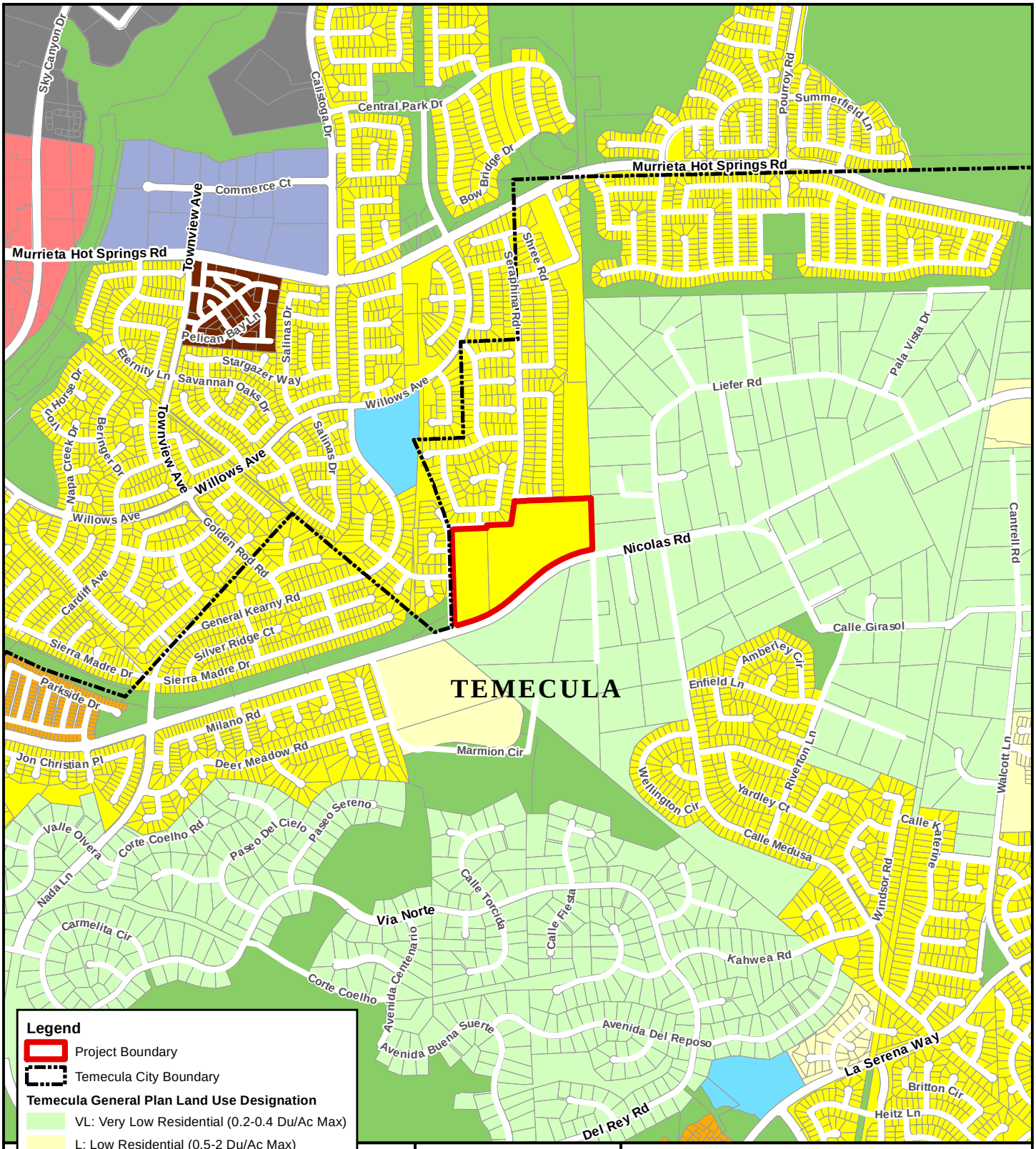

Sources: Riverside County; City of Temecula. Map date: October 2, 2017.

SERAPHINA (TTM37290)

Figure 5. Existing General Plan Land Use Map

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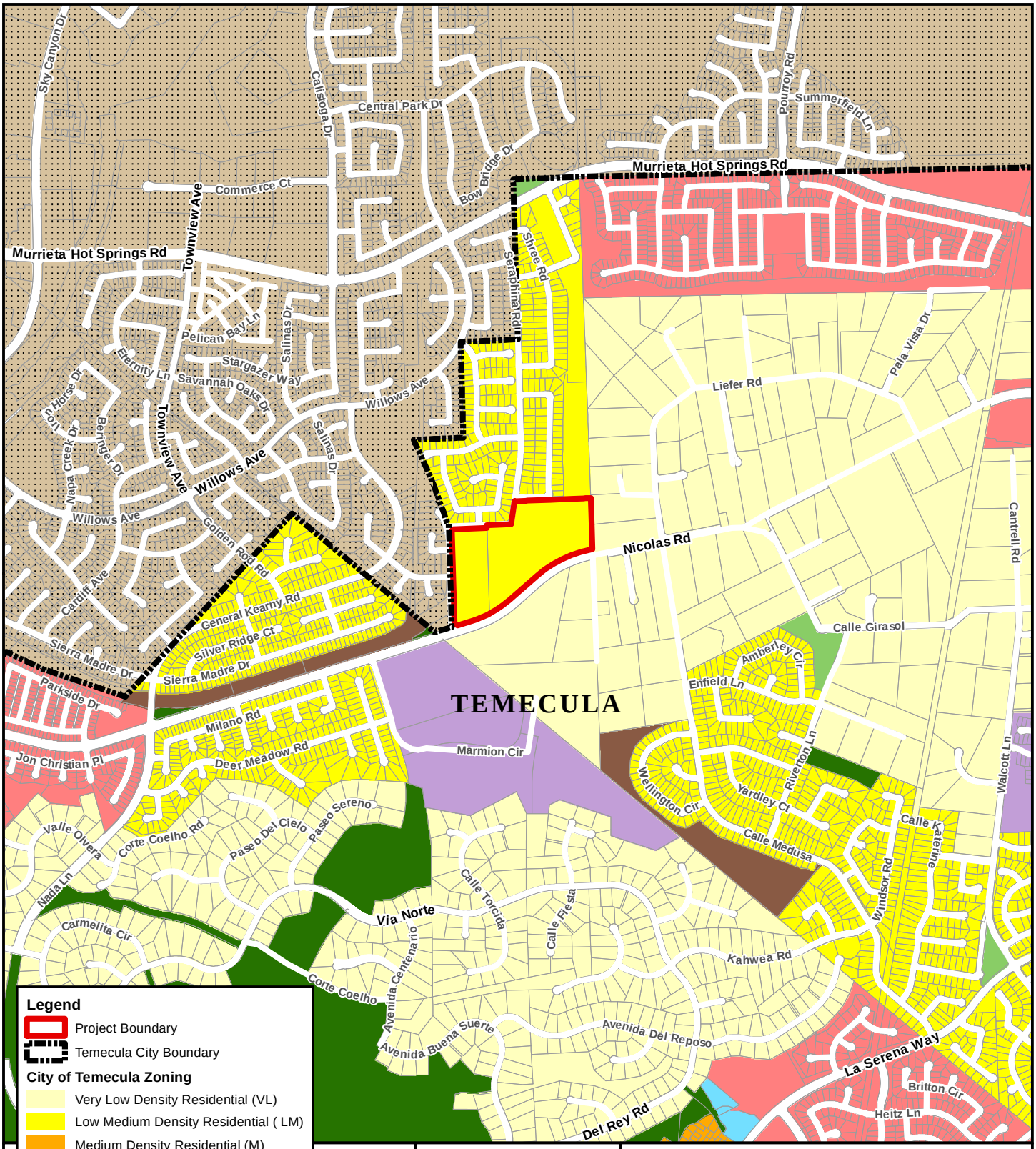

Sources: Riverside County; City of Temecula. Map date: October 2, 2017.

SERAPHINA (TTM37290)

Figure 6. Zoning Map

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ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

None of the environmental factors listed below would have potentially significant impacts as a result of development of this project, as described on the following pages.

	Aesthetics		Agriculture and Forest Resources		Air Quality
X	Biological Resources	X	Cultural Resources	X	Geology and Soils
	Greenhouse Gasses	X	Hazards and Hazardous Materials	X	Hydrology and Water Quality
X	Land Use and Planning		Mineral Resources		Noise
	Population and Housing		Public Services		Recreation
	Transportation and Traffic	X	Tribal Cultural Resources		Utilities and Service Systems
	Mandatory Findings of Significance				

DETERMINATION

On the basis of this initial evaluation:

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

Signature Date

EVALUATION INSTRUCTIONS

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 Section XVII, "Earlier Analyses," 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 measures 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) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) 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 significant.

EVALUATION OF ENVIRONMENTAL IMPACTS

In each area of potential impact listed in this section, there are one or more questions which assess the degree of potential environmental effect. A response is provided to each question using one of the four impact evaluation criteria described below. A discussion of the response is also included.

- Potentially Significant Impact. This response is appropriate when there is substantial evidence that an effect is significant. If there are one or more "Potentially Significant Impact" entries, upon completion of the Initial Study, an EIR is required.
- Less than Significant With Mitigation Incorporated. This response applies when 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.
- Less than Significant Impact. A less than significant impact is one which is deemed to have little or no adverse effect on the environment. Mitigation measures are, therefore, not necessary, although they may be recommended to further reduce a minor impact.
- No Impact. These issues were either identified as having no impact on the environment, or they are not relevant to the Project.

ENVIRONMENTAL CHECKLIST

This section of the Initial Study incorporates the most current Appendix "G" Environmental Checklist Form, contained in the CEQA Guidelines. Impact questions and responses are included in both tabular and narrative formats for each of the 19 environmental topic areas.

I. AESTHETICS

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?			X	

Responses to Checklist Questions

Responses a), c): For analysis purposes, a scenic vista can be discussed in terms of a foreground, middleground, and background viewshed. The middleground and background viewshed is often referred to as the broad viewshed. Examples of scenic vistas can include mountain ranges, valleys, ridgelines, or water bodies from a focal point of the forefront of the broad viewshed, such as visually important trees, rocks, or historic buildings. An impact would generally occur if a project would change the view to the middle ground or background elements of the broad viewshed, or remove the visually important trees, rocks, or historic buildings in the foreground.

The proposed project will not significantly disrupt middleground or background views from public viewpoints. The proposed project would result in changes to the foreground views from the public viewpoint by adding residential homes to a site that is undeveloped. The San Gertrudis Creek flood channel is situated such that there will be significant visual relief in the foreground views between the public frontage along Nicolas Road and the physical development of the residential units within the project site. Upon build-out, the project would be of similar visual character to adjacent developments. For motorists travelling along nearby roadways, such as Nicolas Road, the project would appear to be a continuation of adjacent land uses and would not present unexpected and otherwise unpleasant aesthetic values within the general project vicinity. The General Plan identifies important community scenic assets including viewsheds, city gateways, and focal intersections on Figure CD-1, Community Design Plan, of the General Plan Community Design Element; however, the project site is not visible from the designated important viewsheds, and is not part of a designated city gateway or focal intersection.

Sound walls currently exist along Rita Way, north of the project site, and along Joseph Road, west of the project site. The greatest visual change would apply to neighbors that abut the project site with a direct view of the area. However, views of the project site are not generally visible from many nearby residences due to the existing fencing, mature trees, and vegetation that obscure views.

The change in character of the project site, once developed, is anticipated by the General Plan and would be visually compatible with surrounding existing residential neighborhoods to the north, northwest, and west. Therefore, implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

Response b): The project site is not located within view of a state scenic highway. The nearest highway subject to this program is State Route (SR) 74, an Officially Designated State Scenic Highway, located approximately 19.4 miles northeast of the project site. Therefore, the proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. Implementation of the proposed project would have ***no impact*** relative to this topic.

Response d): The project site is currently undeveloped and does not contain existing lighting. There is a potential for the proposed project to create new sources of light and glare. Examples of lighting would include construction lighting, street lighting, security lighting along sidewalks, exterior building lighting, interior building lighting, and automobile lighting. Examples of glare would include reflective building materials and sometimes automobiles.

Residential development and streets to the north, south, east, and west currently produce a moderate amount of nighttime lighting from street lighting, residential interiors, and exterior building lighting. Because light sources from the project would be consistent with the type and intensity of existing lighting sources, the existing, ambient condition would not substantially change. With development of the project, sources of nighttime lighting would be added and would increase nighttime lighting in the area with a type and intensity of lighting consistent with residential neighborhoods located north, northwest, and west of the project site. When viewed from more distant areas, the lighting associated with the residential development could appear to increase skyglow in the area because the existing project site is currently dark.

The proposed project would be subject to the City of Temecula's City-Wide Design Guidelines (adopted August 9, 2005) which provide direction on appropriate project lighting. The proposed project would also be designed consistent with § 17.24.050F of the Development Code that requires new outdoor lighting sources to be designed in a manner that avoids light intrusion onto adjacent property. Additionally, City of Temecula General Plan Policy 2.5 of the Community Design Element limits light and glare pollution through design standards for outdoor lighting, the use of low intensity lights, and lighting that supports the continued use of the Mt. Palomar Observatory.

Outdoor lighting would be installed in conformance with all City codes and ordinances, applicable safety and illumination requirements, and California Title 24 requirements. Lighting would be installed at pedestrian crossings, as appropriate for public safety, and where lighting is needed for public safety. Limited safety and security lighting and indirect shielded lighting would also be provided. Further, proposed lighting would also be placed to ensure it illuminates only the intended areas and does not penetrate into residential communities.

Development on the project site would also increase daytime glare because of an increase in the number of windows and use of certain types of building materials. However, use of non-reflective building materials is proposed as part of the project and the project would be required to undergo design review with the City to confirm it complies with the City-Wide Design Guidelines. There is a certain amount of daytime glare associated with developed areas, and such glare is to be expected, however, it is not expected that the proposed project would result in any significant level of glare.

Implementation of the proposed project would have a ***less than significant*** relative to this topic.

II. AGRICULTURE AND FOREST RESOURCES

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
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?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1222(g)) or timberland (as defined in Public Resources Code section 4526)?				X
d) Result in the loss of forest land or conversion of forest land to non-forest use?				X
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?				X

Responses to Checklist Questions

Response a): As shown in Figure 7, the project site is designated as Other Land (8.22 acres), Urban and Built-Up Land (0.38 acres), and Farmland of Local Importance (20.39 acres). The project site does not contain prime farmland, unique farmland, or farmland of statewide importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. The proposed project would result in the conversion of undeveloped land to non-agricultural use. Implementation of the proposed project would have ***no impact*** relative to this issue.

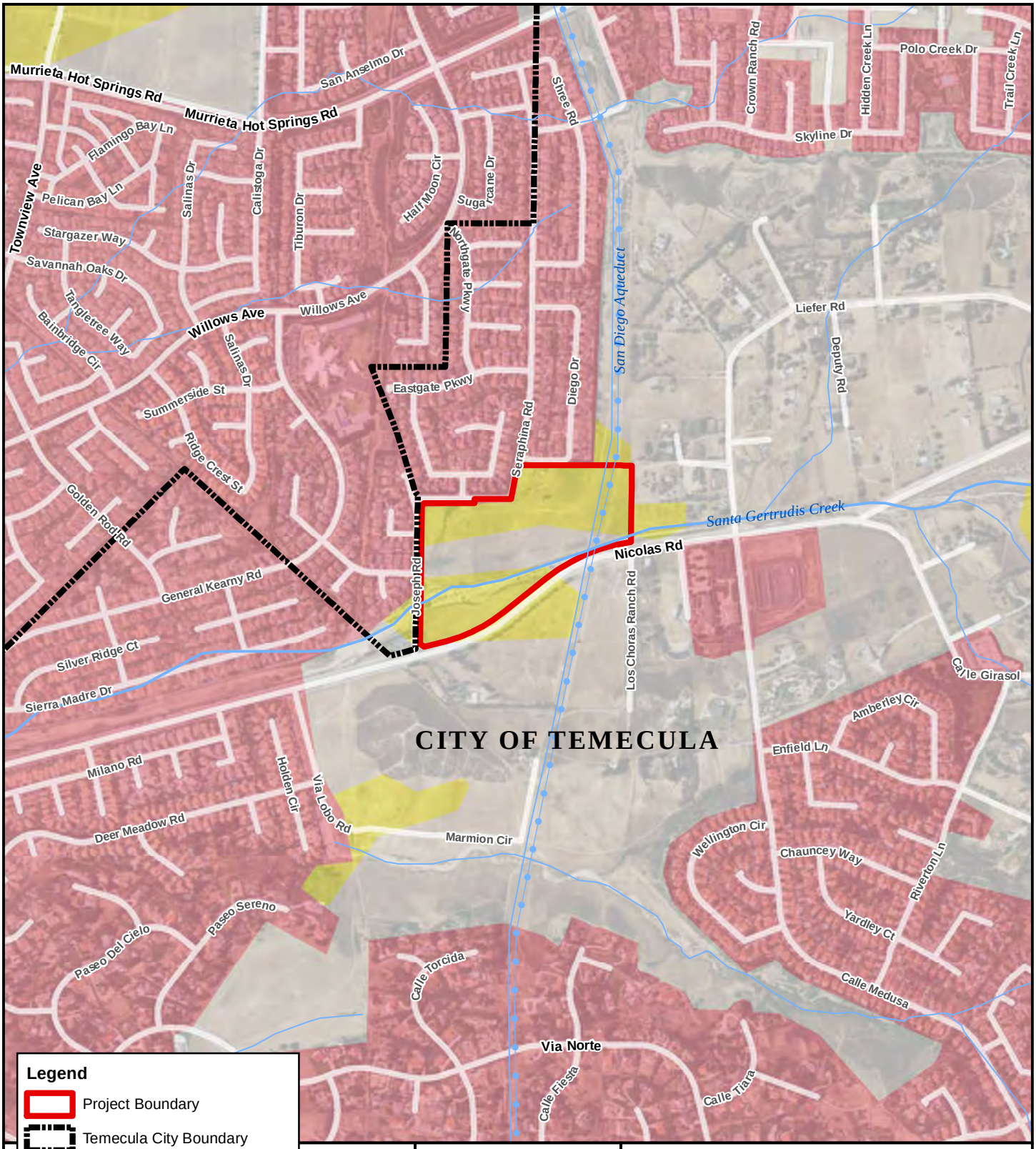
Response b): The project site is not zoned for agricultural use nor is it under a Williamson Act contract. The proposed project would not conflict with existing zoning for agricultural use, or a Williamson Act contract. Implementation of the proposed project would have ***no impact*** relative to this issue.

Response c): The project site is not forest land (as defined in Public Resources Code section 1222(g)) or timberland (as defined in Public Resources Code section 4526). The proposed project would not conflict with existing zoning for, or cause rezoning of, forest land or timberland. Implementation of the proposed project would have ***no impact*** relative to this issue.

Response d): The project site is not forest land. The proposed project would not result in the loss of forest land or conversion of forest land to non-forest use. Implementation of the proposed project would have ***no impact*** relative to this issue.

Response e): The project site does not contain agricultural land or forest land. While the project site does contain 20.39 acres of land designated by the Department of Conservation as Farmland of Local Importance, historical aerial photos show that the land has not been used as

farmland over the last 30 years. Lands adjacent to the project site are designated Other Land, Urban and Built-Up Land, and Farmland of Local Importance. The lands adjacent also do have not been used as farmland over the last 30 years. The proposed project does not involve 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. Implementation of the proposed project would have ***no impact*** relative to this issue.



Sources: Farmland Mapping and Monitoring Program, Riverside County 2016; Riverside County; ArcGIS Online World Imagery Map Service. Map date: October 4, 2017.

SERAPHINA (TTM37290)

Figure 7. Important Farmlands Map

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III. AIR QUALITY

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Conflict with or obstruct implementation of the applicable air quality plan?			X	
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?			X	
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)?			X	
d) Expose sensitive receptors to substantial pollutant concentrations?			X	
e) Create objectionable odors affecting a substantial number of people?			X	

Existing Setting

The project site is located within the South Coast Air Basin (SoCAB), which is governed by the South Coast Air Quality Management District (SCAQMD). This agency is responsible for monitoring air pollution levels and ensuring compliance with federal and state air quality regulations within SoCAB and has jurisdiction over most air quality matters within its borders.

The SCAQMD and the Southern California Association of Governments (SCAG) are responsible for preparing the air quality management plan (AQMP), which addresses federal and state Clean Air Act requirements. The AQMP details goals, policies, and programs for improving air quality in the SoCAB.

The 2016 AQMP was adopted by the SCAQMD Governing Board on March 3, 2017. The purpose of the 2016 AQMP for the SoCAB is to set forth a comprehensive and integrated program that will lead the region into compliance with the federal 24-hour $PM_{2.5}$ air quality standard, and to provide an update to the SoCAB's commitment towards meeting the federal 8-hour ozone standards. The AQMP would also serve to satisfy recent U.S. Environmental Protection Agency (USEPA) requirements for a new attainment demonstration of the revoked 1-hour ozone standard, as well as a vehicle miles travelled (VMT) emissions offset demonstration. Specifically, the AQMP would serve as the official State Implementation Plan (SIP) submittal for the federal 2006 24-hour $PM_{2.5}$ standard. In addition, the AQMP updates specific new control measures and commitments for emissions reductions to implement the attainment strategy for the 8-hour ozone SIP. The 2016 AQMP sets forth programs which require integrated planning efforts and the cooperation of all levels of government: local, regional, state, and federal.

Responses to Checklist Questions

Responses a-c): Air quality emissions would be generated during construction and operation of the proposed project. Construction-related air quality impacts and operational air quality impacts are addressed separately below.

Construction-Related Emissions

Construction Activities/Schedule: Construction activities will consist of multiple activities over many months. These construction activities can be described as site improvements (grading, underground infrastructure, and topside improvements) and vertical construction (building construction and architectural coatings). For purposes of this analysis, it is assumed that the entire project is built-out from May 2018 to September 2019. The assumptions made for the air quality and greenhouse gas emissions analysis are included as Appendix A.

Site Improvements: For purposes of this analysis it is assumed that site improvements are installed in one phase. The site improvement phase of construction will begin with site preparation. Site preparation will include the use of rubber tired dozers and tractors/loaders/backhoes to strip (clear and grub) all organic materials and the upper half-inch to inch of soil from the project site. This task will generally take approximately three days to complete and will include vehicle trips from construction workers.

After the site is stripped of organic materials, grading will begin. This activity will involve the use of excavators, graders, dozers, loaders, and backhoes to move soil around the project site to create specific engineered grade elevations and soil compaction levels. After grading and compaction all underground infrastructure would be installed. This includes the excavation of trenches to install storm water, wastewater, potable water, and dry utilities, and then backfilling and compacting the soil over the infrastructure. Grading and infrastructure for the project site would take approximately 60 days and will include vehicle trips from construction workers. *(Note: It would be possible to grade the site under a more compacted schedule with extra equipment operating or under a longer timeframe with less equipment.).*

The last task is to install the topside improvements, which includes pouring concrete curbs, gutters, sidewalks, and access aprons and then paving of all streets and parking lots. This task will involve the use of pavers, paving equipment, and rollers and will take approximately nine days and will include vehicle trips from construction workers. *(Note: It would be possible to install the topside improvements under a more compacted schedule with extra equipment operating or under a longer timeframe with less equipment).*

Building Construction/Architectural Coatings: Building construction involves the vertical construction of structures and landscaping around the structures. This task will involve the use of cranes, forklifts, generator sets, and small tractors/loaders/backhoes. For purposes of this analysis it is assumed that the entire project is constructed in approximately 245 days (11 months). Architectural coatings involve the interior and exterior painting associated with the structures. This task will generally be completed within 245 days and will begin two months after building construction begins.

Construction Emissions: A quantification of the emissions of nitrogen oxides (NO_X), carbon monoxide (CO), coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$) that will be emitted by project construction has been performed. CalEEMod™ (v. 2016.3.1) was used to estimate construction emissions for the proposed project. Below is a list of model assumptions used in the construction screens of CalEEMod. Table 1 presents the estimated construction phase schedule, which shows the duration of each construction phase. Table 2 shows the off-

road construction equipment used during construction for each phase. Following these tables are a list of default factors that were used in the model.

Model Assumptions (Construction)

Table 1: Construction Phase

Phase #	Phase Name	Start Date	End Date	# Days/Week	# Days
1	Site Preparation	5/1/18	5/3/18	5	3
2	Grading	5/3/18	7/25/18	5	60
3	Building Construction	8/6/18	7/12/19	5	245
4	Paving	7/25/18	8/6/18	5	9
5	Architectural Coating	10/6/18	9/13/19	5	245

SOURCE: CALEEMOD (V.2016.3.1)

Table 2: Off-Road Equipment

Equipment Type	Unit Amount	Hours/Day	Horsepower	Load Factor
SITE PREPARATION				
Rubber Tired Dozers	1	6.00	367	0.48
Tractors/Loaders/Backhoes	2	6.00	97	0.37
GRADING				
Excavators	2	8.00	158	0.38
Graders	1	8.00	187	0.41
Rubber Tired Dozers	1	8.00	247	0.40
Tractors/Loaders/Backhoes	1	8.00	97	0.37
Welders	1	8.00	367	0.48
BUILDING CONSTRUCTION				
Cranes	1	3.00	231	0.29
Forklifts	1	8.00	89	0.20
Generator Sets	1	8.00	84	0.74
Tractors/Loaders/Backhoes	1	4.00	97	0.37
PAVING				
Pavers	1	8.00	130	0.42
Paving Equipment	1	6.00	132	0.36
Rollers	1	6.00	80	0.38
ARCHITECTURAL COATINGS				
Air Compressors	1	6.00	78	0.48

SOURCE: CALEEMOD (V.2016.3.1)

Table 3 shows the construction emissions for the construction years 2018 and 2019.

Table 3: Construction Emissions (Unmitigated)

Thresholds	NO_X	CO	$PM_{2.5}$	PM_{10}
	≤ 100 lbs/day	≤ 550 lbs/day	≤ 55 lbs/day	≤ 150 lbs/day
2018	60.6807	34.7414	10.0383	21.4606
2019	11.1175	9.8157	0.6959	0.9224
Maximum	**60.6807**	**34.7414**	**10.0383**	**21.4606**
Threshold Exceeded in any Year?	**No**	**No**	**No**	**No**

NOTE: LBS/DAY = POUNDS PER DAY.

SOURCE: CALEEMOD (V.2016.3.1)

The SCAQMD has established construction related emissions thresholds of significance as follows: 100 pounds per day (lbs/day) of NO_x, 550 lbs/day of CO, 55 lbs/day of $PM_{2.5}$, and 150 lbs/day of PM_{10}. If the proposed project's emissions will exceed the SCAQMD's threshold of significance for construction-generated emissions, the proposed project will have a significant impact on air quality and all feasible mitigation is required to be implemented to reduce emissions. As shown in Table 3 above, annual construction emissions of NO_x, CO, $PM_{2.5}$, and PM_{10} will not exceed the SCAQMD thresholds of significance in any given year.

The project will be subject to SCAQMD Rule 403 (Fugitive Dust) during construction. SCAQMD Rule 403 does not require a permit for construction activities, but rather, sets forth general and specific requirements for all construction sites (as well as other fugitive dust sources) in the SoCAB. The general requirement prohibits a person from causing or allowing emissions of fugitive dust from construction (or other fugitive dust source) such that the presence of such dust remains visible in the atmosphere beyond the property line of the emissions source. SCAQMD Rule 403 also prohibits a construction site from causing an incremental PM_{10} concentration impact at the property line of more than 50 micrograms per cubic meter as determined through PM_{10} high-volume sampling, but the concentration standard and associated PM_{10} sampling do not apply if specific measures identified in the rule are implemented and appropriately documented. In accordance with Rule 403, the SCAQMD requires that contractors implement Best Available Control Technology (BACT) for construction activities. Rule 403 identifies two sets of specific measures, one for all projects and another set of conditions for projects that exceed 50 acres. The proposed project will be required to implement Rule 403 during construction activities to ensure particulates are minimized.

Because construction of the proposed project would not exceed SCAQMD's air quality significance thresholds for construction emissions, the proposed project would have a ***less than significant*** impact related to construction emissions.

Operational Emissions

The SCAQMD is tasked with implementing programs and regulations required by the Federal Clean Air Act and the California Clean Air Act. In that capacity, the SCAQMD has prepared plans to attain Federal and State ambient air quality standards. To achieve attainment with the standards, the SCAQMD has established thresholds of significance for criteria pollutant emissions in its *SCAQMD Air Quality Significance Thresholds* (2015) document. Projects with emissions below the thresholds of significance for criteria pollutants would be determined to "Not conflict or obstruct implementation of the District's air quality plan".

The proposed project would be a direct and indirect source of air pollution, in that it would generate and attract vehicle trips in the region (mobile source emissions) and it would increase area source emissions and energy consumption. The mobile source emissions would be entirely from vehicles, while the area source emissions would be primarily from the use of natural gas fuel combustion, landscape fuel combustion, consumer products, and architectural coatings.

CalEEMod™ (v.2016.3.1) was used to estimate emissions for buildout of the proposed project. Table 4 shows the emissions, which include mobile, area source, and energy emissions of criteria pollutants that would result from operations of the proposed project.

Table 4: Operational Buildout Generated Emissions (Unmitigated)

	NO_X	***CO***	***$PM_{2.5}$***	***PM_{10}***
Thresholds / ***Category***	***55 lbs/day***	***550 lbs/day***	***55 lbs/day***	***150 lbs/day***
Area	1.0637	28.9816	3.7653	3.7653
Energy	0.4593	0.1955	0.0371	0.0371
Mobile	5.5041	13.5561	0.9931	3.5803
Total	**7.0271**	**42.7332**	**4.7955**	**7.3827**
Threshold Exceeded?	**No**	**No**	**No**	**No**

NOTE: LBS/DAY = POUNDS PER DAY.

SOURCE: CALEEMOD (V.2016.3.1)

The long-term operational emissions estimate for buildout of the proposed project incorporates the potential area source and vehicle emissions, and emissions associated with utility and water usage, and wastewater and solid waste generation.

The SCAQMD has established their thresholds of significance by which the project emissions are compared against to determine the level of significance. The SCAQMD has established operations related emissions thresholds of significance as follows: 55 lbs/day of NO_x, 550 lbs/day of CO, 55 lbs/day of $PM_{2.5}$, and 150 lbs/day of PM_{10}. If the proposed project's emissions will exceed the SCAQMD's threshold of significance for operational-generated emissions, the proposed project will have a significant impact on air quality and all feasible mitigation are required to be implemented to reduce emissions to the extent feasible. As shown in Table 4 above, annual emissions of NO_x, CO, $PM_{2.5}$, and PM_{10} would not exceed the SCAQMD thresholds of significance. Because the annual emissions of NO_x, CO, $PM_{2.5}$, and PM_{10} would not exceed the SCAQMD thresholds of significance, operation of the proposed project would have a ***less than significant*** impact relative to operational air emissions.

Consistency with Applicable AQMP

The proposed project is located within the SoCAB, which is under the jurisdiction of the SCAQMD. As such, SCAQMD's 2016 AQMP is the applicable air quality plan for the proposed project. Projects that are consistent with the regional population, housing, and employment forecasts identified by SCAG are considered to be consistent with the AQMP growth projections, since the forecast assumptions by SCAG forms the basis of the land use and transportation control portions of the AQMP. Additionally, because SCAG's regional growth forecasts are based upon, among other things, land uses designated in general plans, a project that is consistent with the land use designated in a general plan would also be consistent with the SCAG's regional forecast projections, and thus also with the AQMP growth projections.

The project site is identified in the General Plan as LM, the intent of which is to provide a range of housing types, including single-family detached, single-family zero lot line, patio homes and duplexes. The allowed density under the LM designation is 3.0 to 6.9 dwelling units per acre (du/ac). The proposed 49 units on 15.58 acres (30.18 total acres minus 0.43-acre park minus 0.47-acre park minus 13.7-acre Creek) would result in a density of 3.15 du/ac. The proposed housing type is single-family. Therefore, the proposed project would be consistent with the land use objectives identified in the General Plan.

As such, because the proposed development is consistent with the intent of General Plan land use policies, the growth resulting from the project is anticipated to be consistent with SCAG's

regional forecast projections and, in turn, would also be consistent with the growth projections accounted for in SCAQMD's AQMP. The project would not conflict with, or obstruct, implementation of the AQMP and this impact would be ***less than significant.***

Response d): Sensitive receptors are those parts of the population that can be severely impacted by air pollution. Sensitive receptors include children, the elderly, and the infirm. The residents located to the north and west of the project site are considered sensitive receptors. As described below, the operations of the proposed project would not contribute substantial concentrations of pollutants to sensitive receptors. The construction phase of the proposed project has the potential to increase pollution concentrations that would impact sensitive receptors.

Construction-Related Impacts on Sensitive Receptors: The construction phase of the project would be temporary and short-term, and compliance with SCAQMD Rule 403 would greatly reduce pollution concentrations generated during construction activities. Operation of the proposed project would result in emissions primarily from vehicle trips, area sources, and energy sources. As described under Response a) – c) above, the proposed project would not generate significant concentrations of air emissions. Impacts to sensitive receptors during construction would be negligible and this is a ***less than significant*** impact.

Toxic Air Contaminant Impacts on Sensitive Receptors: A toxic air contaminant (TAC) is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air. However, their high toxicity or health risk may pose a threat to public health even at very low concentrations. In general, for those TACs that may cause cancer, there is no concentration that does not present some risk. This contrasts with the criteria pollutants for which acceptable levels of exposure can be determined and for which the state and federal governments have set ambient air quality standards.

The California Air Resources Board (CARB) published the *Air Quality and Land Use Handbook: A Community Health Perspective* (2007) to provide information to local planners and decision-makers about land use compatibility issues associated with emissions from industrial, commercial and mobile sources of air pollution. The CARB Handbook indicates that mobile sources continue to be the largest overall contributors to the State's air pollution problems, representing the greatest air pollution health risk to most Californians. The most serious pollutants on a statewide basis include diesel exhaust particulate matter (diesel PM), benzene, and 1,3-butadiene, all of which are emitted by motor vehicles. These mobile source air toxics are largely associated with freeways and high traffic roads. Non-mobile source air toxics are largely associated with industrial and commercial uses. Table 5 provides the CARB minimum separation recommendations on siting sensitive land uses.

Table 5: CARB Minimum Separation Recommendations on Siting Sensitive Land Uses

Source Category	***Advisory Recommendations***
Freeways and High-Traffic Roads	• Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	• Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). • Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	• Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. • Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	• Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the CARB on the status of pending analyses of health risks.
Refineries	• Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	• Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloro-ethylene	• Avoid siting new sensitive land uses within 300 feet of any dry-cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. • Do not site new sensitive land uses in the same building with perc dry cleaning operations.
Gasoline Dispensing Facilities	• Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50-foot separation is recommended for typical gas dispensing facilities.

SOURCE: AIR QUALITY AND LAND USE HANDBOOK: A COMMUNITY HEALTH PERSPECTIVE" (CARB 2005).

The proposed project does not include any source categories. Additionally, there are no source categories that are within screening distances or minimum separation distances suggested for sensitive uses. SR 79 is the closest freeway and is located approximately 1.2 miles (6,155 feet) from the project site. The project is consistent with the *CARB Minimum Separation Recommendations on Siting Sensitive Land Uses* (2005). A health risk assessment is not warranted for any further assessment. Implementation of the proposed project would not result in an increased exposure of sensitive receptors to localized concentrations of TACs. This project would have a ***less than significant*** impact relative to this topic.

Response e): The proposed project would not generate objectionable odors. People in the immediate vicinity of construction activities may be subject to temporary odors typically associated with construction activities (diesel exhaust, hot asphalt, etc.). However, any odors generated by construction activities would be minor and would be short and temporary in duration. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

IV. BIOLOGICAL RESOURCES

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
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 Game or U.S. Fish and Wildlife Service?		X		
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 Game or US Fish and Wildlife Service?		X		
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?		X		
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?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?			X	
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?			X	

Background

The project site is located north of Nicolas Road, east of Joseph Road in Temecula, California. The project site totals approximately 30.18 acres and is currently undeveloped. The elevation of the site ranges from approximately 1,155 feet above MSL in the northeast corner to 1,138 feet above MSL on the southwest side, with gently rolling topography.

A number of relevant technical studies have been prepared for the project site including: *2017 Burrowing Owl Survey Report for the Seraphina Estates Project in the City of Temecula, Riverside County, California* (Helix Environmental Planning, August 2017) (Appendix B), *Habitat Mitigation and Monitoring Plan* (Helix Environmental Planning, September 2017) (Appendix C), *Coastal California Gnatcher Habitat Assessment and Quino Checkerspot Butterfly Surveys at the Seraphina Project Site, Riverside County, California* (Chambers Group, Inc., May 2004) (Appendix D) and *Biological Resources Surveys for the Seraphina Project Site, Riverside County, California* (Chambers Group, Inc., September 2004) (Appendix E). De Novo Planning Group peer reviewed these reports for use in the Initial Study, and performed a reconnaissance-level survey of the project site on September 20, 2017.

The proposed project includes a *Habitat Mitigation and Monitoring Plan* (Helix Environmental Planning, September 2017) that presents the mitigation and monitoring plan for impacts to jurisdictional habitat for the project. Mitigation proposed in the plan is intended to fulfill mitigation requirements of several regulatory agencies, including the USACE, RWQCB, and CDFW, and fulfill the project's obligation under CEQA. The mitigation described in the Plan will take place on the project site as establishment and re-establishment. The mitigation area will be protected in perpetuity either through inclusion in a conservation easement or the placement of a restrictive covenant.

Responses to Checklist Questions

Response a): A records search reveals that there are 49 special status plant species, 12 special status animal species, and seven sensitive communities (federal/state listed, CNPS List 1B or 2, and/or Western Riverside County MSHCP) documented within the 9-quadrangle regional search of the project site (Appendix F).

In addition to the records search, the project site has been extensively surveyed over the past decade. This included surveys performed on March 10, 18, 27, 29, April 6, and 15, and July 27, 2004 (Chambers Group, Inc), April 7, 2016 (United States Army Corps of Engineers), March 24, 2014, July 3, 7, 12, and 21, 2017 (Helix Environmental Planning), eight focused surveys performed from May 26 to July 31, 2017 (Helix Environmental Planning, and a reconnaissance-level survey on September 20, 2017 (De Novo Planning Group). These surveys included plant surveys, habitat assessments, and focused surveys for California gnatcatcher, Quino checkerspots butterfly, least Bell's vireo, and burrowing owl.

Field surveys have documented buckwheat scrub and ruderal, as well as mule fat scrub, southern riparian woodland, disturbed wetland, freshwater marsh, and streambed. There is a single stand of riparian woodland in San Gertrudis Creek, on the project site. This area is composed of winter-deciduous trees that require water near the soil surface. The on-site woodland consists primarily of red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*) in the tree and shrub strata. Mule fat scrub is a depauperate, shrubby riparian scrub community dominated by mule fat and interspersed with small willows. The on-site mule fat scrub consists of a sparse cover of mule fat interspersed with a few individuals of tarragon (*Artemisia dracunculus*), California sagebrush (*Artemisia californica*), and flat-top buckwheat *(Eriogonum fasciculatum*). Streambed is essentially unvegetated. It has very coarse soils and has only a few, scattered plants. Species noted in this habitat include mule fat, tarragon, flat-top buckwheat, salt heliotrope (*Heliotropium curassavicum*), everlasting cudweed (*Pseudognaphalium microcephalum*), and white sage (*Salvia apiana*).

There is one federally listed plant documented within the boundary of the project site. The boundary of the occurrence extends to the north well beyond the project site. The plant is San Diego ambrosia (*Ambrosia pumila*), which is federally endangered and is found in chaparral, coastal scrub, and valley and foothill grassland. They are generally found in sandy loam or clay soil (sometimes alkaline), and are typically in valleys from 3 to 580 meters. They persist where disturbance has been superficial, and are sometimes on margins or near vernal pools. The occurrence is in the northeastern portion of the project site along the utility right of way. There were four to five subpopulations with a total of 15,500 rosettes observed in 2006 (apparently fewer in 2010), and 3,561 stems observed in 2011. This portion of the project site is planned to remain undeveloped, therefore, there will not be a direct impact to this population. The following mitigation measure is designed to ensure that this area is designated as an environmentally sensitive area and that there are no disturbances to this area during

construction. This measure will ensure that any potential for impact is reduced to a less than significant level.

> ***Mitigation Measure Bio-1:*** *Prior to any permit issuance for grubbing, grading, or tree trimming/removal, fencing shall be installed in order to protect all environmentally sensitive area. The environmentally sensitive areas shall include all areas not required to be disturbed, and shall specifically include the utility right of way and San Gertrudis Creek. No vehicular or construction equipment shall be allowed into the environmentally sensitive areas.*

Based on habitat assessments, there were several special status species that warranted a closer, more focused, investigation to determine the potential for presence. This included burrowing owl, California gnatcatcher, Quino checkerspots butterfly, and least Bell's vireo.

Focused surveys were recently performed for burrowing owl on July 3, 7, 12, and 21, 2017. All potential owl burrows were checked for signs of recent owl occupation, which include: pellets/casting (regurgitated fur, bones, and insect parts), white wash (excrement), and feathers. The project area includes multiple burrows with potential to support burrowing owls. None of the burrows showed sign of current or past occupation by burrowing owl and the site is therefore not considered occupied by the burrowing owl. The MSHCP states that pre-construction surveys for burrowing owls should be conducted for all properties that contain suitable burrowing owl habitat. A pre-construction survey should be conducted prior to ground disturbance of the property. Mitigation Measure Bio-1 requires pre-construction surveys for protected birds, including burrowing owls, and provides special protections in the event that the site becomes occupied in the future. This measure will ensure that any potential for impact is reduced to a less than significant level.

> ***Mitigation Measure Bio-2:*** *Within 30 days of any ground-disturbing activities, the project applicant shall retain the services of a qualified biologist to conduct a survey of the construction zone. The City will require the developer to submit a copy of the executed contract for such services prior to the issuance of any grading permits. The survey shall occur not more than seven days prior to the initiation of those construction activities. If the biologist detects any occupied burrows of burrowing owls within the construction zone or in close proximity, they shall be mapped on construction plans and the project applicant will either perform owl evictions in conformance with the CDFW requirements, or fence off the area(s) supporting burrows with temporary construction fencing, providing a minimum buffer of 200 feet between the burrows and limits of construction. If the biologist detects any occupied nests of birds within the construction zone or in close proximity to, they shall be mapped on construction plans and the project applicant will fence off the area(s) supporting bird nests with temporary construction fencing, providing a minimum buffer of 200 feet between the nest and limits of construction. (This buffer zone shall be at least 500 feet for raptors until the young have fledged, are no longer being fed by the parents, have left the nest, and will no longer be impacted by the project.). The construction crew will be instructed to avoid any activities in the zone until the bird burrow(s)/nest(s) is/are no longer occupied, per a subsequent survey by the qualified biologist.*

A habitat assessment was performed for California gnatcatcher on the project site and it was determined that there is not suitable density of California buckwheat habitat for foraging or nesting. In addition, it was found that the habitat is isolated on the project site and that there are not appropriate characteristics on the project site to support this species.

Field surveys were conducted on the project site for Quino checkerspot butterfly. There were no host plants for this species observed during the habitat assessment or focused adult surveys. There was a total of 12 species of butterfly observed throughout the five-week season; however, this special status species was not observed. This species is presumed to be absent from the project site.

Eight focused surveyed were performed for least Bell's vireo from March 26 through July 31, 2017. The surveys determined that this species is not present on the project site.

Conclusion

The project site has been extensively surveyed for over a decade and there has not been any evidence of special status plants or wildlife on the project site. Based on site conditions and the results of focused field surveys, no special status species are anticipated to be present; however, a mitigation measure has been incorporated into the project to ensure that preconstruction surveys are performed as a final verification prior to ground disturbing activities. With the implementation of the previously list mitigation measure, the proposed project would have a **less than significant** impact on special-status species.

Responses b-c): Riparian habitat is a vegetated ecosystem found in the interface between a river or stream and adjacent uplands through which energy, materials, and water pass. These habitats are significant in ecology, environmental management, and civil engineering because of their role in soil conservation, their habitat biodiversity, and the influence they have on fauna and aquatic ecosystems, including grassland, woodland, wetland or even non-vegetative.

Sensitive natural communities are those that are considered rare in the region, support special-status plant or wildlife species, or receive regulatory protection (i.e., §404 and 401 of the Clean Water Act, the CDFG §1600 et seq. of the California Fish and Game Code, and/or the Porter-Cologne Act). In addition, the CNDDB has designated a number of communities as rare; these communities are given the highest inventory priority (Holland 1986, CDFG 2003e).

Project Habitat Types

Habitat types on site include buckwheat scrub and ruderal, as well as mule fat scrub, southern riparian woodland, disturbed wetland, freshwater marsh, and streambed.

Southern riparian woodland is typically composed of winter-deciduous trees that require water near the soil surface. Willow (*Salix* sp.), cottonwood (*Populus* sp.), and western sycamore (*Platanus racemosa*) form a dense medium height woodland or forest in moist canyons and drainage bottoms. Associated understory species may include mule fat (*Baccharis salicifolia*), stinging nettle (*Urtica dioica* ssp. *holosericea*), and wild grape (*Vitis girdiana*). The on-site woodland consists primarily of red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*) in the tree and shrub strata. There is a single stand of riparian woodland in San Gertrudis Creek, on the project site.

Mule fat scrub is a depauperate, shrubby riparian scrub community dominated by mule fat and interspersed with small willows. This vegetation community occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table. This early seral community is maintained by frequent flooding, the absence of which would lead to a cottonwood or sycamore dominated riparian woodland or forest (Holland 1986). In some environments, limited hydrology may favor the persistence of mule fat scrub. The on-site mule fat scrub consists of a sparse cover of mule fat interspersed with a few individuals of tarragon (*Artemisia dracunculus*), California sagebrush (*Artemisia californica*), and flat-top buckwheat *(Eriogonum fasciculatum*).

Streambed is essentially unvegetated. It has very coarse soils and has only a few, scattered plants. Species noted in this habitat include mule fat, tarragon, flat-top buckwheat, salt heliotrope (*Heliotropium curassavicum*), everlasting cudweed (*Pseudognaphalium microcephalum*), and white sage (*Salvia apiana*).

Jurisdictional Impacts

The project site contains habitat and wetlands under the jurisdictions of both the USACE and CDFW. The total USACE jurisdictional areas on site consist of approximately 1.92 acres: 0.16 acre of wetland waters of the U.S (WUS) and 1.77 acres of non-wetland waters of the U.S. (WUS) along a total of 2,855 linear feet. The project would result in permanent impacts to 0.08 acre (186 linear feet) of wetland WUS and 0.83 acre (2,058 linear feet) of non-wetland WUS. See Table 8.

Table 8: USACE Jurisdictional Impacts and Avoidance

Habitat Type	Existing[1]		Impacted[1]		Avoided (acres)
	Acres	Linear Feet	Acres	Linear Feet	
Wetland WUS					
Mule Fat Scrub	0.08	0	0.03	0	0.05
Southern Riparian Woodland	0.06	135	0.03	135	0.03
Disturbed Wetland	0.01	113	0.01	20	0.00
Freshwater Marsh	0.01	31	0.01	31	0.00
Non-Wetland WUS					
Streambed	1.77	2,576	0.83	2,058	0.93
TOTAL	*1.92*	*2,855*	*0.91*	*2,244*	*1.01*

NOTES: ACREAGE IS ROUNDED TO THE NEAREST 0.01. LINEAR FEET ARE ROUNDED TO THE NEAREST WHOLE FOOT.
[1] INCLUDES OFF-SITE IMPACT AREAS.
SOURCE: HELIX ENVIRONMENTAL, 2017.

Habitat under CDFW jurisdiction located on the project site totals 3.15 acres, of which 0.45 acre consists of vegetated riparian habitat. The project would impact 1.70 acres of waters of the state (WS) consisting of 0.33 acre of vegetated riparian habitats and 1.37 acres of streambed. See Table 9.

Table 9: CDFW Jurisdictional Impacts and Avoidance

Habitat Type	Existing[1]		Impacted[1]		Avoided (acres)
	Acres	Linear Feet	Acres	Linear Feet	
Vegetated Riparian Habitat					
Mule Fat Scrub	0.17	0	0.08	0	0.08
Southern Riparian Woodland	0.21	135	0.18	135	0.05
Disturbed Wetland	0.06	113	0.06	113	0.00
Freshwater Marsh	0.01	31	0.01	31	0.00
Southern Willow Scrub	0.01	19	0.01	19	0.00
Streambed					
Streambed	3.03	2,576	1.37	2,191	1.66
TOTAL	*3.49*	*2,874*	*1.70*	*2,489*	*1.79*

NOTES: ACREAGE IS ROUNDED TO THE NEAREST 0.01. LINEAR FEET ARE ROUNDED TO THE NEAREST WHOLE FOOT.
[1] INCLUDES OFF-SITE IMPACT AREAS.
SOURCE: HELIX ENVIRONMENTAL, 2017.

The project has been designed to avoid impacts to Santa Gertrudis Creek to the greatest extent possible. Two small tributary drainages on the northern portion of the site will be impacted. Along Santa Gertrudis Creek, the northern and southern banks of the channel will be reinforced with riprap. On the west side of the project site, the riprap will impact 0.23 acre of streambed and less than 0.01 acre of mule fat scrub on the north side of Santa Gertrudis Creek. Santa Gertrudis Creek will be realigned on the east side of the project site to allow room for the

widening of Nicolas Road, as required by the City. The road widening will require substantial fill, pavement, and a riprap slope extending across Santa Gertrudis Creek. On the east side of the project site, including off-site impacts, road widening will impact 1.09 acres of streambed and 0.08 acre of mule fat scrub. The existing San Diego aqueduct crosses Santa Gertrudis Creek near the eastern project boundary, and will need to be protected from existing and future scour by a concrete and riprap cover. These impacts are included in the road widening impacts noted above.

Mitigation Requirements

Pursuant to Section 404 of the federal Clean Water Act, the USACE regulates the discharge of fill material into WUS and evaluates the impacts of the placement of proposed fill into such waters. Under Section 401 of the federal Clean Water Act, the RWQCB also has authority over USACE jurisdictional areas. The CDFW regulates impacts to wetland and streambed habitats pursuant to Section 1602 of the California Fish and Game Code. To ensure no-net-loss of functions and services, the compensatory mitigation is required for all jurisdictional impacts.

Waters of the U.S.

Construction of the residential development requires impacts to a total of 0.08 acre (186 linear feet) of USACE jurisdictional wetland WUS and 0.83 acre (2,058 linear feet) of USACE jurisdictional non-wetland WUS. Mitigation ratios of 2:1 for non-wetland WUS and 3:1 for wetland WUS result in a total of 1.90 acres of mitigation, which will be completed on-site through a combination of 1.75 acres of streambed/riparian scrub establishment/re-establishment and through purchase of 0.15 mitigation credits from the Barry Jones Wetland Mitigation Bank (Table 10).

Table 10: CDFW Jurisdictional Impacts and Avoidance

Vegetation Type	*Impacts (Acres)*	*Mitigation Ratio*	*Total Mitigation (Acres)*
Wetland WUS	0.08	3:1	0.24
Non-wetland WUS	0.083	2:1	1.66
TOTAL	*0.91*	--	*1.90*

NOTES: ACREAGE IS ROUNDED TO THE NEAREST 0.01. LINEAR FEET ARE ROUNDED TO THE NEAREST WHOLE FOOT.

[1] INCLUDES OFF-SITE IMPACT AREAS.

SOURCE: HELIX ENVIRONMENTAL, 2017.

Waters of the State / CDFW Habitat

Mitigation for impacts to vegetated CDFW habitats will be at a 3:1 ratio while impacts to unvegetated streambed will be mitigated at a 2:1 ratio (Table 11; Figure 9. A total of 3.73 acres of mitigation will occur through a combination of on-site establishment and re-establishment of 3.58 acres of streambed/riparian scrub, and through purchase of 0.15 mitigation credits from the Barry Jones Wetland Mitigation Bank. The mitigation will include a minimum of 1:1 establishment or re-establishment. Mitigation for unavoidable impacts to WS resources will be biologically equivalent or superior to resources being impacted by the proposed project.

Table 11: CDFW Jurisdictional Impacts and Avoidance

Vegetation Type	*Impacts (Acres)*	*Mitigation Ratio*	*Mitigation Required (Acres)*
Mule Fat Scrub	0.08	3:1	0.24
Southern Riparian Woodland	0.17	3:1	0.51
Disturbed Wetland	0.06	3:1	0.18
Freshwater Marsh	0.01	3:1	0.03
Southern Willow Scrub	0.01	3:1	0.03
Streambed	1.37	2:1	2.74
TOTAL	*1.70*	--	*3.73*

NOTES: ACREAGE IS ROUNDED TO THE NEAREST 0.01. LINEAR FEET ARE ROUNDED TO THE NEAREST WHOLE FOOT.
[1] INCLUDES OFF-SITE IMPACT AREAS.
SOURCE: HELIX ENVIRONMENTAL, 2017.

Additional Water Quality Linear Foot Requirements

In order to address the loss of linear foot functions and services of the Santa Gertrudis Creek and two side tributaries, the project mitigation includes the redirecting of the existing flows from the easternmost tributary, Drainage 2, to an earthen streambed along the eastern boundary of the site (Figure 7). This, combined with the length of the low flow channel through the restored portions of Santa Gertrudis Creek, will result in a total of 2,150 linear feet of mitigation, which is approximately 86 percent (2,150/2,489 feet) of the linear feet being impacted.

Mitigation Area Location

Mitigation for the proposed project will occur on the project site within the existing and realigned portions of Santa Gertrudis Creek and the eastern portion of the site (Figure 9), and through purchase of 0.15 mitigation credit from the Barry Jones Wetland Mitigation Bank. Santa Gertrudis Creek runs along the southern portion of the site, north of Nicolas Road. The existing creek will be realigned and widened as mitigation for the project. Additionally, Drainage 2 is being directed to an earthen streambed along the eastern boundary of the site to offset functions and services lost from impacts associated with the two side tributaries. The Barry Jones Mitigation Bank is located approximately 1.2 miles north of the project site.

Conclusion

As demonstrated above, the potential impacts to habitat and on-site wetlands would be mitigated on- and off-site. The project would comply with the Habitat Mitigation and Monitoring Plan, as well as all regulatory requirements pertaining to wetlands and/or jurisdictional areas. With implementation of the following mitigation, implementation of the proposed project would have a ***less than significant*** impact relative to this issue.

> ***Mitigation Measure Bio-3****: Prior to any construction activities that would disturb protected wetlands and/or jurisdictional areas on the project site, the appropriate state and federal authorizations (Streambed Alteration Agreement, Section 404 permit, Section 401 water quality certification) shall be obtained. All requirements of these authorizations shall be adhered to throughout the construction phase.*
>
> ***Mitigation Measure Bio-4****: The project proponent shall compensate for any authorized disturbance to protected wetlands and/or jurisdictional areas at a minimum of 1:1 establishment or re-establishment to ensure no net loss of habitat functions and values, pursuant to the Habitat Mitigation and Monitoring Plan (Helix Environmental Planning, 2017). Compensation ratios shall be based on site-specific information and determined through coordination with state, federal, and local agencies as part of the permitting process for the project. The regulatory/permitting agency shall determine the actual ratio of*

restored, created, and/or preserved for protected wetlands and/or jurisdictional areas disturbed. Compensation may comprise onsite restoration/creation, off-site restoration, preservation, or mitigation credits (or a combination of these elements) if approved by the regulatory/permitting agency.

Response d): The project site is currently undeveloped and does not serve as a wildlife nursery site. Santa Gertrudis Creek is the main drainage occurring on site and will be widened and realigned as part of the project. The creek provides wildlife habitat, sediment transport, infiltration, and flood control functions. The two drainages in the northern portion of the site are narrow, ephemeral streambeds that provide limited wildlife habitat and sediment transport functions. The on-site drainages support very marginal habitat for listed species such as least Bell's vireo (*Vireo bellii pusillus*); the site is not suitable for the southwestern willow flycatcher (*Empidonax traillii extimus*). Focused surveys for the least Bell's vireo in 2017 have been negative to date.

The project has been designed to avoid impacts to Santa Gertrudis Creek to the greatest extent possible. Along Santa Gertrudis Creek, the northern and southern banks of the channel will be reinforced with riprap. On the west side of the project site, the riprap will impact 0.23 acre of streambed and less than 0.01 acre of mule fat scrub on the north side of Santa Gertrudis Creek. Santa Gertrudis Creek will be realigned on the east side of the project site to allow room for the widening of Nicolas Road, as required by the City. The road widening will require substantial fill, pavement, and a riprap slope extending across Santa Gertrudis Creek. On the east side of the project site, including off-site impacts, road widening will impact 1.09 acres of streambed and 0.08 acre of mule fat scrub. The existing San Diego aqueduct crosses Santa Gertrudis Creek near the eastern project boundary, and will need to be protected from existing and future scour by a concrete and riprap cover. These impacts are included in the road widening impacts noted above.

The proposed project would not 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. Implementation of the proposed project would result in a ***less than significant*** impact relative to this topic.

Response e): The removal of certain trees are regulated via the City's Heritage Tree Ordinance (Municipal Code Section 8.48.1360), which defines heritage tree and outlines the permit requirements for cutting, removing, relocating, or encroaching on a heritage tree. The project site contains some trees in the area that is characterized as southern riparian woodland, however, none of these trees meets the definition of a heritage tree. Implementation of the proposed project would have a ***less than significant*** impact relative to this issue.

Response f): The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) is a comprehensive, multijurisdictional plan focused on conservation of species and their associated habitats in Western Riverside County. The MSHCP is one of several large, multijurisdictional habitat-planning efforts in Southern California, with the overall goal of maintaining biological and ecological diversity within a rapidly urbanizing region. The MSHCP allows Riverside County and the cities within the County to better control local land-use decisions and maintain a strong economic climate in the region while addressing the requirements of the State and federal Endangered Species Acts.

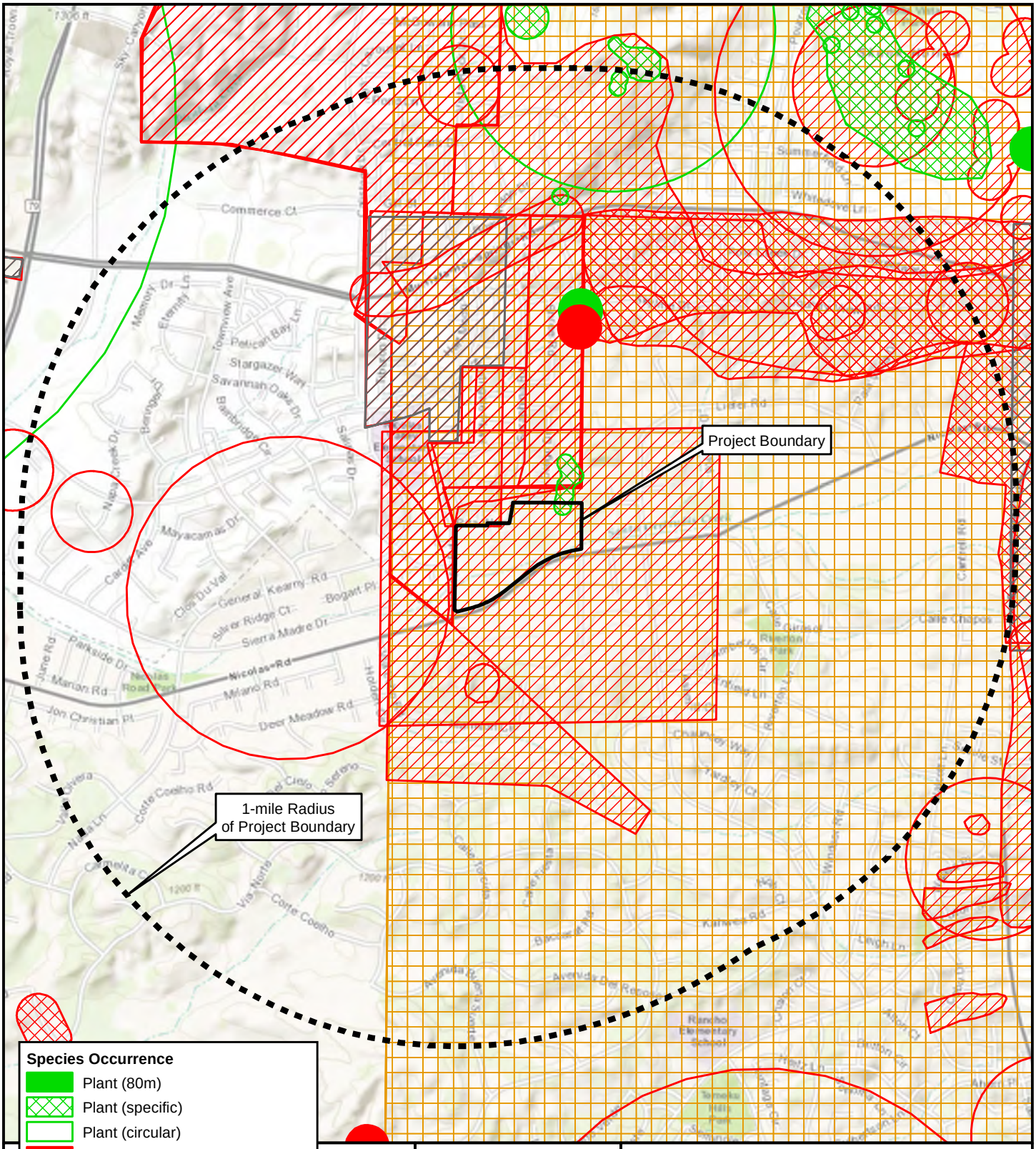
The MSHCP Plan Area encompasses approximately 1.26 million acres, including all unincorporated Riverside County land west of the crest of the San Jacinto Mountains to the

Orange County line. It includes the cities of Temecula, Murrieta, Lake Elsinore, Canyon Lake, Norco, Corona, Riverside, Moreno Valley, Banning, Beaumont, Calimesa, Perris, Hemet, and San Jacinto. The HCP covers multiple species and multiple habitats within a diverse landscape, from urban centers to undeveloped foothills and forests, under multiple jurisdictions. The Plan extends across many bioregions, including the Santa Ana Mountains, Riverside Lowlands, San Jacinto Foothills, San Jacinto Mountains, Agua Tibia Mountains, Desert Transition, and San Bernardino Mountains and establishes a coordinated implementation program to preserve biological diversity and maintain the region's quality of life.

A Criteria Cell describes areas where MSHCP conservation will be focused. The MSHCP Conservation Area comprises a variety of existing and proposed Cores, Linkages, Constrained Linkages and Noncontiguous Habitat Blocks (referred to generally as "Cores and Linkages"). The MSHCP Conservation Area will be comprised of existing Public/Quasi-Public Lands and new Conservation on approximately 153,000 acres of land within the Criteria Area.

According to the *Habitat Mitigation and Monitoring Plan* (Helix Environmental Planning, 2017), the project site is not located within an MSHCP Criteria Cell. The project site is also not within any Conservation Area or Cores and Linkages Subunits. However, compliance with the MSHCP requires development projects even outside of these special areas to submit a pre-application review and payment of associated mitigation fees to the County of Riverside Transportation and Land Management Agency. Payment of the mitigation fees and compliance with the requirements of Section 6.0 of the MSHCP are intended to provide full mitigation under CEQA, the National Environmental Policy Act (NEPA), Federal Endangered Species Act, and California Endangered Species Act for impacts to the species and habitat covered by the MHSCP pursuant to agreements with the USFWS, CDFW, and/or any other appropriate participating regulatory agencies and as set for the in the Implementation Agreement for the MHSCP.

The proposed project is subject to the MSHCP, and prior to ground disturbing activities, the project proponent will submit the appropriate application and mitigation fee payment to the County of Riverside Transportation and Land Management Agency. Additionally, the project proponent will be subject to any specific measures issued for the proposed project. The proposed project would have a ***less than significant*** impact relative to this issue.



CNDDB version 10/03/2017. Please Note: the occurrences shown on this map represent the known locations of the species listed here as of the date of this version. There may be additional occurrences or additional species within this area which have not been surveyed and/or mapped. Lack of information in the CNDDB about a species or an area can never be used as proof that no special status species occur in an area. Basemap: ArcGIS Online Topographic Map Service. Map date: October 4, 2017.

SERAPHINA (TTM37290)

Figure 8. California Natural Diversity Database

1-mile Radius Search

De Novo Planning Group

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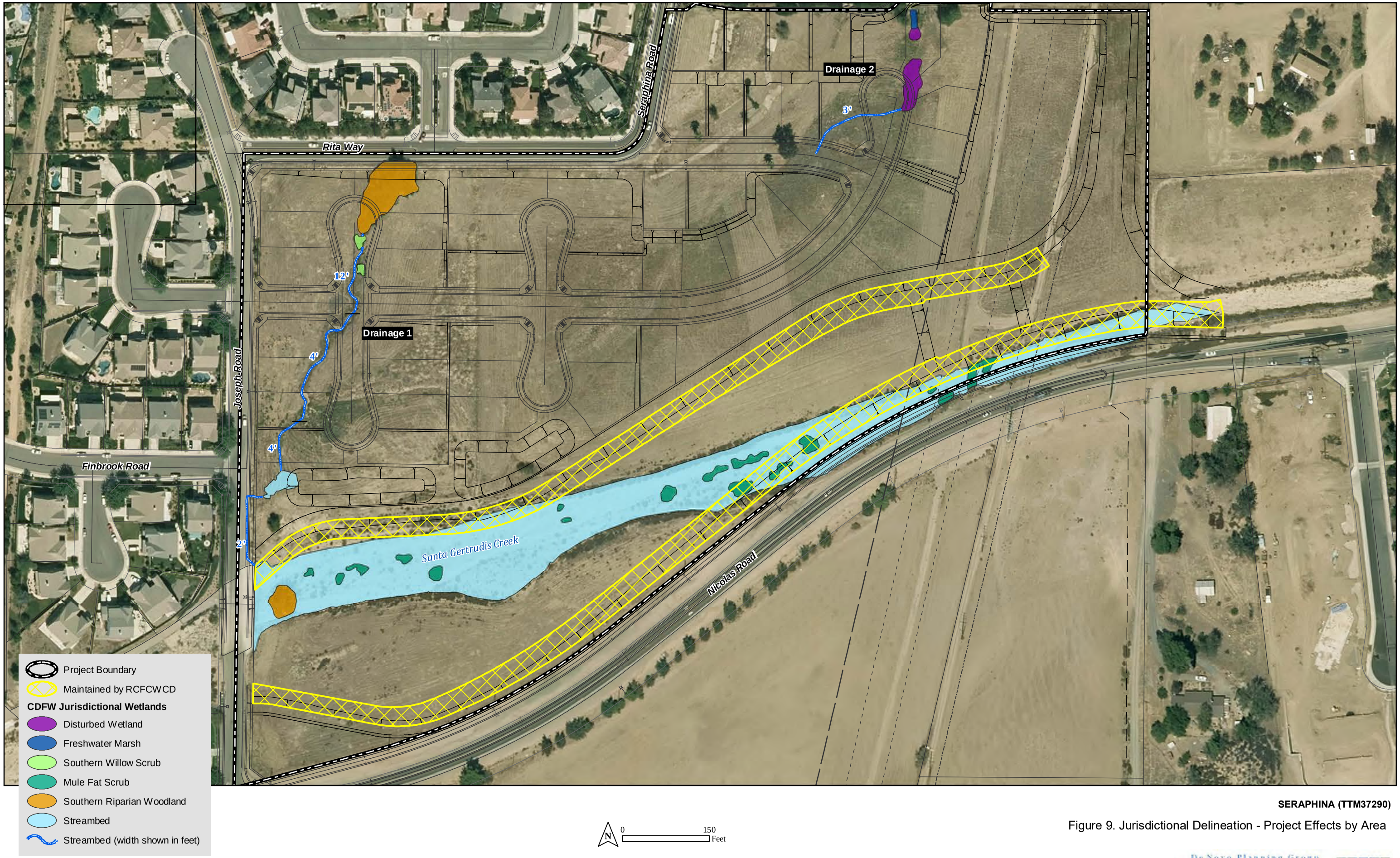

SERAPHINA (TTM37290)

Figure 9. Jurisdictional Delineation - Project Effects by Area

Source: *Helix Environmental Planning. Map date: October 5, 2017.*

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

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V. CULTURAL RESOURCES

Would the project:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to '15064.5?		X		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		
d) Disturb any human remains, including those interred outside of formal cemeteries?		X		

Responses to Checklist Questions

Response a): A Cultural Resources Survey Report, including a site visit conducted on February 23, 2017, was prepared for the project (Helix Environmental Planning, February 28, 2017). The cultural resources assessment is included as Appendix G.

Historic resources generally consist of buildings, structures, improvements, and remnants associated with a significant historic event or person(s) and/or having a historically significant style, design, or achievement. Damage to or demolition of such resources is typically considered to be a significant impact. Impacts to historic resources can occur through direct impacts, such as destruction or removal, and through indirect impacts, such as a change in the setting of a historic resource.

The Pechanga Band of Luiseño Indians states that the project area is part of Luiseño, and therefore the Tribe's, aboriginal territory (letter from Pechanga Cultural Resources, Temecula Band of Luiseño Mission Indians, dated March 13, 2017). The traditional territory of the Luiseño includes Luiseño place names, "tóota yixélval" (pictographs, rock art, and petroglyphs), village complexes, sacred places, tribal cultural places, and other tangible and intangible tribal cultural resources. The Pechanga Band of Luiseño Indians is a federally-recognized Indian tribe and sovereign government.

A record search of previously recorded archaeological resources, reports, and historic addresses of the project area and a 1-mile radius was requested from the Eastern Information Center (EIC). The EIC records search revealed that 39 cultural resources studies have been conducted within the search radius, four of which covered portions of the project site and two of which were directly adjacent to the site. The record search results indicate that nine cultural resources have been previously recorded within a one-mile radius of the project site. These sites include two artifact scatters consisting of ground stone implements and fragments; one bedrock milling feature with a light artifact scatter; one lithic scatter with ground stone manos, a core tool, and a core; and five isolated artifacts. No cultural resources identified by the record search have been identified on the project site. The nearest historic-period recorded resources are located within a ¼-mile and to the north and to the southeast of the project site. All three of these resources are isolated artifacts, and include a metate fragment (P-33-013327), a core tool (P-33-013328), and a quartz flake (P-33-017881). No buildings or structures are shown on the project site on historic topographic maps, including the 1901 USGS 30-minute Elsinore quadrangle, the 1943 War Department 15-minute Murrieta quadrangle, and the 1953 USGS 7.5-

minute Bachelor Mountain quadrangle. Nicolas Road is shown in its present location by 1901, but no structures are shown in the immediate vicinity of the project area. Additionally, during the field survey, no surface cultural resources were recorded within the project site boundaries.

According to the Cultural Resources Survey Report, cultural resources that weren't visible during the site survey could potentially be encountered during grading and other ground-disturbing activity. Although the three closest resources to the project site are isolated artifacts, their presence in the vicinity does indicate that the area was traveled by pre-contact native inhabitants. Mitigation Measures Cul-1 through Cul-8 require the presence of an archaeological monitor and Pechanga Tribal Monitor during all project-related ground disturbance activities. With adherence to Mitigation Measures Cul-1 through Cul-8, the project would not cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064, and any potential impact would be reduced to a ***less than significant*** level.

Mitigation Measure Cul-1: *A Riverside County qualified/City of Temecula approved professional archaeological monitor shall be retained by the project applicant and be present to monitor all ground-disturbing activities associated with the project. The archaeological monitor shall work under the direct supervision of a Cultural Resources Professional that meets the Secretary of the Interior's Professional Qualification Standards for Archaeology (U.S. Department of Interior, 2012) and as approved by the City of Temecula to provide archaeological expertise in carrying out all mitigation measures related to archaeological resources (Mitigation Measures Cul-2, Cul-3, and Cul-5).*

Mitigation Measure Cul-2: *The qualified archaeologist, or an archaeologist working under the direction of the qualified archaeologist, along with a representative of the Pechanga Tribe, shall conduct pre-construction cultural resources worker sensitivity training to inform construction personnel of the types of cultural resources that may be encountered, and to bring awareness to personnel of actions to be taken in the event of a cultural resources discovery. The City shall ensure that construction personnel are made available for and attend the training and shall retain documentation demonstrating attendance.*

Mitigation Measure Cul-3: *Prior to the start of ground-disturbing activities, the qualified archaeologist shall designate an archaeological monitor to observe ground-disturbing activities, including but not limited to, brush clearance and grubbing, grading, trenching, excavation, and the construction of fencing and access roads, in consultation with the Pechanga tribal monitor. If ground-disturbing activities occur simultaneously in two or more areas located more than 500 feet apart, additional archaeological monitors may be required. Any newly discovered cultural resource deposits shall be subject to a cultural resources evaluation (see Mitigation Measure Cul-8). The archaeological monitor's authority to stop and redirect grading shall be exercised in consultation with the Pechanga Tribe in order to evaluate the significance of any potential resources discovered on the project site. The archaeological monitor shall keep daily logs. After monitoring is complete, the qualified archaeologist shall prepare a monitoring report that details the results of monitoring activities, which shall be submitted to the City, Pechanga Tribe, and the EIC at the University of California, Riverside.*

Mitigation Measure Cul-4: *At least 30 days and no more than 60 days prior to the issuance of a grading permit, the City shall contact and coordinate with the Pechanga Tribe to develop a Cultural Resources Treatment and Monitoring Agreement (Agreement). The Agreement shall be in place prior to issuance of a grading permit. The Agreement shall address the treatment and disposition of known cultural resources; the designation, responsibilities, and participation of professional Pechanga Tribal monitors during grading, excavation, and all 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.*

The Pechanga Tribal monitor shall have the limited authority to stop and redirect grading activities should an inadvertent cultural resource be identified. The Pechanga monitor's authority to stop and redirect grading shall be exercised in consultation with the project archaeologist in order to evaluate the significance of any potential resources discovered on the project site. The Pechanga Tribal monitor shall be allowed to observe ground-disturbing activities, including but not limited to, brush clearance and grubbing, grading, trenching, excavation, and the construction of fencing and access roads, in consultation with the archaeological monitor. If ground-disturbing activities occur simultaneously in two or more areas located more than 500 feet apart, additional archaeological monitors may be required. The Pechanga Tribal monitor shall keep daily logs. If ground-disturbing activities occur simultaneously in two or more locations, additional Pechanga Tribal monitors may be required.

Mitigation Measure Cul-5: *If inadvertent discoveries of subsurface archaeological/cultural resources are made during ground-disturbing activities, the applicant, the qualified archaeologist, and the Pechanga Tribe shall assess the significance of such resources and shall meet and confer regarding the mitigation for such resources. Pursuant to Public Resources Code (PRC) Section 21083.2(b), avoidance is the preferred method of preservation for archaeological resources. PRC Section 21084.3 further requires that agencies shall avoid damaging effects to tribal cultural resources, if feasible. If the City, the qualified archaeologist, and the Pechanga Tribe cannot agree on the significance or the mitigation for such resources, these issues will be presented to the City Community Development Director for decision. The City Community Development Director shall make the determination based on the provisions of CEQA with respect to archaeological resources and shall take into account the religious beliefs, customs, and practices of the Pechanga Tribe. Notwithstanding any other rights available under law, the decision of the City Community Development Director shall be appealable to the City Planning Commission and/or City Council.*

Mitigation Measure Cul-6: *The following shall be included in the "Notes" section of the proposed project Grading Plan: "The City (and/or landowner) shall agree to relinquish ownership of all cultural resources, including sacred items, burial goods, and all archaeological artifacts that are recovered as a result of project implementation, to the Pechanga Tribe for proper treatment and disposition as outlined in the Cultural Resources Treatment and Monitoring Agreement (Agreement)" (as required by Mitigation Measure Cul-4).*

Mitigation Measure Cul-7: *The following shall be included in the "Notes" section of the proposed project Grading Plan: "All sacred sites, should they be encountered within the project area, shall be avoided and preserved as the preferred mitigation, if feasible."*

Mitigation Measure Cul-8: *The following shall be included in the "Notes" section of the proposed project Grading Plan:*

- *"If at any time during excavation/construction of the site, archaeological/cultural resources, or any artifacts or other objects which reasonably appear to be evidence of cultural or archaeological resources are discovered, the property owner shall immediately advise the City of such and the City shall cause all further excavation or other disturbance of the affected area to immediately cease. The Director of Community Development at his/her sole discretion may require the property owner to deposit a sum of money it deems reasonably necessary to allow the City to consult and/or authorize an independent, fully qualified specialist to inspect the site at no cost to the City, in order to assess the significance of the find. Upon determining that the discovery is not an archaeological/ cultural resource, the Community Development Director shall notify the property owner of such determination and shall authorize the resumption of work. Upon determining that the discovery is an archaeological/cultural resource, the Community Development Director shall notify the property owner that no further excavation or development may take place until a mitigation plan or other corrective measures have been approved by the Community Development Director."*

- *"If cultural resources are discovered during the project construction (inadvertent discoveries), all work in the area of the find shall cease, and the qualified archaeologist and the Pechanga monitor shall investigate the find, and make recommendations as to treatment."*

- *"A qualified archaeological monitor shall be present and shall have the authority to stop and redirect grading activities, in consultation with the Pechanga Tribe and their designated monitors, to evaluate the significance of any potential resources discovered on the project site."*

- *"A Pechanga Tribal monitor shall be present and shall have the authority to stop and redirect grading activities, in consultation with the project archaeologist and their designated monitors, to evaluate the significance of any potential resources discovered on the project site."*

Response b): Archaeological sites are locations that contain resources associated with former human activities and may contain such resources as human skeletal remains, waste from tool manufacture, tool concentrations, and/or discoloration or accumulation of soil or food remains. As described above, no archaeological resources have been identified within the project site boundaries; however, nine sites were identified within a mile of the project site.

Ground-disturbing activities have the potential to yield buried deposits not observed on the surface during surveys. Mitigation Measures Cul-1 through Cul-8 would be implemented for all ground-disturbing activities and would require the presence of an archaeological monitor and Pechanga Tribe representative during ground-disturbing activities to monitor excavation activities. The qualified archaeologist would have the authority to stop or divert construction excavation as necessary to protect resources consistent with State law. With the implementation of Mitigation Measures Cul-1 through Cul-8, impacts to archaeological resources would be mitigated to ***less than significant***.

*Implement **Mitigation Measures Cul-1** through **Cul-8.***

Response c): Paleontological resources are the preserved fossilized remains of plants and animals. Fossils and traces of fossils are preserved in sedimentary rock units, particularly fine- to medium-grained marine, lake, and stream deposits, such as limestone, siltstone, sandstone, or shale, and in ancient soils (paleosols). They are also found in coarse-grained sediments, such as conglomerates or coarse alluvium sediments. Fossils are rarely preserved in igneous or metamorphic rock units. Fossils may occur throughout a sedimentary unit and, in fact, are more likely to be preserved subsurface, where they have not been damaged or destroyed by previous ground disturbance, amateur collecting, or natural causes such as erosion. In contrast, archaeological and historic resources are often recognized by surface evidence of their presence.

No cultural resources were observed during the 2017 field survey; dense grasses and forbs covered a majority of the project area, apart from dirt roads and within the limits of Santa Gertrudis Creek. According to the Cultural Resources Survey Report, the northern portion of the project site appears to have been subjected to heavier disturbance than the remainder of the site, including electrical utilities, concrete pads, and evidence of grading (terraced area for concrete pads). East of the southern end of the tributary drainage to Santa Gertrudis Creek, numerous dumped piles of soil with concrete and asphalt slabs, PVC pipe, electrical conduit and wiring, and other modern debris (building tiles, modern glass) were observed. Several areas within the project site bear evidence of machine manipulation, including constructed berms, a rusted trailer that looked as though it was going to be buried but was never backfilled, and headrows left by discing. Raw materials observed during the survey include numerous unmodified quartz and quartzite cobbles and metavolcanic cobbles. One fossilized oyster shell

was also observed near the project's western boundary just west of the concrete pads described above; the shell was located on the top of the manufactured slope leading down to the street level of Joseph Road. Soils onsite consisted of a fine- to coarse-grained sandy loam. Refer to Appendix G for the full Report.

Additionally, the Environmental Impact Report (EIR) for the City of Temecula General Plan identifies the project site as a highly sensitive area for paleontological resources (General Plan Figure 5-7). Ground-disturbing activities have the potential to yield archaeological resources. Mitigation Measures Cul-1 through Cul-8 would be implemented for all ground-disturbing activities and would require the presence of an archaeological monitor and Pechanga Tribe representative during ground-disturbing activities to monitor excavation activities. With the implementation of Mitigation Measures Cul-1 through Cul-8, impacts to archaeological resources would be mitigated to ***less than significant***.

*Implement **Mitigation Measures Cul-1** through **Cul-8.***

Response d): It is not anticipated that human remains or informal cemetery areas are present on the project site; however, ground-disturbing activities such as grading or excavation have the potential to disturb human remains. If human remains are found, those remains would require proper treatment, in accordance with applicable laws. California PRC Section 5097.98 and Health and Safety Code Sections 7050.5-7055 describe the general provisions regarding human remains, including requirements if any human remains are accidentally discovered during excavation of a site.

As required by State law, the requirements and procedures set forth in Section 5097.98 of the California PRC would be implemented, including notification of the County Coroner, notification of the Native American Heritage Commission (NAHC), and consultation with the individual identified by the NAHC to be the "most likely descendant."

If human remains are found during excavation, Mitigation Measure Cul-9 requires that construction activities be halted in the vicinity of the find and any area that is reasonably suspected to overlie adjacent remains until the County Coroner has been notified, and the remains have been investigated and appropriate recommendations have been made for the treatment and removal of the remains. Compliance with Federal and State regulations, which detail the appropriate actions necessary in the event human remains are encountered, in addition to Mitigation Measure Cul-9, will ensure that potential impacts to human remains are ***less than significant***.

Mitigation Measure Cul-9: *Consistent with State CEQA Guidelines Section 15064.5, Subdivision (e), in the event of an accidental discovery or recognition of any human remains, the Riverside County Coroner shall be notified and construction activities at the affected work site shall be halted. Further, pursuant to PRC Section 5079.98(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 Riverside County Coroner shall notify the NAHC within 24 hours. The NAHC must immediately notify the "most likely descendant(s)" under PRC Section 5097.98, and the descendants must make recommendations or state their preference for treatment within 48 hours of being granted access as identified in the Agreement described in Mitigation Measure Cul-4.*

VI. GEOLOGY AND SOILS

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation***	***Less Than Significant Impact***	***No Impact***
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.			X	
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?			X	
b) Result in substantial soil erosion or the loss of topsoil?		X		
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?		X		
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?		X		
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?				X

Background

A Geotechnical/Geological Engineering Study (EnGEN Corporation, 2003) was prepared for the project site in association with a previously proposed development (Appendix H). As part of this Study, six exploratory borings were excavated on the project site at a maximum depth of approximately 51.5 feet below ground surface. Additionally, a Geotechnical Investigation (CHJ, Inc., 2004) was also prepared for the site (Appendix I). De Novo Planning Group peer reviewed these reports for use in the Initial Study.

Responses to Checklist Questions

Responses a.i), a.ii), aiii): The project site is within the City of Temecula, Riverside County. As shown in Figure 10, the City contains land within a delineated Alquist-Priolo Earthquake Fault Zone. However, the Alquist-Priolo Earthquake Fault Zone is located approximately 2.9 miles west of the project site. Additionally, mapped earthquake faults exist within the City and region,

although none cross the project site. The nearest mapped fault, the Murrietta Hot Springs fault, is located approximately 1.6 miles north of the site.

All of Southern California, including the project site, is considered to be a seismically active region. Seismic hazards that may affect the site include ground shaking, liquefaction, and dynamic settlement. Due to lack of faults in the immediate vicinity of the project site, other hazards such as ground rupture along a pre-existing fault of grounds lurching are considered unlikely.

Liquefaction normally occurs when sites underlain by saturated, loose to medium dense, granular soils are subjected to relatively high ground shaking. During an earthquake, ground shaking may cause certain types of soil deposits to lose shear strength, resulting in ground settlement, oscillation, loss of bearing capacity, landsliding, and the buoyant rise of buried structures. The majority of liquefaction hazards are associated with sandy soils, silty soils of low plasticity, and some gravelly soils. Cohesive soils are generally not considered to be susceptible to liquefaction. In general, liquefaction hazards are most severe within the upper 50 feet of the surface, except where slope faces or deep foundations are present. The on-site soils are fine-grained in nature (fine- to medium-grained silty sands, medium-grained poorly graded sands, sandy silts). According to the Geotechnical/Geological Engineering Study (EnGEN Corporation, 2003), the potential for liquefaction of the site is considered moderate to high.

In order to minimize potential damage to the buildings and site improvements, all construction in California is required to be designed in accordance with the latest seismic design standards of the California Building Code. The California Building Code, Title 24, Part 2, Chapter 16 addresses structural design and Chapter 18 addresses soils and foundations. Collectively, these state requirements, which have been adopted by the City of Temecula, include design standards and requirements that are intended to minimize impacts to structures in seismically active areas of California. Section 1613 specifically provides structural design standards for earthquake loads. Section 1803.5.11 and 1803.5.12 provide requirements for geotechnical investigations for structures assigned varying Seismic Design Categories in accordance with Section 1613. Design in accordance with these standards and policies would reduce any potential impact to the extent feasible. Absent any known faults, and because development of the proposed project must be designed in conformance with state and local standards and policies that minimize risk from seismic shaking to the extent practicable, any potential impact would be ***less than significant***.

Response a.iv): There are several categories of landslides including: rockfalls, deep slope failure, and shallow slope failure. Factors such as the geological conditions, drainage, slope, vegetation, and others directly affect the potential for landslides. One of the most common causes of landslides is construction activity that is associated with road building (i.e. cut and fill). Figure 12 shows the landslide potential for the project site. As shown in the figure, the project site is located within an area of low landslide susceptibility. This is a ***less than significant*** impact and no mitigation is required.

Response b): The project site is currently undeveloped and is not at significant risk of erosion under the existing conditions. Construction activities including grading could temporarily increase soil erosion during and shortly after project construction if not properly managed. Construction-related erosion could result in the loss of a substantial amount of nonrenewable topsoil and could adversely affect water quality in nearby surface waters.

The RWQCB requires a project specific Storm Water Pollution Prevention Plan (SWPPP) to be prepared for each project that disturbs an area one acre or larger. The SWPPP includes project specific best management measures that are designed to control drainage and erosion. The proposed project includes detailed project specific drainage plan that control storm water runoff and erosion, both during and after construction. This plan is subject to the review and approval of the City through the improvement plan process.

A Preliminary Drainage Study was prepared for the project (Michael Baker International, April 2017). The Study provides the hydrologic and hydraulic basis of design for the proposed flood control features. The SWPPP and the project specific drainage study will manage storm water and reduce the potential for erosion. Implementation of the following mitigation measure would ensure that the proposed project would result in a ***less-than-significant*** impact relative to this topic.

> ***Mitigation Measure Geo-1:*** *The project applicant shall submit a Notice of Intent (NOI) and Storm Water Pollution Prevention Plan (SWPPP) to the RWQCB in accordance with the NPDES General Construction Permit requirements. The SWPPP shall be designed to control pollutant discharges utilizing Best Management Practices (BMPs) and technology to reduce erosion and sediments. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater runoff from the project site. Measures shall include temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) that will be employed to control erosion from disturbed areas. Final selection of BMPs will be subject to approval by the City and the RWQCB. The SWPPP will be kept on site during construction activity and will be made available upon request to representatives of the RWQCB and City.*

Responses c), d): Expansive soils are those that undergo volume changes as moisture content fluctuates, swelling substantially when wet or shrinking when dry. Soil expansion can damage structures by cracking foundations, causing settlement and distorting structural elements. Expansion is a typical characteristic of clay-type soils. Expansive soils shrink and swell in volume during changes in moisture content, such as a result of seasonal rain events, and can cause damage to foundations, concrete slabs, roadway improvements, and pavement sections.

Soil expansion is dependent on many factors. The more clayey, critically expansive surface soil and fill materials will be subjected to volume changes during seasonal fluctuations in moisture content. Figure 11 shows the soils within the Project site. The soils encountered at the site consist of Ramona very fine sandy loam (0 to 8 percent slopes, 15.03 acres), Riverwash (5.90 acres), Hanford coarse sandy loam (2 to 8 percent slopes, 2.80 acres), Arlington and Greenfield fine sandy loams (8 to 15 percent slopes, 2.24 acres), Arlington and Greenfield fine sandy loams (2 to 8 percent slopes, 1.96 acres), Hanford coarse sandy loam (0 to 2 percent slopes, 0.61 acres), Ramona sandy loam (0 to 2 percent slopes, 0.31 acres), and Tujunga loamy sand, channeled (0 to 8 percent slopes, 0.12 acres). Additionally, undocumented fill was encountered in the central and western portions of the project site, and is two to four feet deep in these areas. According to the Geotechnical/Geological Engineering Study (EnGEN Corporation, 2003), the expansion potential of the near-surface soils on the project site have a very low to low expansion potential. Additionally, the potential for liquefaction of the site is considered moderate to high, as described in the previous response.

Based on the geotechnical conclusions, the proposed project would require proper geotechnical design requirements to be incorporated into the building and improvement plans, and additional soil testing during the design and engineering phase of the project to further define the geotechnical engineering requirements for the individual structures. With implementation

of the following mitigation measure, this potential impact would be reduced to a ***less than significant*** level.

> ***Mitigation Measure Geo-2****: Prior to earthmoving activities for the project, a certified geotechnical engineer, or equivalent, shall be retained to perform a final geotechnical evaluation of the soils at a design-level as required by the requirements of the California Building Code Title 24, Part 2, Chapter 18, Section 1803.1.1.2. The evaluation shall be prepared in accordance with the standards and requirements outlined in California Building Code, Title 24, Part 2, Chapter 16, Chapter 17, and Chapter 18, which addresses structural design, tests and inspections, and soils and foundation standards. The final geotechnical evaluation shall include design recommendations to ensure that soil conditions do not pose a threat to the health and safety of people or structures. The grading and improvement plans shall be designed in accordance with the recommendations provided in the final geotechnical evaluation.*

Response e): The proposed project would not require the use of septic tanks or alternative waste water disposal systems for the disposal of waste water. Implementation of the proposed project would result in ***no impact*** relative to this topic.

