DRAFT

MITIGATED NEGATIVE DECLARATION FOR THE OTAY WATER DISTRICT, REGULATORY SITE ACCESS ROAD IMPROVEMENTS

PREPARED FOR:

Otay Water District
2554 Sweetwater Springs Boulevard
Spring Valley, California 91978

PREPARED BY:

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B Biological Resources Letter Report for the Otay Water District Regulatory Site Access Road Improvements, ICF International, November 2012.

C Cultural Resource Survey for the Otay Water District Regulatory Site Access Road Improvements, ICF International, September 2011

D Geotechnical Report, MTGL, November 2011

E Noise Calculations for the Otay Water District Regulatory Site Access Road Improvements, ICF International, September 2011.

F Preliminary Hydrology and Hydraulics Report, Otay Water District, June 2012

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Acronyms

ADT	average daily trips
APE	area of potential effect
AQIA	Air Quality Impact Analysis
Biological Letter	Biological Letter Resources Report
BMPs	best management practices
CAAQS	California Ambient Air Quality Standards
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CH_4	methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Species
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2-equivalent
CWA	County Water Authority
DFG	California Department of Fish and Game
DG	Decomposed Granite
District	Otay Water District
DPM	Diesel Particulate Matter
EDR	Environmental Data Resources
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GHG	greenhouse gas
GWP	global warming potential
HHDT	heavy-heavy duty diesel trucks
HMA	San Miguel Habitat Management Area
HMA	Habitat Management Area
I-	Interstate
LDA	light duty automobiles
LLG	Linscott, Law & Greenspan, Engineers
LOS	level of service
LUST	leaking underground storage tanks

MBTA	Federal Migratory Bird Treaty Act
ME	Medical Examiner's
MLD	Most Likely Descendent
MND	Mitigated Negative Declaration
MSCP	San Diego County Multiple Species Conservation Program
$MTCO_2e$	metric tons of CO_2e
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NSLU	Noise-Sensitive Land Use
O_3	ozone
OPR	Office of Planning and Research
PCE	passenger car equivalency
PI	Principal Investigator
PM_{10}	particulate matter less than 10 microns
$PM_{2.5}$	particulate matter less than 2.5 microns
RAQS	Regional Air Quality Strategy
RCNM	Roadway Construction Noise Model
RCP	reinforced concrete pipe
RMS	root-mean-squared
ROG	reactive organic gas
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
SCIC	South Coastal Information Center
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SIP	State Implementation Plan
SO_X	sulfur oxides
SR-	State Route
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TIF	Transportation Impact Fee
USACE	U.S. Army Corps of Engineers

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Section 1
Project Background

1.1 Project Need and Objectives

The proposed Otay Water District Regulatory Site Access Road (access road) would be used as an alternate route for Otay Water District (District) staff to access the District's Regulatory Site and would allow the San Miguel Fire Protection District to access the Heartland Regional Training Facility, located within the District's Regulatory Site. Currently, District staff vehicles utilize the existing right-turn-in/-out only driveway on State Route (SR-) 94. The project would provide three key benefits: safely allowing the ingress and egress of larger vehicles, including fire apparatus and construction vehicles, to the Regulatory Site; provide the Heartland Fire Training Authority with two access routes to the Heartland Fire Regional Training Facility; and provide the San Diego County Sheriff's Department a secondary entrance/exit to the Rancho San Diego Sheriff Station.

1.2 Project Location

The access road would extend from the District's Regulatory Site at 11880 Campo Road, Spring Valley, California 91978, through parcel 506-140-13-00, which is owned by the County of San Diego. The site's regional location is shown in Figure 1.

1.3 Project Description

The proposed access road would connect the District's Regulatory Site to the terminus of a road serving the under-construction Sheriff's Station and to a paved road that connects to SR-94. The anticipated access road alignment is shown in Figure 2. The access road would be 24 feet wide, would be paved with asphalt concrete, and would include 2-foot-wide shoulders on each side of the access road. The specific alignment would be based on future drawings; however, the proposed alignment would generally occur along the existing unpaved access road that extends to the under-construction Sheriff Station site and to an existing paved road that connects to SR-94. The existing site conditions, including the unpaved access road, and the general location of the County of San Diego Sheriff Station, are also shown in Figure 2.

The access road would be used by District staff as well as San Miguel Fire District vehicles accessing the Heartland Regional Training Facility within the District Regulatory Site. Currently, District staff vehicles utilize an existing right-turn-in/-out only driveway on SR-94 at the south entrance. The access road would be an alternate route for District staff as well as for San Miguel Fire Protection District vehicles that will access the Heartland Regional Training Facility currently being constructed within the District Regulatory Site. District vehicles and future vehicles accessing the Heartland Regional Training Facility would generate approximately 46 average daily trips (ADT), with 19 (13 inbound/6 outbound) trips during the AM peak hour and 19 (6 inbound/13 outbound) trips during the PM peak hour (Otay Water District, August 2010).

The Sheriff's Station project is scheduled to be completed through a design-build contract. A conceptual site plan showing the under-construction Sheriff Station as well as the proposed terminus of the Sheriff Station road that would connect with the proposed access road is shown in Figure 3. The analysis completed for the Sheriff's Station Mitigated Negative Declaration (MND) generally does not include the area for the proposed access road. As a result, the technical analysis completed for the MND would not be specific enough to the project area to cover impact analysis for the access road.

The ownership and maintenance rights for the new access road would include the 24-foot-wide travelway and both 2-foot-wide shoulders. A temporary construction easement would be required along each side of the new roadway to allow for construction traffic and grading. The construction easement will vary in width but will be only as wide as is needed to allow for proper construction of the road. The maximum width of the construction easement will be 14 feet on each side of the road. The proposed extent of the construction impacts on the sides of the road are shown in Figure 5. Temporary fencing will be installed before the start of any construction activity to ensure that work does not impact sensitive areas outside of the designated construction areas. Additionally, a drainage easement(s) would be required for new storm drain facilities constructed for the project. The facilities include but may not be limited to a storm drain culvert, headwalls, rip rap, drainage ditches, and spillways. Both easements would be granted to the District.

The storm water conveyance from the smaller, southern portion of the Regulatory Site would be affected by the project. This storm water conveyance, together with the flows from the northern portion of the new access road, would be conveyed through a storm drain system and discharged through an energy dissipater to a low point in the terrain. The storm water flows for the southern portion of the new access road would be collected by curb and gutter and conveyed to the existing drainage ditch that parallels the paved road ultimately reaching the two 30-inch reinforced concrete pipe (RCP) storm drain culverts at Campo Road. The access road extension from the Sheriff Station site would cross perpendicularly to an existing storm water channel that conveys flows from the higher, surrounding areas. A storm drain culvert with headwalls would be sized and constructed to allow and maintain this conveyance. Storm water from the surface of the access road extension would be conveyed to the low point near the culvert and discharged at this location along with the flows from the upper portion of the access road and southern portion of the Regulatory Site.

1.4 Site Description and Surrounding Land Uses

The Regulatory Site consists of four drinking-water reservoirs, three of which are partially buried and partially above ground. In addition to the reservoirs, there are two pump stations and supporting water conveyance facilities on this site. The primary access points to the site are paved and unpaved roads that access from Jamacha Road. There is a secondary paved access road off Via Escuda. The anticipated access road alignment would follow an existing dirt road (as shown in Figure 2), which is surrounded by predominantly native vegetation on undulating terrain. The areas surrounding the proposed access road include residential housing to the north and west, Cuyamaca Community College to the east, existing water reservoirs to the south, and Skyline Wesleyan Church to the southwest (see Figure 2).

1.5 Authority to Prepare a Mitigated Negative Declaration

As provided in California Environmental Quality Act (CEQA) Section 15070 (Title 14 – California Code of Regulations), an MND may be prepared for a project subject to CEQA when an Initial Study has identified potentially significant effects on the environment, but when revisions to the project have been made so that no significant effect on the environment would result from project implementation. The District is the lead agency and is responsible for planning, constructing, and operating the training facility. The County of San Diego is a responsible agency under CEQA and may need to issue approvals for the project. Based on the findings of the Initial Study/Environmental Checklist Form prepared for this project, the District has determined that preparation of the MND is the appropriate method to present environmental review of the proposed project in compliance with CEQA. Section 3 of this MND provides the Initial Study/ Environmental Checklist Form.

1.6 Preparers of the Mitigated Negative Declaration

This MND was prepared by ICF International, 9775 Businesspark Avenue, Suite 200, San Diego, California, 92131. The following professionals contributed to its preparation:

Otay Water District

Lisa Coburn-Boyd – Environmental Compliance Specialist

Erin Schorr – Project Director

Devon Muto – Technical Review

Jim Harry – Project Manager

Erika Eidson – Biological Resources

Aaron Brownwood – Environmental Planner

Steve Bossi – Environmental Planner

Matt McFalls – Air Quality

Michael Green – Noise

1.7 Results of Public Review

RESULTS OF PUBLIC REVIEW TO BE PROVIDED

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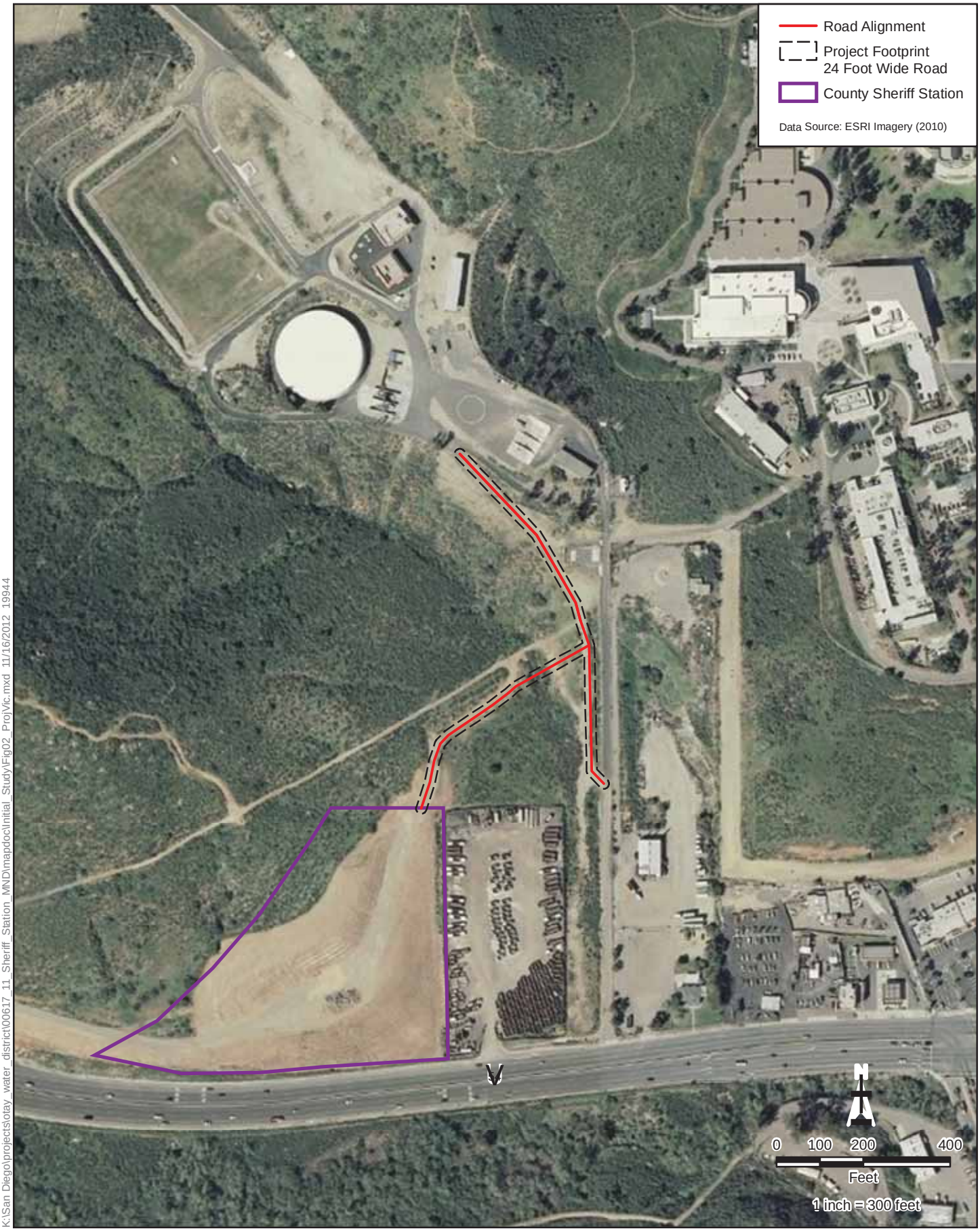
ICF INTERNATIONAL

Figure 1
Regional Location
Otay Water District Regulatory Site Access Road Improvements



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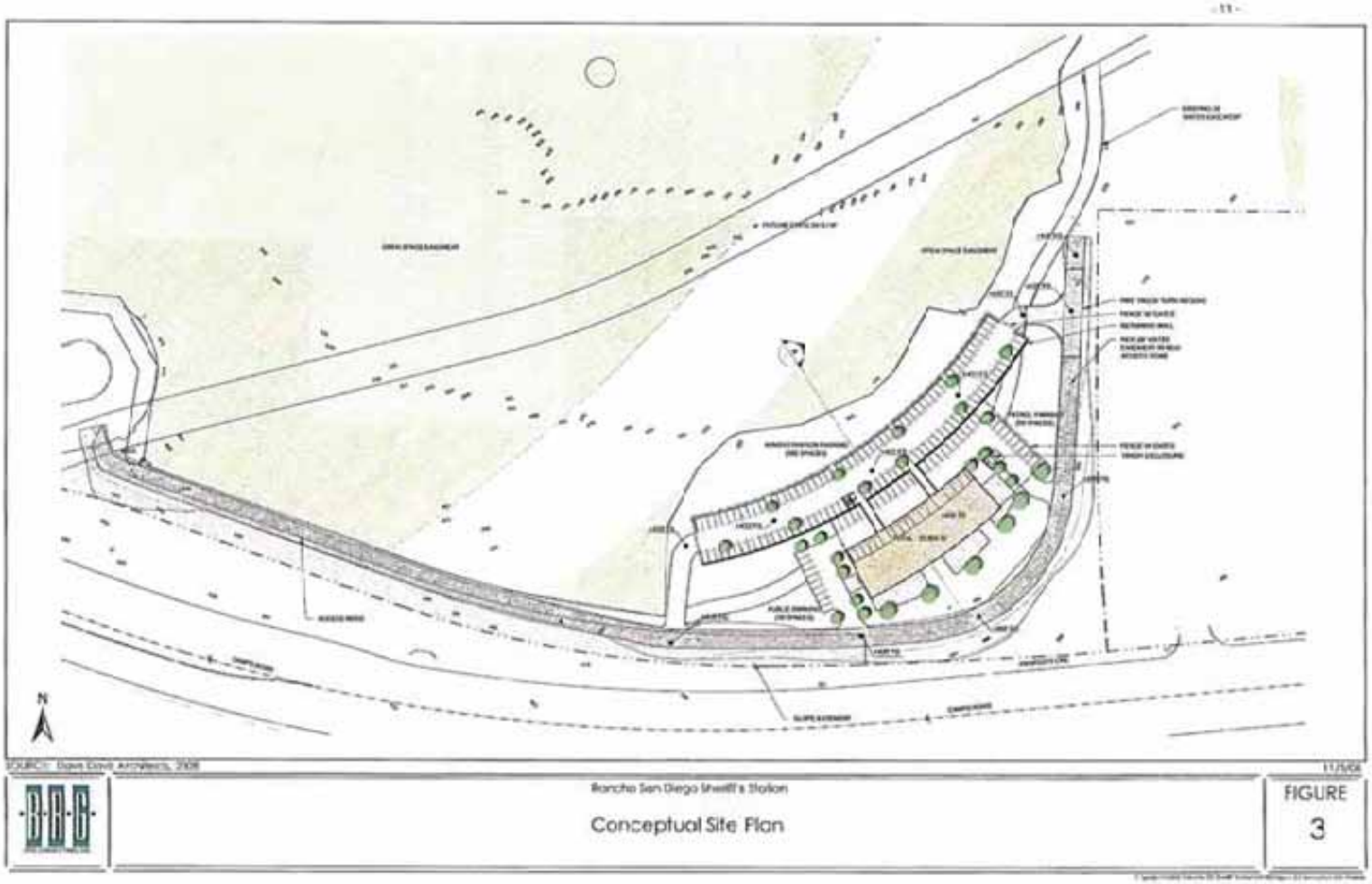
ICF INTERNATIONAL

Figure 2
Project Vicinity
Otay Water District Regulatory Site Access Road Improvements



Source: Davis Davis Architects, 2008

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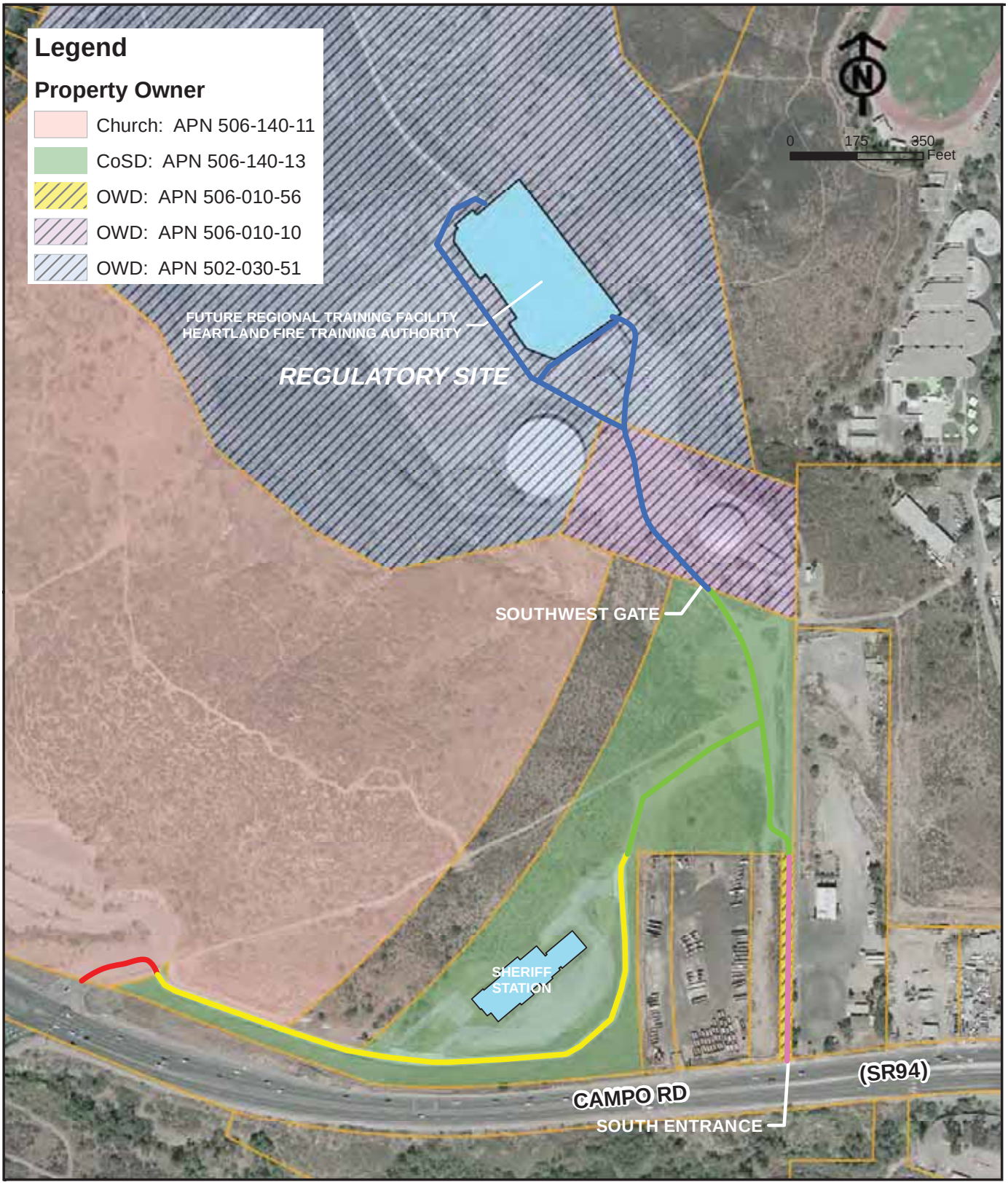
Figure 3
County Sheriff Station Conceptual Site Plan
Otay Water District Regulatory Site Access Road Improvements