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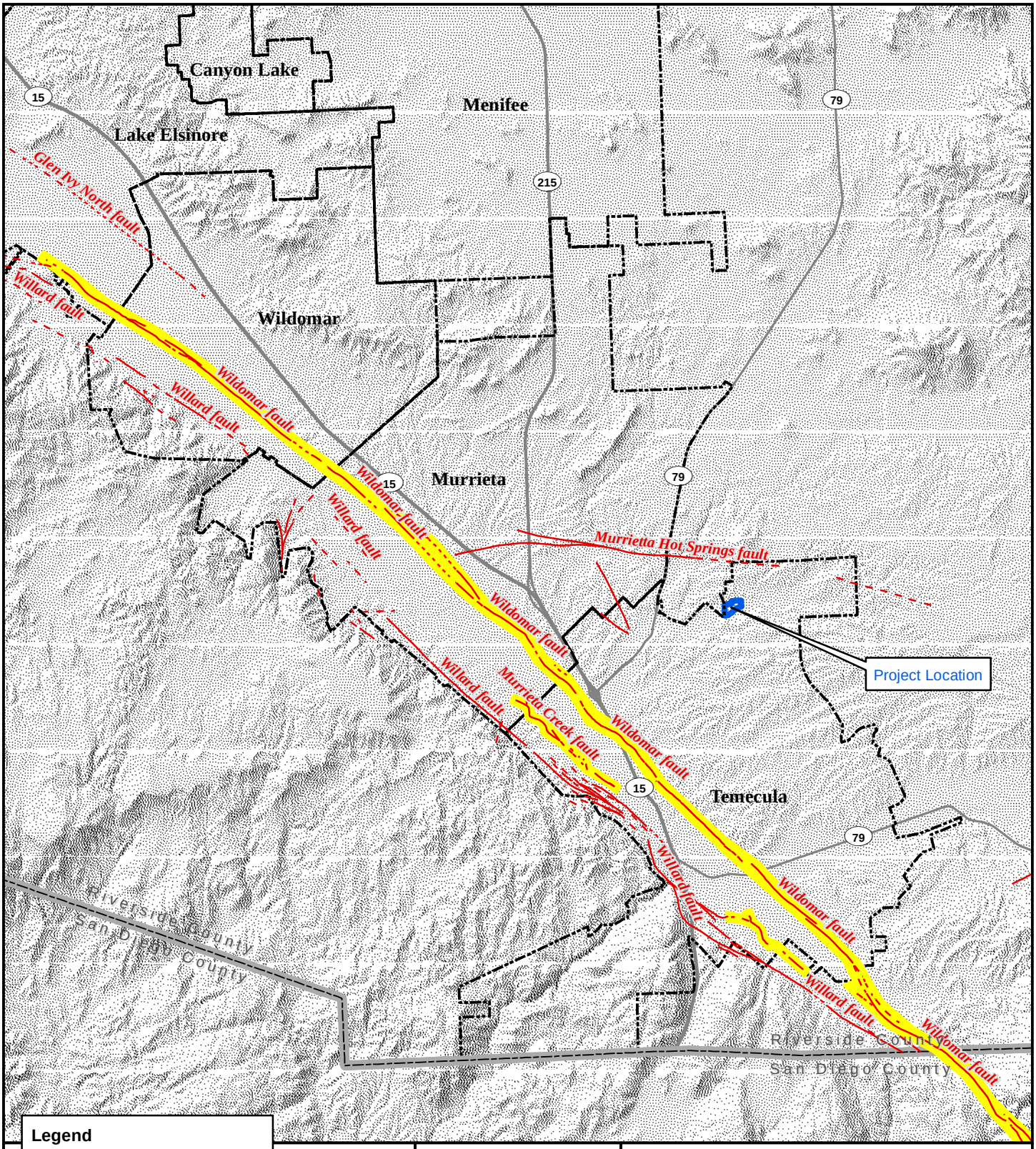

Legend

- Project Boundary

Quaternary Faults

- Well-constrained
- Moderately-constrained
- Inferred
- Alquist-Priolo Fault Zones

Sources: US Geological Survey; Riverside County GIS. Map date: October 6, 2017.

N

0 1 2
Miles

SERAPHINA (TTM37290)

Figure 10. Earthquake Fault Map

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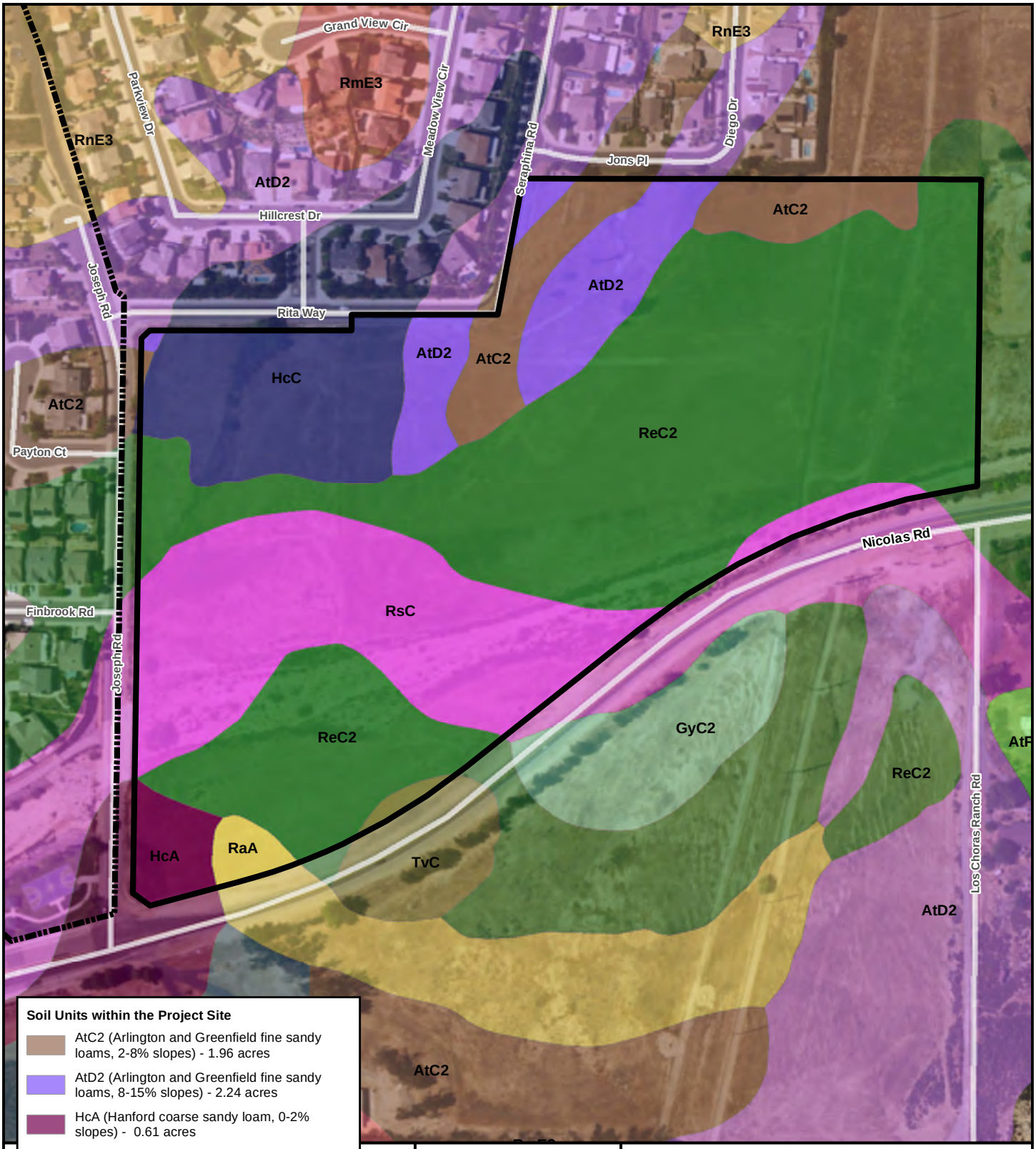

Soil Units within the Project Site

- AtC2 (Arlington and Greenfield fine sandy loams, 2-8% slopes) - 1.96 acres
- AtD2 (Arlington and Greenfield fine sandy loams, 8-15% slopes) - 2.24 acres
- HcA (Hanford coarse sandy loam, 0-2% slopes) - 0.61 acres
- HcC (Hanford coarse sandy loam, 2-8% slopes) - 2.80 acres
- RaA (Ramona sandy loam, 0-2% slopes) - 0.31 acres
- ReC2 (Ramona very fine sandy loam, 0-8% slopes) - 15.03 acres
- RsC (Riverwash) - 5.90 acres
- TvC (Tujunga loamy sand, channeled, 0-8% slopes) - 0.12 acres

Sources: NRCS Web Soil Survey; Riverside County; ArcGIS Online World Imagery Map Service. Map date: October 5, 2017.

N

0 125 250

Feet

SERAPHINA (TTM37290)

Figure 11. Project Site Soils

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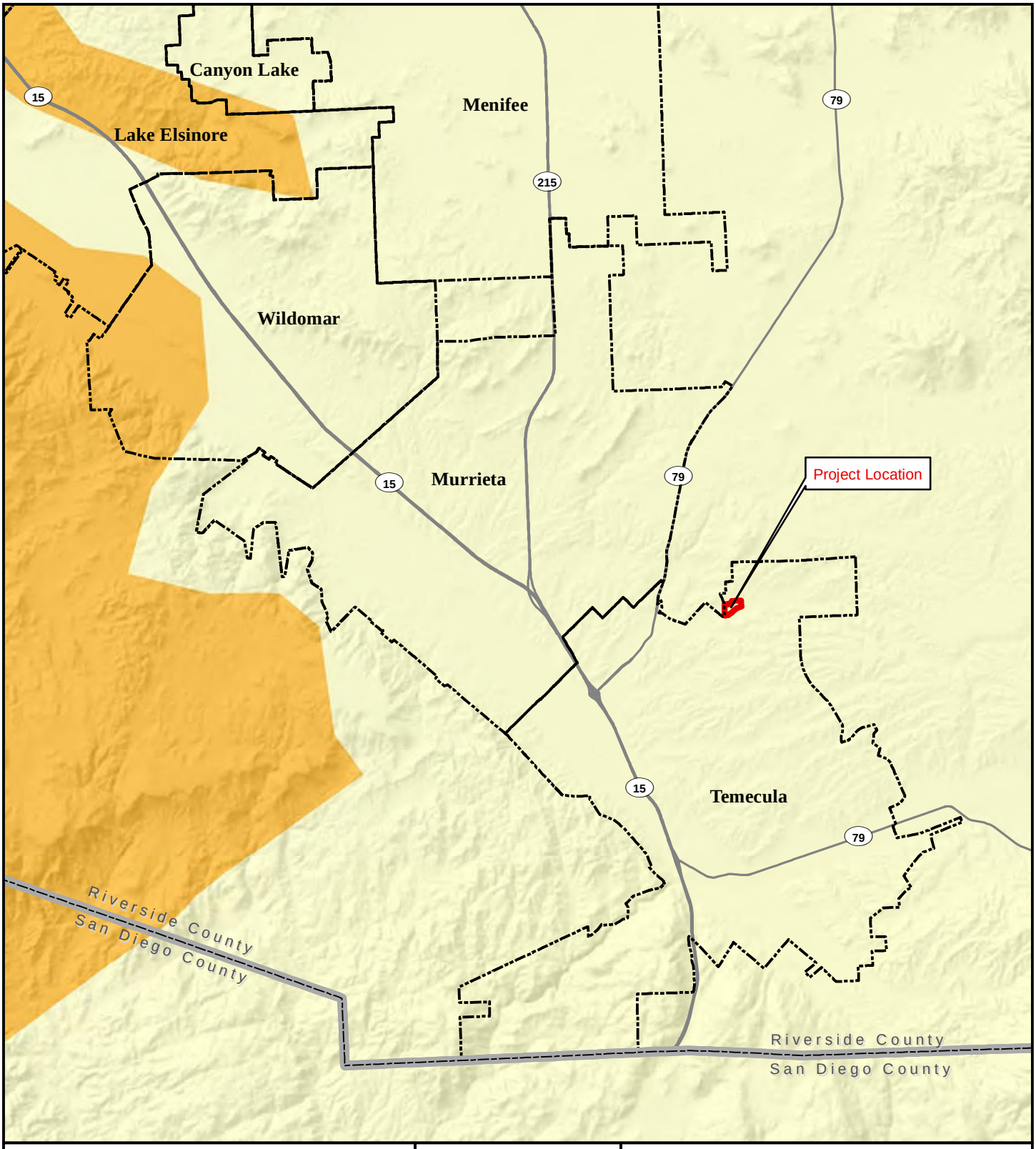

Legend

Project Boundary

Incidence

Low incidence (<1.5% of the area involved)

Moderate incidence (1.5-15% of the area involved)

Sources: USGS Open-File Report 97-289: Landslide Overview Map of the Conterminous United States; Riverside County GIS. Map date: October 6, 2017.

N

0 1 2

Miles

SERAPHINA (TTM37290)

Figure 12. Landslide Susceptibility

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XII. GREENHOUSE GAS EMISSIONS

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

EXISTING SETTING

Background

Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases (GHGs), play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere from space, and a portion of the radiation is absorbed by the Earth's surface. The Earth emits this radiation back toward space, but the properties of the radiation change from high-frequency solar radiation to lower-frequency infrared radiation.

Naturally occurring greenhouse gases include water vapor (H_2O), carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and ozone (O_3). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also greenhouse gases, but they are, for the most part, solely a product of industrial activities. Although the direct greenhouse gases CO_2, CH_4, and N_2O occur naturally in the atmosphere, human activities have changed their atmospheric concentrations. From the pre-industrial era (i.e., ending about 1750) to 2011, concentrations of these three greenhouse gases have increased globally by 40, 150, and 20 percent, respectively (Intergovernmental Panel on Climate Change [IPCC], 2013).

Greenhouse gases, which are transparent to solar radiation, are effective in absorbing infrared radiation. As a result, this radiation that otherwise would have escaped back into space is now retained, resulting in a warming of the atmosphere. This phenomenon is known as the greenhouse effect. Among the prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), ozone (O_3), water vapor, nitrous oxide (N_2O), and chlorofluorocarbons (CFCs).

The emissions from a single project will not cause global climate change, however, GHG emissions from multiple projects throughout the world could result in a cumulative impact with respect to global climate change. Therefore, the analysis of GHGs and climate change presented in this section is presented in terms of the proposed project's contribution to cumulative impacts and potential to result in cumulatively considerable impacts related to GHGs and climate change.

Cumulative impacts are the collective impacts of one or more past, present, and future projects that, when combined, result in adverse changes to the environment. In determining the significance of a proposed project's contribution to anticipated adverse future conditions, a lead agency should generally undertake a two-step analysis. The first question is whether the *combined* effects from *both* the proposed project *and* other projects would be cumulatively significant. If the agency answers this inquiry in the affirmative, the second question is whether "the proposed project's *incremental* effects are cumulatively considerable" and thus significant

in and of themselves. The cumulative project list for this issue (climate change) comprises anthropogenic (i.e., human-made) GHG emissions sources across the globe and no project alone would reasonably be expected to contribute to a noticeable incremental change to the global climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context and process for developing an enforceable statewide cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires that lead agencies consider evaluating the cumulative impacts of GHGs. Small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable and, therefore, significant.

Significance Thresholds

In 2008, the SCAQMD provided guidance to lead agencies on the determination of significance of GHG project emissions. As part of the process, the SCAQMD assembled a GHG Significance Threshold Working Group with the goal to develop and reach a consensus on acceptable significance thresholds to be used in CEQA analyses for GHG emissions on an interim basis until CARB (or another state agency) develops statewide guidance on assessing the significance of GHG emissions under CEQA.

In September 2010, the Working Group released the following recommended tiered approach in determining the significance of residential and commercial projects as indicated in draft guidance issued by the SCAQMD, which includes:

- Tier 1: If the project is exempt under existing statutory or categorical exemptions there is a presumption of "less-than-significant" impacts with respect to climate change.
- Tier 2: If the project's GHG emissions are within the GHG budgets in an approved regional plan (plans consistent with CEQA sections 15064(h)(3), 15125(d), or 15152(s)), there is a presumption of "less-than-significant" impacts with respect to climate change.
- Tier 3: Consists of screening values at the discretion of the lead agency; however, they should be consistent for all projects within its jurisdiction. Project-related construction emissions should be amortized over 30 years and should be added back the project's operational emissions. The following thresholds are proposed for consideration:
    - 3,000 $MTCO_2e$ per year for all land use types; or
    - 3,500 $MTCO_2e$ per year for residential; 1,400 $MTCO_2e$ per year for commercial; or 3,000 MTCO2e per year for mixed-use projects.
- Tier 4: Does the project meet one of the following performance standards? If yes, there is a presumption of "less-than-significant" impacts with respect to climate change.
    - Option 1: Reduce emissions from business as usual by a certain percentage (currently undefined);
    - Option 2: Early implementation of applicable AB 32 Scoping Plan measures; or
    - Option 3: A project-level efficiency target of 4.8 $MTCO_2e$ per service population as a 2020 target and 3.0 $MTCO_2e$ per service population as a 2035 target. The recommended plan-level target for 2020 is 6.6 $MTCO_2e$ and the plan level target for 2035 is 4.1 $MTCO_2e$.
- Tier 5: Involves mitigation offsets to achieve target significance thresholds (SCAQMD, 2010).

The City of Temecula has not adopted its own numeric threshold of significance for determining impacts with respect to GHG emissions, and relies upon the SCAQMD draft screening level

threshold. Therefore, for the proposed project, the 3,000 MT CO_2e per year non-industrial screening threshold is used for the significance threshold, in addition to the qualitative thresholds of significance set forth below from Section VII of Appendix G to the CEQA Guidelines.

RESPONSES TO CHECKLIST QUESTIONS

Responses a), b): The proposed project's short-term construction-related and long-term operational GHG emissions for buildout of the proposed project were estimated using the California Emission Estimator Model (CalEEMod)™ (v.2016.3.1). CalEEMod is a statewide model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify GHG emissions from land use projects. The model quantifies direct GHG emissions from construction and operation (including vehicle use), as well as indirect GHG emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Emissions are expressed in annual metric tons of CO_2 equivalent units of measure (i.e., $MTCO_2e$), based on the global warming potential of the individual pollutants.

Short-Term Construction GHG Emissions

Estimated increases in GHG emissions associated with construction of the proposed project are summarized in Table 12.

Table 12: Construction GHG Emissions (Unmitigated)

Year	*MT CO_2e*
2018	216.3017
2019	121.0171
Maximum Per Year	**216.3017**
Overall Total	**337.3188**
30-Year Annual Amortized Rate	***11.2440***

SOURCE: CALEEMOD (V.2016.3.1).

As presented in the table, construction activities would generate 337.32 MT CO_2e total, which is equivalent to 11.24 MT CO_2e per year over a 30-year amortization period. Construction GHG emissions would cease upon completion of the construction phase of the project and would therefore be a small fraction of total project-related emissions when considering the longevity of operation emissions associated with the project.

These construction GHG emissions are a one-time release and are comparatively much lower than overall emissions associated with operational phases of a project. Construction GHG emissions from the proposed project do not impede local GHG reduction efforts, or violate GHG reduction goals set by AB 32, as required by the Public Resources Code, Section 21082.2. Therefore, cumulatively these construction emissions would not generate a significant contribution to global climate change.

Long-Term Operational GHG Emissions

The long-term operational GHG emissions estimate for buildout of the proposed project incorporates the potential area source and vehicle emissions, and emissions associated with

energy, utility and water usage, and wastewater and solid waste generation. GHG emissions from project-related operational activities are included in Table 13.

For the operational phase, the proposed project's GHG emissions are separated into emission sources for the applicable GHG emissions sectors established by CARB. Mobile sector emissions are emissions produced from vehicular travel to and from the project site. Energy sector emissions include indirect sources of energy (electricity and natural gas). Area emissions include emissions from landscaping activities. Solid waste emissions are generated by the decomposition over time of trash sent to landfill. Water sector emissions are produced from the transport of water to and from the project site. In general, transportation sector emissions make up the largest proportion of emissions associated with a project. The second largest source of emissions is from energy sources.

Table 13: Operational GHG Emissions (Unmitigated)

Emissions Category	***MT CO_2e / Year***
Area	16.5454
Energy	244.4213
Mobile	713.6854
Solid Waste	31.7532
Water	24.7883
Total Operational GHG Emissions	***1,031.1936***

SOURCE: CALEEMOD (V.2016.3.1).

Overall GHG Emissions

As shown in Table 13, proposed project operations would generate approximately 1,031.1936 MT CO_2e per year. In addition, as shown in Table 12, construction emissions (amortized over 30 years) would generate 11.2440 MT CO_2e per year. This results in a total of 1,042.4376 MT CO_2e per year. The 3,000 MT CO_2e per year threshold established by the SCAQMD draft screening level threshold would not be exceeded in the unmitigated scenarios and thus no mitigation is required.

Conclusion

As described above, the proposed project would not generate an amount of greenhouse gas emissions, either directly or indirectly, that would have a significant impact on the environment. In addition, the proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gasses. Therefore, there is a ***less than significant*** impact relative to this topic.

VIII. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?			X	
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?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
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?			X	
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?		X		
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?		X		
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
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?			X	

Responses to Checklist Questions

Responses a), b): The proposed project would not routinely transport, use, or dispose of hazardous materials, or present a reasonably foreseeable release of hazardous materials, with the exception of common household hazardous materials such as household cleaners, paint, etc. The operational phase of the proposed project does not pose a significant hazard to the public or the environment.

On-site reconnaissance and historical records indicate that there are no known underground storage tanks or pipelines located on the project site that contain hazardous materials. Therefore, the disturbance of such items during construction activities is unlikely. Construction equipment and materials would likely require the use of petroleum based products (oil,

gasoline, diesel fuel), and a variety of common chemicals including paints, cleaners, and solvents. Transportation, storage, use, and disposal of hazardous materials during construction activities would be required to comply with applicable federal, state, and local statutes and regulations. Compliance would ensure that human health and the environment are not exposed to hazardous materials. Therefore, the proposed project would have a ***less than significant*** impact relative to this issue.

Response c): The project site is within the ¼ mile radius of the nearest school. The closest school is Nicolas Valley Elementary School, located approximately 0.13 miles to the northwest of the project site. The operations of the proposed residences would not emit hazardous emissions or result in the storage or handling of hazardous or acutely hazardous materials, substances or waste other than common hazardous materials such as household cleaners, paint, etc. Implementation of the proposed project would result in a ***less than significant*** impact relative to this topic.

Response d): According the California Department of Toxic Substances Control (DTSC) there are no Federal Superfund Sites, State Response Sites, or Voluntary Cleanup Sites on, or in the vicinity of the project site. The project site is not included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5. The nearest investigation site includes:

- Temecula Learning Center (site # 33010042): This site, located at Nicolas Road and Calle Medusa (approximately 0.1 miles west of the project site), is a School Investigation Site which has a status of Inactive (withdrawn as of March 7, 2001). The site was part of a larger cattle ranch between early 1900s and 1974. Subsequently, the site was used for open grazing and dry farming until the mid-1990s. The current owner stated that pesticides, herbicides or fertilizers have not been used at the site for at least the past 20 years. The site was investigated for contamination because of the previous uses of the site. No potential hazards have been identified with this site.

Implementation of the proposed project would result in a ***less than significant*** impact relative to this environmental topic.

Responses e), f): The Federal Aviation Administration (FAA) establishes distances of ground clearance for take-off and landing safely based on such items as the type of aircraft using the airport. The project site is not located within the vicinity of a private airstrip. The closest airstrip is the Billy Joe Airport approximately 3.81 miles southeast of the project site. This airport does not have an Airport Land Use Compatibility Plan.

The project site is not located within one mile of the airport, nor along the extended runway centerline. The nearest airport, French Valley Airport, is located approximately 1.62 miles northwest of the project site. The project site is located within the French Valley Airport Compatibility Plan. As shown in Map FV-1 of the Riverside County Airport Land Use Compatibility Plan Policy Document, the northern portion of the project site is located in Compatibility Zone D, and the southern portion of the project site (roughly following the Creek corridor) is within Compatibility Zone E. The compatibility criteria associated with the compatibility zones is outlined in Table 2A of the Riverside County Airport Land Use Compatibility Plan Policy Document.

Within Compatibility Zone D, residential uses with average parcel sizes greater than five acres must have densities less than or equal to 0.2 du/ac (gross). The proposed 49 units on 15.58 acres (30.18 total acres minus 0.43-acre park minus 0.47-acre park minus 13.7-acre Creek)

would result in a density of 3.15 du/ac. Therefore, the project does not meet the residential density of less than or equal to 0.2 du/ac. It is noted that Section 3.3.6, Other Special Conditions, of the Riverside County Airport Land Use Compatibility Plan Policy Document notes that the compatibility criteria set forth in the Plan are intended to be applicable to all locations within each airport's influence area. However, it is recognized that there may be specific situations where a normally incompatible use can be considered compatible because of terrain, specific location, or other extraordinary factors or circumstances related to the site:

a) After due consideration of all the factors involved in such situations, the Commission may find a normally incompatible use to be acceptable.
b) In reaching such a decision, the Commission shall make specific findings as to why the exception is being made and that the land use will not create a safety hazard to people on the ground or aircraft in flight nor result in excessive noise exposure for the proposed use. Findings also shall be made as to the nature of the extraordinary circumstances that warrant the policy exception.
c) The burden for demonstrating that special conditions apply to a particular development proposal rests with the project proponent and/or the referring agency, not with the Riverside County Airport Land Use Commission.
d) The granting of a special conditions exception shall be considered site specific and shall not be generalized to include other sites.
e) Special conditions that warrant general application in all or part of the influence area of one airport, but not at other airports, are set forth in Chapter 3 of this Compatibility Plan.

Additionally, for development within Compatibility Zone D, 10 percent of the project site must be open land. The project would exceed this requirement by maintaining the 13.7-acre Creek channel. Further, hazards to flight are prohibited in this zone, and airspace review is required for objects greater than 70 feet tall. Hazards to flight include physical (e.g., tall objects), visual, and electronic forms of interference with the safety of aircraft operations. The project does not include any hazards to flight or buildings over 70 feet tall. Deed notices are required for homes within Compatibility Zone D.

Within Compatibility Zone E, maximum densities/intensities are not required. Hazards to flight are prohibited in this zone, and airspace review is required for objects greater than 100 feet tall. The proposed project consists of a residential subdivision, and does not propose any structures of substantial height that would protrude into active airspace. Deed notices would be recorded for all proposed residential uses. Building height would be consistent with surrounding uses. The Riverside County Airport Land Use Commission would review the proposed project for compatibility with the French Valley Airport compatibility zones.

Implementation of the following mitigation measure would ensure that the proposed project would result in a ***less-than-significant*** impact relative to the French Valley Airport Compatibility Zones D and E.

> ***Mitigation Measure Haz-1:*** *A deed notification shall be recorded for residential land uses within Compatibility Zones D and E and an airport proximity disclosure shall be provided for residential land uses within Compatibility Zones D and E.*

Response g): While the proposed project will minimally impact traffic flow during the temporary construction period, it will not conflict with or interfere with emergency evacuation of the project area. Further, the project would add a negligible number of additional trips to

Nicolas Road and the surrounding roadways. As such, these roadways would continue to function as emergency access routes if necessary. No revisions to an adopted emergency plan would be required as a result of the proposed project. The proposed project does not include any actions that would impair or physically interfere with an adopted emergency response plan or emergency evacuation plan. Implementation of the proposed project would result in ***no impact*** on this environmental topic.

Response h): The risk of wildfire is related to a variety of parameters, including fuel loading (vegetation), fire weather (winds, temperatures, humidity levels and fuel moisture contents), and topography (degree of slope). Steep slopes contribute to fire hazard by intensifying the effects of wind and making fire suppression difficult. Fuels such as grass are highly flammable because they have a high surface area to mass ratio and require less heat to reach the ignition point, while fuels such as trees have a lower surface area to mass ratio and require more heat to reach the ignition point.

The California Department of Forestry has designated the western edge of the City as a Local Responsibility Area (LRA), which is within the very high fire hazard severity zone; however, this rating does not extend to the project site. The project will require fire hydrants consistent with the standards of the City, and such fire hydrants will assist with fire suppression efforts if a fire was to occur. Because the project site is not located within a designated wildfire hazard area, this is a ***less than significant*** impact and no mitigation is required.

IX. HYDROLOGY AND WATER QUALITY

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Violate any water quality standards or waste discharge requirements?			X	
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)?			X	
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?			X	
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?			X	
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?			X	
f) Otherwise substantially degrade water quality?			X	
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?		X		
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?		X		
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?				X
j) Inundation by seiche, tsunami, or mudflow?				X

Responses to Checklist Questions

Response a): Implementation of the proposed project would not violate any water quality or waste discharge requirements. Construction activities including grading could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of soil and could adversely affect water quality in nearby surface waters. The RWQCB requires a project specific SWPPP to be prepared for each project that disturbs an area one acre or larger. The SWPPP is required to include project specific best

management measures that are designed to control drainage and erosion. A SWPPP has been prepared for the project and would be implemented throughout the construction phase. The SWPPP is designed to reduce the potential for the proposed project to violate water quality standards during construction. The RWQCB requires regular monitoring and reporting to ensure that the SWPPP is effectively controlling stormwater pollution. This is a regulatory requirement that is required of all projects, and would mitigate the potential for an impact to occur. Implementation of the proposed project would result in a ***less-than-significant*** impact relative to this topic.

Response b): The EMWD would provide water services to the project site. The majority of EMWD's supplies are imported water purchased through Metropolitan Water District of Southern California (MWD) from the State Water Project (SWP) and the Colorado River Aqueduct (CRA). Imported water is delivered to EMWD either as potable water treated by MWD, or as raw water that EMWD can either treat at one of its two local filtration plants or deliver as raw water for non-potable uses. EMWD's local supplies include groundwater, desalinated groundwater, and recycled water. .

The proposed project would not 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). The project site is not a recharge site.

Project construction would add additional impervious surfaces to the project site; however, the southern portion of the site would remain largely pervious, which would allow infiltration to underlying groundwater. The proposed water quality basins and park areas would continue to contribute to groundwater recharge following construction of the project. In addition, the project is not anticipated to significantly affect groundwater quality because sufficient stormwater infrastructure would be constructed as part of project to detain and filter stormwater runoff and prevent long-term water quality degradation. Therefore, project construction and operation would not substantially deplete or interfere with groundwater supply or quality. This impact would be ***less than significant***.

Responses c-e): When land is in a natural or undeveloped condition, precipitation will infiltrate/percolate the soils. Much of the rainwater that falls on natural or undeveloped land slowly infiltrates the soil and is stored either temporarily or permanently in underground layers of soil. When the soil becomes completely soaked or saturated with water or the rate of rainfall exceeds the infiltration capacity of the soil, the rainwater begins to flow on the surface of land to low lying areas, ditches, channels, streams, and rivers. Rainwater that flows off of a site is defined as storm water runoff. When a site is in a natural condition or is undeveloped, a larger percentage of rainwater infiltrates into the soil and a smaller percentage flows off the site as storm water runoff.

The infiltration and runoff process is altered when a site is developed with urban uses. Houses, buildings, roads, and parking lots introduce asphalt, concrete, and roofing materials to the landscape. These materials are relatively impervious, which means that they absorb less rainwater. As impervious surfaces are added to the ground conditions, the natural infiltration process is reduced. As a result, the volume and rate of storm water runoff increases. The increased volumes and rates of storm water runoff can result in flooding in some areas if adequate storm drainage facilities are not provided.

The project site consists of five drainage sub-areas, as illustrated in Figure 13. The boundary of the watershed associated with the Project was delineated using recent aerial topography flown and compiled for the Project. The size of the drainage basin located within the boundaries of the Project is approximately 19.1 acres. The drainage basin consists of mild-sloping foothill terrain with a maximum elevation of 1,155 feet at the headwaters and a ground elevation of 1,136 feet at the confluence with the existing Santa Gertrudis Creek north of Nicolas Road. The runoff associated with the current drainage basin is tributary to the Santa Gertrudis Creek which travels west over Joseph Road at a low-flow crossing.

Site runoff runs through proposed streets, before being intercepted by catch basins and conveyed through proposed local storm drain systems that discharge to a water quality basin and drainage channel.

Adjacent to the site is an existing neighborhood which currently has two drainage outlets onto the project area. These two flows will be diverted around the project, and therefore will not be included in the onsite hydrologic analysis. Refer to Figure 14 for an illustration of off-site and on-site areas associated with the project. Flows from drainage management areas A (A-1) and B (B-1 and B-2) will be conveyed to the two proposed basins, respectively, through sheet flow. As shown in Figure 14, approximately 4.71 acres of the project site would be located within drainage management area A-1, and 8.31 acres (3.57 acres plus 4.74 acres) of the project site would be located within drainage management areas B-1 and B-2.

Hydrology calculations to determine the 10- and 100-year discharges were performed as part of the Preliminary Drainage Study, per the RCFC & WCD Hydrology Manual (April 1978) guidelines. The table below shows the results of the on-site hydrology analysis for the 10-, and 100-year storm events, for both the existing, and proposed conditions. A proposed on-site detention basin will be analyzed for mitigation of the 100-year storm event to pre-project conditions.

Table 14: Summary of Hydrology Results

Existing / Proposed	*Node Location*	*Total Area (Acres)*	*10-Year (cfs)*	*100-Year (cfs)*
Existing	6	19.0	17.4	28.6
Proposed (A-1)	*10*	*4.71*	*7.3*	*11.7*
Proposed (B-1 and B-2)	*21*	*8.31*	*12.8*	*20.6*

NOTE: CFS = CUBIC FEET PER SECOND.

SOURCE: MICHAEL BAKER INTERNATIONAL, 2017. TABLE 2-1.

The overall increase in flow for the 100-year event is 3.7 cubic feet per second (cfs). This increase will need to be mitigated on-site through flood attenuation.

Flood attenuation will be accomplished on-site via a combined water quality/flood attenuation basin. The basin is designed to retain the governing volume between Low Impact Development (LID) and Hydrologic Conditions of Concern (HCOC) as it is outlined in RCFC WCD "*Design Handbook for Low Impact Development Best Management Practices*." Above the retained water quality volume, the basin is designed to attenuate the ultimate condition 10-year discharge to less than the pre-project, baseline condition.

Along Santa Gertrudis Creek, the northern and southern banks of the channel will be reinforced with riprap. Santa Gertrudis Creek will be realigned on the east side of the project site to allow room for the widening of Nicolas Road, as required by the City. The road widening will require substantial fill, pavement, and a riprap slope extending across Santa Gertrudis Creek. The

existing San Diego aqueduct crosses Santa Gertrudis Creek near the eastern project boundary, and will need to be protected from existing and future scour by a concrete and riprap cover. These impacts are included in the road widening impacts noted above.

The proposed project would increase impervious surfaces throughout the project site and would require the installation of storm drainage infrastructure to ensure that storm waters properly drain from the project site. The storm drainage plan was designed and engineered to ensure proper construction of storm drainage infrastructure to control runoff and prevent flooding, erosion, and sedimentation. The proposed storm drainage plan includes an engineered network of storm drain lines, manholes, inlets, and detention basins. However, the construction of these facilities would not substantially alter the existing drainage pattern of the area, or alter the course of a stream or river causing adverse environmental impacts. Therefore, the project would have a ***less-than-significant*** impact relative to this environmental topic.

Response f): Construction activities including grading could temporarily increase soil erosion rates during and shortly after project construction. Construction-related erosion could result in the loss of soil and could adversely affect water quality in nearby surface waters. The RWQCB requires a project specific SWPPP to be prepared for each project that disturbs an area one acre or larger. The SWPPP is required to include project specific best management measures that are designed to control drainage and erosion. A SWPPP has been prepared for the proposed project and will be implemented throughout the construction phase of the project. Furthermore, the proposed project includes a storm drainage plan that controls storm water runoff and erosion after construction. The SWPPP and the storm drainage plan would reduce the potential for polluted runoff and/or degradation of water quality. Implementation of the proposed project would result in a ***less-than-significant*** impact relative to this topic.

Responses g-h): As shown in Figure 15, the majority of the project site is located within Flood Zone X, which is not within the 100-year flood zone as shown on the Flood Insurance Rate Map (FIRM). However, the southern portion of the project site is located within Zone A, which includes areas within the 100-year flood zone (one percent annual chance flood hazard). FEMA requires the property owner to complete a form request for a Letter of Map Revision Based on Fill (LOMR-F), or Conditional Letter of Map Revision Based on Fill (CLOMR-F) for existing or proposed, single, or multiple lots/structures. A LOMR-F is a letter from FEMA stating that an existing structure or parcel of land that has been elevated by fill would not be inundated by the base flood. Lastly, a CLOMR-F is a letter from FEMA stating that a parcel of land or proposed structure that will be elevated by fill would not be inundated by the base flood if fill is placed on the parcel as proposed or the structure is built as proposed.

The review is often done to the property that determines effects to the hydrologic or hydraulic characteristics of a flooding source and any resulting effects in the modification of the existing regulatory floodway, the effective Base Flood Elevations (BFEs), or the SFHA. The letter does not revise an effective NFIP map but only indicates whether a project, if built as proposed, would be recognized by FEMA. Because a CLOMR does not change the NFIP map, once a project has been completed, an agency must request a revision to the FIRM to reflect the project. "As-built" certification and other data must be submitted to support the revision request.

To remove an existing or proposed structure from the SFHA by the placement of fill, a LOMR-F or Letter of Map Revision (LOMR) is required according to FEMA. Fill is defined as material from any source placed to raise the ground to or above the base flood elevation BFE. Removing unsuitable existing material (topsoil) and backfilling with select structural material is not considered placement of fill if the practice does not alter the existing (natural grade or ground)

elevation, which is at or above the BFE. NFIP regulations require that the lowest adjacent grade (the lowest ground touching the structure) be at or above the BFE. To remove the entire lot and structure, both the lowest point on the lot and the lowest adjacent grade of the structure must be at or above the BFE. Additionally, the participating community must also determine that the land and any existing or proposed structures to be removed from the SFHA are "reasonably safe from flooding."

The majority of the proposed structures would not be located within the 100-year flood zone; however, there is a portion of the subdivision that would place houses within an area currently designated as 100-year floodplain. As noted above, the storm drainage system, including the two basins, are designed to mitigate for the 10- and 100-year storm events. It is anticipated that the property owner would submit a LOMR-F to revise the FIRM to take the entire subdivision out of the 100-year floodplain. Implementation of the following mitigation measure would ensure that no structures are built within the 100-year floodplain and that these potential impacts is reduced to a ***less than significant*** level.

> ***Mitigation Measure Hyd-1:*** *Prior to issuance of a grading permit, the project proponent shall obtain a Letter of Map Revision (LOMR) from FEMA ensuring that no construction will occur within a designated 100-year floodplain.*

Response i): The project site is not located within an area with a control levee or dam. As shown in Figure 16, the project site is not located within a dam inundation area. The proposed project would not expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of a levee or dam. Implementation of the proposed project would have ***no impact*** relative to this environmental topic.

Response j): The project site is not anticipated to be inundated by a tsunami because it is located at an elevation of 1,138 to 1,155 feet above MSL and is approximately 36 miles away from the Pacific Ocean which is the closest ocean waterbody. Implementation of the proposed project would have ***no impact*** relative to this environmental topic.

The project site is not anticipated to be inundated by a seiche because it is not located in close proximity to a water body capable of creating a seiche. Implementation of the proposed project would have ***no impact*** relative to this environmental topic.

A mudflow is a category of landslide that is associated with heavy saturation of soils and sometimes is associated with seismicity. Factors such as the geological conditions, drainage, slope, vegetation, and others directly affect the potential for mudflow. The City's General Plan EIR does not identify mudslides as a topic of concern. Additionally, the project site does not contain significant slopes and would be graded as part of the project. No steep areas that would have the potential to generate mudflows during operations would be created. Therefore, implementation of the proposed project would have ***no impact*** relative to this environmental topic.

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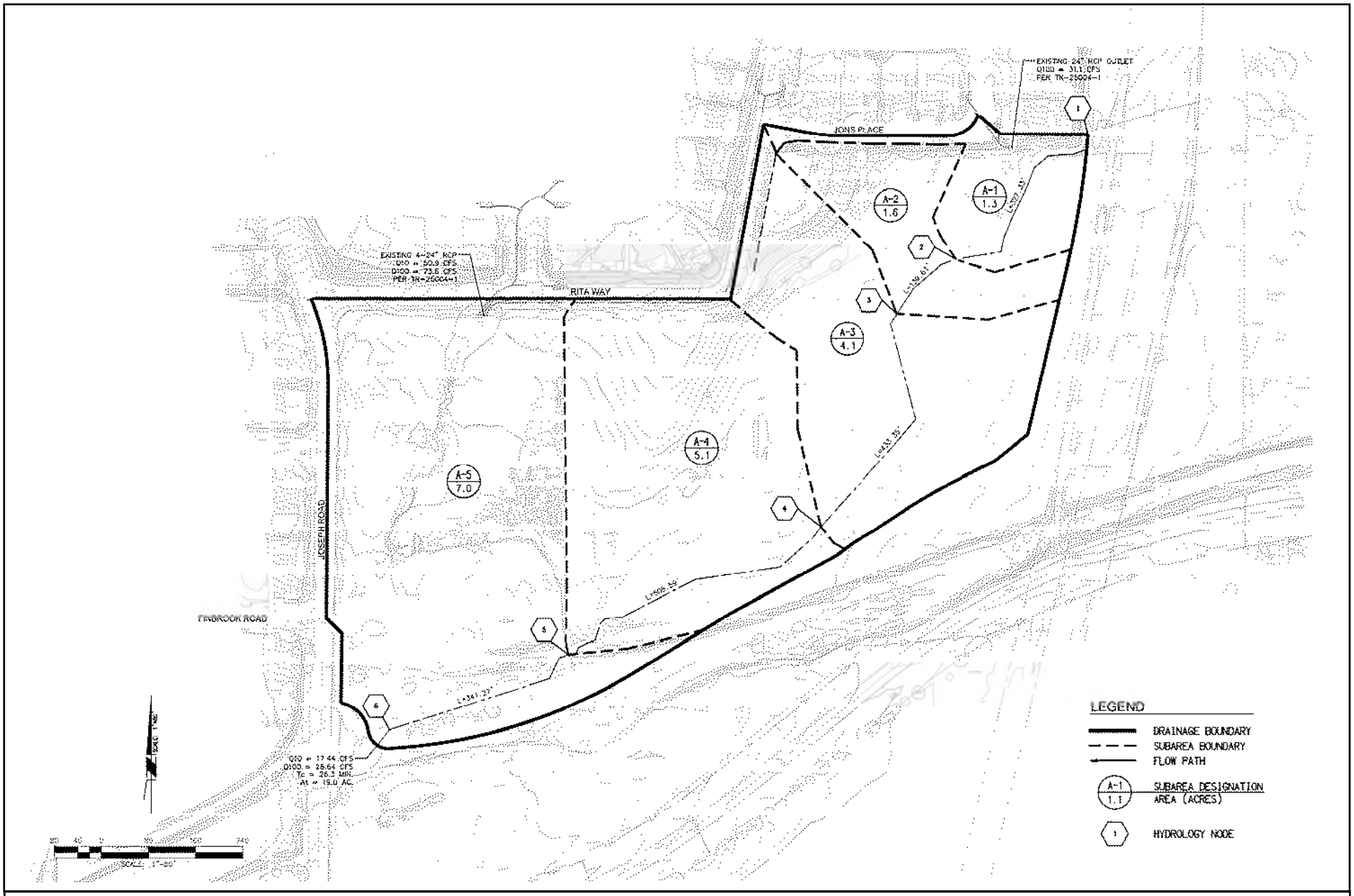

SERAPHINA (TTM37290)

Figure 13. Existing Conditions Hydrology Map

Source: Michael Baker International. Map date: October 5, 2017.

De Novo Planning Group
A Land Use Planning, Design, and Environmental Firm

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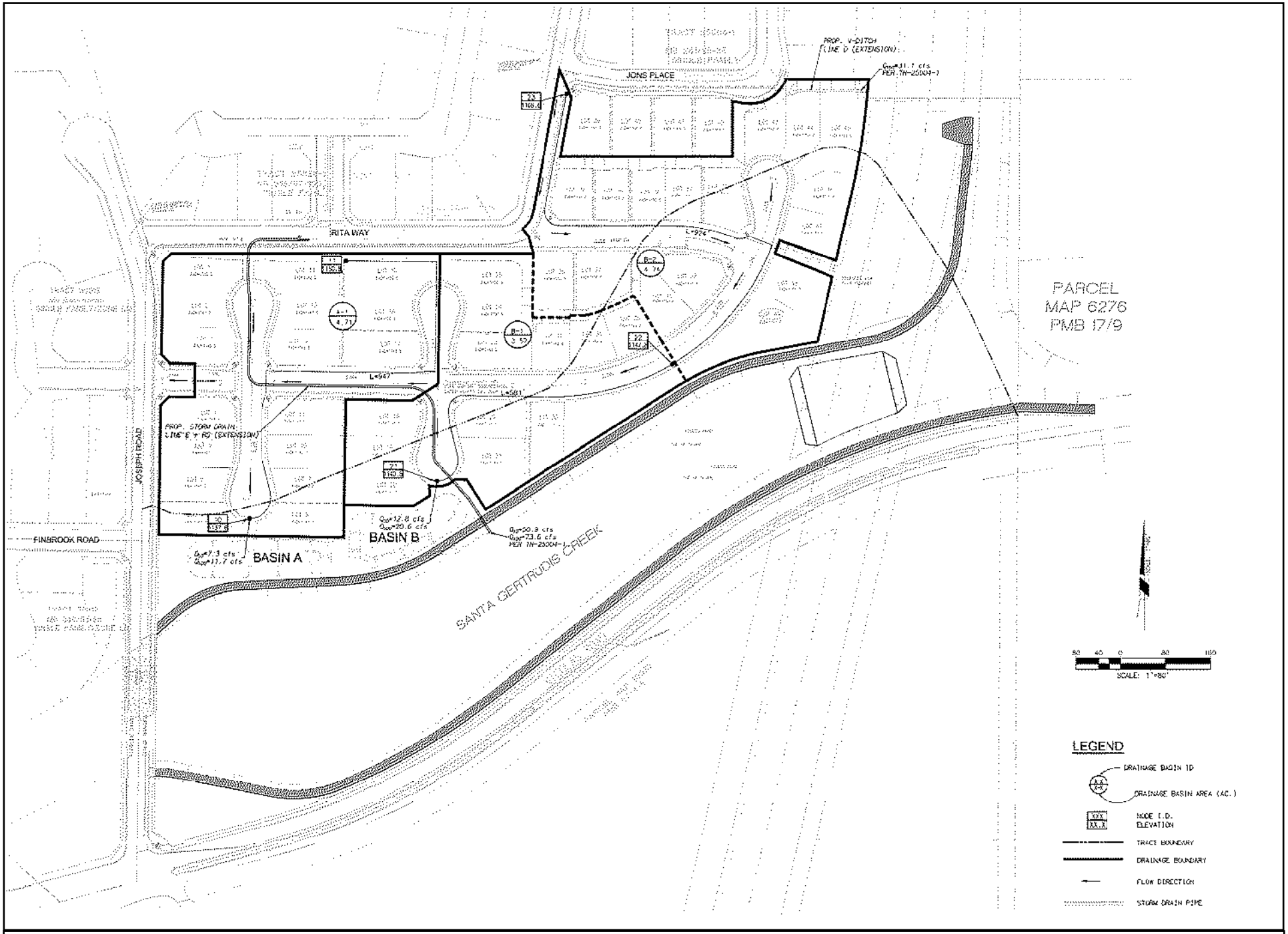

SERAPHINA (TTM37290)

Figure 14. Proposed Hydrology Map

Source: Michael Baker International. Date: October 5, 2017.

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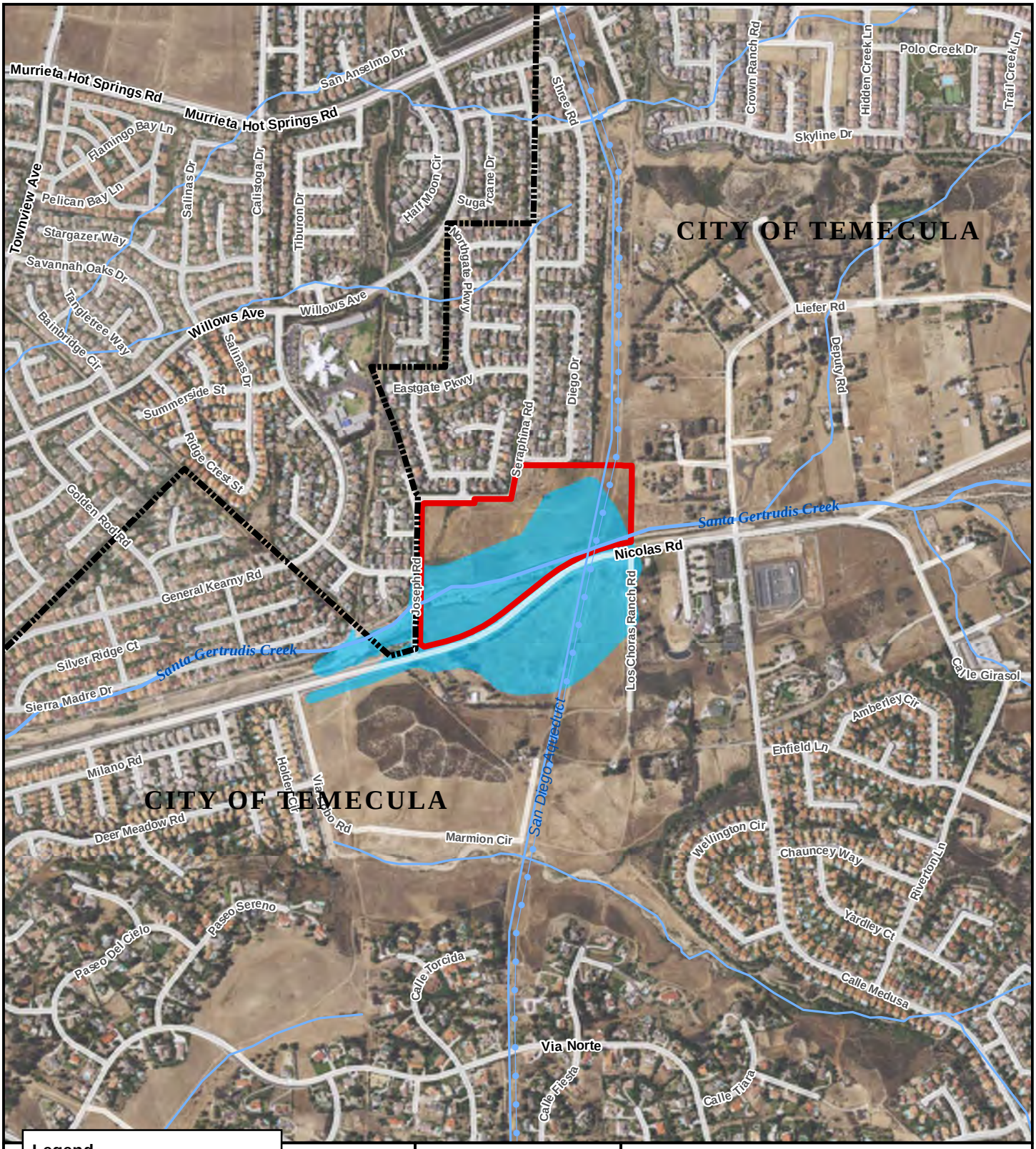

Legend

Project Boundary

Temecula City Boundary

FEMA Flood Zone Designation

Zone A - 1% Annual Chance Flood Hazard (100-yr Flood Zone)

N

0 250 500

Feet

SERAPHINA (TTM37290)

Figure 15. FEMA Flood Insurance Rate Map

Sources: FEMA's National Flood Hazard Layer (Official); Riverside County; ArcGIS Online World Imagery Map Service. Map date: October 5, 2017.

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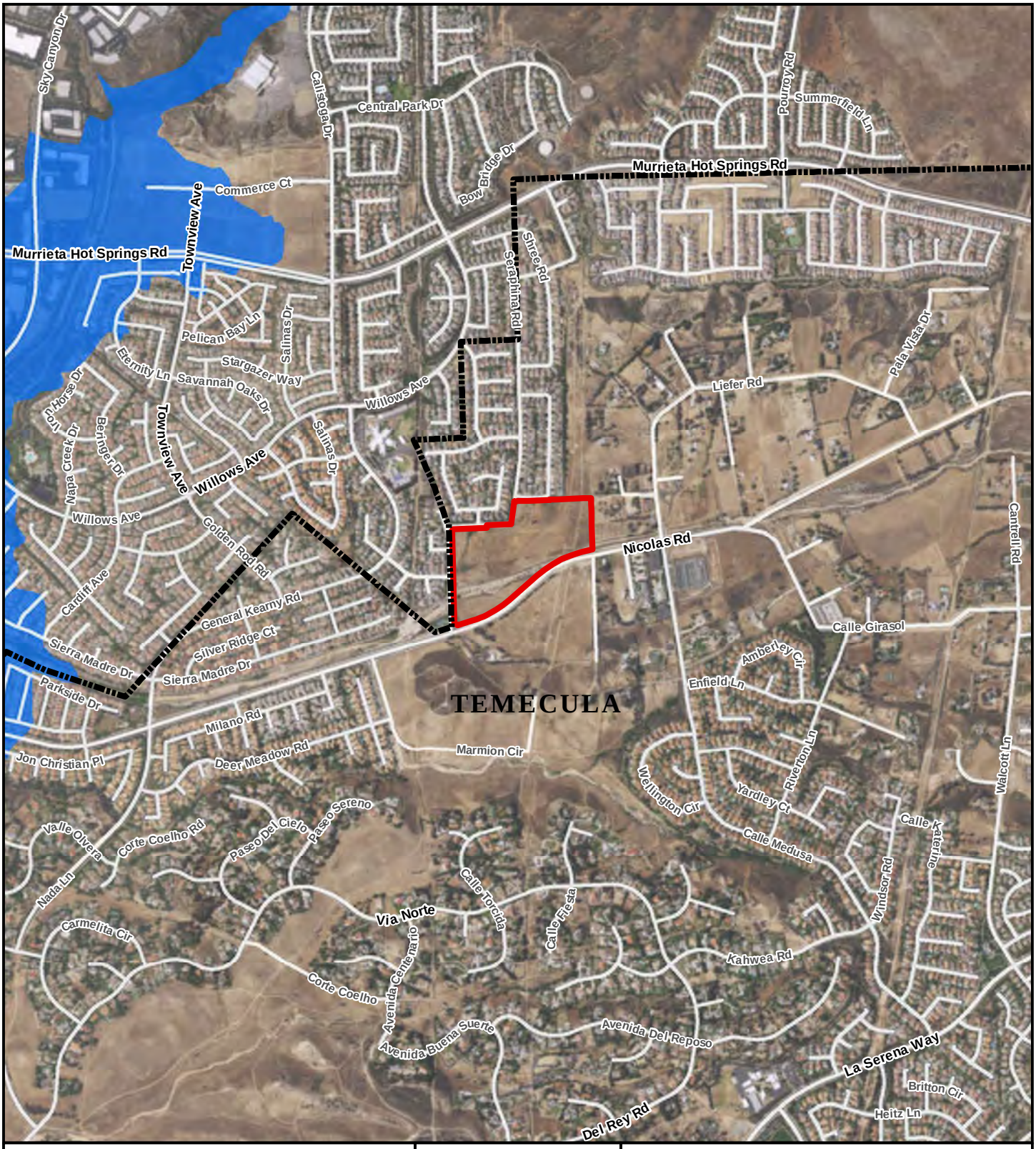

Legend

- Project Boundary
- Temecula City Boundary
- Dam Inundation Area:
  - Diamond Valley Lake
  - Robert A Skinner Reservoir

Sources: Statewide Dam Inundations, OES; Riverside County; City of Temecula. Map date: October 5, 2017.

N

0 500 1,000
Feet

SERAPHINA (TTM37290)

Figure 16. Dam Inundation Map

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X. LAND USE AND PLANNING

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Physically divide an established community?			X	
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?		X		
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Background

The project site is the site of the previously-proposed TTM 32346 Seraphina Tract Project. The TTM 32346 Seraphina Tract was proposed on 29 acres, which includes the project site (30.18 acres). The applicant for this previous project proposed development of 72 single-family lots. The City review process for the previously-proposed TTM 32346 Seraphina Tract Project began in 2004, which included preparation of an Initial Study Checklist, Negative Declaration, and other supplemental technical studies. The Initial Study and Negative Declaration were finalized in 2005, and the City approved the previously-proposed TTM 32346 Seraphina Tract Project in 2005. Since the time TTM 32346 was approved, the project has been redesigned to accommodate the development of 49 single-family lots, a reduction of 23 single-family lots versus the previously approved TTM. Due to the age of the previous studies, analysis, and findings prepared for TTM 32346, and change to the project design and description, the City of Temecula is requiring a new discretionary approval process.

Responses to Checklist Questions

Response a): The proposed project includes development of residential uses on an undeveloped site that is surrounded by residential uses and open space. The proposed residences are consistent with the surrounding uses and would not physically divide an established community. The project site was previously approved for residential development, but the Tentative Map had expired prior to any construction activities. The proposed project is substantially similar to the previously approved residential subdivision, but with a decrease in density. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

Response b): The key planning documents that are directly related to, or that establish a framework within which the proposed project must be consistent, include:

- City of Temecula General Plan;
- City of Temecula Zoning Ordinance; and
- Riverside County Airport Land Use Compatibility Plan Policy Document.

The project site currently has an LM General Plan Land Use Designation and an LM Zoning Designation. The LM designation denotes areas for typical single-family neighborhoods, including single-family detached, single-family zero lot line, patio homes, and duplexes. The allowed density under the LM designation is 3.0 to 6.9 du/ac. The proposed 49 units on 15.58

acres (30.18 total acres minus 0.43-acre park minus 0.47-acre park minus 13.7-acre Creek) would result in a density of 3.15 du/ac.

As noted in Section VIII, Hazards and Hazardous Materials, the project site is located within the French Valley Airport Compatibility Plan. As shown in Map FV-1 of the Riverside County Airport Land Use Compatibility Plan Policy Document, the northern portion of the project site is located in Compatibility Zone D, and the southern portion of the project site (roughly following the Creek corridor) is within Compatibility Zone E. The compatibility criteria associated with the compatibility zones is outlined in Table 2A of the Riverside County Airport Land Use Compatibility Plan Policy Document.

Within Compatibility Zone D, residential uses with average parcel sizes greater than five acres must have densities less than or equal to 0.2 du/ac (gross). The proposed project would result in a density of 3.15 du/ac. Therefore, the project does not meet the residential density of less than or equal to 0.2 du/ac. It is noted that Section 3.3.6, Other Special Conditions, of the Riverside County Airport Land Use Compatibility Plan Policy Document notes that the compatibility criteria set forth in the Plan are intended to be applicable to all locations within each airport's influence area. However, it is recognized that there may be specific situations where a normally incompatible use can be considered compatible because of terrain, specific location, or other extraordinary factors or circumstances related to the site.

The proposed project is consistent with the other compatibility criteria associated with Compatibility Zones D and E.

The project, as proposed, may conflict with the Riverside County Airport Land Use Compatibility Plan Policy Document. With the implementation of Mitigation Measure Haz-1, impacts to land use compatibility would be mitigated to ***less than significant***.

*Implement **Mitigation Measure Haz-1.***

Response c): As noted previously, the Western Riverside County MSHCP is a comprehensive, multijurisdictional HCP focusing on conservation of species and their associated habitats in Western Riverside County. The MSHCP Plan Area encompasses approximately 1.26 million acres, including all unincorporated Riverside County land west of the crest of the San Jacinto Mountains to the Orange County line. It includes the cities of Temecula, Murrieta, Lake Elsinore, Canyon Lake, Norco, Corona, Riverside, Moreno Valley, Banning, Beaumont, Calimesa, Perris, Hemet, and San Jacinto. The HCP covers multiple species and multiple habitats within a diverse landscape, from urban centers to undeveloped foothills and forests, under multiple jurisdictions. The project site is within the MSHCP Plan Area. Impacts associated with compliance with the MSHCP are discussed in Section IV, Biological Resources. There is no conflict with the MSHCP. Therefore, implementation of the proposed project would have a l***ess than significant*** impact relative to this issue.

XI. MINERAL RESOURCES

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
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?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

Responses to Checklist Questions

Response a): The City's General Plan EIR determined that impacts related to mineral resources as a result of General Plan buildout would not be significant. No mineral extraction operations exist at the property. Additionally, there are no oil and gas extraction wells within or near the property. Implementation of the proposed project would have ***no impact*** relative to this issue.

Response b): The project site does not contain a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. The proposed project would not result in loss of a mineral resource. Implementation of the proposed project would have ***no impact*** relative to this issue.

XII. NOISE

Would the project result in:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
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?			X	
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
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?			X	
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?			X	

Responses to Checklist Questions

Responses a-f): According to the City's General Plan EIR, even at full buildout, the projected 65 dB noise contour is 100 feet from the centerline of Nicolas Road. This is consistent with the noise standard set forth by the City of Temecula General Plan, which notes that, for LM areas, noise levels shall not exceed 65 dBL. With this in mind, the project site is located over 220 feet away from Nicolas Road.

The project site is located within 1.62 miles from the French Valley Airport. However, the project site is located outside of the Noise Compatibility Contours Map, as shown in Map FV-3 of the Riverside County Airport Land Use Compatibility Plan Policy Document.

The proposed project would not result in substantial permanent increases in ambient noise levels above levels without the project.

Sensitive receptors in the immediate project vicinity include the residential uses located to the north, northwest, west, and east. Noise from construction activities on the project site would add to the noise environment in the immediate project vicinity. Noise would also be generated during the construction phase by increased truck traffic on area roadways. This construction related noise increase would be of short duration, and would occur primarily during daytime hours.

Significant construction noise impacts would occur if construction activities occurred during noise-sensitive times (i.e. early morning, late evening, or nighttime hours). The City has requirements in the Municipal Code that limit construction hours to the least sensitive times of the day to ensure that significant construction noise impacts do not occur. Adherence to City Municipal Code (Section 9.20.060) would minimize any impacts from noise during construction. Therefore, all impacts related to noise would be ***less than significant***.

XIII. POPULATION AND HOUSING

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
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)?			X	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Responses to Checklist Questions

Response a): According to the 2016 US Census population estimates, the population in Temecula is 113,054 people. Additionally, the average household size is 3.15. The proposed project would result in the construction of residential housing that would generate an estimated 154 people. This is an estimated 0.14 percent growth in Temecula. An estimated 0.14 percent growth in Temecula is not considered substantial growth in Temecula or the region and it is consistent with the assumed growth in the General Plan. The 154 people may come from Temecula or surrounding communities.

The proposed project would not include upsizing of offsite infrastructure or roadways. The installation and sizing of new infrastructure would be limited to the needs of the proposed uses. The proposed project would not induce substantial population growth in an area, either directly or indirectly. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

Responses b), c): The project site is currently undeveloped and does not contain housing. The proposed project would not displace housing or people. Implementation of the proposed project would have ***no impact*** relative to this topic.

XIV. PUBLIC SERVICES

	Potentially Significant Impact	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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:				
Fire protection?			X	
Police protection?			X	
Schools?			X	
Parks?			X	
Other public facilities?				X

Responses to Checklist Questions

Response a):

Fire Protection

The Riverside County Fire Department (RCFD) would provide fire protection service. The RCFD, operating in conjunction with the California Department of Forestry and Fire Protection (CDF), provides fire protection and emergency medical services to the City of Temecula on a contract basis. The City contract provides funding for 55 firefighters, seven engine companies, two paramedic squads, and one truck company. As of 2017, five fire stations served the Temecula area. The stations are staffed by both paid and volunteer personnel. In addition to the five fire stations serving Temecula, the City began the F.A.S.T. program (Faster Ambulance Service in Temecula) on July 27, 1999. The program consists of a paramedic squad vehicle which responds to calls inside the City limits within five minutes. The Emergency Response Program handles all fire, life, and environmental emergencies within five minutes.

Station #83, which is located at 37480 Winchester Road, Murrieta, serves the Temecula area and is the nearest fire station to the project site (2.8 miles north). The remaining fire stations which serve the Temecula area are located within 5.8 miles of the project site. At the present time, the RCFD has a target goal of responding within five minutes to any call for services 90 percent of the time.

In 2016, the RCFD responded to 8,571 incidents in Temecula. The City and County expand fire protection services as growth and development occurs to meet the adopted fire response time as a general guideline. (General Plan Policies PSR-1 and PSR-2). Funding for fire operations and services is derived from a combination of development impact fees and the City's budget. Development impact fees are paid prior to construction and are typically used to fund new facilities and equipment. Additionally, as set forth in City Municipal Code Section 15.060.020, the project applicant would be required to pay development impact fees related to fire protection to enable the expansion of fire protection facilities, addition of fire protection personnel, and the acquisition of additional fire equipment, as needed to maintain their performance standards.

Compliance with City goals, policies, and performance standards, as well as Section 15.060.020 of the City Municipal Code, would ensure that the proposed buildings would include adequate fire detection and suppression systems to allow for fires to be quickly contained and would ensure that the fire department maintains an adequately sized staff and equipment in order to meet any additional demands generated by the project. Compliance with such regulations would reduce the burden on existing fire stations serving the project area, and would ensure that the RCFD has adequate equipment, staff, and station space to provide fire protection and emergency services to the project area and the City.

The proposed project would not result in a need to construct a new fire station or physically alter an existing fire station. The RCFD would receive development impact fees from the project for capital improvements and infrastructure costs even though a new facility would not be created. The fair share funds are intended to pay for project financial impacts on fire protection service. The proposed project's environmental impact to fire service is considered ***less than significant***.

Police Protection

Police protection service for the project would be provided by the Temecula Police Department (TPD). Temecula contracts with the Riverside County Sheriff's Department for law enforcement services. The current contract provides for the assignment of 76 sworn officers and 12 non-sworn officers to the City. Other resources such as bomb disposal, an emergency services team, and internal affairs investigations are provided through various divisions with the Sheriff's Department. The current personnel to population ratio established by the City is one full-time officer per 1,000 residents. The Temecula Police Department currently employs officers at the rate of 0.94 officers per 1,000 residents.[1]

The City expands police protection service consistent with community needs and provides an adequate level of service based on demand (General Plan Policies PSR-1 and PSR-2). The proposed project would be required to pay development impact fees, as set forth in City Code Section 15.06.020, which would allow the police department to add additional staff to provide services to accommodate this growth. These fees are used to fund the direct impact on increased demand for police facilities and equipment.

The proposed project would not result in a need to construct a new police station or physically alter an existing police station. As previously stated, the development impact fees for capital improvements and infrastructure costs would be collected even though a new facility would not be created. The fair share funds are intended to pay for project financial impacts on police protection service. The proposed project's environmental impact to police service is considered ***less than significant***.

Schools

School services would be provided by the Temecula Valley Unified School District (TVUSD). The TVUSD service boundaries extend north to Jean Nicholas Road in Winchester, south to the Riverside County-San Diego County line, east to Vail Lake, and west to the Temecula city limit. The TVUSD currently (2017) operates 19 elementary schools, six middle schools, and three high schools. The total TVUSD enrollment (2016-2017) is 29,917 students.

[1] City of Temecula. Altair Specific Plan Draft Environmental Impact Report (SCH No. 2014111029). May 2016. Page 3.12-12.

Development of the proposed project would increase enrollment at TVUSD schools. The following table shows the student generation resulting from development of the project based on development of 49 single-family detached units.

Table 15: TVUSD Student Generation

Education Level	*Generation Factor*	*Students Generated*
Elementary (K-5)	0.3892	19
Middle (6-8)	0.1831	9
High (9-12)	0.1983	10
TOTAL	--	*38*

SOURCE: CITY OF TEMECULA GENERAL PLAN FINAL EIR, TABLE 5.12-3.

As shown in the table, development of the project would result in 19 additional elementary school students, 9 middle school students, and 10 high school students, for a total of 38 students.

Funding for new school construction is provided through State and local revenue sources. The TVUSD does levy school fees on new development in accordance with SB 50. The District currently assesses a Level I developer school fees on new development. The current fee for residential development without a mitigation agreement is $3.48 per square foot (effective June 20, 2016). The project would be subject to these Level I developer school fees.

The proposed project would not result in a need to construct a new school or physically alter an existing school. The proposed project would be subject to SB 50 impact fees, which would mitigate the financial impacts of the proposed project on school facilities. The proposed project's environmental impact to schools is considered ***less than significant***.

Parks

City parks and recreation facilities are provided by the City of Temecula and operated and maintained by the Community Development Department. The City's parks system consists of existing neighborhood, specialty, and sports parks. The City also has two recreation centers, an outdoor amphitheater, a gymnasium, two swimming pools, a senior center, the Temecula Museum, Temecula Children's Museum, sports fields, and picnic shelter areas that can be reserved for parties or picnics.

To ensure that adequate parks and recreational opportunities are available to the residents in Temecula, the City has established a parkland standard of five acres for each 1,000 residents, consistent with the Quimby Act.

The project would result in the construction of 49 single-family residential homes. According to the 2016 US Census population estimates, the population in Temecula is 113,054 people. Additionally, the average household size is 3.15. Based on the City's ratio, the addition of 49 single-family units at the site would increase population by up to 154 individuals. This would require the project to create 0.77 acres of parks or pay an in-lieu fee for 0.77 acres of park land. The project includes two park areas within the project site, totaling 0.9 acres. It is assumed that the 0.9 acres of proposed park will be publicly available and will qualify toward the 0.77-acre requirement. As such, the proposed project includes adequate park facilities.

The proposed project would not result in a need to physically alter an existing park off-site. The construction of the 0.9 acres of park within the project site is analyzed throughout this Initial Study, and all impacts have been determined to be less than significant, or they can be reduced

to an insignificant level with mitigation measure. As such, the proposed project would have a ***less than significant*** impact relative to this topic.

Other Public Facilities

The proposed project would not result in a need for other public facilities that are not addressed above, or in Section XVIII Utilities and Service Systems. Implementation of the proposed project would have ***no impact*** relative to this issue.

XV. RECREATION

	Potentially Significant Impact	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	
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?				X

Responses to Checklist Questions

Responses a): The project would result in the construction of 49 single-family residential homes. As noted previously, the addition of 49 single-family units at the site would increase population by up to 154 individuals. This would require the project to create 0.77 acres of parks or pay an in-lieu fee for 0.77 acres of park land. The project includes two park areas within the project site, totaling 0.9 acres. It is assumed that the 0.9 acres of proposed park will be publicly available and will qualify toward the 0.77-acre requirement. As such, the proposed project includes adequate park facilities.

The proposed project would not increase the use of existing parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

Responses b): The proposed project does not include the construction of recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Implementation of the proposed project would have ***no impact*** relative to this topic.

XVI. TRANSPORTATION AND TRAFFIC

Would the project:	*Potentially Significant Impact*	*Less Than Significant with Mitigation Incorporation*	*Less Than Significant Impact*	*No Impact*
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			X	
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?			X	
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?			X	
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
e) Result in inadequate emergency access?			X	
f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?			X	

Responses to Checklist Questions

Responses a-f): The City of Temecula prepared and certified an EIR for the General Plan. The General Plan EIR includes an analysis of traffic impacts from buildout of the General Plan, including development of residential units on the project site. The City's General Plan EIR notes that property zoned LM (i.e. the project site) has a daily trip rate of 10 trips per dwelling unit. This generation rate is largely consistent with, but slightly higher than, the Institute of Transportation Engineers (ITE) Trip Generation Rates, 9th Edition, which estimates that 9.52 daily trips would be generated for each single-family home. Using the City's daily trip generation rate, the proposed 49 units would generate approximately 490 daily trips.

The General Plan EIR forecasts the average daily trips at buildout for Nicolas Road. Approximately 20,600 trips would be generated from Winchester to General Kearny, 16,300 trips from General Kearny to Calle Medusa, and 16,000 trips from Calle Medusa to Butterfield Stage Road. The additional 490 daily trips per day generated by the proposed project does not warrant offsite street/roadway improvements. The existing street/roadways in the City can accommodate the additional 490 daily trips from proposed project.

The proposed project does not include the construction of any new offsite public streets/roads and will not change the street pattern or design of the City's circulation network. There will be no increased hazards due to design features. The project will not result in inadequate parking or emergency access. The site is located within sufficient response time for Fire and Police Departments and other emergency agencies. The individual lots will be required to provide no

less than two off-street parking spaces per unit. Staff has consulted with public transportation agencies, such as the Riverside Transit Agency, and it was determined that the project warrants a bus turn-out. The project would be conditioned to place a bus stop turnout adjacent to the proposed trailhead parking lot. The project would not conflict with any adopted policies, plans, or programs. The project improvement plans would be required to provide necessary bicycle lanes as shown on the City's Master Trails Plan.

Overall, implementation of the proposed project is consistent with the General Plan, for which the City has a certified EIR, and would have a ***less than significant*** impact relative to transportation and traffic.

XVII. TRIBAL CULTURAL RESOURCES

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

Responses to Checklist Questions

Responses a-b): The City has initiated tribal consultation in accordance with Assembly Bill (AB) 52. In letters dated February 1, 2017, the City sent tribal consultation letters to the following tribes: Pechanga Band of Luiseño Indians, Agua Caliente Band of Cahuilla Indians, Rincon Band of Luiseño Indians, Soboba Band of Luiseño Indians, and Torres Martinez Desert Cahuilla Indians. In the letters, the City provided the tribes with information regarding the proposed project and requested that the tribes supply any information they might have concerning prehistoric sites or traditional use areas within the project site. As of this writing, response letters have been received from two tribes. The Pechanga Band of Luiseño Indians requested that the Tribe be consulted throughout the environmental review process for the project. The Agua Caliente Band of Cahuilla Indians (ACBCI) indicates that a records check of the ACBCI cultural registry revealed that this project is not located within the Tribe's Traditional Use Area (TUA) and that their letter concludes their consultation efforts.

Based on previous cultural evaluations and consultations, there is a potential for the discovery of prehistoric, ethnohistoric, or historic archaeological sites that may meet the definition of Tribal Cultural Resources (TCRs). Although no TCRs have been documented on the project site, the project is in a region where significant cultural resources have been recorded and there remains a potential that undocumented archaeological resources that may meet the TCR definition could be unearthed or otherwise discovered during ground-disturbing and construction activities. Examples of significant archaeological discoveries that may meet the TCR definition would include villages and cemeteries. Due to the possible presence of undocumented TCRs within the project site, construction-related impacts on tribal cultural resources would be potentially significant. Implementation of the mitigation measures Cul-1 through Cul-9 would require appropriate steps to preserve and/or document any previously undiscovered resources that may be encountered during construction activities, including human remains. Implementation of these measures would reduce any potential impact to a ***less than significant*** level.

XVIII. UTILITIES AND SERVICE SYSTEMS

Would the project:	***Potentially Significant Impact***	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			X	
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?			X	
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?			X	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?			X	
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 projects projected demand in addition to the providers existing commitments?			X	
f) Be served by a landfill with sufficient permitted capacity to accommodate the projects solid waste disposal needs?			X	
g) Comply with federal, state, and local statutes and regulations related to solid waste?			X	

Background

The proposed project would connect to existing City infrastructure to provide water, sewer, and storm drainage utilities. EMWD would provide water and sewer service to the project, and the RCFC & WCD would maintain the San Gertrudis Creek flood channel (Lot E). The two water quality basins (Lot C) would be maintained by the HOA. One of the two proposed parks (Lot A) would also be maintained by the HOA, while the other park (Lot B) would be maintained by the City of Temecula.

Responses to Checklist Questions

Responses a), b) and e): EMWD provides potable water, recycled water, and wastewater services to an area of approximately 555 square miles in western Riverside County. The 555-square mile service area includes seven incorporated cities in addition to unincorporated areas in the County of Riverside. EMWD is both a retail and wholesale agency, serving a retail population of 546,146 people and a wholesale population of 215,075 people. The EMWD has four service areas and operates four operational Regional Water Reclamation Facilities (RWRFs): San Jacinto Valley, Moreno Valley, Temecula Valley, and Perris Valley. The Temecula Valley RWRF is located within the central commercial area of Temecula. The four RWRFs are

spread throughout EMWD's service area. An intricate web of pipelines connects the four RWRFs, as well as several distribution storage ponds, to manage the delivery of recycled water. All of EMWD's RWRFs produce tertiary effluent, suitable for all Department of Health Services permitted uses, including irrigation of food crops and full-body contact. According to the EMWD's 2015 Urban Water Management Plan, the four RWRFs have a combined capacity of 81,800 acre-feet per year (AFY):

- San Jacinto Valley: 15,700 AFY;
- Moreno Valley: 17,900 AFY;
- Temecula Valley: 20,200 AFY; and
- Perris Valley: 28,000 AFY.

EMWD treats all of the wastewater collected in its service area to tertiary standards and disposes of its recycled water in one of three ways; 1) customer sales 2) discharge to Temescal Creek, or, 3) through percolation and evaporation while stored in ponds throughout EMWD. In 2015, EMWD collected and treated a total of 48,665 acre-feet (AF) of wastewater at its four RWRFs:

- San Jacinto Valley: 6,884 AF;
- Moreno Valley: 11,554 AF;
- Temecula Valley: 14,071 AF; and
- Perris Valley: 12,876 AF.

As shown above, all four of the EMWD's RWRFs had excess treatment capacity in 2015. The typical daily flows, current capacities, and ultimate capacities of the RWRFs are shown below.

Table 16: EMWD RWRF Flows and Capacities

RWRF	*Typical Daily Flows*	*Current Capacity (October 2016)*	*Ultimate Capacity*
San Jacinto Valley RWRF	7.0	14.0	27.0
Moreno Valley RWRF	10.6	16.0	41.0
Temecula Valley RWRF	14.0	18.0	28.0
Perris Valley RWRF	13.8	22.0	100.0

NOTE: ALL VALUES ARE SHOWN IN MILLION-GALLONS PER DAY (MGD)
SOURCES: EMWD RWRF NEWSLETTERS (2016). AVAILABLE AT: HTTPS://WWW.EMWD.ORG/SERVICES/WASTEWATER-SERVICE/TREATMENT-PROCESS.

The EMWD treats approximately 46 million gallons per day (MGD) of wastewater and is capable of treating 56 MGD. The EMWD RWRF connection system includes a network of pipelines that extend for approximately 1,600 miles, supported by 45 lift (pumping) stations (EMWD 2011).

The EMWD wastewater generation (average daily flow) factor for low density residential uses is 105 gallons per day (gpd) per capita.[2] According to the 2016 US Census, the average household

[2] City of Temecula. Cypress Ridge Project Draft Environmental Impact Report (SCH No. 2016051073). March 2017. Table 3.14-3, Page 3.14-4.

size in Temecula is 3.15. Based on the City's ratio, the addition of 49 single-family units at the site would increase population by up to 154 individuals. Therefore, the project would generate an estimated 16,170 gpd, or 5,902,050 gallons per year (5.9 million gallons per year, or 18.1 AFY). The resulting daily wastewater generation would account for 0.02 percent of the EMWD's RWRFs total capacity of 81,800 AFY.

Sewer mains are located under existing streets within the vicinity of the project site. These sewer mains collect and convey raw sewage generated by the existing single-family residential development to the EMWD's RWRFs. The raw sewage generated by the proposed project would be conveyed from the site via a series of sewer pipes. The proposed sewer facilities would be designed in accordance with the Uniform Plumbing Code. As a result, project implementation will not result in significant impacts; no mitigation measures are required.

The City's General Plan EIR indicates that the sewer collection system contains adequate capacity to handle foreseeable future development. EMWD serves the project site for sewer service. The District must comply with the wastewater treatment regulations and requirements of the RWQCB. Wastewater currently discharged from EMWD's four RWRFs complies with the treatment requirements of the RWQCB-issued permits. Because of the Regional Board compliance requirements, wastewater treatment requirements are not anticipated to be exceeded.

The City has established that there is adequate capacity at the EMWD's RWRFs to serve build-out of anticipated residential land in the City, and the distribution system operates at acceptable levels and has been designed to accommodate expansions and service extensions. The project applicant would be required to pay applicable connection fees and ongoing user fees to offset any financial impacts. There would not be a need to expand or build a new treatment facility. Implementation of the proposed project would have a ***less than significant*** impact.

Response c): Development on the project site would place impervious surfaces on the approximately 30.18-acre project site. Development of the project site would potentially increase local runoff, and would introduce constituents into storm water that are typically associated with urban runoff. These constituents include heavy metals (such as lead, zinc, and copper) and petroleum hydrocarbons. BMPs will be applied to the proposed site development to limit the concentrations of these constituents in any site runoff that is discharged into downstream facilities to acceptable levels.

The project would be designed and constructed with on-site storm drainage bio-retention basins. The two water quality basins would be located within Lot C near the western portion of the site (see Lot C, Figure 4). Site runoff would run through the proposed streets before being intercepted by the two basins and conveyed through proposed local storm drain systems that discharge to a water quality basin and drainage channel. The two basins are designed to mitigate for the 10- and 100-year storm events. The project proponent will file a Letter of Map Revision (LOMR) with FEMA to ensure that there are no homes built within the mapped 100-year floodplain.

Along Santa Gertrudis Creek, the northern and southern banks of the channel will be reinforced with riprap. Santa Gertrudis Creek will be realigned on the east side of the project site to allow room for the widening of Nicolas Road, as required by the City. The road widening will require substantial fill, pavement, and a riprap slope extending across Santa Gertrudis Creek. The existing San Diego aqueduct crosses Santa Gertrudis Creek near the eastern project boundary,

and will need to be protected from existing and future scour by a concrete and riprap cover. These impacts are included in the road widening impacts noted above.

The construction of the project would be required to comply with the development planning requirements of the RWQCB municipal separate stormwater sewer system (MS4) permit and the City of Temecula Stormwater Ordinance. These include implementation of nonstructural, structural, source control and treatment control BMPs during the planning process prior to project approval for development projects, which can include infiltration basin, detention basin, vegetated swale, media filter, pervious concrete, storm drain stenciling or signage, protection of material and trash storage areas from rainfall, and vector avoidance strategies. As required by the Stormwater Ordinance, the project would be required to submit a Water Quality Management Plan (WQMP), which would ensure that the project implements specific drainage features in order to meet the City's MS4 Permit and Stormwater Ordinance requirements. As a part of the WQMP the project would be required to incorporate and maintain LID BMPs into the project design, which include measures to reduce increases in runoff through hydromodification and infiltration protection.

The construction of the stormwater conveyance and detention system would ensure that the project is consistent with all applicable plans and regulations related to stormwater conveyance and detention as required by the City, and would ensure that offsite, or onsite flooding does not occur during storm events.

The environmental impacts associated with the construction of drainage facilities fall within the project "footprint" and have been addressed throughout this environmental document. Implementation of the proposed project would have a ***less than significant*** impact.

Response d): Temecula is served by two water companies: the RCWD and EMWD. The EMWD would provide water services to the project site. EMWD provides potable water, recycled water, and wastewater services to an area of approximately 555-square miles in western Riverside County. The 555-square mile service area includes seven incorporated cities in addition to unincorporated areas in the County of Riverside. EMWD is both a retail and wholesale agency, serving a retail population of 546,146 people and a wholesale population of 215,075 people. In 2015, the EMWD provided potable water services to 147,300 accounts.

EMWD has four sources of water supply: imported water from MWD, local groundwater, desalinated groundwater, and recycled water. Delivery points for each source of water are located throughout the EMWD service area.

Potable imported water is treated and delivered to EMWD directly from MWD's two large filtration plants. The Henry J. Mills (Mills) Water Treatment Plant treats water from Northern California and provides it to EMWD through two connection points located in the northeast portion of EMWD's service area. The Robert F. Skinner (Skinner) Water Treatment Plant treats a blend of Colorado River water and water from Northern California and provides it to EMWD through a connection point in the southwest portion of EMWD's service area.

EMWD owns and operates two microfiltration plants that filter raw imported water delivered through MWD, removing particulate contaminants to achieve potable water standards. The two treatment plants, the Perris Water Filtration Plant and the Hemet Water Filtration Plant, are located in Perris and Hemet, respectively. Raw water from MWD is also used for groundwater replenishment in the eastern part of EMWD. EMWD and others can extract this water at a later date for beneficial uses. Untreated water from MWD used for agricultural purposes is delivered

in the northeast for use by EMWD retail and wholesale accounts and in the south for RCWD agricultural accounts.

EMWD produces potable and brackish groundwater from the San Jacinto Groundwater Basin that underlies the EMWD service area. Groundwater wells are mostly located within the San Jacinto Watershed and serve the northern portion of EMWD, with the largest amount of production taking place around the cities of Hemet and San Jacinto. EMWD owns and operates two desalination plants in Sun City, the Menifee Desalter and the Perris I Desalter, which treat brackish groundwater through reverse osmosis to achieve potable water standards.

In addition to the potable system, EMWD maintains a regional recycled water system that provides tertiary-treated recycled water to customers for agricultural, landscape irrigation, environmental, and industrial use. EMWD's recycled water system consists of four RWRFs that treat municipal sewage and produce water for recycling. The four RWRFs, the San Jacinto Valley RWRF, the Moreno Valley RWRF, the Temecula Valley RWRF, and the Perris Valley RWRF, are spread throughout EMWD's service area. An intricate web of pipelines connects the four RWRFs, as well as several distribution storage ponds, to manage the delivery of recycled water.

In 2015, the approximate amount of total potable and raw water demand in the EMWD service area was 78,937 acre-feet (AF).

The proposed project includes development of up to 49 single family residential units on the 30.18-acre site. The EMWD's 10-year baseline daily per capita water use rate of 197 gallons per capita per day was used to calculate estimated water demand for the proposed project.[3] As noted previously, the addition of 49 single-family units at the site would increase population by up to 154 individuals total daily demand is estimated to be 30,338 gpd (11,073,370gallons per year, or 11.1MGD). According to the EMWD 2015 Urban Water Management Plan, the total retail water supply in 2015 was 123,087 AFY. The additional water demand (11.1 MGD or 34.0 AFY) would not exceed the District's available water supply. According to the EMWD 2015 Urban Water Management Plan, EMWD has sufficient supply capabilities to meet the expected demands of its member agencies from 2020 through 2040 under normal, historic single-dry and historic multiple-dry year conditions.

The resulting increase in demand would be minimal in comparison to the District's total available water supply. The City's water treatment and conveyance infrastructure is adequate to serve existing demand, in addition to the demand created by the proposed project.

In accordance with the Water Conservation in Landscaping Act, Chapter 17.32 of the City's Municipal Code requires that all landscape designs facilitate the implementation of landscape maintenance practices which foster long-term conservation. All development proposals, including the proposed project, must include landscaping and irrigation plans that comply with the water purveyor's water-efficient landscaping requirements.

The City's General Plan EIR indicates that impacts related to adequate water supply would be less than significant. The water demand generated by the project was quantified within the City's General Plan EIR. Implementation of the proposed project would have a ***less than significant*** impact.

[3] Eastern Municipal Water District. 2015 Urban Water Management Plan. June 2016. Table 5-4.

Responses f), g): The City of Temecula contracts with CR&R, a private solid waste hauler, to collect and dispose of the solid waste/refuse generated in the City. According to the City's General Plan EIR, household waste is transported to a processing center in the City of Stanton, and commercial/industrial waste is transported to the Perris Transfer Station/Materials Recovery Facility (TS/MRF) (located at 1706 Goetz Road). At TS/MRFs, the solid waste is unloaded from collection vehicles and loaded onto larger long-distance transport vehicles for shipment to landfills or other treatment or disposal facilities. The City of Temecula's solid waste is hauled to both the El Sobrante Landfill (located at 10910 Dawson Canyon Road in Corona) and Badlands Landfill (located at 31125 Ironwood Avenue in Moreno Valley) in Riverside County. Both landfills are located approximately 27 miles from the project area.

According to the CalRecycle webpage, the remaining capacity of the El Sobrante Landfill was 145,530,000 tons with an estimated cease operation date of 2045. The daily disposal rate is 16,054 tons/day. According to the CalRecycle webpage, the remaining capacity of the Badlands Landfill was 15,748,799 cubic yards with an estimated cease operation date of 2022. The daily disposal rate is 4,500 tons/day.

The City provides curbside recycling services and green waste services. Recyclable materials are collected and transported to the Perris TS/MRF for processing. Garden materials are hauled to a separate facility for composting, and the remaining waste is hauled to the El Sobrante and Badlands Landfills. The TS/MRF and the El Sobrante Landfill are open to the public for personal delivery; both accept electronic waste (e-waste) and appliances.

Project construction activities would generate solid waste, including excess construction materials and material removed during site clearing. However, the site is vacant, and construction would not require demolition of existing structures or removal of large quantities of waste. It is anticipated that compliance with the construction waste requirements in CALGreen would be sufficient to minimize solid waste generation during construction. As a result, construction impacts associated with the proposed project would be ***less than significant***.

During operation of the project, the residential uses would produce solid waste that would be collected and transferred to the landfill system. According to California's 2016 per capita disposal rate, the average California resident produces 6.0 pounds per day.[4] Based on this rate and the resulting project population of 154 individuals, the project is expected to produce approximately 924 pounds per day (168.6 tons of solid waste annually).

The City of Temecula is required to maintain a 50 percent diversion rate as mandated by the State via the California Integrated Waste Management Act for all solid waste. The project is subject to this diversion rate for solid waste generated by the project. The solid waste generated by the project would place a minimal burden on the City's required diversion rate. The increase would not require additional landfill capacity. Since the landfill would have sufficient permitted capacity (through 2045), the project is not anticipated to cause an adverse impact to either solid waste collection service or the landfill disposal system. Implementation of the proposed project would have a ***less than significant*** impact relative to this topic.

[4] CalRecycle. California 2016 Per Capita Disposal Rate Estimate. Accessed October 2017. Available at: <http://www.calrecycle.ca.gov/lgcentral/goalmeasure/disposalrate/MostRecent/default.htm>.

XVIX. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	***Less Than Significant with Mitigation Incorporation***	***Less Than Significant Impact***	***No Impact***
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 endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
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)?		X		
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		X		

Responses to Checklist Questions

Response a): This Initial Study includes an analysis of the project impacts associated with aesthetics, agricultural and forest resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation and traffic, tribal cultural resources, and utilities and service systems. The analysis covers a broad spectrum of topics relative to the potential for the proposed project to have environmental impacts. This includes the potential for the proposed project to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. It was found that the proposed project would have either no impact, a less than significant impact, or a less than significant impact with the implementation of mitigation measures. For the reasons presented throughout this Initial Study, the proposed project would not substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. With the implementation of mitigation measures presented in this Initial Study, the proposed project would have a ***less than significant*** impact relative to this topic.

*Implement **Mitigation Measures Bio-1** through **Bio-4**, and **Cul-1** through **Cul-9.***

Response b): This Initial Study includes an analysis of the project impacts associated with aesthetics, agricultural and forest resources, air quality, biological resources, cultural resources,

geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, tribal cultural resources, and utilities and service systems. The analysis covers a broad spectrum of topics relative to the potential for the proposed project to have environmental impacts. It was found that the proposed project would have either no impact, a less than significant impact, or a less than significant impact with the implementation of mitigation measures. These mitigation measures would also function to reduce the project's contribution to cumulative impacts.

The project would increase the population and use of public services and systems; however, it was found that there is adequate capacity to accommodate the project. There are no significant cumulative or cumulatively considerable effects that are identified associated with the proposed project after the implementation of all mitigation measures presented in this Initial Study. With the implementation of all mitigation measures presented in this Initial Study, the proposed project would have a ***less than significant*** impact relative to this topic.

> *Implement* ***Mitigation Measures Bio-1*** *through* ***Bio-4****,* ***Mitigation Measures Cul-1*** *through* ***Cul-9****,* ***Mitigation Measures Geo-1*** *and* ***Geo-2****,* ***Mitigation Measure Haz-1****, and* ***Mitigation Measures Hyd-1.***

Response c): The construction phase could affect surrounding neighbors through increased air emissions, noise, and traffic; however, the construction effects are temporary and are not substantial. The operational phase could also affect surrounding neighbors through increased air emissions, noise, and traffic; however, mitigation measures have been incorporated into the proposed project that would reduce the impacts to a less than significant level. The proposed project would not cause substantial adverse effects on human beings. With the implementation of all mitigation measures presented in this Initial Study, the proposed project would have a ***less than significant*** impact relative to this topic.

> *Implement* ***Mitigation Measures Bio-1*** *through* ***Bio-4****,* ***Mitigation Measures Cul-1*** *through* ***Cul-9****,* ***Mitigation Measures Geo-1*** *and* ***Geo-2****,* ***Mitigation Measure Haz-1****, and* ***Mitigation Measures Hyd-1.***

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Appendix A

Air Quality and Greenhouse Gas Modeling

CalEEMod Assumptions

- Air District: South Coast AQMD
- Climate Zone: 10
- Land Use Setting: Urban
- Start of Construction: Tuesday, May 1, 2018
- Operational Year: 2019
- Utility Company: Southern California Edison
- Land Uses:

Land Use Type and Subtype	Unit Amount and Metric	Lot Acreage	Square Footage	Population
Residential – Single Family Housing	49 DU	16.48	--	154

According to the 2016 US Census population estimates, the average household size in Temecula is 3.15.

- Construction Tab – Phasing: Engineer's estimate.
  - Demolition: 0 days
  - Site Prep: 3 days
    - 5/1/18 – 5/3/18
    - Assumed 5 acres prepped per day
  - Grading: 60 days
    - 5/3/18 – 7/25/18
    - Assumed 1/3 acre graded per day
    - Assumed non-phased grading, all underground utility construction, worst case scenario
  - Building Construction: 245 days
    - 8/6/18 – 7/12/19
    - Assumed construction of 1 unit per week
    - Assumed construction 5 days per week
  - Paving: 9 days
    - 7/25/18 – 8/6/18
    - Assumed 2 acres paved per day
  - Architectural Coating: 245 days
    - 10/6/18 – 9/13/19
    - Assumed construction of 1 unit per week
    - Assumed construction 5 days per week

Phase #	Phase Name	Start Date	End Date	# Days/Week	# Days
1	Site Preparation	5/1/18	5/3/18	5	3
2	Grading	5/3/18	7/25/18	5	60
3	Building Construction	8/6/18	7/12/19	5	245
4	Paving	7/25/18	8/6/18	5	9
5	Architectural Coating	10/6/18	9/13/19	5	245

- Construction Tab – Off-Road Equipment: Engineer's estimate.
    - Demolition: N/A
    - Site Prep: 1 dozers, 2 tractors
        - Engineer's estimate
    - Grading: 2 excavators, 1 graders, 1 dozers, 1 scrapers, 1 backhoes
        - Engineer's estimate
    - Building Construction: 1 crane (3 hours per day), 1 forklifts, 1 generator sets, 1 backhoes (4 hours per day), 0 welders
        - 1 machine per subdivision, no welding
    - Paving: 1 pavers, 1 paving equipment, 1 rollers
        - 1 machine per subdivision
    - Architectural Coating: 1 compressors (6 hours per day)
        - 1 compressor per subdivision

Equipment Type	Unit Amount	Hours/Day	Horsepower	Load Factor
Site Preparation				
Rubber Tired Dozers	1	6.00	367	0.48
Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading				
Excavators	2	8.00	158	0.38
Graders	1	8.00	187	0.41
Rubber Tired Dozers	1	8.00	247	0.40
Tractors/Loaders/Backhoes	1	8.00	97	0.37
Welders	1	8.00	367	0.48
Building Construction				
Cranes	1	3.00	231	0.29
Forklifts	1	8.00	89	0.20
Generator Sets	1	8.00	84	0.74
Tractors/Loaders/Backhoes	1	4.00	97	0.37
Paving				
Pavers	1	8.00	130	0.42
Paving Equipment	1	6.00	132	0.36
Rollers	1	6.00	80	0.38
Architectural Coatings				
Air Compressors	1	6.00	78	0.48

- Construction Tab – Dust From Material Movement:
    - Grading Total Acres Disturbed: 16.48
    - Site Prep Total Acres Disturbed: 16.48
- Operational Tab – Mobile:
    - ITE Number 210 (CalEEMod default, per Table 1 of CalEEMod User's Guide)

Seraphina Project

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	49.00	Dwelling Unit	16.48	88,200.00	154

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - See Appendix A for assumptions

Construction Phase - See Appendix A for assumptions

Off-road Equipment - No demolition required.

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment -

Grading - See Appendix A for assumptions

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	5
tblConstructionPhase	NumDays	20.00	245.00
tblConstructionPhase	NumDays	300.00	245.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	30.00	60.00
tblConstructionPhase	NumDays	20.00	9.00
tblConstructionPhase	NumDays	10.00	3.00
tblConstructionPhase	PhaseEndDate	4/30/2018	9/13/2019
tblConstructionPhase	PhaseEndDate	4/30/2018	7/12/2019
tblConstructionPhase	PhaseEndDate	4/30/2018	7/25/2018
tblConstructionPhase	PhaseEndDate	4/30/2018	8/6/2018
tblConstructionPhase	PhaseEndDate	4/30/2018	5/3/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	10/6/2018

tblConstructionPhase	PhaseStartDate	5/1/2018	8/6/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	5/3/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	7/25/2018
tblGrading	AcresOfGrading	90.00	16.48
tblGrading	AcresOfGrading	0.00	16.48
tblLandUse	LotAcreage	15.91	16.48
tblLandUse	Population	140.00	154.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	3.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	8.00	18.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2596	1.9555	1.2883	2.3800e-003	0.2283	0.0966	0.3249	0.1118	0.0904	0.2022	0.0000	215.0184	215.0184	0.0513	0.0000	216.3017
2019	0.3041	0.8152	0.7286	1.3700e-003	0.0200	0.0477	0.0677	5.3500e-003	0.0461	0.0514	0.0000	120.6185	120.6185	0.0159	0.0000	121.0171
Maximum	**0.3041**	**1.9555**	**1.2883**	**2.3800e-003**	**0.2283**	**0.0966**	**0.3249**	**0.1118**	**0.0904**	**0.2022**	**0.0000**	**215.0184**	**215.0184**	**0.0513**	**0.0000**	**216.3017**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2018	0.2596	1.9555	1.2883	2.3800e-003	0.1019	0.0966	0.1985	0.0470	0.0904	0.1374	0.0000	215.0182	215.0182	0.0513	0.0000	216.3015
2019	0.3041	0.8152	0.7286	1.3700e-003	0.0200	0.0477	0.0677	5.3500e-003	0.0461	0.0514	0.0000	120.6184	120.6184	0.0159	0.0000	121.0170
Maximum	**0.3041**	**1.9555**	**1.2883**	**2.3800e-003**	**0.1019**	**0.0966**	**0.1985**	**0.0470**	**0.0904**	**0.1374**	**0.0000**	**215.0182**	**215.0182**	**0.0513**	**0.0000**	**216.3015**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**50.91**	**0.00**	**32.20**	**55.28**	**0.00**	**25.54**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**5-1-2018**	**7-31-2018**	1.4423	1.4423
2	**8-1-2018**	**10-31-2018**	0.4175	0.4175
3	**11-1-2018**	**1-31-2019**	0.5111	0.5111
4	**2-1-2019**	**4-30-2019**	0.4665	0.4665
5	**5-1-2019**	**7-31-2019**	0.4121	0.4121
6	**8-1-2019**	**9-30-2019**	0.0689	0.0689
		Highest	1.4423	1.4423

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5224	0.0186	0.8193	8.2000e-004		0.0496	0.0496		0.0496	0.0496	5.2047	10.8271	16.0319	0.0163	3.5000e-004	16.5454
Energy	9.8100e-003	0.0838	0.0357	5.4000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	243.3212	243.3212	7.9000e-003	3.0300e-003	244.4213
Mobile	0.1742	0.9725	2.3897	7.7400e-003	0.6011	8.9600e-003	0.6100	0.1611	8.4300e-003	0.1695	0.0000	712.7302	712.7302	0.0382	0.0000	713.6854
Waste						0.0000	0.0000		0.0000	0.0000	12.8169	0.0000	12.8169	0.7575	0.0000	31.7532
Water						0.0000	0.0000		0.0000	0.0000	1.0129	20.3698	21.3827	0.1049	2.6300e-003	24.7883
Total	**0.7064**	**1.0749**	**3.2447**	**9.1000e-003**	**0.6011**	**0.0653**	**0.6664**	**0.1611**	**0.0648**	**0.2259**	**19.0344**	**987.2484**	**1,006.2828**	**0.9248**	**6.0100e-003**	**1,031.1936**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.5224	0.0186	0.8193	8.2000e-004		0.0496	0.0496		0.0496	0.0496	5.2047	10.8271	16.0319	0.0163	3.5000e-004	16.5454
Energy	9.8100e-003	0.0838	0.0357	5.4000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	243.3212	243.3212	7.9000e-003	3.0300e-003	244.4213
Mobile	0.1742	0.9725	2.3897	7.7400e-003	0.6011	8.9600e-003	0.6100	0.1611	8.4300e-003	0.1695	0.0000	712.7302	712.7302	0.0382	0.0000	713.6854
Waste						0.0000	0.0000		0.0000	0.0000	12.8169	0.0000	12.8169	0.7575	0.0000	31.7532
Water						0.0000	0.0000		0.0000	0.0000	1.0129	20.3698	21.3827	0.1049	2.6300e-003	24.7883
Total	**0.7064**	**1.0749**	**3.2447**	**9.1000e-003**	**0.6011**	**0.0653**	**0.6664**	**0.1611**	**0.0648**	**0.2259**	**19.0344**	**987.2484**	**1,006.2828**	**0.9248**	**6.0100e-003**	**1,031.1936**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	5/1/2018	4/30/2018	5	0	
2	Site Preparation	Site Preparation	5/1/2018	5/3/2018	5	3	
3	Grading	Grading	5/3/2018	7/25/2018	5	60	
4	Paving	Paving	7/25/2018	8/6/2018	5	9	
5	Building Construction	Building Construction	8/6/2018	7/12/2019	5	245	
6	Architectural Coating	Architectural Coating	10/6/2018	9/13/2019	5	245	

Acres of Grading (Site Preparation Phase): 16.48

Acres of Grading (Grading Phase): 16.48

Acres of Paving: 0

Residential Indoor: 178,605; Residential Outdoor: 59,535; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Seraphina Project - South Coast AQMD Air District, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	0	8.00	158	0.38
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	3.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	1	8.00	80	0.38
Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Building Construction	Welders	0	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	18.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	0	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0178	0.0000	0.0178	5.9100e-003	0.0000	5.9100e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5500e-003	0.0267	0.0136	2.0000e-005		1.4700e-003	1.4700e-003		1.3600e-003	1.3600e-003	0.0000	2.0217	2.0217	6.3000e-004	0.0000	2.0375
Total	**2.5500e-003**	**0.0267**	**0.0136**	**2.0000e-005**	**0.0178**	**1.4700e-003**	**0.0192**	**5.9100e-003**	**1.3600e-003**	**7.2700e-003**	**0.0000**	**2.0217**	**2.0217**	**6.3000e-004**	**0.0000**	**2.0375**

3.3 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.2000e-004	1.2600e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2842	0.2842	1.0000e-005	0.0000	0.2844
Total	**1.4000e-004**	**1.2000e-004**	**1.2600e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2842**	**0.2842**	**1.0000e-005**	**0.0000**	**0.2844**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					6.9300e-003	0.0000	6.9300e-003	2.3000e-003	0.0000	2.3000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.5500e-003	0.0267	0.0136	2.0000e-005		1.4700e-003	1.4700e-003		1.3600e-003	1.3600e-003	0.0000	2.0217	2.0217	6.3000e-004	0.0000	2.0375
Total	**2.5500e-003**	**0.0267**	**0.0136**	**2.0000e-005**	**6.9300e-003**	**1.4700e-003**	**8.4000e-003**	**2.3000e-003**	**1.3600e-003**	**3.6600e-003**	**0.0000**	**2.0217**	**2.0217**	**6.3000e-004**	**0.0000**	**2.0375**

3.3 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.2000e-004	1.2600e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2842	0.2842	1.0000e-005	0.0000	0.2844
Total	**1.4000e-004**	**1.2000e-004**	**1.2600e-003**	**0.0000**	**3.0000e-004**	**0.0000**	**3.0000e-004**	**8.0000e-005**	**0.0000**	**8.0000e-005**	**0.0000**	**0.2842**	**0.2842**	**1.0000e-005**	**0.0000**	**0.2844**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1894	0.0000	0.1894	0.1003	0.0000	0.1003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1103	1.2810	0.7190	1.3100e-003		0.0566	0.0566		0.0521	0.0521	0.0000	119.9349	119.9349	0.0373	0.0000	120.8683
Total	**0.1103**	**1.2810**	**0.7190**	**1.3100e-003**	**0.1894**	**0.0566**	**0.2460**	**0.1003**	**0.0521**	**0.1524**	**0.0000**	**119.9349**	**119.9349**	**0.0373**	**0.0000**	**120.8683**

3.4 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1900e-003	2.6100e-003	0.0280	7.0000e-005	6.5800e-003	5.0000e-005	6.6400e-003	1.7500e-003	5.0000e-005	1.8000e-003	0.0000	6.3150	6.3150	2.2000e-004	0.0000	6.3204
Total	**3.1900e-003**	**2.6100e-003**	**0.0280**	**7.0000e-005**	**6.5800e-003**	**5.0000e-005**	**6.6400e-003**	**1.7500e-003**	**5.0000e-005**	**1.8000e-003**	**0.0000**	**6.3150**	**6.3150**	**2.2000e-004**	**0.0000**	**6.3204**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0739	0.0000	0.0739	0.0391	0.0000	0.0391	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1103	1.2810	0.7190	1.3100e-003		0.0566	0.0566		0.0521	0.0521	0.0000	119.9348	119.9348	0.0373	0.0000	120.8682
Total	**0.1103**	**1.2810**	**0.7190**	**1.3100e-003**	**0.0739**	**0.0566**	**0.1305**	**0.0391**	**0.0521**	**0.0912**	**0.0000**	**119.9348**	**119.9348**	**0.0373**	**0.0000**	**120.8682**

3.4 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1900e-003	2.6100e-003	0.0280	7.0000e-005	6.5800e-003	5.0000e-005	6.6400e-003	1.7500e-003	5.0000e-005	1.8000e-003	0.0000	6.3150	6.3150	2.2000e-004	0.0000	6.3204
Total	**3.1900e-003**	**2.6100e-003**	**0.0280**	**7.0000e-005**	**6.5800e-003**	**5.0000e-005**	**6.6400e-003**	**1.7500e-003**	**5.0000e-005**	**1.8000e-003**	**0.0000**	**6.3150**	**6.3150**	**2.2000e-004**	**0.0000**	**6.3204**

3.5 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.7000e-003	0.0394	0.0333	5.0000e-005		2.1500e-003	2.1500e-003		1.9800e-003	1.9800e-003	0.0000	4.6826	4.6826	1.4600e-003	0.0000	4.7191
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.7000e-003**	**0.0394**	**0.0333**	**5.0000e-005**		**2.1500e-003**	**2.1500e-003**		**1.9800e-003**	**1.9800e-003**	**0.0000**	**4.6826**	**4.6826**	**1.4600e-003**	**0.0000**	**4.7191**

3.5 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.9000e-004	3.1500e-003	1.0000e-005	7.4000e-004	1.0000e-005	7.5000e-004	2.0000e-004	1.0000e-005	2.0000e-004	0.0000	0.7104	0.7104	2.0000e-005	0.0000	0.7111
Total	**3.6000e-004**	**2.9000e-004**	**3.1500e-003**	**1.0000e-005**	**7.4000e-004**	**1.0000e-005**	**7.5000e-004**	**2.0000e-004**	**1.0000e-005**	**2.0000e-004**	**0.0000**	**0.7104**	**0.7104**	**2.0000e-005**	**0.0000**	**0.7111**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.7000e-003	0.0394	0.0333	5.0000e-005		2.1500e-003	2.1500e-003		1.9800e-003	1.9800e-003	0.0000	4.6826	4.6826	1.4600e-003	0.0000	4.7191
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**3.7000e-003**	**0.0394**	**0.0333**	**5.0000e-005**		**2.1500e-003**	**2.1500e-003**		**1.9800e-003**	**1.9800e-003**	**0.0000**	**4.6826**	**4.6826**	**1.4600e-003**	**0.0000**	**4.7191**

3.5 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.6000e-004	2.9000e-004	3.1500e-003	1.0000e-005	7.4000e-004	1.0000e-005	7.5000e-004	2.0000e-004	1.0000e-005	2.0000e-004	0.0000	0.7104	0.7104	2.0000e-005	0.0000	0.7111
Total	**3.6000e-004**	**2.9000e-004**	**3.1500e-003**	**1.0000e-005**	**7.4000e-004**	**1.0000e-005**	**7.5000e-004**	**2.0000e-004**	**1.0000e-005**	**2.0000e-004**	**0.0000**	**0.7104**	**0.7104**	**2.0000e-005**	**0.0000**	**0.7111**

3.6 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0546	0.5067	0.3748	6.3000e-004		0.0314	0.0314		0.0300	0.0300	0.0000	55.3378	55.3378	0.0101	0.0000	55.5894
Total	**0.0546**	**0.5067**	**0.3748**	**6.3000e-004**		**0.0314**	**0.0314**		**0.0300**	**0.0300**	**0.0000**	**55.3378**	**55.3378**	**0.0101**	**0.0000**	**55.5894**

3.6 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1500e-003	0.0328	8.4400e-003	7.0000e-005	1.6700e-003	2.4000e-004	1.9100e-003	4.8000e-004	2.3000e-004	7.1000e-004	0.0000	6.6193	6.6193	4.7000e-004	0.0000	6.6311
Worker	5.0700e-003	4.1500e-003	0.0445	1.1000e-004	0.0105	9.0000e-005	0.0106	2.7800e-003	8.0000e-005	2.8600e-003	0.0000	10.0409	10.0409	3.4000e-004	0.0000	10.0494
Total	**6.2200e-003**	**0.0369**	**0.0530**	**1.8000e-004**	**0.0121**	**3.3000e-004**	**0.0125**	**3.2600e-003**	**3.1000e-004**	**3.5700e-003**	**0.0000**	**16.6602**	**16.6602**	**8.1000e-004**	**0.0000**	**16.6805**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0546	0.5067	0.3748	6.3000e-004		0.0314	0.0314		0.0300	0.0300	0.0000	55.3378	55.3378	0.0101	0.0000	55.5893
Total	**0.0546**	**0.5067**	**0.3748**	**6.3000e-004**		**0.0314**	**0.0314**		**0.0300**	**0.0300**	**0.0000**	**55.3378**	**55.3378**	**0.0101**	**0.0000**	**55.5893**

3.6 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1500e-003	0.0328	8.4400e-003	7.0000e-005	1.6700e-003	2.4000e-004	1.9100e-003	4.8000e-004	2.3000e-004	7.1000e-004	0.0000	6.6193	6.6193	4.7000e-004	0.0000	6.6311
Worker	5.0700e-003	4.1500e-003	0.0445	1.1000e-004	0.0105	9.0000e-005	0.0106	2.7800e-003	8.0000e-005	2.8600e-003	0.0000	10.0409	10.0409	3.4000e-004	0.0000	10.0494
Total	**6.2200e-003**	**0.0369**	**0.0530**	**1.8000e-004**	**0.0121**	**3.3000e-004**	**0.0125**	**3.2600e-003**	**3.1000e-004**	**3.5700e-003**	**0.0000**	**16.6602**	**16.6602**	**8.1000e-004**	**0.0000**	**16.6805**

3.6 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0632	0.5996	0.4815	8.2000e-004		0.0354	0.0354		0.0339	0.0339	0.0000	72.0231	72.0231	0.0129	0.0000	72.3443
Total	**0.0632**	**0.5996**	**0.4815**	**8.2000e-004**		**0.0354**	**0.0354**		**0.0339**	**0.0339**	**0.0000**	**72.0231**	**72.0231**	**0.0129**	**0.0000**	**72.3443**

3.6 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3700e-003	0.0405	0.0102	9.0000e-005	2.1900e-003	2.7000e-004	2.4600e-003	6.3000e-004	2.5000e-004	8.9000e-004	0.0000	8.6031	8.6031	6.0000e-004	0.0000	8.6180
Worker	6.0400e-003	4.8000e-003	0.0522	1.4000e-004	0.0137	1.1000e-004	0.0138	3.6500e-003	1.0000e-004	3.7500e-003	0.0000	12.7513	12.7513	4.0000e-004	0.0000	12.7613
Total	**7.4100e-003**	**0.0453**	**0.0623**	**2.3000e-004**	**0.0159**	**3.8000e-004**	**0.0163**	**4.2800e-003**	**3.5000e-004**	**4.6400e-003**	**0.0000**	**21.3544**	**21.3544**	**1.0000e-003**	**0.0000**	**21.3793**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0632	0.5996	0.4815	8.2000e-004		0.0354	0.0354		0.0339	0.0339	0.0000	72.0231	72.0231	0.0129	0.0000	72.3442
Total	**0.0632**	**0.5996**	**0.4815**	**8.2000e-004**		**0.0354**	**0.0354**		**0.0339**	**0.0339**	**0.0000**	**72.0231**	**72.0231**	**0.0129**	**0.0000**	**72.3442**

3.6 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.3700e-003	0.0405	0.0102	9.0000e-005	2.1900e-003	2.7000e-004	2.4600e-003	6.3000e-004	2.5000e-004	8.9000e-004	0.0000	8.6031	8.6031	6.0000e-004	0.0000	8.6180
Worker	6.0400e-003	4.8000e-003	0.0522	1.4000e-004	0.0137	1.1000e-004	0.0138	3.6500e-003	1.0000e-004	3.7500e-003	0.0000	12.7513	12.7513	4.0000e-004	0.0000	12.7613
Total	**7.4100e-003**	**0.0453**	**0.0623**	**2.3000e-004**	**0.0159**	**3.8000e-004**	**0.0163**	**4.2800e-003**	**3.5000e-004**	**4.6400e-003**	**0.0000**	**21.3544**	**21.3544**	**1.0000e-003**	**0.0000**	**21.3793**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0687					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.1100e-003	0.0612	0.0566	9.0000e-005		4.5900e-003	4.5900e-003		4.5900e-003	4.5900e-003	0.0000	7.7874	7.7874	7.4000e-004	0.0000	7.8059
Total	**0.0778**	**0.0612**	**0.0566**	**9.0000e-005**		**4.5900e-003**	**4.5900e-003**		**4.5900e-003**	**4.5900e-003**	**0.0000**	**7.7874**	**7.7874**	**7.4000e-004**	**0.0000**	**7.8059**

3.7 Architectural Coating - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	5.3000e-004	5.6900e-003	1.0000e-005	1.3400e-003	1.0000e-005	1.3500e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2841	1.2841	4.0000e-005	0.0000	1.2852
Total	**6.5000e-004**	**5.3000e-004**	**5.6900e-003**	**1.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.2841**	**1.2841**	**4.0000e-005**	**0.0000**	**1.2852**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0687					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	9.1100e-003	0.0612	0.0566	9.0000e-005		4.5900e-003	4.5900e-003		4.5900e-003	4.5900e-003	0.0000	7.7874	7.7874	7.4000e-004	0.0000	7.8059
Total	**0.0778**	**0.0612**	**0.0566**	**9.0000e-005**		**4.5900e-003**	**4.5900e-003**		**4.5900e-003**	**4.5900e-003**	**0.0000**	**7.7874**	**7.7874**	**7.4000e-004**	**0.0000**	**7.8059**

3.7 Architectural Coating - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.5000e-004	5.3000e-004	5.6900e-003	1.0000e-005	1.3400e-003	1.0000e-005	1.3500e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.2841	1.2841	4.0000e-005	0.0000	1.2852
Total	**6.5000e-004**	**5.3000e-004**	**5.6900e-003**	**1.0000e-005**	**1.3400e-003**	**1.0000e-005**	**1.3500e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.2841**	**1.2841**	**4.0000e-005**	**0.0000**	**1.2852**

3.7 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2072					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0245	0.1689	0.1694	2.7000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	23.4899	23.4899	1.9800e-003	0.0000	23.5395
Total	**0.2318**	**0.1689**	**0.1694**	**2.7000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**	**0.0000**	**23.4899**	**23.4899**	**1.9800e-003**	**0.0000**	**23.5395**

3.7 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7800e-003	1.4100e-003	0.0153	4.0000e-005	4.0400e-003	3.0000e-005	4.0700e-003	1.0700e-003	3.0000e-005	1.1000e-003	0.0000	3.7510	3.7510	1.2000e-004	0.0000	3.7539
Total	**1.7800e-003**	**1.4100e-003**	**0.0153**	**4.0000e-005**	**4.0400e-003**	**3.0000e-005**	**4.0700e-003**	**1.0700e-003**	**3.0000e-005**	**1.1000e-003**	**0.0000**	**3.7510**	**3.7510**	**1.2000e-004**	**0.0000**	**3.7539**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2072					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0245	0.1689	0.1694	2.7000e-004		0.0119	0.0119		0.0119	0.0119	0.0000	23.4899	23.4899	1.9800e-003	0.0000	23.5395
Total	**0.2318**	**0.1689**	**0.1694**	**2.7000e-004**		**0.0119**	**0.0119**		**0.0119**	**0.0119**	**0.0000**	**23.4899**	**23.4899**	**1.9800e-003**	**0.0000**	**23.5395**

3.7 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7800e-003	1.4100e-003	0.0153	4.0000e-005	4.0400e-003	3.0000e-005	4.0700e-003	1.0700e-003	3.0000e-005	1.1000e-003	0.0000	3.7510	3.7510	1.2000e-004	0.0000	3.7539
Total	**1.7800e-003**	**1.4100e-003**	**0.0153**	**4.0000e-005**	**4.0400e-003**	**3.0000e-005**	**4.0700e-003**	**1.0700e-003**	**3.0000e-005**	**1.1000e-003**	**0.0000**	**3.7510**	**3.7510**	**1.2000e-004**	**0.0000**	**3.7539**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1742	0.9725	2.3897	7.7400e-003	0.6011	8.9600e-003	0.6100	0.1611	8.4300e-003	0.1695	0.0000	712.7302	712.7302	0.0382	0.0000	713.6854
Unmitigated	0.1742	0.9725	2.3897	7.7400e-003	0.6011	8.9600e-003	0.6100	0.1611	8.4300e-003	0.1695	0.0000	712.7302	712.7302	0.0382	0.0000	713.6854

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	466.48	485.59	422.38	1,581,834	1,581,834
Total	466.48	485.59	422.38	1,581,834	1,581,834

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	146.2421	146.2421	6.0400e-003	1.2500e-003	146.7653
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	146.2421	146.2421	6.0400e-003	1.2500e-003	146.7653
NaturalGas Mitigated	9.8100e-003	0.0838	0.0357	5.4000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	97.0791	97.0791	1.8600e-003	1.7800e-003	97.6560
NaturalGas Unmitigated	9.8100e-003	0.0838	0.0357	5.4000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	97.0791	97.0791	1.8600e-003	1.7800e-003	97.6560

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.81919e+006	9.8100e-003	0.0838	0.0357	5.4000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	97.0791	97.0791	1.8600e-003	1.7800e-003	97.6560
Total		**9.8100e-003**	**0.0838**	**0.0357**	**5.4000e-004**		**6.7800e-003**	**6.7800e-003**		**6.7800e-003**	**6.7800e-003**	**0.0000**	**97.0791**	**97.0791**	**1.8600e-003**	**1.7800e-003**	**97.6560**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	1.81919e+006	9.8100e-003	0.0838	0.0357	5.4000e-004		6.7800e-003	6.7800e-003		6.7800e-003	6.7800e-003	0.0000	97.0791	97.0791	1.8600e-003	1.7800e-003	97.6560
Total		**9.8100e-003**	**0.0838**	**0.0357**	**5.4000e-004**		**6.7800e-003**	**6.7800e-003**		**6.7800e-003**	**6.7800e-003**	**0.0000**	**97.0791**	**97.0791**	**1.8600e-003**	**1.7800e-003**	**97.6560**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	458984	146.2421	6.0400e-003	1.2500e-003	146.7653
Total		**146.2421**	**6.0400e-003**	**1.2500e-003**	**146.7653**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	458984	146.2421	6.0400e-003	1.2500e-003	146.7653
Total		**146.2421**	**6.0400e-003**	**1.2500e-003**	**146.7653**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.5224	0.0186	0.8193	8.2000e-004		0.0496	0.0496		0.0496	0.0496	5.2047	10.8271	16.0319	0.0163	3.5000e-004	16.5454
Unmitigated	0.5224	0.0186	0.8193	8.2000e-004		0.0496	0.0496		0.0496	0.0496	5.2047	10.8271	16.0319	0.0163	3.5000e-004	16.5454

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0276					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1605	0.0127	0.3115	7.9000e-004		0.0468	0.0468		0.0468	0.0468	5.2047	10.0017	15.2065	0.0155	3.5000e-004	15.6998
Landscaping	0.0155	5.8800e-003	0.5078	3.0000e-005		2.7800e-003	2.7800e-003		2.7800e-003	2.7800e-003	0.0000	0.8254	0.8254	8.1000e-004	0.0000	0.8457
Total	**0.5223**	**0.0186**	**0.8193**	**8.2000e-004**		**0.0496**	**0.0496**		**0.0496**	**0.0496**	**5.2047**	**10.8271**	**16.0319**	**0.0163**	**3.5000e-004**	**16.5455**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0276					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.3187					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.1605	0.0127	0.3115	7.9000e-004		0.0468	0.0468		0.0468	0.0468	5.2047	10.0017	15.2065	0.0155	3.5000e-004	15.6998
Landscaping	0.0155	5.8800e-003	0.5078	3.0000e-005		2.7800e-003	2.7800e-003		2.7800e-003	2.7800e-003	0.0000	0.8254	0.8254	8.1000e-004	0.0000	0.8457
Total	**0.5223**	**0.0186**	**0.8193**	**8.2000e-004**		**0.0496**	**0.0496**		**0.0496**	**0.0496**	**5.2047**	**10.8271**	**16.0319**	**0.0163**	**3.5000e-004**	**16.5455**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	21.3827	0.1049	2.6300e-003	24.7883
Unmitigated	21.3827	0.1049	2.6300e-003	24.7883

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	3.19255 / 2.01269	21.3827	0.1049	2.6300e-003	24.7883
Total		**21.3827**	**0.1049**	**2.6300e-003**	**24.7883**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	3.19255 / 2.01269	21.3827	0.1049	2.6300e-003	24.7883
Total		**21.3827**	**0.1049**	**2.6300e-003**	**24.7883**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	12.8169	0.7575	0.0000	31.7532
Unmitigated	12.8169	0.7575	0.0000	31.7532

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	63.14	12.8169	0.7575	0.0000	31.7532
Total		**12.8169**	**0.7575**	**0.0000**	**31.7532**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	63.14	12.8169	0.7575	0.0000	31.7532
Total		**12.8169**	**0.7575**	**0.0000**	**31.7532**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Seraphina Project

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	49.00	Dwelling Unit	16.48	88,200.00	154

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Seraphina Project - South Coast AQMD Air District, Summer

Project Characteristics -

Land Use - See Appendix A for assumptions

Construction Phase - See Appendix A for assumptions

Off-road Equipment - No demolition required.

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment -

Grading - See Appendix A for assumptions

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	5
tblConstructionPhase	NumDays	20.00	245.00
tblConstructionPhase	NumDays	300.00	245.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	30.00	60.00
tblConstructionPhase	NumDays	20.00	9.00
tblConstructionPhase	NumDays	10.00	3.00
tblConstructionPhase	PhaseEndDate	4/30/2018	9/13/2019
tblConstructionPhase	PhaseEndDate	4/30/2018	7/12/2019
tblConstructionPhase	PhaseEndDate	4/30/2018	7/25/2018
tblConstructionPhase	PhaseEndDate	4/30/2018	8/6/2018
tblConstructionPhase	PhaseEndDate	4/30/2018	5/3/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	10/6/2018

tblConstructionPhase	PhaseStartDate	5/1/2018	8/6/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	5/3/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	7/25/2018
tblGrading	AcresOfGrading	90.00	16.48
tblGrading	AcresOfGrading	0.00	16.48
tblLandUse	LotAcreage	15.91	16.48
tblLandUse	Population	140.00	154.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	3.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	8.00	18.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	5.5802	60.6667	34.9225	0.0632	18.5859	2.8747	21.4606	7.3936	2.6447	10.0383	0.0000	6,355.9325	6,355.9325	1.8502	0.0000	6,402.1885
2019	3.5554	11.1100	9.8967	0.0187	0.2779	0.6445	0.9224	0.0744	0.6214	0.6958	0.0000	1,821.7054	1,821.7054	0.2448	0.0000	1,827.8254
Maximum	**5.5802**	**60.6667**	**34.9225**	**0.0632**	**18.5859**	**2.8747**	**21.4606**	**7.3936**	**2.6447**	**10.0383**	**0.0000**	**6,355.9325**	**6,355.9325**	**1.8502**	**0.0000**	**6,402.1885**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	5.5802	60.6667	34.9225	0.0632	7.5076	2.8747	10.3823	2.9522	2.6447	5.5970	0.0000	6,355.9325	6,355.9325	1.8502	0.0000	6,402.1885
2019	3.5554	11.1100	9.8967	0.0187	0.2779	0.6445	0.9224	0.0744	0.6214	0.6958	0.0000	1,821.7054	1,821.7054	0.2448	0.0000	1,827.8254
Maximum	**5.5802**	**60.6667**	**34.9225**	**0.0632**	**7.5076**	**2.8747**	**10.3823**	**2.9522**	**2.6447**	**5.5970**	**0.0000**	**6,355.9325**	**6,355.9325**	**1.8502**	**0.0000**	**6,402.1885**

Seraphina Project - South Coast AQMD Air District, Summer

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**58.73**	**0.00**	**49.49**	**59.47**	**0.00**	**41.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	14.8617	1.0637	28.9816	0.0638		3.7653	3.7653		3.7653	3.7653	458.9790	889.2791	1,348.2581	1.3759	0.0312	1,391.9392
Energy	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
Mobile	1.0739	5.3680	14.4620	0.0465	3.5284	0.0516	3.5799	0.9442	0.0485	0.9927		4,715.4770	4,715.4770	0.2451		4,721.6039
Total	**15.9894**	**6.8911**	**43.6390**	**0.1132**	**3.5284**	**3.8540**	**7.3824**	**0.9442**	**3.8510**	**4.7952**	**458.9790**	**6,191.1199**	**6,650.0989**	**1.6322**	**0.0419**	**6,703.3913**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	14.8617	1.0637	28.9816	0.0638		3.7653	3.7653		3.7653	3.7653	458.9790	889.2791	1,348.2581	1.3759	0.0312	1,391.9392
Energy	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
Mobile	1.0739	5.3680	14.4620	0.0465	3.5284	0.0516	3.5799	0.9442	0.0485	0.9927		4,715.4770	4,715.4770	0.2451		4,721.6039
Total	**15.9894**	**6.8911**	**43.6390**	**0.1132**	**3.5284**	**3.8540**	**7.3824**	**0.9442**	**3.8510**	**4.7952**	**458.9790**	**6,191.1199**	**6,650.0989**	**1.6322**	**0.0419**	**6,703.3913**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	5/1/2018	4/30/2018	5	0	
2	Site Preparation	Site Preparation	5/1/2018	5/3/2018	5	3	
3	Grading	Grading	5/3/2018	7/25/2018	5	60	
4	Paving	Paving	7/25/2018	8/6/2018	5	9	
5	Building Construction	Building Construction	8/6/2018	7/12/2019	5	245	
6	Architectural Coating	Architectural Coating	10/6/2018	9/13/2019	5	245	

Acres of Grading (Site Preparation Phase): 16.48

Acres of Grading (Grading Phase): 16.48

Acres of Paving: 0

Residential Indoor: 178,605; Residential Outdoor: 59,535; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Seraphina Project - South Coast AQMD Air District, Summer

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	0	8.00	158	0.38
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	3.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	1	8.00	80	0.38
Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Building Construction	Welders	0	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	18.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	0	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					11.8478	0.0000	11.8478	3.9393	0.0000	3.9393			0.0000			0.0000
Off-Road	1.6983	17.8194	9.0499	0.0148		0.9832	0.9832		0.9045	0.9045		1,485.7253	1,485.7253	0.4625		1,497.2884
Total	**1.6983**	**17.8194**	**9.0499**	**0.0148**	**11.8478**	**0.9832**	**12.8309**	**3.9393**	**0.9045**	**4.8438**		**1,485.7253**	**1,485.7253**	**0.4625**		**1,497.2884**

3.3 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0970	0.0695	0.9032	2.2100e-003	0.2012	1.6000e-003	0.2028	0.0534	1.4800e-003	0.0548		219.4833	219.4833	7.4800e-003		219.6704
Total	**0.0970**	**0.0695**	**0.9032**	**2.2100e-003**	**0.2012**	**1.6000e-003**	**0.2028**	**0.0534**	**1.4800e-003**	**0.0548**		**219.4833**	**219.4833**	**7.4800e-003**		**219.6704**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.6206	0.0000	4.6206	1.5363	0.0000	1.5363			0.0000			0.0000
Off-Road	1.6983	17.8194	9.0499	0.0148		0.9832	0.9832		0.9045	0.9045	0.0000	1,485.7253	1,485.7253	0.4625		1,497.2884
Total	**1.6983**	**17.8194**	**9.0499**	**0.0148**	**4.6206**	**0.9832**	**5.6038**	**1.5363**	**0.9045**	**2.4408**	**0.0000**	**1,485.7253**	**1,485.7253**	**0.4625**		**1,497.2884**

3.3 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0970	0.0695	0.9032	2.2100e-003	0.2012	1.6000e-003	0.2028	0.0534	1.4800e-003	0.0548		219.4833	219.4833	7.4800e-003		219.6704
Total	**0.0970**	**0.0695**	**0.9032**	**2.2100e-003**	**0.2012**	**1.6000e-003**	**0.2028**	**0.0534**	**1.4800e-003**	**0.0548**		**219.4833**	**219.4833**	**7.4800e-003**		**219.6704**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3134	0.0000	6.3134	3.3417	0.0000	3.3417			0.0000			0.0000
Off-Road	3.6771	42.7005	23.9659	0.0438		1.8882	1.8882		1.7371	1.7371		4,406.8536	4,406.8536	1.3719		4,441.1514
Total	**3.6771**	**42.7005**	**23.9659**	**0.0438**	**6.3134**	**1.8882**	**8.2015**	**3.3417**	**1.7371**	**5.0788**		**4,406.8536**	**4,406.8536**	**1.3719**		**4,441.1514**

3.4 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1078	0.0773	1.0035	2.4500e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		243.8703	243.8703	8.3200e-003		244.0782
Total	**0.1078**	**0.0773**	**1.0035**	**2.4500e-003**	**0.2236**	**1.7800e-003**	**0.2253**	**0.0593**	**1.6400e-003**	**0.0609**		**243.8703**	**243.8703**	**8.3200e-003**		**244.0782**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4622	0.0000	2.4622	1.3033	0.0000	1.3033			0.0000			0.0000
Off-Road	3.6771	42.7005	23.9659	0.0438		1.8882	1.8882		1.7371	1.7371	0.0000	4,406.8536	4,406.8536	1.3719		4,441.1514
Total	**3.6771**	**42.7005**	**23.9659**	**0.0438**	**2.4622**	**1.8882**	**4.3504**	**1.3033**	**1.7371**	**3.0404**	**0.0000**	**4,406.8536**	**4,406.8536**	**1.3719**		**4,441.1514**

3.4 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1078	0.0773	1.0035	2.4500e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		243.8703	243.8703	8.3200e-003		244.0782
Total	**0.1078**	**0.0773**	**1.0035**	**2.4500e-003**	**0.2236**	**1.7800e-003**	**0.2253**	**0.0593**	**1.6400e-003**	**0.0609**		**243.8703**	**243.8703**	**8.3200e-003**		**244.0782**

3.5 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8219	8.7605	7.3982	0.0114		0.4781	0.4781		0.4398	0.4398		1,147.0444	1,147.0444	0.3571		1,155.9716
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8219**	**8.7605**	**7.3982**	**0.0114**		**0.4781**	**0.4781**		**0.4398**	**0.4398**		**1,147.0444**	**1,147.0444**	**0.3571**		**1,155.9716**

3.5 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0808	0.0580	0.7526	1.8400e-003	0.1677	1.3400e-003	0.1690	0.0445	1.2300e-003	0.0457		182.9028	182.9028	6.2400e-003		183.0587
Total	**0.0808**	**0.0580**	**0.7526**	**1.8400e-003**	**0.1677**	**1.3400e-003**	**0.1690**	**0.0445**	**1.2300e-003**	**0.0457**		**182.9028**	**182.9028**	**6.2400e-003**		**183.0587**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8219	8.7605	7.3982	0.0114		0.4781	0.4781		0.4398	0.4398	0.0000	1,147.0444	1,147.0444	0.3571		1,155.9716
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8219**	**8.7605**	**7.3982**	**0.0114**		**0.4781**	**0.4781**		**0.4398**	**0.4398**	**0.0000**	**1,147.0444**	**1,147.0444**	**0.3571**		**1,155.9716**

3.5 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0808	0.0580	0.7526	1.8400e-003	0.1677	1.3400e-003	0.1690	0.0445	1.2300e-003	0.0457		182.9028	182.9028	6.2400e-003		183.0587
Total	**0.0808**	**0.0580**	**0.7526**	**1.8400e-003**	**0.1677**	**1.3400e-003**	**0.1690**	**0.0445**	**1.2300e-003**	**0.0457**		**182.9028**	**182.9028**	**6.2400e-003**		**183.0587**

3.6 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0306	9.5605	7.0725	0.0118		0.5915	0.5915		0.5652	0.5652		1,150.9344	1,150.9344	0.2093		1,156.1666
Total	**1.0306**	**9.5605**	**7.0725**	**0.0118**		**0.5915**	**0.5915**		**0.5652**	**0.5652**		**1,150.9344**	**1,150.9344**	**0.2093**		**1,156.1666**

3.6 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0213	0.6059	0.1509	1.3100e-003	0.0320	4.4300e-003	0.0364	9.2100e-003	4.2400e-003	0.0135		139.3290	139.3290	9.4800e-003		139.5661
Worker	0.0970	0.0695	0.9032	2.2100e-003	0.2012	1.6000e-003	0.2028	0.0534	1.4800e-003	0.0548		219.4833	219.4833	7.4800e-003		219.6704
Total	**0.1183**	**0.6755**	**1.0541**	**3.5200e-003**	**0.2332**	**6.0300e-003**	**0.2392**	**0.0626**	**5.7200e-003**	**0.0683**		**358.8123**	**358.8123**	**0.0170**		**359.2365**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0306	9.5605	7.0725	0.0118		0.5915	0.5915		0.5652	0.5652	0.0000	1,150.9344	1,150.9344	0.2093		1,156.1666
Total	**1.0306**	**9.5605**	**7.0725**	**0.0118**		**0.5915**	**0.5915**		**0.5652**	**0.5652**	**0.0000**	**1,150.9344**	**1,150.9344**	**0.2093**		**1,156.1666**

3.6 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0213	0.6059	0.1509	1.3100e-003	0.0320	4.4300e-003	0.0364	9.2100e-003	4.2400e-003	0.0135		139.3290	139.3290	9.4800e-003		139.5661
Worker	0.0970	0.0695	0.9032	2.2100e-003	0.2012	1.6000e-003	0.2028	0.0534	1.4800e-003	0.0548		219.4833	219.4833	7.4800e-003		219.6704
Total	**0.1183**	**0.6755**	**1.0541**	**3.5200e-003**	**0.2332**	**6.0300e-003**	**0.2392**	**0.0626**	**5.7200e-003**	**0.0683**		**358.8123**	**358.8123**	**0.0170**		**359.2365**

3.6 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9094	8.6275	6.9285	0.0118		0.5100	0.5100		0.4873	0.4873		1,142.3299	1,142.3299	0.2038		1,147.4240
Total	**0.9094**	**8.6275**	**6.9285**	**0.0118**		**0.5100**	**0.5100**		**0.4873**	**0.4873**		**1,142.3299**	**1,142.3299**	**0.2038**		**1,147.4240**

3.6 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0193	0.5721	0.1383	1.3000e-003	0.0320	3.7900e-003	0.0358	9.2100e-003	3.6300e-003	0.0128		138.1099	138.1099	9.1400e-003		138.3383
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	**0.1074**	**0.6335**	**0.9471**	**3.4400e-003**	**0.2332**	**5.3600e-003**	**0.2386**	**0.0626**	**5.0700e-003**	**0.0676**		**350.6879**	**350.6879**	**0.0158**		**351.0825**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9094	8.6275	6.9285	0.0118		0.5100	0.5100		0.4873	0.4873	0.0000	1,142.3299	1,142.3299	0.2038		1,147.4240
Total	**0.9094**	**8.6275**	**6.9285**	**0.0118**		**0.5100**	**0.5100**		**0.4873**	**0.4873**	**0.0000**	**1,142.3299**	**1,142.3299**	**0.2038**		**1,147.4240**

3.6 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0193	0.5721	0.1383	1.3000e-003	0.0320	3.7900e-003	0.0358	9.2100e-003	3.6300e-003	0.0128		138.1099	138.1099	9.1400e-003		138.3383
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	**0.1074**	**0.6335**	**0.9471**	**3.4400e-003**	**0.2332**	**5.3600e-003**	**0.2386**	**0.0626**	**5.0700e-003**	**0.0676**		**350.6879**	**350.6879**	**0.0158**		**351.0825**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.2526					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.1171
Total	**2.5512**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.1171**

3.7 Architectural Coating - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0216	0.0155	0.2007	4.9000e-004	0.0447	3.6000e-004	0.0451	0.0119	3.3000e-004	0.0122		48.7741	48.7741	1.6600e-003		48.8156
Total	**0.0216**	**0.0155**	**0.2007**	**4.9000e-004**	**0.0447**	**3.6000e-004**	**0.0451**	**0.0119**	**3.3000e-004**	**0.0122**		**48.7741**	**48.7741**	**1.6600e-003**		**48.8156**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.2526					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.1171
Total	**2.5512**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.1171**

3.7 Architectural Coating - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0216	0.0155	0.2007	4.9000e-004	0.0447	3.6000e-004	0.0451	0.0119	3.3000e-004	0.0122		48.7741	48.7741	1.6600e-003		48.8156
Total	**0.0216**	**0.0155**	**0.2007**	**4.9000e-004**	**0.0447**	**3.6000e-004**	**0.0451**	**0.0119**	**3.3000e-004**	**0.0122**		**48.7741**	**48.7741**	**1.6600e-003**		**48.8156**

3.7 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.2526					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**2.5191**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

3.7 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0196	0.0136	0.1797	4.7000e-004	0.0447	3.5000e-004	0.0451	0.0119	3.2000e-004	0.0122		47.2396	47.2396	1.4800e-003		47.2765
Total	**0.0196**	**0.0136**	**0.1797**	**4.7000e-004**	**0.0447**	**3.5000e-004**	**0.0451**	**0.0119**	**3.2000e-004**	**0.0122**		**47.2396**	**47.2396**	**1.4800e-003**		**47.2765**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.2526					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**2.5191**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

3.7 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0196	0.0136	0.1797	4.7000e-004	0.0447	3.5000e-004	0.0451	0.0119	3.2000e-004	0.0122		47.2396	47.2396	1.4800e-003		47.2765
Total	**0.0196**	**0.0136**	**0.1797**	**4.7000e-004**	**0.0447**	**3.5000e-004**	**0.0451**	**0.0119**	**3.2000e-004**	**0.0122**		**47.2396**	**47.2396**	**1.4800e-003**		**47.2765**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0739	5.3680	14.4620	0.0465	3.5284	0.0516	3.5799	0.9442	0.0485	0.9927		4,715.4770	4,715.4770	0.2451		4,721.6039
Unmitigated	1.0739	5.3680	14.4620	0.0465	3.5284	0.0516	3.5799	0.9442	0.0485	0.9927		4,715.4770	4,715.4770	0.2451		4,721.6039

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	466.48	485.59	422.38	1,581,834	1,581,834
Total	466.48	485.59	422.38	1,581,834	1,581,834

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
NaturalGas Unmitigated	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	4984.09	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
Total		**0.0538**	**0.4593**	**0.1955**	**2.9300e-003**		**0.0371**	**0.0371**		**0.0371**	**0.0371**		**586.3638**	**586.3638**	**0.0112**	**0.0108**	**589.8482**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	4.98409	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
Total		**0.0538**	**0.4593**	**0.1955**	**2.9300e-003**		**0.0371**	**0.0371**		**0.0371**	**0.0371**		**586.3638**	**586.3638**	**0.0112**	**0.0108**	**589.8482**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.8617	1.0637	28.9816	0.0638		3.7653	3.7653		3.7653	3.7653	458.9790	889.2791	1,348.2581	1.3759	0.0312	1,391.9392
Unmitigated	14.8617	1.0637	28.9816	0.0638		3.7653	3.7653		3.7653	3.7653	458.9790	889.2791	1,348.2581	1.3759	0.0312	1,391.9392

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1512					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.7464					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	12.8398	1.0167	24.9190	0.0636		3.7430	3.7430		3.7430	3.7430	458.9790	882.0000	1,340.9790	1.3688	0.0312	1,384.4815
Landscaping	0.1244	0.0471	4.0626	2.1000e-004		0.0223	0.0223		0.0223	0.0223		7.2791	7.2791	7.1400e-003		7.4577
Total	**14.8617**	**1.0637**	**28.9816**	**0.0638**		**3.7653**	**3.7653**		**3.7653**	**3.7653**	**458.9790**	**889.2791**	**1,348.2581**	**1.3759**	**0.0312**	**1,391.9392**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1512					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.7464					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	12.8398	1.0167	24.9190	0.0636		3.7430	3.7430		3.7430	3.7430	458.9790	882.0000	1,340.9790	1.3688	0.0312	1,384.4815
Landscaping	0.1244	0.0471	4.0626	2.1000e-004		0.0223	0.0223		0.0223	0.0223		7.2791	7.2791	7.1400e-003		7.4577
Total	**14.8617**	**1.0637**	**28.9816**	**0.0638**		**3.7653**	**3.7653**		**3.7653**	**3.7653**	**458.9790**	**889.2791**	**1,348.2581**	**1.3759**	**0.0312**	**1,391.9392**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Seraphina Project

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	49.00	Dwelling Unit	16.48	88,200.00	154

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2019
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Seraphina Project - South Coast AQMD Air District, Winter

Project Characteristics -

Land Use - See Appendix A for assumptions

Construction Phase - See Appendix A for assumptions

Off-road Equipment - No demolition required.

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment - See Appendix A for assumptions

Off-road Equipment -

Grading - See Appendix A for assumptions

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	40	5
tblConstructionPhase	NumDays	20.00	245.00
tblConstructionPhase	NumDays	300.00	245.00
tblConstructionPhase	NumDays	20.00	0.00
tblConstructionPhase	NumDays	30.00	60.00
tblConstructionPhase	NumDays	20.00	9.00
tblConstructionPhase	NumDays	10.00	3.00
tblConstructionPhase	PhaseEndDate	4/30/2018	9/13/2019
tblConstructionPhase	PhaseEndDate	4/30/2018	7/12/2019
tblConstructionPhase	PhaseEndDate	4/30/2018	7/25/2018
tblConstructionPhase	PhaseEndDate	4/30/2018	8/6/2018
tblConstructionPhase	PhaseEndDate	4/30/2018	5/3/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	10/6/2018

tblConstructionPhase	PhaseStartDate	5/1/2018	8/6/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	5/3/2018
tblConstructionPhase	PhaseStartDate	5/1/2018	7/25/2018
tblGrading	AcresOfGrading	90.00	16.48
tblGrading	AcresOfGrading	0.00	16.48
tblLandUse	LotAcreage	15.91	16.48
tblLandUse	Population	140.00	154.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	3.00
tblOffRoadEquipment	UsageHours	7.00	4.00
tblProjectCharacteristics	OperationalYear	2018	2019
tblTripsAndVMT	WorkerTripNumber	0.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	8.00	18.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	5.5980	60.6807	34.7414	0.0629	18.5859	2.8747	21.4606	7.3936	2.6447	10.0383	0.0000	6,326.0370	6,326.0370	1.8492	0.0000	6,372.2677
2019	3.5659	11.1175	9.8157	0.0185	0.2779	0.6445	0.9224	0.0744	0.6215	0.6959	0.0000	1,800.9603	1,800.9603	0.2450	0.0000	1,807.0841
Maximum	**5.5980**	**60.6807**	**34.7414**	**0.0629**	**18.5859**	**2.8747**	**21.4606**	**7.3936**	**2.6447**	**10.0383**	**0.0000**	**6,326.0370**	**6,326.0370**	**1.8492**	**0.0000**	**6,372.2677**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2018	5.5980	60.6807	34.7414	0.0629	7.5076	2.8747	10.3823	2.9522	2.6447	5.5970	0.0000	6,326.0370	6,326.0370	1.8492	0.0000	6,372.2677
2019	3.5659	11.1175	9.8157	0.0185	0.2779	0.6445	0.9224	0.0744	0.6215	0.6959	0.0000	1,800.9603	1,800.9603	0.2450	0.0000	1,807.0841
Maximum	**5.5980**	**60.6807**	**34.7414**	**0.0629**	**7.5076**	**2.8747**	**10.3823**	**2.9522**	**2.6447**	**5.5970**	**0.0000**	**6,326.0370**	**6,326.0370**	**1.8492**	**0.0000**	**6,372.2677**

Seraphina Project - South Coast AQMD Air District, Winter

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**58.73**	**0.00**	**49.49**	**59.47**	**0.00**	**41.38**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	14.8617	1.0637	28.9816	0.0638		3.7653	3.7653		3.7653	3.7653	458.9790	889.2791	1,348.2581	1.3759	0.0312	1,391.9392
Energy	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
Mobile	1.0258	5.5041	13.5561	0.0439	3.5284	0.0519	3.5803	0.9442	0.0489	0.9931		4,463.2547	4,463.2547	0.2440		4,469.3535
Total	**15.9413**	**7.0271**	**42.7332**	**0.1107**	**3.5284**	**3.8544**	**7.3827**	**0.9442**	**3.8513**	**4.7955**	**458.9790**	**5,938.8976**	**6,397.8766**	**1.6311**	**0.0419**	**6,451.1409**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	14.8617	1.0637	28.9816	0.0638		3.7653	3.7653		3.7653	3.7653	458.9790	889.2791	1,348.2581	1.3759	0.0312	1,391.9392
Energy	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
Mobile	1.0258	5.5041	13.5561	0.0439	3.5284	0.0519	3.5803	0.9442	0.0489	0.9931		4,463.2547	4,463.2547	0.2440		4,469.3535
Total	**15.9413**	**7.0271**	**42.7332**	**0.1107**	**3.5284**	**3.8544**	**7.3827**	**0.9442**	**3.8513**	**4.7955**	**458.9790**	**5,938.8976**	**6,397.8766**	**1.6311**	**0.0419**	**6,451.1409**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	5/1/2018	4/30/2018	5	0	
2	Site Preparation	Site Preparation	5/1/2018	5/3/2018	5	3	
3	Grading	Grading	5/3/2018	7/25/2018	5	60	
4	Paving	Paving	7/25/2018	8/6/2018	5	9	
5	Building Construction	Building Construction	8/6/2018	7/12/2019	5	245	
6	Architectural Coating	Architectural Coating	10/6/2018	9/13/2019	5	245	

Acres of Grading (Site Preparation Phase): 16.48

Acres of Grading (Grading Phase): 16.48

Acres of Paving: 0

Residential Indoor: 178,605; Residential Outdoor: 59,535; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Seraphina Project - South Coast AQMD Air District, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	0	8.00	158	0.38
Demolition	Concrete/Industrial Saws	0	8.00	81	0.73
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	3.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	1	8.00	130	0.42
Paving	Rollers	1	8.00	80	0.38
Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	1	4.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Paving	Paving Equipment	1	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	1	8.00	367	0.48
Building Construction	Welders	0	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Architectural Coating	1	4.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	4	18.00	5.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	0	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	3	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads

Clean Paved Roads

3.2 Demolition - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.2 Demolition - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

3.3 Site Preparation - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					11.8478	0.0000	11.8478	3.9393	0.0000	3.9393			0.0000			0.0000
Off-Road	1.6983	17.8194	9.0499	0.0148		0.9832	0.9832		0.9045	0.9045		1,485.7253	1,485.7253	0.4625		1,497.2884
Total	**1.6983**	**17.8194**	**9.0499**	**0.0148**	**11.8478**	**0.9832**	**12.8309**	**3.9393**	**0.9045**	**4.8438**		**1,485.7253**	**1,485.7253**	**0.4625**		**1,497.2884**

3.3 Site Preparation - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1055	0.0762	0.8174	2.0600e-003	0.2012	1.6000e-003	0.2028	0.0534	1.4800e-003	0.0548		205.3223	205.3223	7.0100e-003		205.4974
Total	**0.1055**	**0.0762**	**0.8174**	**2.0600e-003**	**0.2012**	**1.6000e-003**	**0.2028**	**0.0534**	**1.4800e-003**	**0.0548**		**205.3223**	**205.3223**	**7.0100e-003**		**205.4974**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					4.6206	0.0000	4.6206	1.5363	0.0000	1.5363			0.0000			0.0000
Off-Road	1.6983	17.8194	9.0499	0.0148		0.9832	0.9832		0.9045	0.9045	0.0000	1,485.7253	1,485.7253	0.4625		1,497.2884
Total	**1.6983**	**17.8194**	**9.0499**	**0.0148**	**4.6206**	**0.9832**	**5.6038**	**1.5363**	**0.9045**	**2.4408**	**0.0000**	**1,485.7253**	**1,485.7253**	**0.4625**		**1,497.2884**

3.3 Site Preparation - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1055	0.0762	0.8174	2.0600e-003	0.2012	1.6000e-003	0.2028	0.0534	1.4800e-003	0.0548		205.3223	205.3223	7.0100e-003		205.4974
Total	**0.1055**	**0.0762**	**0.8174**	**2.0600e-003**	**0.2012**	**1.6000e-003**	**0.2028**	**0.0534**	**1.4800e-003**	**0.0548**		**205.3223**	**205.3223**	**7.0100e-003**		**205.4974**

3.4 Grading - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3134	0.0000	6.3134	3.3417	0.0000	3.3417			0.0000			0.0000
Off-Road	3.6771	42.7005	23.9659	0.0438		1.8882	1.8882		1.7371	1.7371		4,406.8536	4,406.8536	1.3719		4,441.1514
Total	**3.6771**	**42.7005**	**23.9659**	**0.0438**	**6.3134**	**1.8882**	**8.2015**	**3.3417**	**1.7371**	**5.0788**		**4,406.8536**	**4,406.8536**	**1.3719**		**4,441.1514**

3.4 Grading - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1172	0.0846	0.9082	2.2900e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		228.1358	228.1358	7.7800e-003		228.3305
Total	**0.1172**	**0.0846**	**0.9082**	**2.2900e-003**	**0.2236**	**1.7800e-003**	**0.2253**	**0.0593**	**1.6400e-003**	**0.0609**		**228.1358**	**228.1358**	**7.7800e-003**		**228.3305**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.4622	0.0000	2.4622	1.3033	0.0000	1.3033			0.0000			0.0000
Off-Road	3.6771	42.7005	23.9659	0.0438		1.8882	1.8882		1.7371	1.7371	0.0000	4,406.8536	4,406.8536	1.3719		4,441.1514
Total	**3.6771**	**42.7005**	**23.9659**	**0.0438**	**2.4622**	**1.8882**	**4.3504**	**1.3033**	**1.7371**	**3.0404**	**0.0000**	**4,406.8536**	**4,406.8536**	**1.3719**		**4,441.1514**

3.4 Grading - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1172	0.0846	0.9082	2.2900e-003	0.2236	1.7800e-003	0.2253	0.0593	1.6400e-003	0.0609		228.1358	228.1358	7.7800e-003		228.3305
Total	**0.1172**	**0.0846**	**0.9082**	**2.2900e-003**	**0.2236**	**1.7800e-003**	**0.2253**	**0.0593**	**1.6400e-003**	**0.0609**		**228.1358**	**228.1358**	**7.7800e-003**		**228.3305**

3.5 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8219	8.7605	7.3982	0.0114		0.4781	0.4781		0.4398	0.4398		1,147.0444	1,147.0444	0.3571		1,155.9716
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8219**	**8.7605**	**7.3982**	**0.0114**		**0.4781**	**0.4781**		**0.4398**	**0.4398**		**1,147.0444**	**1,147.0444**	**0.3571**		**1,155.9716**

3.5 Paving - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0879	0.0635	0.6811	1.7200e-003	0.1677	1.3400e-003	0.1690	0.0445	1.2300e-003	0.0457		171.1019	171.1019	5.8400e-003		171.2479
Total	**0.0879**	**0.0635**	**0.6811**	**1.7200e-003**	**0.1677**	**1.3400e-003**	**0.1690**	**0.0445**	**1.2300e-003**	**0.0457**		**171.1019**	**171.1019**	**5.8400e-003**		**171.2479**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8219	8.7605	7.3982	0.0114		0.4781	0.4781		0.4398	0.4398	0.0000	1,147.0444	1,147.0444	0.3571		1,155.9716
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.8219**	**8.7605**	**7.3982**	**0.0114**		**0.4781**	**0.4781**		**0.4398**	**0.4398**	**0.0000**	**1,147.0444**	**1,147.0444**	**0.3571**		**1,155.9716**

3.5 Paving - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0879	0.0635	0.6811	1.7200e-003	0.1677	1.3400e-003	0.1690	0.0445	1.2300e-003	0.0457		171.1019	171.1019	5.8400e-003		171.2479
Total	**0.0879**	**0.0635**	**0.6811**	**1.7200e-003**	**0.1677**	**1.3400e-003**	**0.1690**	**0.0445**	**1.2300e-003**	**0.0457**		**171.1019**	**171.1019**	**5.8400e-003**		**171.2479**

3.6 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0306	9.5605	7.0725	0.0118		0.5915	0.5915		0.5652	0.5652		1,150.9344	1,150.9344	0.2093		1,156.1666
Total	**1.0306**	**9.5605**	**7.0725**	**0.0118**		**0.5915**	**0.5915**		**0.5652**	**0.5652**		**1,150.9344**	**1,150.9344**	**0.2093**		**1,156.1666**

3.6 Building Construction - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0222	0.6069	0.1675	1.2700e-003	0.0320	4.5000e-003	0.0365	9.2100e-003	4.3000e-003	0.0135		135.3782	135.3782	0.0102		135.6329
Worker	0.1055	0.0762	0.8174	2.0600e-003	0.2012	1.6000e-003	0.2028	0.0534	1.4800e-003	0.0548		205.3223	205.3223	7.0100e-003		205.4974
Total	**0.1277**	**0.6831**	**0.9849**	**3.3300e-003**	**0.2332**	**6.1000e-003**	**0.2393**	**0.0626**	**5.7800e-003**	**0.0684**		**340.7005**	**340.7005**	**0.0172**		**341.1303**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.0306	9.5605	7.0725	0.0118		0.5915	0.5915		0.5652	0.5652	0.0000	1,150.9344	1,150.9344	0.2093		1,156.1666
Total	**1.0306**	**9.5605**	**7.0725**	**0.0118**		**0.5915**	**0.5915**		**0.5652**	**0.5652**	**0.0000**	**1,150.9344**	**1,150.9344**	**0.2093**		**1,156.1666**

3.6 Building Construction - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0222	0.6069	0.1675	1.2700e-003	0.0320	4.5000e-003	0.0365	9.2100e-003	4.3000e-003	0.0135		135.3782	135.3782	0.0102		135.6329
Worker	0.1055	0.0762	0.8174	2.0600e-003	0.2012	1.6000e-003	0.2028	0.0534	1.4800e-003	0.0548		205.3223	205.3223	7.0100e-003		205.4974
Total	**0.1277**	**0.6831**	**0.9849**	**3.3300e-003**	**0.2332**	**6.1000e-003**	**0.2393**	**0.0626**	**5.7800e-003**	**0.0684**		**340.7005**	**340.7005**	**0.0172**		**341.1303**

3.6 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9094	8.6275	6.9285	0.0118		0.5100	0.5100		0.4873	0.4873		1,142.3299	1,142.3299	0.2038		1,147.4240
Total	**0.9094**	**8.6275**	**6.9285**	**0.0118**		**0.5100**	**0.5100**		**0.4873**	**0.4873**		**1,142.3299**	**1,142.3299**	**0.2038**		**1,147.4240**

3.6 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0201	0.5725	0.1540	1.2600e-003	0.0320	3.8500e-003	0.0359	9.2100e-003	3.6800e-003	0.0129		134.1581	134.1581	9.8200e-003		134.4036
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	**0.1161**	**0.6397**	**0.8837**	**3.2600e-003**	**0.2332**	**5.4200e-003**	**0.2386**	**0.0626**	**5.1200e-003**	**0.0677**		**332.9962**	**332.9962**	**0.0160**		**333.3970**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.9094	8.6275	6.9285	0.0118		0.5100	0.5100		0.4873	0.4873	0.0000	1,142.3299	1,142.3299	0.2038		1,147.4240
Total	**0.9094**	**8.6275**	**6.9285**	**0.0118**		**0.5100**	**0.5100**		**0.4873**	**0.4873**	**0.0000**	**1,142.3299**	**1,142.3299**	**0.2038**		**1,147.4240**

3.6 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0201	0.5725	0.1540	1.2600e-003	0.0320	3.8500e-003	0.0359	9.2100e-003	3.6800e-003	0.0129		134.1581	134.1581	9.8200e-003		134.4036
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	**0.1161**	**0.6397**	**0.8837**	**3.2600e-003**	**0.2332**	**5.4200e-003**	**0.2386**	**0.0626**	**5.1200e-003**	**0.0677**		**332.9962**	**332.9962**	**0.0160**		**333.3970**

3.7 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.2526					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.1171
Total	**2.5512**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.1171**

3.7 Architectural Coating - 2018

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0234	0.0169	0.1816	4.6000e-004	0.0447	3.6000e-004	0.0451	0.0119	3.3000e-004	0.0122		45.6272	45.6272	1.5600e-003		45.6661
Total	**0.0234**	**0.0169**	**0.1816**	**4.6000e-004**	**0.0447**	**3.6000e-004**	**0.0451**	**0.0119**	**3.3000e-004**	**0.0122**		**45.6272**	**45.6272**	**1.5600e-003**		**45.6661**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.2526					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.1171
Total	**2.5512**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.1171**

3.7 Architectural Coating - 2018

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0234	0.0169	0.1816	4.6000e-004	0.0447	3.6000e-004	0.0451	0.0119	3.3000e-004	0.0122		45.6272	45.6272	1.5600e-003		45.6661
Total	**0.0234**	**0.0169**	**0.1816**	**4.6000e-004**	**0.0447**	**3.6000e-004**	**0.0451**	**0.0119**	**3.3000e-004**	**0.0122**		**45.6272**	**45.6272**	**1.5600e-003**		**45.6661**

3.7 Architectural Coating - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.2526					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288		281.4481	281.4481	0.0238		282.0423
Total	**2.5191**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**		**281.4481**	**281.4481**	**0.0238**		**282.0423**

3.7 Architectural Coating - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0213	0.0149	0.1622	4.4000e-004	0.0447	3.5000e-004	0.0451	0.0119	3.2000e-004	0.0122		44.1862	44.1862	1.3800e-003		44.2207
Total	**0.0213**	**0.0149**	**0.1622**	**4.4000e-004**	**0.0447**	**3.5000e-004**	**0.0451**	**0.0119**	**3.2000e-004**	**0.0122**		**44.1862**	**44.1862**	**1.3800e-003**		**44.2207**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	2.2526					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2664	1.8354	1.8413	2.9700e-003		0.1288	0.1288		0.1288	0.1288	0.0000	281.4481	281.4481	0.0238		282.0423
Total	**2.5191**	**1.8354**	**1.8413**	**2.9700e-003**		**0.1288**	**0.1288**		**0.1288**	**0.1288**	**0.0000**	**281.4481**	**281.4481**	**0.0238**		**282.0423**

3.7 Architectural Coating - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0213	0.0149	0.1622	4.4000e-004	0.0447	3.5000e-004	0.0451	0.0119	3.2000e-004	0.0122		44.1862	44.1862	1.3800e-003		44.2207
Total	**0.0213**	**0.0149**	**0.1622**	**4.4000e-004**	**0.0447**	**3.5000e-004**	**0.0451**	**0.0119**	**3.2000e-004**	**0.0122**		**44.1862**	**44.1862**	**1.3800e-003**		**44.2207**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.0258	5.5041	13.5561	0.0439	3.5284	0.0519	3.5803	0.9442	0.0489	0.9931		4,463.2547	4,463.2547	0.2440		4,469.3535
Unmitigated	1.0258	5.5041	13.5561	0.0439	3.5284	0.0519	3.5803	0.9442	0.0489	0.9931		4,463.2547	4,463.2547	0.2440		4,469.3535

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	466.48	485.59	422.38	1,581,834	1,581,834
Total	466.48	485.59	422.38	1,581,834	1,581,834

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Single Family Housing	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.546418	0.044132	0.199182	0.124467	0.017484	0.005870	0.020172	0.031831	0.001999	0.002027	0.004724	0.000704	0.000991

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
NaturalGas Unmitigated	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	4984.09	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
Total		**0.0538**	**0.4593**	**0.1955**	**2.9300e-003**		**0.0371**	**0.0371**		**0.0371**	**0.0371**		**586.3638**	**586.3638**	**0.0112**	**0.0108**	**589.8482**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	4.98409	0.0538	0.4593	0.1955	2.9300e-003		0.0371	0.0371		0.0371	0.0371		586.3638	586.3638	0.0112	0.0108	589.8482
Total		**0.0538**	**0.4593**	**0.1955**	**2.9300e-003**		**0.0371**	**0.0371**		**0.0371**	**0.0371**		**586.3638**	**586.3638**	**0.0112**	**0.0108**	**589.8482**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	14.8617	1.0637	28.9816	0.0638		3.7653	3.7653		3.7653	3.7653	458.9790	889.2791	1,348.2581	1.3759	0.0312	1,391.9392
Unmitigated	14.8617	1.0637	28.9816	0.0638		3.7653	3.7653		3.7653	3.7653	458.9790	889.2791	1,348.2581	1.3759	0.0312	1,391.9392

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1512					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.7464					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	12.8398	1.0167	24.9190	0.0636		3.7430	3.7430		3.7430	3.7430	458.9790	882.0000	1,340.9790	1.3688	0.0312	1,384.4815
Landscaping	0.1244	0.0471	4.0626	2.1000e-004		0.0223	0.0223		0.0223	0.0223		7.2791	7.2791	7.1400e-003		7.4577
Total	**14.8617**	**1.0637**	**28.9816**	**0.0638**		**3.7653**	**3.7653**		**3.7653**	**3.7653**	**458.9790**	**889.2791**	**1,348.2581**	**1.3759**	**0.0312**	**1,391.9392**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1512					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.7464					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	12.8398	1.0167	24.9190	0.0636		3.7430	3.7430		3.7430	3.7430	458.9790	882.0000	1,340.9790	1.3688	0.0312	1,384.4815
Landscaping	0.1244	0.0471	4.0626	2.1000e-004		0.0223	0.0223		0.0223	0.0223		7.2791	7.2791	7.1400e-003		7.4577
Total	**14.8617**	**1.0637**	**28.9816**	**0.0638**		**3.7653**	**3.7653**		**3.7653**	**3.7653**	**458.9790**	**889.2791**	**1,348.2581**	**1.3759**	**0.0312**	**1,391.9392**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Appendix B

Burrowing Owl Survey Report

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
Suite 200
La Mesa, CA 91942
619.462.1515 **tel**
619.462.0552 **fax**
www.**helixepi**.com

August 8, 2017 HLH-05

Mr. David Arnold
Hillcrest Homes
355 W. 2nd Street
Tustin, CA 92780

Subject: 2017 Burrowing Owl Survey Report for the Seraphina Estates Project in the City of Temecula, Riverside County, California

Dear Mr. Arnold:

At your request, HELIX Environmental Planning, Inc. (HELIX) conducted a focused burrowing owl (*Athene cunicularia*) survey for the Seraphina Estates Project (project) in the City of Temecula, Riverside County, California. This letter documents the results of the survey, which meets applicable conditions under the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) approved in 2003. The MSHCP is a comprehensive planning effort that includes the County of Riverside (County) and multiple cities. As part of the MSHCP implementation, enrolled jurisdictions are required to impose terms of the MSHCP, including appropriate surveys in accordance with Section 6, Volume I. The site is within the survey area for burrowing owl; therefore, surveys are required if potential habitat is present (Dudek and Associates 2003). This report presents the details and results of the survey.

PROPERTY LOCATION AND DESCRIPTION

The project area consists of an approximately 30-acre lot in the City of Temecula (City), in southwestern Riverside County, California (Figure 1). The project area is in Section 19 of Township 7 South, Range 2 West, on the US Geological Survey (USGS) 7.5-minute Bachelor Mountain quadrangle (Figure 2). The project site is located on the northeast corner of Nicolas Road and Joseph Road, to the east of Interstate 15; Rita Way and Diego Drive are located along the project's northern border (Figure 3).

The property shows signs of previous mechanical disturbance and is overgrown with non-native plant species (Figure 3). The topography is relatively flat with a drainage along the southern border. Elevation on site ranges from 1,138 to 1,155 feet above mean sea level. The project site is bordered to the north and west by dense residential development, to the east by rural residential and to the south by Nicolas Road and undeveloped land. The property is within the Southwest Area Plan of the MSHCP but is not within a subunit, cell, or cell group.

PROJECT DESCRIPTION

The proposed project would include development of approximately 22 acres within the study area and avoidance of approximately 8 acres. The development would include construction of 53 single-family homes and on-site roads connecting to Joseph Road at Payton Court and to Rita Way, where it connects to Seraphina Road. The two proposed roads would meet in the northeastern part of the site and connect to five cul-de-sacs. Lots 43 through 46 would access Jons Place. The project includes road improvements along Rita Way, Joseph Road, and Nicolas Road. A hardened encasement of the California Aqueduct is being constructed to protect the aqueduct from scour within the realigned Santa Gertrudis Creek as a Metropolitan Water District requirement for the project.

METHODS

HELIX conducted a nesting season burrowing owl (*Athene cunicularia*) survey in 2017 (Table 1). The surveys were conducted in accordance with the Burrowing Owl Survey Instruction for the Western Riverside Multiple Species Habitat Conservation Plan Area (County 2006). The survey covered the entire property. Burrows, with a diameter of at least 3 inches, with potential to support burrowing owls were mapped (Figure 3). HELIX biologist Robert Hogenauer surveyed transects no greater than 30 meters apart through potential owl habitat located on the property (Figure 4). In addition, a 500-foot buffer zone was visually surveyed using binoculars to the northeast, east and south from the edge of the subject property where owl habitat bordered the property. The biologist walked slowly and methodically, closely checking the areas that met the basic requirements of owl habitat:

- Open expanses of sparsely vegetated areas (less than 30 percent canopy cover for trees and shrubs);
- Gently rolling or level terrain;
- An abundance of small mammal burrows, especially those of California ground squirrel (*Spermophilus beecheyi*); and,
- Fence posts, rock, or other low perching locations.

Table 1
BURROWING OWL SURVEY INFORMATION

DATE	TIME (hours)	WEATHER CONDITIONS
7/3/2017	0530-0705	Start: 0% clouds, temp 52° F, wind 0-3 mph End: 0% clouds, temp 56° F, wind 0-3 mph
7/7/2017	0540-0720	Start: 30% clouds, temp 68° F, wind 0-1 mph End: 10% clouds, temp 72° F, wind 0-1 mph
7/12/2017	0630-0750	Start: 5% clouds, temp 75° F, wind 1-2 mph End: 5% clouds, temp 77° F, wind 1-2 mph
7/21/2017	0625-0750	Start: 0% clouds, temp 68° F, wind 0-1 mph End: 0% clouds, temp 71° F, wind 0-2 mph

RESULTS

Vegetation/Habitats

Vegetation within the project area is dominated by disturbed habitat and non-native grassland. Other vegetation (and land use types) occurring on the site include southern riparian woodland, mule fat scrub, disturbed wetland, freshwater marsh, southern willow scrub, disturbed Riversidean sage scrub, and streambed. The burrowing owl survey concentrated on the disturbed habitat and non-native grassland that dominate the site.

Burrowing Owls

All potential owl burrows were checked for signs of recent owl occupation, which include:

- Pellets/Casting – regurgitated fur, bones, and insect parts
- White wash – excrement
- Feathers

The project area includes multiple burrows with potential to support burrowing owls (Figure 3). None of the burrows showed sign of current or past occupation by burrowing owl and the site is therefore not considered occupied by the burrowing owl. Wildlife observed was recorded and a complete list of wildlife observed was created (Attachment A).

The MSHCP states that pre-construction surveys for burrowing owls should be conducted for all properties that contain suitable burrowing owl habitat. A pre-construction survey should be conducted within 30 days prior to ground disturbance of the property.

Please call me at (562) 537-2426 or Barry Jones at (619) 462-1515 if you have any questions about this report.

Sincerely,

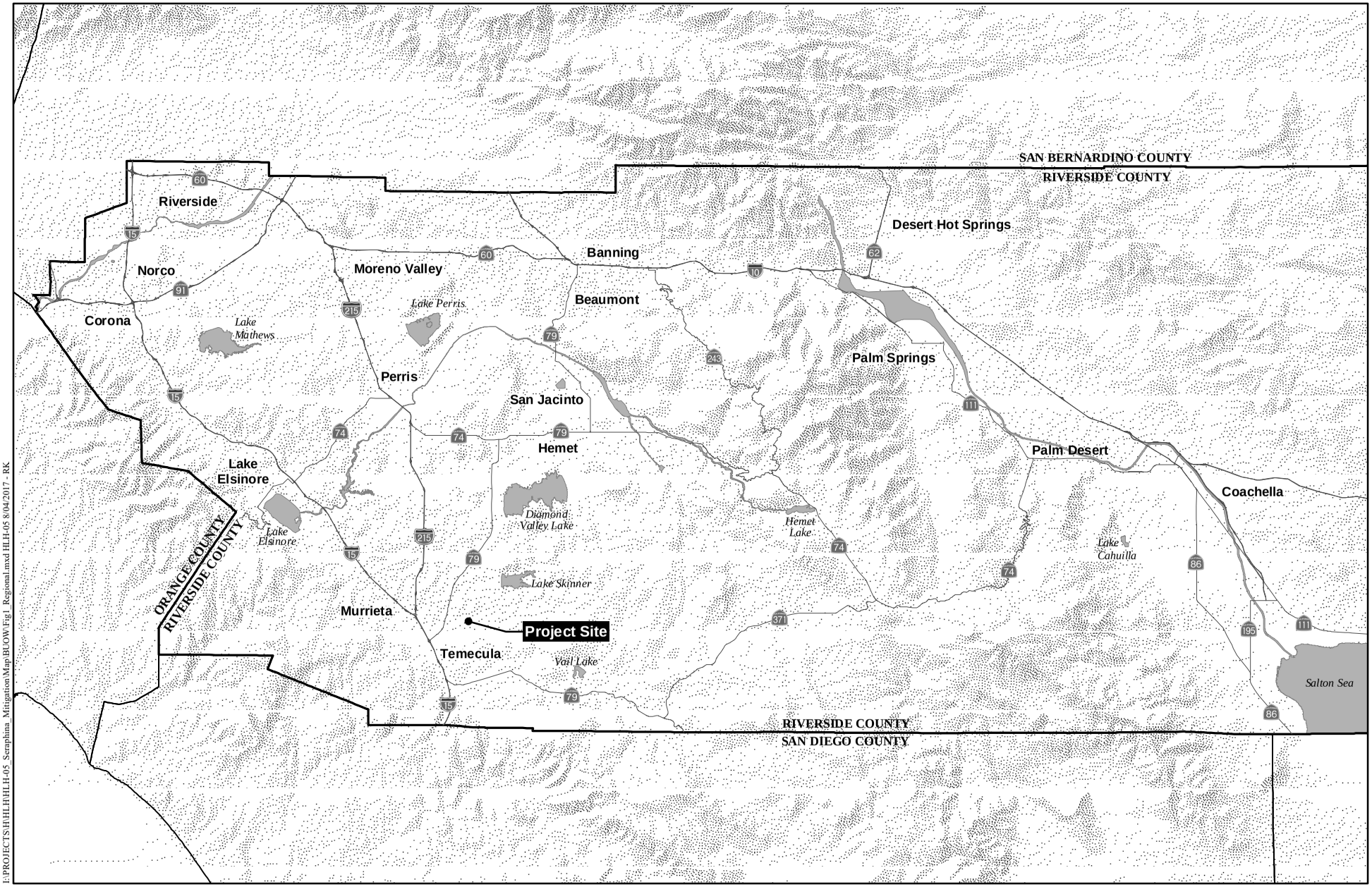
Rob Hogenauer
Biologist

Enclosures:
Figure 1 Regional Location
Figure 2 Project Vicinity (USGS Topography)
Figure 3 Potential Burrows
Figure 4 Survey Transects
Attachment A Animal Species Observed or Detected

REFERENCES

County of Riverside (County) Environmental Programs Department. 2006. Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area. Available at: http://rctlma.org/Portals/1/EPD/consultant/burrowing_owl_survey_instructions.pdf. March 29.

Dudek and Associates. 2003. Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Final MSHCP Volume I. Prep. for County of Riverside, Transportation and Land Management Agency.



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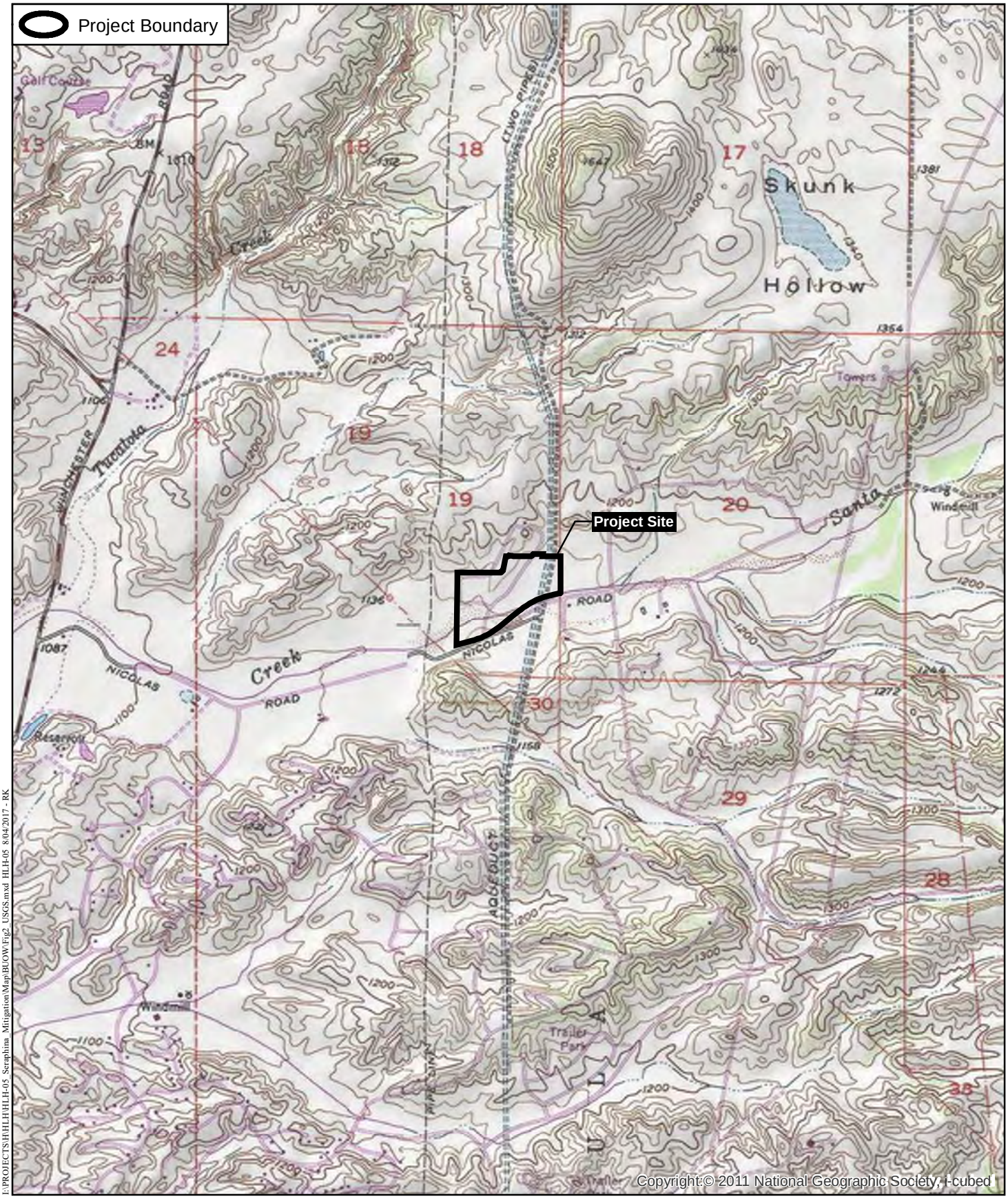
Regional Location

SERAPHINA

HELIX Environmental Planning

N 0 10 Miles

Figure 1



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Project Vicinity (USGS Topography)

SERAPHINA

HELIX Environmental Planning

0 2,000 Feet

Figure 2

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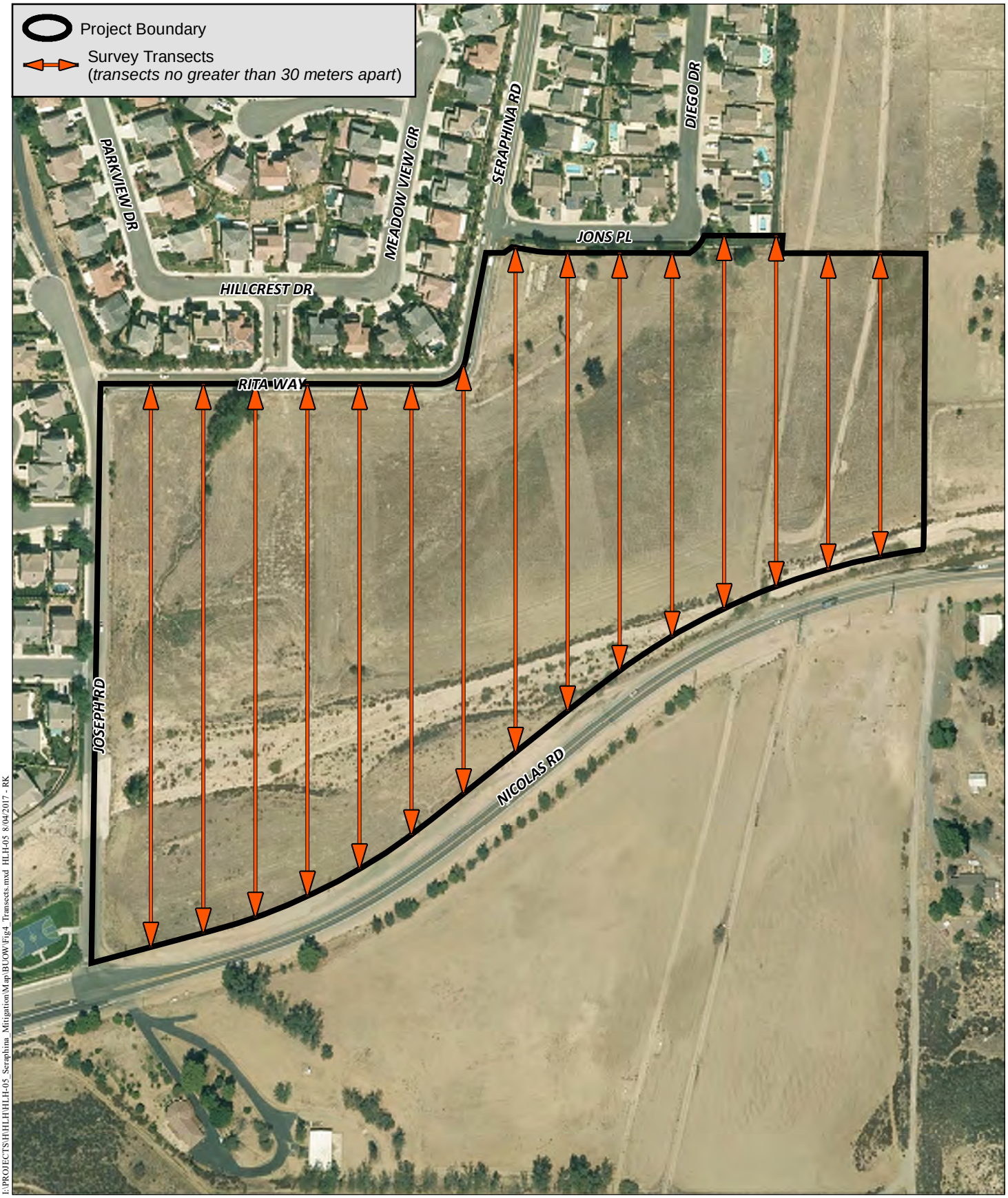
Potential Burrows

SERAPHINA

HELIX Environmental Planning

N 0 250 Feet

Figure 3



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Survey Transects

SERAPHINA

HELIX Environmental Planning

0 250 Feet

Figure 4

ATTACHMENT A
ANIMAL SPECIES OBSERVED OR DETECTED

TAXON		SCIENTIFIC NAME	COMMON NAME
VERTEBRATES			
Mammals			
Order	Family		
Rodentia	Geomyidae	*Thomomys bottae*	Botta's pocket gopher
	Sciuridae	*Otospermophilus beecheyi*	California ground squirrel
Birds			
Order	Family		
Accipitriformes	Accipitridae	*Buteo jamaicensis*	Red-tailed Hawk
Caprimulgiformes	Trochilidae	*Calypte anna*	Anna's Hummingbird
Charadriiformes	Charadriidae	*Charadrius vociferus*	Killdeer
Columbiformes	Columbidae	*Zenaida macroura*	Mourning Dove
Falconiformes	Falconidae	*Falco sparverius*	American kestrel
Passeriformes	Aegithalidae	*Psaltriparus minimus*	Bushtit
	Corvidae	*Corvus brachyrhynchos*	American Crow
		Corvus corax	Common Raven
	Icteridae	*Sturnella neglecta*	Western Meadowlark
	Fringillidae	*Haemorhous mexicanus*	House Finch
		Spinus psaltria	Lesser Goldfinch
	Tyrannidae	*Sayornis nigricans*	Black Phoebe
		Tyrannus vociferans	Cassin's Kingbird

Appendix C

Habitat Mitigation and Monitoring Plan

HELIX
Environmental Planning

Seraphina Estates Project (TTM 32346)

Habitat Mitigation and Monitoring Plan

September 2017

Prepared for:
Hillcrest Homes
355 W. 2nd Street
Tustin, CA 92780

Prepared by:
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

Seraphina Estates Project
Habitat Mitigation and Monitoring Plan

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1.0 INTRODUCTION

This report presents the mitigation and monitoring plan for impacts to jurisdictional habitat for the Seraphina project (project). Mitigation proposed in this plan will fulfill mitigation requirements of several regulatory agencies, including the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Wildlife (CDFW), and fulfill the project's obligation under the California Environmental Quality Act (CEQA). The mitigation described in this plan will take place on the project site as establishment and re-establishment. The mitigation area will be protected in perpetuity either through inclusion in a conservation easement or the placement of a restrictive covenant.