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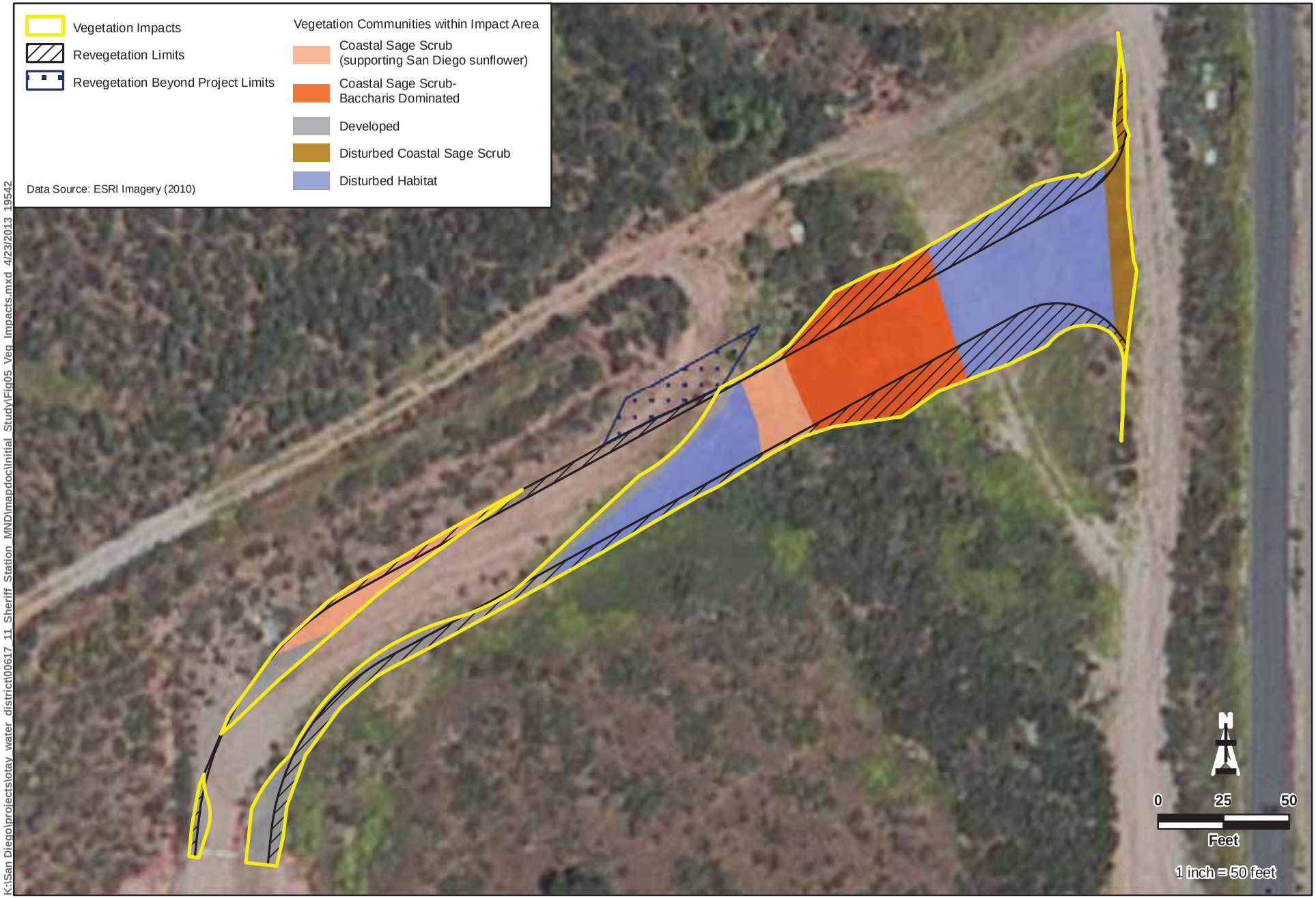
ICF INTERNATIONAL

Figure 4
Existing Easements in the Project Vicinity
Otay Water District Regulatory Site Access Road Improvements



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ICF INTERNATIONAL

Figure 5
Vegetation Impacts
Otay Water District Regulatory Site Access Road Improvements

Section 2
Determination

In conformance with State CEQA Guidelines, the District prepared an Initial Study and completed an Environmental Checklist Form (see Section 3) for the proposed access road. During the Initial Study process, the lead agency determined that, unless specific mitigation was implemented, the proposed project would have a significant impact on biological resources. The project has been revised to include specific measures (see Section 2.1) that fully mitigate for these potentially significant impacts. The Initial Study Checklist (see Section 3) provides an analysis of all environmental issues.

2.1 Mitigation Measures

Implementation of the mitigation measures described below would reduce all impacts to a less-than-significant level.

2.1.1 Biological Resources

Mitigation Measure BIO-1: Biological Monitoring. Due to the observed presence of coast horned lizard, orangethroat lizard, and the coastal California gnatcatcher, a biological monitor will be present during removal of vegetation to avoid potential impacts on these species.

Mitigation Measure BIO-2: San Miguel HMA. Impacts on 0.12 acre of sensitive vegetation communities, consisting of 0.04 acre of Diegan coastal sage scrub, 0.04 acre of disturbed Diegan coastal sage scrub, and 0.04 acre of baccharis-dominated Diegan coastal sage scrub will be mitigated at a ratio of 2:1 through the use of available credits at the District's San Miguel Habitat Management Area (HMA) or through the creation of Diegan coastal sage scrub within the HMA.

Mitigation Measure BIO-3: Onsite Revegetation. Impacts to sensitive vegetation communities, consisting of Diegan coastal sage scrub will also be mitigated on-site through revegetation of impact areas outside of the road width with Diegan coastal sage scrub species. Revegetation will be done with a mix of container plants and seeding. The extent of the revegetation areas are indicated in Figure 5 and will cover 0.12 acre, of which 0.015 acre is previously disturbed area outside of the project limits, within County easement area.

Mitigation Measure BIO-4: Construction Not to Occur during Coastal California Gnatcatcher Breeding Season. Prior to any construction activity, all contractual agreements with the District will ensure that the following project requirements regarding sensitive wildlife species are completed.

- No clearing, grubbing, or grading of vegetation will occur between February 15 and August 31, the breeding season of the coastal California gnatcatcher. However, if construction is proposed during the breeding season for the gnatcatcher, the following requirements will have to be met to the satisfaction of the County:

- U.S. Fish and Wildlife Service protocol surveys will be required in order to determine species' presence or absence.

- If no gnatcatchers are detected within 300 feet of the proposed grading/construction, then no restriction on grading will be necessary.

- If gnatcatchers are present, measures to minimize noise impacts will be required and should include temporary noise walls and/or berms. The measures implemented shall ensure that noise levels from grading/construction activities during the breeding season do not exceed 60 dBA hourly LEQ at the edge of the occupied habitat, or the ambient noise level if noise levels already exceed 60 dBA hourly LEQ.

- If the survey is not performed and construction is proposed during the species' breeding season, presence will be assumed and a temporary wall/berm will be required.

Section 3

Initial Study/Environmental Checklist Form

1.	**Project Title:**	Otay Water District Regulatory Site Access Road Improvements
2.	**Lead Agency Name and Address:**	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978-2004
3.	**Contact Person and Phone Number:**	Lisa Coburn-Boyd, Environmental Compliance Specialist (619) 670-2219
4.	**Project Location:**	The Access road would extend from the Otay Water District's Regulatory Site at 11880 Campo Road, Spring Valley, CA 91978, to the County of San Diego Sheriff Station that is under construction and to a secondary access road that connects to SR-94. The access road would extend through parcel 506-140-13-00. The site's regional location is shown in Figure 1.
5.	**Project Sponsor's Name and Address:**	Otay Water District 2554 Sweetwater Springs Boulevard Spring Valley, CA 91978-2004 San Miguel Consolidated Fire Protection District 2850 Via Orange Way Spring Valley. California 91978-1746
6.	**General Plan Designation:**	Valle De Oro Community Plan Area
7.	**Zoning:**	M-52 Industrial

8. Description of Project:

(See Section 1.3)

9. Surrounding Land Uses and Setting:

(See Section 1.4)

10. Other Public Agencies whose Approval Is Required:

- County of San Diego (Responsible Agency) – County Access Easement (Doc No. 1996-0046806), Grading Permits (Sec.87.201)
- California Department of Transportation (Caltrans) – State Highway Encroachment Permit

Environmental Factors Potentially Affected:

The environmental factors checked below would potentially be affected by this project (i.e., the project would involve at least one impact that is a "Potentially Significant Impact"), as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agricultural and Forest Resources	☐ Air Quality
☒ Biological Resources	☐ Cultural Resources	☐ Geology/Soils
☐ Greenhouse Gas Emission	☐ Hazards and Hazardous Materials	☐ Hydrology/Water Quality
☐ Land Use/Planning	☐ Mineral Resources	☐ Noise
☐ Population/Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☐ Utilities/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.

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

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have an impact on the environment that is "potentially significant" or "potentially significant unless mitigated" 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 ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier ENVIRONMENTAL IMPACT REPORT or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required.

Lisa Coburn-Boyd
Signature

Apr. 25, 2013
Date

Lisa Coburn-Boyd
Printed Name

For

Evaluation of Environmental Impacts:

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained if it is based on project-specific factors as well as general standards (e.g., the project would 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 offsite as well as onsite, 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, 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 Environmental Impact Report (EIR) is required.
4. "Negative Declaration: Less than Significant with Mitigation Incorporated" applies when the incorporation of mitigation measures has reduced an effect from a "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 19, "Earlier Analyses," may be cross-referenced.)
5. Earlier analyses may be used if, pursuant to 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 earlier analyses 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 Incorporated," describe the mitigation measures that 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, when 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 a less-than-significant level.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
1.	**AESTHETICS.** Would the project:				
a.	Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b.	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?	☐	☐	☒	☐
c.	Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d.	Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area?	☐	☐	☐	☒

3.1 Aesthetics

a. **Have a substantial adverse effect on a scenic vista?**

No Impact. Construction of the roadway would not adversely impact scenic vistas because there are no designated scenic vistas in the area. The roadway would involve grading for a 24-foot-wide paved area. As shown in Figure 2, the proposed alignment would follow an existing dirt road. Paving of an existing dirt road would not be considered an adverse effect on a scenic vista and there are no designated scenic vistas in the area. Therefore, there would be no impact.

b. **Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings along a scenic highway?**

Less-than-Significant Impact. Three highways in the project area have been classified as eligible for state scenic highway status. Only SR-125 has been officially designated as a state scenic highway from Interstate (I-) 8 to SR-94. I-8 and SR-94 have been classified as "eligible state scenic highway – not officially designated." SR-125 is more than 3.5 miles west of the proposed access road and is not visible from the site. There are no other officially designated scenic routes in the project vicinity. Therefore, implementation of the access road would not adversely impact views from a scenic highway.

c. **Substantially degrade the existing visual character or quality of the site and its surroundings?**

Less-than-Significant Impact. The roadway would involve grading for a 24-foot-wide paved area, and the proposed alignment would follow an existing dirt road. Grading for the access road would involve disturbance within the 24-foot impact area and would not involve extensive use of cut or fill manufactured slopes that would substantially alter the terrain within the area proposed for the roadway. Grading for the road would involve disturbance of 0.12 acre of vegetated areas, including

sensitive vegetation and disturbed habitat. As shown in Figure 2, the area surrounding the proposed access road includes native vegetation on hillsides within a County open space easement. Considering the scale of the extensive native vegetation on the hillsides near the project site, removal of 0.12 acre of vegetation would not be a significant adverse impact on the entire visual character of the area.

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

No Impact. The proposed access road design would not include lighting facilities. Therefore, there would be no impact.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
2.	**AGRICULTURAL AND FOREST RESOURCES.** In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation. Would the project:				
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?	☐	☐	☐	☒
b.	Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?	☐	☐	☐	☒
c.	Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined in Public Resources Code section 4526)?	☐	☐	☐	☒
d.	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e.	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest to non-forest use?	☐	☐	☐	☒

3.2 Agriculture and Forest Resources

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?**

No Impact. According to the San Diego Important Farmland Map, the area proposed for the access road is classified as grazing land and built-up land. An area identified as farmland of Local Importance extends adjacent to SR-94 south of the site. However, the proposed access road would not extend into this area. Therefore, the proposed site does not contain any designated prime farmland,

unique farmland, or farmland of statewide importance. Consequently, there would be no impact on prime farmland, unique farmland, or farmland of statewide importance from implementation of the proposed project.

b. **Conflict with existing zoning for agricultural use or conflict with a Williamson Act contract?**

No Impact. No Williamson Act contracts exist for the project site, and the site is not zoned for agricultural use. In addition, no agricultural land adjoins the project site. Therefore, no impact would result from implementation of the proposed project.

c. **Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)) or timberland (as defined in Public Resources Code section 4526)?**

No Impact. The project site, including offsite improvements, does not contain forest lands or timberland. The County of San Diego does not have any existing Timberland Production Zones. In addition, the project is consistent with existing zoning, and a rezone of the property is not proposed. Therefore, project implementation would not conflict with existing zoning for, or cause rezoning of, forest land, timberland, or timberland production zones.

d. **Result in the loss of forest land or conversion of forest land to non-forest use?**

No Impact. The project site does not contain any forest lands as defined in Public Resources Code section 12220(g); therefore project implementation would not result in the loss or conversion of forest land to a non-forest use. In addition, the project is not in the vicinity of offsite forest resources.

e. **Involve other changes in the existing environment that, 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?**

No Impact. No impact would result from implementation of the proposed project. There are no agricultural land or forest uses on or adjacent to the access road. Therefore, construction of the access road would not involve any other changes to the existing environment that could result in the conversion of farmland to non-agricultural use or forest to non-forest use.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
3.	**AIR QUALITY.** When available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a.	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is a nonattainment area for an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d.	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e.	Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

3.3 Air Quality

a. **Conflict with or obstruct implementation of the applicable air quality plan?**

Less-than-Significant Impact. The project site is in the San Diego Air Basin (SDAB) whose boundaries are contiguous with the political boundaries of San Diego County. The San Diego Air Pollution Control District (SDAPCD) is required, pursuant to the federal and state Clean Air Acts, to reduce emissions of criteria pollutants for which the SDAB is in nonattainment. The SDAB is currently classified as a nonattainment area for the federal 8-hour ozone (O_3) standard, a maintenance area for federal carbon monoxide (CO), and nonattainment area for state 8-hour O_3, serious nonattainment area for state 1-hour O_3, particulate matter less than 2.5 microns ($PM_{2.5}$) and particulate matter less than 10 microns (PM_{10}) standards (SDAPCD 2010a, EPA 2011). All areas designated as nonattainment are required to prepare plans showing how the area would meet federal and state air quality standards by their attainment dates. The San Diego Regional Air Quality Strategy (RAQS) is the region's plan for improving regional air quality while attaining state standards, while the State Implementation Plan (SIP) is the region's plan for improving regional air quality while attaining federal standards.

Both the RAQS and SIP rely on information from the California Air Resources Board (CARB) and the San Diego Association of Governments (SANDAG), including projected growth in the County; and mobile, area, and all other source emissions in order to project future emissions and determine from that the strategies necessary for the reduction of stationary source emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends and land use plans developed by the region's cities, county, and special districts. Projects that propose development that is consistent with the growth anticipated by the relevant planning documents that were used in the formulation of the RAQS and SIP would be consistent with the RAQS and SIP. The proposed project area is in an area designated as a Specific Plan Area according to the County of San Diego General Plan. The site is zoned M-52 (Limited Industrial), which allows for a wide range of industrial and commercial uses frequently associated with industrial operations, such as wholesaling, auto and truck repair, and administrative and professional offices. Extension of a roadway would be allowed within the Specific Plan Area designation and the M-52 zone (see Section 3.10, "Land Use and Planning"). Thus, the proposed project is consistent with the General Plan and zoning use regulations. Additionally, both short-term construction and long-term operations would result in minimal emissions far below thresholds, as described below. The project would not result in any land use or zoning changes that would conflict with the General Plan or zoning designations. As such, because the project would be consistent with the County of San Diego General Plan, which was used in the formulation of the RAQS and SIP, the project is therefore considered consistent with the RAQS and SIP.

The primary construction-related pollutant in terms of the SDAB air quality plan is PM_{10}. Grading and construction activities would be subject to SDAPCD rules and regulations, including Rule 50 (Visible Emissions), Rule 51 (Nuisance), and Rule 55 (Fugitive Dust Control) (SDAPCD 2010b). The principal sources of PM_{10} emissions would be fugitive dust from earthmoving activities and vehicle travel on unpaved and paved surfaces. The requirements of Rules 50, 51, and 55 can be met by the implementation of standard construction best management practices (BMPs) for dust control. In addition, the project would be subject to the requirements of SDAPCD Rule 67.7, which sets provisions on the application and sale of emulsified asphalt materials. Standard construction measures utilized by the District during recent construction projects that would be included as part of the project include the following:

- Dust prevention to eliminate amounts of dust that could damage property, cultivated vegetation, or domestic animals, or cause a nuisance to persons living in or occupying buildings in the vicinity of the site.
- Measures to enclose, cover, water (as needed), or apply nontoxic soil binders according to manufacturer's specifications on material piles (i.e., gravel, sand, dirt) with a silt content of 5% or greater.
- Application of water or non-toxic soil stabilizers to maintain adequate dust control for active or inactive construction areas.

Project construction and grading activities would also be required to adhere to these dust control measures, and would thereby adhere to applicable SDAPCD rules and regulations.

b. **Violate any air quality standard or contribute substantially to an existing or projected air quality violation?**

Less-than-Significant Impact. Construction of the proposed project would result in emissions as a result of ground disturbance, off-road construction vehicle exhaust, emissions from employee and

asphalt delivery travel, and off-gassing from paving activities. Emissions would vary from day to day, depending on the level of activity, the specific type of construction activity occurring, and, for fugitive dust, prevailing weather conditions. The project's construction emissions were estimated and compared to SDAPCD air quality impact analysis (AQIA) trigger levels, as shown in SDAPCD Rule 20.2. An adverse impact on air quality would result if the emission levels from the project were to exceed any of the AQIA trigger levels. As shown in Table 1, project construction is not anticipated to exceed any AQIA trigger levels.

Emissions were calculated using the California Emissions Estimator Model (CalEEMod), version 2011.1.1). Construction schedule, equipment numbers and types, and number of asphalt deliveries were provided by the project applicant. CalEEMod defaults with respect to hours of equipment use per day as well as delivery trip length were used. For purposes of analysis, it was assumed that project construction would occur in two separate phases, with grading and paving activities overlapping over a 12-month period. Grading activities would occur over a 12-month period, and were assumed to be limited to general ground disturbance and assumed no cut and fill activities. Paving activities would occur over an approximately 2-month period, and paving acreage was assumed to be approximately 1 acre (road dimension of 1,800 feet in length and 24 feet in width). Daily asphalt delivery trips were estimated to be 54 daily trips, based on 2,700 tons of asphalt material, 10 ton truck capacity, and 5 days of asphalt deliveries. With respect to project operations, ADTs were obtained from the traffic report (LLG 2012), subtracting out for passenger car equivalency (PCE) for heavy duty trucks. The vehicle fleet mix within CalEEMod was adjusted to reflect the fleet mix shown in the traffic analysis, which separated vehicles into greater than and less than 1-ton vehicle weight classes. Vehicles were separated into EMFAC vehicle classes based on weight: vehicles less than 1 ton were assumed to be light duty automobiles (LDA), and vehicles greater than 1 ton were assumed to be heavy-heavy duty diesel trucks (HHDT).