2.0 PROJECT DESCRIPTION

2.1 PROJECT LOCATION AND SETTING

The approximately 30-acre Seraphina project site is in the City of Temecula (City), in southwestern Riverside County, California (Figure 1). The site is located east of Interstate (I-) 15 and Highway 79, and northeast of the intersection of Nicolas Road and Joseph Road (Figure 2). It is located within Section 19, Township 7 South, Range 2 West, of the U.S. Geological Survey (USGS) 7.5 minute Bachelor Mountain quadrangle map (Figure 3).

The elevation of the site ranges from approximately 1,155 feet above mean sea level (amsl) in the northeast corner to 1,138 feet amsl on the southwest side, with gently rolling topography. It drains from north to south and from east to west, resulting in three distinct drainage areas. Santa Gertrudis Creek crosses the southern portion of the site. Off-site flows generated from existing residential tracts to the north enter the site at two locations along the northern boundary. Flows entering at the northwest boundary pool near the northern boundary; flows entering at the northwest boundary continue to flow southwesterly to Joseph Road, then south into Santa Gertrudis Creek.

Habitat types on site include buckwheat scrub and ruderal (Chambers Group 2004), as well as mule fat scrub, southern riparian woodland, disturbed wetland, freshwater marsh, and streambed (Figure 4; HELIX 2016). Southern riparian woodland, mule fat scrub, and streambed habitat types are found in the channel where the mitigation will be installed. These three habitat types are described in greater detail below.

Southern riparian woodland is typically composed of winter-deciduous trees that require water near the soil surface. Willow (*Salix* sp.), cottonwood (*Populus* sp.), and western sycamore (*Platanus racemosa*) form a dense medium height woodland or forest in moist canyons and drainage bottoms. Associated understory species may include mule fat (*Baccharis salicifolia*), stinging nettle (*Urtica dioica* ssp. *holosericea*), and wild grape (*Vitis girdiana*). The on-site woodland consists primarily of red willow (*Salix laevigata*) and arroyo willow (*Salix lasiolepis*) in the tree and shrub strata. There is a single stand of riparian woodland in San Gertrudis Creek, on the project site.

Mule fat scrub is a depauperate, shrubby riparian scrub community dominated by mule fat and interspersed with small willows. This vegetation community occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table. This early seral community is maintained by frequent flooding, the absence of which would lead to a cottonwood or sycamore dominated riparian woodland or forest (Holland 1986). In some environments, limited hydrology may favor the persistence of mule fat scrub. The on-site mule fat scrub consists of a sparse cover of mule fat interspersed with a few individuals of tarragon (*Artemisia dracunculus*), California sagebrush (*Artemisia californica*), and flat-top buckwheat *(Eriogonum fasciculatum*).

Streambed is essentially unvegetated. It has very coarse soils and has only a few, scattered plants. Species noted in this habitat include mule fat, tarragon, flat-top buckwheat, salt heliotrope (*Heliotropium curassavicum*), everlasting cudweed (*Pseudognaphalium microcephalum*), and white sage (*Salvia apiana*).

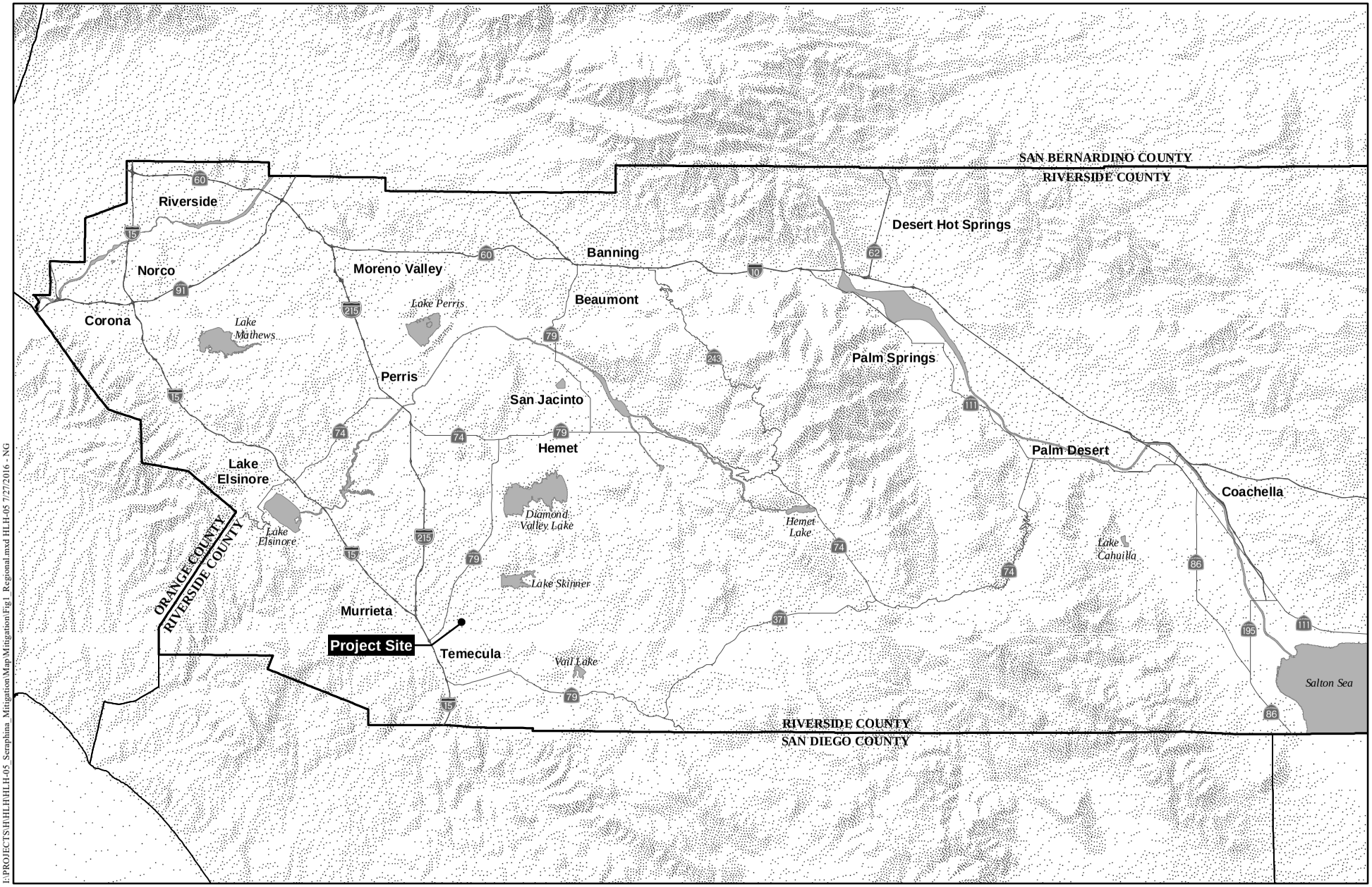
The site is currently vacant. The California Aqueduct crosses the east side of the project site. Surrounding uses include existing single-family residential to the west and north, larger lot residential and vacant land to the east and south, and a pocket park to the southwest. The entire property is located within the City of Temecula. The project site is located within the Southwest Area Plan of the County of Riverside Western Riverside Multiple Species Habitat Conservation Plan (MSHCP) but is not located within an MSHCP Criteria Cell.

2.2 PROJECT DESCRIPTION

The approximately 30-acre Seraphina project will develop approximately 22 acres and avoid approximately eight acres on site. Impacts include 0.91 acre under USACE jurisdiction (Figure 5) and 1.70 acres under CDFW jurisdiction (Figure 6). The project would include construction of 53 single-family homes. The project includes on-site roads connecting to Joseph Road at Payton Court and to Rita Way where it connects to Seraphina Road. The two proposed roads would meet in the northeastern portion of the site and connect to five cul-de-sacs. Lots 43 through 46 would access Jons Place. The project includes road improvements along Rita Way, Joseph Road, and Nicolas Road. The California Aqueduct easement on the east side of the site would be avoided except for an aqueduct access road to be built per Metropolitan Water District requirements over the realigned Santa Gertrudis Creek.

2.3 JURISDICTIONAL IMPACTS

The total USACE jurisdictional areas on site consist of approximately 1.92 acres: 0.16 acre of wetland WUS and 1.77 acres of non-wetland wasters of the U.S. (WUS) along a total of 2,855 linear feet. The project would result in permanent impacts to 0.08 acre (186 linear feet) of wetland WUS and 0.83 acre (2,058 linear feet) of non-wetland WUS (Table 1; Figure 5).



Regional Location

SERAPHINA

HELIX Environmental Planning

N 0 10 Miles

Figure 1

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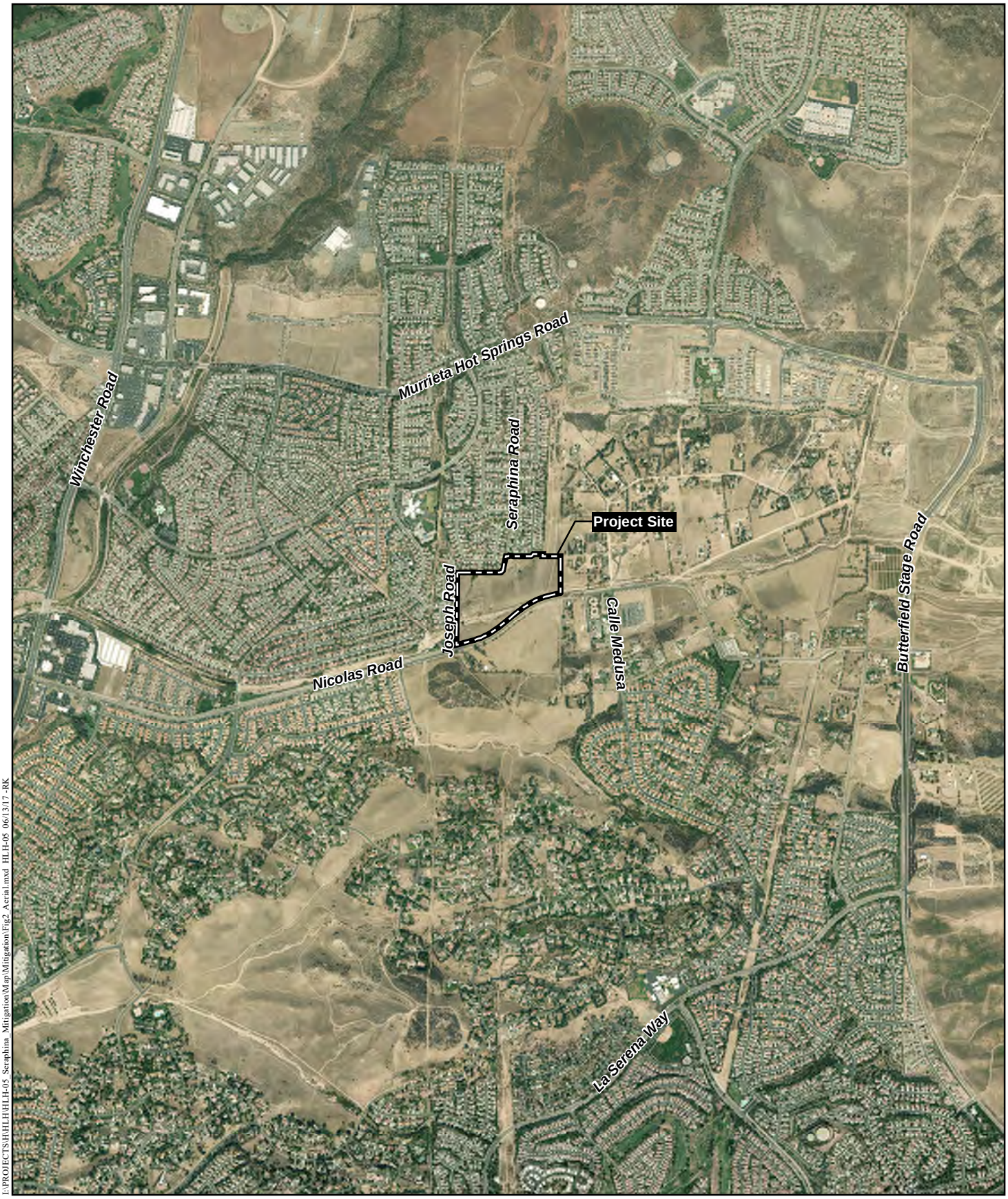

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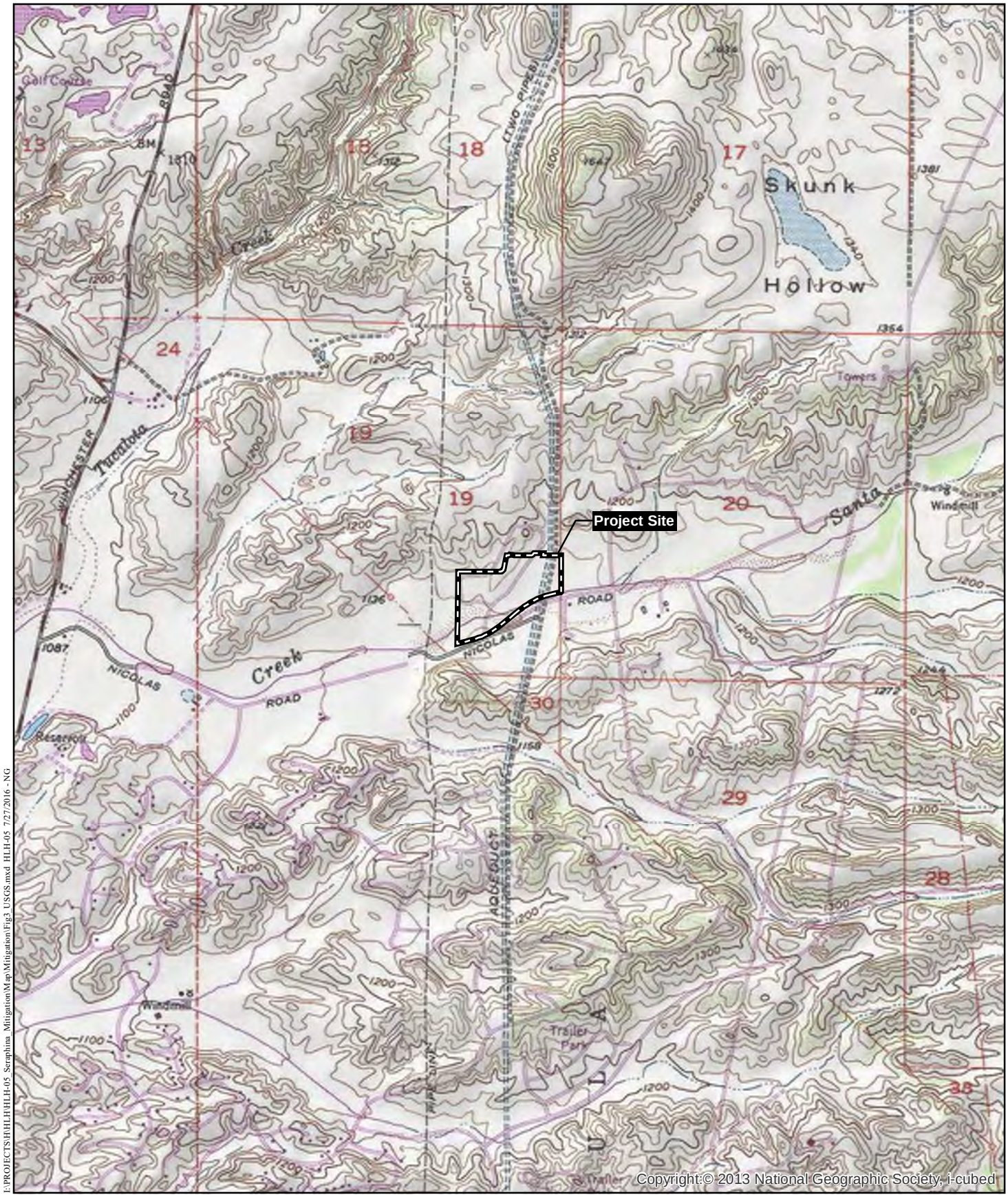
Project Vicinity (Aerial Photograph)

SERAPHINA

HELIX Environmental Planning

N 0 2,000 Feet

Figure 2



Project Vicinity (USGS Topography)

SERAPHINA

HELIX Environmental Planning

0 2,000 Feet

Figure 3

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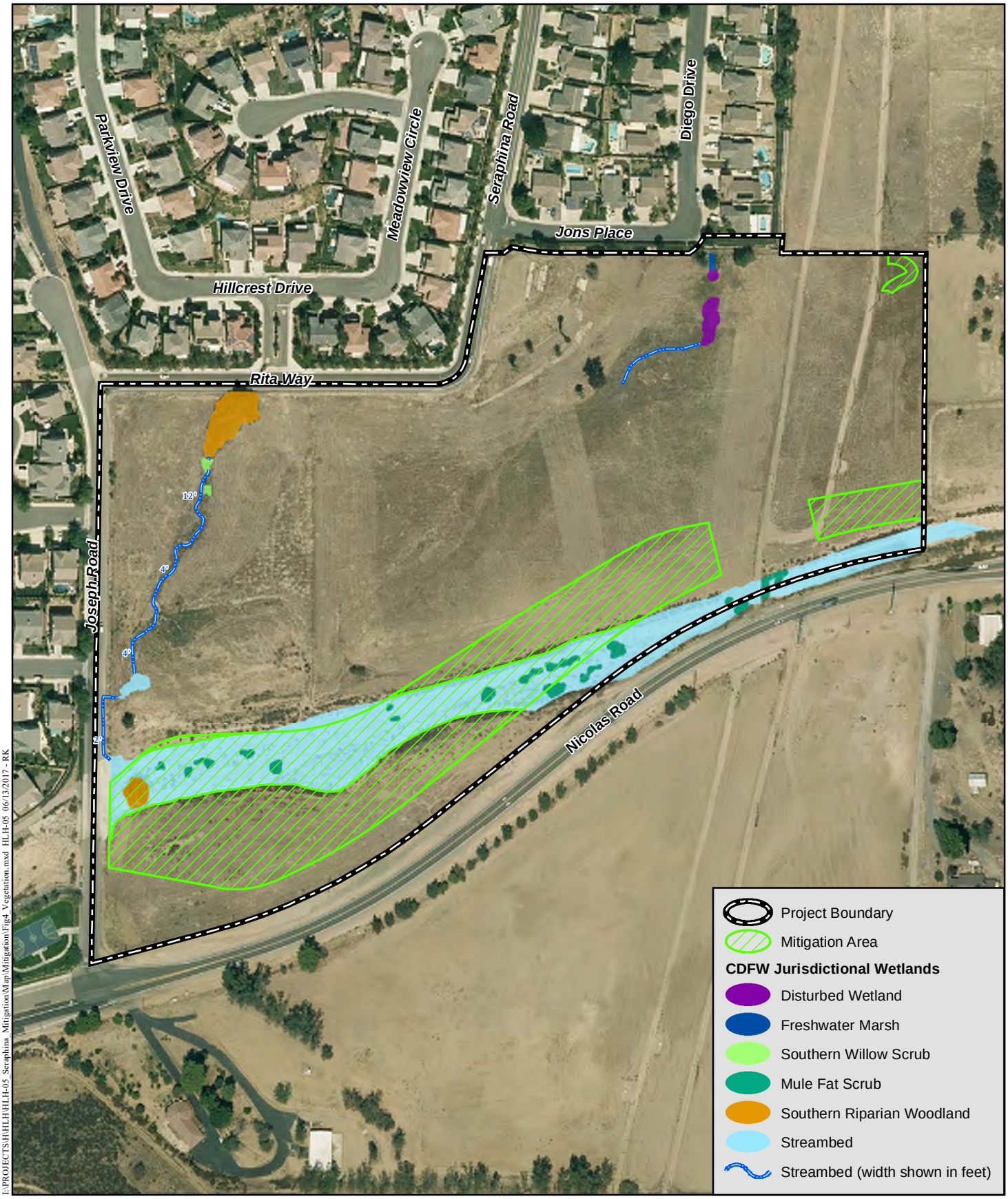

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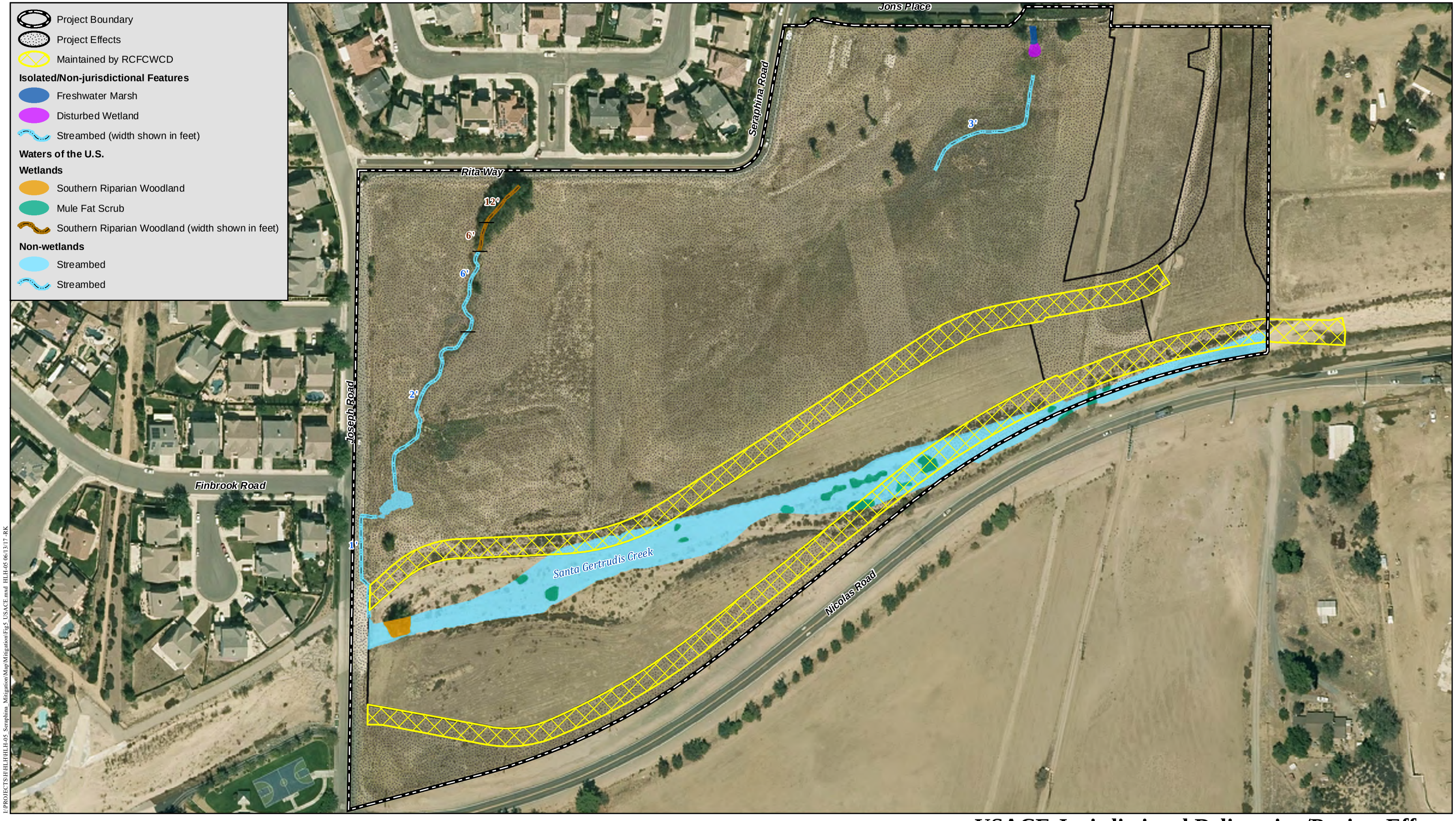
Existing Vegetation

SERAPHINA

HELIX Environmental Planning

N 0 250 Feet

Figure 4



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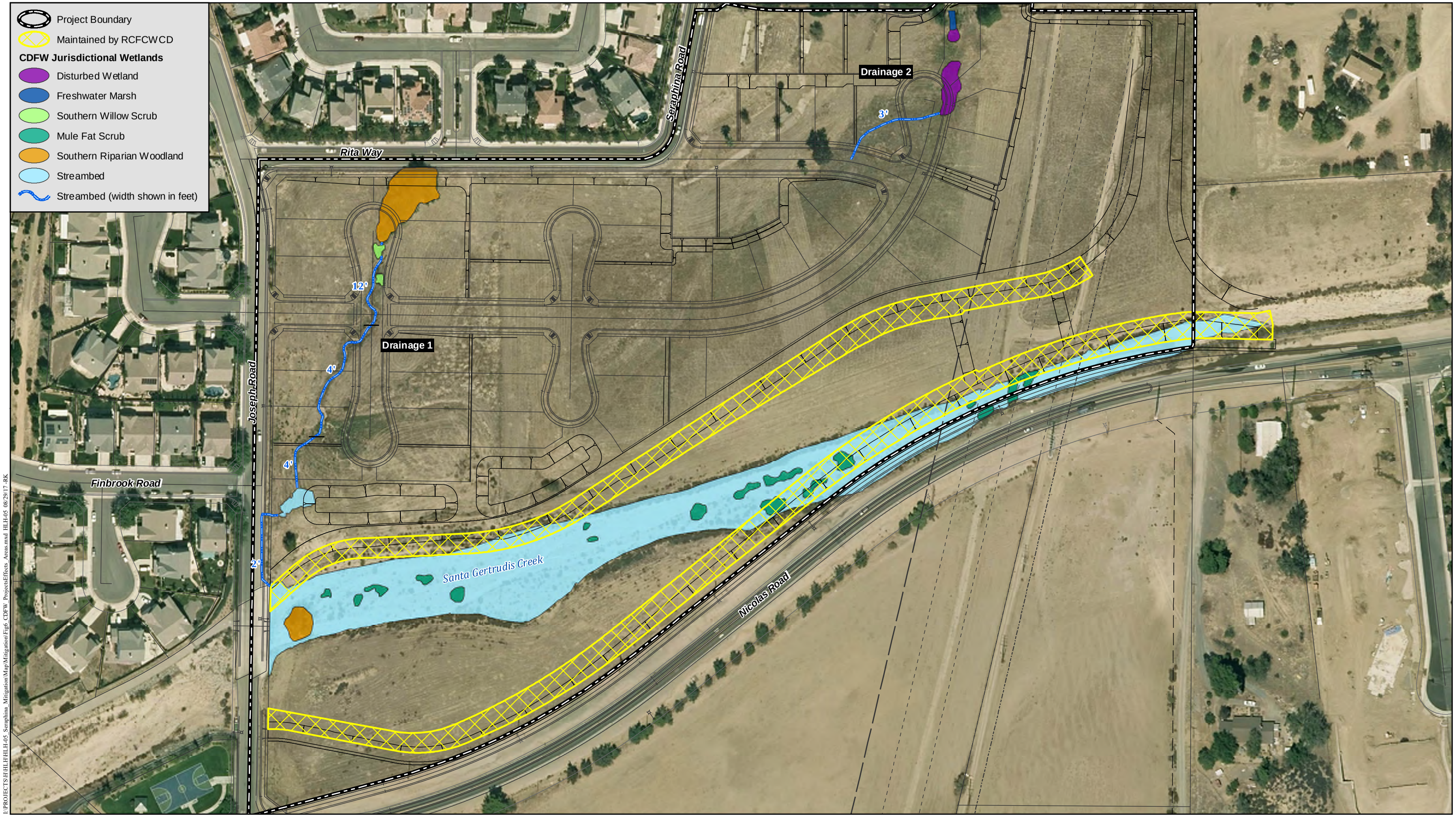
USACE Jurisdictional Delineation/Project Effects

SERAPHINA

HELIX Environmental Planning

N 0 150 Feet

Figure 5



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CDFW Jurisdictional Delineation/Project Effects by Area

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N 0 150 Feet

Figure 6

Table 1 USACE JURISDICTIONAL IMPACTS AND AVOIDANCE*					
HABITAT TYPE	**EXISTING ON SITE****		**IMPACTED****		**AVOIDED (Acres)**
	Acres	**Linear Feet**	**Acres**	**Linear Feet**	
Wetland WUS					
Mule Fat Scrub	0.08	0	0.03	0	0.05
Southern Riparian Woodland	0.06	135	0.03	135	0.03
Disturbed Wetland	0.01	113	0.01	20	0
Freshwater Marsh	0.01	31	0.01	31	0
Non-Wetland WUS					
Streambed	1.77	2,576	0.83	2,058	0.93
TOTAL	**1.92**	**2,855**	**0.91**	**2,244**	**1.01**

*Acreage is rounded to the nearest 0.01. Linear feet are rounded to the nearest whole foot.
** Includes off-site impact areas.

Habitat under CDFW jurisdiction located on the project site totals 3.15 acres, of which 0.45 acre consists of vegetated riparian habitat. The project would impact 1.70 acres of waters of the state (WS) consisting of 0.33 acre of vegetated riparian habitats and 1.37 acres of streambed (Table 2; Figure 5).

Table 2 CDFW JURISDICTIONAL IMPACTS AND AVOIDANCE*					
HABITAT TYPE	**EXISTING ON SITE****		**IMPACTED****		**AVOIDED (Acres)**
	Acres	**Linear Feet**	**Acres**	**Linear Feet**	
Vegetated Riparian Habitat					
Mule Fat Scrub	0.17	0	0.08	0	0.08
Southern Riparian Woodland	0.21	135	0.17	135	0.05
Disturbed Wetland	0.06	113	0.06	113	0
Freshwater Marsh	0.01	31	0.01	31	0
Southern Willow Scrub	0.01	19	0.01	19	0
Streambed					
Streambed	3.03	2,576	1.37	2,191	1.66
TOTAL	**3.49**	**2,874**	**1.70**	**2,489**	**1.79**

*Acreage is rounded to the nearest 0.01. Linear feet are rounded to the nearest whole foot.
**Includes off-site impact areas.

The project has been designed to avoid impacts to Santa Gertrudis Creek to the greatest extent possible. Two small tributary drainages on the northern portion of the site will be impacted. Along Santa Gertrudis Creek, the northern and southern banks of the channel will be reinforced with riprap. On the west side of the project site, the riprap will impact 0.23 acre of streambed and less than 0.01 acre of mule fat scrub on the north side of Santa Gertrudis Creek. Santa Gertrudis Creek will be realigned on the east side of the project site to allow room for the widening of

Nicolas Road, as required by the City. The road widening will require substantial fill, pavement, and a riprap slope extending across Santa Gertrudis Creek. On the east side of the project site, including off-site impacts, road widening will impact 1.09 acres of streambed and 0.08 acre of mule fat scrub. The existing San Diego aqueduct crosses Santa Gertrudis Creek near the eastern project boundary, and will need to be protected from existing and future scour by a concrete and riprap cover. These impacts are included in the road widening impacts noted above.

2.4 FUNCTIONS AND SERVICES OF JURISDICTIONAL AREAS TO BE IMPACTED

Santa Gertrudis Creek is the main drainage occurring on site and will be widened and realigned as part of the project. The creek provides wildlife habitat, sediment transport, infiltration, and flood control functions. The two drainages in the northern portion of the site are narrow, ephemeral streambeds that provide limited wildlife habitat and sediment transport functions. The on-site drainages support very marginal habitat for listed species such as least Bell's vireo (*Vireo bellii pusillus*); the site is not suitable for the southwestern willow flycatcher (*Empidonax traillii extimus*). Focused surveys for the least Bell's vireo in 2017 have been negative to date.

2.5 MITIGATION REQUIREMENTS

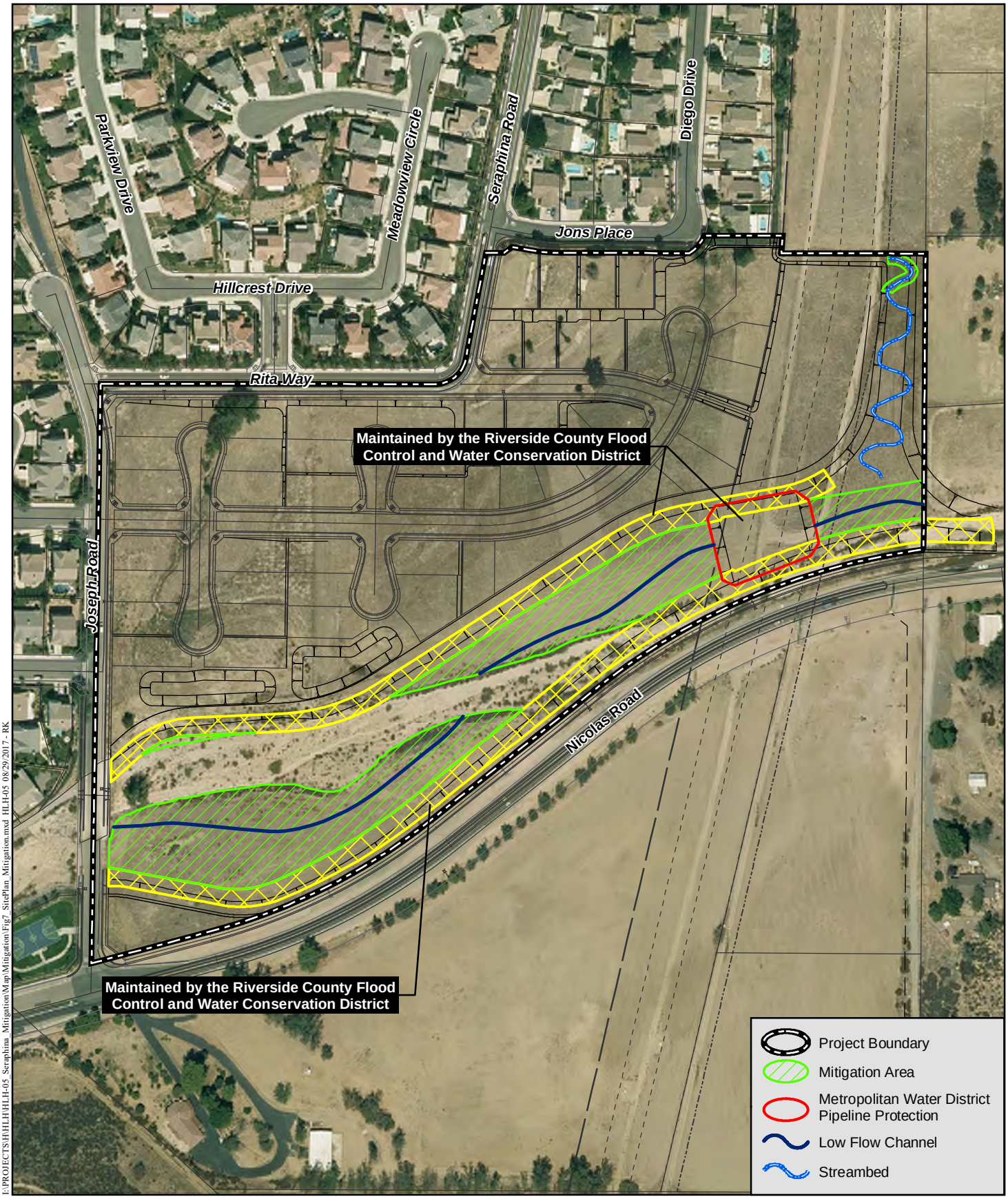
Pursuant to Section 404 of the federal Clean Water Act, the USACE regulates the discharge of fill material into WUS and evaluates the impacts of the placement of proposed fill into such waters. Under Section 401 of the federal Clean Water Act, the RWQCB also has authority over USACE jurisdictional areas. The CDFW regulates impacts to wetland and streambed habitats pursuant to Section 1602 of the California Fish and Game Code. To ensure no-net-loss of functions and services, the compensatory mitigation is required for all jurisdictional impacts.

2.5.1 Waters of the U.S.

Construction of the residential development requires impacts to a total of 0.08 acre (186 linear feet) of USACE jurisdictional wetland WUS and 0.83 acre (2,058 linear feet) of USACE jurisdictional non-wetland WUS (HELIX 2016). Mitigation ratios of 2:1 for non-wetland WUS and 3:1 for wetland WUS result in a total of 1.90 acres of mitigation, which will be completed on-site through a combination of 1.75 acres of streambed/riparian scrub establishment/ re-establishment (Figure 7) and through purchase of 0.15 mitigation credits from the Barry Jones Wetland Mitigation Bank (Table 3).

Table 3
MITIGATION FOR IMPACTS TO JURISDICTIONAL RESOURCES

VEGETATION TYPE	IMPACTS (acres)	MITIGATION RATIO	TOTAL MITIGATION (acres)
Wetland WUS	0.08	3:1	0.24
Non-wetland WUS	0.83	2:1	1.66
TOTAL	**0.91**		1.90



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Site Plan and Mitigation Areas

SERAPHINA

HELIX Environmental Planning

N 0 250 Feet

Figure 7

2.5.2 Waters of the State/CDFW Habitat

Mitigation for impacts to vegetated CDFW habitats will be at a 3:1 ratio while impacts to unvegetated streambed will be mitigated at a 2:1 ratio (Table 4; Figure 7). A total of 3.73 acres of mitigation will occur through a combination of on-site establishment and re-establishment of 3.58 acres of streambed/riparian scrub, and through purchase of 0.15 mitigation credits from the Barry Jones Wetland Mitigation Bank. The mitigation will include a minimum of 1:1 establishment or re-establishment. Mitigation for unavoidable impacts to WS resources will be biologically equivalent or superior to resources being impacted by the proposed project.

Table 4
MITIGATION FOR IMPACTS TO CDFW JURISDICTIONAL RESOURCES

VEGETATION TYPE	IMPACTS*	MITIGATION RATIO	MITIGATION REQUIRED*
Mule Fat Scrub	0.08	3:1	0.24
Southern Riparian Woodland	0.17	3:1	0.51
Disturbed Wetland	0.06	3:1	0.18
Freshwater Marsh	0.01	3:1	0.03
Southern Willow Scrub	0.01	3:1	0.03
Streambed	1.37	2:1	2.74
TOTAL	**1.70**		**3.73**

*Impacts are shown in acres

2.5.3 Additional Water Quality Linear Foot Requirements

In order to address the loss of linear foot functions and services of the Santa Gertrudis Creek and two side tributaries, the project mitigation includes the redirecting of the existing flows from the easternmost tributary, Drainage 2, to an earthen streambed along the eastern boundary of the site (Figure 7). This, combined with the length of the low flow channel through the restored portions of Santa Gertrudis Creek will result in a total of 2,150 linear feet of mitigation, which is approximately 86 percent (2,150/2,489 feet) of the linear feet being impacted.

3.0 MITIGATION AREA DESCRIPTION

3.1 MITIGATION LOCATION

Mitigation for the proposed project will occur on the project site within the existing and realigned portions of Santa Gertrudis Creek and the eastern portion of the site (Figure 7), and through purchase of 0.15 mitigation credit from the Barry Jones Wetland Mitigation Bank. Santa Gertrudis Creek runs along the southern portion of the site, north of Nicolas Road. The existing creek will be realigned and widened as mitigation for the project. Additionally, Drainage 2 is being directed to an earthen streambed along the eastern boundary of the site to offset functions

and services lost from impacts associated with the two side tributaries. The Barry Jones Mitigation Bank is located approximately 1.2 miles north of the project site.

3.2 EXISTING FUNCTIONS AND SERVICES

As discussed under Section 2.4, Santa Gertrudis Creek is the main drainage occurring on site and will be widened and realigned as part of the project. This drainage provides wildlife habitat, sediment transport, infiltration, and flood control functions. Areas selected for streambed/riparian scrub creation currently consist of non-native grassland habitat that provides wildlife habitat for widespread native species, such as Audubon's cottontail (*Sylvilagus audubonii*), coyote (*Canis latrans*), and white-crowned sparrow (*Zonotrichia leucophrys*). Areas of the existing streambed that will be restored following regrading of the channel are primarily unvegetated.

3.3 MITIGATION SITE SUITABILITY

The mitigation area is considered suitable for non-wetland waters/streambed establishment/re-establishment and riparian scrub establishment/re-establishment due to its location directly adjacent to the Santa Gertrudis Creek. The mitigation project would widen and realign this existing channel but, would essentially maintain existing drainage patterns and flow through the site.

4.0 MITIGATION DESIGN CONCEPT

To meet USACE, CDFW, and RWQCB (hereafter referred to as "regulatory agencies") mitigation requirements, as appropriate, this plan recommends measures to establish and re-establish streambed habitat and flood plain scrub habitat on site. It is anticipated that the functions and services of the proposed establish and re-establish areas would equal or exceed those provided by the impacted streambeds.

4.1 MITIGATION DESIGN

4.1.1 Riparian Scrub/Streambed Creation and Restoration

The entire mitigation site contains 3.26 acres of channel bottom. Approximately 1.66 acres of the channel bottom will be maintained by the Riverside County Flood Control and Water Conservation District (RCFCWCD) as a road, and is not included in the mitigation area. Additionally, the side slopes of the channel will be lined with rip rap and will not be counted toward the total mitigation.

Santa Gertrudis Creek would be widened and realigned throughout the project site. This drainage ranges from approximately 30 to 165 feet across, and would be widened to approximately 40 to 200 feet across as part of the mitigation implementation. Riparian scrub species would be installed within the Creek, with container stock installed in the highest concentration near the detention basin outfalls, and native seed applied throughout the bottom of the Creek.

The re-aligned Drainage 2 along the eastern boundary will be graded to a width of approximately 20 feet and a depth of one foot. Riparian scrub species will be planted along the upper 100 feet of the drainage and will have adequate hydrology to support this vegetation based on existing vegetation in the eastern drainage being impacted. The lower portion of the drainage will be seeded with a riparian herbaceous seed mix.

4.2 TARGET FUNCTIONS AND SERVICES

The overall goal of this mitigation effort is to increase the functions and services of streambed habitat within the project site so that it would replace functions and services that are lost by project implementation.

Riparian scrub and streambed establishment and re-establishment will provide wildlife habitat, in addition to water quality functions through the trapping of sediment, absorption of potential pollutants in urban runoff, and flood abatement.

4.3 RATIONALE FOR EXPECTING IMPLEMENTATION SUCCESS

The compensatory mitigation program is expected to be successful because the riparian scrub and streambed establishment/re-establishment areas are essentially a realignment and re-establishment of Santa Gertrudis Creek, which currently receives flow from upstream of the project site, and re-alignment of Drainage 2 to the east. Flows within the established/ re-established channel are anticipated to be similar to flows in the existing Creek, which would be appropriate for the target habitats of riparian scrub and streambed. Species used in the mitigation effort are appropriate for the anticipated ephemeral/intermittent nature of the channel. The re-aligned Drainage 2 will be utilizing flows that have resulted in the establishment of wetland vegetation in the existing condition, and the amount of habitat targeted for restoration is similar to the amount impacted, and success of this restoration area is, therefore, assumed to be viable.

5.0 PROJECT RESPONSIBILITY

5.1 PROJECT PROPONENT

Cardinal Investment Properties–Seraphina is the project proponent for this project and will be responsible for financing the installation and five-year maintenance and monitoring of the mitigation proposed in this plan, unless the property is sold and the regulatory permits are transferred to the new ownership entity, which would then become the responsible party. Contact information is provided below.

Mr. David Arnold
Cardinal Investment Properties–Seraphina
375 Bristol St., Suite 50
Costa Mesa, CA 92626
(714) 814-9500

5.2 RESTORATION SPECIALIST

Overall supervision of the installation, maintenance, and monitoring of this mitigation project will be the responsibility of a restoration specialist with experience in wetland habitat restoration. The restoration specialist will oversee the efforts of the landscape contractor(s) for the life of the project. This person has the authority to substitute and change this plan as conditions of the site dictate, if the appropriate regulatory agencies are notified. Specific tasks of the restoration specialist include educating all participants about mitigation goals and requirements; directly overseeing grading, installation of container stock and seed, and maintenance during the five-year mitigation effort; and conducting annual assessments. When necessary, the restoration specialist will provide the project proponent and contractor with a written monitoring memo, including a list of items in need of attention. The restoration specialist will prepare and submit required reports to the project proponent and regulatory agencies each year during the five-year maintenance and monitoring period. Contact information for the restoration specialist is provided below.

HELIX Environmental Planning, Inc.
7578 El Cajon Blvd.
La Mesa, CA 91942
(619) 462-1515

5.3 LANDSCAPE ARCHITECT

A licensed landscape architect will prepare the construction documents, including grading, irrigation, and planting plans. This person will inspect the irrigation system and assist in other inspections, as necessary.

5.4 INSTALLATION/MAINTENANCE CONTRACTOR

The installation contractor will have wetland habitat restoration experience and be responsible for completion of grading, weeding, irrigation installation, and seeding/planting of the mitigation area. The restoration specialist will supervise the contractor regarding the installation of seed and container stock in the mitigation area.

After the installation contract is completed, the project proponent will hire a maintenance contractor for the duration of the five-year monitoring period. The maintenance contractor and the installation contractor may be the same entity. The project proponent may change contractors at its discretion. The maintenance contractor will have prior knowledge regarding the maintenance of native wetland habitat and be familiar with native and non-native plants. The maintenance contractor will maintain the entire mitigation area per the maintenance schedule (Section 7.2). Maintenance will include, but not be limited to, weed control, trash removal, replacement of dead plants, and re-seeding. All activities will be seasonally appropriate and identified by the restoration specialist. The maintenance contractor will meet the restoration specialist at the site when requested and will perform all checklist items in a timely manner.

6.0 MITIGATION INSTALLATION

A summary of all major tasks related to the project, starting with the pre-construction phase and ending with the end of the five-year maintenance and monitoring period, is provided in Table 5.

Table 5
MITIGATION PLAN CHECKLIST

CONSTRUCTION PHASE	MITIGATION TASK	APPLICABLE PARTIES				
		Project Proponent	Grading Contractor	Installation Contractor	Maintenance Contractor	Restoration Specialist
Pre-construction	Order seed and container stock[1]			X		X[2]
	Attend pre-construction meeting	X	X	X		X
	10-day notification to regulatory agencies					X
Installation	Delineate mitigation boundaries			X		X[2]
	Remove/treat non-native vegetation			X		X[2]
	Install irrigation and complete coverage test			X		X[2]
	Install seed and container stock			X		X[2]
	Prepare/submit as-built report					X
Five-year Maintenance & Monitoring Period	Maintain site for remainder of five years, until sign off by regulatory agencies				X	X[2]

[1] Installation contractor must provide all source locations and receive authorization of final seed and plant lists from the restoration specialist prior to ordering.
[2] Inspecting work related to this task.

6.1 INSTALLATION SCHEDULE

Installation of the mitigation will occur concurrently with project construction/impacts to jurisdictional areas and be completed within the time frames identified in the regulatory permits to be issued for the project.

6.2 SITE PREPARATION

6.2.1 Grading

Grading of the mitigation area will occur concurrently with project construction. The goal of grading is to create hydrological conditions appropriate to support native species suitable for ephemeral to intermittent streambed habitat. The Santa Gertrudis Creek and Drainage 2 channels are anticipated to support open riparian scrub and unvegetated streambed habitat and will consist of a low flow channel and side terraces. Grading will be monitored by the restoration specialist.

6.2.2 Weeding

It is expected that grading, where it occurs, would remove all exotic species. Any weed species that are not removed by grading will be removed by hand or through the use of herbicide prior to seeding and planting the area with native species. The restoration specialist will provide guidance to the maintenance contractor on how weeding should be accomplished.

6.3 IRRIGATION

An irrigation system will be used to help the native seed and container stock installed in the channel bottom become established. After the initial plant establishment period, water will be applied infrequently and only as needed to prevent the mortality of plants and seedlings. The irrigation schedule will attempt to develop deep-root growth with evenly spaced, infrequent, deep applications of water. To obtain deep penetration of water, the irrigation system may be activated several times in one 24-hour period. Irrigation will be minimized to the extent possible following natural rainfall events.

The goal is to obtain germination and growth with the least amount of irrigation. Frequent irrigation encourages weed invasion and leaches nutrients from the soil. Native plantings that are infrequently irrigated may grow slower initially but will ultimately develop into better habitat. Thus, irrigation will be used for the first three years, or less, of the five-year monitoring period. The restoration specialist will provide direction on the timing, frequency, and duration of irrigation during the irrigation period. The restoration specialist also will meet with the installation/maintenance contractor to complete an irrigation coverage test prior to installation of seed material. Once the plant material is established and does not require supplemental irrigation, the above-ground portions of the system will be removed.

6.4 PLANTING PLAN

Installation of plant materials in the mitigation area is anticipated to begin immediately following initial site preparation and installation of irrigation. Once the mitigation areas have been graded and cleared of weeds, and irrigation installation is complete, the areas will be seeded and container stock installed. Seed would be hand-spread following planting and raked in or applied as a hydroseed mixture. Container stock would be installed in the channel bottom.

Only locally native species (no cultivars) obtained within western Riverside County from as close to the project site as possible will be used (Table 6). Seeding will include annual and perennial species. Fast-growing annual species that are quick to germinate will provide initial cover and help protect freshly graded soils from erosion. Container stock will consist of native herbaceous and shrub species adapted to well-drained soils with intermittent to ephemeral surface water flows.

Container stock will be installed in the mitigation area near the detention basin outfalls, where water supplies will be more regular. Seeding would occur within the remainder of the channel (Table 6).

Table 6
MITIGATION AREA PLANT PALETTE
(3.58 acres)

SHRUB CONTAINER STOCK*					
Scientific Name	**Common Name**	**Spacing on Center** (feet)	**Number per Acre**	**Grouping Size**	**Total Quantity**
Artemisia dracunculus	tarragon	5	90	5	322
Baccharis salicifolia	mule fat	8	140	7	501
Sambucus mexicana	blue elderberry	10	22	2	79
				TOTAL	**902**
SEED MIXTURE*					
Scientific Name	**Common Name**		**% Purity/ %Germination**	**Lbs./Acre**	**Total Lbs.**
Ambrosia psilostachya	western ragweed		45/45	3.0	10.7
Acmispon americanus	Spanish-clover		98/75	2.0	7.2
Croton californica	California croton		90/40	1.0	3.6
Datura wrightii	western jimson weed		90/75	2.0	7.2
Artemisia dracunculus	Tarragon		10/50	3.0	10.7
Eriogonum fasciculatum	California buckwheat		55/20	3.0	10.7
Eriogonum gracile	slender buckwheat		40/30	1.0	3.6
Pseudognaphalium microcephalum	white everlasting		NA	2.0	7.2
Camissonia bistorta	California sun cup		90/80	1.0	3.6
				TOTAL	**64.5**

* Container Size for all species in one-gallon.

6.5 AS-BUILT CONDITIONS

The restoration specialist shall submit a brief as-built letter report to the regulatory agencies within six weeks of completion of installation of the mitigation area. The letter will describe mitigation area preparation, installation methods, and the as-built status of the site. To document implementation of the mitigation plan, the letter will include an as-built graphic on an aerial photo base as well as photos taken from designated photo stations before and after mitigation installation. The as-built letter will serve as the "time zero" report, noting when the five-year maintenance and monitoring period of the mitigation area began.

7.0 MAINTENANCE PLAN

7.1 MAINTENANCE ACTIVITIES

A five-year maintenance program is proposed to ensure the successful establishment and persistence of the mitigation area. The maintenance program will include removal of trash, weed control, and any remedial measures deemed necessary for the success of the mitigation program (e.g., re-seeding). Maintenance activities will be directed by the restoration specialist.

7.1.1 General Maintenance

It is the contractor's responsibility to keep the entire mitigation area free of debris, monitor the establishment and health of installed plants and germinated seed, and remove non-native vegetation. Maintenance personnel will be fully informed of the mitigation program so that they understand the effort's goals and maintenance requirements. A professional with experience in and knowledge of habitat restoration will inspect all maintenance activities.

Damage to the site occurring because of unusual weather or vandalism will be repaired, as directed by the restoration specialist. The contractor will repair any damage caused by the contractor's inadequate maintenance, as determined by the restoration specialist.

7.1.2 Weed Removal

Weed eradication will be conducted as necessary to minimize and/or eliminate weed cover. Competition from weeds should never prevent the establishment of native species. As weeds become evident, they should be removed by hand or controlled with the proper herbicides. Maintenance personnel should be knowledgeable in distinguishing between native and non-native species; however, guidance will be provided, as needed, by the restoration specialist.

7.1.3 Other Pests

Insects, vertebrate pests, and diseases will be monitored. There will be a high threshold of tolerance before control measures are considered. As required by law, specific recommendations will be made only by a licensed pest control adviser. All applicable federal and state laws and

regulations will be closely followed. The restoration specialist will be consulted on any pest control matters.

7.1.4 Fertilization

Fertilizer will not be applied except in extraordinary circumstances and only at the written direction of the restoration specialist.

7.1.5 Pruning

No post-installation pruning is necessary unless otherwise directed by the restoration specialist.

7.2 MAINTENANCE SCHEDULE

Maintenance of the mitigation area will be conducted monthly from February through July, and once in December during Years 1 through 3, bi-monthly in Year 4 and quarterly during Year 5 (Table 7). The maintenance contractor will complete maintenance requests from the restoration specialist within 14 days of any written request or monitoring report.

Table 7
MAINTENANCE SCHEDULE*

YEAR	SCHEDULE
1 through 3	Monthly February-September, December
4	Every other month
5	Quarterly

*This schedule is only a guideline; maintenance will be performed as necessary and as directed by the restoration specialist. Maintenance to be performed by the maintenance contractor.

8.0 MONITORING PLAN

Monitoring and annual assessments will be carried out by a restoration specialist. This monitoring program will begin with mitigation installation and continue for 5 years. Monitoring of the mitigation effort is divided into four phases: (1) installation monitoring, (2) post-installation data collection, (3) maintenance monitoring, and (4) annual technical monitoring. Details of each phase are provided in this section of the mitigation plan.

8.1 INSTALLATION MONITORING

A restoration specialist will monitor all phases of the installation process, including site preparation and installation of irrigation, plants, and seed (Table 8). The restoration specialist must inspect and authorize each phase of work before the next phase can begin. The regulatory agencies will be notified in writing that installation is to begin at least 10 days before the anticipated start date. Pre-installation photos will be taken from designated photo documentation

stations. This information will be used to track the changes in vegetation during of the mitigation effort.

8.2 MAINTENANCE MONITORING

Monitoring will be carried out under observation of the restoration specialist to identify maintenance activities (maintenance monitoring) and assess the progress (annual technical monitoring) of the mitigation effort. The maintenance monitoring program will begin following the completion of installation and continue for five years (Table 8). During each visit, the restoration specialist will inspect the site to ensure that the mitigation effort is progressing as planned and to identify any problems that may affect the effort. Monitoring memos noting any issues with plant establishment, irrigation, sediment control, etc. will be provided as necessary to the maintenance contractor and project proponent.

Table 8
MAINTENANCE MONITORING SCHEDULE

PHASE	SCHEDULE*
Installation	Daily
Post Installation	
Years 1 through 2	Six visits per year
Years 3 through 5	Quarterly (four visits per year)

*Maintenance monitoring visits to be conducted by the restoration specialist.

8.3 ANNUAL TECHNICAL MONITORING

The restoration specialist will conduct an annual technical monitoring visit each year during the five-year monitoring period. The timing of this assessment should correspond with the peak of the wetland vegetation growth for that year.

8.3.1 Qualitative Monitoring

The restoration specialist will conduct a site visit to the mitigation area once during each year of the five-year monitoring period to assess native vegetative cover and species richness, as well as non-native cover, and use of the mitigation area by wildlife species, in addition to documenting indicators of wetland hydrology. This qualitative monitoring will consist of visual estimates of cover by native and non-native species, as well as compiling a list of plant species observed, identification of wildlife detected, and a list of wetland hydrology indicators observed (e.g., drift lines, sediment deposits, and soil saturation). Because the mitigation area (including the water quality drainages) is anticipated to be a primarily unvegetated channel, quantitative monitoring (transects) is not proposed as part of this plan.

8.3.2 Photo Documentation

Permanent photo documentation stations will be established for the mitigation area. Photos will be taken of the mitigation area following installation and as part of all five annual monitoring events and will be included in the annual reports.

8.3.3 Annual Reports

An annual report will be prepared each year during the five-year monitoring period. These reports will be based on qualitative data and focus on what, if any, adjustments are necessary to ensure ultimate success of the mitigation project. Each report will evaluate the success of the mitigation effort to date, along with any recommendations for future work that may be deemed necessary. Following review by the project proponent, the annual reports will be submitted to the regulatory agencies.

9.0 SUCCESS CRITERIA

The following sections provide standards to determine the successful completion of the mitigation plan. Attainment of these standards indicates that the mitigation area is progressing toward attaining the habitat function and services targeted by this plan. These success criteria apply to Years 3 through 5 of the monitoring period. There are no success criteria for Years 1 and 2. Methods to be used to measure these success criteria are described in the following text.

9.1 SUCCESS CRITERIA

9.1.1 Vegetative Cover

Native and non-native (weed) plant species cover will be visually assessed to evaluate project success. Annual performance goals have been set to track the progress of the mitigation effort. No specific cover criteria have been established for Years 1 or 2. For Years 3 through 5, native species cover within the mitigation area should be 10, 15, and 20 percent, respectively (Table 9). Weed species cover within the mitigation area should be no greater than 10 percent for Years 3 and 4, and five percent for Year 5. However, the mitigation area should be free of highly invasive plant species (i.e., those listed as High by the California Invasive Plant Council 2017) in Years 3 through 5. If the annual goals for native and non-native cover are not met, additional measures (e.g., reseeding, planting, weeding, etc.) will be taken as necessary to ensure final success.

9.1.2 Species Richness

Species richness is the number of native species present in each area. During the annual monitoring, species richness within the creation and enhancement areas will be determined by visual assessment. Annual success criteria for species richness for native species vary by year (Table 9). If the species richness goal for a given year is not met, corrective measures (e.g., reseeding, planting, etc.) will be taken to ensure eventual achievement of the five-year goal.

Table 9 SUCCESS CRITERIA (percent)			
HABITAT/PARAMETER	**YEAR 3**	**YEAR 4**	**YEAR 5**
Percent native cover (shrub and herb)	10	15	20
Percent non-native cover	10	10	5
Percent highly invasive species cover*	0	0	0
Native Species Richness	3	4	5

*Limited to California Invasive Plant Council High rated species

9.2 TARGET FUNCTIONS AND SERVICES

Upon meeting success criteria, the riparian scrub and streambed establishment/re-establishment areas will provide at least 3.58 acres and 2,150 linear feet of open riparian scrub habitat/unvegetated streambed, and would also provide wildlife habitat, as well as water quality functions through the trapping of sediment and absorption of potential pollutants in urban runoff, as well as flood abatement.

9.3 TARGET HYDROLOGICAL REGIME

The mitigation area will be designed to receive minor amounts of runoff from detention basin outflows, and will have a hydrologic regime typified by ephemeral to intermittent drainages. The mitigation area is anticipated to convey water during and shortly after rain events and varied amounts of intermittent flows generated by urban/irrigation runoff during the remainder of the year. Flows should be sufficient to support small pockets of open riparian scrub vegetation but may also cause scour during intense rainfall events, as well as redistribution of detritus such as debris jams or drift lines.

9.4 TARGET MITIGATION ACREAGE

The proposed mitigation area, when combined with the 0.15 credit purchased from the Barry Jones Mitigation Bank would result in a minimum of 1.90 acres of USACE jurisdictional WUS and 3.73 acres of CDFW jurisdictional habitat to meet the on-site compensatory mitigation requirements of the project.

10.0 SITE PROTECTION

The proposed mitigation site will include areas that are to be maintained for biological resource values and can be counted towards meeting mitigation obligations for the projects. Additionally, portions of the channel will be maintained by the RCFCWCD. These areas would include the access roads. A conservation easement or restrictive covenant will be placed over those portions of the channel used for mitigation purposes. The conservation area must be held and maintained by a qualified entity. Funding for long-term management shall be provided through contribution

to a non-wasting endowment. The endowment shall be held by a qualified entity. The funding necessary to maintain the mitigation area in perpetuity shall be determined through preparation of a Property Analysis Report or similar assessment mechanism. The USACE, CDFW and RWQCB shall review and approve the Property Analysis Report prior to creation of the endowment.

11.0 COMPLETION OF MITIGATION

11.1 NOTIFICATION OF COMPLETION

The regulatory agencies will be notified of completion of the mitigation effort through the submittal of the final (Year 5) monitoring report.

11.2 CONFIRMATION

If the project meets all success standards at the end of the minimum five-year monitoring period, and the regulatory agencies have signed-off in writing (e-mail or letter) concurring that the site has met its success criteria, then the mitigation will be considered a success. If, in this timeframe, the success criteria are not met, the maintenance and monitoring program for the entire mitigation area will be extended annually until the standards are met. Specific remedial measures (approved by the regulatory agencies) will be used during any such extension. This process will continue until all Year 5 performance standards are attained or until the regulatory agencies determine that other mitigation measures are appropriate.

12.0 CONTINGENCY MEASURES

12.1 INITIATING PROCEDURES

If any of the agencies determine upon receipt of any of the annual monitoring reports that the mitigation effort is not meeting success standards for the project, the agencies shall notify the project proponent in writing that the mitigation effort may require augmentation for successful implementation. The project proponent shall then have 30 days to respond to the correspondence, confirming that contingency measures will be required. The project proponent shall be responsible for all costs associated with mitigation creation and restoration, monitoring, and any remedial measures.

12.2 NATURAL DISASTER

Should the mitigation area fail during the five-year maintenance and monitoring period due to a natural disaster such as an earthquake or flood, the project proponent will confer with the regulatory agencies to determine a mutually agreeable course of action, which would be based on the goals and objectives outlined in this plan.

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Appendix D

Coastal California Gnatcher Habitat Assessment and Quino Checkerspot Butterfly Surveys

COASTAL CALIFORNIA GNATCATCHER HABITAT ASSESSMENT AND QUINO CHECKERSPOT BUTTERFLY SURVEYS AT THE SERAPHINA PROJECT SITE RIVERSIDE COUNTY, CALIFORNIA

Prepared for:

CARINO & ASSOCIATES
2010 65th Avenue West, Suite 100
Fircrest, Washington 98466

Prepared by:

CHAMBERS GROUP, INC.
17671 Cowan Avenue, Suite 100
Irvine, California 92614
(949) 261-5414

May 2004

Chambers Group®

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SECTION 1.0 – INTRODUCTION

Chambers Group, Inc. was retained by Carino and Associates to conduct a habitat assessment for the Quino checkerspot butterfly (*Euphydryas editha quino*) and a coastal California gnatcatcher (*Polioptila californica californica*) habitat assessment, at the approximately 28-acre Seraphina project site in Riverside County. The results of the Quino checkerspot butterfly (Quino) habitat assessment determined suitable habitat for Quino on the project site. Therefore, five focused surveys were conducted on a weekly basis to determine the presence/absence of the Quino. The purpose of this report is to summarize the findings of the coastal California gnatcatcher (California gnatcatcher) and Quino habitat assessments and to document the results of the Quino focused surveys.

1.1 COASTAL CALIFORNIA GNATCATCHER

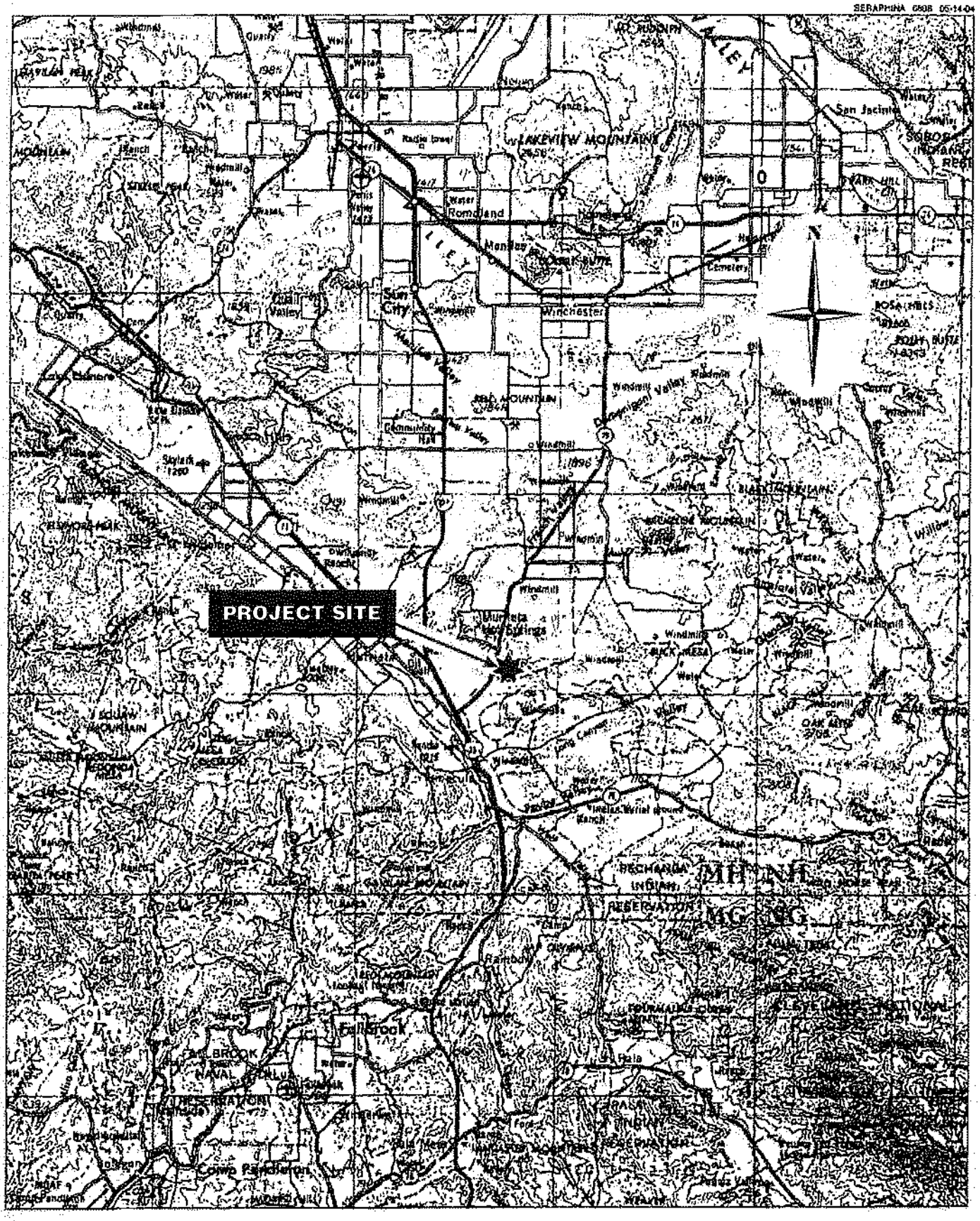
The California gnatcatcher was listed as threatened by the USFWS in 1993 and is designated as a California Species of Special Concern (CSC). The gnatcatcher is a nonmigratory songbird that nests and forages in moderately dense stands of coastal sage scrub occurring on arid hillsides, mesas, and washes. The floristic composition of coastal sage scrub shows substantial geographic variation, forming at least 12 recognized subcommunities that generally are dominated by aromatic, waist-high drought-deciduous species. California sagebrush (*Artemisia californica*), which dominates stands of coastal sage scrub, are preferred by the California gnatcatcher. Other species that may be present include white sage (*Salvia apiana*), California bush sunflower (*Encelia californica*), and California buckwheat (*Eriogonum fasiculatum*). The birds do not appear to be obligately dependent on any particular plant species found in coastal sage scrub, rather they typically avoid habitats that are either very sparse or extensively invaded by taller shrubs and trees or by non-native plant species. Habitat loss, degradation and fragmentation due to land alteration and development are considered the major threats to this species.

1.2 QUINO CHECKERSPOT BUTTERFLY

The Quino was federally listed as an endangered species in January 1997. Drought, loss of habitat, and displacement of two of the species' primary larval host plants, western plantain (*Plantago erecta*) and woolly plantain (*Plantago patagonica*), by invasive non-native grasses and other weedy annuals have contributed heavily to the decline of this once abundant southern California butterfly species. The Quino is primarily found in Riverside, Orange, and San Diego counties in areas with clay soils, which support western plantain, woolly plantain, white snapdragon (*Antirrhinum coulterianum*), birds-beak (*Cordylanthus rigidus*) and/or purple owl's clover (*Castilleja exserta*). In addition to the presence of its larval host plants, the Quino requires certain topographic features and plants that serve as a nectar source for the adult butterflies. Adults are found in open grasslands, and on low hilltops, rocky outcrops, and ridges which are patrolled by the Quino in search of a mate. Nectar sources most likely to be visited include, but are not limited to: members of the sunflower (Asteraceae) family, including goldfields (*Lasthenia* spp.), tidy-tips (*Layia* spp.), and pinebush (*Ericameria* spp.); members of the borage (Boraginaceae) family, including common fiddleneck (*Amsinckia menziesii*) and popcorn flowers (*Cryptantha* spp. and *Playgiobothrys* spp.); members of the figwort (Scrophulariaceae) family, including Indian paintbrush (*Castilleja* spp.), Chinese houses (*Collinsia* spp.), and bird's beak (*Cordylanthus* spp.); flowering annuals including strigose lotus (*Lotus strigosus*) and onion (*Allium* spp.). Quinos are associated with sage scrub, open chaparral, grasslands, and vernal pools and are typically active from mid-February to mid-May.

SECTION 2.0 – SITE LOCATION AND DESCRIPTION

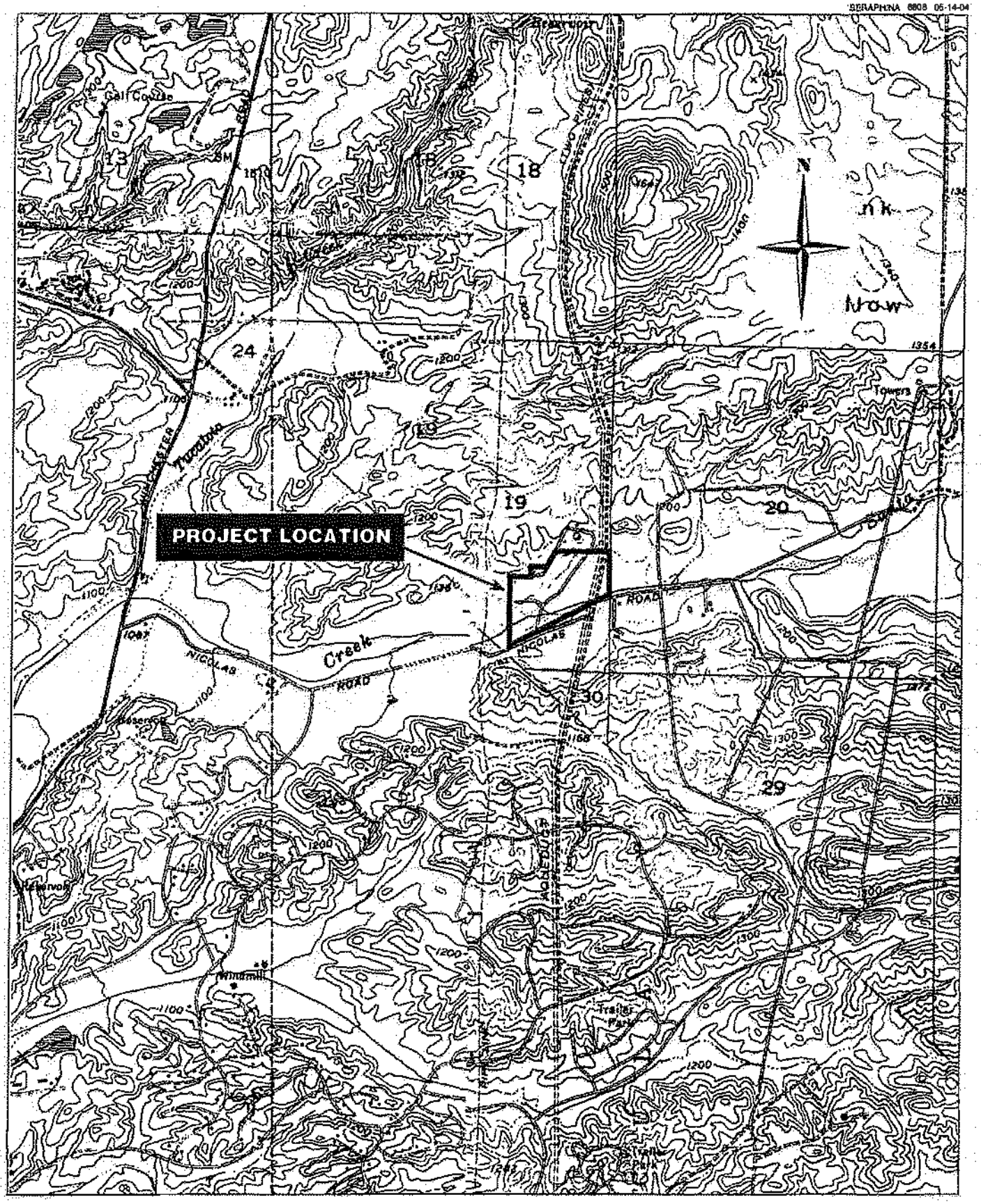
The Seraphina property is an approximately 28-acre site located in the City of Temecula, immediately adjacent to Interstate 79 and southeast of the City of Murrieta in Riverside County. (Figure 1) The site is located within Area 3 of the USFWS designated Quino survey area (2002 survey protocol) and within the historic range of the California gnatcatcher. The project site is located north of Nicolas Road and east of Joseph Road and is surrounded by development and recent grading activities. Santa Gertrudis Creek runs through the center portion of the project site. The elevation of the site is approximately 1,200 feet above mean sea level (msl). The Seraphina project site is located on the U.S. Geological Survey (USGS) Bachelor Mountain 7.5-minute topographic quadrangle in portions of Section 19 of T.7S, R.2W (Figure 2).



Chambers Group

Scale: 1" = 250,000'
Source: SANTA ANA CA. QUADRANGLE
1959 REVISED 1979

SERAPHINA
PROJECT SITE
Figure 1



Chambers Group

Scale: 1" = 24,000'
Source: BACHELOR MTN CA. & MURIETTA, CA QUADRANGLES

SERAPHINA
PROJECT LOCATION
Figure 2

SECTION 3.0 – SURVEY METHODOLOGY

3.1 EXISTING PLANT COMMUNITIES

During the biological surveys, all habitat types were visited to identify dominant species and to classify each vegetation type according to the California Native Plant Society's (CNPS's) nomenclature (Sawyer and Keeler-Wolf 1995) or other systems, as applicable (e.g., Holland 1986). All plant species observed were recorded in field notes. Plants of uncertain identity were collected and subsequently identified from keys and descriptions, in Hickman (1993) and Munz (1974). A list of plant species observed during the surveys is presented in Appendix A.

3.2 COASTAL CALIFORNIA GNATCATCHER HABITAT ASSESSMENT

A California gnatcatcher habitat assessment was conducted by Chambers Group biologists, Lisa Allen and Lindsay Messett on March 10, 2004. Conditions during the site visit were clear with winds of 1 to 3 miles per hour (mph) and temperatures ranging from 78 to 84°F. The entire site was surveyed to determine the suitability of the site as potential gnatcatcher habitat focusing on areas of coastal sage scrub vegetation or riparian vegetation adjacent to or intermixed with sage scrub. All wildlife and plant species encountered during the habitat assessment survey were recorded on standardized data sheets and are included in Appendix B.

3.3 QUINO CHECKERSPOT BUTTERFLY HABITAT ASSESSMENT

A Quino habitat assessment was conducted by Ms. Allen and Ms. Messett on March 10, 2004. Conditions during the site visit were clear with winds of 1 to 3 mph and temperatures ranging from 78 to 84°F. The habitat assessment was conducted in accordance with guidelines set forth by the USFWS 2002 Quino checkerspot survey protocol. The entire site was surveyed to determine the suitability of the site as potential Quino habitat. Developed areas, closed canopy riparian areas, dense chaparral, and small openings completely enclosed within a closed-canopy or dense chaparral area were regarded as unsuitable habitat and designated as excluded areas. All non-excluded areas (regardless of the presence and/or absence of host plants and nectar sources) were regarded as potential habitat that required focused adult surveys. All wildlife and plant species encountered during the habitat assessment survey were recorded on standardized data sheets and are included as Appendix B. All host plants and nectar sources were noted and host plants were mapped on a 7.5 minute USGS topographic quadrangle (enlarged 200 percent).

3.3.1 Adult Focused Surveys

Five adult Quino surveys were conducted by Ms. Allen, Permit No. TE-050450 and Ms. Messett, Permit No. TE-067064 on March 18, 27, and 29, and April 6, and 15, 2004. Surveys were conducted in accordance with guidelines set forth by the USFWS 2002 Quino checkerspot survey protocol. Surveys were conducted once per week throughout the 5-week long survey season (weather permitting). Surveys were not conducted during adverse weather conditions including excess wind, cold weather, fog, drizzle, and rain. Quino surveyors utilized butterfly nets and appropriate reference materials to identify butterflies observed in the field. Copies of the survey data sheets are included in Appendix C.

Surveys were conducted by walking transects within all non-excluded areas and recording data on standardized data sheets. Surveys covered all non-excluded areas and concentrated on areas of high Quino potential such as hilltops, ridgelines, rocky outcrops, and areas containing host plants or nectar sources. Special care was taken to eliminate the crushing of host plants and potential Quino larvae. All butterfly species observed during the surveys were recorded and can be found on the wildlife list included as Appendix D.

SECTION 4.0 – RESULTS

4.1 EXISTING PLANT COMMUNITIES

One vegetation community, California buckwheat series, was identified on the Seraphina project site. In addition, due to prior disturbances (i.e., dirt roads, grading, existing buildings), ruderal and disturbed areas were present in the northern portion of the project site. A description of each vegetation community is presented below. A vegetation communities map is depicted as Figure 3.

4.1.1 California Buckwheat Series

California buckwheat scrub (California buckwheat series) is a subtype of coastal sage scrub that occurs on the project site. California buckwheat series occurs in the southern portion of the site. The California buckwheat vegetation community is scattered in linear patches along the edge of Santa Gertrudis Creek channel and is dominated by California buckwheat. Other species present include, mule fat (*Baccharis salicifolia*), and sparse amounts of California sagebrush. This matches the Riversidean sage scrub described by Holland (1986) with the exception that the site is dominated by California buckwheat with sparse amounts of California sagebrush present.

4.1.2 Ruderal

Ruderal areas are generally a result of disturbances caused by humans. Ruderal areas are typically characterized by heavily compacted or frequently disturbed soils. Plant species occurring in ruderal areas are adapted to survive in these conditions and readily colonize disturbed ground. Ruderal areas on the site exhibit varying degrees of past surface disturbance and the vegetation in some areas consist of 100 percent cover of common fiddleneck (*Amsinckia menziesii* ssp. *intermedia*). The plant species that occur in this area includes black mustard (*Brassica nigra*), red-stemmed filaree (*Erodium cicutarium*), horehound (*Marrubium vulgare*), telegraph weed (*Heterotheca grandiflora*), and Mediterranean schismus (*Schismus barbatus*). Several Quino nectar sources occur within the ruderal areas and include common fiddleneck, California popcorn flower (*Plagiobothrys collinus*), and coast goldfields (*Lasthenia californica*).

4.1.3 Developed/Disturbed Areas

Developed areas include buildings, paved roads, parks, and other maintained areas. Disturbed areas are those areas that are either devoid of vegetation (cleared or graded) such as dirt roads, or those areas that are dominated by a sparse cover of ruderal vegetation. The developed/disturbed area on the site is a recently abandoned residence, primarily devoid of vegetation. The area consists of old buildings, graded areas, and dirt roads. The developed/disturbed portions of the site are located in the northern portion of the project site.

4.2 COASTAL CALIFORNIA GNATCATCHER HABITAT ASSESSMENT

California buckwheat series occurs in the southern portion of the site along the banks of the Santa Gertrudis Creek channel. This community is dominated by California buckwheat with scattered species including deerweed, mule fat, and occasional California sagebrush. The California buckwheat habitat is patchy, sparse, and is restricted to the northern and southern banks of the channel (Figures 3 and 5). The vegetation community within this portion of Santa Gertrudis Creek does not have a suitable density to provide sufficient foraging or nesting habitat for the California gnatcatcher. In addition, the habitat is isolated (i.e., no suitable coastal sage scrub habitat occurs within close proximity to the project site), surrounded by development and previously disturbed areas, and does not contain many of the characteristics required to support this species. Therefore, it was determined that there is low potential to support the California gnatcatcher on the Seraphina project site.

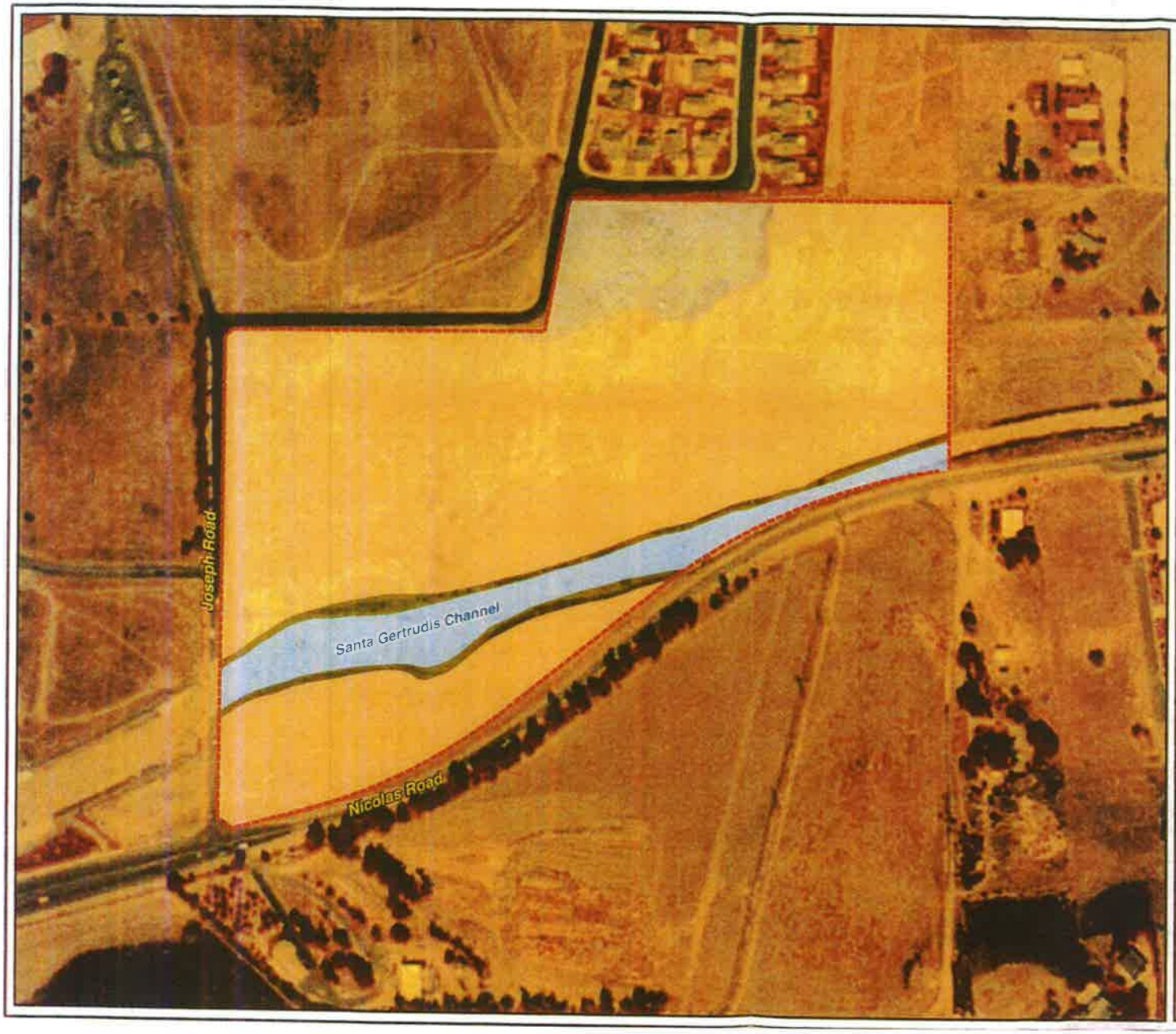


Figure 3
Seraphina Development
Vegetation Communities Map

LEGEND

- Project Boundary
- Buckwheat Scrub
- Ruderal
- Santa Gertrudis Channel
- Developed/Disturbed

N

1:2,402

Meters
0 25 50 100

Feet
0 50 100 200 300

Chambers Group, Inc.

4.3 QUINO CHECKERSPOT BUTTERFLY HABITAT ASSESSMENT

The flight season surveys were conducted within an area that included approximately 25.6 acres of suitable habitat to determine the presence or absence of the Quino on the site. Approximately 2.4 acres of the site were excluded and determined to be unsuitable habitat for the Quino. The site consists predominantly of ruderal vegetation with areas of sparse vegetation, bare ground and the presence of several nectar sources, and therefore was considered potential Quino habitat. The buckwheat scrub community present along portions of Santa Gertrudis Creek was also considered potential Quino habitat because of the sparse understory and open areas of bare ground. However, the developed and/or disturbed portion of the site was not considered potential Quino habitat due to the lack of vegetation and the recently abandoned residence. Figure 4 is a map depicting excluded and non-excluded habitat. Representative site photographs are included as Figure 5.

4.3.1 Host Plants and Nectar Sources

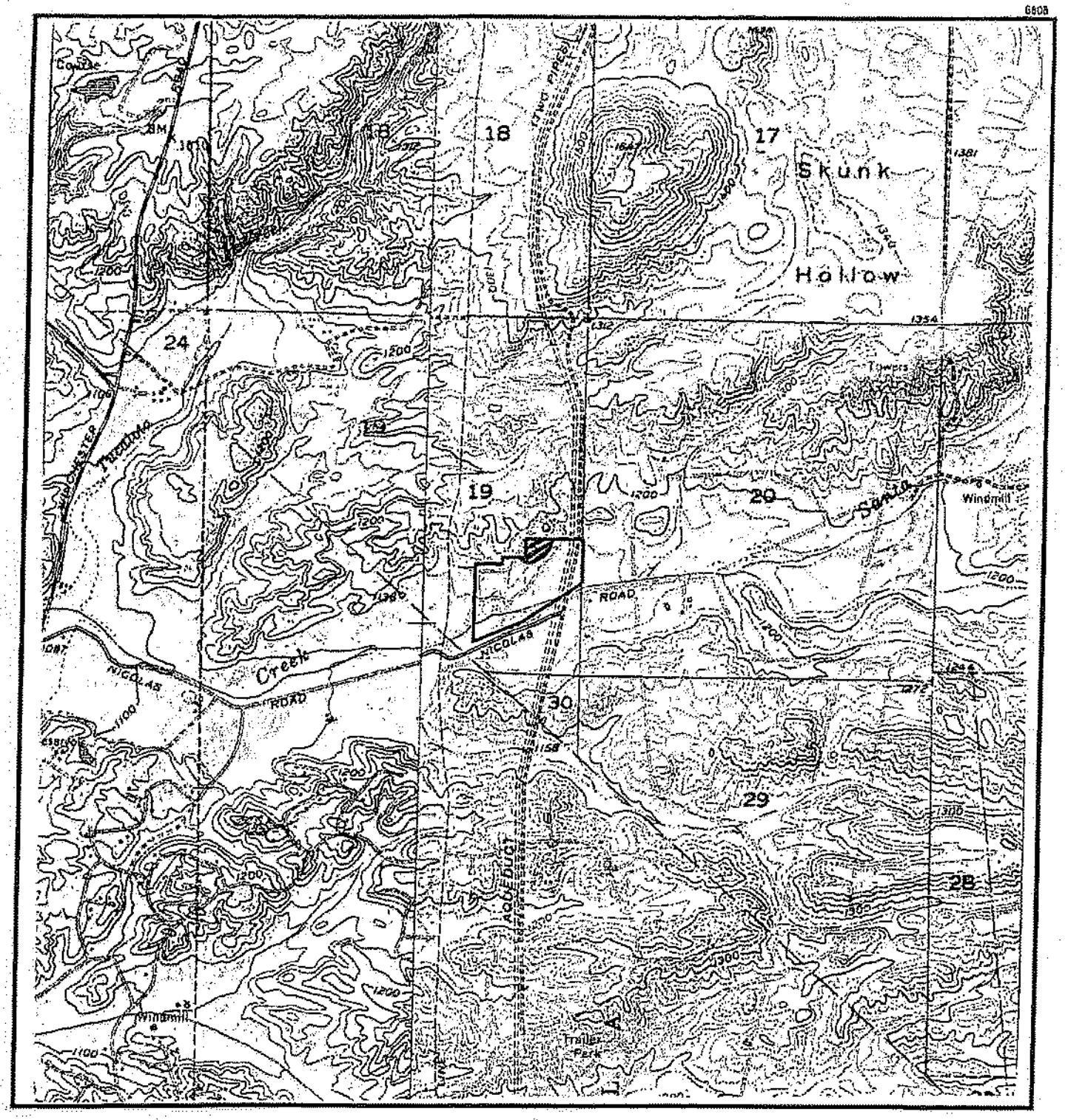
No host plants for the Quino were observed during the 2004 habitat assessment or focused surveys. However, several nectar sources occur throughout the property including: common fiddleneck, California popcorn flower, and coast goldfields. Nectar sources were found scattered throughout the ruderal areas on the project site. A general list of plant species identified during the surveys is presented in Appendix A.