As shown in Table 1, project construction emissions would be below applicable SDAPCD thresholds for criteria pollutants. Construction of the project would not result in an impact on air quality because emissions would not exceed SDAPCD applicable air quality standards or contribute to existing air quality violations.

Table 1. Estimated Construction Criteria Pollutant Emissions

	Pounds per day					
Construction Phase	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Mass Site Grading	6.89	59.06	27.15	0.06	4.32	3.08
Paving	6.86	48.86	25.36	0.05	3.44	2.88
Maximum Daily Emissions	***13.75***	***107.92***	***52.51***	***0.11***	***7.76***	***5.96***
SDAPCD Significance Threshold	**75**	**250**	**550**	**250**	**100**	**55**
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

ROG = reactive organic gas.
CO = carbon monoxide.
PM_{10} = particulate matter equal to or less than 10 microns.
$PM_{2.5}$ = particulate matter less than 2.5 microns.
NO_X = oxides of nitrogen.
SO_X = sulfur oxides.

Both grading and paving phases would overlap.
Note: CalEEMod emission output sheets are provided in Appendix A.

As shown in Table 2, project operations would be below applicable SDAPCD thresholds for criteria pollutants. Project operations would not result in an impact on air quality because emissions would not exceed SDAPCD applicable air quality standards or contribute to existing air quality violations. Therefore, this impact is less than significant.

Table 2. Estimated Operational Criteria Pollutant Emissions

	Pounds per day					
Construction Phase	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Motor Vehicles	6.89	59.06	27.15	0.06	4.32	3.08
SDAPCD Significance Threshold	**75**	**250**	**550**	**250**	**100**	**55**
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

ROG = reactive organic gas.
CO = carbon monoxide.
PM10 = particulate matter equal to or less than 10 microns.
PM2.5 = particulate matter less than 2.5 microns.
NO_X = oxides of nitrogen.
SO_X = sulfur oxides.

Note: CalEEMod emission output sheets are provided in Appendix A.

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

Less-than-Significant Impact. See response to 3a and 3d. Cumulative impacts could result if the project would exceed established thresholds of significance. The SDAB is currently in nonattainment for O_3 under National Ambient Air Quality Standards (NAAQS) as well as O_3, PM_{10}, and $PM_{2.5}$ under California Ambient Air Quality Standards (CAAQS), which is a result of past and present projects and will be further impeded by reasonably foreseeable future projects. As discussed under 3a, criteria pollutant emissions would be below SDAPCD thresholds during both construction and operational activities. In addition, cumulative impacts could result if the proposed project would be constructed at the same time as other development projects in the area, thereby exposing sensitive receptors to cumulative emission concentrations (see response 3d).

As shown in Figure 2, surrounding uses consist of residential land uses, Cuyamaca College, and open space. However, residential land uses are over 2,000 feet away, and it is not anticipated that extensive construction would occur in the area while the proposed project is being constructed. In addition, construction activities that might occur near the same period as proposed project construction include construction at the college and road improvements. Possible cumulative impacts on air quality as a result of these activities and all construction activities in the area would be addressed by the standard SDAPCD measures that apply to construction projects. It is anticipated that, with the incorporation of the standard SDAPCD dust control measures, the contribution of the project to cumulative impacts related to PM_{10} and $PM_{2.5}$ emissions would be less than significant. Project operations would not contribute to any significant cumulative impacts related to nonattainment status for ozone, PM_{10}, or $PM_{2.5}$. The proposed access road would not result in emissions that exceed SDAPCD regional significance thresholds, and therefore would not negatively impact regional air quality (see Tables 1

and 2). Therefore, proposed project construction and operations would not result in a cumulatively considerable net increase in emissions. This impact would be less than significant.

d. **Expose sensitive receptors to substantial pollutant concentrations?**

Less-than-Significant Impact. See response to 3a and 3c. Diesel Particulate Matter (DPM), which is classified as a carcinogenic toxic air contaminant by CARB, is the primary pollutant of concern with regards to health risks to sensitive receptors. Diesel-powered construction equipment and heavy duty on-road vehicles operating on- and off site during construction and operations will emit diesel exhaust, which can be inhaled by nearby sensitive receptors. Land uses near the project area include Cuyamaca College to the immediate west, a cluster of residences approximately 2,000 feet to the east, and open and undeveloped land to the north and south. Construction activities would occur over an approximately 45 to 60 day period with a maximum duration of 6 months, which is much shorter than the assumed 70-year exposure period used to estimate lifetime cancer risks. Long-term operations would be limited to 16 daily light duty and 20 heavy duty vehicle trips. Onsite truck idling would be minimal, limited to a maximum of 5 minutes per truck, consistent with CARB's Heavy Duty Idling Reduction Program. The proposed project may create a nuisance for nearby visitors to Cuyamaca College during hours of construction and operations, as diesel trucks could create occasional exposure to exhaust, but this would be minimal. Additionally, adherence to SDAPCD Rules 50, 51, 55, and 67.7 would limit dust and ROG emissions that could impact nearby receptors. Therefore, the potential human health impact is considered to be minimal. In addition, the project would not create congestion at nearby roadways or intersections, so the exposure to elevated CO concentrations is considered minimal. This impact would be less than significant.

e. **Create objectionable odors affecting a substantial number of people?**

Less-than-Significant Impact. Project-related odor emissions would primarily be limited to the construction period, during which emissions from construction equipment could be temporarily evident in the immediately surrounding area. Potential sources of odors during construction activities include diesel exhaust from construction equipment and asphalt paving. In addition, District truck and fire truck trips could create exposure to diesel exhaust along roadways. These odors would not affect a substantial number of people, as the scale of construction would be small, the frequency of permanent trips would be very low, and the potentially affected area would be limited due to the localized evidence of these odors. Additionally, such temporary sources of odors are not considered significant. Therefore, the project's odor impact would be less than significant.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
4.	**BIOLOGICAL RESOURCES.** Would the project:				
a.	Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b.	Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
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, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d.	Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐
f.	Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☒	☐

3.4 Biological Resources

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?**

Less than Significant with Mitigation Incorporated. ICF International staff performed biological surveys and prepared a Biological Letter Resources Report (Biological Letter) in September and November 2011 to analyze potential effects of the proposed project on sensitive biological resources (Appendix B).

Field surveys and a search of the California Natural Diversity Database (CNDDB) and California Native Plant Species (CNPS) identified 93 special-status plant species that occur or have the potential to occur in the project vicinity (refer to Attachment B of the Biological Letter). During the follow-up to an August 2011 site visit on November 1, 2012, two special-status plant species were detected in the survey area: Palmer's goldenbush and San Diego sunflower. San Diego marsh-elder was detected outside of the general biological survey area. Palmer's goldenbush was detected in Diegan coastal sage scrub within the impact area. Two individuals of Palmer's goldenbush were detected within the survey area; however, neither was observed within the impact area. As such, the project would not result in impacts on the two individuals within the survey area, and these individuals do not represent a regionally significant population; thus, impacts on this species are considered to be less than significant. San Diego marsh-elder was detected within the survey area, but outside of the impact area. Thus, impacts on this species would be less than significant. San Diego sunflower was observed throughout the Diegan coastal sage scrub and disturbed Diegan coastal sage scrub in the impact area. A total of 0.04 acre of Diegan coastal sage scrub and 0.04 acre of disturbed Diegan coastal sage scrub supporting the San Diego sunflower would be impacted by the proposed project. However, the project would not result in impacts on a regionally significant population of San Diego sunflower; therefore, impacts on this species are considered less than significant.

Field surveys and a search of the CNDDB also identified 14 special-status wildlife species that occur or have the potential to occur in the project vicinity (refer to Attachment C of the Biological Letter). Focused surveys were conducted for coastal California gnatcatcher and Quino checkerspot butterfly. No adult or larval Quino or Quino host plants were detected during the survey. Coastal California gnatcatcher, coast horned lizard, and orangethroat whiptail were the only special status species detected on site. A single coast horned lizard was detected in Diegan coastal sage scrub close to the impact area. Two orangethroat whiptails were observed in baccharis-dominated Diegan coastal sage scrub and disturbed coastal sage scrub in the general biological survey area; one in the impact area and the other close to the impact area. Impacts on these species would be mitigated to a less-than-significant level by the presence of a biological monitor during vegetation removal (see Mitigation Measure BIO-1).

A mating pair and two fledglings of coastal California gnatcatcher were detected in areas of Diegan coastal sage scrub, baccharis-dominated Diegan coastal sage, and disturbed Diegan coastal sage scrub in the survey area. The proposed project would result in direct impacts on suitable coastal sage scrub habitat occupied by the coastal California gnatcatcher. Implementation of Mitigation Measures BIO-2 and BIO-3 would reduce the project's potential adverse impacts on coastal California gnatcatcher to a less-than-significant level.

Increased noise levels during construction could result in indirect impacts on the coastal California gnatcatcher (or other special-status birds/raptor species or species protected by the Federal Migratory Bird Treaty Act [MBTA]), if construction would occur during the breeding season. Because project construction activities could result in impacts on the coastal California gnatcatcher or other special-status birds/raptor species or species protected by the MBTA, this would be a potentially significant impact. Implementation of Mitigation Measure BIO-4 would reduce the project's potential direct and

indirect adverse impacts from short-term construction noise on coastal California gnatcatcher, special-status birds/raptor species, or species protected by the MBTA to a less-than-significant level.

Mitigation Measure BIO-1: Biological Monitoring. Due to the observed presence of coast horned lizard, orangethroat lizard, and the coastal California gnatcatcher, a biological monitor will be present during removal of vegetation to avoid potential impacts on these species.

Mitigation Measure BIO-2: San Miguel HMA. Impacts on the 0.12 acre of sensitive vegetation communities, consisting of 0.04 acre of Diegan coastal sage scrub, 0.04 acre of disturbed Diegan coastal sage scrub, and 0.04 acre of baccharis-dominated Diegan coastal sage scrub, will be mitigated at a ratio of 2:1 through the use of available credits at the District's San Miguel Habitat Management Area (HMA) or through the creation of Diegan coastal sage scrub within the HMA.

Mitigation Measure BIO-3: Onsite Revegetation. Impacts to sensitive vegetation communities, consisting of Diegan coastal sage scrub will also be mitigated on-site through revegetation of impact areas outside of the road width with Diegan coastal sage scrub species. Revegetation will be done with a mix of container plants and seeding. The extent of the revegetation areas are indicated in Figure 5 and will cover 0.12 acre, of which 0.015 acre is previously disturbed area outside of the project limits, within County easement area.

Mitigation Measure BIO-4: Construction Not to Occur during Coastal California Gnatcatcher Breeding Season. Prior to any construction activity, all contractual agreements with the District will ensure that the following project requirements regarding sensitive wildlife species are completed.

- No clearing, grubbing, grading of vegetation will occur between February 15 and August 31, the breeding season of the coastal California gnatcatcher. However, if construction is proposed during the breeding season for the gnatcatcher, the following requirements will have to be met to the satisfaction of the County:
  - U.S. Fish and Wildlife Service protocol surveys will be required in order to determine species' presence or absence.
  - If no gnatcatchers are detected within 300 feet of the proposed grading/construction, then no restriction on grading will be necessary.
  - If gnatcatchers are present, measures to minimize noise impacts will be required and should include temporary noise walls and/or berms.
  - If the survey is not performed and construction is proposed during the species' breeding season, presence will be assumed and a temporary wall/berm will be required.
  - Noise levels from grading/construction activities during the breeding season should not exceed 60 dBA hourly LEQ at the edge of the occupied habitat, or the ambient noise level if noise levels already exceed 60 dBA hourly LEQ.

b. **Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?**

Less than Significant with Mitigation Incorporated. Natural sensitive vegetation communities were identified within the project footprint, which consists of Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, and baccharis-dominated coastal sage scrub. The project footprint also supports disturbed habitat and urban/developed areas. The project would impact approximately 0.12 acre of sensitive vegetation communities, consisting of 0.04 acre of Diegan coastal sage scrub, 0.04 acre of disturbed Diegan coastal sage scrub, and 0.04 acre of baccharis-dominated Diegan coastal sage scrub. The 0.12 acre of habitat that would be impacted by the project is coastal California gnatcatcher occupied habitat. Therefore, the District is proposing to mitigate impacts on 0.12 acre of coastal sage scrub species at a 2:1 ratio through the use of coastal sage scrub credits at the District's established San Miguel HMA Implementation of Mitigation Measure BIO-2 would reduce the project's potential adverse impacts on sensitive vegetation communities to a less-than-significant level. In addition, the extent of the revegetation areas will cover 0.12 acre, of which 0.015 acre is previously disturbed area outside of the project limits, within County easement area (see Figure 5). Implementation of Mitigation Measure BIO-3 would reduce the project's potential adverse impacts to areas outside of the road width to a less-than-significant level.

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, marshes, vernal pools, coastal wetlands, etc.) through direct removal, filling, hydrological interruption, or other means?**

Less-than-Significant Impact. A drainage feature that crosses the proposed road alignment is jurisdictional under the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and California Department of Fish and Game (DFG) (see Appendix B for location of jurisdictional resources). The drainage feature is a non-wetland waters of the U.S. and State streambed (with no riparian vegetation). The project would result in impacts on 0.002 acre of waters of the U.S. and State streambed. However, total impacts are less than 0.1 acre, and, per Nationwide Permit 14, impacts on less than 0.1 acre do not require mitigation. Permits required for the project include a Nationwide 14 permit from the USACE, a Water Quality Certification from the RWQCB, and a Section 1602 Streambed Alteration Agreement from DFG. Therefore, the proposed project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act. Impacts would be less than significant.

d. **Interfere substantially with the movement of any native resident or migratory fish or wildlife species or within established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?**

Less than Significant with Mitigation Incorporated. See responses to 4a and 4b. Construction and operation of the proposed project would not interfere with the movement of any native resident or migratory fish, because there are no waterways with the ability to support fish on the site. Coastal sage scrub within the project footprint is known to provide suitable breeding and foraging habitat for the California gnatcatcher; however, as stated in the response to 4b, impacts on this vegetation community would be mitigated to a less-than-significant level. As identified in the response to 4a, project construction activities that could result in indirect noise impacts on the coastal California gnatcatcher would require mitigation to ensure impacts remain less than significant. There are no other resident or migratory fish or wildlife species, and there are no established native resident or migratory wildlife corridors or native wildlife nursery sites within the project footprint. The proposed project could potentially result in indirect impacts on wildlife species by creating a deterrent to wildlife movement across the site. However, the proposed road would support limited vehicular traffic and would not include structures or physical barriers that would impede or discourage wildlife

movement across the road. Therefore, implementation of Mitigation Measures BIO-2, BIO-3, and BIO-4 would ensure that impacts on wildlife movement remain less than significant.

e. **Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

Less-than-Significant Impact. The proposed project site is within the San Diego County Multiple Species Conservation Program (MSCP). Design of the proposed project is considered consistent with the provisions of the County MSCP. In order to comply and be consistent with the County MSCP, local jurisdictions are required to implement mitigation and/or encroachment standards, manage and monitor conserved lands, and conduct environmental review as required by CEQA, as detailed in the County MSCP. The adequacy of the biological survey work and the resulting mitigation measures would ensure the proposed project is consistent with the provisions of the County MSCP. In addition, the District has an approved coastal sage scrub mitigation bank from which it would use available credits to reduce potential impacts on coastal sage scrub to less-than-significant levels (see response to 4b). Impacts will also be mitigated on-site through revegetation that will cover 0.12 acre, of which 0.015 acre is previously disturbed area outside of the project limits, within County easement area. The proposed project would not conflict with either of the above-mentioned plans or the provisions of these plans because its design would not result in significant impacts on any biological resources (see responses to 4a and 4b). Impacts would be less than significant.

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?**

Less-than-Significant Impact. See response to 4e. The proposed project would be consistent with provisions identified in the County MSCP. Local jurisdictions are required to implement mitigation and/or encroachment standards, manage and monitor conserved lands, and conduct environmental review as required by CEQA; and the proposed project is consistent with these County MSCP provisions. Impacts would be less than significant.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
5.	**CULTURAL RESOURCES.** Would the project:				
a.	Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☒
b.	Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☒	☐
c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d.	Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

3.5 Cultural Resources

a. **Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?**

No Impact. ICF International completed a cultural resource inventory and field survey for the proposed project in September 2011 (Appendix C). The purpose of the cultural resources report was to assess whether historical or archaeological resources might be adversely affected within the area of potential effect (APE) by the activities associated with construction of the proposed facilities, pursuant to CEQA. The APE included the 24-foot-wide proposed access road.

A cultural resource records search performed at the South Coastal Information Center (SCIC) did not identify any previously recorded resources within a 205-foot radius of the APE. The current records and literature search indicated that no previously recorded resources were known to be present within the project APE. No sites in the APE are listed on the National Register of Historic Places, California Register of Historical Resources, California Inventory of Historic Resources, or California Historical Landmarks. An intensive pedestrian survey used to verify the existence of any previously recorded sites on the property and to identify, map, and describe all new prehistoric and historic cultural resources did not uncover any existing or new cultural resources.

Because no previously recorded cultural resources and no new cultural resources were discovered to be present in the APE during the records search and the current field survey, no impacts would occur. Therefore, implementation of the project would not result in an impact on historical or archaeological resources.

b. **Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?**

Less-than-Significant Impact. See response to 5a. Based on a literature and records search and cultural resources site survey, the project would not result in direct impacts on any known archaeological resource. There would be very limited ground disturbance work, which would minimize the potential for unknown archaeological resources to be found.

Project construction includes activities that have the potential to disturb previously unknown, buried human remains; however, given the very limited ground disturbance work, this potential would be extremely low. In accordance with existing state regulations, if human remains are identified or suspected, the District would immediately notify the Principal Investigator (PI) who, in turn, would notify the Medical Examiner's (ME) office. If the ME, in consultation with the PI, determines that the remains are Native American, then the ME would contact the Native American Heritage Commission (NAHC). The NAHC would then identify Most Likely Descendent (MLD) candidates. The PI would initiate consultation with the MLD(s) before activity continues at the site of discovery. The PI and MLD would establish a mutually agreed upon protocol for processing the remains, associated grave goods, and sacred objects and the analysis and ultimate disposition of these materials. Following completion of applicable analyses, the human remains and any other items of interest would be repatriated to the MLD. Written verification of repatriation from MLD would complete this process. Compliance with state regulations would result in less-than-significant impacts on buried human remains.

c. **Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?**

No Impact. Previous analysis prepared for the project site identified the site being primarily underlain by Cretaceous-aged tonalite, associated with granitic rocks. The earth materials encountered on site are minor alluvium extending to approximately 1 to 2 feet deep and residual soil extending to approximately 7 feet deep. These earth materials are underlain by granitic rock, which has a very low potential for paleontological resources. There are no unique geologic features in the project vicinity. Therefore, implementation of the proposed project would not impact paleontological resources or a unique geologic feature.

d. **Disturb any human remains, including those interred outside of formal cemeteries?**

Less-than-Significant Impact. See responses to 5a and 5b. A letter was sent to the NAHC on September 13, 2011. The response, dated September 15, 2011, indicated that no sacred sites on record with the commission were present on the project property. However, there is a possibility that unmarked, previously unknown Native American or European-American graves could be present within the project site. Potential disturbance of previously undiscovered human remains during project construction activities (i.e., clearing, grading) would not result in significant impacts with compliance of the above-listed policies (see response to 5b) in accordance with state regulations. Therefore, impacts on human remains would be less than significant.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
6.	**GEOLOGY AND SOILS.** Would the project:				
a.	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
	1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☒	☐
	2. Strong seismic groundshaking?	☐	☐	☒	☐
	3. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
	4. Landslides?	☐	☐	☒	☐
b.	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c.	Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project and potentially result in an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐
d.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e.	Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

3.6 Geology and Soils

a. **Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:**

1. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Refer to Division of Mines and Geology Special Publication 42.)