4.3.2 Adult Quino Checkerspot Butterfly Focused Surveys

Table 1 is a summary of the survey dates and field conditions. A total of 12 species of butterfly were observed throughout the 5-week season. Acmon blue (*Icaricia acmon*) and common white (*Pontia protodice*) were the most abundant species observed. The complete list of butterflies is included in the general wildlife list (Appendix D). The Quino was not observed during any of five focused protocol surveys. A signature page signed by the two permitted Quino biologists that conducted the focused surveys is included in Appendix E.

Table 1
Summary of Survey Dates, Hours, Field Conditions, and Personnel for Quino Checkerspot Butterfly Surveys at the Seraphina Project Site

Date	Hours	Field Conditions				Personnel
		General	Winds (mph)	Temperature (°F) Start	Temperature (°F) End	
March 18, 2004	1030-1230	Partly Cloudy	1-3	78	85	Ms. Allen
March 23, 2004	Survey cancelled due to weather conditions	Overcast/Fog	4-7	64		Ms. Allen
March 27, 2004	1100-1300	Clear	1-7	68	74	Ms. Allen
March 29, 2004	1050-1254	Partly Cloudy	1-7	87	90	Ms. Allen
April 6, 2004	1235-1440	Clear	1-7	66	68	Ms. Allen
April 15, 2004	1200-1400	Clear	1-3	71	74	Ms. Messett



QUINO CHECKERSPOT BUTTERFLY EXCLUDED AREAS

SCALE 1:24,000

SOURCE: USGS QUADRANGLE BACHELOR MOUNTAIN (200% ENLARGED)

N

SERAPHINA PROJECT SITE

(CITY OF TEMECULA
RIVERSIDE COUNTY, CALIFORNIA)

Figure 4

=Excluded Area

Chambers Group Inc

6808 SERAPHINA 05-19-04

Photo 1. Representative site photograph, facing north.

Photo 2. Representative coastal California gnatcatcher habitat showing buckwheat scrub series.

Chambers Group

SERAPHINA
SITE PHOTOGRAPHS
Figure 5

6808 SERAPHINA 05-19-04

Photo 3. Representative habitat surveyed for the Quino checkerspot butterfly showing ruderal vegetation as well as open/sparsely vegetated areas.

Chambers Group

SERAPHINA
SITE PHOTOGRAPH
Figure 5

SECTION 5.0 – CONCLUSION

COASTAL CALIFORNIA GNATCATCHER

The coastal sage scrub habitat (i.e., buckwheat series) within this portion of Santa Gertrudis Channel does not contain many of the characteristics required to support the California gnatcatcher. The buckwheat community is patchy, sparse, and does not have the density to provide sufficient foraging or nesting habitat for the gnatcatcher. Therefore, it was determined that there is low potential to support the California gnatcatcher on the Seraphina project site and focused presence/absence surveys are not recommended for this species at this time.

QUINO CHECKERSPOT BUTTERFLY

Despite the presence of some topographical features and nectar source plants for the Quino, all five focused adult surveys conducted during the 2004 flight season were negative. Furthermore, due to the lack of host plants available and because the site is surrounded by development and grading activities, there is a low potential to support Quino on the project site. Therefore, the Quino is presumed to be absent from the Seraphina project site.

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1973 *Bachelor Mountain*, California 7.5-minute quadrangle.

APPENDIX A

PLANT SPECIES OBSERVED AT SERAPHINA

Appendix A
Plant Species Observed at the Seraphina Project Site

Scientific Name	Common Name
VASCULAR PLANTS	
ASTERACEAE	**SUNFLOWER FAMILY**
Artemisia californica	California sagebrush
*Chamomilla suaveolens**	pineapple weed
Heterotheca grandiflora	telegraph weed
Lasthenia californica	coast goldfields
BORAGINACEAE	**BORAGE FAMILY**
Amsinckia menziesii	common fiddleneck
Plagiobothrys collinus	California popcorn flower
BRASSICACEAE	**MUSTARD FAMILY**
*Brassica nigra**	black mustard
*Capsella bursa-pastoris**	shepherd's-purse
*Lobularia maritima**	sweet-alyssum
CHENOPODIACEAE	**GOOSEFOOT FAMILY**
*Salsola tragus**	Russian thistle
FABACEAE	**LEGUME FAMILY**
Lotus strigosus	strigose lotus
Lupinus sp.	lupine
*Medicago polymorpha**	bur clover
GERANIACEAE	**GERANIUM FAMILY**
*Erodium botrys**	broad-lobed filaree
*Erodium cicutarium**	red-stemmed filaree
LAMIACEAE	**MINT FAMILY**
*Marrubium vulgare**	horehound
MALVACEAE	**MALLOW FAMILY**
Malacothamnus fasciculatus	mesa bushmallow
ONAGRACEAE	**EVENING PRIMROSE FAMILY**
Camissonia sp.	camissonia
POLYGONACEAE	**BUCKWHEAT FAMILY**
Eriogonum fasciculatum	California buckwheat
SOLANACEAE	**NIGHTSHADE FAMILY**
*Nicotiana glauca**	tree tobacco
ANGIOSPERMS (MONOCOTYLEDONS)	
POACEAE	**GRASS FAMILY**
Bromus madritensis ssp. *rubens**	foxtail chess
*Schismus barbatus**	Mediterranean schismus
*** = Non-Native Species**	

APPENDIX B

HABITAT ASSESSMENT DATA SHEETS

Quino Checkerspot General Form Survey type: Habitat Assessment / Adult Survey

Surveyor: L. Allen, L. Messett Date: 3-10-04 (mm/dd/yyyy) Site Visit No: 1 2 3 4 5 6 7 8 9 10

Total site acres: 28.0 Site Name: Seraphina Dev. Site Location: Temecula (Nicolas Rd. / Hwy 79)

Time (24 hr)	Sky	Wind (Beaufort)	Temp F or C
Begin 11:10	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	78° F
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
End 12:30	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	84°

Total hours surveyed: 1.20

Focused Survey Acres: 2 Elev Min: 1200 ft Max: ____ ft

Describe, map, and estimate areas surveyed below. (see map)

Host Plants[a]	Patch Size (ft²)	No Plants/ft²	Sparse/Dense[b]	Map ID[c]	
None observed					

a. Larval or nectar resources. Identify species. b. Sparse= plants not touching; dense = plants touching c. Corresponds to polygon on a map.

Surrounding land uses (including adjoining properties):

North Developed / Graded Distance ____ ft./mile

South Resid. / open space Distance ____ ft./mile

East Developed / open space Distance ____ ft./mile

West Developed - some areas Distance ____ ft./mile

Habitat onsite (circle): open soils hilltop ridge Plantago Castilleja soil crusts old roads nectar clay soils rock outcrops

Conditions: (e.g., grazing agriculture sowbugs/earwigs recent fire grading)

Other: non-native grass, dirt piles

Nectar sources

Fiddleneck

Erodium

Plagiobothrys sp.

loamy sand soils

Butterflies Observed (larvae or adults)	Number	Comments
Papilionidae-Swallowtails		
Pale Swallowtail (*Papilio eurymedon*)		
Anise Swallowtail (*P. zelicaon*)		
Western Tiger Swallowtail (*P. rutulus*)		
Pieridae-Whites, Sulfurs, & Orangetips		
Sara Orangetip (*Anthocharis sara*)		
Felder's Orangetip (*A. cethura*)		
Grinnell's Marble (*A. lanceolata australis*)		
Cabbage White (*Artogeia rapae*)		
Sleepy Orange (*Eurema nicippe*)		
Common White (*Pontia protodice*)		
California Dogface (*Zerene eurydice*)		
Alfalfa Butterfly (*Colias eurytheme*)		
Harford's Sulfur (*C. harfordii*)		
Satyrinae-Satyrids		
California Ringlet (*Coenonympha californica*)		
Danaidae-Milkweed Butterflies		
Monarch (*Danaus plexippus*)		
Queen (*D. gilippus*)		
Nymphalidae-Brush Footed Butterflies		
Henne's Checkerspot (*Euphydryas chalcedona hennei*)		
Chalcedon Checkerspot (*E. chalcedona chalcedona*)		
Quino Checkerspot (*E. editha quino*)		
Gabb's Checkerspot (*Charidryas gabbii*)		
Leanira Checkerspot (*Thessalia leanira wrighti*)		
Mylitta Crescent (*Phyciodes mylitta*)		
California Patch (*Chlosyne californica*)		
Painted Lady (*Vannessa cardui*)		
West Coast Lady (*V. annabella*)		
Virginia Lady (*V. viginiensis*)		
Red Admiral (*V. atalanta*)		
Buckeye (*Junonia coenia*)		
Mourning Cloak (*Nymphalis antiopa*)		
California Tortoiseshell (*Nymphalis californica*)		
California Sister (*Adalpha bredowii californica*)		
Satyr Anglewing (*Polygonia satyrus*)		
Lorquin's Admiral (*Basilarchia lorquini*)		
Blues		
Western Tailed Blue (*Everes amyntula*)		
Southern Blue (*Glaucopsyche lygdamus australis*)		
Echo Blue (*Celastrina ladon echo*)		
Sonoran Blue (*Philotes sonorensis*)		
Marine Blue (*Leptotes marina*)		
Acmon Blue (*Icaricia acmon*)		
Edward's Blue (*Lycaeides melisa samuelis*)		
Pygmy Blue (*Brephidium exilis*)		
Hairstreaks		
Gray Hairstreak (*Strymon melinus*)		
Brown Elfin (*Incisalia augustinus*)		
Perplexing Hairstreak (*Callophrys perplexa*)		
Great Purple Hairstreak (*Atlides halesus*)		
Metalmarks		
Behr's Metalmark (*Apodemia mormo virgulti*)		
Wright's Metalmark (*Calephelis wrightii*)		
Hesperiidae-Common Skippers		
Common Checkered Skipper (*Pyrgus communis*)		
Duskywings		
Funereal Duskywing (*Erynnis funeralis*)		
Mournful Duskywing (*Erynnis tristis*)		
Lacustra Duskywing (*Erynnis brizo lacustra*)		

Chambers Group, Inc.

Biological Resources Survey Form

Project Name Seraphina Development **Project #** 6808 **Task** A **Billing Group** 1

Location Temecula (off Nicolas Rd) 79-Fwy **Survey Type** Habitat assess.

Surveyor(s) L. Allen **Date** 3-10-04 **Time (Start)** 11:10 **(End)** 12:30

General Habitat Description of Area Graded & recent dev. surrounding area

Weather (Cloud cover, Estimated wind speed, precipitation) 5% / 2-3mph / ∅

Temperature (In C, taken at 6" above the ground in the shade) **(Start)** 78° **(End)** 82°

Time	Wildlife Species	Sign*	Microhabitat	Comments/Behavior/Notes (GPS Coordinates taken in UTM, Zone 11, NAD83, meters) Easting Northing
	EUST	O,V		
	Acmon blue	O		
	CATO	O		
	S. audub.	O		
	MODO	O		
	painted lady	O		
	CA gnat sq.	O,V		
	ANHU	O,V		
	AMCR	O		
	RTHA	O		

General Comments:

* B = Burrow, C= Carcass, Fe = Feathers, Fu = Fur, N = Nest, O = Observed, S = Scat, T = Tracks, V = Vocalization

FIELD SURVEY DATA SHEET

PROJECT NAME & SITE # Seraphina Development	PROJECT # 6808

GENERAL DATA		WEATHER DATA	
Date 3/10/04		Air temp. (C at 6" above surface in the shade)	
Time start 12:30	end 1:30	Start 85°	End 87°
Surveyor(s) L Allen / L Messett		Cloud cover (%) Ø	
		Precipitation [ ] yes	[✓] no
		Est. wind speed (mph) 1-3	

PHYSICAL CHARACTERISTICS	
Adjacent Land Uses (Ex: residential, commercial, open space - draw on map)	
North Developed / Graded	East Developed / openspace
South Residential / openspace	West Developed
Slope %	Soil description Sandy, alluvial
Aspect	
Is there an obvious wildlife movement corridor?	[ ] yes (draw on map) [X] no
Exisiting structures [X] yes [ ] no describe and draw on map small development north of site	
Is the site staked or marked?	[ ] yes [✓] no
Previous disturbances (natural and human disturbances) - describe and draw on map Disturbed areas contain piles of dirt + graded areas	

POTENTIAL JURISDICTIONAL ISSUES (Take photos and draw on field map)					
Are there drainages on the site? yes		[ ] yes (fill out the section below)			[ ] no
shelving	[X] yes	[ ] no	sediment deposits	[X] yes	[ ] no
debris lines	[X] yes	[ ] no	destruction - upland vegetation	[ ] yes	[ ] no
OHWM	[X] yes	[ ] no	riparian vegetation	[ ] yes	[ ] no
water marks	[ ] yes	[ ] no	flowing and/or standing water	[ ] yes	[ ] no

Notes on Potential Jurisdictional Issues on and adjacent to the site

- Santa Gertrudis creek runs through the property

SENSITIVE SPECIES AND HABITATS

PROJECT NAME & SITE # Seraphina Development	PROJECT # 6806

USGS quads:

Sensitive Species

Species	Habitat	Distance from Site
Riversidian sage scrub (sandy wash)	- in Santa Gertrudis creek	
Sage scrub is sparse, and limited. Does not provide suitable habitat to support gnatcatchers.		
Plant species: E. fasciculatum, E. farinosa, B. mustard in drainage: scattered mule fat, 1 black willow		
- Ruderal areas with openings provides low quality habitat for Quino.		

Sensitive Habitats

Habitat	Distance from Site

Other Issues (Critical Habitat, HCP areas, Wilderness Areas - draw on map)

APPENDIX C

ADULT QUINO CHECKERSPOT BUTTERFLY FOCUSED SURVEY DATA SHEETS

Quino Checkerspot General Form Survey type: Habitat Assessment/Adult Survey #1

Surveyor: L. Allen Date: 3-18-04 (mm/dd/yyyy) Site Visit No 1 2 3 4 5 6 7 8 9 10

Total site acres: 28.0 Site Name: Seraphina Site Location:

Time (24 hr)	Sky	Wind (Beaufort)	Temp F or C
Begin 10:30	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	78°
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
End 12:30	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	85°

Total hours surveyed: 2.0 hrs.

Focused Survey Acres: ~~[illegible]~~ 25.6 Elev Min: 1200 ft Max: ____ ft

Describe, map, and estimate areas surveyed below.

Host Plants[a]	Patch Size (ft²)	No Plants/ft²	Sparse/Dense[b]	Map ID[c]	
none observed					

a. Larval or nectar resources. Identify species. b. Sparse= plants not touching; dense = plants touching c. Corresponds to polygon on a map.

Surrounding land uses (including adjoining properties):

North Developed/graded Distance ____ ft./mile
South Resid. / open space Distance ____ ft./mile
East Developed Distance ____ ft./mile
West Developed Distance ____ ft./mile

Habitat onsite (circle) open soils hilltop ridge Plantago Castilleja soil crusts old roads nectar clay soils rock outcrops

Conditions: (e.g.,grazing agriculture sowbugs/earwigs recent fire grading)

Other:

nectar sources: fiddleneck goldfields alyssum tectobrico
Plagiobothrys sp. mustard - thin lotus strigosus

busch mallow?

lupinus sp., pineapple wed, black mustard horehound

Survey 1-H

Butterflies Observed (larvae or adults)	Number	Comments
Papilionidae-Swallowtails		
Pale Swallowtail (*Papilio eurymedon*)		
Anise Swallowtail (*P. zelicaon*)		
Western Tiger Swallowtail (*P. rutulus*)		
Pieridae-Whites, Sulfurs, & Orangetips		
Sara Orangetip (*Anthocharis sara*)	||||	
Felder's Orangetip (*A. cethura*)		
Grinnell's Marble (*A. lanceolata australis*)		
Cabbage White (*Artogeia rapae*)		
Sleepy Orange (*Eurema nicippe*)		
Common White (*Pontia protodice*)	||	
California Dogface (*Zerene eurydice*)		
Alfalfa Butterfly (*Colias eurytheme*)		
Harford's Sulfur (*C. harfordii*)		
Satyrinae-Satyrids		
California Ringlet (*Coenonympha californica*)		
Danaidae-Milkweed Butterflies		
Monarch (*Danaus plexippus*)		
Queen (*D. gilippus*)		
Nymphalidae-Brush Footed Butterflies		
Henne's Checkerspot (*Euphydryas chalcedona hennei*)		
Chalcedon Checkerspot (*E. chalcedona chalcedona*)		
Quino Checkerspot (*E. editha quino*)		
Gabb's Checkerspot (*Charidryas gabbii*)		
Leanira Checkerspot (*Thessalia leanira wrighti*)		
Mylitta Crescent (*Phyciodes mylitta*)		
California Patch (*Chlosyne californica*)		
Painted Lady (*Vannessa cardui*)		
West Coast Lady (*V. annabella*)		
Virginia Lady (*V. viginiensis*)		
Red Admiral (*V. atalanta*)		
Buckeye (*Junonia coenia*)		
Mourning Cloak (*Nymphalis antiopa*)		
California Tortoiseshell (*Nymphalis californica*)		
California Sister (*Adelpha bredowii californica*)		
Satyr Anglewing (*Polygonia satyrus*)		
Lorquin's Admiral (*Basilarchia lorquini*)		
Blues		
Western Tailed Blue (*Everes amyntula*)		
Southern Blue (*Glaucopsyche lygdamus australis*)		
Echo Blue (*Celastrina ladon echo*)		
Sonoran Blue (*Philotes sonorensis*)		
Marine Blue (*Leptotes marina*)		
Acmon Blue (*Icaricia acmon*)	~~||||~~	
Edward's Blue (*Lycaeides melisa samuelis*)		
Pygmy Blue (*Brephidium exilis*)		
Hairstreaks		
Gray Hairstreak (*Strymon melinus*)		
Brown Elfin (*Incisalia augustinus*)		
Perplexing Hairstreak (*Callophrys perplexa*)		
Great Purple Hairstreak (*Atlides halesus*)		
Metalmarks		
Behr's Metalmark (*Apodemia mormo virgulti*)	||	
Wright's Metalmark (*Calephelis wrighti*)		
Hesperiidae-Common Skippers		
Common Checkered Skipper (*Pyrgus communis*)		
Duskywings		
Funereal Duskywing (*Erynnis funeralis*)		
Mournful Duskywing (*Erynnis tristis*)		
Lacustra Duskywing (*Erynnis brizo lacustra*)		

ANKU - O,V LOSH - O , EUST - O,V

Quino Checkerspot General Form

Survey type: Habitat Assessment/Adult Survey

Surveyor: L. Allen Date: 3-23-04 (mm/dd/yyyy) Site Visit No: 1 2 3 4 5 6 7 8 9 10

Total site acres: 28.0 Site Name: Seraphina Site Location:

Time (24 hr)	Sky	Wind (Beaufort)	Temp F or C
Begin 11:30	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	64°0
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
End	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	

Total hours surveyed: Ø

Focused Survey Acres: Ø Elev Min: ____ft Max: ____ft

Describe, map, and estimate areas surveyed below.

Host Plants[a]	Patch Size (ft^2)	No Plants/ft^2	Sparse/Dense[b]	Map ID[c]	

a. Larval or nectar resources. Identify species. b. Sparse= plants not touching; dense = plants touching c. Corresponds to polygon on a map.

Surrounding land uses (including adjoining properties):

North _____ Distance _____ ft./mile

South _____ Distance _____ ft./mile

East _____ Distance _____ ft./mile

West _____ Distance _____ ft./mile

Habitat onsite (circle): open soils hilltop ridge Plantago Castilleja soil crusts old roads nectar clay soils rock outcrops

Conditions: (e.g.,grazing agriculture sowbugs/earwigs recent fire grading)

Other: _____

* Survey cancelled due to weather

Quino Checkerspot General Form Survey type: Habitat Assessment/Adult Survey

Surveyor: L. Allen Date: 3-27-04 (mm/dd/yyyy) Site Visit No: 1 2 3 4 5 6 7 8 9 10

Total site acres: 28.0 Site Name: Seraphina Site Location: Temecula / Riverside Co.

Time (24 hr)	Sky	Wind (Beaufort)	Temp F or C
Begin 11:00	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	68°C
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
End 1:00pm	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	74°C

Total hours surveyed: 2.0 hrs.

Focused Survey Acres: 25.6 Elev Min: ~~2000~~ 1200 ft Max: ____ ft

Describe, map, and estimate areas surveyed below.

Host Plants[a]	Patch Size (ft²)	No Plants/ft²	Sparse/Dense[b]	Map ID[c]	
none observed					

a. Larval or nectar resources. Identify species. b. Sparse= plants not touching; dense = plants touching c. Corresponds to polygon on a map.

Surrounding land uses (including adjoining properties):

North Dev. /graded Distance ____ ft./mile
South Resid. /openspace Distance ____ ft./mile
East Developed / openspace Distance ____ ft./mile
West Dev. Distance ____ ft./mile

Habitat onsite (circle) open soils hilltop ridge Plantago Castilleja soil crusts old roads nectar clay soils rock outcrops

Conditions: (e.g.,grazing agriculture sowbugs/earwigs recent fire grading)

Other: some dirt piling

Seraphina 01C+104

Butterflies Observed (larvae or adults)	Number	Comments
Papilionidae-Swallowtails		
Pale Swallowtail (*Papilio eurymedon*)		
Anise Swallowtail (*P. zelicaon*)		
Western Tiger Swallowtail (*P. rutulus*)		
Pieridae-Whites, Sulfurs, & Orangetips		
Sara Orangetip (*Anthocharis sara*)		
Felder's Orangetip (*A. cethura*)		
Grinnell's Marble (*A. lanceolata australis*)		
Cabbage White (*Artogeia rapae*)	II	
Sleepy Orange (*Eurema nicippe*)		
Common White (*Pontia protodice*)		
California Dogface (*Zerene eurydice*)		
Alfalfa Butterfly (*Colias eurytheme*)		
Harford's Sulfur (*C. harfordi*)		
Satyrinae-Satyrids		
California Ringlet (*Coenonympha californica*)		
Danaidae-Milkweed Butterflies		
Monarch (*Danaus plexippus*)		
Queen (*D. gilippus*)		
Nymphalidae-Brush Footed Butterflies		
Hennel's Checkerspot (*Euphydryas chalcedona hennel*)		
Chalcedon Checkerspot (*E. chalcedona chalcedona*)		
Quino Checkerspot (*E. editha quino*)		
Gabb's Checkerspot (*Charidryas gabbii*)		
Leanira Checkerspot (*Thessalia leanira wrighti*)		
Mylitta Crescent (*Phyciodes mylitta*)		
California Patch (*Chlosyne californica*)		
Painted Lady (*Vannessa cardui*)	III	
West Coast Lady (*V. annabella*)	IIII	
Virginia Lady (*V. viginiensis*)		
Red Admiral (*V. atalanta*)		
Buckeye (*Junonia coenia*)	II	
Mourning Cloak (*Nymphalis antiopa*)		
California Tortoiseshell (*Nymphalis californica*)		
California Sister (*Adelpha bredowii californica*)		
Satyr Anglewing (*Polygonia satyrus*)		
Lorquin's Admiral (*Basilarchia lorquini*)		
Blues		
Western Tailed Blue (*Everes amyntula*)	[illegible]	
Southern Blue (*Glaucopsyche lygdamus australis*)		
Echo Blue (*Celastrina ladon echo*)		
Sonoran Blue (*Philotes sonorensis*)		
Marine Blue (*Leptotes marina*)		
Acmon Blue (*Icaricia acmon*)	III	
Edward's Blue (*Lycaeides melisa samuelis*)		
Pygmy Blue (*Brephidium exilis*)		
Hairstreaks		
Gray Hairstreak (*Strymon melinus*)	I	
Brown Elfin (*Incisalia augustinus*)		
Perplexing Hairstreak (*Callophrys perplexa*)		
Great Purple Hairstreak (*Atlides halesus*)		
Metalmarks		
Behr's Metalmark (*Apodemia mormo virgulti*)		
Wright's Metalmark (*Calephelis wrightii*)		
Hesperiidae-Common Skippers		
Common Checkered Skipper (*Pyrgus communis*)		
Duskywings		
Funereal Duskywing (*Erynnis funeralis*)	I	
Mournful Duskywing (*Erynnis tristis*)		
Lacustra Duskywing (*Erynnis brizo lacustra*)		

Quino Checkerspot General Form

Survey type: Habitat Assessment/Adult Survey

Surveyor: L. Allen Date: 3-29-04 (mm/dd/yyyy) Site Visit No: 1 2 3 4 5 6 7 8 9 10

Total site acres: 28.0 Site Name: Seraphina Site Location: Temecula / Riverside Co.

Time (24 hr)	Sky	Wind (Beaufort)	Temp F or C
Begin 10:50	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	87°C
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
End 12:54	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	90°C

Total hours surveyed: 2.0 hrs.

Focused Survey Acres: 25.6 Elev Min: 1200 ft Max: ____ ft

Describe, map, and estimate areas surveyed below.

Host Plants[a]	Patch Size (ft²)	No Plants/ft²	Sparse/Dense[b]	Map ID[c]	
none observed					

a. Larval or nectar resources. Identify species. b. Sparse= plants not touching; dense = plants touching c. Corresponds to polygon on a map.

Surrounding land uses (including adjoining properties):

North Dev / grad. Distance ____ ft./mile

South Resid / op. space Distance ____ ft./mile

East Dev. Distance ____ ft./mile

West Dev. Distance ____ ft./mile

Habitat onsite (circle): open soils hilltop ridge Plantago Castilleja soil crusts old roads nectar clay soils rock outcrops

Conditions: (e.g.,grazing agriculture sowbugs/earwigs recent fire grading

Other: → partial disturbance - soil piles

Seraphina 3/29/04

lies Observed (larvae or adults)	Number	Comments
lionidae-Swallowtails		
allowtail (*Papilio eurymedon*)		
Swallowtail (*P. zelicaon*)		
n Tiger Swallowtail (*P. rutulus*)		
ridae-Whites, Sulfurs, & Orangetips		
rangetip (*Anthocharis sara*)		
's Orangetip (*A. cethura*)		
ell's Marble (*A. lanceolata australis*)		
ge White (*Artogeia rapae*)		
y Orange (*Eurema nicippe*)		
non White (*Pontia protodice*)	IIII	
ornia Dogface (*Zerene eurydice*)		
fa Butterfly (*Colias eurytheme*)		
ord's Sulfur (*C. harfordii*)	I	
atyrinae-Satyrids		
fornia Ringlet (*Coenonympha californica*)		
Danaidae-Milkweed Butterflies		
narch (*Danaus plexippus*)		
een (*D. gilippus*)		
Nymphalidae-Brush Footed Butterflies		
nne's Checkerspot (*Euphydryas chalcedona nnei*)		
nalcedon Checkerspot (*E. chalcedona halcedona*)		
Quino Checkerspot (*E. editha quino*)		
Gabb's Checkerspot (*Charidryas gabbii*)		
Leanira Checkerspot (*Thessalia leanira wrighti*)		
Mylitta Crescent (*Phyciodes mylitta*)		
California Patch (*Chlosyne californica*)		
Painted Lady (*Vannessa cardui*)	II	
West Coast Lady (*V. annabella*)		
Virginia Lady (*V. virginiensis*)		
Red Admiral (*V. atalanta*)		
Buckeye (*Junonia coenia*)	II	
Mourning Cloak (*Nymphalis antiopa*)		
California Tortoiseshell (*Nymphalis californica*)		
California Sister (*Adelpha bredowii californica*)		
Satyr Anglewing (*Polygonia satyrus*)		
Lorquin's Admiral (*Basilarchia lorquini*)		
Blues		
Western Tailed Blue (*Everes amyntula*)		
Southern Blue (*Glaucopsyche lygdamus australis*)		
Echo Blue (*Celastrina ladon echo*)		
Sonoran Blue (*Philotes sonorensis*)		
Marine Blue (*Leptotes marina*)		
Acmon Blue (*Icaricia acmon*)	~~IIII~~ I	
Edward's Blue (*Lycaeides melissa samuelis*)		
Pygmy Blue (*Brephidium exilis*)		
Hairstreaks		
Gray Hairstreak (*Strymon melinus*)		
Brown Elfin (*Incisalia augustinus*)		
Perplexing Hairstreak (*Callophrys perplexa*)		
Great Purple Hairstreak (*Atlides halesus*)		
Metalmarks		
Behr's Metalmark (*Apodemia mormo virgulti*)	III	
Wright's Metalmark (*Calephelis wrighti*)		
Hesperiidae-Common Skippers		
Common Checkered Skipper (*Pyrgus communis*)		
Duskywings		
Funereal Duskywing (*Erynnis funeralis*)	II	
Mournful Duskywing (*Erynnis tristis*)		
Lacustra Duskywing (*Erynnis brizo lacustra*)		

#4

Quino Checkerspot General Form Survey type: Habitat Assessment/Adult Survey

Surveyor: L. Allen Date: 4-6-04 (mm/dd/yyyy) Site Visit No: 1 2 3 4 5 6 7 8 9 10

Total site acres: 28 Site Name: Seraphina Site Location:

Time (24 hr)	Sky — 5% cloudcover (sparse)	Wind (Beaufort)	Temp F or C
Begin 12:35	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	66°
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
End 1440	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	68°

Total hours surveyed: 2.0

Focused Survey Acres: 25.6 Elev Min: 1200 ft Max: ____ ft

Describe, map, and estimate areas surveyed below.

Host Plants[a]	Patch Size (ft²)	No Plants/ft²	Sparse/Dense[b]	Map ID[c]	
none observed					

a. Larval or nectar resources. Identify species. b. Sparse= plants not touching; dense = plants touching c. Corresponds to polygon on a map.

Surrounding land uses (including adjoining properties):

North Dev. / graded Distance ____ ft./mile

South Resid / openspace Distance ____ ft./mile

East Dev. Distance ____ ft./mile

West Dev. Distance ____ ft./mile

Habitat onsite (circle) open soils hilltop ridge Plantago Castilleja soil crusts old roads nectar clay soils rock outcrops

Conditions: (e.g.,grazing agriculture sowbugs/earwigs recent fire grading)

Other: Dirt piles & some grading

WLD-44

Butterflies Observed (larvae or adults)	Number	Comments
Papilionidae-Swallowtails		
Pale Swallowtail (*Papilio eurymedon*)		
Anise Swallowtail (*P. zelicaon*)		
Western Tiger Swallowtail (*P. rutulus*)		
Pieridae-Whites, Sulfurs, & Orangetips		
Sara Orangetip (*Anthocharis sara*)		
Felder's Orangetip (*A. cethura*)		
Grinnell's Marble (*A. lanceolata australis*)		
Cabbage White (*Artogeia rapae*)	I	
Sleepy Orange (*Eurema nicippe*)		
Common White (*Pontia protodice*)		
California Dogface (*Zerene eurydice*)		
Alfalfa Butterfly (*Colias eurytheme*)	III	
Harford's Sulfur (*C. harfordi*)		
Satyrinae-Satyrids		
California Ringlet (*Coenonympha californica*)		
Danaidae-Milkweed Butterflies		
Monarch (*Danaus plexippus*)		
Queen (*D. gilippus*)		
Nymphalidae-Brush Footed Butterflies		
Henne's Checkerspot (*Euphydryas chalcedona hennei*)		
Chalcedon Checkerspot (*E. chalcedona chalcedona*)		
Quino Checkerspot (*E. editha quino*)		
Gabb's Checkerspot (*Charidryas gabbii*)		
Leanira Checkerspot (*Thessalia leanira wrighti*)		
Mylitta Crescent (*Phyciodes mylitta*)		
California Patch (*Chlosyne californica*)		
Painted Lady (*Vannessa cardui*)		
West Coast Lady (*V. annabella*)		
Virginia Lady (*V. viginiensis*)		
Red Admiral (*V. atalanta*)		
Buckeye (*Junonia coenia*)	I	
Mourning Cloak (*Nymphalis antiopa*)		
California Tortoiseshell (*Nymphalis californica*)		
California Sister (*Adelpha bredowii californica*)		
Satyr Anglewing (*Polygonia satyrus*)		
Lorquin's Admiral (*Basilarchia lorquini*)		
Blues		
Western Tailed Blue (*Everes amyntula*)		
Southern Blue (*Glaucopsyche lygdamus australis*)		
Echo Blue (*Celastrina ladon echo*)		
Sonoran Blue (*Philotes sonorensis*)		
Marine Blue (*Leptotes marina*)		
Acmon Blue (*Icaricia acmon*)		
Edward's Blue (*Lycaeides melisa samuelis*)		
Pygmy Blue (*Brephidium exilis*)		
Hairstreaks		
Gray Hairstreak (*Strymon melinus*)		
Brown Elfin (*Incisalia augustinus*)		
Perplexing Hairstreak (*Callophrys perplexa*)		
Great Purple Hairstreak (*Atlides halesus*)		
Metalmarks		
Behr's Metalmark (*Apodemia mormo virgulti*)	III	
Wright's Metalmark (*Calephelis wrighti*)		
Hesperiidae-Common Skippers		
Common Checkered Skipper (*Pyrgus communis*)		
Duskywings		
Funereal Duskywing (*Erynnis funeralis*)	~~IIII~~ II	
Mournful Duskywing (*Erynnis tristis*)		
Lacustra Duskywing (*Erynnis brizo lacustra*)		

Quino Checkerspot General Form Survey type: Habitat Assessment/Adult Survey

Surveyor: L. Messett Date: 4/15/04 (mm/dd/yyyy) Site Visit No: 1 2 3 4 5 6 7 8 9 10

Total site acres: 28.0 Site Name: Seraphina Site Location: Temecula, CA.

Time (24 hr)	Sky	Wind (Beaufort)	Temp °F or C
Begin 1200	clear/partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	71° F
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	
End 1400	clear/ partcloudy/overcast/fog/drizzle/shower	<1 1-3 4-7 8-12 >12	74° F

Total hours surveyed: 2 hrs

Focused Survey Acres: 27.0 Elev Min: 1200 ft Max: ____ ft

Describe, map, and estimate areas surveyed below.

Host Plants[a]	Patch Size (ft²)	No Plants/ft²	Sparse/Dense[b]	Map ID[c]	
None observed					

a. Larval or nectar resources. Identify species. b. Sparse= plants not touching; dense = plants touching c. Corresponds to polygon on a map.

Surrounding land uses (including adjoining properties):

North Developed - Residential Distance ____ ft./mile

South Open space - Sparse Residential Distance ____ ft./mile

East Developed - Residential Distance ____ ft./mile

West Developed - Residential Distance ____ ft./mile

Habitat onsite (circle): open soils hilltop ridge Plantago Castilleja soil crusts old roads nectar clay soils rock outcrops

Conditions: (e.g.,grazing agriculture sowbugs/earwigs recent fire grading)

Other: _____

Transect # 5

Butterflies Observed (larvae or adults)	Number	Comments
Papilionidae-Swallowtails		
Pale Swallowtail (*Papilio eurymedon*)		
Anise Swallowtail (*P. zelicaon*)		
Western Tiger Swallowtail (*P. rutulus*)		
Pieridae-Whites, Sulfurs, & Orangetips		
Sara Orangetip (*Anthocharis sara*)		
Felder's Orangetip (*A. cethura*)		
Grinnell's Marble (*A. lanceolata australis*)		
Cabbage White (*Artogeia rapae*)	1	
Sleepy Orange (*Eurema nicippe*)		
Common White (*Pontia protodice*)	~~IIII~~ III	
California Dogface (*Zerene eurydice*)		
Alfalfa Butterfly (*Colias eurytheme*)		
Harford's Sulfur (*C. harfordi*)		
Satyrinae-Satyrids		
California Ringlet (*Coenonympha californica*)		
Danaidae-Milkweed Butterflies		
Monarch (*Danaus plexippus*)		
Queen (*D. gilippus*)		
Nymphalidae-Brush Footed Butterflies		
Henne's Checkerspot (*Euphydryas chalcedona hennei*)		
Chalcedon Checkerspot (*E. chalcedona chalcedona*)		
Quino Checkerspot (*E. editha quino*)		
Gabb's Checkerspot (*Charidryas gabbii*)		
Leanira Checkerspot (*Thessalia leanira wrighti*)		
Mylitta Crescent (*Phyciodes mylitta*)		
California Patch (*Chlosyne californica*)		
Painted Lady (*Vannessa cardui*)	1	
West Coast Lady (*V. annabella*)	II	
Virginia Lady (*V. viginiensis*)		
Red Admiral (*V. atalanta*)		
Buckeye (*Junonia coenia*)	1	
Mourning Cloak (*Nymphalis antiopa*)		
California Tortoiseshell (*Nymphalis californica*)		
California Sister (*Adelpha bredowii californica*)		
Satyr Anglewing (*Polygonia satyrus*)		
Lorquin's Admiral (*Basilarchia lorquini*)		
Blues		
Western Tailed Blue (*Everes amyntula*)		
Southern Blue (*Glaucopsyche lygdamus australis*)		
Echo Blue (*Celastrina ladon echo*)		
Sonoran Blue (*Philotes sonorensis*)		
Marine Blue (*Leptotes marina*)		
Acmon Blue (*Icaricia acmon*)		
Edward's Blue (*Lycaeides melisa samuelis*)		
Pygmy Blue (*Brephidium exilis*)		
Hairstreaks		
Gray Hairstreak (*Strymon melinus*)		
Brown Elfin (*Incisalia augustinus*)		
Perplexing Hairstreak (*Callophrys perplexa*)		
Great Purple Hairstreak (*Atlides halesus*)		
Metalmarks		
Behr's Metalmark (*Apodemia mormo virgulti*)	IIII	
Wright's Metalmark (*Calephelis wrightii*)		
Hesperiidae-Common Skippers		
Common Checkered Skipper (*Pyrgus communis*)		
Duskywings		
Funereal Duskywing (*Erynnis funeralis*)	1	
Mournful Duskywing (*Erynnis tristis*)		
Lacustra Duskywing (*Erynnis brizo lacustra*)		

APPENDIX D

WILDLIFE SPECIES OBSERVED AT SERAPHINA

Appendix D
Wildlife Species Observed at the Seraphina Project Site

Scientific Name	Common Name	Sign*
CLASS INSECTA		
PIERIDAE	**WHITES & SULPHURS**	
Anthocharis sara	Sara orangetip	O
Artogeia rapae	cabbage white	O
Pontia protodice	common white	O
Colias eurytheme	alfalfa butterfly	O
Colias harfordi	Harford's sulfur	O
NYMPHALIDAE	**BRUSH-FOOTED BUTTERFLIES**	
Vanessa cardui	painted lady	O
Vanessa annabella	west coast lady	O
Junonia coenia	buckeye	O
LYCAENIDAE	**GOSSAMER WINGS**	
Icaricia acmon	acmon blue	O
Strymon melinus	gray hairstreak	O
RIODINIDAE	**METALMARKS**	
Apodemia mormo virgulti	Behr's metalmark	O
HESPERIIDAE	**TRUE SKIPPERS**	
Erynnis funeralis	funereal duskywing	O
CLASS REPTILIA	**REPTILES**	
PHRYNOSOMATIDAE	**ZEBRA-TAILED, EARLESS, FRINGE-TOED, SPINY, TREE, SIDE-BLOTCHED, AND HORNY LIZARDS**	
Sceloporus occidentalis	western fence lizard	O
CLASS AVES	**BIRDS**	
ACCIPITRIDAE	**HAWKS, KITES, EAGLES**	
Buteo jamaicensis	red-tailed hawk	O
COLUMBIDAE	**PIGEONS & DOVES**	
Zenaida macroura	mourning dove	O
TROCHILIDAE	**HUMMINGBIRDS**	
Calypte anna	Anna's hummingbird	O, V
CORVIDAE	**JAYS & CROWS**	
Corvus brachyrhynchos	American crow	O, V
LANIIDAE	**SHRIKES**	
Lanius ludovicianus	loggerhead shrike	O
STURNIDAE	**STARLINGS**	
Sturnus vulgaris	European starling	O, V
ICTERIDAE	**BLACKBIRDS**	
Sturnella neglecta	western meadowlark	O, V
EMBERIZIDAE	**EMBERIZIDS**	
Pipilo crissalis	California towhee	O, V
CLASS MAMMALIA	**MAMMALS**	
LEPORIDAE	**HARES & RABBITS**	
Sylvilagus audubonii	desert cottontail	O
SCIURIDAE	**SQUIRRELS**	
Spermophilus beecheyi	California ground squirrel	O, V

*** O = Observation, V = Vocalization**

APPENDIX E

PERMIT SIGNATURE PAGE

FIELD PERSONNEL SIGNATURE PAGE
SERAPHINA PROJECT SITE

Lisa Allen
Lisa Allen
TE-050450

5-24-04
Date

Lindsay Messett
Lindsay Messett
TE-067064

5-24-04
Date

6808A
05/24/04

Appendix E

Biological Resources Surveys

Chambers Group®
Environmental Services
Biological Resources
Cultural Resources

September 28, 2004
(6808A 002)

Mr. Scott Carino
Carino & Associates
2010 65th Avenue West, Suite 100
Fircrest, WA 98466

Subject: Results of the Biological Resources Surveys for the Seraphina Project Site, Riverside County, California

Dear Mr. Carino:

This letter report summarizes the results of the biological resources surveys conducted at the Seraphina project site located in the City of Temecula, Riverside County, California. The Seraphina project site is a 28-acre development project located immediately adjacent to Highway 79 and southeast of the City of Murrieta. The biological resources surveys were conducted to document the current biological diversity and assess the habitat for its potential to support sensitive plant and wildlife species.

SITE LOCATION AND DESCRIPTION

The Seraphina project site is located in the City of Temecula, Riverside County, California. The survey area is located north of Nicolas Road and east of Joseph Road. Santa Gertrudis Creek runs through the center portion of the project site. The site is bordered by residential development and recent grading activities to the north and west and private ranch development to the east and south. The elevation of the site is approximately 1,200 feet above mean sea level (MSL). The project site can be found on the U.S. Geological Survey (USGS) Bachelor Mountain 7.5-minute topographic quadrangle in Section 19 of T.7S, R.2W.

METHODOLOGY

As part of the biological review, searches of the most current versions (2004) of the California Natural Diversity Database (CNDDB) and the California Native Plant Society Electronic Inventory (CNPSEI) were conducted. These databases contain records of federal- or state-listed or proposed endangered or threatened species, former federal Species of Concern (FSC) and state of California Special Concern Species (CSC), or otherwise sensitive species or habitats reported on or in close proximity to the site. The vegetation community nomenclature used here follows that of Sawyer and Keeler-Wolf (1995) and Holland (1986).

Field Surveys

Chambers Group, Inc., biologists conducted two biological surveys on March 10 and July 27, 2004, between the hours of 9:00 a.m. and 11:00 a.m. The surveys were conducted by walking the project site and recording data on standardized data sheets. Plant communities were identified, biological resources on the site were inventoried, and the potential for the presence of sensitive plant and wildlife species and sensitive habitats was assessed, focusing on those species listed as threatened or endangered by the

Corporate Headquarters
17671 Cowan Avenue, Suite 100
Irvine, CA 92614
(949) 261-5414
Fax: (949) 261-8950

Inland Empire
302 Brookside Avenue
Redlands, CA 92373
(909) 335-7068
Fax: (909) 335-6318

Reno
955 South Virginia Street, Suite 209
Reno, NV 89502
(775) 323-3555
Fax: (775) 323-3554

www.chambersgroupinc.com

Certified Small Business Enterprise (SBE)
Certified Disabled Veteran Business Enterprise (DVBE)

state and federal agencies. In addition, five focused surveys were conducted for the Quino checkerspot butterfly (*Euphydryas editha quino*) from March 10 to April 15, 2004. Photographs were taken to document current conditions on the site at the time of the surveys..

Burrowing Owl Habitat Assessment

A field survey was conducted on March 10 by wildlife biologist Lisa Allen of Chambers Group in order to identify possible habitat for the burrowing owl within the Seraphina project site, including an approximately 500-foot buffer zone around the project boundary. The surveys were conducted by walking the entire property, looking for individual owls and/or potential suitable burrow sites. Occupancy of suitable burrowing owl habitat can be verified during a habitat assessment by an observation of at least one burrowing owl, or molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance. Burrowing owls have high site fidelity, reusing burrows year after year. A site is assumed to be occupied if one or more burrowing owls have been observed occupying a burrow there within the last three years (California Burrowing Owl Consortium 1993).

RESULTS

Soils

Soils were determined in accordance with categories set forth by the U.S. Department of Agriculture (USDA) Soil Conservation Service and by referencing the USDA Soil Survey of Western Riverside County, California (1971).

Two soil types, as defined below, were found on the Seraphina project site:

- Ramona Series (Riverwash) – Sandy, gravelly, or cobbly soils, found on alluvial fans. Alluvial material is light gray to pale brown.
- Ramona Series (Very fine sandy loam) – Well-drained soil on alluvial fans with a dark-brown, very fine sandy loam surface layer.

Vegetation Communities

Two vegetation communities, California buckwheat series and ruderal, were identified on the Seraphina project site. In addition, due to prior disturbances (i.e., dirt roads, grading, or existing buildings), developed/disturbed areas were present in the northern portion of the project site. A description of each vegetation community is presented below.

California Buckwheat Series

California buckwheat scrub (California buckwheat series) is a subtype of coastal sage scrub that occurs on the project site. California buckwheat series occurs in the southern portion of the site. The California buckwheat vegetation community is scattered in linear patches along the edge of the Santa Gertrudis Creek channel and is dominated by California buckwheat (*Eriogonum fasciculatum*). Other species present include mule fat (*Baccharis salicifolia*) and sparse amounts of California sagebrush (*Artemisia californica*). This matches the Riversidean sage scrub described by Holland (1986) with the exception that the site is dominated by California buckwheat with sparse amounts of California sagebrush present.

Ruderal

Ruderal areas are generally a result of disturbances caused by humans. Ruderal areas are typically characterized by heavily compacted or frequently disturbed soils. Plant species occurring in ruderal areas are adapted to survive in these conditions and readily colonize disturbed ground. Ruderal areas on the site exhibit varying degrees of past surface disturbance, and the vegetation in some areas consists of 100 percent cover of common fiddleneck (*Amsinckia menziesii* ssp. *intermedia*). Other plant species that occur in this area include black mustard (*Brassica nigra*), red-stemmed filaree (*Erodium cicutarium*), horehound (*Marrubium vulgare*), telegraph weed (*Heterotheca grandiflora*), and Mediterranean schismus (*Schismus barbatus*).

Developed/Disturbed Areas

Developed areas include buildings, paved roads, parks, and other maintained areas. Disturbed areas are either those areas that are devoid of vegetation (cleared or graded) such as dirt roads, or those areas that are dominated by a sparse cover of ruderal vegetation. The developed/disturbed area on the site is a recently abandoned residence, primarily devoid of vegetation. The area consists of old buildings, graded areas, and dirt roads. The developed/disturbed portions of the site are located in the northern portion of the project site.

Sensitive Plant Species

The literature search resulted in a list of 12 sensitive plant species, including 9 federal- and state-listed as threatened or endangered species, that have been reported in the vicinity of the site. Several of these sensitive plant species occur within vernal pool systems, which do not occur within the Seraphina project site. All of these plant species were determined to have a low potential of occurring on the project site. None of the sensitive species identified in the literature search were observed within the project site.

The following sensitive plant species were determined to have a **low potential** to occur on the site, due to the level of disturbance by non-native species, lack of suitable soils, and/or proximity to other occurrences:

- **Munz's onion** (*Allium munzii*) – Federally listed as endangered (FE) and state-listed as threatened (ST).
- **San Diego ambrosia** (*Ambrosia pumila*) – FE, no state status, CNPS List 1B (a list 1B species indicates the plants are rare and endangered in California and throughout their range; list 1B species are CEQA significant).
- **Thread-leaved brodiaea** (*Brodiaea filifolia*) – Federally listed as threatened (FT) and state-listed as endangered (SE), CNPS List 1B
- **Nevin's barberry** (*Berberis nevinii*) – FE and SE, CNPS List 1
- **Vail Lake ceanothus** (*Ceanothus ophiochilus*) – FT and SE, CNPS List 1B
- **Slender-horned spineflower** (*Dodecahema leptoceras*) – FE and SE, CNPS List 1B
- **San Diego button-celery** (*Eryngium aristulatum* var. *parishii*) – FE and SE, CNPS List 1B
- **Spreading navarretia** (*Navarretia fossalis*) – FT, no state status, CNPS List 1B
- **California Orcutt grass** (*Orcuttia californica*) – FE and SE, CNPS List 1B
- **Orcutt's brodiaea** (*Brodiaea orcuttii*) – CNPS List 1B
- **Prostrate navarretia** (*Navarretia prostrata*) – CNPS List 1B
- **Parry's tetracoccus** (*Tetracoccus dioicus*) – CNPS List 1B

Sensitive Wildlife Species

The literature search resulted in a list of 22 sensitive wildlife species, including 8 federal- and state-listed as threatened or endangered species, that have been reported in the vicinity of the site. None of the sensitive species identified in the literature search were observed within the project site. Eight of the 22 species were determined to be absent from the project site, 9 species have a low potential, and 5 species have a moderate potential to occur on the project site. Due to the limited native habitat and disturbed vegetation that covers the majority of the site, none of the sensitive wildlife species have a high potential to occur on the project site.

The following sensitive wildlife species were determined to be **absent** from the site, due to the lack of habitat or because focused surveys failed to detect the species:

- **Quino checkerspot butterfly** – FE
  The site is located in Area 3 of the U.S. Fish and Wildlife Service (USFWS) designated Quino survey area and contains suitable topographical features and nectar sources (e.g., common fiddleneck and California popcorn flower [*Plagiobothrys collinus*]). However, no host plants (*Plantago erecta, Castilleja exserta*) were observed during the biological surveys, and the Quino checkerspot butterfly was not observed during focused surveys in 2004. Therefore, this species is presumed to be absent from the site.

- **Western yellow-billed cuckoo** *(Coccyzus americanus occidentalis)* – SE
  This species requires riparian habitat, which is not present on the site.

- **Least Bell's vireo** (*Vireo bellii pusillus*) – FE and SE
  This species requires riparian habitat, which is not present on the site.

- **Golden eagle** (*Aquila chrysaetos*) – CSC
  This species requires large trees for roosting and cliff-walled canyons for nesting, which are not present on the site.

The following species require permanent water habitat, which is not present on the site.

- **Arroyo chub** (*Gila orcutti*) – CSC.
- **Southwestern pond turtle** (*Clemmys marmorata pallida*) – CSC and (FSC)
- **Two-striped garter snake** (*Thamnophis hammondii*) – CSC
- **Bald eagle** (*Haliaeetus leucocephalus*) – Federally proposed for delisting (FPD), SE

The following sensitive wildlife species were determined to have a **low potential** to occur on the site, due to the level of disturbance, limited amount of suitable habitat, poor quality habitat, and proximity to other occurrences:

- **Western spadefoot** (*Spea hammondii*) – CSC and (FSC): This species requires vernal pools for breeding, which do not occur on the site.

- **Riverside fairy shrimp** (*Streptocephalus woottoni*) – FE: This species occurs in vernal pools filled by winter/spring rains. There are no vernal pools or suitable soils present within the project site. This species has a low potential to occur on the project site.

- **Vernal pool fairy shrimp** (*Branchinecta lynchi*) – FT: This species occurs in vernal pools filled by winter/spring rains. There are no vernal pools or suitable soils present within the project site. This species has a low potential to occur on the project site.

- **Northern red-diamond rattlesnake** (*Crotalus ruber ruber*) – CSC: This species requires rocky areas with dense vegetation, which are not present on the site.

- **Rosy boa** (Charina trivirgata) – (FSC): This species requires rocky areas with dense vegetation, which are not present on the site.

- **Southern California rufous-crowned sparrow** (*Aimophila ruficeps canescens*) – CSC: The southern California rufous-crowned sparrow is a resident in southern California coastal sage scrub and sparse mixed chaparral. Coastal sage scrub habitat (i.e., buckwheat series) is present within Santa Gertrudis Creek. However, this community is patchy and sparse, and does not have the density to provide sufficient foraging or nesting habitat for this species. There is a low potential for this species to occur within the project site.

- **Coastal cactus wren** (*Campylorhynchus brunneicapillus*) – CSC: This species requires cactus scrub habitat, which is not present on the site.

- **Coastal California gnatcatcher** (*Polioptila californica californica*) – FT, CSC: The gnatcatcher is a non-migratory songbird that nests and forages in moderately dense stands of coastal sage scrub occurring on arid hillsides, mesas, and washes. Coastal sage scrub habitat (i.e., buckwheat series) is present within Santa Gertrudis Creek. However, this community is patchy and sparse, and does not have the density to provide sufficient foraging or nesting habitat for the gnatcatcher. There is a low potential for this species to occur within the project site.

- **Burrowing owl** (*Athene cunicularia*) – (FSC), CSC: This species occurs in open, dry, annual or perennial grasslands and requires abandoned ground squirrel burrows for breeding. Suitable habitat is present for this species within the ruderal portions of the project site, and several ground squirrel burrows were observed. However, the site is surrounded by development, this species was not observed during any of the biological surveys, and no evidence of burrowing owls was present (e.g., active burrows with whitewash). There is a low potential for this species to occur within the project site.

The following sensitive wildlife species were determined to have a **moderate potential** to occur on the site:

- **Orange-throated whiptail** (*Cnemidophorus hyperythrus*) – CSC: This species frequents sandy washes, rocky hillsides, chaparral, and coastal sage scrub that support adequate prey species (termites and other invertebrates). Suitable habitat is present within Santa Gertrudis Creek and adjacent areas. However, this species was not observed on the project site during any of the biological surveys in 2004.

- **California horned lark** (*Eremophila alpestris actia*) – CSC: This species is found in short-grass prairies, open coastal plains, fallow grain fields, and alkali flats. Suitable habitat for this species is found throughout the project site. However, this species was not observed on the project site during any of the biological surveys in 2004.

- **Northwestern San Diego pocket mouse** (*Chaetodipus fallax fallax*) – CSC: This species frequents coastal scrub and grasslands with sandy, herbaceous areas, usually in association with rocks or coarse gravel. Suitable habitat is present within portions of the Santa Gertrudis Creek channel.

- **Los Angeles pocket mouse** (*Perognathus longimembris brevinasus*) – CSC: This species inhabits lower elevation grasslands and coastal sage communities with open ground and fine sandy soils. Suitable habitat for this species is present within Santa Gertrudis Creek, and adjacent areas.

- **Stephens' kangaroo rat** (*Dipodomys stephensi*) – FE, ST: This species occurs primarily in annual and perennial grasslands, but also occurs in coastal scrub and sagebrush with sparse canopy cover. Limited suitable habitat for this species is present within Santa Gertrudis Creek, and there are known recorded occurrences within the upper portions of the creek.

Wildlife Corridors

Wildlife movement corridors are of substantial importance to the viability of regional planning efforts to preserve habitat linkages. The concept of habitat corridors addresses the linkage between large blocks of habitat that allows the safe movement of mammals and other wildlife species from one habitat area to another. The definition of a corridor is varied, but corridors may include such areas as greenbelts, refuge systems, underpasses, and biogeographic land bridges. A wildlife movement corridor is traditionally defined as linear habitat whose primary wildlife function is to connect two or more significant habitat areas (Harris and Gallagher 1989). More specifically, a wildlife corridor is a piece of habitat, usually longer than it is wide, with vegetation and topography that facilitate the movements of wild animals (and plants) from one large patch of suitable habitat to another in order to fulfill foraging, breeding, and territorial needs. Wildlife movement corridors are critical for the survivorship of ecological systems for several reasons. Corridors can connect water, food, and cover sources, spatially linking these three resources with wildlife in different areas. In addition, wildlife movement between habitat areas provides for genetic exchange between wildlife species populations, thereby maintaining genetic variability and adaptability to maximize the success of wildlife responses to changing environmental conditions. This is especially critical for small populations subject to the loss of variability from genetic drift and the effects of inbreeding. Naturally, the nature of corridor use and wildlife movement patterns vary greatly among species. The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat.

Drainages generally serve as movement corridors because wildlife can move easily through these areas and fresh water is available. Corridors also offer wildlife unobstructed terrain to forage in and for the dispersal of young individuals. Movement corridors are particularly important to larger terrestrial species, such as mountain lions (*Felis concolor*), coyotes (*Canis latrans*), bobcats (*Lynx rufus*), and mule deer (*Odocoileus hemionus*), due to the protective cover afforded by dense vegetation. Some wildlife species, such as mule deer, may be responsible, as a result of their large size, for creating trails through the habitats that may then be utilized by other wildlife species. Habitat connectivity is also important for other wildlife species, such as herpetofauna and avifauna, for overwintering, dispersal, and migration.

Due to the extreme urbanization in the region, remaining habitat is considered vital to maintaining habitat connectivity. Specifically, features that facilitate animal movement include waterways, flood-control channels, riparian corridors, contiguous or semi-contiguous habitat, underpasses, and culverts (Missing Linkages 2000). Santa Gertrudis Creek, an ephemeral drainage, serves as a wildlife corridor within the Seraphina project site. The Santa Gertrudis Creek is channelized immediately west of the project site and is sparsely vegetated with upland species (i.e., buckwheat scrub) throughout much of the creek channel. However, the creek channel and its associated vegetation provide foraging habitat for many resident wildlife species, including coyote, raccoon (*Procyon lotor*), small mammal species, and several bird species. The channel is a tributary to Murrieta Creek and provides a connection between land areas east and west of Interstate 15. Although Santa Gertrudis Creek is sparsely vegetated and surrounded by residential development, resident wildlife species would still be expected to utilize the channel.

CONCLUSIONS AND RECOMMENDATIONS

Western Riverside County Multiple Species Habitat Conservation Plan

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) is a comprehensive, multi-jurisdictional Habitat Conservation Plan (HCP) focusing on the conservation of species and their associated habitats in western Riverside County. The MSHCP allows Riverside County and its cities to better control local land-use decisions and maintain a strong economic climate in the region while addressing the requirements of the state and federal Endangered Species Acts. The MSHCP provides a coordinated Conservation Area and implementation program to preserve biological diversity and maintain the region's quality of life. It allows the participating jurisdictions to authorize "take" of specific plant and wildlife species identified within the Plan Area. Under the MSHCP, the USFWS and the California Department of Fish and Game (CDFG) will grant "Take Authorization" for otherwise lawful actions – such as public and private development that may incidentally take or harm individual species or their habitat outside of the MSHCP Conservation Area – in exchange for the assembly and management of a coordinated MSHCP Conservation Area.

The Seraphina site does not fall within any Conservation Area or Cores and Linkages Subunits and is not located within a proposed criteria area. However, compliance with the MSHCP requires development projects to submit to a pre-application review and payment of associated mitigation fees to the County of Riverside Transportation and Land Management Agency. Payment of the mitigation fees and compliance with the requirements of Section 6.0 of the MSHCP are intended to provide full mitigation under the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), Federal Endangered Species Act, and California Endangered Species Act for impacts to the species and habitat covered by the MSHCP pursuant to agreements with the USFWS, CDFG, and/or any other appropriate participating regulatory agencies and as set forth in the Implementation Agreement for the MSHCP.

Sensitive Plant Species

There are no sensitive vegetation communities present within the Seraphina project site. The literature search resulted in a list of 12 sensitive plant species that have been reported in the vicinity of the site. These include Munz's onion, San Diego ambrosia, thread-leaved brodiaea, Nevin's barberry, Vail Lake ceanothus, slender-horned spineflower, San Diego button-celery, spreading navarretia, prostrate navarretia, Parry's tetracoccus, and California orcutt grass. Three of these plant species, San Diego button-celery, spreading navarretia, and California orcutt grass, are found in vernal pool habitats. None of the sensitive species identified in the literature search were observed within the project site. Based on the vegetation communities, the soils present, the disturbed nature of the site, and the lack of vernal pool habitats, there is no potential for these sensitive species to occur within the project site, and focused plant surveys are not recommended.

Sensitive Wildlife Species

There are no sensitive habitats present within the Seraphina project site. The literature search resulted in a list of 8 federal- and state-listed as threatened or endangered wildlife species that have been reported in the vicinity of the site. None of the listed species identified in the literature search were observed within the project site, and based on the results of focused surveys, the Quino checkerspot butterfly is presumed to be absent from the site. The potential for the bald eagle, western yellow-billed cuckoo, Riverside fairy shrimp, vernal pool fairy shrimp, coastal California gnatcatcher, and least Bell's vireo is considered to be low or nonexistent based on the lack of suitable habitat available within the project site.

Four of the five sensitive wildlife species that have potential to occur onsite are species that are "adequately conserved" by the Western Riverside MSHCP and do not require focused surveys. The MSHCP-covered species that are "adequately conserved" and have the potential to occur on the site include:

- Orange-throated whiptail
- California horned lark
- Northwestern San Diego pocket mouse
- Stephens' kangaroo rat

Los Angeles pocket mouse

This species frequents coastal scrub and grasslands with sandy, herbaceous areas, usually in association with rocks or coarse gravel. Suitable habitat is present within portions of the Santa Gertrudis Creek channel. According to MSHCP guidelines, the Los Angeles pocket mouse is considered to be "not adequately conserved" and, therefore, surveys are required within specific survey areas. However, the Seraphina project site does not fall within the required survey area for the Los Angeles pocket mouse (Figure 6-5 of the Final MSHCP). Therefore, focused surveys for this species are not required for this species.

Burrowing Owl

Burrowing owls were not observed or detected during the habitat assessment at the Seraphina project site. Although there are known occurrences of burrowing owls within the vicinity of the project site, the grassland habitat present on the site is of low quality and the burrows observed within the project site were most likely utilized by small rodents and were not large enough to support owls. Additionally, signs of burrowing owl presence, such as molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance, were not observed. Based on the habitat assessment results, the habitat within the Seraphina project site does not currently appear to support burrowing owls. Therefore, no further surveys are recommended at this time.

Chambers Group is pleased to provide this letter report summarizing the results of the biological study of the Seraphina project site in Riverside County. If you have any questions, please do not hesitate to call me at (949) 261-5414.

Sincerely,

CHAMBERS GROUP, INC.

Lisa Allen

Lisa Allen
Senior Wildlife Biologist/Project Manager

Chambers Group®

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Bachelor Mountain 7.5' Topographic Quadrangle.

Appendix F

California Natural Diversity Database Search Results

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Temecula (3311742) OR Romoland (3311762) OR Winchester (3311761) OR Hemet (3311668) OR Murrieta (3311752) OR Bachelor Mtn. (3311751) OR Sage (3311658) OR Pechanga (3311741) OR Vail Lake (3311648))
 AND Taxonomic Group IS (Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects)
 AND (Federal Listing Status IS (Endangered OR Threatened OR Proposed Endangered OR Proposed Threatened OR Candidate) OR State Listing Status IS (Endangered OR Threatened OR Rare OR Candidate Endangered OR Candidate Threatened))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Candidate Endangered	G2G3	S1S2	SSC
Anaxyrus californicus arroyo toad	AAABB01230	Endangered	None	G2G3	S2S3	SSC
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Dipodomys merriami parvus San Bernardino kangaroo rat	AMAFD03143	Endangered	None	G5T1	S1	SSC
Dipodomys stephensi Stephens' kangaroo rat	AMAFD03100	Endangered	Threatened	G2	S2	
Euphydryas editha quino quino checkerspot butterfly	IILEPK405L	Endangered	None	G5T1T2	S1S2	
Haliaeetus leucocephalus bald eagle	ABNKC10010	Delisted	Endangered	G5	S3	FP
Polioptila californica californica coastal California gnatcatcher	ABPBJ08081	Threatened	None	G4G5T2Q	S2	SSC
Streptocephalus woottoni Riverside fairy shrimp	ICBRA07010	Endangered	None	G1G2	S1S2	
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	

Record Count: 12

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Temecula (3311742) OR Romoland (3311762) OR Winchester (3311761) OR Hemet (3311668) OR Murrieta (3311752) OR Bachelor Mtn. (3311751) OR Sage (3311658) OR Pechanga (3311741) OR Vail Lake (3311648))
 AND Taxonomic Group IS (Dune OR Scrub OR Herbaceous OR Marsh OR Riparian OR Woodland OR Forest OR Alpine OR Inland Waters OR Marine OR Estuarine OR Riverine OR Palustrine)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Riversidian Alluvial Fan Sage Scrub	CTT32720CA	None	None	G1	S1.1	
Riversidian Alluvial Fan Sage Scrub						
Southern Coast Live Oak Riparian Forest	CTT61310CA	None	None	G4	S4	
Southern Coast Live Oak Riparian Forest						
Southern Cottonwood Willow Riparian Forest	CTT61330CA	None	None	G3	S3.2	
Southern Cottonwood Willow Riparian Forest						
Southern Interior Basalt Flow Vernal Pool	CTT44310CA	None	None	G1	S1.2	
Southern Interior Basalt Flow Vernal Pool						
Southern Sycamore Alder Riparian Woodland	CTT62400CA	None	None	G4	S4	
Southern Sycamore Alder Riparian Woodland						
Southern Willow Scrub	CTT63320CA	None	None	G3	S2.1	
Southern Willow Scrub						
Valley Needlegrass Grassland	CTT42110CA	None	None	G3	S3.1	
Valley Needlegrass Grassland						

Record Count: 7

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Temecula (3311742) OR Romoland (3311762) OR Winchester (3311761) OR Hemet (3311668) OR Murrieta (3311752) OR Bachelor Mtn. (3311751) OR Sage (3311658) OR Pechanga (3311741) OR Vail Lake (3311648))
 AND Taxonomic Group IS (Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes)
 AND CNPS List IS (1A OR 1B OR 1B.1 OR 1B.2 OR 1B.3 OR 2A)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Abronia villosa var. aurita chaparral sand-verbena	PDNYC010P1	None	None	G5T2T3	S2	1B.1
Allium munzii Munz's onion	PMLIL022Z0	Endangered	Threatened	G1	S1	1B.1
Ambrosia pumila San Diego ambrosia	PDAST0C0M0	Endangered	None	G1	S1	1B.1
Arctostaphylos rainbowensis Rainbow manzanita	PDERI042T0	None	None	G2	S2	1B.1
Astragalus pachypus var. jaegeri Jaeger's milk-vetch	PDFAB0F6G1	None	None	G4T2	S2	1B.1
Atriplex coronata var. notatior San Jacinto Valley crownscale	PDCHE040C2	Endangered	None	G4T1	S1	1B.1
Atriplex parishii Parish's brittlescale	PDCHE041D0	None	None	G1G2	S1	1B.1
Atriplex serenana var. davidsonii Davidson's saltscale	PDCHE041T1	None	None	G5T1	S1	1B.2
Berberis nevinii Nevin's barberry	PDBER060A0	Endangered	Endangered	G1	S1	1B.1
Brodiaea filifolia thread-leaved brodiaea	PMLIL0C050	Threatened	Endangered	G2	S2	1B.1
Brodiaea orcuttii Orcutt's brodiaea	PMLIL0C0B0	None	None	G2	S2	1B.1
Brodiaea santarosae Santa Rosa Basalt brodiaea	PMLIL0C0G0	None	None	G1	S1	1B.2
California macrophylla round-leaved filaree	PDGER01070	None	None	G4	S4	1B.2
Calochortus weedii var. intermedius intermediate mariposa-lily	PMLIL0D1J1	None	None	G3G4T2	S2	1B.2
Ceanothus ophiochilus Vail Lake ceanothus	PDRHA041M0	Threatened	Endangered	G1	S1	1B.1
Centromadia pungens ssp. laevis smooth tarplant	PDAST4R0R4	None	None	G3G4T2	S2	1B.1
Chaenactis glabriuscula var. orcuttiana Orcutt's pincushion	PDAST20095	None	None	G5T1T2	S1	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Chaenactis parishii Parish's chaenactis	PDAST200D0	None	None	G3G4	S3	1B.3
Chorizanthe parryi var. parryi Parry's spineflower	PDPGN040J2	None	None	G3T2	S2	1B.1
Chorizanthe polygonoides var. longispina long-spined spineflower	PDPGN040K1	None	None	G5T3	S3	1B.2
Clarkia delicata delicate clarkia	PDONA050D0	None	None	G3	S3	1B.2
Clinopodium chandleri San Miguel savory	PDLAM08030	None	None	G2	S2	1B.2
Cryptantha wigginsii Wiggins' cryptantha	PDBOR0A400	None	None	G2	S1	1B.2
Deinandra mohavensis Mojave tarplant	PDAST4R0K0	None	Endangered	G2	S2	1B.3
Dodecahema leptoceras slender-horned spineflower	PDPGN0V010	Endangered	Endangered	G1	S1	1B.1
Dudleya multicaulis many-stemmed dudleya	PDCRA040H0	None	None	G2	S2	1B.2
Dudleya viscida sticky dudleya	PDCRA040T0	None	None	G2	S2	1B.2
Eryngium aristulatum var. parishii San Diego button-celery	PDAPI0Z042	Endangered	Endangered	G5T1	S1	1B.1
Horkelia cuneata var. puberula mesa horkelia	PDROS0W045	None	None	G4T1	S1	1B.1
Hulsea californica San Diego sunflower	PDAST4Z030	None	None	G3	S3	1B.3
Juncus luciensis Santa Lucia dwarf rush	PMJUN013J0	None	None	G3	S3	1B.2
Lasthenia glabrata ssp. coulteri Coulter's goldfields	PDAST5L0A1	None	None	G4T2	S2	1B.1
Lepechinia cardiophylla heart-leaved pitcher sage	PDLAM0V020	None	None	G3	S2S3	1B.2
Linanthus orcuttii Orcutt's linanthus	PDPLM090X0	None	None	G3	S2	1B.3
Mielichhoferia shevockii Shevock's copper moss	NBMUSA1010	None	None	G2	S2	1B.2
Monardella hypoleuca ssp. intermedia intermediate monardella	PDLAM180A4	None	None	G4T2?	S2?	1B.3
Monardella macrantha ssp. hallii Hall's monardella	PDLAM180E1	None	None	G5T3	S3	1B.3
Navarretia fossalis spreading navarretia	PDPLM0C080	Threatened	None	G2	S2	1B.1

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Navarretia prostrata prostrate vernal pool navarretia	PDPLM0C0Q0	None	None	G2	S2	1B.1
Nolina cismontana chaparral nolina	PMAGA080E0	None	None	G3	S3	1B.2
Orcuttia californica California Orcutt grass	PMPOA4G010	Endangered	Endangered	G1	S1	1B.1
Packera ganderi Gander's ragwort	PDAST8H1F0	None	Rare	G2	S2	1B.2
Penstemon californicus California beardtongue	PDSCR1L110	None	None	G3	S2	1B.2
Phacelia keckii Santiago Peak phacelia	PDHYD0C4G1	None	None	G1	S1	1B.3
Saltugilia latimeri Latimer's woodland-gilia	PDPLM0H010	None	None	G3	S3	1B.2
Scutellaria bolanderi ssp. austromontana southern mountains skullcap	PDLAM1U0A1	None	None	G4T3	S3	1B.2
Symphyotrichum defoliatum San Bernardino aster	PDASTE80C0	None	None	G2	S2	1B.2
Tetracoccus dioicus Parry's tetracoccus	PDEUP1C010	None	None	G3?	S2	1B.2
Tortula californica California screw moss	NBMUS7L090	None	None	G2G3	S2S3	1B.2

Record Count: 49

Appendix G

Cultural Resources Survey Report

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 **tel**
619.462.0552 **fax**
www.**helixepi**.com

February 28, 2017 HLH-05

Mr. David Arnold
Hillcrest Homes
355 W. 2nd Street
Tustin, CA 92780

Subject: Seraphina Estates Project (TTM 32346) Cultural Resources Survey Report

Dear Mr. Arnold:

HELIX Environmental Planning, Inc., (HELIX) was contracted to conduct a cultural resources survey for the Seraphina Estates project (project) in the City of Temecula, California. The cultural resources survey included a records search, Sacred Lands File (SLF) search and Native American outreach, review of historic maps and aerial photographs, an intensive survey by a HELIX archaeologist and a Luiseño Native American monitor, and preparation of this letter report. No cultural resources have been identified within the project area; therefore, it is anticipated that the project will have no impacts to cultural resources. However, as discussed below, the project site is in an area that is sensitive in terms of cultural resources, and ground visibility during the field survey was extremely poor. As a result, monitoring during grading activities is recommended. This letter report details the methods and results of the cultural resources survey.

PROJECT DESCRIPTION

The project area consists of an approximately 30-acre lot in the City of Temecula (City), in southwestern Riverside County, California (Figure 1, *Regional Location*). The project site is located on the northeast corner of Nicolas Road and Joseph Road, to the east of Interstate 15; Rita Way and Diego Drive are located along the project's northern border (Figures 2 and 3, *Project Vicinity [USGS Topography*], and *Project Vicinity* [*Aerial Photograph}*, respectively). The project area is in Section 19 of Township 7 South, Range 2 West, on the US Geological Survey (USGS) 7.5-minute Bachelor Mountain quadrangle (Figure 2).

The proposed project would include development of approximately 22 acres within the study area and avoidance of approximately 8 acres. The development would include construction of 53 single-family homes and on-site roads connecting Joseph Road at Payton Court and to Rita Way, where it connects to Seraphina Road. The two proposed roads would meet in the northeastern

part of the site and connect to five cul-de-sacs. Lots 43 through 46 would access Jons Place. The project includes road improvements along Rita Way, Joseph Road, and Nicolas Road. A hardened encasement of the California Aqueduct is being constructed to protect the aqueduct from scour within the realigned Santa Gertrudis Creek as a Metropolitan Water District requirement for the project.

ENVIRONMENTAL BACKGROUND

The project area is situated within Temecula Valley, where the climate is characterized as semi-arid to subhumid, with warm, dry summers and cool, moist winters (National Cooperative Soil Survey 2003). Bachelor Mountain is located just over 5 miles to the northeast of the project area, and Buck Mesa is just over 3 miles to the east, accessible from the project site through a drainage valley that departs from Santa Gertrudis Creek just ½-mile to the east. The elevation of the site ranges from approximately 1,155 feet above mean sea level (amsl) in the northeast corner to 1,138 feet amsl on the southwest side, with gently rolling topography. It drains from north to south and from east to west, creating three distinct drainage areas. Santa Gertrudis Creek crosses the southern portion of the site. The California Aqueduct crosses the east side of the project site. Surrounding uses include existing single-family residential to the west and north, larger lot residential and vacant land to the east and south, and a pocket park to the southwest.

Geologically, the project area is underlain by Pliocene to early Pleistocene sandstone and Quaternary old alluvial deposits including lake, playa and terrace deposits (Morton and Kennedy 2003). The alluvial deposits date to the latter period of the Pleistocene, and early sandstone in this area is composed of primarily friable, caliche-rich sandstone (Morton and Kennedy 2003). Two soil types are found within the project site: Ramona riverwash and Ramona very fine sandy loam (Chambers Group 2004). Previous biological surveys of the project identified existing onsite vegetation such as buckwheat scrub and ruderal (Chambers Group 2004), as well as mule fat scrub, southern riparian woodland, disturbed wetland, freshwater marsh, and streambed (HELIX 2016). The site is currently vacant. During the study in 2004, the northern portion of the project had already been subjected to disturbance in the form of dirt roads, buildings, and previous grading (Chambers Group 2004).

Many of the plant species naturally occurring onsite and in the vicinity of the project area are known to have been used by native populations for food, medicine, tools, and ceremonial and other uses (Bean and Shipek 1978; White 1963). In addition, Santa Gertrudis Creek and its tributaries, and the nearby cismontane environment would have provided a vast range of resources for indigenous populations living in or traveling through the area; many of the animal species living within these communities (such as rabbits, deer, small mammals, and birds) would have been used by native inhabitants.

CULTURAL BACKGROUND

The culture history presented here (up to the discussion of the Late Prehistoric period) is based on Wallace's (1978) discussion of the Post-Pleistocene for southern California (circa 9000 Before Common Era [BCE] to 2000 BCE). The earliest inhabitants of California subsisted mainly by hunting, as attested to by "the finding of projectile points and other stone implements

adapted to the chase at ancient campsites" throughout California (Wallace 1978:25). Wallace refers to this early period as Period I: Hunting. It generally equates with the Paleoindian or Lithic stage (Willey and Phillips 1958), in which little diversity of resource exploitation is evident.

Wallace's (1978) Period II: Food Collecting equates with Willey and Phillips (1958) Archaic stage and is often referred to in southern California as the Early Archaic, Early Milling period, or Milling Stone Horizon. "A changeover from hunting to the collection of seed foods is clearly reflected in the archeological record for the period between 6000 and 3000 BC. The importance of seeds in the diet of the prehistoric peoples can be seen in the numbers of food-grinding implements present at their settlements" (Wallace 1978:28).

After about 3000 BCE, a more diversified subsistence strategy is evident throughout southern California. "Everywhere increased subsistence efficiency in the form of wider exploitation of available food resources can be seen" (Wallace 1978:30). The artifact assemblages changed slowly over time, with a few additions or changes. "By the end of the millennium the new ways and techniques had become firmly established and formed the basis for succeeding cultural traditions" (Wallace 1978:35).

"Perhaps as early as 1500-1000 B.C. the Takic branch of Uto-Aztecan [including the forebears of the Luiseño people] began to spread westward across the Mojave Desert" (Moratto 1984:560). There is disagreement about the date of the "Shoshonean intrusion" into various parts of southern California, including Riverside County. Moratto indicated that Kowta (1969:50) "proposed dates of circa 1000 B.C. for the entry of 'Shoshoneans' in the Los Angeles Basin" (Moratto 1984:560). "Considering both linguistic and archaeological data, C. Bull (1977:56) sets the western movement of the 'Luisenic language family' at circa 500 B.C." (Moratto 1984:165). Others offer varying dates for the presence of Luiseño ancestors in Orange and San Diego Counties.

It must be noted that this interpretation by archaeologists and linguistic anthropologists differs from the beliefs of the Luiseño people. The creation stories indicate that the Luiseño people have always been here, not migrating from elsewhere. The creation story of the Pechanga Band of the Luiseño tells that the world was created at Temecula. "The Káamalam [first people] moved to a place called Nachíivo Pomíisavo, but it was too small so they moved to a place called 'exva Teméeku, this place you now know as Temeku. Here they settled while everything was still in darkness (DuBois 1908)" (Masiel-Zamora 2013:2).

The Late Prehistoric period is represented in northern San Diego County and Riverside County by the San Luis Rey complex, which is the archaeological manifestation of the Shoshonean predecessors of the ethnohistoric Luiseño people (named for the Mission San Luis Rey).

The San Luis Rey (SLR) complex is divided into two phases, SLR I and SLR II. Elements of the SLR complex include small, triangular, pressure-flaked projectile points (generally Cottonwood series, but Desert side-notched series also occurs); milling implements: mortars and pestles, manos and metates, and bedrock milling features; bone awls; Olivella shell beads; other stone and shell ornaments; and cremations (Meighan 1954; Moratto 1984; True et al. 1974). The later SLR II complex also includes several elements not found in the SLR I complex: "pottery vessels, cremation urns, red and black pictographs, and such nonaboriginal items as metal knives and

glass beads (Meighan 1954:223)" (Moratto 1984:154). True noted a greater number of quartz projectile points at SLR sites than at Cuyamaca complex sites (in central and southern San Diego County), which he interpreted as a cultural preference for quartz (True 1966). The general mortuary pattern at San Luis Rey sites is ungathered cremations.

SLR I was originally thought to date from 1400 CE to 1750 CE, with SLR II dating between 1750 CE and 1850 CE (Meighan 1954). However, that division was based on the assumption that the Luiseño people did not practice pottery manufacture until just prior to the arrival of the Spanish. The chronology has since been revised due to evidence that pottery may have been introduced to the Luiseño circa 1200-1600 CE. Ceramics were probably introduced from the Luiseños' southern neighbors, the Kumeyaay (True et al. 1974).

The name Luiseño derives from Mission San Luis Rey de Francia and has been used to refer to the Indian people associated with the mission. The Luiseño language belongs to the Cupan group of the Takic subfamily, which has also been called Southern California Shoshonean, and is part of the widespread Uto-Aztecan language family (Bean and Shipek 1978; Sparkman 1908; White 1963). Neighboring groups that speak Cupan languages are Cupeño, Cahuilla, and Gabrielino. The Indian people associated with Mission San Juan Capistrano, called Juaneño by the Spanish, were described by Kroeber and Harrington as a separate group, based on linguistic differences. However, the language, culture, and territory of the Luiseño and Juaneño are so closely related that several other ethnographers have considered them to be a single ethnic nationality (Bean and Shipek 1978; White 1963). Cameron (1987:319-321) noted archaeological differences between the two groups, and the Luiseño and Juaneño people consider themselves to be separate peoples.

The territory of the Luiseño people is generally described as extending along the coast from Agua Hedionda Creek on the southwest to Aliso Creek on the northwest. On the north this boundary extended east beyond Santiago Peak to the eastern side of the Elsinore Fault Valley, continuing southeast to Palomar Mountain, then around the southern slope above the valley of San Jose. The southern boundary follows westerly to Agua Hedionda Creek (Bean and Shipek 1978; White 1963).

Luiseño social organization is noted for "(1) extensive proliferation of social statuses; (2) clearly defined ruling families that interlocked various rancherias within the ethnic nationality; (3) a sophisticated philosophical structure associated with the taking of hallucinogenics (datura); and (4) elaborate ritual paraphernalia including sand paintings symbolic of an avenging sacred being named Chingichngish" (Bean and Shipek 1978:550).

Ethnographic and ethnohistoric studies of the Luiseño people include Bean and Shipek (1978), Boscana (1947), Kroeber (1976), Robinson (1947), Shipek (1977), Sparkman (1908), Talley (1982), and White (1963). Archaeological studies addressing the Late Prehistoric San Luis Rey complex include Meighan (1954), McCown (1955), True et al. (1974), and Wallace (1960). Most of the ethnographic studies, as well as the "classic" archaeological studies of the Luiseño, have concentrated on the Pauma Valley and the Palomar Mountain area, although Wallace's (1960) study was an archaeological survey of the Buena Vista Creek watershed. A recent Master's

thesis study by a Pechanga tribal member included an analysis of all the pre-contact cultural material from excavations undertaken at Temeku in 1952 (Masiel-Zamora 2013).

REGULATORY FRAMEWORK

Resource importance is assigned to districts, sites, buildings, structures, and objects that possess exceptional value or quality illustrating or interpreting the heritage of the region in history, architecture, archaeology, engineering, and culture. Several criteria are used in demonstrating resource importance. Specifically, criteria outlined in the National Historic Preservation Act (NHPA) and the California Environmental Quality Act (CEQA) provide the guidance for making such a determination. This section details the criteria that a resource must meet in order to be determined significant.

National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment. The historic preservation review process mandated by Section 106 is outlined in regulations issued by ACHP. Revised regulations, "Protection of Historic Properties" (36 Code of Federal Regulations [CFR] Part 800), became effective August 5, 2004.

Historic properties are properties that are included in the National Register of Historic Places (NRHP) or those that meet the criteria for inclusion in the NRHP, as outlined below. If the agency's undertaking could affect historic properties, the agency determines the scope of appropriate identification efforts and then proceeds to identify historic properties in the Area of Potential Effects (APE). The agency reviews background information, consults with the State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer (THPO) and others, seeks information from knowledgeable parties, and conducts additional studies as necessary. Districts, sites, buildings, structures, and objects listed in the NRHP are considered; unlisted properties are evaluated against the National Park Service's published criteria, in consultation with the SHPO/THPO and any Indian tribe or Native Hawaiian organization that may attach religious or cultural importance to them.

If questions arise about the eligibility of a given property, the agency may seek a formal determination of eligibility from the National Park Service. Section 106 review gives equal consideration to properties that have been included in the NRHP and those that have not been but that meet NRHP criteria.

If the agency finds that no historic properties are present or affected, it provides documentation to the SHPO/THPO and, barring any objection in 30 days, proceeds with its undertaking. If the agency finds that historic properties are present, it proceeds to assess possible adverse effects. If adverse effects are identified, they must be resolved.

Section 60.6 of 36 CFR Part 60 presents the criteria for the evaluation of cultural resources for nomination to the NRHP as follows:

The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, 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 or 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 [36 CFR Part 60].

Cultural resources that are eligible for inclusion in the NRHP are defined as historic properties. Impacts to historic properties constitute effects under the NHPA.

California Environmental Quality Act (CEQA)

The CEQA Guidelines (§15064.5) address determining the significance of impacts to archaeological and historic resources.

(a) For purposes to this section, the term "historical resources" shall include the following:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (CRHR) (Public Resources Code §5024.1, Title 14 CCR, Section 4850 et seq.).

(2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial

evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California CRHR (Public Resources Code Section 5024.1, Title 14, Section 4852) including the following:

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

(B) Is associated with the lives of persons important in our past;

(C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(D) Has yielded, or may be likely to yield, information important in prehistory or history.

(4) The fact that a resource is not listed in or determined eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the Public Resource Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code Section 5020.1(j) or 5024.1.

(b) A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

(1) Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

(2) The significance of an historical resource is materially impaired when a project:

(A) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or

(B) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the Public Resources Code, unless the public agency

reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or

(C) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

(c) CEQA applies to effects on archaeological sites.

(1) When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource, as defined in subsection (a).

(2) If a lead agency determines that the archaeological site is an historical resource, it shall refer to the provisions of Section 21084.1 of the Public Resources Code, and this section, Section 15126.4 of the Guidelines, and the limits contained in Section 21083.2 of the Public Resources Code do not apply.

(3) If an archaeological site does not meet the criteria defined in subsection (a), but does meet the definition of a unique archaeological resource in Section 21083.2 of the Public Resources Code, the site shall be treated in accordance with the provisions of Section 21083.2. The time and cost limitations described in Public Resources Code Section 21083.2 (c-f) do not apply to surveys and site evaluation activities intended to determine whether the project location contains unique archaeological resources.

(4) If an archaeological resource is neither a unique archaeological nor an historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment. It shall be sufficient that both the resource and the effect on it are noted in the Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be considered further in the CEQA process.

Section 15064.5 (d) & (e) contain additional provisions regarding human remains. Regarding Native American human remains, paragraph (d) provides:

(d) When an Initial Study identifies the existence of, or the probable likelihood, of Native American human remains within the project, a lead agency shall work with the appropriate Native Americans as identified by the Native American Heritage Commission as provided in Public Resources Code §5097.98. The applicant may develop an agreement for treating or disposing of, with appropriate dignity, the human remains and any items associated with Native American burials with the appropriate Native Americans as identified by the Native American Heritage Commission. Action implementing such an agreement is exempt from:

(1) The general prohibition on disinterring, disturbing, or removing human remains from any location other than a dedicated cemetery (Health and Safety Code Section 7050.5).

(2) The requirements of CEQA and the Coastal Act.

METHODS

A record search of previously recorded archaeological resources, reports, and historic addresses of the project area and a 1-mile radius was requested from the Eastern Information Center (EIC) on January 20, 2017 and received on February 13, 2017. Historic aerial photographs from 1938 to 2016 were reviewed, as were historic topographic maps from 1901 to 2012. The Native American Heritage Commission (NAHC) was contacted for a SLF search and list of Native American contacts, which were received on January 26, 2017. Letters were sent on February 17, 2017 to the contacts listed by the NAHC.

HELIX archaeologist Kristina Davison and Native American monitor Todd Perry from the Pechanga Band of Luiseño Indians surveyed the property for cultural resources on February 23, 2017. The intensive pedestrian survey was conducted in parallel transects spaced 5 meters apart to achieve maximum ground coverage across the parcel.

RESULTS

The EIC records search has a record of 39 cultural resource studies having been conducted within the search radius, four of which covered portions of the project property and two of which were directly adjacent to it. One of the studies is shown as covering a majority of the current project area apart from a small area along the western boundaries; this study was conducted in 1989 for Tract 25004 (Yohe 1989). Two of the previous studies were linear in nature and focused along the aqueduct pipes shown as traveling north through the eastern end of the project area on topographic maps (Figure 2); these surveys were conducted for a pipeline right-of-way and facilities project (Desautels 1979) and for the Williams Communications, Inc., Fiberoptic Cable System Installation project (Jones and Stokes Associates, Inc. 2000). The project area's western half was also included in a 1986 survey of approximately 200 acres of land (McCarthy 1986). Studies conducted adjacent to the project site include a survey for the Rancho California Water District's EM-20 Pipeline and Turnouts project, which was focused along Nicolas Road to the south (Robbins-Wade 1999), and an archaeological assessment of the Willows Tract 23428, to the west (Drover 1988).

The record search results from the EIC indicate that nine cultural resources have been previously recorded within a 1-mile radius of the project property (Table 1, *Previously Recorded Resources within 1 Mile of Project Site*). These sites include two artifact scatters consisting of ground stone implements and fragments; one bedrock milling feature with a light artifact scatter; one lithic scatter with ground stone manos, a core tool, and a core; and five isolated artifacts. No archaeological resources have been identified on the project property; the closest recorded resources (P-33-013327, -013328, and -017881) are located within a ¼-mile and to the north and to the southeast of the project area. All three of these resources are isolated artifacts, and include a metate fragment (P-33-013327), a core tool (P-33-013328), and a quartz flake (P-33-017881).

Table 1.
PREVIOUSLY RECORDED RESOURCES
WITHIN 1 MILE OF PROJECT SITE

Resource Number (P-33-#)	Resource Number (CA-RIV-#)	Description	Recorder, Date
003654	003654	Lithic scatter containing one mano and four metate fragments of varying material; area has since been graded and no remnants were present at the time of the last visit in 2013	Drover and Smith 1989; Smallwood 2013
005088	005088	Lithic scatter containing two ground stone fragments and one complete oval mano with battering	McHenry and Strudwick 1993
005571		Isolated bifacial mano (quartzite)	McHenry and Strudwick 1993
013327		Isolated metate fragment (granitic)	Brian F. Smith & Associates 2003
013328		Isolated core tool (chert)	Brian F. Smith & Associates 2003
013329		Isolated mano fragment (granitic)	Brian F. Smith & Associates 2003
013330	007428	Bedrock milling feature with ground stone artifacts and one historic horseshoe	Brian F. Smith & Associates 2003
013331	007429	Lithic scatter with ground stone manos, a core tool (metavolcanic), and a chert core	Brian F. Smith & Associates 2003
017881		Isolated quartz flake	Brian F. Smith & Associates 2003; Said-Abdelwahed 2009

No buildings or structures are shown on the property on historic topographic maps, including the 1901 USGS 30-minute Elsinore quadrangle, the 1943 War Department 15-minute Murrieta quadrangle, and the 1953 USGS 7.5-minute Bachelor Mountain quadrangle. Nicolas Road is

shown in its present location by 1901, but no structures are shown in the immediate vicinity of the project area.