Less-than-Significant Impact. The District prepared a geotechnical analysis for the proposed access road in November 2011. The report is included as Appendix D. According to the Alquist-Priolo Earthquake Fault Zoning Map (2002), the proposed project site is approximately 2.5 miles south of the nearest branch of the Lyon Valley Fault. There are no other faults within 6 miles of the project site. The closest active fault likely to generate the highest ground accelerations at the site is the Rose Canyon Fault, located 11.1 miles west of the site. Per the findings in the geotechnical analysis, the site is not within an earthquake fault zone. Therefore, potential impacts from rupture of an onsite fault or faults in the vicinity to the access road would be less than significant.

2. Strong seismic groundshaking?

Less-than-Significant Impact. The District prepared a geotechnical analysis for the Regulatory Site Ninyo & Moore 2005). The following is a summary of the information from this report that applies to the access road that would extend from the Regulatory Site. As with most southern California regions, the project site would be subject to strong ground shaking in the event of a major earthquake. Two branches of the Lyons Valley Fault are within 2.5 and 5 miles north of the project site. In addition, branches of the Nacion Fault are between 6 and 10 miles southwest of the project site. There are no other faults within 10 miles of the project site. Although the site is not within an earthquake fault zone, the closest active fault likely to generate the highest ground accelerations at the site is the Rose Canyon Fault, located 11.1 miles west of the site. Therefore, the project site could experience ground motion during its design life as a result of regional seismic activity. Potential for ground shaking during earthquakes and engineering design measures would be a part of the proposed access road. With incorporation of standard measures, potential impacts on the proposed access road from seismic groundshaking would be less than significant.

3. Seismic-related ground failure, including liquefaction?

Less-than-Significant Impact. Based on the geotechnical report prepared by MTGL Inc. in November 2011 the potential exists that grading for the access road could encounter liquefiable soils. Research and historical data indicate that loose granular soils and non-plastic silts saturated by a relatively shallow groundwater table are susceptible to liquefaction. Due to the lack of a shallow groundwater table, and the hard sandy clay and very dense weathered rock formation underlying the area proposed for the access road, the potential for liquefaction at the site is very low. Furthermore, a search of readily available City and County maps shows that the site is not located within a liquefaction hazard zone. Based on this information, the potential for impact on the proposed project from liquefaction is less than significant.

4. Landslides?

Less-than-Significant Impact. Based on the geotechnical report, no landslides were identified on or near the proposed access road. Additionally, according to County sources the proposed project is not

within an area of high or moderate landslide susceptibility (County of San Diego 2009). Therefore, there is no potential impact on the proposed project from landslides.

b. **Result in substantial soil erosion or the loss of topsoil?**

Less-than-Significant Impact. Onsite soils consist of alluvium, residual soil, and granitic rock. Based on the geotechnical report, onsite soils are likely to be susceptible to erosion; therefore, the project plans and specifications would contain design features and construction recommendations of the geotechnical report. Construction projects that disturb more than 1 acre of land are required to obtain coverage under the statewide National Pollutant Discharge Elimination System (NPDES) General Permit for Construction Activities (Permit No. CAS000002). This general permit requires the applicant to file a public notice of intent to discharge stormwater and to prepare and implement a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP includes a site map and a description of proposed construction activities and demonstration of compliance with relevant local ordinances and regulations, and describes BMPs that would be implemented to prevent soil erosion and discharge of other construction-related pollutants that could contaminate nearby water resources. Permittees are further required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants. Compliance with these NPDES General Permit for Construction Activities requirements during and after construction would ensure that there would be no significant impacts from substantial soil erosion or the loss of topsoil. Therefore the impact is considered less than significant.

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 an onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?**

Less-than-Significant Impact. The geotechnical report determined that the proposed project would be located on 1 to 2 feet of alluvium that may be susceptible to subsidence or collapse. To achieve uniform soil density, the alluvium soil would be excavated, moisture conditioned, and recompacted as engineered fill. Compliance with these measures during excavation and construction would ensure that the potential impact on the proposed project from unstable geologic units would be less than significant.

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?**

Less-than-Significant Impact. The geotechnical report and update determined that the proposed project would be on soil that includes alluvium, residual soil, and weathered material, which possess a low to very low expansion potential and that are suitable to support the expected loads of the vehicles. There is potential that localized highly expansive clayey soils would be present within the residual soil and, if this material is found less than 2 feet deep, the expansive clayey soils should be excavated and replaced with non-expansive material. Compliance with these measures during excavation and construction would ensure that the potential impact on the proposed project from expansive soil would be less than significant.

e. **Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems in areas where sewers are not available for the disposal of wastewater?**

No Impact. The project does not propose the use of septic tanks or alternative wastewater disposal systems; therefore, no impacts would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
7.	**GREENHOUSE GAS EMISSIONS.** Would the project:				
a.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b.	Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

3.7 Greenhouse Gas Emissions

a. **Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?**

Less-than-Significant Impact. California Assembly Bill 32, the Global Warming Solutions Act of 2006, codified the state's greenhouse gas (GHG) emissions target by requiring the state's global warming emissions to be reduced to 1990 levels by 2020. State Senate Bill 97 directed the Office of Planning and Research (OPR) to adopt State CEQA Guidelines concerning the effects and mitigation of GHG emissions by January 1, 2010. These guidelines were finalized on December 30, 2009, and became effective on March 18, 2010. The new CEQA Amendments do not prescribe a particular threshold of significance or method for determining significance of GHG emissions in CEQA documents, but instead defer adoption of CEQA thresholds to the lead agency. Various air districts and jurisdictions throughout California are considering and have proposed quantitative GHG thresholds.

Project construction would result in GHG emissions from off-road diesel equipment exhaust and emissions from employee and material delivery travel. The primary emissions occur as CO_2 from gasoline and diesel combustion, with more limited vehicle tailpipe emissions of methane (CH_4) and nitrous oxide (N_2O) and other GHG emissions related to vehicle cooling systems. Project operations would result in GHG emissions from motor vehicles traveling on the proposed access road. Construction- and operations-period CO_2-equivalent (CO_2e) emissions were obtained from the CalEEMod (version 2011.1.1) emissions model. As shown in Table 3, project construction would result in approximately 864 metric tons of CO_2e ($MTCO_2e$) over the entire 12-month construction period. Additionally, project operations would result in approximately 150 $MTCO_2e$ annually. When summed, project construction and operations would result in approximately 1,014 $MTCO_2e$ annually. The relative quantity of project-related GHG emissions is negligible compared to statewide and worldwide daily emissions. CalEEMod emission outputs are presented in Appendix A.

Table 3. Estimated Construction and Operational GHG Emissions

	Metric Tons Per Year		
Project Element	**CO_2**	**CH_4**	**CO_2e**
Construction			
Grading	757	0.07	758
Paving	106	0.01	106
Total	*863*	*0.08*	*864*
Operations			
Mobile Sources	150	0.005	150
Total	*150*	*0.005*	*150*
Sum of Construction Total + Operations	**--**	**--**	***1,014***
GHG Significance Threshold	**--**	**--**	**2,500**
Exceed Threshold?	**--**	**--**	**No**

CO_2 = carbon dioxide.
CH_4 = methane.
CO_2e = carbon dioxide equivalent. CO_2e is a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). The GWP of CO_2 is 1 and the GWP of CH_4 is 21.

Construction emissions were calculated based on the maximum daily construction emissions and days per construction phase. Operational emissions were calculated based on the maximum daily operational emissions and days per year (365).

Note: CalEEMod emission output sheets are provided in Appendix A.

The new State CEQA Guidelines state that, when assessing the significance of impacts of GHGs, the lead agency should determine whether project emissions exceed a threshold of significance. While the District has not adopted thresholds for GHG impacts under CEQA, the County of San Diego has recently adopted thresholds of significance for various types of projects. With respect to the proposed project, the County's 2,500 MT bright line threshold is the most appropriate threshold for analyzing construction and operation of an access road. While the District has not adopted this threshold, the County's 2,500 MT threshold is used for this analysis to show the relatively minor contribution project construction would have on climate change. As shown in Table 3 above, GHG emissions generated from project construction would not exceed this 2,500 MT threshold. Therefore, the project would not generate GHG emissions, either directly or indirectly, that could have a significant impact on the environment.

b. **Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?**

Less-than-Significant Impact. The District has yet to adopt a qualified plan, policy, or regulation to reduce GHG emissions. Therefore, the most applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions is Assembly Bill 32, which codified the state's GHG emissions reduction targets for the future. The County of San Diego has recently adopted a Climate Action Plan and thresholds of significance for various types of projects. As discussed in the response to 7a, the combined construction and operations GHG emissions would not exceed the County's 2,500 MT

bright line threshold. Long-term operations would provide alternate access for emergency services training to fire and public utilities entities, and project traffic would be minimal. Therefore, project construction and operations would not hinder implementation of Assembly Bill 32 and would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. This impact is considered less than significant.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
8.	**HAZARDS AND HAZARDOUS MATERIALS.** Would the project:				
a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c.	Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d.	Be located on a site that 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?	☐	☐	☒	☐
e.	Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f.	Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.8 Hazards and Hazardous Materials

a. **Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

Less-than-Significant Impact. No hazardous materials are expected to be used during project operations. Transporting hazardous materials along the proposed access road during project operations would not be a routine project activity. The measures that are outlined in the San Miguel Fire District Ordinance No. 2007-02 would ensure proper handling, storage, and usage of hazardous materials and would limit the quantity of hazardous materials allowed in order to safeguard life and property from fire and explosion. Compliance with this ordinance would ensure that the transport, use, and disposal of hazardous materials would not create a significant hazard to the public during project operation.

During the project construction phase, construction equipment would use diesel fuel and other petroleum-based products. The use of diesel fuel and petroleum-based products would be temporary, and standard BMPs outlined in the San Miguel Fire District Ordinance No. 2007-02 would be applied to ensure that all hazards potentially occurring during this phase of the project would not create a significant hazard to the public. Therefore, impacts would be less than significant.