A review of historic aerial photographs revealed that the project site was situated within a grassy plain between the years of 1938 and 1967, until the surrounding area was the subject of increasing development (NETR Online 2017). Santa Gertrudis Creek and the tributary drainage in the northwest portion of the project are shown much in their current condition in later aerials (1967 – present), though in 1938 the creek was much more meandering and occupied a wider swath of land (NETR Online 2017). Joseph Road and Rita Way, on the project's western and northern borders (respectively), were constructed between 1967 and 1978, and presumably allowed development of the area to increase. By 1996, the housing tract to the north of the project's northeastern corner is visible, and the surrounding areas to the east, west, and south had been mostly developed (NETR Online 2017).

A SLF search was requested from the NAHC on January 20, 2017. The response, received on January 26, 2017 indicated: "A search of the SLF was completed for the USGS quadrangle information provided with negative results." Letters were sent on February 17, 2017 to the contacts listed by the NAHC. To date the only response received has been from the Agua Caliente Band of Cahuilla Indians, who indicated that the project site is outside the Tribe's Traditional Use Area, and they defer to other tribes closer to the project site. When additional responses are received, they will be forwarded to the applicant and to City staff.

No cultural resources were observed during the 2017 field survey; dense grasses and forbs covered a majority of the project area, apart from dirt roads and within the limits of Santa Gertrudis Creek. The northern portion of the property appears to have been subjected to heavier disturbance than the remainder of the project, including electrical utilities, concrete pads, and evidence of grading (terraced area for concrete pads). East of the southern end of the tributary drainage to Santa Gertrudis Creek, numerous dumped piles of soil with concrete and asphalt slabs, PVC pipe, electrical conduit and wiring, and other modern debris (building tiles, modern glass) were observed. Several areas within the project bear evidence of machine manipulation, including constructed berms, a rusted trailer that looked as though it was going to be buried but was never backfilled, and headrows left by discing. Raw materials observed during the survey include numerous unmodified quartz and quartzite cobbles and metavolcanic cobbles. One fossilized oyster shell was also observed near the project's western bounder just west of the concrete pads described above; the shell was located on the top of the manufactured slope leading down to the street level of Joseph Road. Soils onsite consisted of a fine- to coarse-grained sandy loam.

CONCLUSIONS

A cultural resources survey was conducted by HELIX for the Seraphina Estates project, including a record search, SLF search, Native American outreach, review of historic maps and aerial photographs, intensive field survey, and this letter report. The record search revealed nine previously recorded cultural resources within a 1-mile radius of the property. The field survey conducted in 2017 did not identify any cultural resources on site, and the project site has been subjected to some level of grading in previous years, as well as vegetation abatement in

recent years. However, ground visibility during the survey was extremely poor, due to dense grasses throughout the project area. There is a potential for encountering cultural resources that weren't visible during the survey during grading and other ground-disturbing activity. Further, although the three closest resources to the project site are isolated artifacts, their presence in the vicinity does indicate that the area was traveled by pre-contact native inhabitants. Based on this, it is recommended that an archaeological monitoring program be implemented. The monitoring program, which is detailed in Attachment A, would include: the archaeologist and the Native American monitor attend a preconstruction meeting with the grading contractor to explain the requirements of the monitoring program; an archaeologist and a Native American monitor be on-site to observe ground disturbance in the upper several feet of soil, including brushing/grubbing, grading, trenching, and other ground-disturbing activities; and submittal of a monitoring report. If cultural resources are encountered, both the archaeologist and the Native American monitor will have the authority to temporarily halt or redirect grading while the cultural material is assessed as to significance. The assessment of significance will be made through discussion among the archaeologist, Native American monitor, and City staff. If resources are determined to be significant, appropriate mitigation measures will be developed and implemented.

If you have any questions, please contact Mary Robbins-Wade at (619) 462-1515.

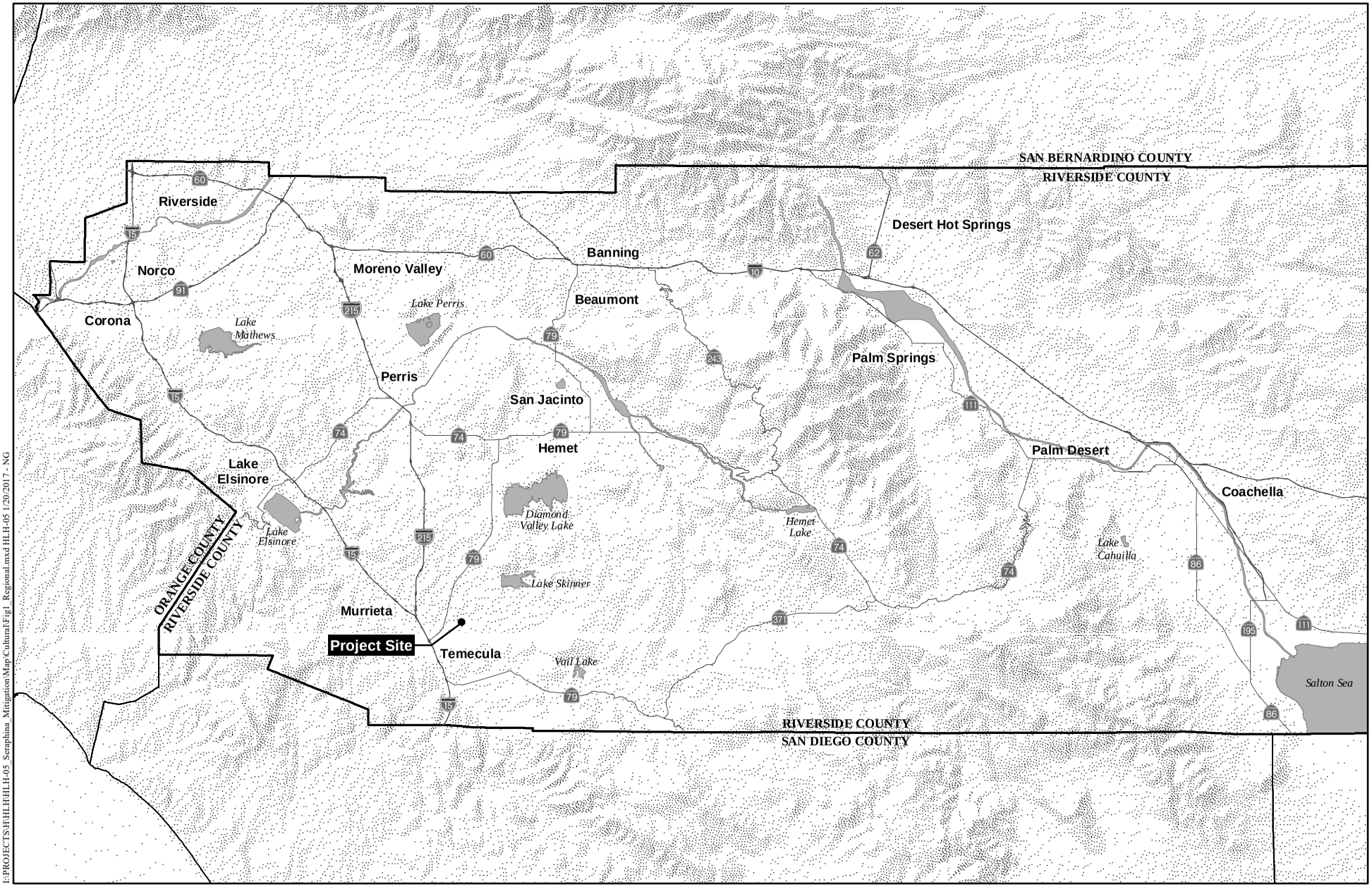
Kristina Davison
Staff Archaeologist

Mary Robbins-Wade, RPA
Director of Cultural Resources
Southern California

Enclosures:
Figure 1 Regional Location
Figure 2 Project Vicinity (USGS Topography)
Figure 3 Project Vicinity (Aerial Photograph)

Attachment A Mitigation Measures (Monitoring Program)

Confidential Appendices:
A Records Search Map
B Native American Correspondence



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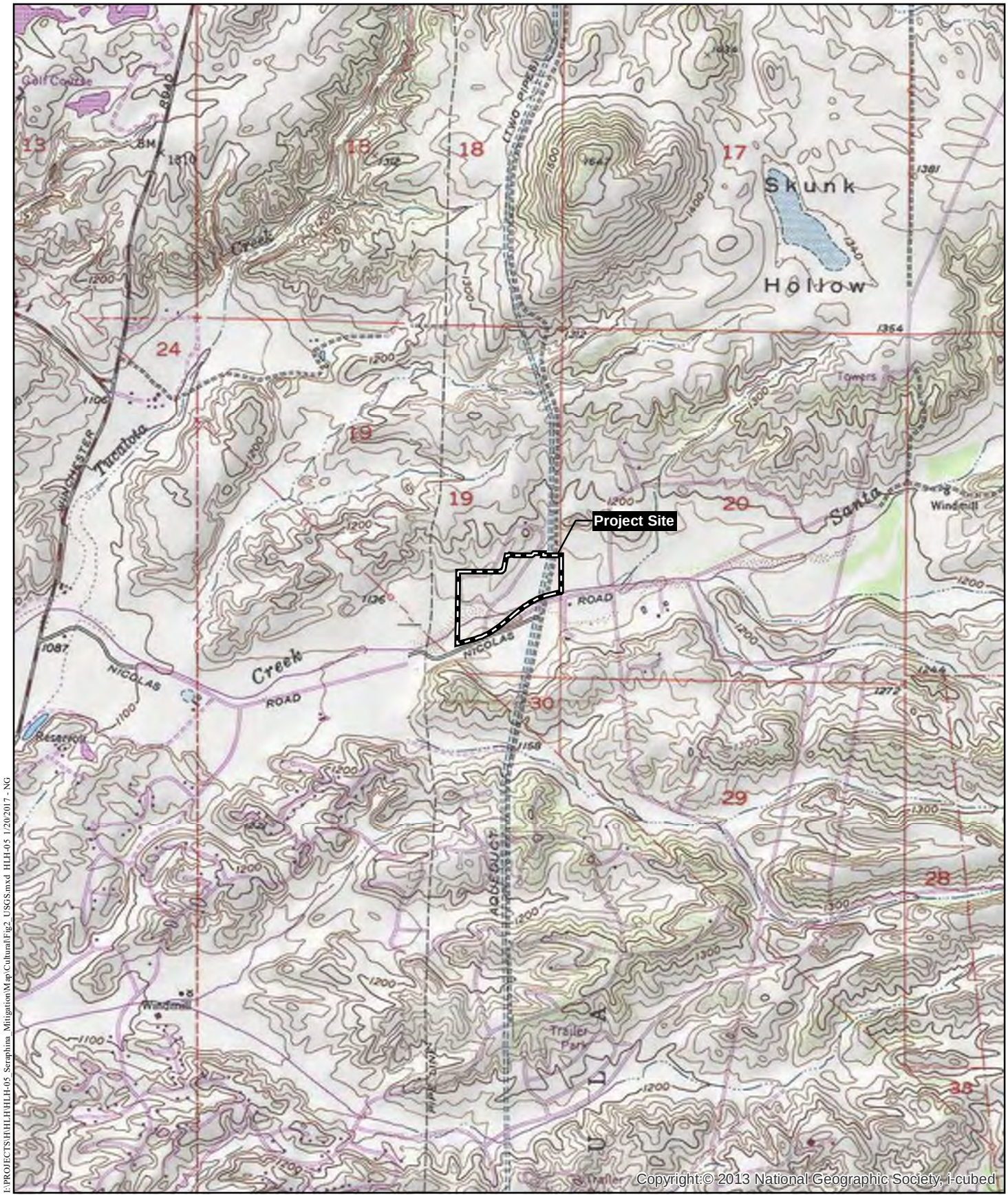
Regional Location

SERAPHINA

HELIX Environmental Planning

N 0 10 Miles

Figure 1



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Project Vicinity (USGS Topography)

SERAPHINA

HELIX Environmental Planning

N 0 2,000 Feet

Figure 2

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Project Vicinity (Aerial Photograph)

SERAPHINA

HELIX Environmental Planning

N 0 500 Feet

Figure 3

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Attachment A

MITIGATION MEASURES (MONITORING PROGRAM)

CULTURAL RESOURCES MITIGATION MEASURES

MM-CUL-1: The Applicant/Developer shall retain a qualified archaeologist who meets the Secretary of the Interior's Professional Qualifications Standards to oversee an archaeological monitor who shall be present during ground -disturbing activities for construction, including clearing/grubbing, grading, trenching, or any other construction excavation activity associated with the Project that is within soils in which cultural material could reasonably be expected. A Native American monitor from a Tribe traditionally culturally affiliated with the Project area shall be retained to monitor during all activities requiring an archaeological monitor. The frequency of monitoring shall be determined by the archaeological monitor and the Native American monitor, based on the rate of excavation and grading activities, proximity to known cultural resources, the materials being excavated (native versus fill or young versus old soils), the depth of excavation, and if found, the abundance and type of archaeological resources encountered. Excavations into formational material are not required to be monitored by the archaeologist, as these sediments are too old to contain archaeological resources. Full-time field observation can be reduced to part-time inspections or ceased entirely if determined adequate by the qualified archaeologist and the Native American monitor.

MM-CUL-2: In the event that archaeological resources are unearthed, ground-disturbing activities shall be halted or diverted away from the vicinity of the find so that the find can be evaluated. A buffer area of at least 25 feet shall be established around the find, in which construction activities shall not be allowed to continue until authorized by the qualified archaeologist and Native American monitor. Work shall be allowed to continue outside of the buffer area. All archaeological resources unearthed by Project construction activities shall be evaluated by a qualified archaeologist and a Native American monitor. The archaeologist and the Native American monitor shall coordinate with the City to develop an appropriate treatment plan for the resources if they are determined to be potentially eligible for the California Register of Historical Resources (CRHR) or potentially qualify as unique archaeological resources pursuant to CEQA. The treatment plan may include preservation in place (if feasible) and/or the implementation of archaeological data recovery excavations, along with subsequent laboratory processing and analysis. The City, in consultation with the archaeologist and the Native American monitor shall designate repositories that meet State standards to curate the archaeological material recovered. Project material shall be curated in accordance with the State Historical Resources Commission's *Guidelines for Curation of Archaeological Collections*.

MM-CUL-3: The archaeological monitor shall prepare a final report at the conclusion of archaeological monitoring. The report shall be submitted by the Applicant/Developer to the City, the Eastern Information Center, and representatives of other appropriate or concerned agencies to signify the satisfactory completion of the Project and required mitigation measures. The report shall include a description of resources unearthed, if any, treatment of the resources, and evaluation of the resources with respect to the CRHR.

MM-CUL-4: If human remains are encountered unexpectedly during implementation of the Project, State Health and Safety Code Section 7050.5 requires that no further disturbance occurs until the County Coroner has made the necessary findings as to origin and disposition pursuant to PRC Section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC shall then identify the person(s) thought to be the Most Likely Descendant (MLD). The MLD may inspect the site of the discovery of the Native American remains and may recommend

means for treating, with appropriate dignity, the human remains and any associated grave goods. The MLD shall complete inspection and make a recommendation within 48 hours of being granted access by the Applicant/Developer to inspect the discovery. The recommendation may include the scientific removal and nondestructive analysis of human remains and items associated with Native American burials.

Upon the discovery of the Native American remains, the Applicant/Developer shall ensure that the immediate vicinity where the Native American human remains are located, according to generally accepted cultural or archaeological standards or practices, are not damaged or disturbed by further development activity until the Applicant/Developer and the City have discussed and conferred, as described in the mitigation measure, with the MLD regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The Applicant/Developer shall discuss all reasonable options with the MLD regarding the MLD's preferences for treatment.

Whenever the NAHC is unable to identify an MLD, or the MLD identified fails to make a recommendation, or the Applicant/Developer or their authorized representative rejects the recommendation of the MLD and the mediation provided for in Subdivision (k) of PRC Section 5097.94, if invoked, fails to provide measures acceptable to the Applicant/Developer, the Applicant/Developer or authorized representative shall inter the human remains and items associated with Native American human remains with appropriate dignity on the property in a location not subject to further and future subsurface disturbances.

Appendix H

Geotechnical/Geological Engineering Study

EnGEN Corporation
• Soil Engineering and Consulting Services • Engineering Geology • Compaction Testing • Inspections • Construction Materials Testing • Laboratory Testing • Percolation Testing • Geology • Water Resource Studies • Phase I & II Environmental Site Assessments
ENVIRONMENTAL & GEOTECHNICAL ENGINEERING NETWORK

GEOTECHNICAL/GEOLOGICAL ENGINEERING STUDY

Carino Homes - Temecula
Assessor's Parcel Numbers: 957-080-014 and 957-080-019
Nicolas Road and Joseph Road
City of Temecula, County of Riverside, California
Project Number: T2995-GS

December 17, 2003

Prepared for:

Carino Homes
2010 65th Avenue West
Fircrest, Washington 98466

CORPORATE OFFICE 41607 Enterprise Circle North, Suite 1, Temecula, CA 92590 • phone: (909) 296-2230 • fax: (909) 296-2237
ORANGE COUNTY OFFICE 2615 Orange Avenue, Santa Ana, CA 92707 • phone: (714) 546-4051 • fax: (714) 546-4052
WEB SITE: www.engencorp.com • E-MAIL: engencorp@engencorp.com

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ENVIRONMENTAL & GEOTECHNICAL ENGINEERING NETWORK

December 17, 2003

Carlno Homes
2010 65th Avenue West
Fircrest, Washington 98466
(253) 565-6090 / FAX (253) 565-4610

Attention: Mr. Gordon Hulst

Regarding: **GEOTECHNICAL/GEOLOGICAL ENGINEERING STUDY**
Carlno Homes - Temecula
Assessor's Parcel Numbers: 957-080-014 and 957-080-019
Nicholas Road and Joseph Road
City of Temecula, County of Riverside, California
Project Number: T2995-GS

Reference: 1. **Apex Engineering,** *Seraphina Development,* Conceptual Grading and Utility Plan, Scale: 1" = 80', plan dated November 12, 2003.

Dear Mr. Hulst:

According to your request and signed authorization, we have performed a Geotechnical/ Geological Engineering Study for the subject project. The purpose of this study was to evaluate the existing geologic and geotechnical conditions within the subject property with respect to recommendations for rough grading of the site and design recommendations for foundations, slabs on-grade, etc., for the proposed development. Submitted, herewith, are the results of this firm's findings and recommendations, along with the supporting data.

1.0 EXECUTIVE SUMMARY

A geotechnical study of the subsurface conditions of the subject site has been performed for the proposed development. Exploratory excavations have been completed and earth material samples subjected to laboratory testing. The data has been analyzed with respect to the project information furnished to us for the proposed development. It is the opinion of this firm that the proposed development is feasible from a geotechnical/geologic standpoint, provided that the recommendations presented in this report are followed in the design and construction of the project.

CORPORATE OFFICE 41607 Enterprise Circle North, Suite 1, Temecula, CA 92590 • phone: (909) 296-2230 • fax: (909) 296-2237
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WEB SITE: www.engencorp.com • E-MAIL: engencorp@engencorp.com

The flat lower elevations of the site consist of alluvium. The upper portions of the alluvium may be subject to hydroconsolidation. These materials need to be removed and recompacted in order to maintain tolerable settlement predictions. Based on our experience in the general vicinity, the Pauba Formation bedrock can contain significant amounts of expansive clays which may become exposed during grading.

2.0 INTRODUCTION

2.1 **Authorization:** This report presents the results of the geotechnical engineering study performed on the subject site for the proposed development. Authorization to perform this study was in the form of a signed proposal.

2.2 **Scope of Work:** The scope of work performed for this study was designed to determine and evaluate the surface and subsurface conditions within the subject site with respect to geotechnical characteristics, and to provide recommendations and criteria for use by the design engineers and architect for the development of the site and for design and construction of the proposed development. The scope of work included the following: site reconnaissance and surface geologic mapping; subsurface exploration; sampling of on-site earth materials; laboratory testing; engineering analysis of field and laboratory data; and the preparation of this report.

2.3 **Previous Site Studies:** No previous geotechnical studies are known by this firm to have been performed for this site.

3.0 PROPOSED DEVELOPMENT / PROJECT DESCRIPTION

Final grading plans were unavailable at the time of this report. When these plans become available, they should be reviewed by this office in order to make additional recommendations, if necessary. It is assumed that residential lots are planned with one or two story, slab-on-grade type structures with associated landscape and hardscape improvements. It is assumed that relatively light loads will be imposed on the foundation soils. The foundation loads are not anticipated to exceed 2,000 pounds per lineal foot (plf) for continuous footings. The above project description and assumptions were used as the basis for the field and laboratory exploration and testing programs and the engineering analysis for the conclusions and recommendations presented in this report. This office should be notified if structures, foundation loads, grading, and/or details other than those

represented herein are proposed for final development of the site so a review can be performed, supplemental evaluation made, and revised recommendations submitted, if required.

4.0 SITE DESCRIPTION

4.1 **Location:** The site encompasses approximately 31-acres and is located north of Nicholas Road, south of Rita Way and Jons Place, east of Joseph Road and Seraphina Road, in the City of Temecula, County of Riverside, California.

4.2 **Legal Description:** Assessor's Parcel Numbers: 957-080-014 and 957-080-019.

4.3 **Topography:** The majority of the site is relatively flat. Low rolling hills are located in the center and northern portions of the site. Drainage on site is to the south by sheet flow. The Santa Gertrudis Creek is located on the south side of the site; the creek flows to the west.

4.4 **Vegetation:** At the time of the field study, the site had a moderate cover of grasses and weeds. Brush was located along the Santa Gertrudis Creek.

4.5 **Structures:** A mobile home and several garages and sheds were located in the central-northern portion of the site. Several cars, trucks and pieces of equipment were stored in this area. It is assumed that the mobile home may be serviced by a septic system.

5.0 FIELD STUDY

Field reconnaissance and geologic mapping were conducted on November 6, 2003, by our Geologist. A study of the property's subsurface condition was performed to evaluate underlying earth strata and the presence of groundwater. Six (6) exploratory borings were excavated on the study site. The borings were performed by **Martini Drilling** using a CME 75 truck-mounted drill rig equipped with 7.0-inch outside diameter hollow-stem augers. The maximum depth explored was approximately 51.5-feet below the existing ground surface at the boring locations. Bulk and relatively undisturbed ring samples of the earth materials encountered were obtained at various depths in the exploratory borings and returned to our soils laboratory for verification of field classifications and testing. Bulk samples were obtained from cuttings developed during the excavation process and represent a mixture of the soils within the depth indicated on the logs. Relatively

undisturbed samples of the earth materials encountered were obtained by driving a thin-walled steel sampler lined with 1.0-inch high, 2.42-inch inside diameter brass rings. The sampler was driven with successive drops of a 140-pound weight having a free fall of approximately 30-inches. The blow counts for each successive 6.0-inches of penetration, or fraction thereof, are shown in the Geotechnical Boring Logs presented in the Appendix. The ring samples were retained in close-fitting moisture-proof containers and returned to our laboratory for testing. The approximate locations of the exploratory borings and pits are denoted on the Geotechnical Site Plan (Plate 1). The exploratory borings were backfilled with native soil cuttings.

6.0 LABORATORY TESTING

6.1 **General:** The results of laboratory tests performed on samples of earth material obtained during the field investigation are presented in the Appendix. Following is a listing and brief explanation of the laboratory tests which were performed. The samples obtained during the field investigation will be discarded 30 days after the date of this report. This office should be notified immediately if retention of samples will be needed beyond 30 days.

6.2 **Classification:** The field classification of soil materials encountered in the exploratory borings were verified in the laboratory in general accordance with the Unified Soils Classification System, ASTM D 2488-93, Standard Practice for Determination and Identification of Soils (Visual-Manual Procedures). The final classification is shown in the Geotechnical Boring Logs presented in the Appendix.

6.3 **In-Situ Moisture Content and Density Test:** The in-situ moisture content and dry density were determined in general accordance with ASTM D 2216-98 and ASTM D 2937-94 procedures, respectively, for each selected undisturbed sample obtained. The dry density is determined in pounds per cubic foot and the moisture content is determined as a percentage of the oven dry weight of the soil. Test results are shown in the Geotechnical Boring Logs presented in the Appendix.

6.4 **Maximum Dry Density / Optimum Moisture Content Relationship Test:** Maximum dry density/optimum moisture content relationship determinations were performed on samples of near-surface earth material in general accordance with ASTM D 1557-00 procedures using a 4.0-inch diameter mold. Samples were prepared at various moisture contents and compacted in five (5) layers using a 10-pound weight dropping 18-inches and with 25

blows per layer. A plot of the compacted dry density versus the moisture content of the specimens is constructed and the maximum dry density and optimum moisture content determined from the plot.

6.5 **Consolidation Test:** Settlement predictions of the on-site soil and compacted fill behavior under load were made, based on consolidation tests that were performed in general accordance with ASTM D 2435-96 procedures. The consolidation apparatus is designed to receive a 1.0-inch high, 2.416-inch diameter ring sample. Porous stones are placed in contact with the top and bottom of each specimen to permit addition and release of pore water and pore pressure. Loads normal to the face of the specimen are applied in several increments in a geometric progression under both field moisture and submerged conditions. The resulting changes in sample thickness are recorded at selected time intervals. Water was added to the test apparatus at various loads to create a submerged condition and to measure the collapse potential (hydroconsolidation) of the sample. The resulting change in sample thickness was recorded.

6.6 **Direct Shear Test:** Direct shear tests were performed on selected samples of near-surface earth material in general accordance with ASTM D 3080-98 procedures. The shear machine is of the constant strain type. The shear machine is designed to receive a 1.0-inch high, 2.416-inch diameter ring sample. Specimens from the sample were sheared at various pressures normal to the face of the specimens. The specimens were tested in a submerged condition. The maximum shear stresses were plotted versus the normal confining stresses to determine the shear strength (cohesion and angle of internal friction).

6.7 **Expansion Test:** Laboratory expansion tests were performed on samples of near-surface earth material in general accordance with the Uniform Building Code (UBC) Standard. In this testing procedure, a remolded sample is compacted in two (2) layers in a 4.0-inch diameter mold to a total compacted thickness of approximately 1.0-inch by using a 5.5-pound weight dropping 12-inches and with 15 blows per layer. The sample is compacted at a saturation between 49 and 51 percent. After remolding, the sample is confined under a pressure of 144 pounds per square foot (psf) and allowed to soak for 24 hours. The resulting volume change due to the increase in moisture content within the sample is recorded and the Expansion Index (EI) calculated.

6.8 **Plasticity Index:** Liquid limit and plastic limit testing was performed on samples of near-surface earth material. The tests were performed in general conformance with ASTM D 4318-98 procedures. The material tested has a Plasticity Index of 9.

6.9 **Soluble Sulfate Test:** Samples of near-surface earth material were obtained for soluble sulfate testing for the site. The concentration of soluble sulfates was determined in general conformance with California Test Method 417 procedures. The test results indicate a low percentage of water-soluble sulfates (less than 0.001% by weight). As a result, no sulfate resistance concretes are considered necessary.

7.0 ENGINEERING GEOLOGY

7.1 **Geologic Setting:** The site is located in the Northern Peninsular Range on the southern sector of the structural unit known as the Perris Block. The Perris Block is bounded on the northeast by the San Jacinto Fault Zone, on the southwest by the Elsinore Fault Zone, and on the north by the Cucamonga Fault Zone. The southern boundary of the Perris Block is not as distinct, but is believed to coincide with a complex group of faults trending southeast from the Murrieta, California area. The Peninsular Range is characterized by large Mesozoic age intrusive rock masses flanked by volcanic, metasedimentary, and sedimentary rocks. Various thicknesses of colluvial/alluvial sediments derived from the erosion of the elevated portions of the region fill the low-lying areas. Undocumented fill, alluvium and Pauba Formation sandstone underlie the subject property. The earth materials encountered on the subject site are described in more detail in subsequent sections of this report.

7.2 **Faulting:** The site is not located within an Alquist-Priolo Earthquake Fault Zone (Hart and Bryant, 1997, updated 1999). No known active faults traverse the property. The nearest active faults to the site are described below.

7.2.1 **Elsinore Fault Zone:** The Elsinore Fault Zone – Temecula Segment is located approximately 6.3 kilometers (3.9 miles) southwest of the site. The Elsinore Fault Zone – Julian segment is located 20.9 kilometers (13 miles) southeast of the site. The Elsinore Fault Zone – Glen Ivy Segment is located 23.8 kilometers (14.8 miles) northwest of the site. The Elsinore Fault Zone is a prominent and youthful structural boundary between the Perris Block to the northeast and the Santa Ana mountains block to the southwest. The Elsinore Fault system is a major right lateral strike-slip fault system that has experienced

strong earthquakes in historical times, (1856, 1894, and 1910), and exhibits Holocene movement.

7.2.2 **San Jacinto Fault Zone:** The San Jacinto Fault is located approximately 29.1 kilometers (18.1 miles) northeast of the site. The San Jacinto Fault Zone trends northwest-southeast and is a major right lateral strike-slip fault, which has displayed surface rupture and associated seismic ground shaking in 1899, 1918, 1923, 1934, 1937, 1942, and 1954.

7.3 **Seismicity:** The project lies within an active area of faulting and seismicity in the Southern California region. This predominance of seismic activity has been associated with the San Jacinto Fault Zone along its southeast section in the vicinity of the Salton Sea, and within the northwest portion near its junction with the San Andreas Fault Zone. The predominance of the remaining recorded activity has been associated with the San Andreas Fault Zone. A list of faults within 62 miles (100 kilometers) of the site are shown on Table A in the Appendix. Based on computer software by Thomas F. Blake (EQSEARCH, Blake 2000b), the maximum peak ground acceleration experienced at the site since 1800 was approximately 0.28g from a magnitude 6.8 earthquake in 1918.

Although no known active faults exist within the project limits, the site will experience ground motion and effects from earthquakes generated along active faults located off-site.

To estimate the potential ground shaking, EnGEN Corporation has analyzed the seismic parameters using the probabilistic ground motion analysis. The probabilistic ground motion analysis requires information regarding fault geometry, the magnitude of the maximum credible earthquake on each fault, and the regional attenuation equation, which relates the considered seismic parameters to the magnitude and the source-site distance.

To perform this analysis EnGEN Corporation utilized the computer software FRISKSP developed by Thomas F. Blake (Blake, 2000c).

The attenuation relationships by Boore et al. (1997) for soil type SD (stiff soil – shear wave velocity 250 m/s) was utilized. For a complete discussion of the software and probabilistic methods the reader is referred to Blake (2000c).

The intensity of ground shaking at a given location depends primarily upon the earthquake magnitude, distance from the source (epicenter), and the site response characteristics. The Elsinore Fault – Temecula Segment is potentially capable of

producing the most intense horizontal ground acceleration at the site, due to its proximity and associated maximum credible earthquake magnitude of 6.8. Such an earthquake near the site could produce seismic shaking with an estimated maximum credible peak horizontal ground acceleration of 0.50g. This horizontal acceleration has a 10 percent chance of being exceeded in 50 years. The maximum credible earthquake is the maximum earthquake that appears capable of occurring under the presently known tectonic framework.

In sum, these results are based on many unavoidable geological and statistical uncertainties, but are consistent with current standard-of-practice. As engineering seismology evolves, and as more fault-specific geological data are gathered, more certainty and different methodologies may also evolve.

7.4 **Earth Materials:** A brief description of the earth materials encountered in the exploratory excavations is presented in the following sections. A more detailed description of the earth materials encountered is presented on the Geotechnical Boring Logs presented in the Appendix. The earth material strata as shown on the logs represent the conditions in the actual exploratory locations and other variations may occur between the excavations. Lines of demarcation between the earth materials on the logs represent the approximate boundary between the material types; however, the transition may be gradual.

7.4.1 **Undocumented Fill (Afu):** Undocumented fill was encountered in the central and western portions of the site, and is approximately 2 to 4-feet thick in these areas. It is assumed that minor fills on the order of 1 to 2-feet thick may be associated with the existing structures. An unknown thickness of fill exists in the Metropolitan Water District easement in the eastern portion of the site. The undocumented fill consists of silty fine-grained sand and was found to be dry to moist and loose to dense in-place.

7.4.2 **Alluvium (Qal):** Alluvial materials were encountered to a depth of approximately 7-feet bgs in Boring B-5, to depths of 23 to 35-feet in Borings B-1, B-2 and B-3 and to the maximum depth explored in Borings B-4 and B-6 (31.5-feet and 11.5-feet, respectively). Alluvial materials consist of poorly graded fine- to coarse-grained sands, silty fine- to medium-grained sands and clayey sands that were found to be dry to wet and loose to dense in-place.

7.4.3 **Pauba Formation Sandstone (Qps):** The Pauba Formation underlies the site and is exposed on the north-central portion of the site. On-site the Pauba Formation consists of medium-grained sandstone, silty fine-grained sandstone, sandy siltstone, clayey siltstone and silty claystone. The Pauba Formation was found to be moist and was stiff to hard and medium dense to very dense in place.

7.5 **Groundwater:** Groundwater was encountered directly above bedrock at a depth of 28-feet in Borings B-1, B-2 and B-4. Borings B-3, B-5 and B-6 were shallow, and therefore they did not encounter groundwater. The regional groundwater in the vicinity has been reported to occur much deeper. The cooperative well measuring program reports that State Well No. 7S3W25E01 (Rancho California Water District No. 108), which lies approximately one mile west of the site, has a surface elevation of 1073.9-feet and the depth to water was 305.98-feet on April 28, 2002.

7.6 **Liquefaction Evaluation:** Liquefaction is a phenomenon where a sudden large decrease of shearing resistance takes place in fine-grained cohesionless and/or low plasticity cohesive soils due to the cyclic stresses produced by earthquakes causing a sudden, but temporary, increase of porewater pressure. The increased porewater pressure occurs below the water table, but can cause propagation of groundwater upward into overlying soil and possibly to the ground surface and cause sand to boil as excess porewater escapes. Potential hazards due to liquefaction include significant total and/or differential settlements of the ground surface and structures as well as possible collapse of structures due to loss of support of foundations. It has been shown by laboratory testing and from the analysis of soil conditions at sites where liquefaction has occurred that the soil types most susceptible to liquefaction are saturated, fine sand to sandy silt with a mean grain size ranging from approximately 0.075 mm to 0.5 mm. These soils derive their shear strength from intergranular friction and do not drain quickly during earthquakes. Published studies and field and laboratory test data indicate that coarse sands and silty or clayey sands beyond the above-mentioned grain size range are considerably less vulnerable to liquefaction. To a large extent, the relative density of the soil also controls the susceptibility to liquefaction for a given number of cycles and acceleration levels during a seismic event. Other characteristics such as confining pressure and the stresses created within the soil during a seismic event also affect the liquefaction potential of a site. Liquefaction of soil does not generally occur at depths of 40 to 50-feet below ground

surface due to the confining pressure at that depth. The potential for liquefaction of the site is considered to be moderate to high due to the following conditions:

- The existence of nearby major active faults may cause exceptionally high ground accelerations at the site.
- The fine-grained nature (fine- to medium-grained silty sands, medium-grained poorly graded sands, sandy silts) of the earth materials encountered makes them susceptible to liquefaction.
- Low to medium relative densities of some of the in-situ soils above and below the groundwater table.
- Relatively shallow (up to 28-feet bgs) presence of groundwater.

The total potential settlement in the event of liquefaction has been calculated at 4.0-inches.

The proposed 7-foot minimum blanket of engineered fill in the alluvial areas (See Section 8.2.5) is expected to aid in mitigating the potential effects of liquefaction to within tolerable limits.

7.7 **Secondary Effects of Seismic Activity:** The secondary effects of seismic activity normally considered as possible hazards to a site include various types of ground failure and seismically induced flooding. Since there are no nearby confined large bodies of water, seismically-induced flooding and earthquake-induced surface flooding due to seiches is considered low. Due to its distance form the Pacific Ocean, the probability of tsunamis is considered low. The probability of occurrence of each type of ground failure depends on the severity of the earthquake, the distance of the site from the zone of maximum energy release of the quake, the topography of the site, the subsurface materials at the site, and groundwater conditions beneath the site, besides other factors. Since there are no active faults on the site, the probability of hazards due to fault ground rupture is considered low. Due to the overall favorable geologic structure of the area, the potential for earthquake-induced landslides is considered low.

8.0 CONCLUSIONS AND RECOMMENDATIONS

8.1 **General:** The conclusions and recommendations presented in this report are based on the results of field and laboratory data obtained from the exploratory excavations located across the property, experience gained from work conducted by this firm on projects within the general vicinity, and the project description and assumptions presented in the Proposed Development/Project Description section of this report. Based on a review of the field and laboratory data and the engineering analysis, the proposed development is feasible from a geotechnical/geologic standpoint. The actual conditions of the near-surface supporting material across the site may vary. The nature and extent of variations of the surface and subsurface conditions between the exploratory excavations may not become evident until construction. If variations of the material become evident during construction of the proposed development, this office should be notified so that EnGEN Corporation can evaluate the characteristics of the material and, if needed, make revisions to the recommendations presented herein. Recommendations for general site grading, foundations, slab support, pavement design, slope maintenance, etc., are presented in the subsequent paragraphs.

8.2 Earthwork Recommendations

8.2.1 **General:** The grading recommendations presented in this report are intended for: 1) the use of a conventional shallow foundation system and concrete slabs cast on-grade; and 2) the rework of unsuitable near-surface earth materials to create an engineered building pad and suitable support for exterior hardscape (sidewalks, patios, etc.) and pavement. If pavement subgrade soils are prepared at the time of rough grading of the building site and the areas are not paved immediately, additional observations and testing of the subgrade soil will have to be performed before placing aggregate base material or asphaltic concrete or PCC pavement to locate areas which may have been damaged by construction traffic, construction activities, and/or seasonal wetting and drying. The following recommendations may need to be modified and/or supplemented during rough grading as field conditions require.

8.2.2 **Clearing:** All debris, roots, grasses, weeds, brush and other deleterious materials should be removed from the proposed structure, exterior hardscape and pavement areas and areas to receive structural fill before grading is performed. No discing or mixing of organic

material into the soils should be performed. Man-made objects encountered should be overexcavated and exported from the site.

8.2.3 **Excavation Characteristics:** Excavation and trenching within the alluvium is anticipated to be relatively easy. Excavation within the bedrock will be more difficult, due to higher densities. However, the bedrock in the immediate vicinity has been excavated by conventional grading equipment.

8.2.4 **Suitability of On-Site Materials as Fill:** In general, the on-site earth materials present are considered suitable for reuse as fill. Fill materials should be free of significant amounts of organic materials and/or debris. Fill materials should not contain rocks greater than 6-inches in maximum diameter in the upper 5.0-feet of fill.

8.2.5 **Removal and Recompaction:** All existing undocumented fills and/or unsuitable, loose, or disturbed near-surface soil, man-made objects and vegetation in areas which will support structural fills, structures, exterior hardscape (sidewalks, patios, etc.), and pavement should be removed. As stated above, final grading plans were not available at the time of this report. When these plans become available, they should be reviewed by this office in order to make additional recommendations, if necessary. The following recommendations are based on field and laboratory results:

1. All undocumented fills should be removed.
2. After undocumented fills have been removed, the removals in alluvial (Qal) areas should be made to a minimum depth of 7-feet below existing grades in fill areas and 7-feet below proposed grades in cut areas, or to competent bedrock if alluvial areas are less than 7-feet deep.
3. Weathered bedrock (Qps) should be removed to competent bedrock. The anticipated depth of removal is 1 to 2-feet.
4. All exposed removal and overexcavation bottoms should be inspected by the Geotechnical Engineer's Representative prior to placement of any fill. An approved bottom should be relatively free of porous material that could potentially hydrocollapse. Undisturbed alluvial bottoms should meet a minimum of 85 percent relative compaction.

5. The approved exposed bottoms of all removal areas should be scarified 12-inches, brought to near optimum moisture content, and compacted to a minimum of 90 percent relative compaction before placement of fill. Maximum dry density and optimum moisture content for compacted materials should be determined according to ASTM D 1557-00 procedures.

6. Where cut/fill transitions exist beneath a structure, the cut and shallow fill portions should be overexcavated. The depth of overexcavation should be half the maximum fill thickness beneath the structure with a minimum of 3-feet. The overexcavation should extent beyond the structure a distance equal to the depth of overexcavation, with a minimum of 5-feet.

7. If expansive materials are exposed during grading, selective grading may be considered an option. If selective grading is desired, expansive materials should be placed deeper than 3-feet below finish grade.

8. Geologic contacts as shown on the attached site plan are approximate. Final determination of removal and overexcavation depths should be made during grading.

8.2.6 **Fill Placement Requirements:** All fill material, whether on-site material or import, should be approved by the Project Geotechnical Engineer and/or his representative before placement. All fill should be free of vegetation, organic material, and debris. Oversized material should be disposed of in accordance with Section 8.2.7. Import fill should be no more expansive than the existing on-site material. Approved fill material should be placed in horizontal lifts not exceeding 10-inches in compacted thickness and watered or aerated to obtain near optimum moisture content (±2.0 percent of optimum). Each lift should be spread evenly and should be thoroughly mixed to ensure uniformity of soil moisture. Structural fill should meet a minimum relative compaction of 90 percent. Maximum dry density and optimum moisture content for compacted materials should be determined in accordance with ASTM D 1557-00 procedures. Moisture content of fill materials should not vary more than 2.0 percent from optimum, unless approved the Project Geotechnical Engineer.

8.2.7 **Oversize Material:** Oversize material is defined as rock, or other irreducible material with a maximum dimension greater than 12-inches shall not be buried or placed in fill unless

location, materials, and placement methods are specifically accepted by the Project Geotechnical Engineer. Placement operations shall be such that nesting of oversize material does not occur, and such that the oversize material is completely surrounded by compacted fill (windrow). Alternative methods, such as water jetting or wheel rolling with a backhoe may be required to achieve compaction in the fill materials immediately adjacent to the windrow. Oversize material shall not be placed within ten (10) vertical feet of finish grade, within fifteen (15) lateral feet of a finished slope face, or within two (2) feet of future utilities.

8.2.8 **Compaction Equipment:** It is anticipated that fill compaction for the project will be achieved by the use of a combination of rubber-tired and track-mounted heavy equipment Compaction by rubber-tired or track-mounted equipment, by itself, may not be sufficient. Adequate water trucks, water pulls, and/or other suitable equipment should be available to provide sufficient moisture and dust control. The actual selection of equipment is the responsibility of the contractor performing the work and should be such that uniform and proper compaction of the fill is achieved.

8.2.9 **Shrinkage and Subsidence:** There will be a material loss due to the clearing and grubbing operations. Shrinkage of alluvium that is excavated and replaced as compacted fill should be anticipated. It is estimated that the average shrinkage of these soils will be on the order of 15 percent, based on fill volumes when compacted to a minimum of 90 percent relative compaction. A higher relative compaction would mean a larger shrinkage value.

8.2.10 **Fill Slopes:** Finish fill slopes should not be inclined steeper than 2:1 (horizontal to vertical). Fill slope surfaces should be compacted to 90 percent relative compaction based on a maximum dry density for the soil as determined by ASTM D 1557-00 procedures to the face of the finished slope. Fill slopes should be constructed in a skillful manner so that they are positioned at the design orientations and slope ratio. Achieving a uniform slope surface by subsequent thin wedge filling should be avoided. Any add-on correction to a fill slope should be conducted under the observation and recommendations of the Project Geotechnical Engineer. The proposed add-on correction procedures should be submitted in writing by the contractor prior to commencement of corrective grading and reviewed by the Project Geotechnical Engineer. Compacted fill slopes should be backrolled with suitable equipment for the type of soil being used during fill placement at

intervals not exceeding 4.0 feet in vertical height. As an alternative to the backrolling of the fill slopes, over-filling of the slopes will be considered acceptable and preferred. The fill slope should be constructed by over-filling with compacted fill a minimum of 3.0 feet horizontally, and then trimmed back to exposed the dense inner core of the slope surface.

8.2.11 **Cut Slopes:** All cut slopes should not be inclined steeper than 2:1 (horizontal to vertical). Steeper cut slopes of 1.5:1 will probably be acceptable but will require slope stability analysis to verify stability once grading plans become available. All cut slopes should be inspected by the engineering geologist to check for any adverse conditions. Cut slopes with adverse conditions may require flattening or buttressing to maintain stability.

8.2.12 **Keyways:** A keyway excavated into competent bedrock should be constructed at the toe of all fill slopes that are proposed on natural grades of 5:1 (horizontal to vertical) or steeper. Keyways should be a minimum of 15-feet wide (equipment width) and tilted a minimum of 2 percent into the hillside. A series of level benches should be constructed into competent bedrock on natural grades of 5:1 (horizontal to vertical) or steeper prior to placing fill.

8.2.13 **Subdrains:** Although the need for subdrains is not anticipated at this time, final recommendations should be made during grading by the Project Geologist.

8.2.14 **Observation and Testing:** During grading, observation and testing should be conducted by the Geotechnical Engineer and/or his representative to verify that the grading is being performed according to the recommendations presented in this report. The Project Geotechnical Engineer and/or his representative should observe the scarification and the placement of fill and should take tests to verify the moisture content, density, uniformity and degree of compaction obtained. Where testing demonstrates insufficient density, additional compaction effort, with the adjustment of the moisture content where necessary, should be applied until retesting shows that satisfactory relative compaction has been obtained. The results of observations and testing services should be presented in a formal Finish Grading Report following completion of the grading operations. Grading operations undertaken at the site without the Geotechnical Engineer and/or his representative present may result in exclusions of the affected areas from the finish grading report for the project. The presence of the Geotechnical Engineer and/or his representative will be for the purpose of providing observations and field testing and will not include any supervision or

directing of the actual work of the contractor or the contractor's employees or agents. Neither the presence and/or the non-presence of the Geotechnical Engineer and/or his field representative nor the field observations and testing shall excuse the contractor in any way for defects discovered in the contractor's work.

8.2.15 **Soil Expansion Potential:** Upon completion of fine grading of the building pad, near-surface samples should be obtained for expansion potential testing to identify the expansion potential for each lot and assign appropriate foundation and slab-on-grade recommendations for construction. The results of recent testing indicate a very low to low expansion potential (Expansion Index (EI) = 18 to 31). Based on our experience in the general vicinity, the Pauba Formation can contain significant amounts of expansive clays. Mixing of these clays during grading could affect the overall EI of the fill. Final foundation design parameters should be based on EI testing of near-surface soils and be performed at the conclusion of rough grading.

8.2.16 **Plasticity Index:** The following parameters may be used for preliminary design purposes. Upon completion of grading near-surface samples should be obtained in order to make appropriate foundation and slab-on-grade recommendations.

Expansion Index	Liquid Limit	Plastic Limit	Plasticity Index
31	36	27	9

8.3 **Foundation Design Recommendations:**

8.3.1 **General:** Foundations for the proposed structure may consist of conventional column footings and continuous wall footings founded upon either a minimum of 18-inches of properly compacted fill or competent bedrock (but not a combination of both). The recommendations presented in the subsequent paragraphs for foundation design and construction are based on geotechnical characteristics and a low expansion potential for the supporting soils and are not intended to preclude more restrictive structural requirements. The Structural Engineer for the project should determine the actual footing width and depth to resist design vertical, horizontal, and uplift forces.

8.3.2 **Foundation Size:** Continuous footings should have a minimum width of 12-inches. Continuous footings should be continuously reinforced with a minimum of one (1) No. 4 steel reinforcing bar located near the top and one (1) No. 4 steel reinforcing bar located

near the bottom of the footings to minimize the effects of slight differential movements which may occur due to minor variations in the engineering characteristics or seasonal moisture change in the supporting soils. Final foundation size and reinforcing should be determined based on the expansive potential of the supporting soils. Column footings should have a minimum width of 18-inches by 18-inches and be suitably reinforced, based on structural requirements. A grade beam, founded at the same depths and reinforced the same as the adjacent footings, should be provided across doorways, garage or any other types of perimeter openings.

8.3.3 **Depth of Embedment:** Exterior and interior footings founded in properly compacted fill or competent bedrock should extend to a minimum depth of 12-inches below lowest adjacent finish grade for single story structures and 18-inches for two story structures. Deeper footings may be necessary for expansive soils purposes, depending on the final determination of lot specific expansive potential.

8.3.4 **Bearing Capacity:** Provided the recommendations for site earthwork, minimum footing width, and minimum depth of embedment for footings are incorporated into the project design and construction, the allowable bearing value for design of continuous and column footings for the total dead plus frequently-applied live loads is 2,000 psf for continuous footings and 2,000 psf for column footings in properly compacted fill. Footings founded entirely in competent bedrock may be designed for an allowable bearing value of 3,000 psf. The allowable bearing value has a factor of safety of at least 3.0 and may be increased by 33.3 percent for short durations of live and/or dynamic loading such as wind or seismic forces.

8.3.5 **Settlement:** Footings designed according to the recommended bearing values and the maximum assumed wall and column loads are not expected to exceed a maximum settlement of 0.75-inch or a differential settlement of 0.50-inch in properly compacted fill under static load conditions.

Total settlement due to possible liquefaction, however, has been calculated at 4.0-inches. Due to the minimum 7-feet of engineered fill proposed beneath the structures in alluvial areas, it is our opinion that differential settlement due to possible liquefaction will be minimized and may be considered, for design purposes, to be 50 percent of the total settlement, that is 2.0-inches, across the maximum dimension of a typical residence,

which falls well within the normally acceptable limits of 2-inches in 40-feet. In addition, the Project Structural Engineer should consider whether or not an additional safety factor would be prudent in the design of roof ties in an effort to reduce the potential for collapse and promote the intent of "acceptable level of risk" performance as described in CDMG Special Publication 117 and Title 14 of the California Code of Regulations.

8.3.6 **Lateral Capacity:** Additional foundation design parameters for resistance to static lateral forces, are as follows:

Allowable Lateral Pressure (Equivalent Fluid Pressure), Passive Case:
Compacted Fill or Bedrock – 250 pcf

Allowable Coefficient of Friction:
Compacted Fill or Bedrock - 0.35

Lateral load resistance may be developed by a combination of friction acting on the base of foundations and slabs and passive earth pressure developed on the sides of the footings and stem walls below grade when in contact with properly compacted fill or competent native earth materials. The above values are allowable design values and have safety factors of at least 2.0 incorporated into them and may be used in combination without reduction in evaluating the resistance to lateral loads. The allowable values may be increased by 33.3 percent for short durations of live and/or dynamic loading, such as wind or seismic forces. For the calculation of passive earth resistance, the upper 1.0-foot of material should be neglected unless confined by a concrete slab or pavement. The maximum recommended allowable passive pressure is 5.0 times the recommended design value.

8.3.7 **Seismic Design Parameters:** The following seismic design factors apply:

Design Fault: Elsinore Fault – Temecula Segment
Fault Type: Type B Fault
Closest Distance to Fault: 6.3 Km
Soil Profile Type: SD

8.4 **Slab-on-Grade Recommendations:** The recommendations for concrete slabs, both interior and exterior, excluding PCC pavement, are based upon the expansion potential for the supporting material. Concrete slabs should be designed to minimize cracking as a result of shrinkage. Joints (isolation, contraction, and construction) should be placed in accordance with the American Concrete Institute (ACI) guidelines. Special precautions

should be taken during placement and curing of all concrete slabs. Excessive slump (high water / cement ratio) of the concrete and/or improper curing procedures used during either hot or cold weather conditions could result in excessive shrinkage, cracking, or curling in the slabs. It is recommended that all concrete proportioning, placement, and curing be performed in accordance with ACI recommendations and procedures.

8.4.1 **Interior Slabs:** Interior concrete slabs-on-grade should be a minimum of 4.0-inches nominal in thickness and be underlain by a 1.0 to 2.0-inches of clean coarse sand or other approved granular material placed on properly prepared subgrade per the Earthwork Recommendations Section of this report. Minimum slab reinforcement should consist of No. 3 reinforcing bars placed 24-inches on center, or a suitable equivalent, as determined by the Project Structural Engineer. Final lot identification and slab construction requirements will be presented in the compaction report upon completion of grading. It is essential that the reinforcing be placed at mid-depth in the slab. The concrete section and/or reinforcing steel should be increased appropriately for anticipated excessive or concentrated floor loads. In areas where moisture sensitive floor coverings are anticipated over the slab, we recommend that a polyethylene vapor barrier with a minimum of 6.0 mil in thickness be placed beneath the slab. The moisture barrier should be overlapped or sealed at splices and covered top and bottom by a 1.0 to 2.0 inch minimum layer of clean, moist (not saturated) sand to aid in concrete curing and to minimize potential punctures.

8.4.2 **Exterior Slabs:** All exterior concrete slabs cast on finish subgrade (patios, sidewalks, etc., with the exception of PCC pavement) should be a minimum of 4.0-inches nominal in thickness and should be underlain by a minimum of 12.0-inches of soil that has been prepared in accordance with the Earthwork Recommendation section of this report. Reinforcing in the slabs and the use of a compacted sand or gravel base beneath the slabs should be according to the current local standards. Subgrade soils should be moisture conditioned to at least optimum moisture content to a depth of 12.0-inches and proof compacted to a minimum of 90 percent relative compaction based on ASTM D 1557-00 procedures immediately before placing the concrete.

8.5 **Pavement Design Recommendations:** The following recommendations for the structural pavement section for the proposed parking and driveway areas for the subject development are presented for preliminary design purposes only. The pavement section has been determined in general accordance with the Standard Specifications for Public

Works Construction (Green Book) and is based on an assumed Traffic Index (TI) and an assumed R-Value of 5. The R-Value of any imported fill material may vary from the assumed value thereby changing the proposed pavement section design. The sections listed below for reference purposes are calculated minimum based on varying Traffic Indexes:

Traffic Index	Calculated Section
5.0	3-inches Asphaltic Concrete over 10.0-inches Aggregate Base, placed on properly prepared subgrade.
5.5	3-inches Asphaltic Concrete over 12.0-inches Aggregate Base, placed on properly prepared subgrade.
6.0	3-inches Asphaltic Concrete over 14.0-inches Aggregate Base, placed on properly prepared subgrade.
6.5	3-inches Asphaltic Concrete over 16.0-inches Aggregate Base, placed on properly prepared subgrade.
7.0	3-inches Asphaltic Concrete over 17.5-inches Aggregate Base, placed on properly prepared subgrade.

Asphalt concrete pavement materials should be as specified in Sections 203-6 of the Standard Specifications for Public Works Construction (Green Book) or a suitable equivalent. Aggregate base should conform to 3/4-inch crushed aggregate base as specified in Section 200-2.2 of Standard Specifications for Public Works Construction (Green Book) or a suitable equivalent. The subgrade soil, including utility trench backfill, should be compacted to at least 90 percent relative compaction. The aggregate base material should be compacted to at least 95 percent relative compaction. Maximum dry density and optimum moisture content for subgrade and aggregate base materials should be determined according to ASTM D 1557-00 procedures. If pavement subgrade soils are prepared at the time of rough grading of the building site and the areas are not paved immediately, additional observations and testing will have to be performed before placing aggregate base material, asphaltic concrete, or PCC pavement to locate areas that may have been damaged by construction traffic, construction activities, and/or seasonal wetting and drying. In the proposed pavement areas, soil samples should be obtained at the time the subgrade is graded for R-Value testing according to California Test Method 301 procedures to verify the pavement design recommendations.

8.6 **Utility Trench Recommendations:** Utility trenches within the zone of influence of foundations or under building floor slabs, exterior hardscape, and/or pavement areas should be backfilled with properly compacted soil. All utility trenches within the building pad and extending to a distance of 5.0-feet beyond the building exterior footings should be backfilled with on-site or similar soil. Where interior or exterior utility trenches are proposed to pass beneath or parallel to building, retaining wall, and/or decorative concrete block perimeter wall footings, the bottom of the trench should not be located below a 1:1 plane projected downward from the outside bottom edge of the adjacent footing unless the utility lines are designed for the footing surcharge loads. It is recommended that all utility trenches excavated to depths of 5.0-feet or deeper be cut back according to the Temporary Construction Excavation Recommendations section of this report or be properly shored during construction. Backfill material should be placed in a lift thickness appropriate for the type of backfill material and compaction equipment used. Backfill material should be compacted to a minimum of 90 percent relative compaction by mechanical means. Jetting or flooding of the backfill material will not be considered a satisfactory method for compaction unless the procedures are reviewed and approved in writing by the Project Geotechnical Engineer. Maximum dry density and optimum moisture content for backfill material should be determined according to ASTM D 1557-00 procedures.

8.7 **Finish Lot Drainage Recommendations:** Positive drainage should be established away from the tops of slopes, the exterior walls of structures, the back of retaining walls, and the decorative concrete block perimeter walls. Finish lot surface gradients in unpaved areas should be provided next to tops of slopes and buildings to guide surface water away from foundations and slabs and from flowing over the tops of slopes. The surface water should be directed toward suitable drainage facilities. Ponding of surface water should not be allowed next to structures or on pavements. In unpaved areas, a minimum positive gradient of 4.0 percent away from the structures and tops of slopes for a minimum distance of 3.0-feet and a minimum of 1.0 percent pad drainage off the property in a nonerosive manner should be provided. Landscape trees and plants with high water needs should be planted at least 5.0-feet away from the walls of the structures. Downspouts from roof drains should discharge to a surface which slopes away from the structure a minimum of 5.0-feet from the exterior building walls. In no case should

downspouts from roof drains discharge into planter areas immediately adjacent to the building unless there is positive drainage away from the structure at a minimum gradient of 2.0 percent, directed onto a permanent all-weather surface or subdrain system.

8.8 **Planter Recommendations:** Planters around the perimeter of the structures should be designed to ensure that adequate drainage is maintained and minimal irrigation water is allowed to percolate into the soils underlying the buildings.

8.9 **Temporary Construction Excavation Recommendations:** Temporary construction excavations for rough grading, foundations, retaining walls, utility trenches, etc., more than 5.0-feet in depth and to a maximum depth of 15-feet should be properly shored or cut back to the following inclinations:

Earth Material	Inclination
Alluvium	1.5:1
Compacted Fill or Bedrock	1:1

No surcharge loads (spoil piles, earthmoving equipment, trucks, etc.) should be allowed within a horizontal distance measured from the top of the excavation slope equal to 1.5 times the depth of the excavation. Excavations should be initially observed by the project Geotechnical Engineer, Geologist and/or their representative to verify the recommendations presented or to make additional recommendations to maintain stability and safety. Moisture variations, differences in the cohesive or cementation characteristics, or changes in the coarseness of the deposits may require slope flattening or, conversely, permit steepening upon review by the project Geotechnical Engineer, Geologist, or their representative. Deep utility trenches may experience caving which will require special considerations to stabilize the walls and expedite trenching operations. Surface drainage should be controlled along the top of the slope to preclude erosion of the slope face. If excavations are to be left open for long periods, the slopes should be sprayed with a protective compound and/or covered to minimize drying out, raveling, and/or erosion of the slopes. For excavations more than 5.0-feet in depth which will not be cut back to the recommended slope inclination, the contractor should submit to the owner and/or the owner's designated representative detailed drawings showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection. If the drawings do not vary from the requirements of the OSHA Construction Safety Orders (CAL OSHA or FED OSHA, whichever is applicable for the project at the time of construction), a

statement signed by a registered Civil or Structural Engineer in the State of California, engaged by the contractor at his expense, should be submitted certifying that the contractor's excavation safety drawings comply with OSHA Construction Orders. If the drawings vary from the applicable OSHA Construction Safety Orders, the drawings should be prepared, signed, and sealed by a Registered Civil or Structural Engineer in the State of California. The contractor should not proceed with any excavations until the project owner or his designated representative has received and acknowledged the properly prepared excavation safety drawings.

8.10 **Retaining Wall Recommendations:**

8.10.1 **Earth Pressures:** Retaining walls backfilled with non-expansive granular soil (EI=0) or very low expansive potential materials (Expansion Index of 20 or less) within a zone extending upward and away from the heel of the footing at a slope of 0.5:1 (horizontal to vertical) or flatter can be designed to resist the following static lateral soil pressures:

Condition	Level Backfill	2:1 Slope
Active	30 pcf	45 pcf
At Rest	60 pcf	--

Walls that are free to deflect 0.01 radian at the top may be designed for the above-recommended active condition. Walls that need to be restricted from such movement should be assumed rigid and designed for the at-rest condition. The above values assume well-drained backfill and no buildup of hydrostatic pressure. Surcharge loads, dead and/or live, acting on the backfill within a horizontal distance behind the wall should also be considered in the design.

8.10.2 **Foundation Design:** Retaining wall footings should be founded to the same depths into properly compacted fill, or firm, competent, undisturbed, natural soil as standard foundations and may be designed for the same average allowable bearing value across the footing (as long as the resultant force is located in the middle one-third of the footing),and with the same allowable static lateral bearing pressure and allowable sliding resistance as previously recommended. When using the allowable lateral pressure and allowable sliding resistance, a factor of safety of 1.5 should be achieved.

8.10.3 **Subdrain:** A subdrain system should be constructed behind and at the base of all retaining walls to allow drainage and to prevent the buildup of excessive hydrostatic pressures. Typical subdrains may include weep holes with a continuous gravel gallery, perforated pipe surrounded by filter rock, or some other approved system. Gravel galleries and/or filter rock, if not properly designed and graded for the on-site and/or import materials, should be enclosed in a geotextile fabric such as Mirafi 140N, Supac 4NP, or a suitable substitute in order to prevent infiltration of fines and clogging of the system. The perforated pipes should be at least 4.0-inches in diameter. Pipe perforations should be placed downward. Gravel filters should have volume of at least 1.0 cubic foot per lineal foot of pipe. Subdrains should maintain a positive flow gradient and have outlets that drain in a non-erosive manner. In the case of subdrains for basement walls, they need to empty into a sump provided with a submersible pump activated by a change in the water level.

8.10.4 **Backfill:** Backfill directly behind retaining walls (if backfill width is less than 3-feet) may consist of 0.5 to 0.75-inch diameter, rounded to subrounded gravel enclosed in a geotextile fabric such as Mirafi 140N, Supac 4NP, or a suitable substitute or a clean sand (Sand Equivalent Value greater than 50) water jetted into place to obtain proper compaction. If water jetting is used, the subdrain system should be in place. Even if water jetting is used, the sand should be densified to a minimum of 90 percent relative compaction. If the specified density is not obtained by water jetting, mechanical methods will be required. If other types of soil or gravel are used for backfill, mechanical compaction methods will be required to obtain a relative compaction of at least 90 percent of maximum dry density. Backfill directly behind retaining walls should not be compacted by wheel, track or other rolling by heavy construction equipment unless the wall is designed for the surcharge loading. If gravel, clean sand or other imported backfill is used behind retaining walls, the upper 18-inches of backfill in unpaved areas should consist of typical on-site material compacted to a minimum of 90 percent relative compaction in order to prevent the influx of surface runoff into the granular backfill and into the subdrain system. Maximum dry density and optimum moisture content for backfill materials should be determined in accordance with ASTM D 1557-00 procedures.

9.0 PLAN REVIEW

Subsequent to formulation of final plans and specifications for the project, but before bids for construction are requested, grading plans for the proposed development should be reviewed by EnGEN Corporation to verify compatibility with site geotechnical conditions and conformance with the recommendations contained in this report. If EnGEN Corporation is not accorded the opportunity to make the recommended review, we will assume no responsibility for misinterpretation of the recommendations presented in this report.

10.0 PRE-BID CONFERENCE

It may be desirable to hold a pre-bid conference with the owner or an authorized representative, the Project Architect, the Project Civil Engineer, the Project Geotechnical Engineer, and the proposed contractors present. This conference will provide continuity in the bidding process and clarify questions relative to the grading and construction requirements of the project.

11.0 PRE-GRADING CONFERENCE

Before the start of grading, a conference should be held with the owner or an authorized representative, the contractor, the Project Architect, the Project Civil Engineer, and the Project Geotechnical Engineer present. The purpose of this meeting should be to clarify questions relating to the intent of the grading recommendations and to verify that the project specifications comply with the recommendations of this geotechnical engineering report. Any special grading procedures and/or difficulties proposed by the contractor can also be discussed at that time.

12.0 CONSTRUCTION OBSERVATIONS AND TESTING

Rough grading of the property should be performed under engineering observation and testing performed by EnGEN Corporation. Rough grading includes, but is not limited to, overexcavation cuts, fill placement, and excavation of temporary and permanent cut and fill slopes. In addition, EnGEN Corporation should observe all foundation excavations. Observations should be made before installation of concrete forms and/or reinforcing steel to verify and/or modify the conclusions and recommendations in this report. Observations

of overexcavation cuts, fill placement, finish grading, utility or other trench backfill, pavement subgrade and base course, retaining wall backfill, slab presaturation, or other earthwork completed for the subject development should be performed by EnGEN Corporation. If the observations and testing to verify site geotechnical conditions are not performed by EnGEN Corporation, liability for the performance of the development is limited to the actual portions of the project observed and/or tested by EnGEN Corporation. If parties other than EnGEN Corporation are engaged to perform soils and materials observations and testing, they must be notified that they will be required to assume complete responsibility for the geotechnical aspects of the project by concurring with the recommendations in this report or providing alternative recommendations. Neither the presence of the Geotechnical Engineer and/or his field representative, nor the field observations and testing, shall excuse the contractor in any way for defects discovered in the contractor's work. The Geotechnical Engineer and/or his representative shall not be responsible for job or project safety. Job or project safety shall be the sole responsibility of the contractor.

13.0 CLOSURE

This report has been prepared for use by the parties or project named or described in this document. It may or may not contain sufficient information for other parties or purposes. In the event that changes in the assumed nature, design, or location of the proposed development as described in this report are planned, the conclusions and recommendations contained in this report will not be considered valid unless the changes are reviewed and the conclusions and recommendations of this report modified or verified in writing. This study was conducted in general accordance with the applicable standards of our profession and the accepted geotechnical engineering principles and practices at the time this report was prepared. No other warranty, implied or expressed beyond the representations of this report, is made. Although every effort has been made to obtain information regarding the geotechnical and subsurface conditions of the site, limitations exist with respect to the knowledge of unknown regional or localized off-site conditions which may have an impact at the site. The recommendations presented in this report are valid as of the date of the report. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or to the works

of man on this and/or adjacent properties. If conditions are observed or information becomes available during the design and construction process which are not reflected in this report, **EnGEN Corporation** should be notified so that supplemental evaluations can be performed and the conclusions and recommendations presented in this report can be modified or verified in writing. This report is not intended for use as a bid document. Any person or company using this report for bidding or construction purposes should perform such independent studies and explorations as he deems necessary to satisfy himself as to the surface and subsurface conditions to be encountered and the procedures to be used in the performance of the work on this project. Changes in applicable or appropriate standards of care or practice occur, whether they result from legislation or the broadening of knowledge and experience. Accordingly, the conclusions and recommendations presented in this report may be invalidated, wholly or in part, by changes outside the control of **EnGEN Corporation** which occur in the future.

Thank you for the opportunity to provide our services. If we can be of further service or you should have questions regarding this report, please contact this office at your convenience.

Respectfully submitted,
EnGEN Corporation

Colby Matthews
Staff Geologist

Osbjorn Bratene, GE 162
President
Expires 09-30-05

Ramon Chavez, CEG 1599
Certified Engineering Geologist
Expires 09-30-05

CERTIFIED ENGINEERING GEOLOGIST
RAMON CHAVEZ
No. CEG 1599
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
OSBJORN BRATENE
No. 162
GEOTECHNICAL
STATE OF CALIFORNIA

CMR/RC/OB:hh

Distribution: (4) Addressee

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APPENDIX

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TABLE A - DISTANCE TO STATE DESIGNATED ACTIVE FAULTS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE MI	(Km)	MAXIMUM EARTHQUAKE MAG (Mw)
Elsinore – Temecula	3.9	6.3	6.8
Elsinore – Julian	13.0	20.9	7.1
Elsinore – Glen Ivy	14.8	23.8	6.8
San Jacinto – San Jacinto Valley	18.1	29.1	6.9
San Jacinto – Anza	18.1	29.1	7.2
Newport – Inglewood (Offshore)	30.8	49.5	6.9
Chino – Central Avenue (Elsinore)	32.4	52.2	6.7
Rose Canyon	33.4	53.7	6.9
San Jacinto – San Bernardino	33.5	53.9	6.7
San Andreas – Southern	35.4	56.9	7.4
San Andreas – San Bernardino	35.4	56.9	7.3
San Jacinto – Coyote Creek	35.9	57.7	6.8
Whittier	36.7	59.1	6.8
Earthquake Valley	39.8	64.1	6.5
Pinto Mountain	42.4	68.3	7.0
San Andreas – Coachella	45.9	73.9	7.1
Newport – Inglewood (L.A. Basin)	46.4	74.7	6.9
Coronado Bank	47.7	76.8	7.4
Cucamonga	47.9	77.1	7.0
North Frontal Fault Zone (West)	48.2	77.5	7.0
Elysian Park Thrust	49.9	80.3	6.7
Palos Verdes	49.9	81.0	7.1
North Frontal Fault Zone (West)	50.4	81.1	6.7
Burnt Mountain	51.2	82.4	6.4
Cleghorn	51.3	82.5	6.5
San Jose	51.3	82.6	6.5
Compton Thrust	52.1	83.9	6.8
Sierra Madre	53.7	86.4	7.0
Eureka Peak	54.1	87.0	6.4
San Andreas – Mojave	58.1	93.5	7.1
San Andreas – 1857 Rupture	58.1	93.5	7.8
San Jacinto – Borrego	58.4	94.0	6.6
Landers	59.1	95.1	7.3
Helendale – S. Lockhardt	59.1	95.1	7.1
Elsinore – Coyote Mountain	59.2	95.2	6.8

POTENTIAL SETTLEMENT DUE TO LIQUEFACTION CALCULATIONS

BORING NO. 1

Layer No.	Depth Range (ft)	SPT	$(N_1)_{60}$	FS	Ev %	Layer Thickness (ft)	ΔH (Inches)
1	0-4.5	16	28	>1.5	Non-liquefiable (H_2O)	4.5	0
2	4.5-7	11	20	>1.5	Non-liquefiable (H_2O)	2.5	0
3	7-13	8	10	>1.5	Non-liquefiable (H_2O)	6	0
4	13-18	10	15	0.40	2.5	5	1.5-inches
5	18-23	14	23	>1.5	Non-liquefiable (Fines)	5	0
6	23-28	18	22	0.55	1.9	5	1.1-inches
7	28-33	16	17	0.45	2.4	5	1.4-inches

Total ΔH = 4.0-inches
Differential ΔH = 2.0-inches

* Water is set at 13-feet (Groundwater actually encountered at 28-feet)
* Non-liquefiable (H20) = non-liquefiable due to lack of groundwater.
* Non-liquefiable (Fines) = non-liquefiable due to clay content in excess of 15 percent.

EXPLORATORY BORING LOG SUMMARIES
(B-1 through B-6)

GEOTECHNICAL BORING LOG

Project Number: T2995-GS
Boring Number: B-1
Date: 11-6-03

Project: Carino Homes
Surface Elevation: 1139
Logged By: C.M.

Elevation	Soil Graphic	Description	Sampler	Sample Depth	USCS	Blow Count	Dry Density	In-Situ Moisture Content	Maximum Density	Optimum Moisture Content
1139		ALLUVIUM		0						
1136.5		Silty fine sand, yellowish brown, dry, medium dense.			SM	6-8-8		5.9		9.7
1134		Silty fine to medium sand, yellowish brown, dry, medium dense.		5	SM	4-6-5		2.4		9.7
1131.5		Fine to medium sand, yellowish brown, moist, loose.			SP	3-3-4		3.0		
1129		Medium to coarse sand, yellowish brown, moist, loose.		10	SP	4-3-5		3.3		
1124		Medium to coarse sand, yellowish brown, overlying silty fine sand, grayish brown, moist, medium dense.		15	SP-SM	5-6-4		7.3		
1119		Clayey medium sand, yellowish brown, moist, medium dense.		20	SC	3-6-8		10.8		
1114		Silty fine to medium sand, yellowish brown, moist, medium dense.		25	SP	6-8-10		11.3		
1111		GROUNDWATER at 28 to 33 feet.								
1109		Medium sand, yellowish brown, wet, medium dense.		30	SP	6-8-8		9.3		
1106		BEDROCK - PAUBA FORMATION								
1104		Silty claystone, olive gray, moist, firm, with caliche.		35	CL	2-4-6		49.6		

Notes:

GEOTECHNICAL BORING LOG

Project Number: T2995-GS
Boring Number: B-1
Date: 11-6-03

Project: Carino Homes
Surface Elevation: 1139
Logged By: C.M.

Elevation	Soil Graphic	Description	Sampler	Sample Depth	USCS	Blow Count	Dry Density	In-Situ Moisture Content	Maximum Density	Optimum Moisture Content
1099		Sandy siltstone, olive gray, moist, very hard, some caliche.		40	ML	5-8-11		33.5		
1094		Clayey siltstone, olive gray, wet, very hard, with caliche.		45	ML	4-20-11		39.1		
1089		Silty fine sandstone, olive brown, moist, medium dense.		50	SM	4-10-17		16.1		
1087.5		Total Depth 51.5 feet GROUNDWATER encountered at 28 to 33 feet.		55						
				60						
				65						
				70						

Notes:

GEOTECHNICAL BORING LOG

Project Number: T2995-GS
Boring Number: B-2
Date: 11-6-03

Project: Carino Homes
Surface Elevation: 1143
Logged By: C.M.

Elevation	Soil Graphic	Description	Sampler	Sample Depth	USCS	Blow Count	Dry Density	In-Situ Moisture Content	Maximum Density	Optimum Moisture Content
1143		ALLUVIUM		0						
1140.5		Silty fine sand, brown, dry, dense, slightly porous.			SM	22-15-22	108.7	7.1	129.0	9.7
1138		Silty fine sand, brown, moist, medium dense.		5	SM	8-11-11	108.9	3.2		
1135.5		Fine to medium sand, yellowish brown, moist, medium dense.			SP	7-10-14	115.3	3.8		
1133		Medium sand, yellowish brown, moist, medium dense.		10	SP	7-9-11	111.1	3.0		
1128		Medium to coarse sand, yellowish brown, moist, medium dense.		15	SP	7-9-11	105.1	5.7		
1123		Medium sand, yellowish brown, moist, medium dense.		20	SP	10-14-19	117.8	9.7		
1118		Clayey medium sand, few pieces of gravel, dark yellowish brown, moist, loose.		25	SC	5-6-6	103.2	15.1		
1115		GROUNDWATER at 28 to 33 feet.								
1113		Medium sand, yellowish brown, wet, medium dense.		30	SP	10-13-9	103.2	8.4		
1110		BEDROCK - PAUBA FORMATION								
1105		Silty fine sandstone, olive gray, moist, very dense.		35	SM	18-5 for 6"	118.2	14.5		

Notes:-

GEOTECHNICAL BORING LOG

Project Number: T2995-GS
Boring Number: B-2
Date: 11-6-03

Project: Carino Homes
Surface Elevation: 1143
Logged By: C.M.

Elevation	Soil Graphic	Description	Sampler	Sample Depth	USCS	Blow Count	Dry Density	In-Situ Moisture Content	Maximum Density	Optimum Moisture Content
1103		Medium sandstone, yellowish brown, moist, very dense.		40	SP	16-36-50 for 5"	116.2	8.2		
1101.5		Total Depth 41.5 feet. GROUNDWATER at 28 to 33 feet.								
				45						
				50						
				55						
				60						
				65						
				70						

Notes:

GEOTECHNICAL BORING LOG

Project Number: T2995-GS
Boring Number: B-3
Date: 11-6-03

Project: Carino Homes
Surface Elevation: 1146
Logged By: C.M.

Elevation	Soil Graphic	Description	Sampler	Sample Depth	USCS	Blow Count	Dry Density	In-Situ Moisture Content	Maximum Density	Optimum Moisture Content
1146		ALLUVIUM		0						
1143.5		Silty fine sand, brown, moist, medium dense, slightly porous.			SM	13-13-9	102.8	8.1	123.1	11.0
1141				5	SM	6-10-13	101.0	7.6	123.1	11.0
1138.5		Yellowish brown, moist, medium dense, slightly porous.			SM	5-8-10	112.9	9.7		
1136		Loose, slightly porous.		10	SM	4-4-6	101.9	5.9		
1131		Fine to medium sand, overlying silty fine sand, yellowish brown, moist, medium dense.		15	SP-SM	6-7-9	107.6	12.3		
1126		Medium sand, trace clay, light yellowish brown, moist, dense.		20	SP	10-19-29	117.9	5.5		
1123		BEDROCK - PAUBA FORMATION								
1121		Silty fine sandstone, olive gray, moist, dense.		25	SM	13-23-30	120.2	13.8		
1116		Very dense.		30	SM	6-21-48	117.4	14.8		
1114.5		Total Depth 31.5 feet. No groundwater encountered.								
				35						

Notes:

GEOTECHNICAL BORING LOG

Project Number: T2995-GS
Boring Number: B-4
Date: 11-6-03

Project: Carino Homes
Surface Elevation: 1147
Logged By: C.M.

Elevation	Soil Graphic	Description	Sampler	Sample Depth	USCS	Blow Count	Dry Density	In-Situ Moisture Content	Maximum Density	Optimum Moisture Content
1147		ALLUVIUM		0						
1144.5		Silty fine sand, brown, dry, medium dense.			SM	16-14-16	104.9	8.9	123.1	11.0
1142		Yellowish brown, moist, medium dense, porous.		5	SM	7-8-8	103.8	4.8	123.1	11.0
1139.5		Medium to coarse sand, yellowish brown, dry, medium dense.			SP	7-8-11	109.3	2.4		
1137				10	SP	5-7-9	102.4	2.1		
1132		Silty fine to medium sand, dark yellowish brown, moist, medium dense.		15	SM	6-8-11	106.8	6.6		
1127		Silty fine sand, light grayish brown, moist, medium dense.		20	SM	5-14-12	111.1	12.1		
1122				25	SM	5-11-11	103.7	12.4		
1119		GROUNDWATER at 28 feet bgs.								
1117		Wet, loose.		30	SM	3-4-9	96.9	25.8		
1115.5		Total Depth 31.5 feet. GROUNDWATER encountered at 28 feet.								
				35						

Notes:

GEOTECHNICAL BORING LOG

Project Number: T2995-GS
Boring Number: B-5
Date: 11-6-03

Project: Carino Homes
Surface Elevation: 1154
Logged By: C.M.

Elevation	Soil Graphic	Description	Sampler	Sample Depth	USCS	Blow Count	Dry Density	In-Situ Moisture Content	Maximum Density	Optimum Moisture Content
1154		ALLUVIUM		0						
1151.5		Silty fine sand, dark yellowish brown, moist, medium dense.			SM	11-10-7	120.3	5.0		
1149		Loose.		5	SM	2-3-2	90.5	18.7		
1147		BEDROCK - PAUBA FORMATION								
1146.5		Clayey siltstone, tan to light gray, moist, very hard, with caliche.			ML	8-25-28	96.4	26.4		
1144				10	ML	19-22-30	87.7	31.7		
1142.5		Total Depth 11.5 feet. No groundwater encountered.								
				15						
				20						
				25						
				30						
				35						

Notes:

GEOTECHNICAL BORING LOG

Project Number: T2995-GS
Boring Number: B-6
Date: 11-6-03

Project: Carino Homes
Surface Elevation: 1138
Logged By: C.M.

Elevation	Soil Graphic	Description	Sampler	Sample Depth	USCS	Blow Count	Dry Density	In-Situ Moisture Content	Maximum Density	Optimum Moisture Content
1138		FILL		0						
1135.5		Silty fine sand, brown, moist, dense.			SM	14-18-22	126.6	7.9		
1133		ALLUVIUM Silty fine sand, brown, dry, medium dense, porous, rootlets.		5	SM	7-18-19	118.4	5.7	129.0	9.7
1130.5		Dense, slightly porous.			SM	10-18-22	125.8	9.1	129.0	9.7
1128		Yellowish brown, moist, medium dense, slightly porous.		10	SM	7-7-10	113.3	7.9		
1126.5		Boring terminated at a total depth of 11.5 feet. No groundwater.								
				15						
				20						
				25						
				30						
				35						

Notes:

KEY TO SYMBOLS

Symbol Description

Strata symbols

Silty sand

Poorly graded sand

Poorly graded sand with silt

Clayey sand

Low plasticity clay

Silt

Misc. Symbols

Bottom of boring

Boring continues

Water table during drilling

Soil Samplers

Standard penetration test

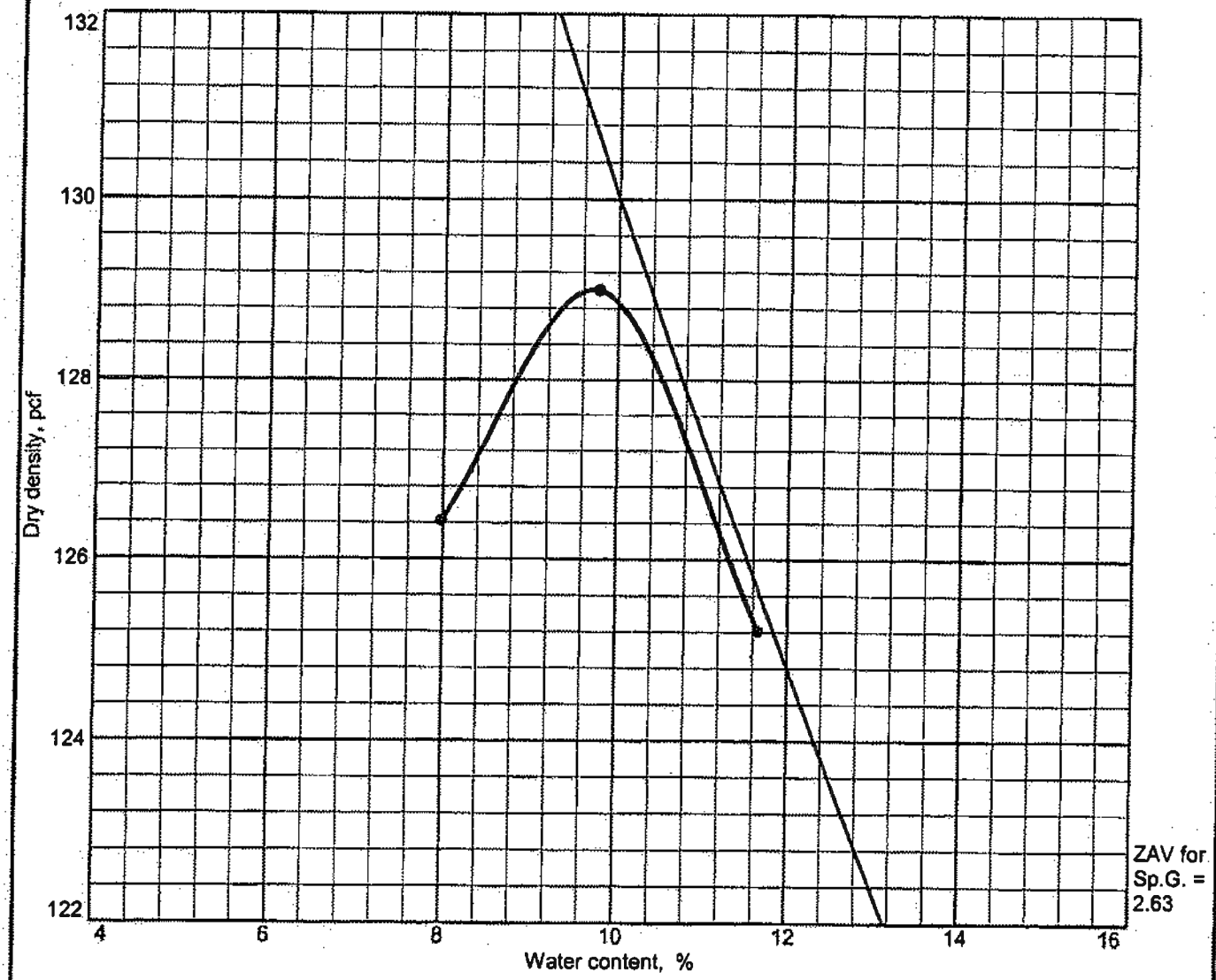
California sampler

Notes:

1. Exploratory borings were drilled on 11-6-03 using a 7-inch diameter continuous flight power auger.
2. Water was encountered at the time of drilling at the depths shown.
3. Boring locations were measured from existing features and elevations extrapolated from the final design plan.
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs.

LABORATORY TEST RESULTS

MOISTURE - DENSITY TEST REPORT



Test specification: ASTM D 1557-00 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SM		5.2					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 129.0 pcf Optimum moisture = 9.7 %	SILTY SAND,BROWN

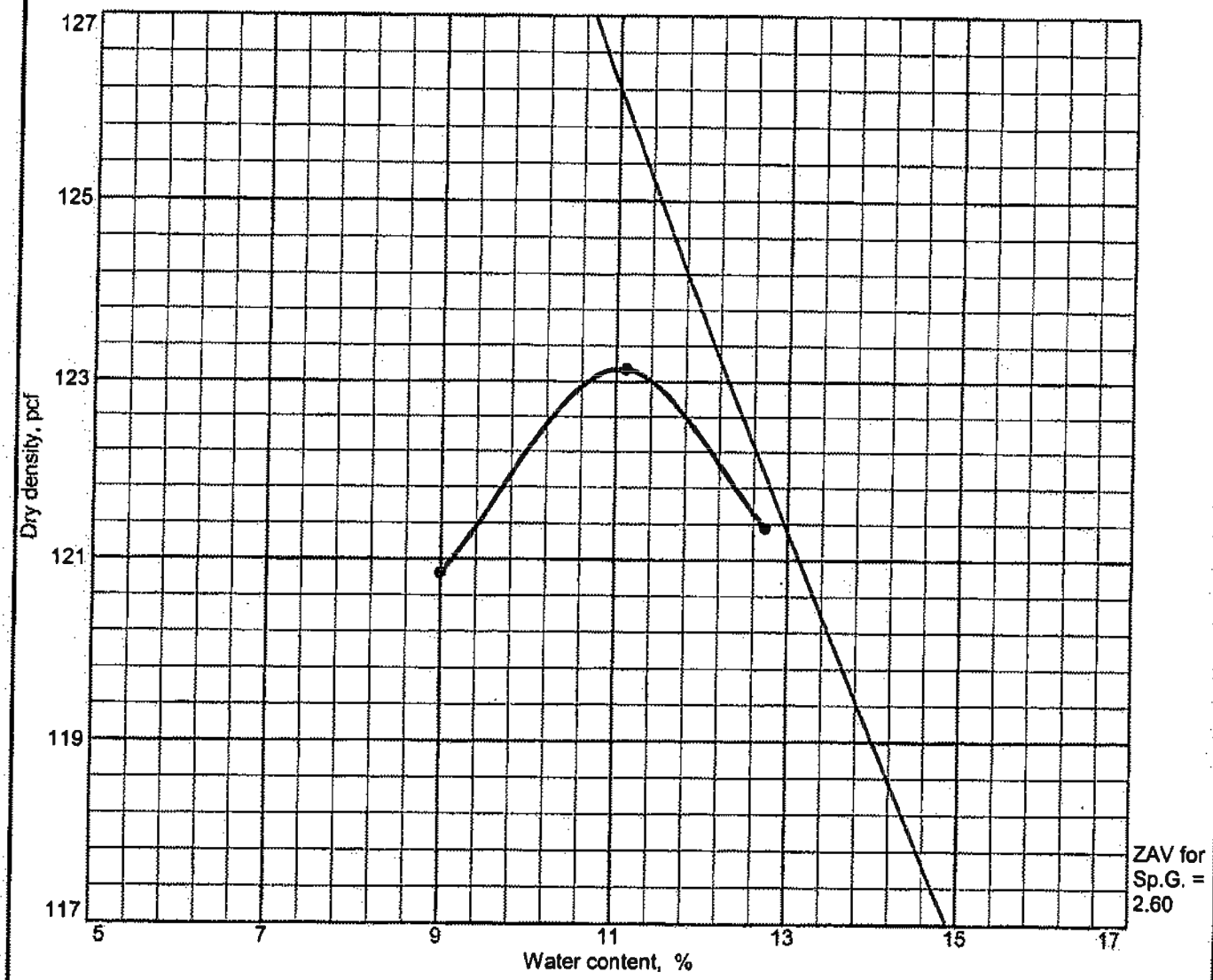
Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA
Location: NICOLAS ROAD

Remarks:
SAMPLE B1 @ 0-5
COLL BY CM
COLL ON 11-5-03

MOISTURE - DENSITY TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

MOISTURE - DENSITY TEST REPORT



Test specification: ASTM D 1557-00 Method A Modified

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO						
	SM		7.1					

TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 123.1 pcf Optimum moisture = 11.0 %	SILTY SAND,BROWN

Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA
Location: NICOLAS ROAD

Remarks:
SAMPLE B4 @ 0-5
COLL BY CM
COLL ON 11-6-03

MOISTURE - DENSITY TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

LABORATORY DATA SHEET - PLASTICITY INDEX

LIQUID LIMIT

SAMPLE NUMBER	B1 @ 0-5				
CONTAINER NUMBER	8				
NUMBER OF BLOWS	26				
(A) WET WEIGHT + TARE	25.65				
(B) DRY WEIGHT + TARE	22.98				
(C) TARE	15.66				
(D) DRY WEIGHT (B - C = D)	7.32				
(E) WEIGHT OF WATER (A - B = E)	2.67				
(F) UNCORRECTED LIQUID LIMIT (E / D = F)	36.0				
(G) CORRECTION FACTOR	1.005				
(H) CORRECTION LIQUID LIMIT (F x G = H)	36				

PLASTIC LIMIT

SAMPLE NUMBER	B1 @ 0-5				
CONTAINER NUMBER	7				
(I) WET WEIGHT + TARE	29.59				
(J) DRY WEIGHT + TARE	26.58				
(K) TARE	15.62				
(L) DRY WEIGHT (J - K = L)	10.96				
(M) WEIGHT OF WATER (I - J = M)	3.01				
(N) PLASTIC LIMIT (M / L = N)	27				

PLASTICITY INDEX

(H) LIQUID LIMIT	36				
(N) PLASTIC LIMIT	27				
(O) PLASTICITY INDEX (H - N = O)	9				

EnGEN Corporation	Project Name/Location: CORINO HOMES / NICOLAS ROAD	
LIQUID AND PLASTIC LIMIT DETERMINATIONS	Project No: T2995-GS	Sample No: B1 @ 0-5
	Sampled By:CM	Date: 11-12-03

UBC Laboratory Expansion Test Results

########

Job Number: T2995-GS
Job Name: CORINO HOMES
Location: NICOLAS ROAD
Sample Source: B4 @ 0-5
Sampled by: CM (11-6-03)
Lab Technician: JT
Sample Descr: SILTY SAND,BROWN

Wet Compacted Wt.:	621.5
Ring Wt.:	197.0
Net Wet Wt.:	424.5
Wet Density:	128.2
Wet Soil:	220.0
Dry Soil:	203.5
Initial Moisture (%):	8.1%
Initial Dry Density:	118.6
% Saturation:	52.0%
Final Wt. & Ring Wt.:	636.7
Net Final Wt.:	439.7
Dry Wt.:	392.7
Loss:	47.0
Net Dry Wt.:	390.1
Final Density:	117.8
Saturated Moisture:	12.1%

	Dial	Change	Time
Reading 1:	0.100	N/A	11:45
Reading 2:	0.099	-0.001	12:00
Reading 3:	0.100	0.000	12:15
Reading 4:	0.117	0.017	7-Nov

Expansion Index:	17
Adjusted Index:	18.0
(ASTM D 4832-95)	

EnGEN Corporation
41607 Enterprise Circle North
Temecula, CA 92590
(909) 296-2230
Fax: (909) 296-2237

UBC Laboratory Expansion Test Results

#######

Job Number: T2995-GS
Job Name: CORINO HOMES
Location: NICOLAS ROAD
Sample Source: B1 @ 0-5
Sampled by: CM (11-6-03)
Lab Technician: JT
Sample Descr: SILTY SAND,BROWN

Wet Compacted Wt.:	600
Ring Wt.:	185.9
Net Wet Wt.:	414.1
Wet Density:	125.1
Wet Soil:	222.3
Dry Soil:	203.6
Initial Moisture (%):	9.2%
Initial Dry Density:	114.5
% Saturation:	52.7%
Final Wt. & Ring Wt.:	631.1
Net Final Wt.:	445.2
Dry Wt.:	379.3
Loss:	65.9
Net Dry Wt.:	376.1
Final Density:	113.6
Saturated Moisture:	17.5%

	Dial	Change	Time
Reading 1:	0.100	N/A	11:45
Reading 2:	0.120	0.020	12:00
Reading 3:	0.125	0.025	12:15
Reading 4:	0.130	0.030	7-Nov

Expansion Index:	30
Adjusted Index:	31.5
(ASTM D 4832-95)	

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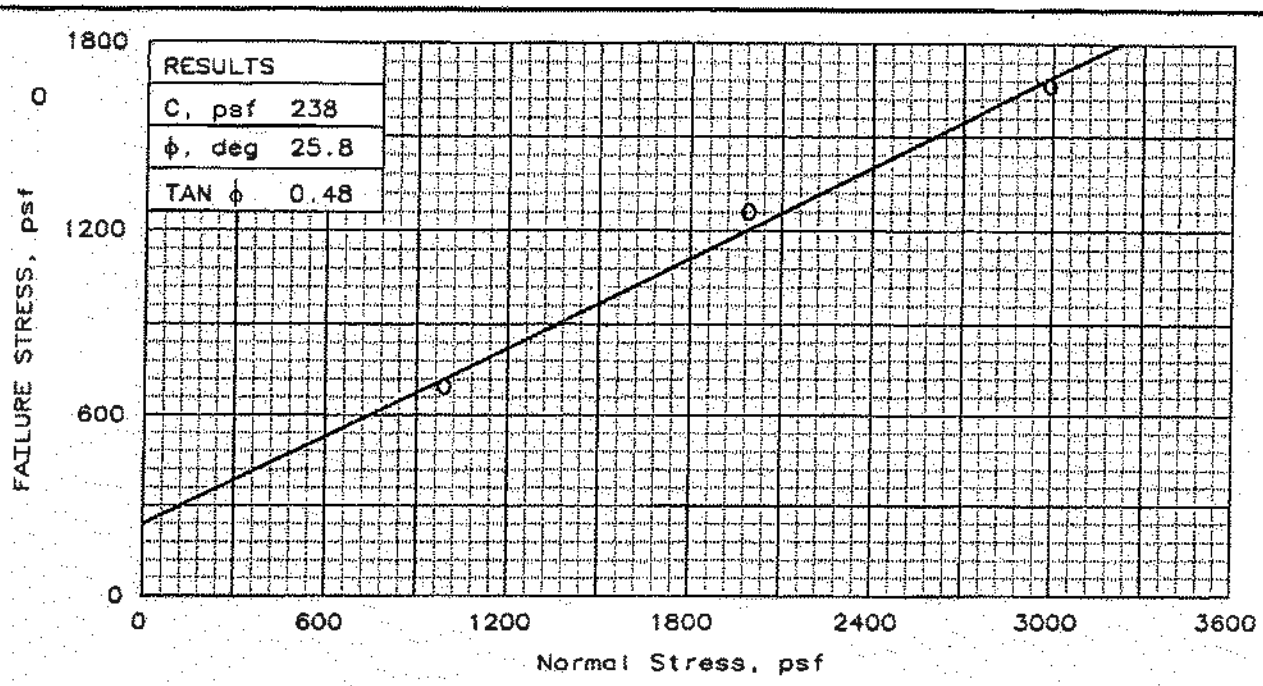
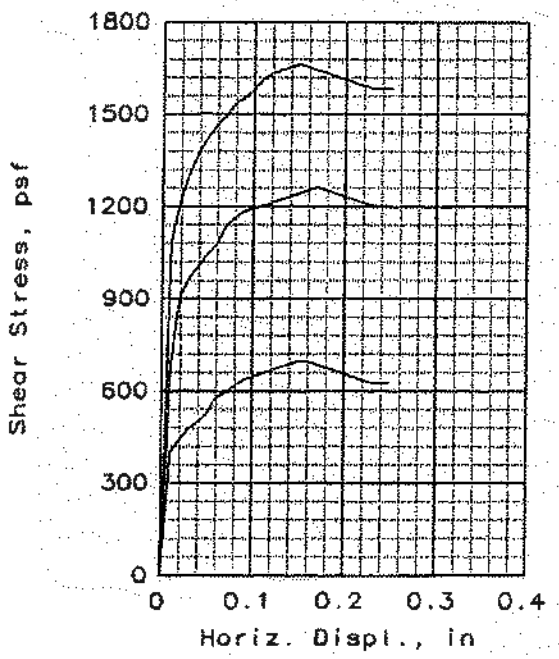
41607 Enterprise Circle North
Temecula, CA 92590
(909) 296-2230
Fax: (909) 296-2237





SAMPLE NO.:		1	2	3
INITIAL	WATER CONTENT, %	12.1	12.1	12.1
	DRY DENSITY, pcf	110.6	110.6	110.6
	SATURATION, %	67.5	67.5	67.5
	VOID RATIO	0.467	0.467	0.467
	DIAMETER, in	2.42	2.42	2.42
	HEIGHT, in	1.00	1.00	1.00
AT TEST	WATER CONTENT, %	0.0	0.0	0.0
	DRY DENSITY, pcf	110.6	110.6	110.6
	SATURATION, %	0.0	0.0	0.0
	VOID RATIO	0.467	0.467	0.467
	DIAMETER, in	2.42	2.42	2.42
	HEIGHT, in	1.00	1.00	1.00
NORMAL STRESS, psf		1000	2000	3000
FAILURE STRESS, psf		694	1262	1663
DISPLACEMENT, in		0.15	0.17	0.15
ULTIMATE STRESS, psf				
DISPLACEMENT, in				
Strain rate, in/min		0.2000	0.2000	0.2000

SAMPLE TYPE:
DESCRIPTION: SILTY SAND,BROWN

SPECIFIC GRAVITY= 2.6
REMARKS: SAMPLE B4 @ 0-5
COLL BY CM
COLL ON 11-6-03

Fig. No.: _____

CLIENT: CARINO HOMES

PROJECT: CARINO HOMES-TEMECULA

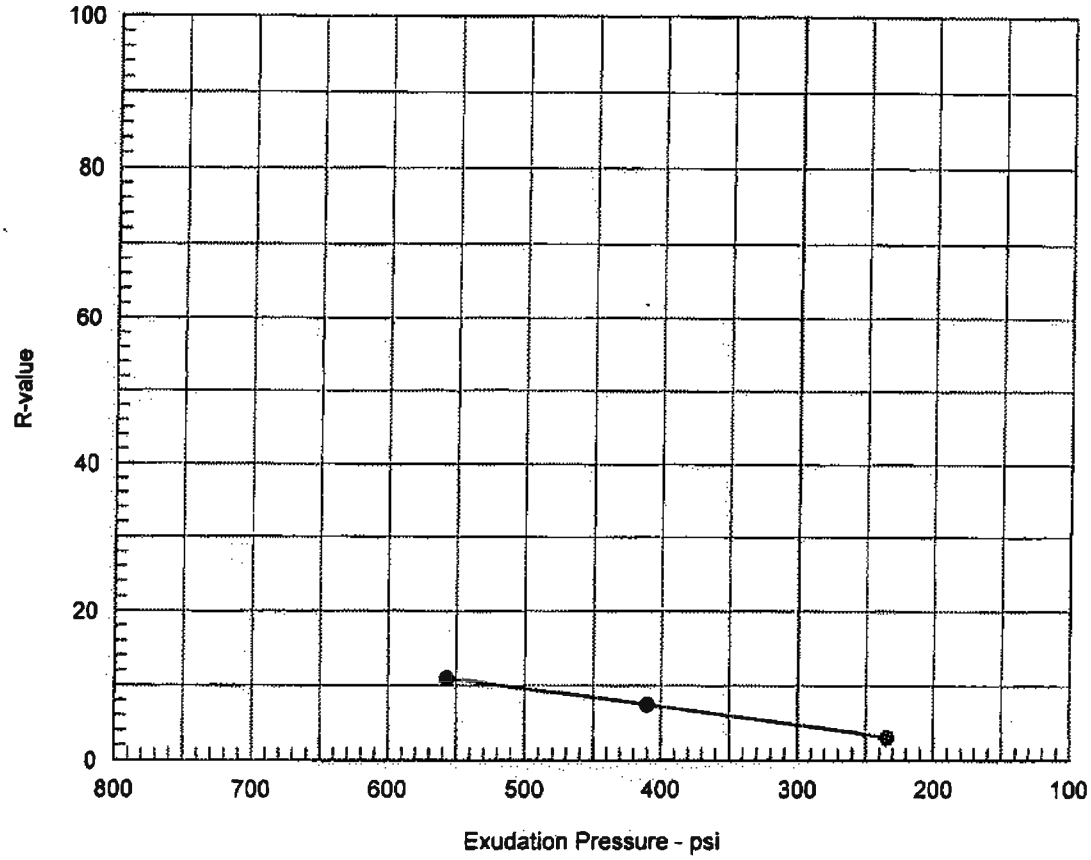
SAMPLE LOCATION: NICOLAS ROAD, TEMECULA

PROJ. NO.: T2995-GS DATE: 11-10-03

DIRECT SHEAR TEST REPORT

EnGEN Corporation

R-VALUE TEST REPORT



Resistance R-Value and Expansion Pressure - Cal Test 301

No.	Compact. Pressure psi	Density pcf	Moist. %	Expansion Pressure psi	Horizontal Press. psi @ 160 psi	Sample Height in.	Exud. Pressure psi	R Value	R Value Corr.
1	100	116.2	15.9	2.43	135	2.64	557	10	11
2	50	108.9	18.9	1.52	140	2.66	411	7	7
3	25	107.6	19.6	0.30	150	2.68	234	3	3

Test Results	Material Description
R-value at 300 psi exudation pressure = 5	CLAYEY SAND(W/SILT),BROWN

Project No.: T2995-GS
Project: CARINO HOMES-TEMECULA
Location: NICOLAS ROAD
Sample Number: B4 @ 0-5
Date: 11/12/2003

Tested by: DB
Checked by: RW
Remarks:
COLL BY CM
COLL ON 11-6-03

R-VALUE TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate 1

E.S. BABCOCK & SONS, INC.
Established 1906

NELAP #02101CA ELAP#1156
6100 Quail Valley Court Riverside, CA 92507-0704
P.O. Box 432 Riverside, CA 92502-0432
PH (909) 653-3351 FAX (909) 653-1662
www.babcocklabs.com

Client Name: Engen, Inc.
Contact: Engen, Inc.
Address: 41607 Enterprise Circle N.
Temecula, CA 92590-5614

Analytical Report: Page 2 of 3
Project Name: Engen-Sulfate
Project Number: Purchase Order #1982
Work Order Number: A3K0728
Report Date: 19-Nov-2003

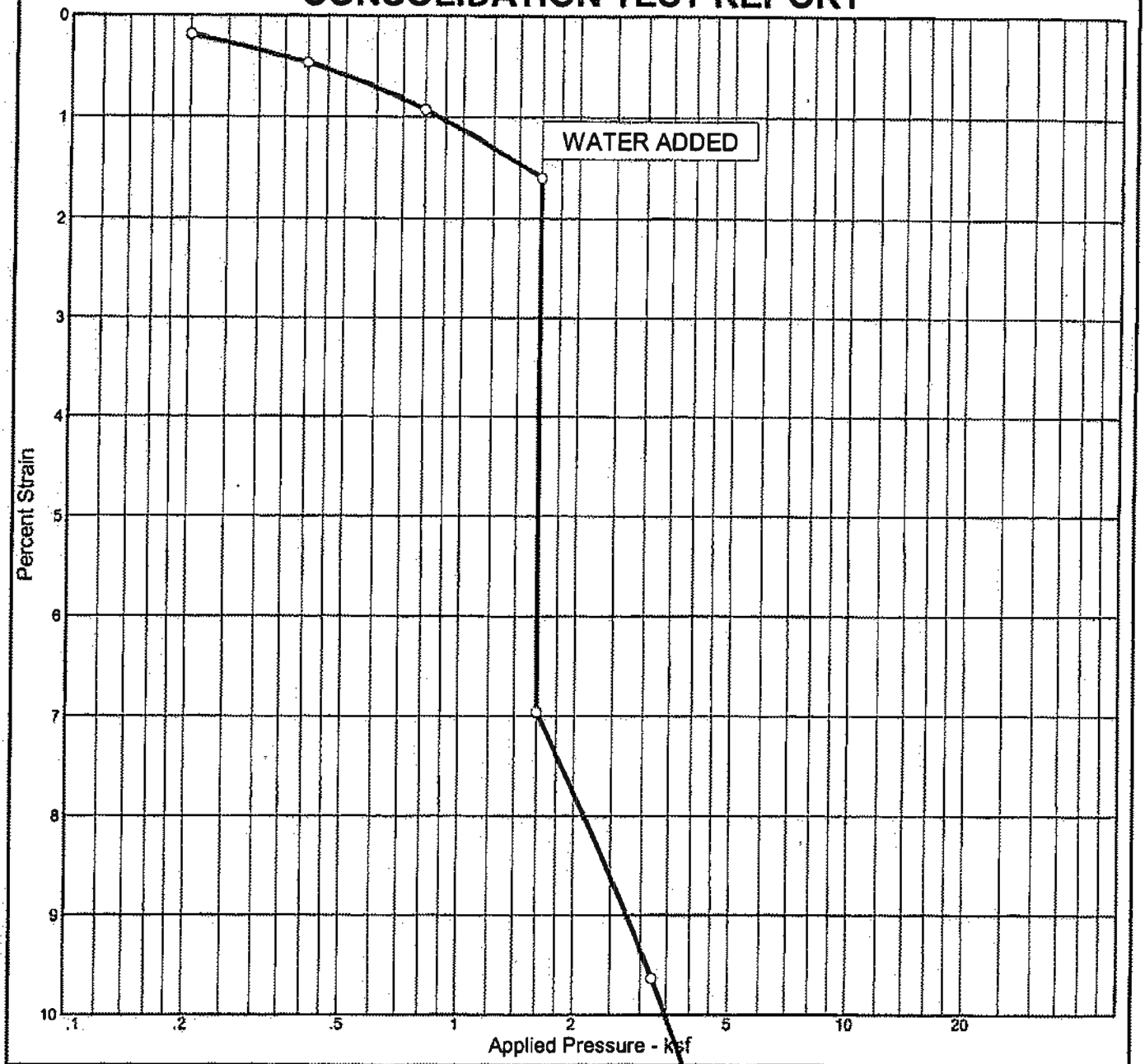
Laboratory Reference Number
A3K0728-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
B4 @ 0-5 - T2995-GS - Carino Homes	Soil	11/10/03 00:00	11/11/03 8:05

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Water Extract							
Sulfate	ND	10	ppm	Ion Chromat.	11/15/03 04:03	KOS	N-SAG, N-WEX

ACCREDITED IN ACCORDANCE WITH nelac

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Swell %	e_o
32.7 %	7.6 %	101.0			2.6		3.53	0.20				0.607

MATERIAL DESCRIPTION	USCS	AASHTO
SILTY SAND,BROWN	SM	

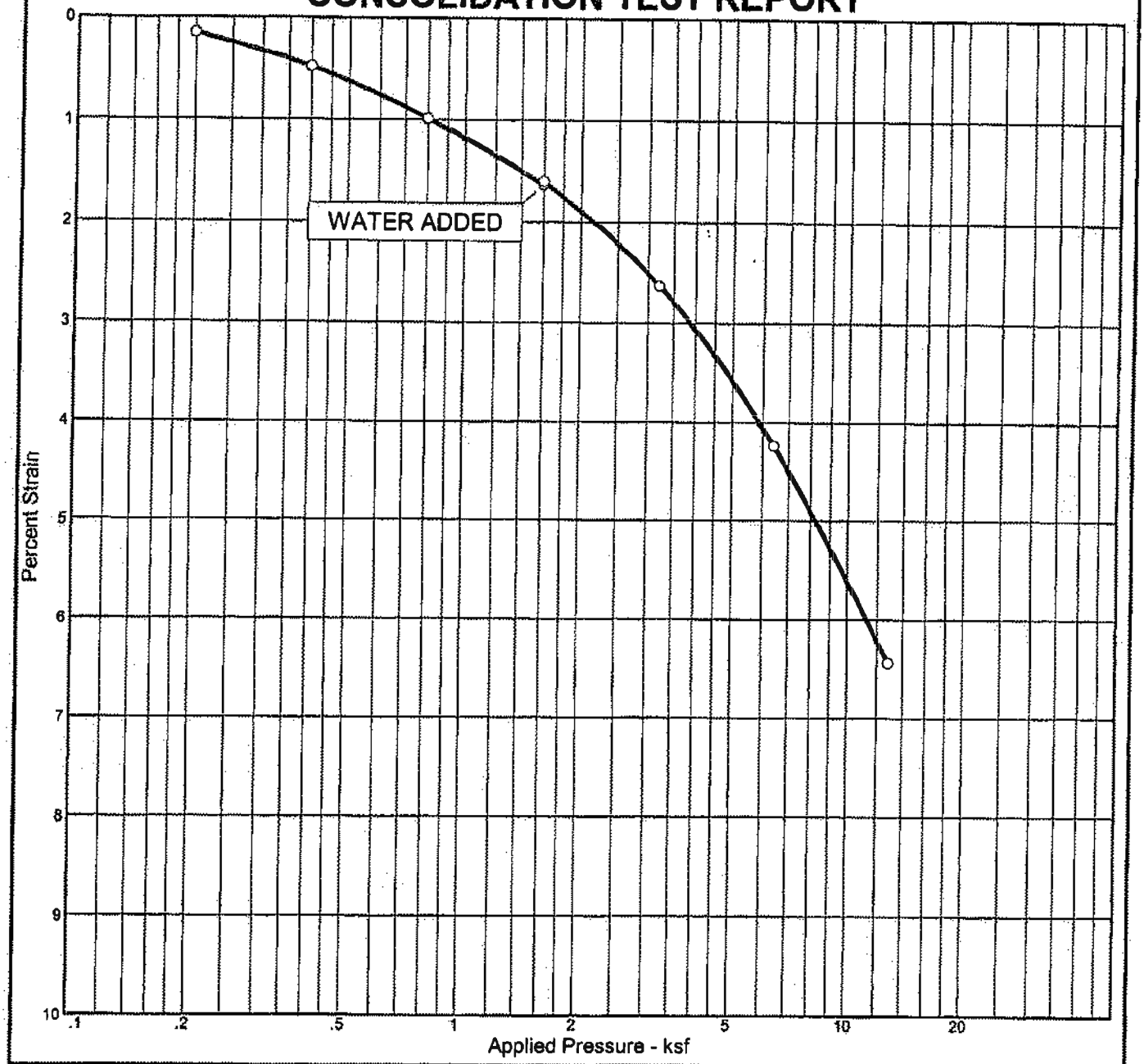
Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA
Location: NICOLAS ROAD

Remarks:
SAMPLE B3 @ 5
COLL BY CM
COLL ON 11-7-03

CONSOLIDATION TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Swell %	e_o
57.7 %	9.7 %	112.8			2.6		4.26	0.11				0.439

MATERIAL DESCRIPTION	USCS	AASHTO
SILTY SAND,BROWN	SM	

Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA

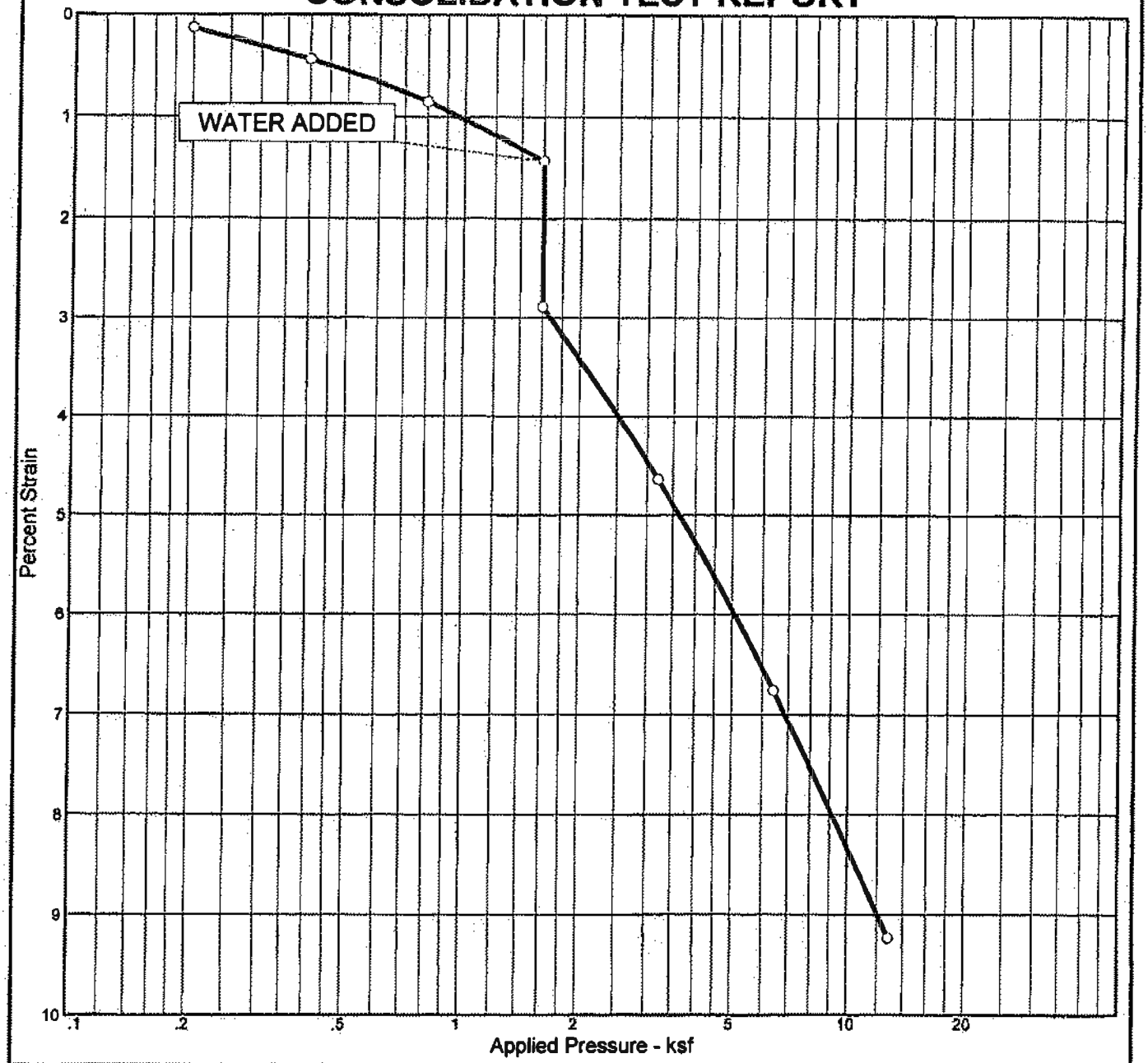
Location: NICOLAS ROAD

Remarks:
SAMPLE B3 @ 7.5
COLL BY CM
COLL ON 11-7-03+

CONSOLIDATION TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Swell %	e_o
25.8 %	5.9 %	102.0			2.6		3.84	0.13				0.592

MATERIAL DESCRIPTION	USCS	AASHTO
SILTY FINE SAND,BROWN	SM	

Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA

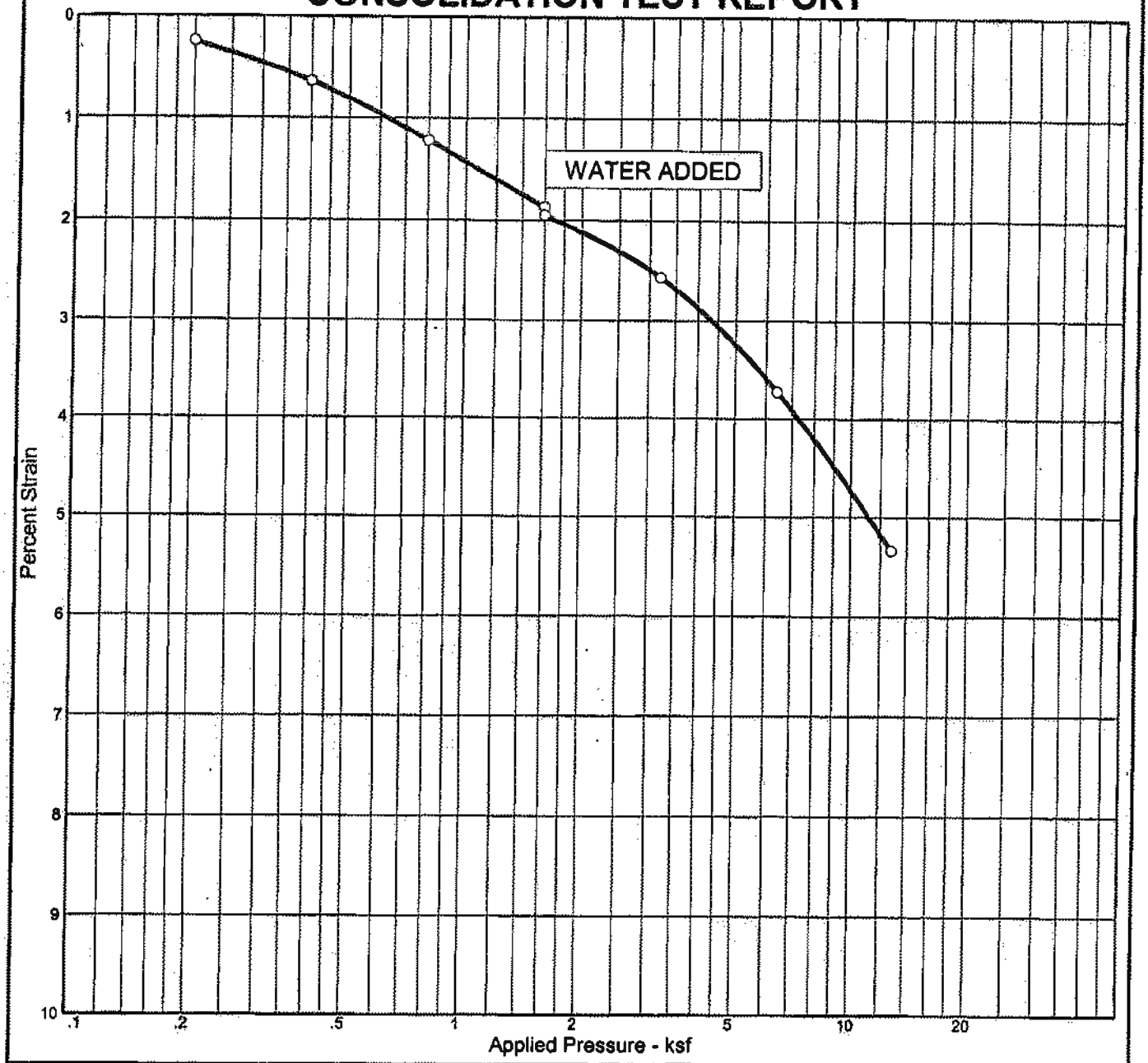
Location: NICOLAS ROAD

Remarks:
SAMPLE B3 @ 10
COLL BY CM
COLL ON 11-7-03

CONSOLIDATION TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Swell %	e_o
63.0 %	12.3 %	107.5			2.6		4.30	0.08				0.509

MATERIAL DESCRIPTION	USCS	AASHTO
CLAYEY FINE SAND,BROWN	SC	

Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA

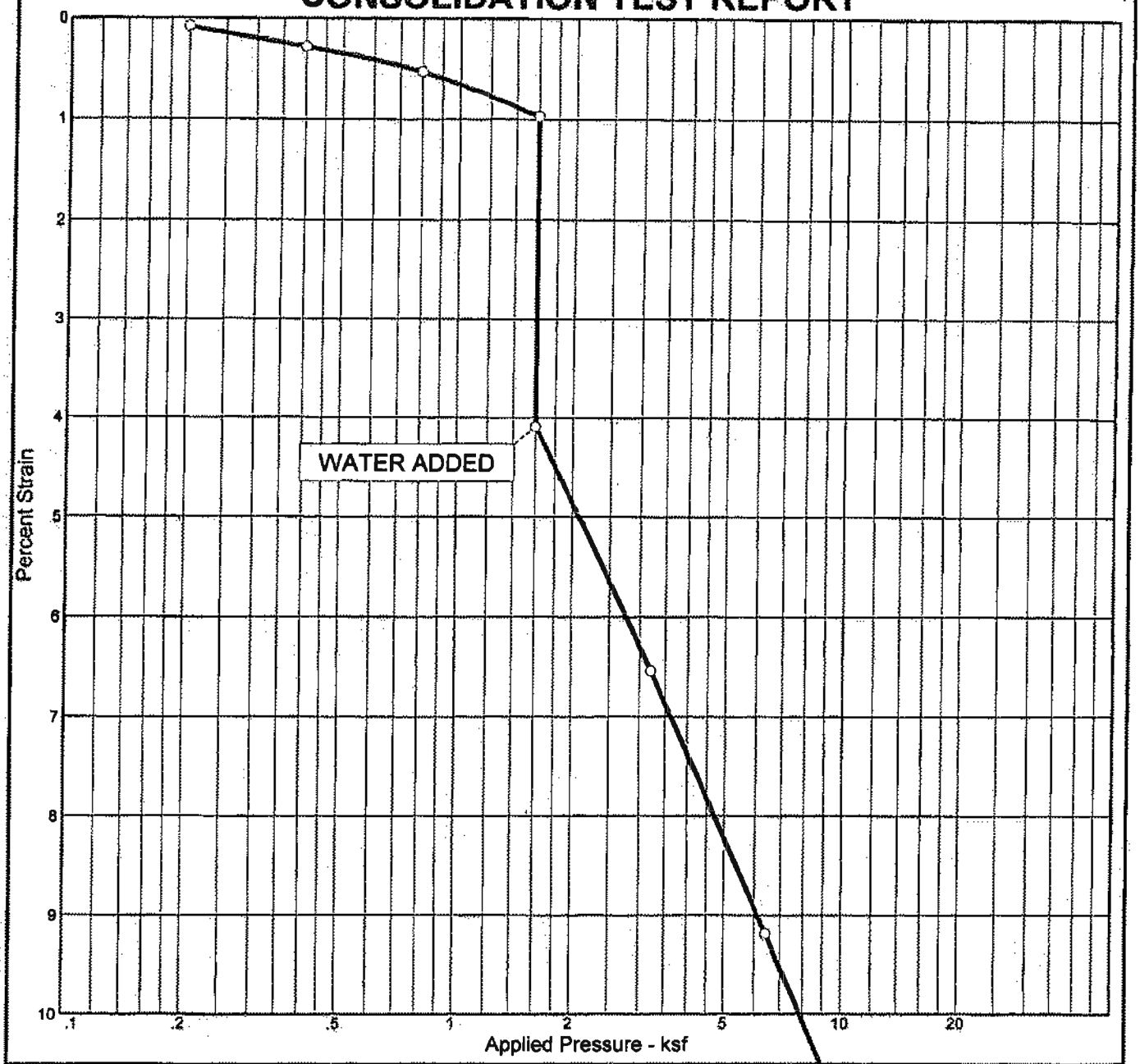
Location: NICOLAS ROAD

Remarks:
SAMPLE B3 @ 15
COLL BY CM
COLL ON 11-7-03

CONSOLIDATION TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Swell %	e_o
21.3 %	4.8 %	103.8			2.65		0.71	0.14				0.593

MATERIAL DESCRIPTION	USCS	AASHTO
SILTY SAND,LIGHT BROWN	SM	

Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA

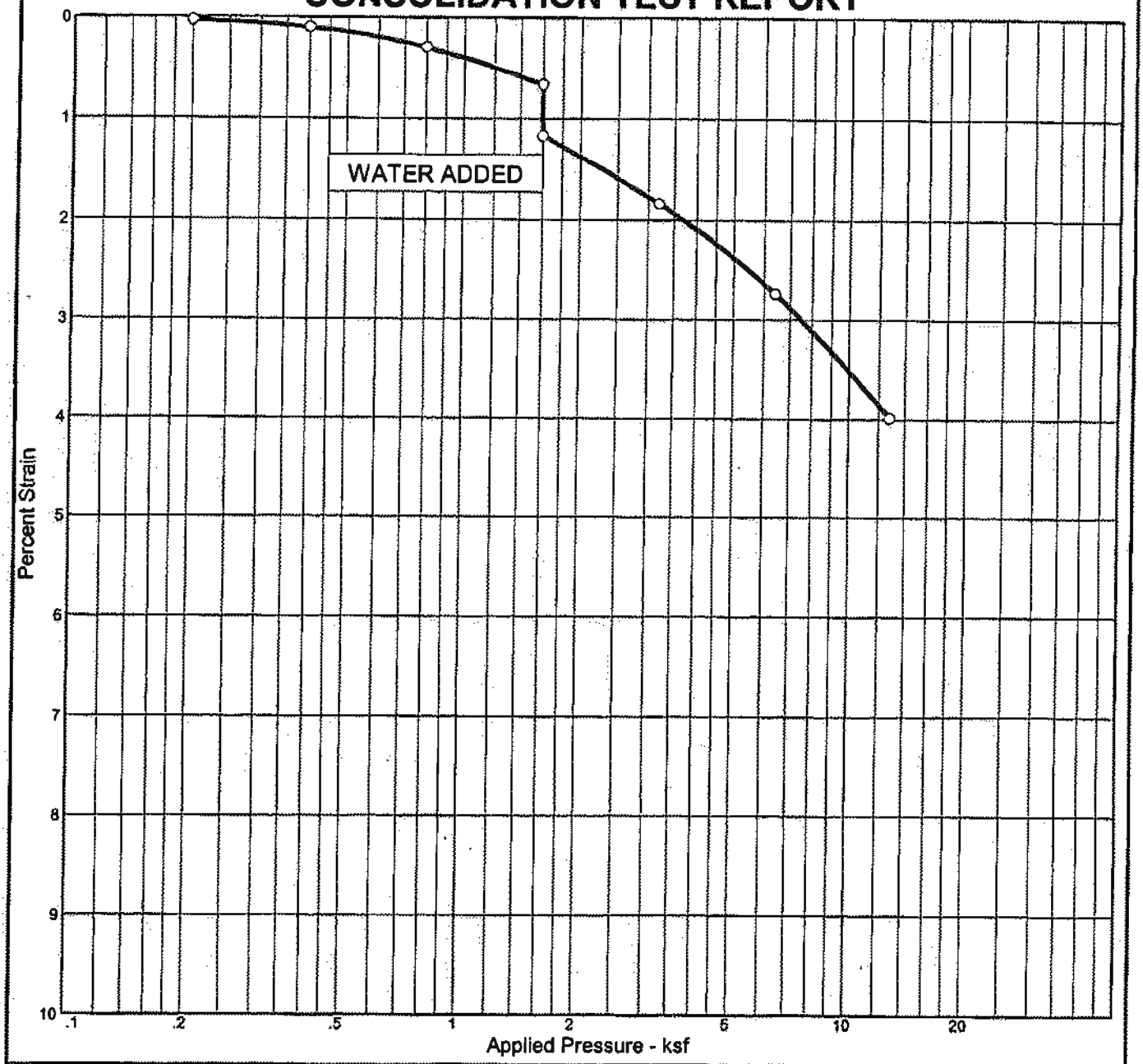
Location: NICOLAS ROAD

Remarks:
SAMPLE B4 @ 5
COLL BY CM
COLL ON 11-7-03

CONSOLIDATION TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Swell %	e_o
32.8 %	6.6 %	106.8			2.6		6.26	0.06				0.519

MATERIAL DESCRIPTION	USCS	AASHTO
SAND,TAN	SP	

Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA

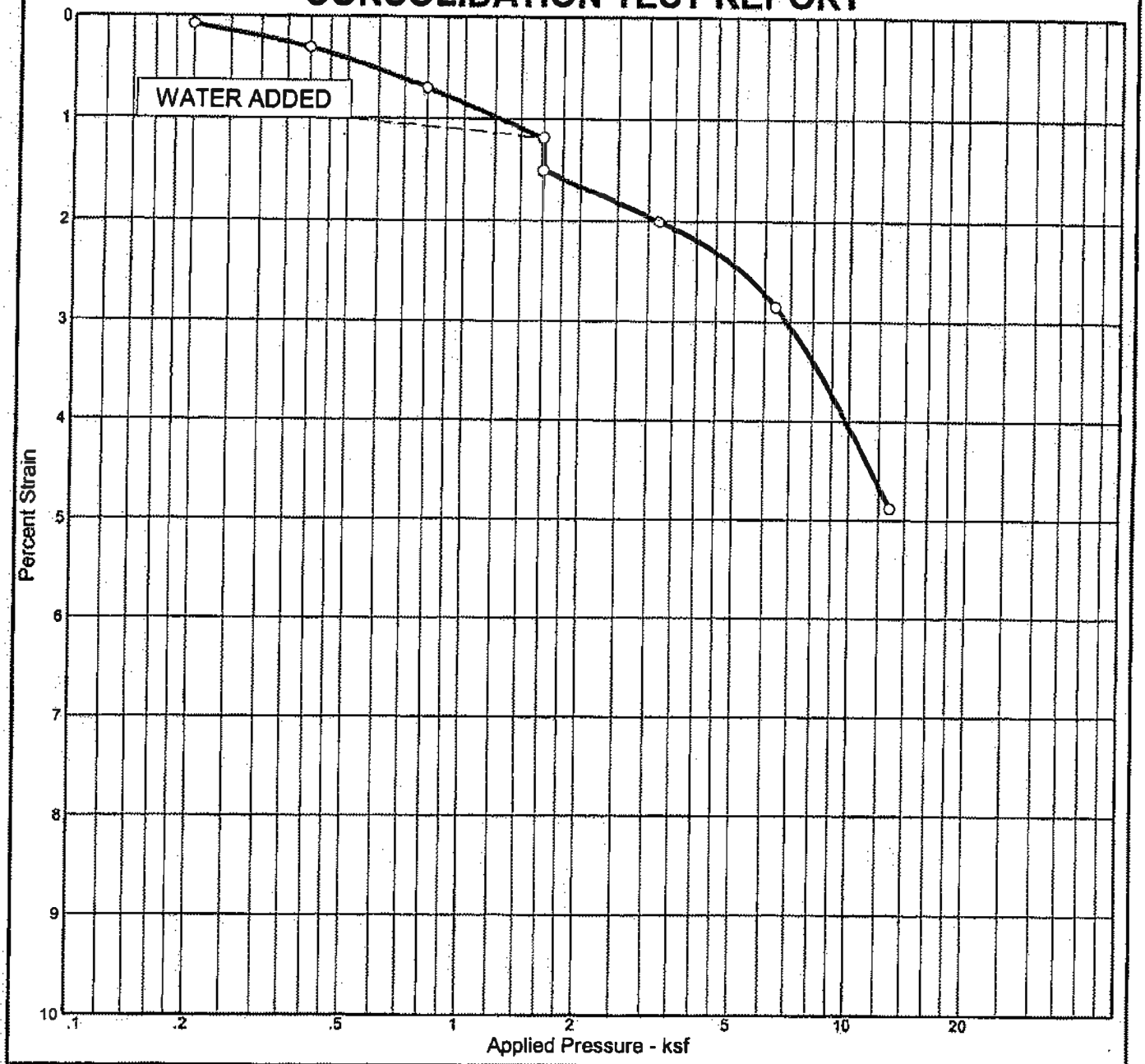
Location: NICOLAS ROAD

Remarks:
SAMPLE B4 @ 15
COLL BY CM
COLL ON 11-7-03

CONSOLIDATION TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Swell %	e_o
68.4 %	12.1 %	111.1			2.6		6.28	0.10				0.461

MATERIAL DESCRIPTION	USCS	AASHTO
SILTY SAND,LIGHT BROWN	SM	

Project No. T2995-GS **Client:** CARINO HOMES
Project: CARINO HOMES-TEMECULA

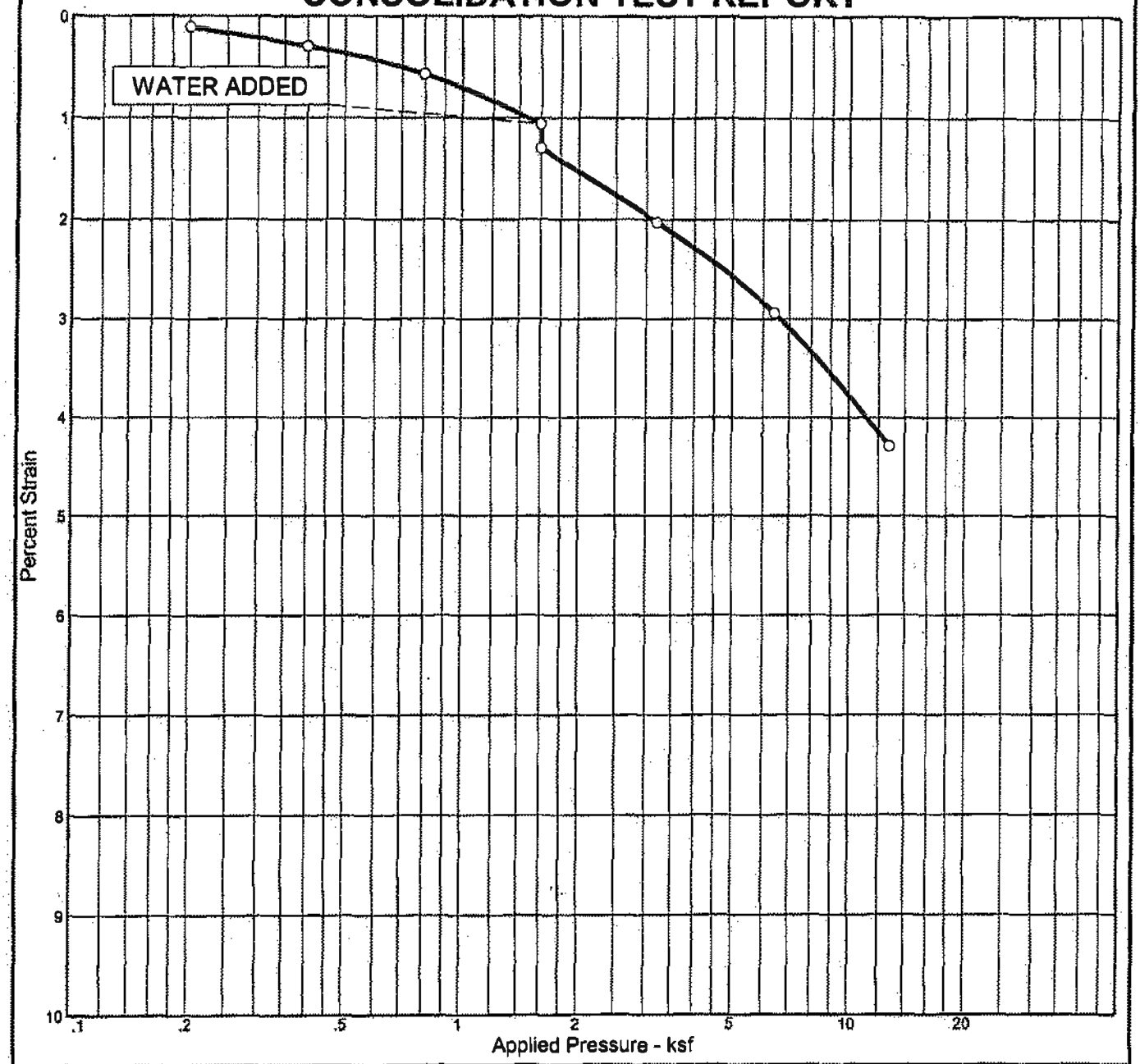
Location: NICOLAS ROAD

Remarks:
SAMPLE B4 @ 20
COLL BY CM
COLL ON 11-7-03

CONSOLIDATION TEST REPORT
ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

CONSOLIDATION TEST REPORT



Natural Sat.	Natural Moist.	Dry Dens. (pcf)	LL	PI	Sp. Gr.	Overburden (ksf)	P_c (ksf)	C_c	C_r	Swell Press. (ksf)	Swell %	e_o
57.2 %	12.4 %	103.7			2.6		2.33	0.07				0.565

MATERIAL DESCRIPTION	USCS	AASHTO
SILTY SAND,TAN	SM	

Project No. T2995-GS **Client:** CARINO HOMES

Project: CARINO HOMES-TEMECULA

Location: NICOLAS ROAD

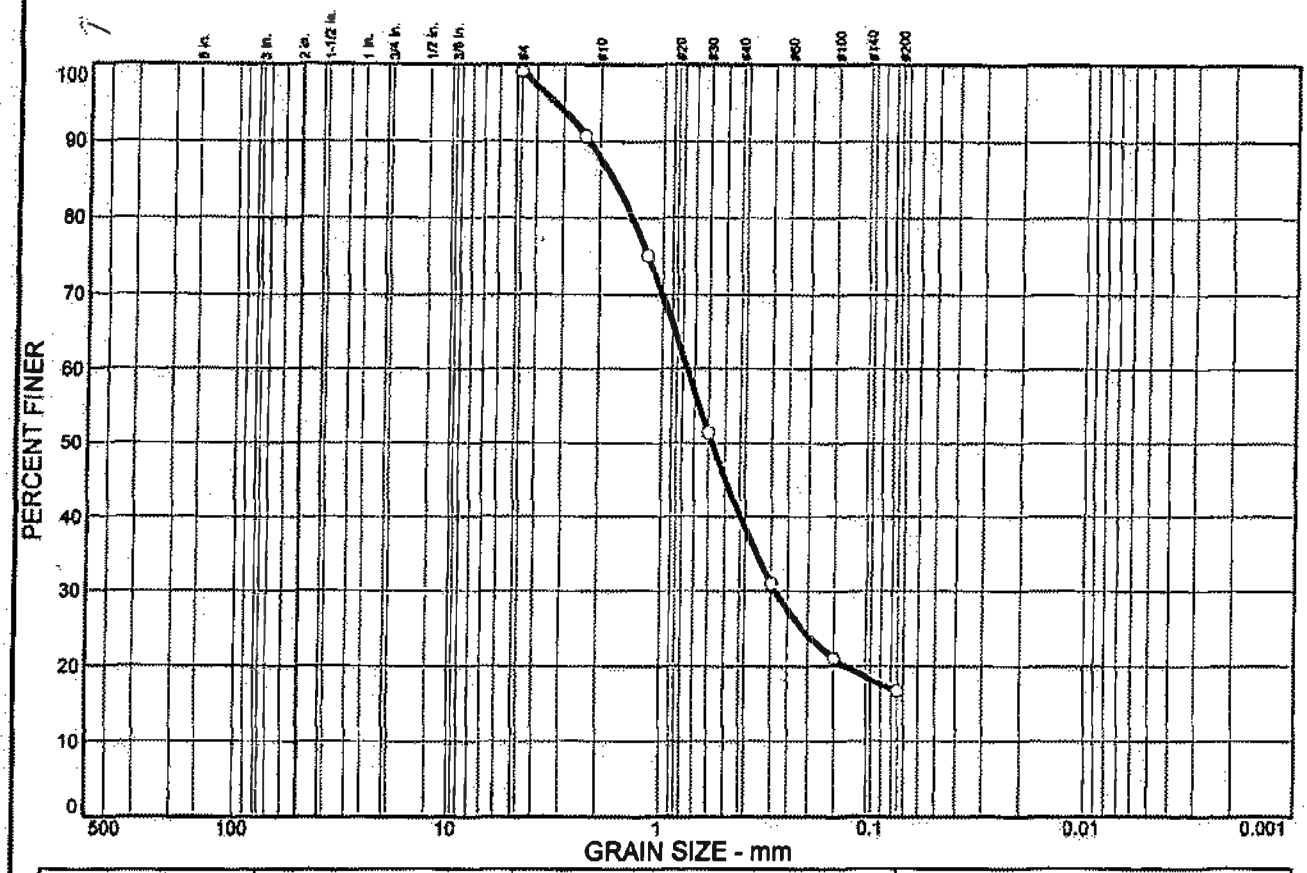
Remarks:
SAMPLE B4 @ 25
COLL BY CM
COLL ON 11-7-03

CONSOLIDATION TEST REPORT

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Plate

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
			11.2	47.7	23.4	16.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	99.0		
#8	90.6		
#16	75.0		
#30	51.4		
#50	31.0		
#100	21.0		
#200	16.7		

* (no specification provided)

Soil Description

SILTY SAND,BROWN

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.74 D_{60}= 0.762 D_{50}= 0.576
D_{30}= 0.286 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO=

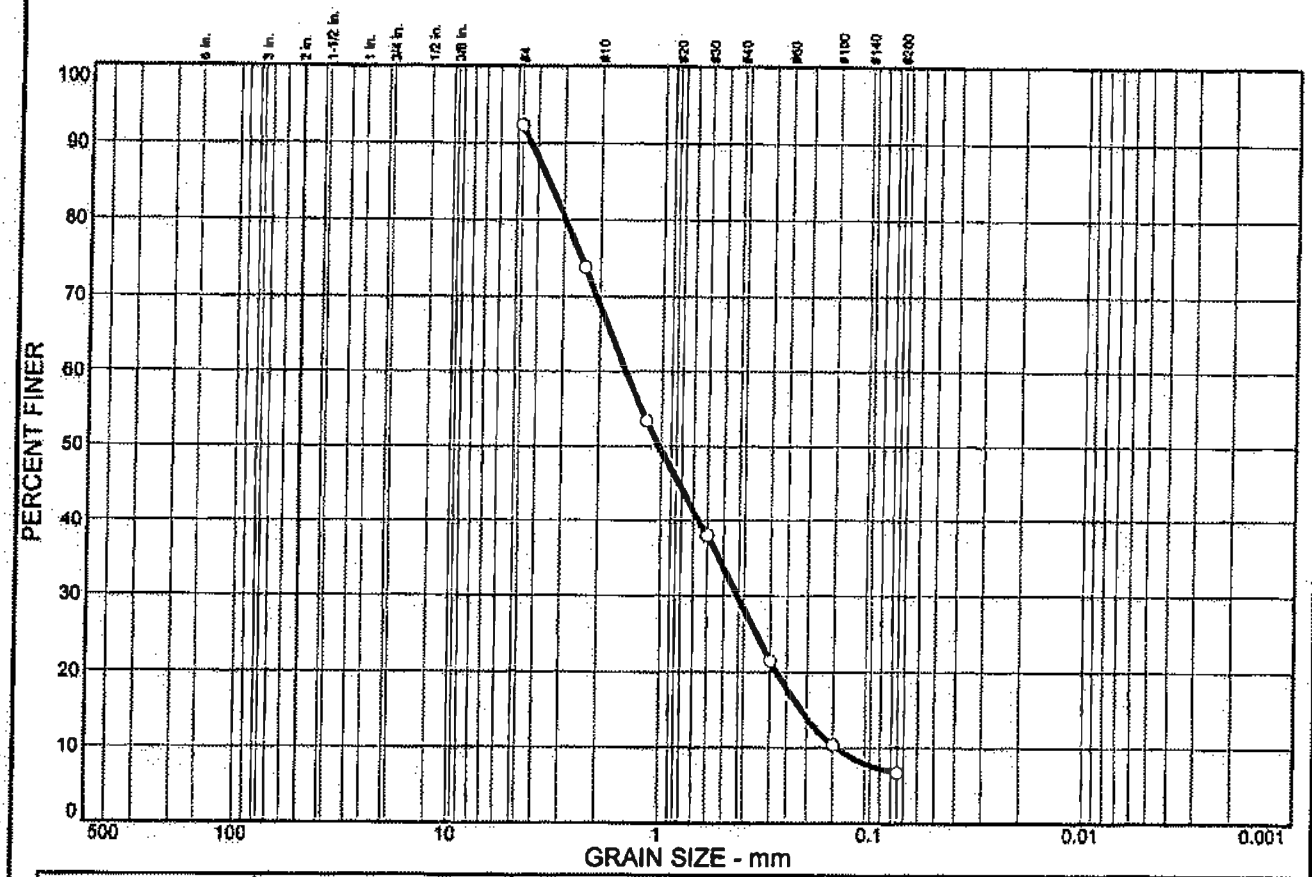
Remarks

SAMPLE B1 @ 5
COLL BY CM
COLL ON 11-7-03

Sample No.: B1 @ 5 **Source of Sample:** SIEVE **Date:** 11-14-03
Location: NICOLAS ROAD **Elev./Depth:**

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION	**Client:** CARINO HOMES **Project:** CARINO HOMES-TEMECULA **Project No:** T2995-GS **Plate**

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
			23.5	39.1	23.0	6.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	92.3		
#8	73.7		
#16	53.3		
#30	37.9		
#50	21.5		
#100	10.4		
#200	6.7		

* (no specification provided)

Soil Description

SAND,BROWN

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.57 D_{60}= 1.50 D_{50}= 1.03
D_{30}= 0.432 D_{15}= 0.213 D_{10}= 0.144
C_u= 10.42 C_c= 0.86

Classification

USCS= SP AASHTO=

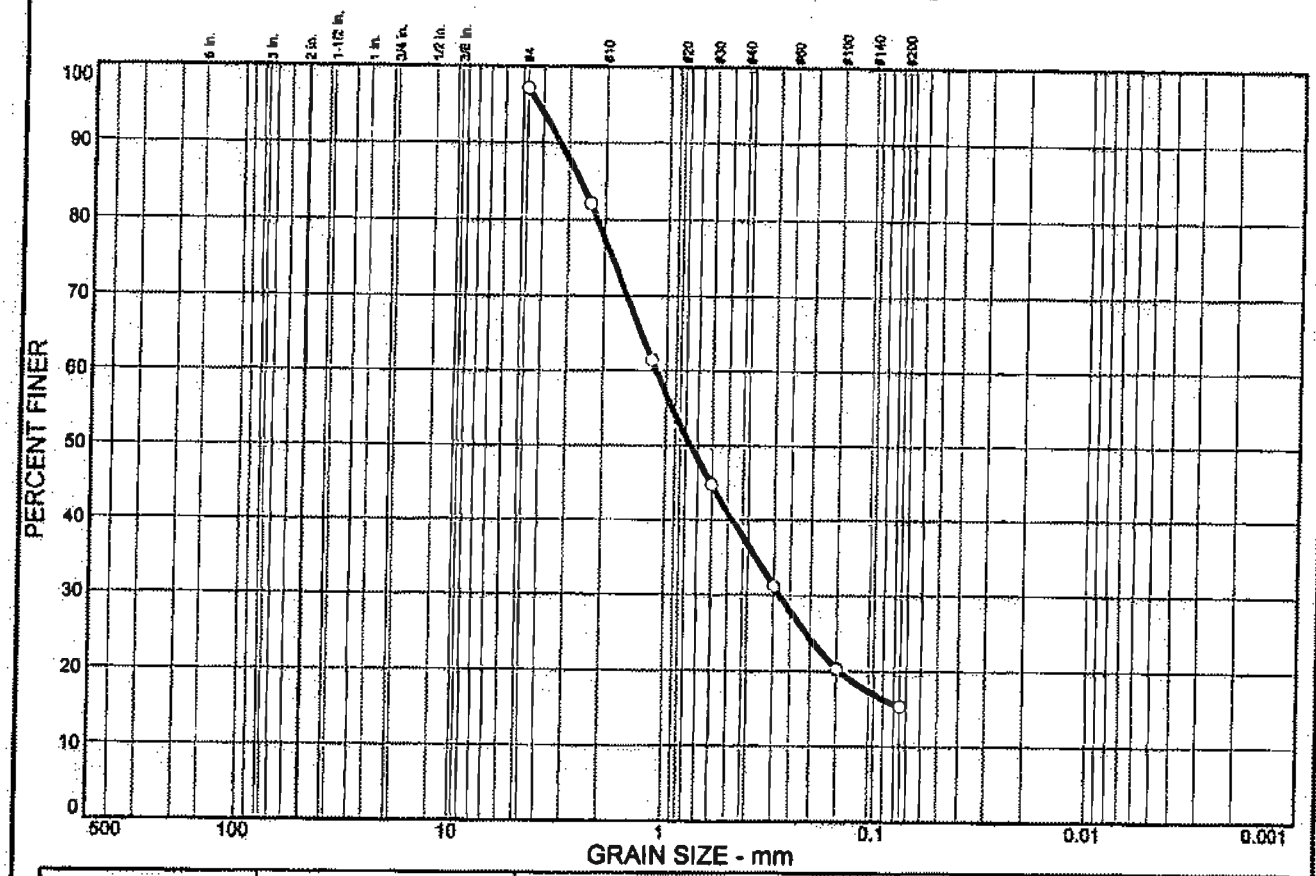
Remarks

SAMPLE B1 @ 10
COLL BY CM
COLL ON 11-7-03

Sample No.: B1 @ 10 **Source of Sample:** SIEVE **Date:** 11-13-03
Location: NICOLAS ROAD **Elev./Depth:**

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION	**Client:** CARINO HOMES **Project:** CARINO HOMES-TEMECULA **Project No:** T2995-GS **Plate**

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
			19.7	39.7	22.3	15.4	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	97.1		
#8	82.1		
#16	61.4		
#30	44.7		
#50	31.2		
#100	20.3		
#200	15.4		

* (no specification provided)

Soil Description

SILTY SAND,BROWN

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.65 D_{60}= 1.12 D_{50}= 0.761
D_{30}= 0.281 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO=

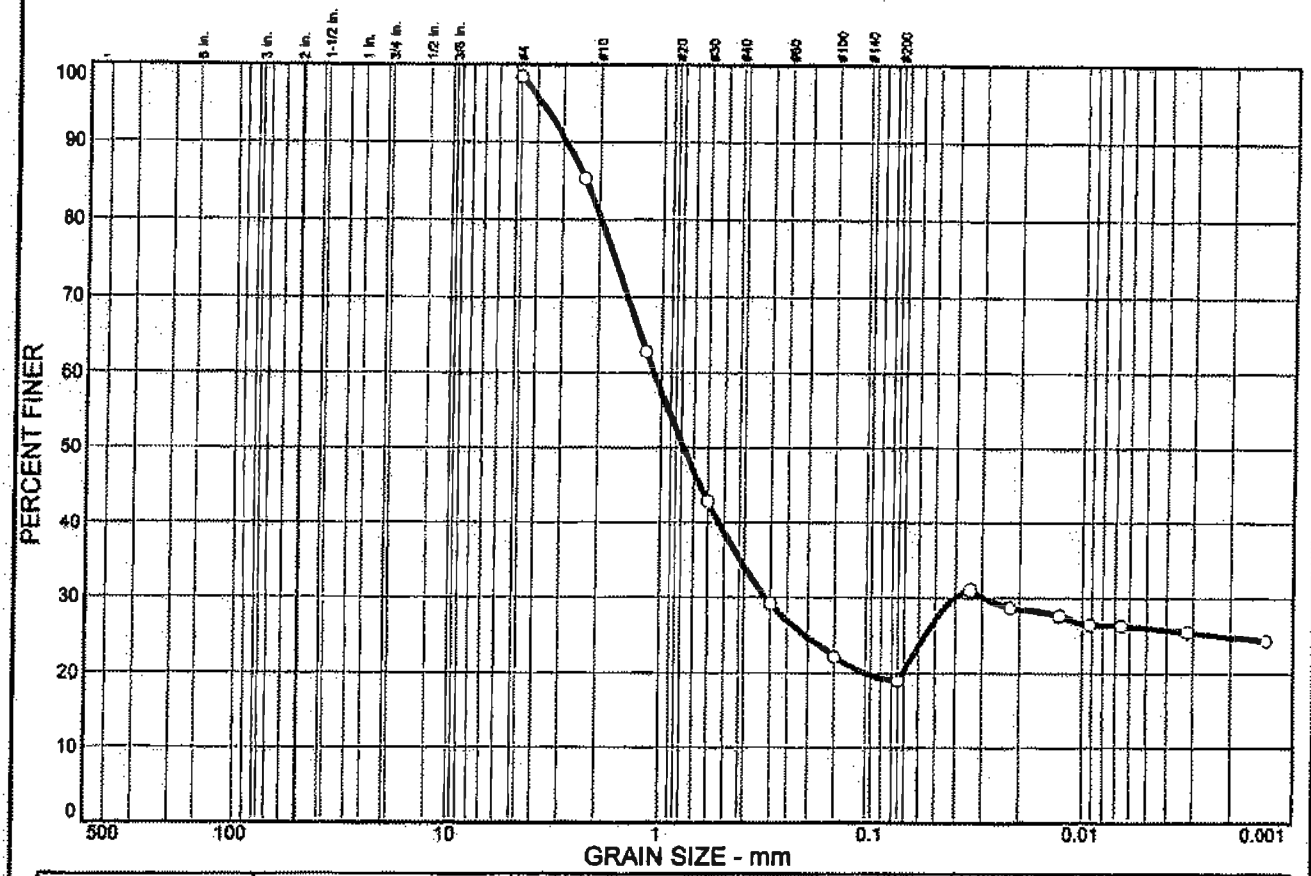
Remarks

SAMPLE B1 @ 15
COLL BY CM
COLL ON 11-7-03

Sample No.: B1 @ 15 **Source of Sample:** SIEVE **Date:** 11-13-03
Location: NICOLAS ROAD **Elev./Depth:**

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION	**Client:** CARINO HOMES **Project:** CARINO HOMES-TEMECULA **Project No:** T2995-GS **Plate**

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
			18.0	45.3	16.2		26.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	98.4		
#8	85.2		
#16	62.7		
#30	42.9		
#50	29.2		
#100	22.1		
#200	18.9		

* (no specification provided)

Soil Description

SILTY SAND,BROWN

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.34 D_{60}= 1.09 D_{50}= 0.783
D_{30}= 0.0291 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= SM AASHTO=

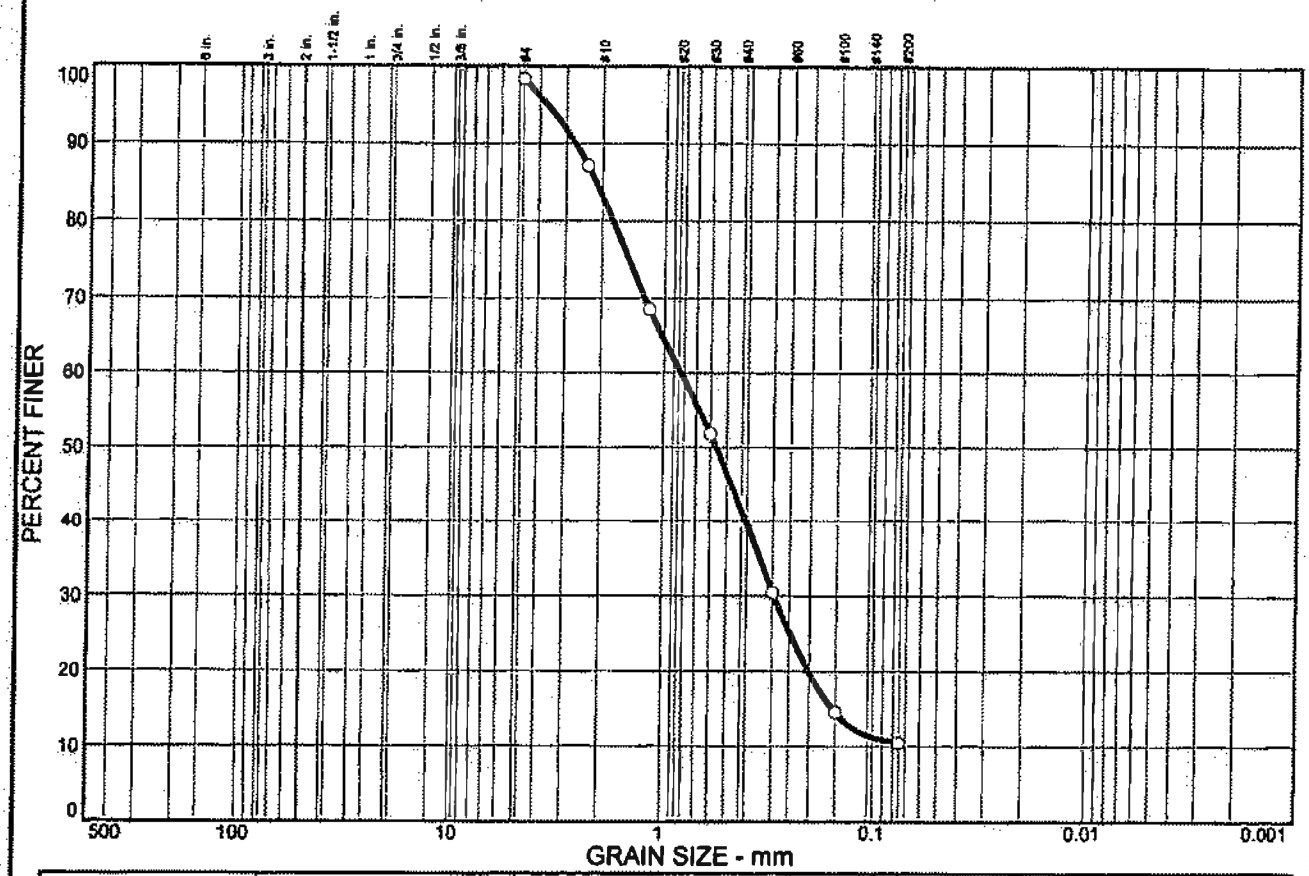
Remarks

SAMPLE B1 @ 20
COLL BY CM
COLL ON 11-6-03

Sample No.: B1 @ 20 **Source of Sample:** SIEVE **Date:** 11-12-03
Location: NICOLAS ROAD **Elev./Depth:**

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION	**Client:** CARINO HOMES **Project:** CARINO HOMES-TEMECULA **Project No:** T2995-GS **Plate**

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
			15.2	41.6	31.0	10.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	98.3		
#8	87.1		
#16	68.5		
#30	51.8		
#50	30.5		
#100	14.5		
#200	10.5		

* (no specification provided)

Soil Description

SAND,BROWN

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.16 D_{60}= 0.832 D_{50}= 0.563
D_{30}= 0.295 D_{15}= 0.155 D_{10}=
C_u= C_c=

Classification

USCS= SP AASHTO=

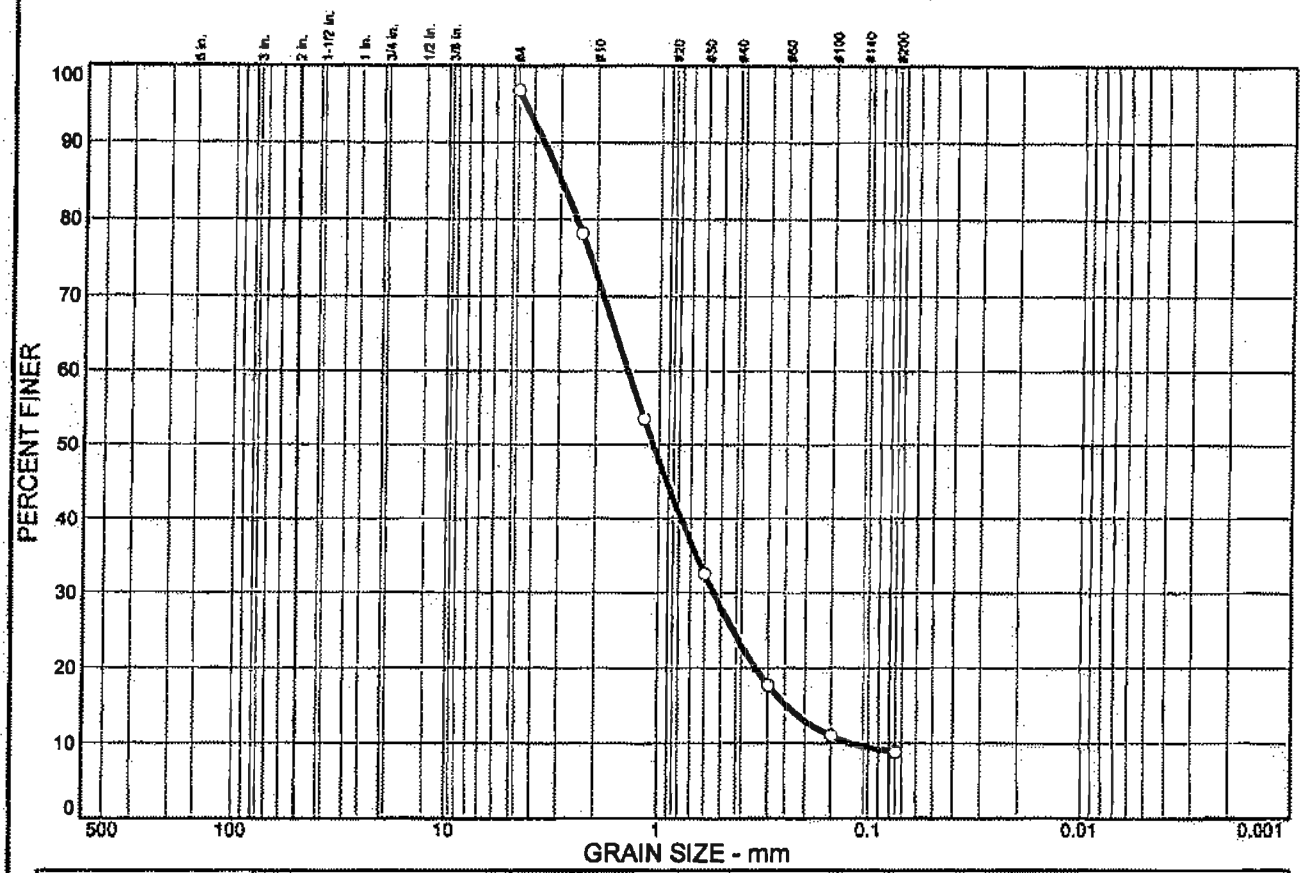
Remarks

SAMPLE B1 @ 25
COLL BY CM
COLL ON 11-7-03

Sample No.: B1 @ 25 **Source of Sample:** SIEVE **Date:** 11-14-03
Location: NICOLAS ROAD **Elev./Depth:**

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION	**Client:** CARINO HOMES **Project:** CARINO HOMES-TEMECULA **Project No:** T2995-GS **Plate**

Particle Size Distribution Report



% COBBLES	% GRAVEL		% SAND			% FINES	
	CRS.	FINE	CRS.	MEDIUM	FINE	SILT	CLAY
			24.2	48.3	15.4	8.8	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	96.7		
#8	78.1		
#16	53.4		
#30	32.6		
#50	17.7		
#100	11.0		
#200	8.8		

* (no specification provided)

Soil Description

SAND(W/SILT),BROWN

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.98 D_{60}= 1.42 D_{50}= 1.07
D_{30}= 0.543 D_{15}= 0.246 D_{10}= 0.119
C_u= 11.91 C_c= 1.75

Classification

USCS= SW AASHTO=

Remarks

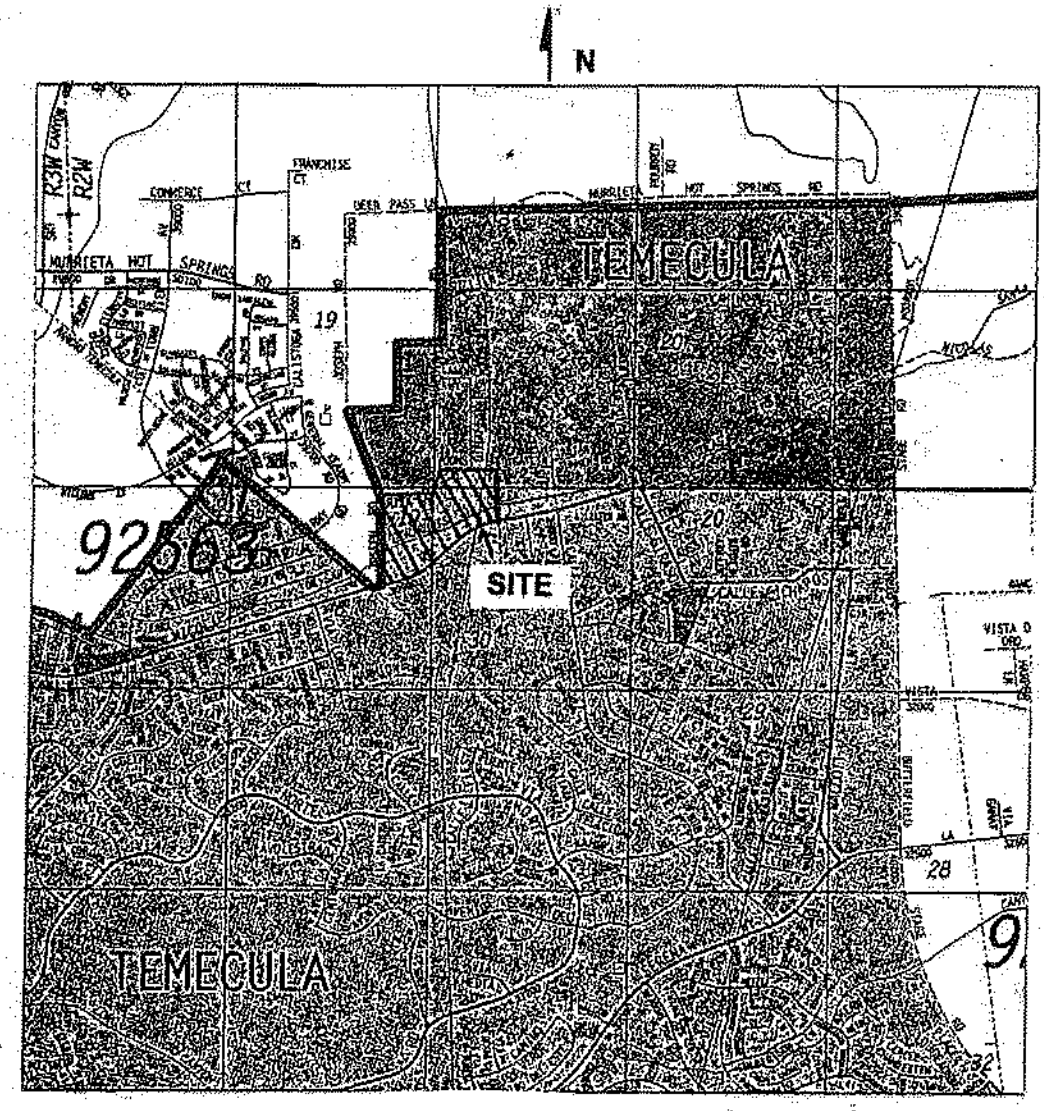
SAMPLE B1 @ 30
COLL BY CM
COLL ON 11-7-03

Sample No.: B1 @ 30 **Source of Sample:** SIEVE **Date:** 11-14-03
Location: NICOLAS ROAD **Elev./Depth:**

ENVIRONMENTAL AND GEOTECHNICAL ENGINEERING NETWORK CORPORATION

Client: CARINO HOMES
Project: CARINO HOMES-TEMECULA
Project No: T2995-GS **Plate**

DRAWINGS



EnGEN Corporation Geotechnical Engineering | Engineering Geology | Special Inspection | Material Testing | Environmental Assessments

VICINITY MAP			
PROJECT NUMBER:	T2995-GS	LEGAL DESCRIPTION:	APN 957-080-014, 957-080-019
DATE: DECEMBER 2003		SCALE: 1"=2400'	
CLIENT NAME:	CARINO HOMES	FIGURE:	1

Base map: Thomas Guide, Riverside Co., 2002, pg 929, 959

Appendix I

Geotechnical Investigation

C·H·J·

GEOTECHNICAL INVESTIGATION
RESIDENTIAL DEVELOPMENT
TEMECULA, CALIFORNIA
PREPARED FOR
SERAPHINA DEVELOPMENT
JOB NO. 041063-3

C·H·J· INCORPORATED

P.O. Box 231, Colton, CA 92324-0231 • 1355 E. Cooley Dr., Colton, CA 92324-3954 • Phone (909) 824-7210 • Fax (909) 824-7209

November 30, 2004

Seraphina Development, LLC
2010 65th Avenue West
Fircrest, Washington 98466
Attention: Mr. Scott V. Carino

Job No. 041063-3

Dear Mr. Carino:

Attached herewith is the Geotechnical Investigation report prepared for the proposed residential development, to be located northeast of the intersection of Nicolas Road and Joseph Road in the City of Temecula, in Riverside County, California.

This report was based upon a scope of services generally outlined in our proposal letter, dated October 20, 2004, and other written and verbal communications.

We appreciate this opportunity to provide geotechnical services for this project. If you have questions or comments concerning this report, please contact this firm at your convenience.

Respectfully submitted,
C.H.J., INCORPORATED

Melvinsky Ramirez

Melvinsky Ramirez, Staff Engineer

MR:bjr
Distribution: Seraphina Development, LLC (6)

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GEOTECHNICAL INVESTIGATION
RESIDENTIAL DEVELOPMENT
TEMECULA, CALIFORNIA
PREPARED FOR
SERAPHINA DEVELOPMENT, LLC
JOB NO. 041063-3

INTRODUCTION

During November of 2004, a geotechnical investigation for the proposed 29± acre residential development, to be constructed northeast of the intersection of Nicolas Road and Joseph Road in the City of Temecula, California, was performed by this firm. The purpose of this investigation was to explore and evaluate the geotechnical conditions at the subject site, and to provide appropriate geotechnical recommendations for design of the proposed structures and infrastructure.

To orient our investigation, a Tentative Tract Map, prepared by Apex Engineering, dated September 7, 2004, was furnished for our use. The Tentative Tract Map indicated the number of proposed lots, and their respective locations and square footage. A USGS Topographic Map for the area was also utilized to aid our investigation. The approximate location of the site is shown on the attached Index Map (Enclosure "A-1").

The results of our investigation, together with our conclusions and recommendations, are presented in this report.

SCOPE OF SERVICES

The scope of services provided during this geotechnical investigation included the following:

- Review of published and unpublished literature and maps
- Review and analysis of stereoscopic aerial photographs flown in 1962 through 2000
- A geologic field reconnaissance of the site and surrounding area
- Logging and sampling of five exploratory borings for testing and evaluation
- Laboratory testing on selected samples
- Evaluation of the geotechnical data to develop site-specific recommendations for site grading, conventional static foundation design, and mitigation of potential geotechnical concerns and hazards

PROJECT CONSIDERATIONS

Information furnished to this office indicates that the subject 29± acre site will be graded and developed as a residential development. It is our understanding that the development will consist of approximately 72 single-family residences and related infrastructure. It is anticipated that the residences will be one- and two-story residences of wood frame and stucco-type construction. Light foundation loads are normally associated with such structures.

The project grading plan was not available at the time of our investigation. However, observation of site topography and of adjacent developments indicates that development of this site will entail maximum cuts and fills on the order of 5 feet.

SITE DESCRIPTION

The 29± acre site (hereafter referred to as the subject site) is located in the City of Temecula, Riverside County, California, and is bounded to the south by Santa Gertrudis Creek which is located north of Nicolas Road, and runs east to west. The subject site is bounded to the west by Joseph Road, to the north by Rita Way, Seraphina Road and Jons Place, and to the east by a branch of the California aquaduct.

No structures existed on the site at the time of our investigation, with the exception of a wooden shack located on the northeast portion of the site. The shack had a fence surrounding it. No other evidence of previous site development was noted during our site visit. The site is generally planar, sloping slightly to the south at a gradient of approximately 1 to 2 percent. The exception to the planar nature of the site is a small hill (approximately 7 to 10 feet in height) which is located near the center of the site. Vegetation on the site consists of a moderately dense growth of weeds and grass. Trash and mounds of debris and end-dump fill were observed throughout the northern portion of the subject site. A wood and wire fence was observed dividing the site into two sections. The wood and wire fence was located on the north portion of the subject site, and extended to the west from the east to approximately the center of the subject site, and then it turned south across the site to the creek.

Review of aerial photographs did not indicate previous development or evidence that the site had been other than undeveloped vacant land. It appears that the only significant usage of the site has been for dry farming.

No other surface features pertinent to this investigation were noted.

FIELD INVESTIGATION

The soil conditions underlying the subject site were explored by utilizing five exploratory borings. The borings were drilled to a maximum depth of 51.5 feet below the existing ground surface with a track mounted, L10T drill rig equipped for soil sampling. The approximate locations of our exploratory borings are indicated on the attached Plat (Enclosure "A-2").

Continuous logs of the subsurface conditions, as encountered within the exploratory borings, were recorded at the time of drilling by a staff engineer from this firm. Relatively undisturbed samples were obtained by driving a split-spoon ring sampler, or a standard penetration test (SPT) sampler ahead of the exploratory borings at selected levels. After the required seating of the sampler, the number of hammer blows required to advance the sampler a total of 12 inches was converted to SPT data, and recorded on the boring logs. The blowcounts presented on the logs of the exploratory borings are the equivalent SPT N-values and have been corrected only for hammer type (automatic vs. manual cathead) and sampler size (California sampler vs. SPT sampler). Undisturbed, as well as bulk samples of typical soil types obtained were returned to the laboratory in sealed containers for testing and evaluation.

Our exploratory boring logs, together with our SPT and in-place density data, are presented in Appendix "B". The stratification lines presented on the boring logs represent approximate boundaries between soil types, which may include gradual transitions.

In conjunction with the exploratory borings, a staff geologist conducted a geologic field reconnaissance of the site and surrounding areas.

LABORATORY INVESTIGATION

Included in our laboratory testing program were field moisture content determinations on all samples returned to the laboratory and field dry densities on all undisturbed samples. The results are included on the boring logs. An optimum moisture content - maximum dry density relationship was established for a typical soil type in order that the relative compaction of the subsoils might be evaluated. A direct shear test was performed on a selected sample for soil strength evaluation for bearing capacity and lateral earth pressure calculations. Sieve analysis tests were performed on selected samples to aid in soil classification. Consolidation testing was conducted on selected samples for settlement and hydroconsolidation evaluations. Expansion testing (UBC method 18-2) was performed on a selected sample in order to evaluate the potential for distress related to soil expansion.

A sample of probable foundation subgrade soil was delivered to M. J. Schiff & Associates, Inc., for soil corrosivity test.

Summaries of the laboratory test results appear in Appendix "C".

SITE GEOLOGY AND SUBSURFACE SOIL CONDITIONS

The site is located within the Temecula Basin, a portion of the Peninsular Ranges Geomorphic Province. The Peninsular Ranges Geomorphic Province is characterized by northwest-trending mountain ranges separated by northwest-trending faults.

The Temecula Basin is a fault-bounded sedimentary basin located between the Elsinore Trough on the southwest and the Perris Block on the northeast. The Temecula Basin is infilled with slightly deformed Late Tertiary to Late Quaternary continental sediments. Young alluvial channel deposits (Holocene and latest Pleistocene) materials, up to 30 feet in thickness, were encountered over the site. These channel deposits have been mapped as "Qya_a" (Kennedy and Morton, 2003) on Enclosure "A-3". These materials are locally derived from the underlying Pauba Formation and are therefore lithologically similar. However, the channel deposits are present in loose to dense states.

Exposed at the surface north of the site and underlying the on-site channel deposits is the Pleistocene age Pauba Formation, mapped as "Qpfs" on Enclosure "A-3". The Pauba formation has a very shallow northerly dip (less than 5 degrees) in the site area (Kennedy, 1977; Kennedy and Morton, 2003). Measured thickness of the Pauba formation is approximately 250 feet (Kennedy, 1977). Subjacent to the Pauba formation are the Pleistocene-age unnamed sandstone and the Upper Pliocene-age Temecula Arkose. The combined maximum thickness of these moderately to well indurated, predominately sandstones is thought to be on the order of 1,900 feet (Kennedy, 1977). An estimated depth to crystalline basement rock at the site of between 1,000 and 2,000 feet therefore appears reasonable.

As encountered at the site, the Pauba formation consist of light brown to gray, slightly consolidated sands, silts, clays and gravels. Based on SPT and ring density data, the Pauba Formation is generally in place in dense to very dense states (cohesionless material) or stiff to hard conditions (cohesive material).

Consolidation testing performed on selected samples of the young alluvial soils indicate that these soils have a potential for only slight to negligible consolidation when subject to a surcharge load and saturation, or near-saturation.

Groundwater was encountered in Exploratory Boring No. 5 at a depth of 32 feet. Groundwater was not encountered within the remaining exploratory borings utilized for this investigation. Historic groundwater data indicates that free water has existed as shallow as 13 feet below the topographically lower portions of the site.

Fill was not encountered within any of our exploratory borings.

Expansive soils (E.I. = 27) were encountered within the upper surficial soils over the site.

Refusal to further advancement of the drilling augers was not experienced in any of the exploratory boring utilized for this investigation.

Slight to moderate caving of the borings was experienced upon removal of the augers.

A more detailed description of the subsurface soil conditions encountered is presented on the attached boring logs (Appendix "B").

FAULTING

The site does not lie within or immediately adjacent to an Alquist-Priolo Earthquake Fault Zone, designated by the State of California to include traces of suspected active faulting. No active or potentially active faults are shown on or in the immediate vicinity of the site on published geologic maps. No evidence for active faulting on or immediately adjacent to the site was observed during the geologic field reconnaissance or on the aerial photographs reviewed.

The tectonics of the Southern California area are dominated by the interaction of the North American plate and the Pacific plate, which are apparently sliding past each other in a translational manner. Although some of the motion may be accommodated by rotation of crustal blocks such as the western Transverse Ranges (Dickinson, 1996), the San Andreas fault zone is thought to represent the major surface expression of the tectonic boundary and to be accommodating most of the translational motion.

between the Pacific plate and the North American plate. However, some of the plate motion is apparently also partitioned out to the other northwest-trending, strike-slip faults that are thought to be related to the San Andreas system, such as the San Jacinto fault and the Elsinore fault. Local compressional or extensional strain resulting from the translational motion along this boundary is accommodated by left-lateral, reverse, and normal faults such as the San Jose fault, the Cucamonga fault zone, and the Crafton Hills fault zone (Matti and others, 1992; Morton and Matti, 1993).

The nearly east-west-trending Murrieta Hot Springs fault is the closest known active fault to the site, approximately 3/4 mile north of the site. The State of California evaluated the Murrieta Hot Springs fault but did not find it to be "sufficiently active and well-defined" to warrant Alquist-Priolo zonation (Saul, 1978). The Murrieta Hot Springs fault is either cut off by, or is an eastern branch of, the Wildomar branch of the Elsinore fault zone (Kennedy, 1977). It is characterized by apparently normal movement along a plane with an average dip of 80 degrees to the south (Kennedy, 1977). As with most occurrences of low-temperature geothermal resources in Southern California the Murrieta hot springs owe their existence to deep circulation of groundwater associated with faulting. Fault investigations conducted by private consultants at the Rancho California Country Club and immediately east of Winchester Road have reported clear evidence of Holocene activity of the Murrieta Hot Springs fault. Unpublished radiometric dates obtained from trenches placed on the Calvary Chapel Conference Center by this firm showed rupture of the fault approximately 900 to 1,000 years ago.

Numerous faults and lineaments are shown in the general site area by Kennedy (1977) and Kennedy and Morton (2003). The closest of these features to the site is located approximately 1/2 mile to the northeast of the site.

The Elsinore fault zone is present approximately 3 3/4 miles southwest of the site. The Elsinore fault zone is composed of multiple *en echelon* and diverging fault traces and splays into the

Whittier and Chino faults to the north. Although a zone of overall right-lateral deformation consistent with the regional plate tectonics, traces of the Elsinore fault zone form the graben of the

Elsinore and Temecula Valleys. Holocene surface rupture events have been documented for several principal strands of the Elsinore fault zone (Saul, 1978; Rockwell and others, 1986; Wills, 1988).

The San Jacinto fault zone, a system of northwest-trending, right-lateral, strike-slip faults, is present as two parallel main strands across the San Jacinto Valley northeast of the site. The western strand, known as the Casa Loma fault, is well expressed in late Holocene alluvium in the Hemet area, but evidence of recent activity decreases to the north. North of the San Jacinto River, Rogers (1966) mapped the Casa Loma fault as a buried trace that links with the Reche Canyon fault as mapped by Morton (1978). That fault is approximately 17 miles northeast of the site. The eastern strand, or Claremont fault, is well expressed in the northern San Jacinto Valley at a closest distance of approximately 19 miles. A maximum moment magnitude (**Mmax**) earthquake of **M** 6.9 is assigned to a rupture of the San Jacinto Valley segment of the San Jacinto fault (Petersen and others, 1996). More large historic earthquakes have occurred on the San Jacinto fault than any other fault in Southern California (Working Group on California Earthquake Probabilities, 1988). Based on the data of Matti and others (1992), this portion of the San Jacinto fault may be accommodating much of the motion between the Pacific plate and the North American plate in this area. Matti and others (1992) suggest this motion is transferred to the San Andreas fault in the Cajon Pass region by "stepping over" to parallel fault strands which include the Glen Helen fault. The Working Group on California Earthquake Probabilities (1995) tentatively assigned a 43 percent (±17 percent) probability of a major earthquake on the San Jacinto Valley segment of the San Jacinto fault for the 30-year interval from 1994 to 2024.

The San Andreas fault zone is located along the southwest margin of the San Bernardino Mountains, approximately 33 miles northeast of the site. The toe of the mountain front in the San Bernardino area roughly demarcates the presently active trace of the San Andreas fault, which is characterized by youthful fault scarps, vegetational lineaments, springs, and offset drainages. The Working Group on California Earthquake Probabilities (1995) tentatively assigned a 28 percent (± 13 percent) probability to a major earthquake occurring on the San Bernardino Mountains segment of the San Andreas fault between 1994 and 2024.

HISTORICAL EARTHQUAKES

A map of recorded earthquake epicenters is included as Enclosure "A-4" (Epi Software, 2004). This map includes the Cal Tech database for earthquakes with magnitudes of 4.0 or greater from 1977 through 2004.

The only large historical earthquake that can definitely be attributed to the Elsinore fault was a **M** 6.0 event in 1910 in the Temescal Valley area. This event caused damage to structures from Corona to Wildomar (Weber, 1977). Since 1932, four **M** 4.0+ earthquakes have occurred along the Elsinore fault zone in the Santiago Peak area (Weber, 1977).

The San Jacinto fault is the most seismically active fault in Southern California, although it has no record of producing great events comparable to those that occurred on the San Andreas fault during the Fort Tejon earthquake of 1857 and the San Francisco earthquake of 1906 (Working Group on California Earthquake Probabilities, 1988). Between 1899 and 1990, seven earthquakes of **M** 6 .0 or greater have occurred along the San Jacinto fault. Two of these earthquakes, an estimated **M** 6.7 in 1899 and a **M** 6.8 in 1918, took place in the San Jacinto Valley, east of the site. Two others, an estimated **M** 6.5 in 1899 and a **M** 6.2 in 1923, took place in the San Bernardino Valley, north of the site (Working Group on California Earthquake Probabilities, 1988).

No large earthquakes have occurred on the San Bernardino Mountains segment of the San Andreas fault within the regional historical time frame. Using dendrochronological evidence, Jacoby and others (1987) inferred that a great earthquake on December 8, 1812 ruptured the northern reaches of this segment. Trenching studies have revealed evidence of rupture on the San Andreas fault at Wrightwood occurred within this time frame (Fumal and others, 1993). Comparison of rupture events at the Wrightwood site and Pallett Creek, and analysis of reported intensities at the coastal missions, led Fumal and others (1993) to conclude that the December 8, 1812 event ruptured the San Bernardino Mountains segment of San Andreas fault largely to the southeast of Wrightwood, possibly extending into the San Bernardino Valley. The average recurrence interval for large earthquakes along the southern San Andreas fault at six paleoseismic is 182 years (Stone and others, 2002). Surface rupture occurred on the Mojave segment of the San Andreas fault in the great 1857 Fort Tejon earthquake. The Coachella Valley segment of the San Andreas fault was responsible for the 1948 **M** 6.5 earthquake in the Desert Hot Springs area and for the 1986 **M** 5.6 earthquake in the North Palm Springs area.

The Murrieta Hot Springs fault has no record of historical seismicity.

SEISMIC ANALYSIS

The precise relationship between magnitude and recurrence interval of large earthquakes for a given fault is not known due to the relatively short time span of recorded seismic activity. As a result, a number of assumptions must be made to quantify the ground shaking hazard at a particular site.

Seismic hazard evaluations can be conducted from both a probabilistic and a deterministic standpoint. The probabilistic method is prescribed for seismic design by current building codes and was utilized to estimate the seismic hazard to the site during this investigation.

PROBABILISTIC HAZARD ANALYSIS:

The probabilistic analysis of seismic hazard is a statistical analysis of seismicity of all known regional faults attenuated to a particular geographic location. The results of a probabilistic seismic hazard analysis are presented as the annual probability of exceedance of a given strong motion parameter for a particular exposure time (Johnson and others, 1992).

For this report, the probabilistic analysis computer program FRISKSP (Blake, 2000) was used to analyze the location of the site under the criteria for NEHRP subgrade Type "D" by Boore and others (1997) in relation to seismogenic faults within a 62-mile (100km) radius of the site. This program assumes that significant earthquakes occur on mappable faults, and that the occurrence rate of earthquakes on a fault is proportional to the estimated slip rate of that fault. Maximum potential earthquake magnitudes are correlated to expected fault rupture areas. The ground motions of each source are attenuated to the site as per the selected method. The probability that the resultant ground motions will be exceeded is calculated. From the summation of the probabilities of exceedance of each ground motion level from all the potential sources, the total average annual probability of an acceleration greater than each of the values requested is calculated (Blake, 2000). The resultant graph of probability of exceedance vs. acceleration (Appendix "D") indicates that a peak ground acceleration of 0.57g has a 10 percent probability of exceedance in 50 years (statistical return period of 475 years). This corresponds to the Design Basis Earthquake as defined in the California Building Code (International Conference of Building Officials, 2001).

SEISMIC ZONE:

Figure 16-2 presented in the 2001 California Building Code (CBC) places the site within Seismic Zone 4. Table 16-I of the 2001 CBC assigns a Seismic Zone Factor "Z" of 0.40 to Seismic Zone 4.

SOIL PROFILE CHARACTERIZATION:

Based on the equivalent SPT-N_{60} data from the exploratory borings and the geologic setting of the site, the soil profile at the site is classified as S_D, stiff soil profile, according to the 2001 CBC.

NEAR-SOURCE EFFECTS:

The seismic hazard to the site is dominated by the Elsinore fault zone at a distance of approximately 3 3/4 miles southeast, and the Murrieta Hot Springs fault, approximately 3/4 mile north of the site. The Elsinore fault is classified as a Type "A" fault by the California Division of Mines and Geology (Cao and others, 2003). The Murrieta Hot Springs fault is not classified by Cao and others (2003); the appropriate classification for it is Type "B". Based on the distances to these faults and their source type, the site is subject to a near-source acceleration factor N_A of 1.30 and a near-source velocity factor N_V of 1.60, as defined in the 2001 CBC.

GROUNDWATER AND LIQUEFACTION

The entire site is underlain at relatively shallow depths by dense to very dense sedimentary rocks of the Pauba Formation. The overlying alluvial soils consist of silty sands and poorly graded sands in loose to dense states.

Data from State Well No. 07S/02W19C, available from Western Municipal Water District (2003), which is located approximately 3/4 mile northwest of the site, indicates a minimum depth to groundwater of 13 feet in 2003. This well is topographically at approximately the same elevation as the lowest portion of the subject site, and is expected to reflect the depth to groundwater within flatter alluvial areas and/or canyon bottoms in the vicinity. This equates to an elevation of approximately 1,122 feet above MSL. Groundwater was encountered within Boring No. 5 at a depth of approximately 32 feet below ground surface (approximate elevation 1,108 feet MSL). Groundwater was not encountered within the remaining exploratory borings utilized for this investigation. The site's groundwater conditions can be expected to rise somewhat following wet years. Based on the depth to groundwater and the proposed surface elevations, it appears that groundwater should not rise above 18 feet (elevation 1122) below lowest surface elevations.

Based on equivalent SPT data and in-place densities, soils below an elevation of 1122 generally have a high relative density.

Liquefaction is a process in which strong ground shaking causes saturated soils to lose their strength and behave as a fluid (Matti and Carson, 1991). Ground failure associated with liquefaction can result in severe damage to structures. The geologic conditions for increased susceptibility to liquefaction are:

1) shallow depth to groundwater (i.e., less than 50 feet), 2) presence of unconsolidated sandy alluvium, typically Holocene in age, and 3) strong ground shaking. All three of these conditions must be present for liquefaction to occur. Based upon the data reviewed during this investigation, two of the three geologic conditions for increased liquefaction susceptibility (strong ground shaking and shallow groundwater) are expected to exist on the site. Due to the density of alluvial soils and sedimentary bedrock below the anticipated groundwater elevation, there is no potential for significant liquefaction to occur at the site, and further evaluation of the liquefaction potential of the site is not warranted.

FLOODING AND EROSION

No evidence of significant historic flooding of the site was observed during our geologic field reconnaissance or on the aerial photographs reviewed. The hazard of major flooding of the site appears minimal.

A branch of the California aquaduct is located immediately east of the site. Seismically induced flooding may be a potential hazard, should the pipeline rupture during a large earthquake. Therefore, emergency drainage should be provided.

The upper soils encountered within the site consist of silty sands and poorly graded sands. These soils are moderately susceptible to erosion by wind and water. Positive drainage should be provided, and water should not be allowed to pond anywhere on the site. Water should not be allowed to flow over any graded or natural areas in such a way as to cause erosion.

SLOPE STABILITY

No significant natural slopes exist on or immediately adjacent to the site. It is anticipated that site development will not entail significant cut or fill slopes or slopes with inclinations in excess of 2 horizontal (h):1 vertical (v)].

CONCLUSIONS

On the basis of our field and laboratory investigations, it is the opinion of this firm that the proposed development is feasible from a geotechnical standpoint, provided that the recommendations contained in this report are implemented during grading and construction.

Moderate to severe seismic shaking of the site can be expected during the lifetime of the proposed structures.

No evidence of recent significant flooding of the site was observed during the geologic field reconnaissance or on the aerial photographs reviewed. The upper soils encountered within the site consist of silty sands that are moderately susceptible to erosion by wind and water.

Seismically induced flooding of the site may be a potential hazard should the California aquaduct rupture during a large earthquake. Emergency drainage should be provided.

Conditions conductive to landsliding are not present at the site. No significant slopes are proposed.

The controlling geotechnical issue for development of this site is the presence of loose, near-surface soils. These soils generally blanketed the site to a depth on the order of 3 feet. Based upon our field investigation and test data, it is our opinion that the loose upper soils blanketing the site will not, in their present condition, provide uniform or adequate support for the proposed fills and structures. These conditions may cause unacceptable differential and/or overall settlement upon application of the anticipated fill surcharges and foundation loads.

Therefore, because of site conditions, it is our opinion that a minimum mandatory removal and recompaction of at least the upper 36 inches of original ground soil in all areas to be graded be conducted. During the grading operation, the engineering geologist should observe the underlying soils so that any remaining pockets of loose soils may be identified and removed at that time and so that these soils may be properly densified to provide support for the proposed structures and infrastructures. The removed soils, if free of deleterious material such as roots, etc., may be reused as compacted fill.

To provide adequate support for the proposed structures, it is our opinion that the building pad areas should be further subexcavated as necessary and recompacted to provide a compacted fill mat beneath footings and slabs. A compacted fill mat should provide a dense, uniform, high-strength soil layer to distribute the foundation loads over the underlying soils. Conventional spread foundations, either individual spread footings and/or continuous wall footings, may be utilized in conjunction with a compacted fill mat.

The density of the deeper soils and the depth to static groundwater preclude a potential for liquefaction or other shallow groundwater-related hazards at the site.

Laboratory testing indicates selected sandy silt with clay on the site exhibit a "low" expansion potential (E.I. =27), which can adversely affect the proposed foundation structures. These expansive conditions can be compensated for using either specialized geotechnical grading parameters or design of special foundation/slab system. Grading of the site could be performed so that all structures will be founded on a minimum of 24 inches of granular non-expansive soils to mitigate the effects of such expansive soil. If the proposed grading creates a minimum of 24 inches of such material beneath the bottom of foundations and slabs, conventional foundations and slabs may be utilized without compensation for these expansive conditions. If the proposed grading establishes less than 24 inches of the granular non-expansive soil beneath foundation and slabs, specialized foundations such as post-tensioned slabs should be designed to resist the effects of these expansive soils. This should be confirmed by the engineering geologist prior to finish grading of the building pad surface. As such, we are providing recommendations for a conventional spread foundation, as well as post-tensioned slabs, although other types of foundations may be designed to resist the effects of expansion. It should be noted that soils with a greater expansion potential may be encountered during the grading operation, which may require a non-expansive blanket of greater thickness. As an alternative, the expansive soil may be mixed with on-site or imported non-expansive material to lower it's expansive index to less than 20.

RECOMMENDATIONS

SEISMIC DESIGN CONSIDERATIONS:

Severe seismic shaking of the site can be expected during the lifetime of the proposed structures. Therefore, the proposed structures should be designed accordingly.

The site is subject to near-source effects of strong motion. The applicable near-source acceleration factor N_a and the near-source velocity factor N_v, as defined in the 2001 California Building Code (CBC), are 1.30 and 1.60, respectively.

Based on the SPT N values, it is our opinion that the area of the site should be classified as S_D, stiff soil.

GENERAL SITE GRADING:

It is imperative that no clearing and/or grading operations be performed without the presence of a representative of the geotechnical engineer. An on-site pre-job meeting with the developer, the contractor, and the geotechnical engineer should occur prior to all grading-related operations. Operations undertaken at the site without the geotechnical engineer present may result in exclusions of affected areas from the final compaction report for the project.

Grading of the subject site should be performed, at a minimum, in accordance with these recommendations and with applicable portions of the CBC.

INITIAL SITE PREPARATION:

All areas to be graded should be stripped of significant vegetation and other deleterious materials. Any existing fills encountered during construction should be completely removed and, after being cleaned of significant deleterious materials, may be reused as compacted fill.

Any existing pockets of undocumented fill or loose disturbed soils encountered during construction should be completely removed, cleaned of significant deleterious materials, and may be reused as compacted fill. Any roots or other deleterious materials encountered at this time should be removed prior to replacing the soil.

In order to verify the suitability of the ground to receive fill and densify the loose upper soils, a mandatory subexcavation operation of all areas to be graded will need to be performed. This mandatory subexcavation operation should include removal of at least the upper 36 inches of existing soils. The depth of removal should be confirmed by the engineering geologist during grading operation.

Cavities created by removal of subsurface obstructions should be thoroughly cleaned of loose soil, organic matter, and other deleterious materials, shaped to provide access for construction equipment, and backfilled as recommended for site fill.

If a conventional spread foundation is selected for the design, within the structure and slab area and 5 feet beyond where possible, at least 24 inches of the expansive soil (E.I.>20) below the footing base grade and slab should be completely removed prior to any grading. This subexcavation operation should include a minimum of the upper 12 inches of existing material, even though planned filling will

be sufficient to satisfy non-expansive compacted fill thickness requirements. The removal of the upper 12 inches of soil, regardless, is to assist in fill identification and removal of buried obstructions and loose and disturbed soils . These expansive soils should not be reused as compacted fill in the building or flatwork areas. Imported or on-site granular non-expansive soils should be used as the fill material. As an alternative, the expansive soil may be mixed with on-site or imported non-expansive material to lower it's E.I. to less than 20.

If a post-tensioned slab foundation is selected for the design, at least the upper 12 inches of existing soil within the building pad area and 5 feet beyond where possible should be completely removed prior to any grading. The soils should be cleaned of significant deleterious materials and may be reused as compacted fill.

PREPARATION OF FILL AREAS:

Prior to placing fill, after the mandatory subexcavation operation, observation, and approval by the engineering geologist, the surfaces of all areas to receive fill should be scarified to a depth of approximately 12 inches. The scarified soils should be brought to between optimum moisture content and 2 percent above and recompacted to a relative compaction of at least 90 percent in accordance with ASTM D 1557.

PREPARATION OF FOOTING AREAS:

All footings should rest upon at least 18 inches of properly compacted fill material. In areas where the required thickness of compacted fill is not accomplished by the mandatory subexcavation operation and by site rough grading, the footing areas should be subexcavated to a depth of at least 18 inches below the proposed footing base grade. The subexcavation should horizontally extend beyond the footing lines a minimum distance of five feet where possible. The bottom of this excavation should then be scarified to a depth of at least 12 inches, brought to between optimum moisture content and 2 percent above, and recompacted to at least 90 percent relative compaction in accordance with ASTM D 1557 prior to refilling the excavation to grade as properly compacted fill.

COMPACTED FILLS:

The on-site soils should provide adequate quality fill material provided they are free from organic matter and other deleterious materials. Unless approved by the geotechnical engineer, rock or similar irreducible material with a maximum dimension greater than 8 inches should not be buried or placed in fills.

Although not anticipated, import fill should be inorganic, non-expansive granular soils free from rocks or lumps greater than 8 inches in maximum dimension. Sources for import fill should be observed and approved by the geotechnical engineer prior to their use.

Fill should be spread in near-horizontal layers, approximately 8 inches in thickness. Thicker lifts may be approved by the geotechnical engineer if testing indicates that the grading procedures are adequate to achieve the required compaction. Each lift shall be spread evenly, thoroughly mixed during spreading to attain uniformity of the material and moisture in each layer, brought to between optimum moisture content and 2 percent above, and compacted to a minimum relative compaction of 90 percent in accordance with ASTM D 1557.

SHRINKAGE AND SUBSIDENCE:

Based upon the relative compaction of the soils determined during this investigation and the relative compaction anticipated for compacted fill soils, we estimate a compaction shrinkage of approximately 5 to 10 percent. Therefore, 1.05 cubic yards to 1.10 cubic yards of in-place soil material would be necessary to yield 1 cubic yard of properly compacted fill material. In addition, we would anticipate subsidence of approximately 0.1 foot. These values are exclusive of losses due to stripping, or the removal of other subsurface obstructions, if encountered, and may vary due to differing conditions within the project boundaries and the limitations of this investigation.

Values presented for shrinkage and subsidence are estimates only. Final grades should be adjusted, and/or contingency plans to import or export material should be made to accommodate possible variations in actual quantities during site grading.

SLOPE CONSTRUCTION:

Significant permanent cut and fill slopes are not anticipated. If significant slopes are proposed, slopes should be constructed no steeper than 2(h):1(v). Our firm should be contacted to provide additional recommendations and evaluation of any significant proposed slope. Measures should be provided to prevent surface water from flowing over slope faces.

SPREAD FOUNDATION DESIGN:

If the sites are prepared as recommended and the site grading has created a minimum of 24 inches of compacted granular non-expansive soil below the bottoms of the foundations or dense native non-expansive soils are exposed, the proposed structures may be safely founded on conventional spread

foundations, either individual spread footings and/or continuous wall footings. Such conventional footings should be a minimum of 12 inches wide and should be established at a minimum depth of 12 inches below lowest adjacent final subgrade level.

For the minimum width and depth, footings may be designed for a maximum safe soil bearing pressure of 1,800 pounds per square foot (psf) for dead plus live loads. This allowable bearing pressure may be increased by 100 psf for each additional foot of width and by 300 psf for each additional foot of depth to a maximum safe soil bearing pressure of 3,000 psf for dead plus live loads. The strength of foundation support material should be verified by the geotechnical engineer.

These bearing values may be increased by one-third for wind or seismic loading.

If structures are to be founded on less than 24 inches of granular non-expansive soils, than a post-tensioned slab, or other specialized foundation system, will ne necessary to resist the effects of the expansive soil conditions. Geotechnical design recommendations for post-tensioned slabs are provided in the POST-TENSIONED SLAB DESIGN section of this report.

Based upon the existing soil conditions and recommended grading procedures, static settlement should not exceed 1/2 inch. Differential settlement between adjacent and similarly loaded foundations should not exceed 1/480 (1/4 inch over 40 feet).

LATERAL LOADING:

Resistance to lateral loads will be provided by passive earth pressure and base friction. For footings bearing against compacted fill or approved native soils, passive earth pressure may be considered to be developed at a rate of 300 psf per foot of depth. Base friction may be computed at 0.30 times the normal load. Base friction and passive earth pressure may be combined without reduction.

For preliminary retaining wall or shoring design purposes, a lateral active earth pressure developed at a rate of 40 psf per foot of depth should be utilized for unrestrained conditions. For restrained conditions, an at-rest earth pressure of 55 psf per foot of depth should be utilized. These values should be verified prior to construction when the backfill materials and conditions have been determined and are applicable only to level properly drained backfill with no additional surcharge loadings. If backfills are proposed, this firm should be contacted to develop appropriate active earth pressure parameters.

Foundation concrete should be placed in neat excavations with vertical sides, or the concrete should be formed and the excavations properly backfilled as recommended for site fill.

SLABS-ON-GRADE:

If the site is prepared as recommended, conventional slabs-on-grade may only be utilized if the site grading has established a minimum of 24 inches of compacted granular non-expansive soils below the bottoms of the slabs. The final pad surfaces should be rolled to provide smooth, dense surfaces upon which to place the concrete. If slabs are to be founded on less than 24 inches of granular non-expansive soils, then a post-tensioned slab, or other specialized foundation system, will be necessary to resist the effects of the expansive soil conditions. Geotechnical design recommendations for post-tensioned slabs are provided in the POST-TENSIONED SLAB DESIGN section of this report.

Slabs to receive moisture-sensitive coverings should be provided with a moisture vapor barrier. This barrier may consist of an impermeable membrane. Two inches of sand over the membrane will reduce punctures and aid in obtaining a satisfactory concrete cure. The sand should be moistened just prior to placing of concrete.

POST-TENSIONED SLAB DESIGN:

The following recommendations are provided for foundations embedded into the native cohesive soils at the site. These values are preliminary and should be verified following the actual grading operation.

Expansion test results indicate that selected soils at the site have an E.I. of 27, which equates to a "low" expansion potential. Based upon the results of the tests, we are providing the following parameters required for the design of post-tensioned slabs (Ch. 18, Div. III, 1997 UBC):

1.	Allowable soil bearing pressure	1,250 psf
2.	Edge moisture variation distance(e_m)	2.5 feet edge lift 5.4 feet center lift
3.	Differential soil movement (y_m)	0.10 inch edge lift 0.78 inch center lift
4.	Slab-subgrade friction coefficient	0.30

Numbers 2 and 3 above relate to expansive soils and are based upon a Thornwaite Moisture Index of -20, a constant suction of 3.6 pF at a depth of 3 feet, a velocity of moisture flow of 0.7 inch per month, and predominantly montmorillonite clay soil with 30 percent clay.

An assumed value of subgrade modulus of 125 pci can be used to determine the partition load coefficient during uniform slab thickness calculations.

For structures founded on expansive soils, consideration should be given to the connection of utility lines. In general, connections should be flexible to allow for differential movement. Flexible pipe such as PVC should be utilized.

CONCRETE FLATWORK:

The expansive soils conditions identified on the site may adversely affect areas of portland cement concrete (PCC) flatwork such as sidewalks, driveways, curbs, and other non structural pavement areas. PCC flatwork will require special geotechnical or structural design considerations to accommodate the effects of expansion. For structural building slab areas, we have provided recommendations for post-tensioned slab design; however, post-tensioned slabs may not be practical for concrete flatwork. As such, we are including the following general recommendations for concrete flatwork where expansive soils are present.

Geotechnical Methods of Mitigation:

Utilizing the weighted expansion index outlined in the UBC, the potential effects of expansive soils can be incrementally decreased with greater thicknesses of granular material beneath the flatwork. The expansive effects can be reduced to a level of insignificance by supporting the flatwork on a minimum of 24 inches of granular material. In cases where this is impractical, a minimum of 12 inches of compacted granular non expansive material should be placed beneath the flatwork.

The expansive soils should be pre-saturated to a depth of 24 inches for the previous 7 days prior to placement of concrete. The pre-saturation should be to at least 5 percent above optimum moisture content.

The expansive soils should be protected from moisture fluctuations to the extent practical. This may involve such factors as providing positive drainage away from the flatwork, avoidance of adjacent landscaping (especially trees) requiring irrigation or perhaps placement of impermeable membranes. Irrigation pipes should not be placed near flatwork and must be properly

maintained in order to avoid distress related to leaks and rupture. Landscape areas should slope away from the flatwork and structural areas by at least 5 percent. All surface water runoff must be diverted away from the margins of flatwork and structural areas, and directed into paved roadways or appropriate drainage features.

Structural Methods of Mitigation:

All flatwork should be designed to resist the effects of expansion. We are providing what we consider typical recommendations. The actual design including reinforcement should be provided by the structural or civil engineer.

All concrete flatwork subject to the effects of expansive soils should be a minimum of 4 inches in thickness and reinforced by utilizing a minimum of 6x6-W6xW6 steel welded wire reinforcement (ASTM A 185-01) or #3 Bars at 14 inches each way at mid height. Curbing should contain at least one number 4 bar continuous top and bottom.

Where the flatwork abuts structures or adjacent flatwork the flatwork should be doweled into the adjacent structure, to avoid differential elevation. The dowels should be smooth and either wrapped or lubricated on one end to prevent bonding and allow for movement. Felt or similar material should be placed between adjacent slab edges.

It should be cautioned that some distress to concrete flatwork may occur in spite of the measures taken to mitigate the effects. However, the distress will be lessened by incorporating as many of the above measures as practical into the design and construction of the flatwork. The costs of these preventative measures should be weighed against the costs of future repairs and maintenance.

POTENTIAL EROSION:

The potential for erosion should be mitigated by proper drainage design. Water should not be allowed to flow over graded areas or natural areas so as to cause erosion. Graded areas should be planted or otherwise protected from erosion by wind or water.

EXPANSIVE SOILS:

Clayey soil materials tested during this investigation exhibited a "low" potential for expansion with an E.I. of 27 in accordance with UBC Standard Test Method 18-2 (2001 CBC). The results of these tests are presented in the Test Data Summary (Enclosure "C-1"). Specialized construction procedures to specifically resist expansive soil forces are therefore recommended. Our calculation, per CBC Chapter

18, indicate that with a minimum of 24 inches of granular non-expansive material established beneath the bottoms of the foundations, weighted expansion index will be 8.1. With such a blanket of non-expansive material, conventional spread foundation designs may be utilized. Without such a blanket of non-expansive material, specialized foundation systems such as post-tensioned slabs are necessary. Geotechnical design recommendations for both types of foundation systems are provided in the representative sections of this report. Requirements for reinforcing steel to satisfy structural criteria are not affected by these recommendations.

Because of the unknowns with respect to the grading operation and the mixing and potential importing of soils at the site, it is our recommendation that the grading operation be closely observed by the geo-technical engineer, and, near the completion of grading, that each pad area be evaluated for expansive soils. The results of that evaluation will determine the specific type of slabs and foundations appropriate for the sites final graded condition.

CORROSIVITY TESTING:

Selected samples of material were delivered to M. J. Schiff & Associates, Inc. for soil corrosivity tests. Laboratory testing consisted of pH, resistivity, and major soluble salts commonly found in soils. The results of the laboratory tests performed by M. J. Schiff & Associates, Inc. are attached as Enclosure "C-6". These tests have been performed in order to screen the site for potentially corrosive soils.

Values from the soil tested are considered mildly corrosive at as-received and corrosive at saturated moisture conditions to ferrous metals at the site.
Testing for ammonium and nitrate values indicated that the soils were not generally corrosive to copper.

Results of the soluble sulfate testing indicate a "negligible" anticipated exposure to sulfate attack, as indicated on the enclosed test results. Based upon the criteria from Table 4.3.4. of the American Concrete Institute (ACI) Manual of Concrete Practice (2000), no special measures, such as specific cement types, water-cement ratios, etc., will be needed for this "negligible" exposure to sulfate attack.

Soluble chloride content of soil was not at levels high enough to be of concern with respect to corrosion of reinforcing steel. The results should be considered in combination with the soluble chloride content of the hardened concrete in determining the effect of chloride on the corrosion of reinforcing steel.

C.H.J., Incorporated does not practice corrosion engineering. If further information concerning the corrosion characteristics, or interpretation of the results submitted herein, are required, then a competent corrosion engineer could be consulted.

CONSTRUCTION OBSERVATION:

All grading operations, including site clearing and stripping, should be observed by a representative of the geotechnical engineer. The presence of the geotechnical engineer's field representative will be for the purpose of providing observation and field testing, and will not include any supervising or directing of the actual work of the contractor, his employees, or agents. Neither the presence of the geotechnical engineer's field representative nor the observations and testing by the geotechnical engineer shall excuse the contractor in any way for defects discovered in his work. It is understood that the geotechnical engineer will not be responsible for job or site safety on this project, which will be the sole responsibility of the contractor.

LIMITATIONS

C.H.J., Incorporated has striven to perform our services within the limits prescribed by our client, and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application, or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of C.H.J., Incorporated. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations

observed and/or sampled are similar to those encountered at the individual locations where observation and sampling was performed. However, conditions between these locations may vary significantly. Should conditions be encountered in the field, by the client or any firm performing services for the client or the client's assign, that appear different than those described herein, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project, or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please do not hesitate to contact this office.

Respectfully submitted,
C.H.J., INCORPORATED

REGISTERED GEOLOGIST
BENNIE DON WILLIAMS
NO. 7542
EXP. 1-31-05
STATE OF CALIFORNIA
11-30-04

Ben Williams, R.G. 7542
Staff Geologist

Melvinsky Ramirez, Staff Engineer

Jay J. Martin, E.G. 1529
Vice President

REGISTERED GEOLOGIST
JAY J. MARTIN
No. 1529
CERTIFIED ENGINEERING GEOLOGIST
Exp. 8-31-06
STATE OF CALIFORNIA
11-30-04

Robert J. Johnson, G.E. 443
President

REGISTERED PROFESSIONAL ENGINEER
ROBERT J. JOHNSON
No. 443
Exp. 3-31-05
GEOTECHNICAL
STATE OF CALIFORNIA
11-30-04

MR/BW/RJJ:bjr

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AERIAL PHOTOGRAPHS REVIEWED

Riverside County Flood Control District, January 30,1962, Black and White Aerial Photographs, Photograph Number 408.

Riverside County Flood Control District, June 20, 1974, Black and White Aerial Photographs, Photograph Numbers 878 and 879.

Riverside County Flood Control District, December 8, 1983, Black and White Aerial Photographs, Photograph Number 398.

Riverside County Flood Control District, January 28, 1990, Black and White Aerial Photographs, Photograph Numbers 17-23 and 17-24.

Riverside County Flood Control District, April 10, 2000, Black and White Aerial Photographs, Photograph Numbers 17-23 and 17-24.

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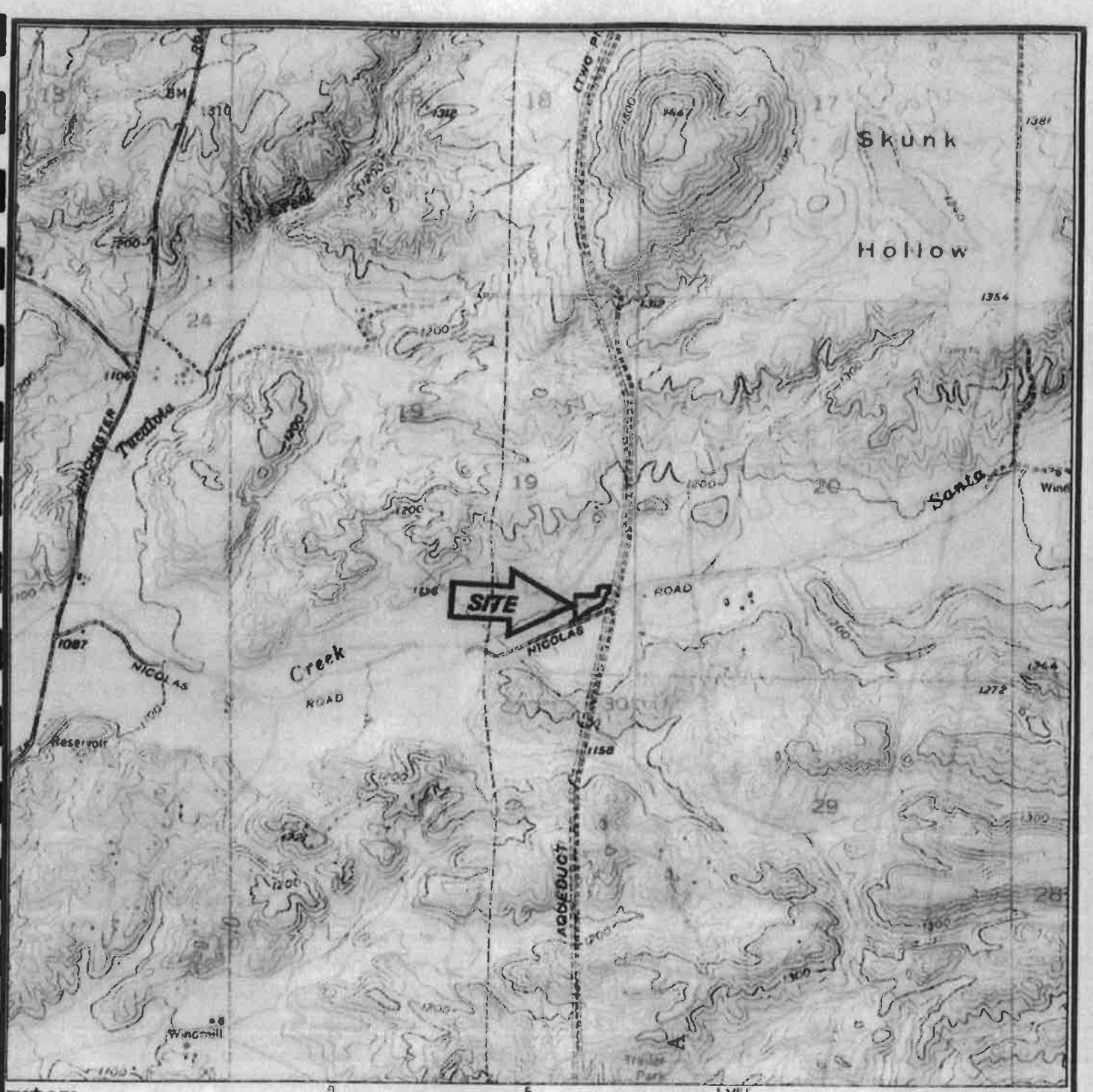
APPENDIX "A"

GEOTECHNICAL MAPS

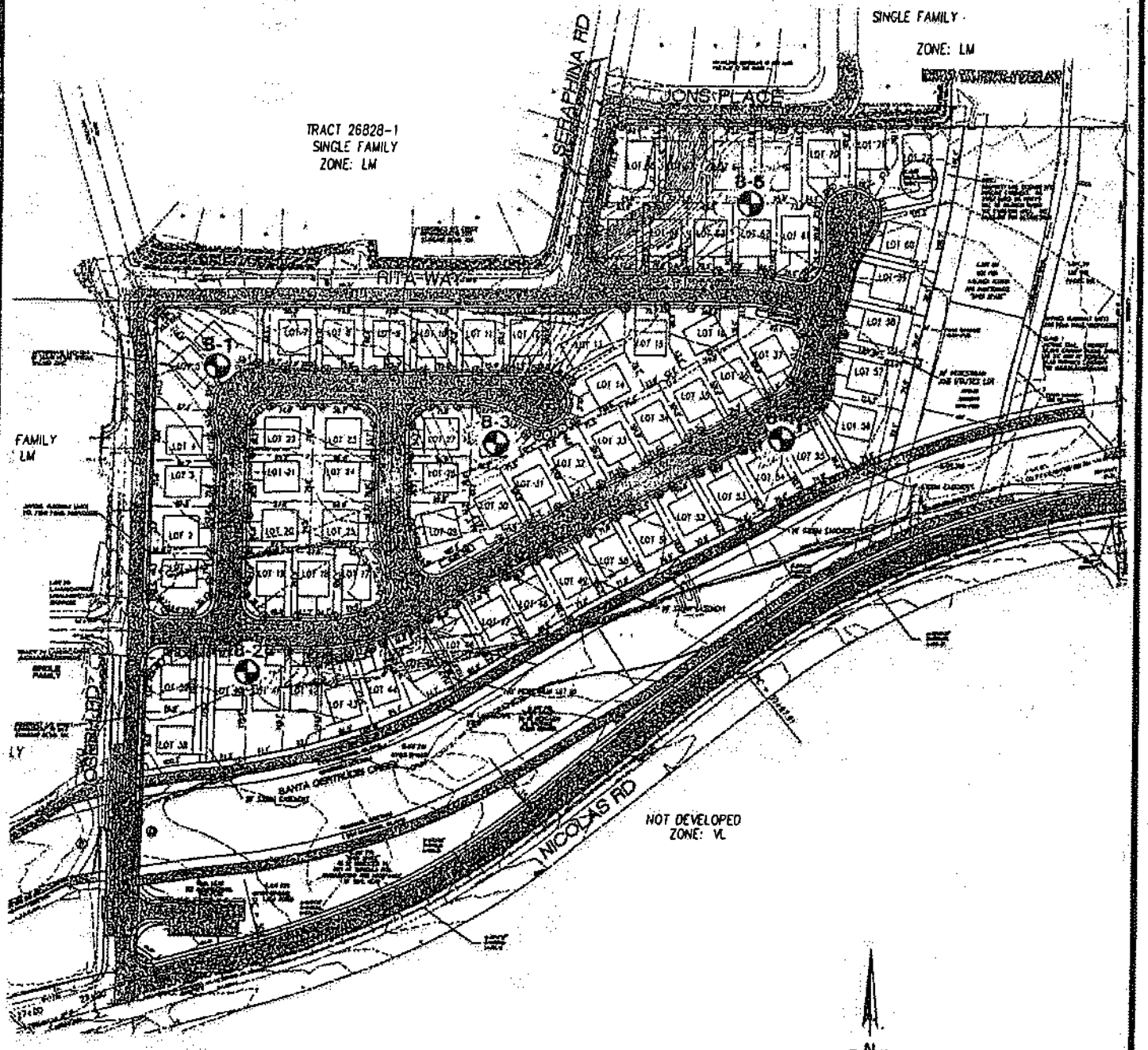


Map created with TOPO!® ©2001 National Geographic (www.nationalgeographic.com/topo)

INDEX MAP

FOR: SERAPHINA DEVELOPMENT	GEOTECHNICAL INVESTIGATION RESIDENTIAL DEVELOPMENT NICOLAS ROAD AND JOSEPH ROAD TEMECULA, CALIFORNIA	ENCLOSURE "A-1"
DATE: NOVEMBER 2004		JOB NUMBER 041063-3

C.H.J., INCORPORATED



LEGEND

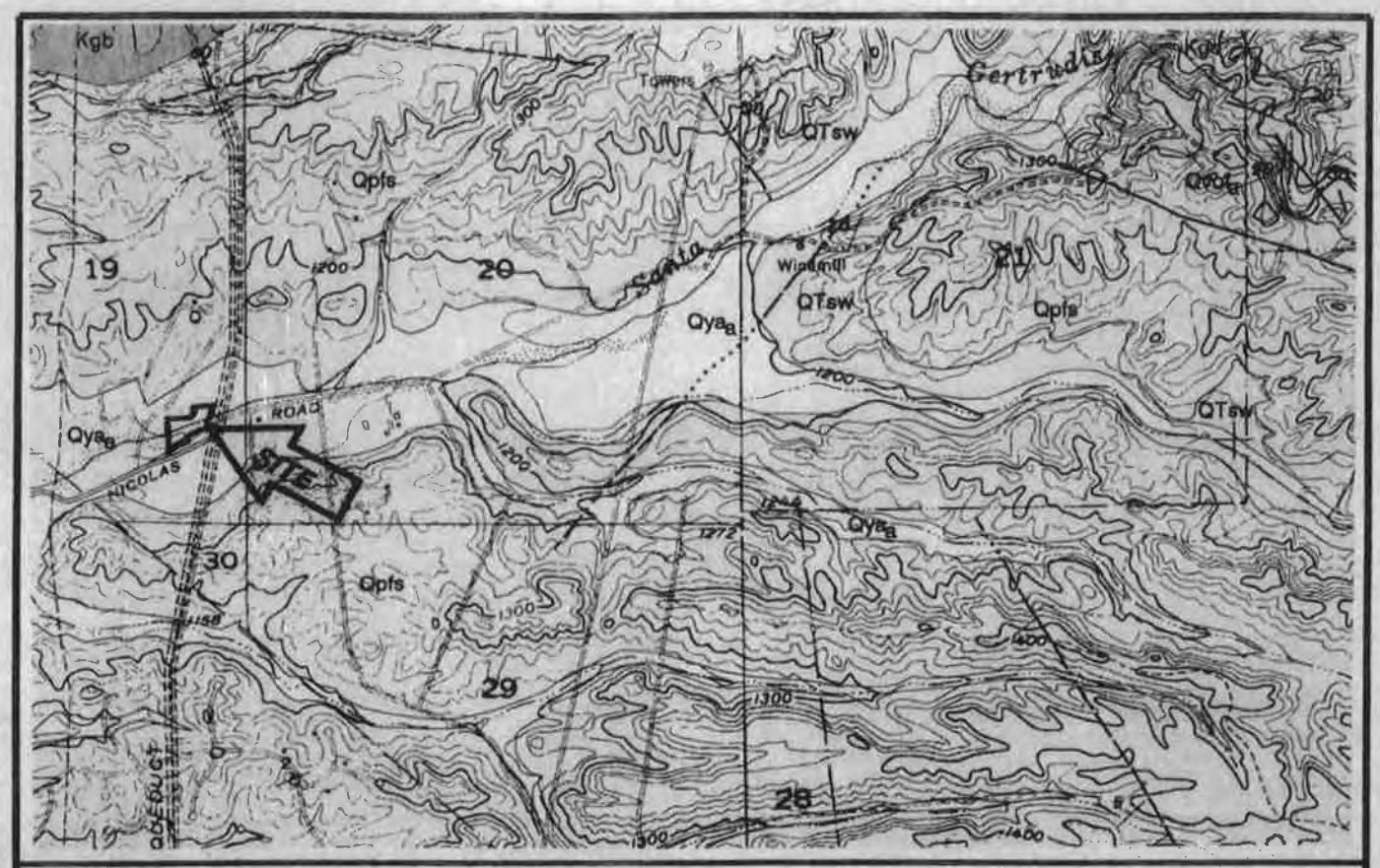
8-5 - *EXPLORATORY BORING LOCATIONS*

SCALE 1"= 120'

PLAT

FOR: **SERAPHINA DEVELOPMENT**	**GEOTECHNICAL INVESTIGATION RESIDENTIAL DEVELOPMENT NICOLAS ROAD AND JOSEPH ROAD TEMECULA, CALIFORNIA**	ENCLOSURE **"A-2"**
DATE: **NOVEMBER 2004**		JOB NUMBER **041063-3**

C.H.J., INCORPORATED



LEGEND

Qya - Young alluvial channel deposits. (Holocene and latest Pleistocene)
Qpfs - Pauba Formation: Sandstone member Brown, moderately well-indurated. (Pleistocene)
QTsw - Pauba Formation: Sandstone unit Restricted here to small area along Santa Gertrudis Creek. (Pleistocene and Pliocene)
Kgb - Gabbro (Cretaceous)

SYMBOLS

Geologic contact: Dashed where approximately located dotted where concealed

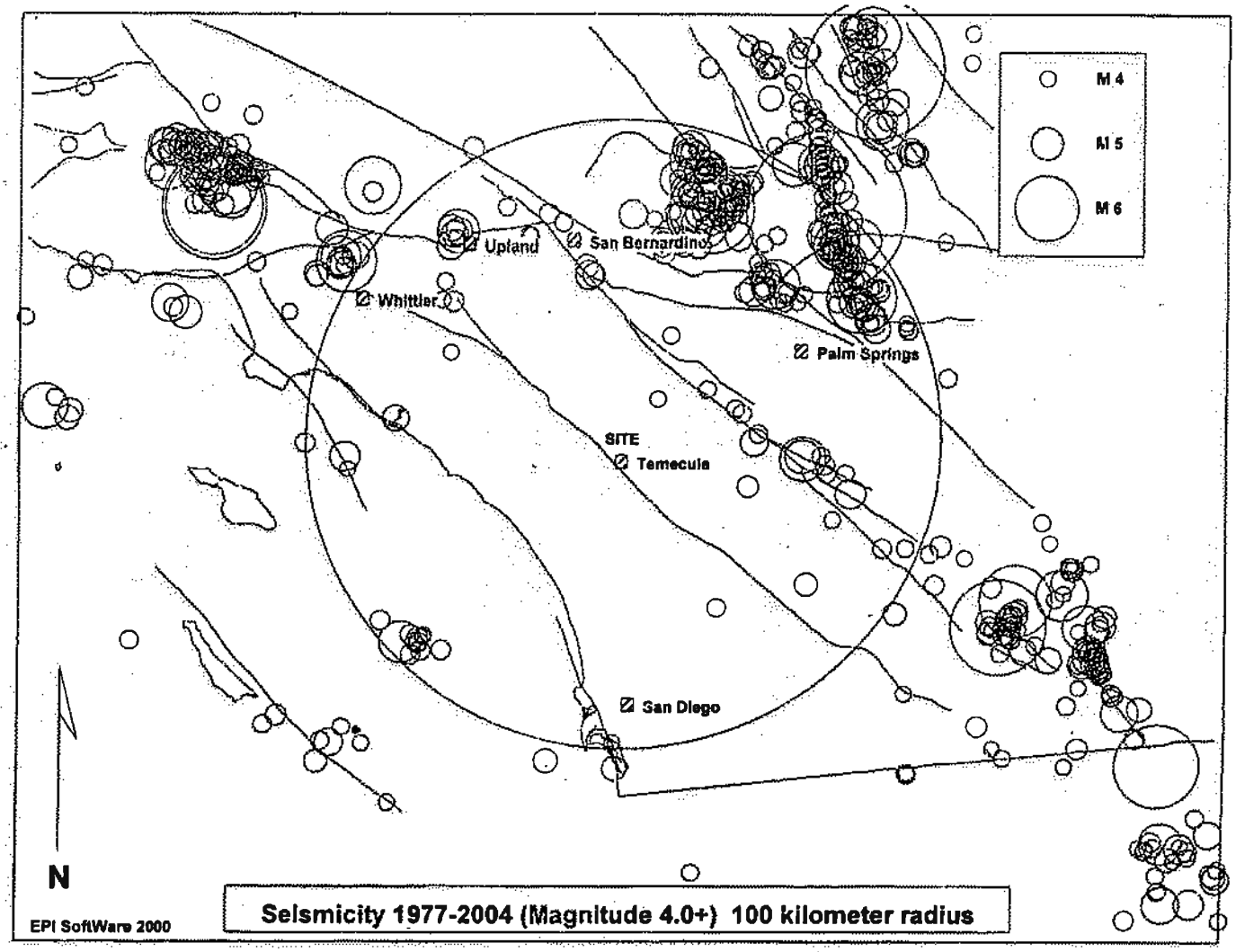
N

SCALE: 1: 24,000

Base Map by; M.P. KENNEDY, AND D.M. MORTON, 2003

GEOLOGIC INDEX MAP

FOR: **SERAPHINA DEVELOPMENT**	**GEOTECHNICAL INVESTIGATION RESIDENTIAL DEVELOPMENT NICOLAS ROAD AND JOSEPH ROAD TEMECULA, CALIFORNIA**	ENCLOSURE **"A-3"**
DATE: **NOVEMBER 2004**		JOB NUMBER **041063-3**



SITE LOCATION: 33.557 LAT. -117.126 LONG.

MINIMUM LOCATION QUALITY: C

TOTAL # OF EVENTS ON PLOT: 560

TOTAL # OF EVENTS WITHIN SEARCH RADIUS: 237

MAGNITUDE DISTRIBUTION OF SEARCH RADIUS EVENTS:

4.0- 4.9 : 212
5.0- 5.9 : 22
6.0- 6.9 : 2
7.0- 7.9 : 1
8.0- 8.9 : 0

0 50 100
KILOMETERS

CLOSEST EVENT: 4.0 ON SUNDAY, DECEMBER 21, 1997 LOCATED APPROX. 17 KILOMETERS NORTHEAST OF THE SITE

EARTHQUAKE EPICENTER

FOR: SERAPHINA DEVELOPMENT	GEOTECHNICAL INVESTIGATION RESIDENTIAL DEVELOPMENT NICOLAS ROAD AND JOSEPH ROAD TEMECULA, CALIFORNIA	ENCLOSURE "A-4"
DATE: NOVEMBER 2004		JOB NUMBER 041063-3

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APPENDIX "B"

EXPLORATORY LOGS

KEY TO LOGS

SAMPLE TYPE:

Corr. Corrosivity Test

Consol. Consolidation Test (ASTM D 2435)

DS Direct Shear Test (ASTM D 3080)

MDC Maximum Density Optimum Moisture Determination (ASTM D 1557)

Ring Indicates Undisturbed Ring Sample. Undisturbed Ring Samples are obtained with a "California Sampler" (3.25" O.D. and 2.42" I.D.) driven with a 140-pound weight falling 30 inches. The blows per foot are converted to equivalent SPT values.

SA Sieve Analysis (ASTM C 136)

SPT Indicates Standard Penetration Test. The SPT –value is the number of blows required to drive an SPT sampler 12 inches using a 140 pound weight falling 30 inches. The SPT sampler is 2" O.D. and 1-3/8" I.D.

ENGINEERING PROPERTIES FROM SPT BLOWS

Relationship of Penetration Resistance to Relative Density for Cohesionless Soils*
(After Mitchell and Katti, 1981)

No. of SPT Blows (N_{60})	Descriptive Relative Density	Approximate Relative Density (%)
<4	Very Loose	0-15
4-10	Loose	15-35
10-30	Medium Dense	35-65
30-50	Dense	65-85
>50	Very Dense	85-100

* At an effective overburden pressure of 1 ton per square foot (100 kPa)

SOIL CLASSIFICATION CHART

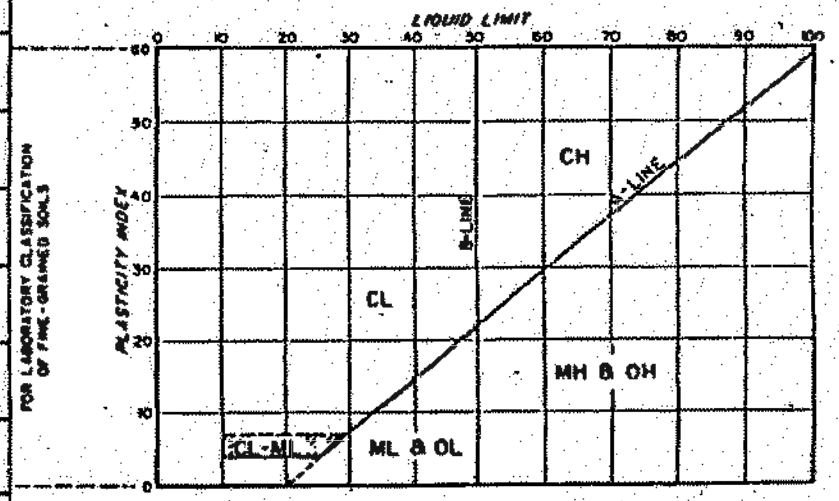
MAJOR DIVISIONS			GRAPH SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE)	GRAVEL AND GRAVELLY SOILS (MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE)	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
	SAND AND SANDY SOILS (MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE)	CLEAN SAND (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS (MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE)	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

GRADATION CHART

MATERIAL SIZE	PARTICLE SIZE			
	LOWER LIMIT		UPPER LIMIT	
	MILLIMETERS	SIEVE SIZE	MILLIMETERS	SIEVE SIZE
SAND				
FINE	.074	#200 ‡	0.42	#40 ‡
MEDIUM	0.42	#40 ‡	2.00	#10 ‡
COARSE	2.00	#10 ‡	4.76	#4 ‡
GRAVEL				
FINE	4.76	#4 ‡	19.1	3/4" *
COARSE	19.1	3/4" *	76.2	3" *
COBBLES	76.2	3"	304.8	12"
BOULDERS	304.8	12	914.4	36"

‡ US STANDARD * CLEAR SQUARE OPENINGS

PLASTICITY CHART



UNIFIED SOIL CLASSIFICATION SYSTEM

C·H·J· INCORPORATED

EXPLORATORY BORING NO. 1

Date Drilled: 11/8/04 | Client: Seraphina Development

Equipment: All Access L10T | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): 1148.0 | Logged by: M.R. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to coarse with gravel to 1", dark brown	Alluvium						
				X		4	12.7	121	Ring
5				X		4	12.5	115	Ring, Consol
		(SP) Sand, fine to medium with coarse and gravel to 1.5", yellow brown			X		7.3		
10				X		34	9.6	122	Ring
15				X		44	15.1	106	Ring
		(CL) Clay, fine to medium with gravel to 1", olive brown			X				
20				X		33	41.5	82	Ring
		(SM) Silt Sand, fine to medium, olive brown			X				
25				X		34	23.1	101	Ring
30		(ML) Siltstone, reducing to Silt with clay	Pauba Formation	X		48	45.6	75	Ring
		END OF BORING PAUBA FORMATION AT 30.0', NO REFUSAL, NO FILL, SLIGHT CAVING NO FREE GROUNDWATER							

BORING LOG 041063-3.GPJ CHJ.GDT 11/29/04

C·H·J·

SERAPHINA DEVELOPMENT
TEMECULA, CALIFORNIA

Job No. 041063-3

Enclosure B-1

EXPLORATORY BORING NO. 2

Date Drilled: 11/8/04 | Client: Seraphina Development

Equipment: All Access L10T | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): 1140.0 | Logged by: M.R. | Measured Depth to Water(ft): N/A

DEPTH (ft)	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
	(SP) Sand, fine to coarse with gravel to 2", yellow brown	Alluvium		▒		4.4		SA
			☒		9	4.0	101	Ring, Consol
5								
			☒		16	5.4	111	Ring, Consol
10	(ML) Sandy Silt, fine to medium, brown			▒		13.2		
			☒		26	25.8	104	Ring
15	(SP) Sand, fine to coarse, yellow brown			▒		14.4		
			☒		27	14.6	110	Ring
20	(ML) Siltstone, reducing to Sandy Silt with clay	Pauba Formation		▒		47.0		
			☒		54	39.7	81	Ring
25	(SP) Sand, fine to coarse, brown							
			☒		56	37.8	82	Ring
	END OF BORING							
30	PAUBA FORMATION AT 20.0' NO REFUSAL, NO FILL SLIGHT CAVING NO FREE GROUNDWATER							

BORING LOG 041063-3.GPJ CHJ.GDT 11/29/04

C·H·J·

SERAPHINA DEVELOPMENT
TEMECULA, CALIFORNIA

Job No. 041063-3

Enclosure B-2

EXPLORATORY BORING NO. 3

Date Drilled: 11/8/04 | Client: Seraphina Development

Equipment: All Access L10T | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): 1148.0 | Logged by: M.R. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to coarse with gravel to 1", dark brown	Alluvium				9.9		
				X		8	7.8	122	Ring
		(ML) Siltstone, reducing to Sandy Silt with clay	Pauba Formation					22.4	
5				X		33	8.0	107	Ring
10				X		67	9.6	108	Ring
15				X		54/11"	11.5	126	Ring
20				X		56/11"	17.6	114	Ring
25				X		38	35.1	90	Ring
30				X		40	44.0	74	Ring
		END OF BORING PAUBA FORMATION AT 3.0', NO REFUSAL, NO FILL, SLIGHT CAVING, NO FREE GROUNDWATER							

BORING LOG 041063-3.GPJ CHJ.GDT 11/29/04

C·H·J·

SERAPHINA DEVELOPMENT
TEMECULA, CALIFORNIA

Job No. 041063-3

Enclosure B-3

EXPLORATORY BORING NO. 4

Date Drilled: 11/8/04 | Client: Seraphina Development

Equipment: All Access L10T | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): 1148.0 | Logged by: M.R. | Measured Depth to Water(ft): N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(ML) Sandy Silt with clay, fine to medium, brown	Alluvium		X		12.1		SA, MDC, DS, Cor
				X		6	18.8	107	Ring, Consol
5									
				X		27	9.2	124	Ring
10		(SP) Sand, fine to coarse with silt, red brown			X		4.8		
				X		17	11.0	107	Ring
15		(ML) Siltstone, reducing to Sandy Silt with clay	Pauba Formation		X		39.0		
				X		51	12.8	103	Ring
		END OF BORING							
20		PAUBA FORMATION AT 15.0' NO REFUSAL NO FILL SLIGHT CAVING NO FREE GROUNDWATER							
25									
30									

BORING LOG 041063-3.GPJ CHJ.GDT 11/29/04

EXPLORATORY BORING NO. 5

Date Drilled: 11/8/04 | Client: Seraphina Development

Equipment: All Access L10T | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): 1150.0 | Logged by: M.R. | Measured Depth to Water(ft): 32.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium with clay, dark brown	Alluvium		▒		9.4		
				☒		14	12.6	116	Ring
5				☒		25	4.6	110	Ring
		(SP) Sand, fine to coarse with silt, yellow brown			▒		3.7		
10				☒		19	4.7	101	Ring
15				☒		18	6.7	105	Ring
20				☒		28	13.9	98	Ring
25		(ML) Siltstone, reducing to Sandy Silt with clay	Pauba Formation	☒	▒	28	26.1 10.6	108	Ring
		(ML) Siltstone, reducing to Silt with clay, yellow brown			▒		13.6		
30			Groundwater	☒		28			SPT

BORING LOG 041063-3.GPJ CHJ.GDT 11/28/04

SERAPHINA DEVELOPMENT
TEMECULA, CALIFORNIA

Job No. 041063-3

Enclosure B-5a

EXPLORATORY BORING NO. 5

Date Drilled: 11/8/04 | Client: Seraphina Development

Equipment: All Access L10T | Driving Weight / Drop: 140 lbs/30 in

Surface Elevation(ft): 1150.0 | Logged by: M.R. | Measured Depth to Water(ft): 32.0

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DRIVE	SAMPLES BULK	BLOWS/FOOT (Equiv. SPT)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(ML) Sandstone, yellow brown							
		(ML) Siltstone, reducing to Sandy Silt, fine to medium with clay, olive brown		X		21	15.7		SPT
40				X		62/5"			SPT
		(SP) Sandstone, reducing to Silty Sand, fine to medium, red brown					14.3		
45				X		98/11"			SPT
50				X		62/4"	3.6		SPT
		END OF BORING							
55		PAUBA FORMATION AT 25.0' NO REFUSAL NO FILL SLIGHT CAVING PERCHED GROUNDWATER AT 32.0'							
60									
65									

BORING LOG 041063-3.GPJ CHJ.GDT 11/29/04

SERAPHINA DEVELOPMENT
TEMECULA, CALIFORNIA

Job No. 041063-3

Enclosure B-5b

C·H·J·

APPENDIX "C"

LABORATORY TESTING

C·M·J·

Enclosure "C-1"
Job No. 041063-3

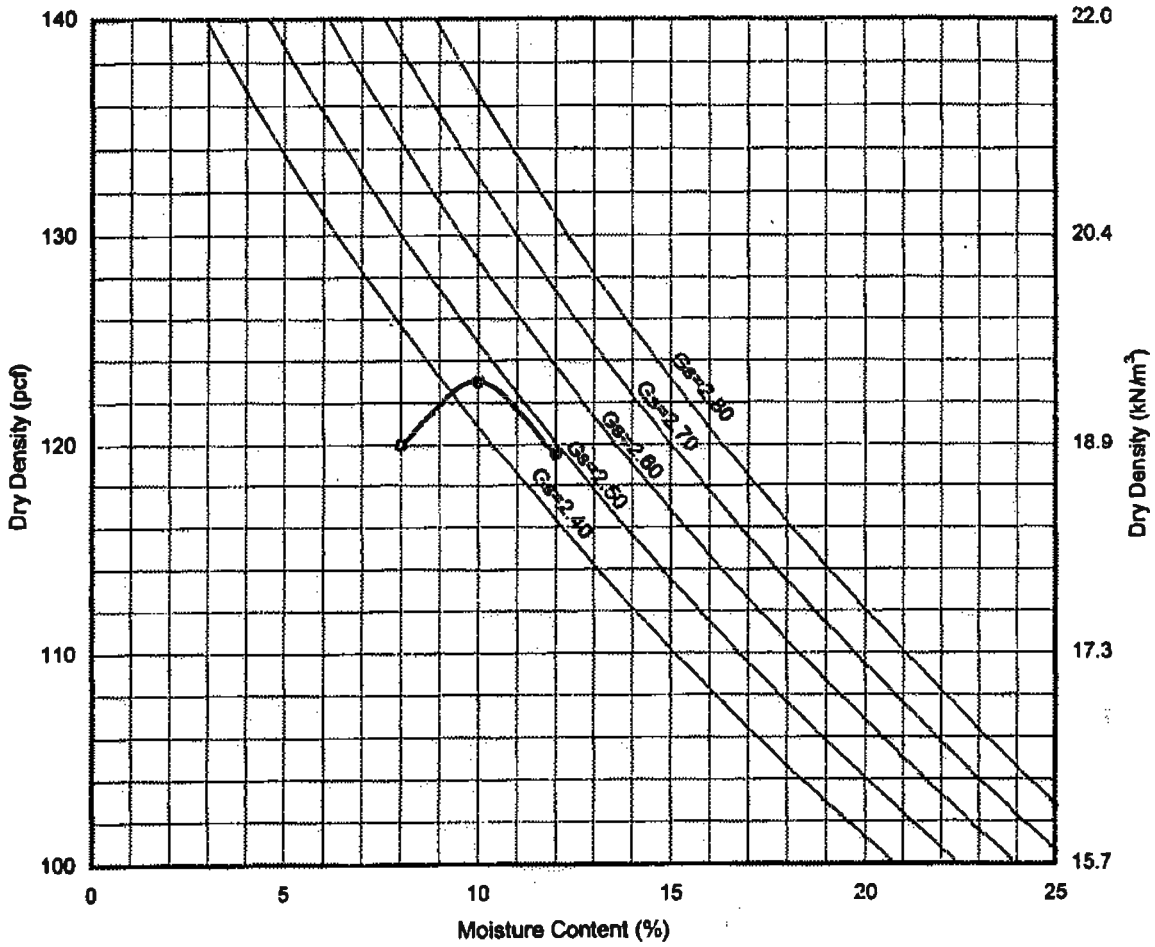
TEST DATA SUMMARY SHEET

EXPANSION INDEX:

California Building Code Standard Test Method 18-2

Boring No.	Depth of Sample (ft.)	Initial Moisture (%)	Final Moisture (%)	Degree of Saturation (%)	Expansion Index	Expansion Potential
4A	1	11.8	21.5	54	27	Low

Maximum Density Optimum Moisture Determination Test (ASTM 1557)



Boring #		Depth(ft)	Soil/Sample Type	γ_{max} (pcf)	w_{opt} (%)
•	4A	1	(ML) Sandy Silt with clay, with fine to medium	123	10.0

MOISTURE DENSITY TEST			
Project:	Seraphina Development		
Location:	Northeast Corner of Nicholas Road and Joseph Road		
Job No.:	041063-3	Enclosure:	C-2

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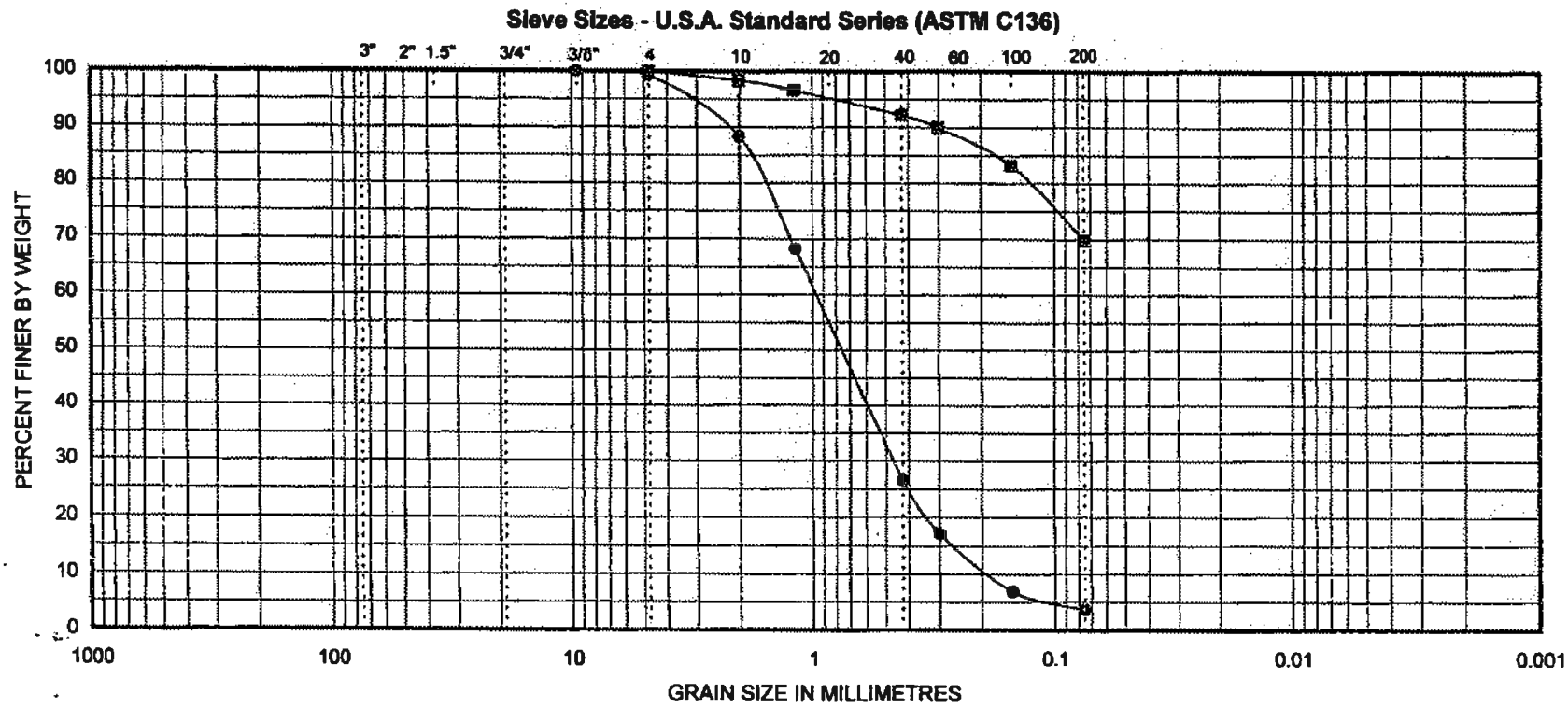

Cobbles & Boulders	Gravel		Sand			Silt or Clay
	Coarse	Fine	Coarse	Medium	Fine	

Symbol	Boring	Depth (ft)	Classification	D_{10} (mm)	D_{30} (mm)	D_{50} (mm)	D_{60} (mm)	C_u	C_c
●	2A	1.0	(SP) Sand, fine to coarse grained	0.184	0.462	0.754	0.964	5.24	1.20
■	4A	1.0	(ML) Sandy Silt, with clay, fine with medium						

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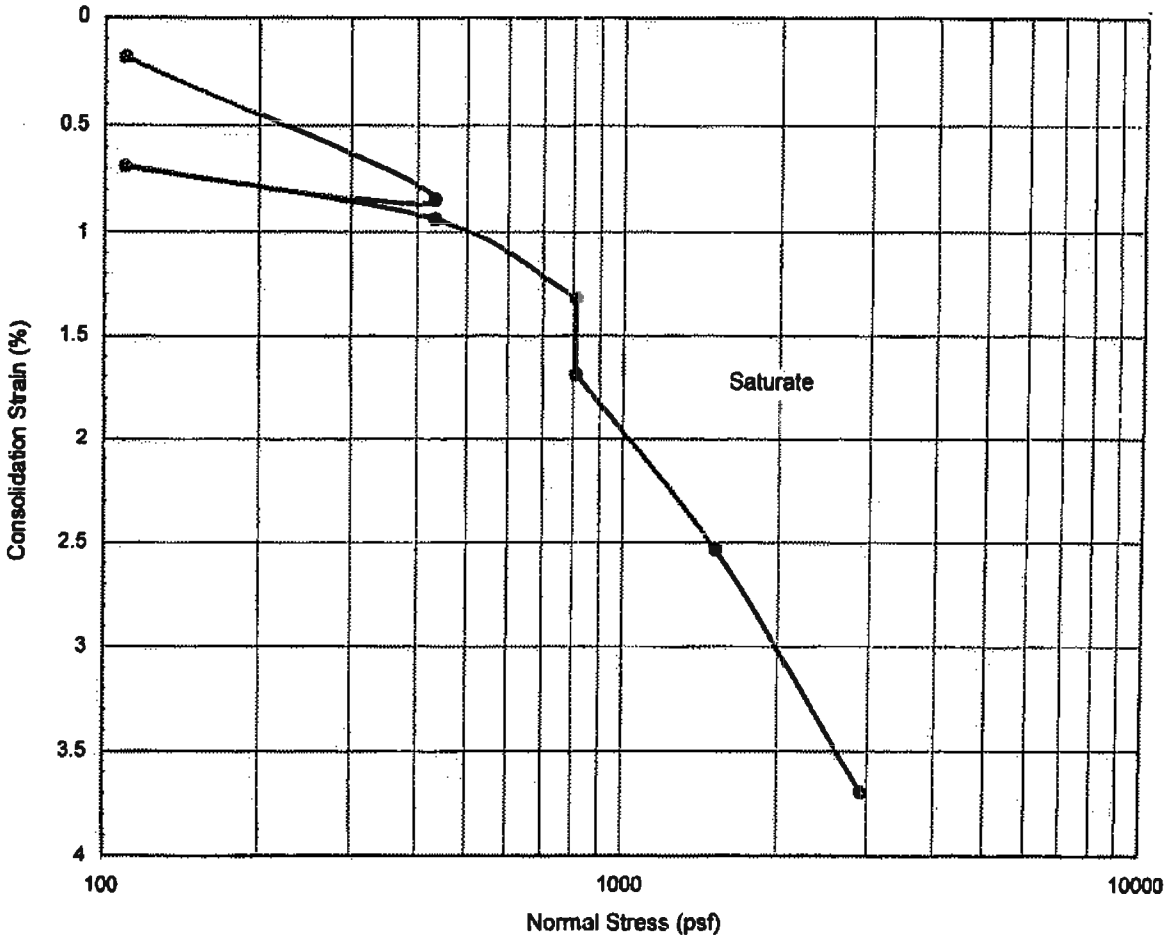
GRADATION CURVES

Project:	Seraphina Development		
Location:	Northeast Corner of Nicholas Road and Joseph Road		
Job Number:	041063-3	Enclosure:	C-3

Consolidation Test (ASTM D 2435)



Boring #		Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	HCS(%)
•	1	5	(SM) Silty sand, fine to coarse with gravel, dark brown	115	12.5	0.37

* HCS - Hydroconsolidation strain in percent.

CONSOLIDATION TEST			
Project:	Seraphina Development		
Location:	NEC of Nicholas Rd & Joseph Rd		
Job No.:	041063-3	Enclosure:	C-4a

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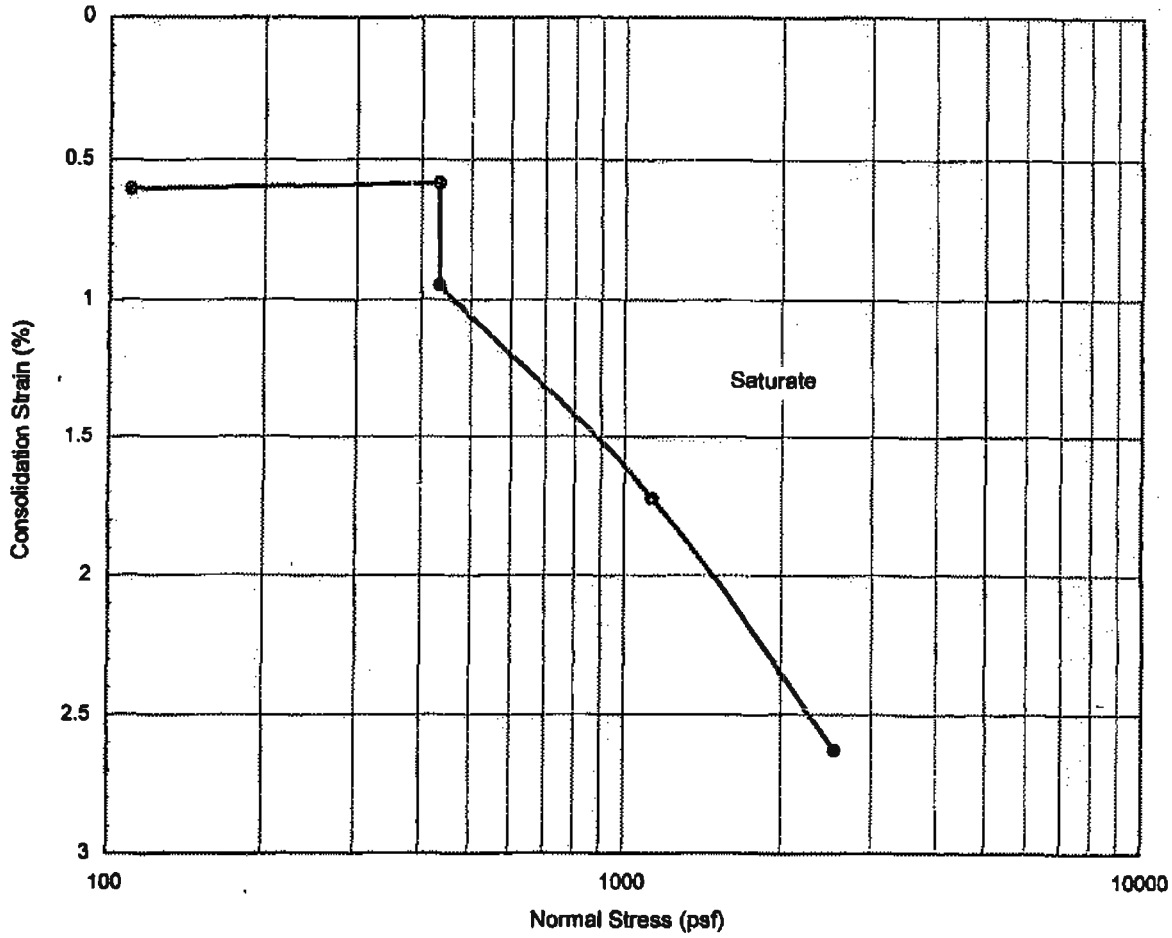
Consolidation Test (ASTM D 2435)



Boring #		Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	HCS(%)
*	2	2	(SP) Sand, fine to coarse with gravel, yellowish brown	101	4.0	0.37

* HCS - Hydroconsolidation strain in percent.

CONSOLIDATION TEST			
Project:	Seraphina Development		
Location:	NEC of Nicholas Rd & Joseph Rd		
Job No.:	041063-3	Enclosure:	C-4b

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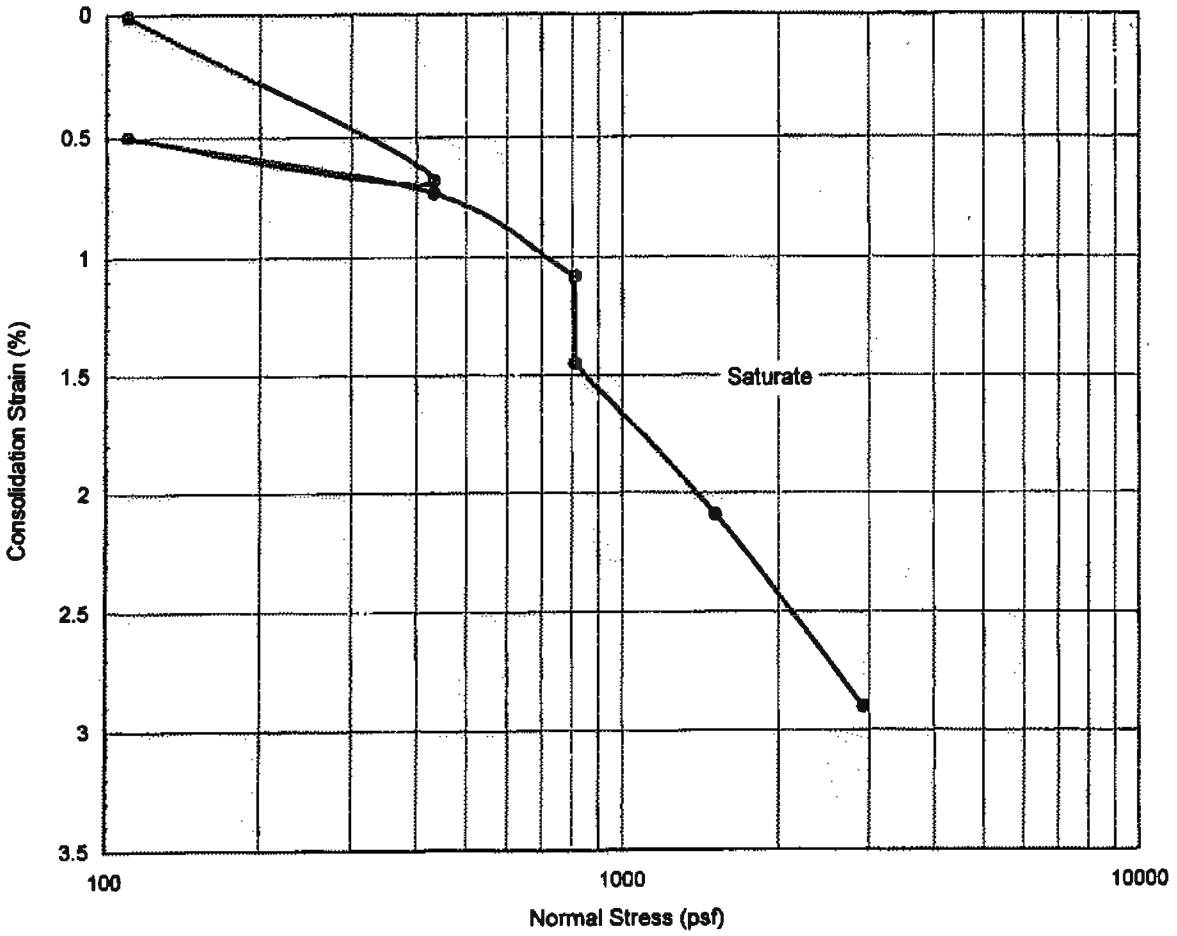
Consolidation Test (ASTM D 2435)



Boring #		Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	HCS(%)
•	2	7	(SP) Sand, fine to coarse with gravel, yellowish brown	111	5.4	0.37

* HCS - Hydroconsolidation strain in percent.

CONSOLIDATION TEST			
Project:	Seraphina Development		
Location:	NEC of Nicholas Rd & Joseph Rd		
Job No.:	041063-3	Enclosure:	C-4c

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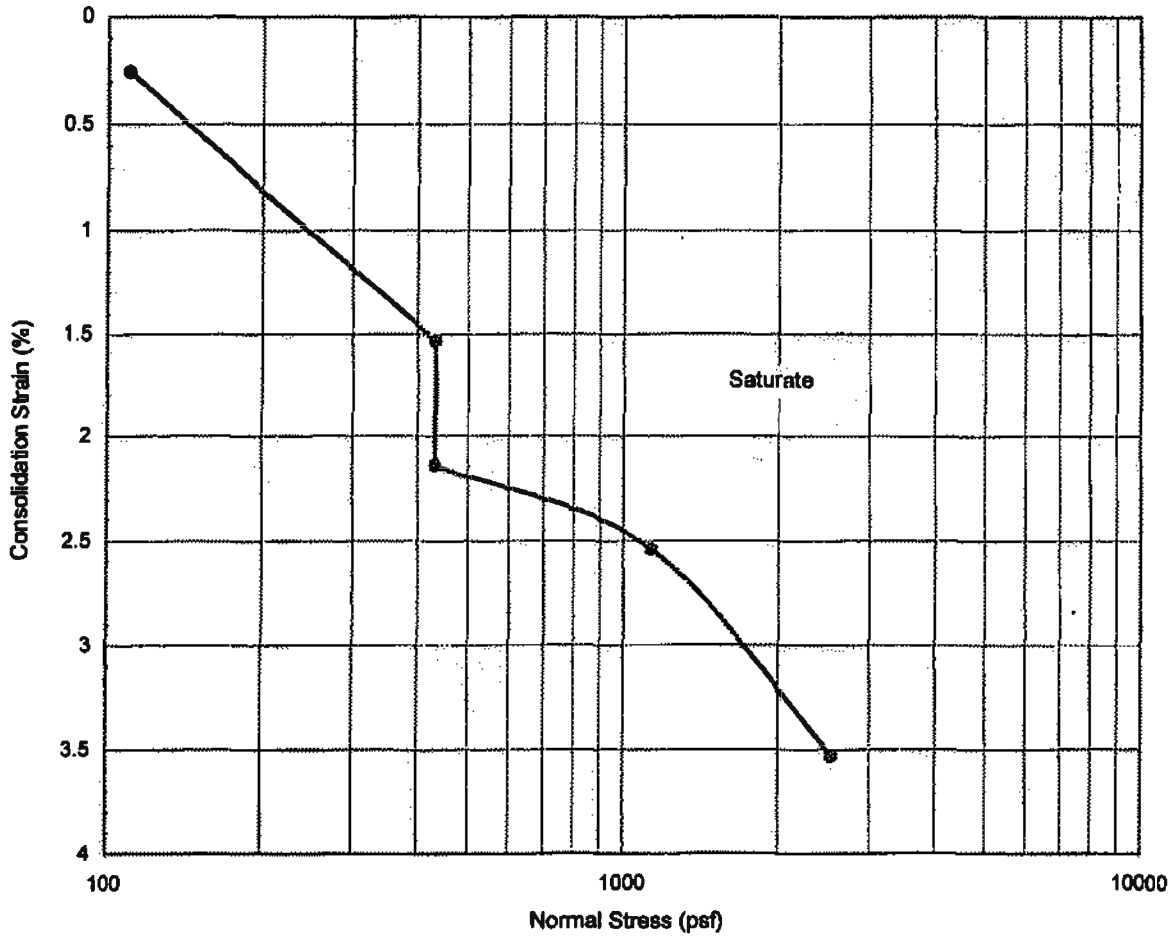
Consolidation Test (ASTM D 2435)



Boring #		Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	HCS(%)
*	4	2	(ML) Sandy Silt with clay, fine to medium, brown	107	18.8	0.61

* HCS - Hydroconsolidation strain in percent.

CONSOLIDATION TEST			
Project:	Seraphina Development		
Location:	NEC of Nicholas Rd & Joseph Rd		
Job No.:	041063-3	Enclosure:	C-4d

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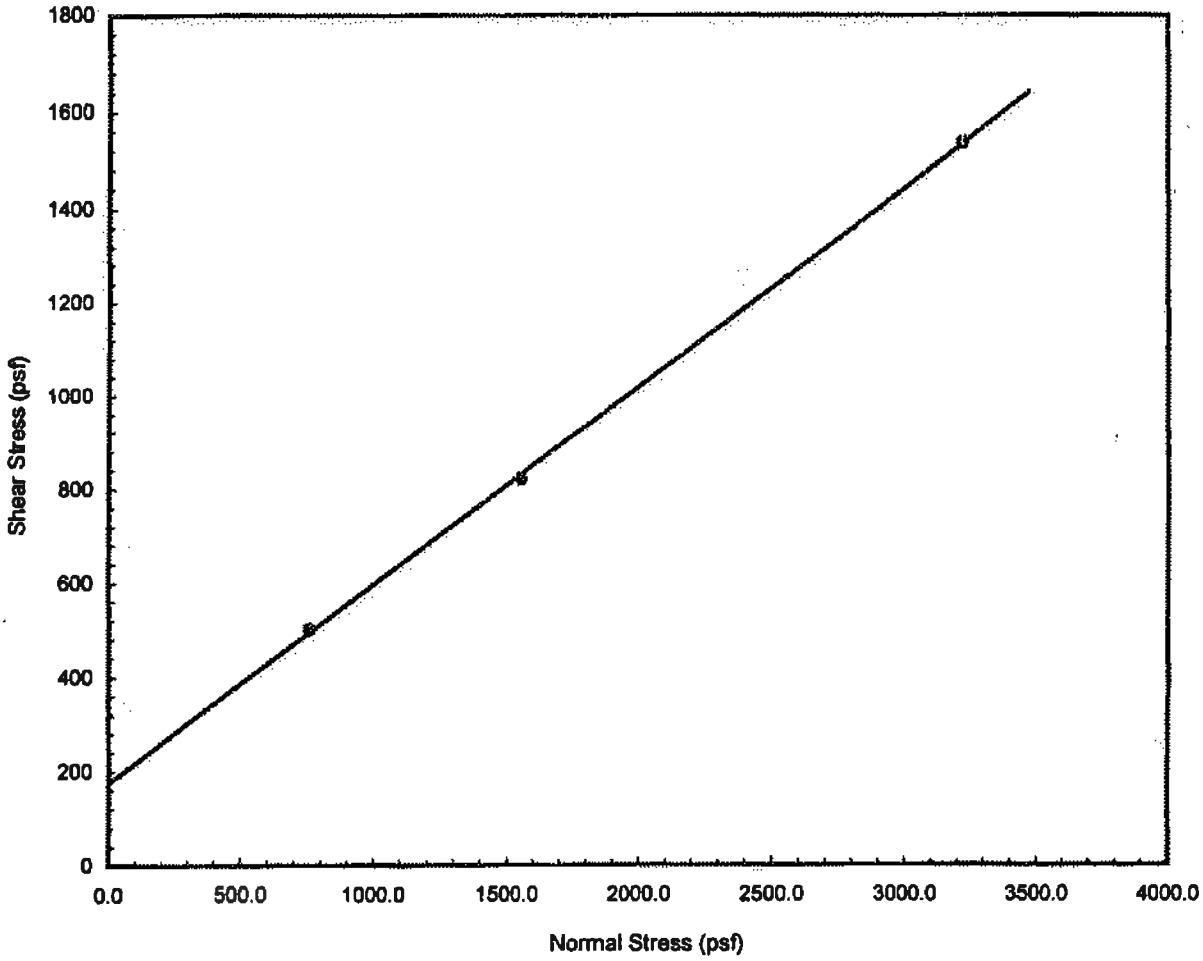
Direct Shear Test (ASTM D 3080)



Boring #		Depth(ft)	Soil/Sample Type	γ_d (pcf)	MC(%)	C (psf)	φ(°)
•	4A	1	(ML) Sandy silt with clay, fine to medium	123	10.0	176	23

DIRECT SHEAR TEST			
Project:	Seraphina Development		
Location:	NEC of Nicholas Rd and Joseph Rd		
Job No.:	041063-3	Enclosure:	C-5

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Enclosure "C-6"
Job No. 041063-3

M. J. Schiff & Associates, Inc.
Consulting Corrosion Engineers - Since 1959
431 W. Baseline Road
Claremont, CA 91711
Phone: (909) 626-0967 Fax: (909) 626-3316
E-mail lab@mjschiff.com
website: mjschiff.com

Table 1 - Laboratory Tests on Soil Samples

Seraphine Dev.
Your #041063-3, MJS&A #04-1614LAB
18-Nov-04

Sample ID			4A ML
Resistivity		**Units**	
as-received		ohm-cm	1,000,000
saturated		ohm-cm	1,250
pH			7.4
Electrical Conductivity		mS/cm	0.33
Chemical Analyses			
Cations			
calcium	Ca^{2+}	mg/kg	148
magnesium	Mg^{2+}	mg/kg	58
sodium	Na^{1+}	mg/kg	15
Anions			
carbonate	CO_3^{2-}	mg/kg	ND
bicarbonate	HCO_3^{1-}	mg/kg	485
chloride	Cl^{1-}	mg/kg	60
sulfate	SO_4^{2-}	mg/kg	155
Other Tests			
ammonium	NH_4^{1+}	mg/kg	2.1
nitrate	NO_3^{1-}	mg/kg	ND
sulfide	S^{2-}	qual	na
Redox		mV	na

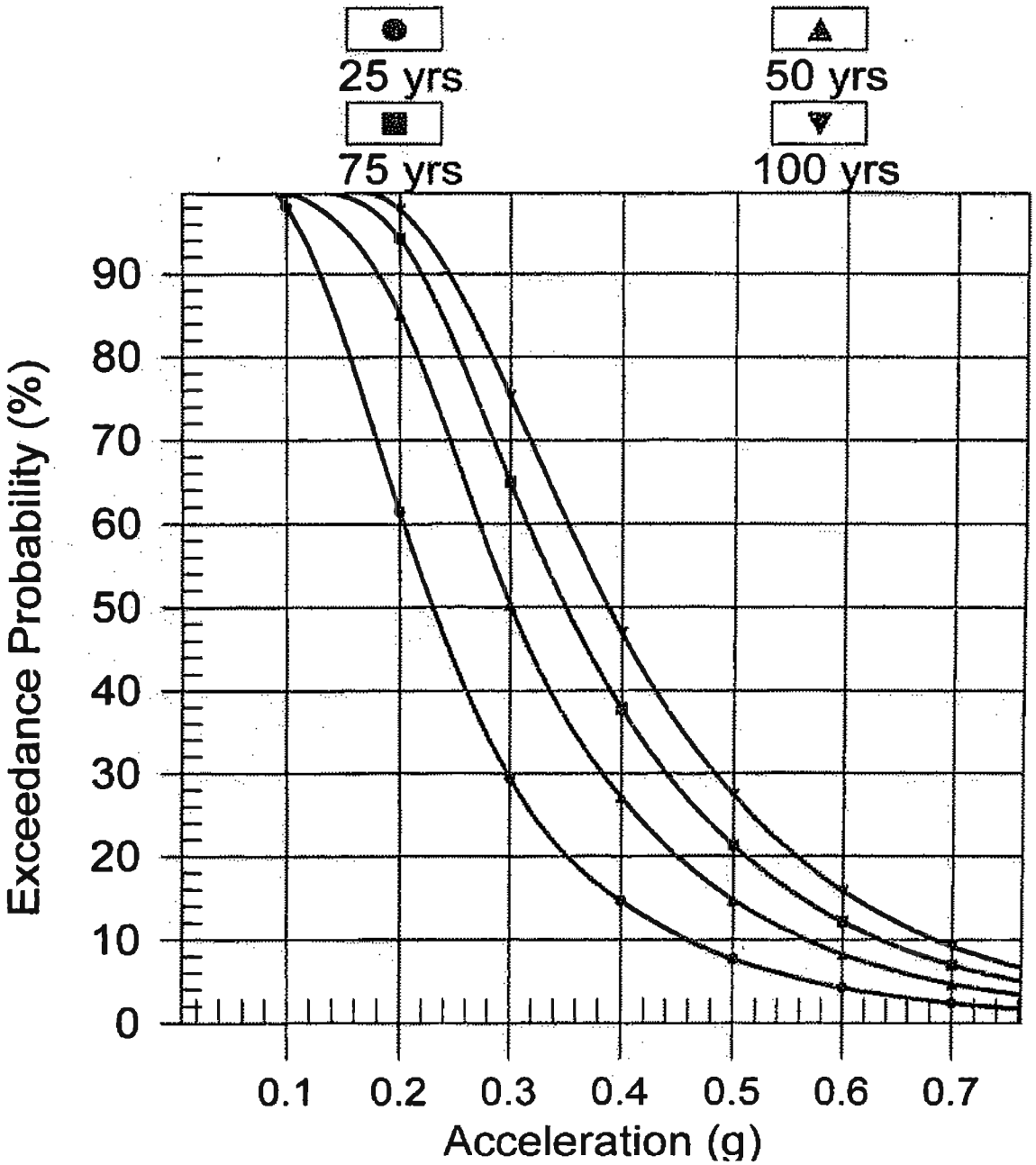
Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

C·M·J·

APPENDIX "D"

SEISMIC DATA

Enclosure "D-1"
Job No. 041063-3

PROBABILITY OF EXCEEDANCE

BOORE ET AL(1997) NEHRP D (250)1