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?**

Less-than-Significant Impact. See response to 8a.

c. **Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?**

Less-than-Significant Impact. See response to 8a.

d. **Be located on a site that 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?**

Less-than-Significant Impact. A government listing of recorded hazardous material/waste sites within a 1-mile radius of the proposed project was generated by Environmental Data Resources (EDR 2005) for the Regulatory Site. This database included the area proposed for the access road. The following are conclusions from the EDR report that apply to the area proposed for the access road. The database indicated that there had been one previously identified waste site within 1 mile of the Regulatory Site. The site, located within District property, consists of a cluster of three reported leaking underground storage tanks (LUSTs). All cases within the District property have been closed and underground tanks removed; therefore, the former LUST sites would not represent a hazard during construction of the access road. Three fuel storage tanks associated with gas stations and other businesses are located near the SR-94/SR-54 intersection. The road alignment would not extend through any developed areas. Therefore, it is not anticipated that the underground storage tanks identified in the EDR study would be encountered during construction of the roadway. A database search conducted for the MND for the County Sheriff Station (County 2009) did not identify any site

that is included on any County databases or Government Code Section 65962.5 within the Sheriff Station parcel. Therefore, impacts would be less than significant.

e. **Be located within an airport land use plan area or, where such a plan has not been adopted, be within two miles of a public airport or public use airport, and result in a safety hazard for people residing or working in the project area?**

No Impact. The proposed project site is not within an airport land use plan area or within 2 miles of a public airport or public use airport. Therefore, no impacts would occur.

f. **Be located within the vicinity of a private airstrip and result in a safety hazard for people residing or working in the project area?**

No Impact. The project site is not in the vicinity of a private airstrip. Therefore, no impacts would occur.

g. **Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

No Impact. Emergency response or evacuation plans of San Diego County include the Operational Area Emergency Plan and Multi-Jurisdictional Hazard Mitigation Plan; San Diego County Nuclear Power Station Emergency Response Plan, Oil Spill Contingency Element; Emergency Water Contingencies Annex and Energy Shortage Response Plan; and Dam Evacuation Plan. The project would not impair implementation of or physically interfere with the above plans because it is not near their features of concern (i.e., nuclear plant or dam). Additionally, the access road would improve emergency access by creating a circular route to and from SR-94 that could be used by emergency vehicles to access both the County Sheriff Station and the Regulatory Site. Therefore, project operations would not conflict with any adopted emergency response plan.

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?**

No Impact. The proposed access road would not be subject to direct impacts from local fires. The access road would improve emergency access by creating a second route to and from SR-94 that could be used by emergency vehicles to access both the County Sheriff Station and the Regulatory Site. Therefore, construction of the access road would not expose people or structures to risk from wildfires.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
9.	**HYDROLOGY AND WATER QUALITY.** Would the project:				
a.	Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in 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 that would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
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 that would result in substantial erosion or siltation onsite or offsite?	☐	☐	☒	☐
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 that would result in flooding onsite or offsite?	☐	☐	☒	☐
e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f.	Otherwise substantially degrade water quality?	☐	☐	☒	☐
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?	☐	☐	☐	☒
h.	Place within a 100-year flood hazard area structures that would impede or redirect floodflows?	☐	☐	☐	☒
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?	☐	☐	☐	☒
j.	Contribute to inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

3.9 Hydrology and Water Quality

a. **Violate any water quality standards or waste discharge requirements?**

Less-than-Significant Impact. The U.S. Environmental Protection Agency (EPA) administers the NPDES. In California, the EPA authorizes the State Water Resources Control Board (SWRCB) to oversee the NPDES program through RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. Construction projects that disturb more than 1 acre of land are required to obtain coverage under the statewide NPDES General Permit for Construction Activities (Permit No. CAS000002). This general permit requires the applicant to file a public notice of intent to discharge stormwater and to prepare and implement a SWPPP. The SWPPP includes a site map and a description of proposed construction activities and demonstration of compliance with relevant local ordinances and regulations, and describes BMPs that would be implemented to prevent soil erosion and discharge of other construction-related pollutants that could contaminate nearby water resources. Permittees are further required to conduct annual monitoring and reporting to ensure that BMPs are correctly implemented and effective in controlling the discharge of stormwater-related pollutants.

Title 6 (Health and Sanitation), Division 7 (Water and Water Supplies), and Chapter 8 (Watershed Protection, Stormwater Management and Discharge Control) of the San Diego County Code of Regulatory Ordinances (added by Ordinance No. 9424 and effective February 20, 2002; amended by Ordinance No. 9926; amended by Ordinance No. 10030) or the County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance contain regulations designed "to protect water resources and to improve water quality by controlling the non-stormwater conveyance system and receiving waters; to cause the use of management practices by the County and its citizens that would reduce the adverse effects of polluted run-off discharges on waters of the state; to secure benefits from use of stormwater as a resource; and to ensure the County is compliant with applicable state and federal law."

Short Term Construction Impacts. There is the potential for short-term impacts on surface water quality during the grading and construction of the access road, including runoff of loose soils and/or a variety of construction wastes and fuels that could be carried off the site in surface runoff and into local storm drains and streets that drain eventually into water resources protected under federal and state laws. An appropriate SWPPP would be prepared by the District and implemented during construction. The SWPPP would show methods for compliance with NPDES and implementation of appropriate BMPs that would ensure that runoff from the construction site would not create significant offsite water quality or erosion impacts. The following are temporary construction BMPs that could be incorporated into the SWPPP.

- Silt fence.
- Fiber rolls.
- Storm drain inlet protection.
- Stockpile management.
- Solid-waste management.
- Stabilized construction entrance/exit.

- Vehicle and equipment maintenance.
- Material delivery and storage.
- Spill prevention and control.
- Concrete-waste management.
- Water conservation practices.
- Paving and grinding operations.
- Any minor slopes created incidental to construction and not subject to a major or minor grading permit will be protected by covering with plastic or tarp prior to a rain event, and will have vegetative cover reestablished within 180 days of completion of the slope and prior to final building approval.

Implementation of standard BMPs identified in the SWPPP would minimize potential impacts from construction activities in accordance with County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance. Therefore, impacts would be less than significant.

Long-term Operations Impacts. With implementation of the access road an area characterized by a dirt road and native vegetation would be converted to paved roadway. As a result, runoff would flow from the site at greater velocities than associated with the existing conditions at the site. All remaining runoff from the access road would be collected in a storm drain system that would be connected with the planned storm drain system within the Sheriff Station because the Sheriff Station is at a lower elevation. In addition, the District proposes to incorporate the BMPs listed below into the storm drain design to ensure that stormwater runoff from the site does not result in increased erosion or impacts on water quality off site. The proposed BMPs would also comply with requirements of the County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance. All areas within the proposed road alignment, but not within the limits of work, would remain undisturbed.

- Minimize erosion from slopes.
- Disturb existing slopes only when necessary.
- Minimize cut and fill areas to reduce slope lengths.
- Incorporate retaining walls to reduce steepness or shorten slopes.
- Shape slopes to reduce concentrated flow.
- Collect concentrated flows in stabilized drains and channels; a Decomposed Granite (DG) area will be located along the western border of the site to collect flows.

Because the District would incorporate BMPs into the proposed drainage system for the access road, the project would not create significant impacts on offsite water quality or erosion or flooding impacts. In addition, by implementing an approved SWPPP and incorporating long-term BMPs into the access road design, the project would comply with the County's Watershed Protection, Stormwater Management, and Discharge Control Ordinance. Therefore, the proposed project would not violate any water quality standards or waste discharge requirements identified, and impacts would be less than significant.

b. **Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in 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 that would not support existing land uses or planned uses for which permits have been granted)?**

No Impact. Construction of the access road would not require the consumption of groundwater supplies or interfere with groundwater recharge. Potable water would be supplied to the construction area. Therefore, no impacts would occur.

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 that would result in substantial erosion or siltation onsite or offsite?**

Less-than-Significant Impact. Construction of the access road would generally follow the alignment of an existing dirt road and therefore would not involve any substantial changes to the topography of the area. As discussed further in Section 3.4, "Biological Resources," the road would cross an unvegetated channel. However, this drainage is not a perennial stream or river, and the proposed crossing of this channel would not redirect flows of water that would create offsite erosion or siltation. The proposed project would involve the installation of a curb inlet and curb and gutter along the existing northerly dirt access road to the proposed access road and a new storm drain culvert. The drainage would discharge to two existing 30-inch storm drains located under Campo Road, and these storm drains would adequately serve the proposed quantity of flow. Therefore, the proposed project would not substantially alter the existing drainage pattern of the project area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off the site. Therefore, impacts would be less than significant.

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 that would result in flooding onsite or offsite?**

Less-than-Significant Impact. See responses to 9a and 9c. Although the proposed access road would increase the extent of impervious surfaces from that associated with the existing dirt road, the proposed storm drain system to be located within the access road, which would connect with the system that is under construction within the Sheriff Station, would be sufficient to handle the increase in stormwater runoff and would not result in flooding on or off the site. Therefore, impacts would be less than significant.

e. **Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?**

Less-than-Significant Impact. See responses to 9a and 9c. Impacts would be less than significant.

f. **Otherwise substantially degrade water quality?**

Less-than-Significant Impact. See responses to 9a and 9c. Impacts would be less than significant.

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?**

No Impact. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for San Diego County, the entire area proposed for the access road is mapped as being outside the 100-year and 500-year floodplains, meaning that there is a very low chance that damaging floods would occur on the site (FEMA 1997). In addition, the proposed project does not include the construction of any housing units. Therefore, the project would not place housing within a 100-year flood hazard area, and no impact would occur.

h. **Place within a 100-year flood hazard area structures that would impede or redirect floodflows?**

No Impact. See response to 9g. The entire area proposed for the access road is mapped as being outside the 100-year and 500-year floodplains (FEMA 1997). Therefore, no impact would occur.

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?**

No Impact. As discussed above, the entire area proposed for the access road is not in an area that is prone to flooding events. The proposed project would not 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, because there are no levees or dams in the project vicinity. No impact would occur.

j. **Contribute to inundation by seiche, tsunami, or mudflow?**

No Impact. The project site is more than 15 miles east of the Pacific Ocean. The closest body of water is the Sweetwater River, approximately 0.75 mile southeast of the project site. No impacts associated with inundation by seiche, tsunami, or mudflow would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
10.	**LAND USE AND PLANNING.** Would the project:				
a.	Physically divide an established community?	☐	☐	☐	☒
b.	Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c.	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

3.10 Land Use and Planning

a. **Physically divide an established community?**

No Impact. The proposed access road would generally follow the alignment of an existing dirt access road. The project does not propose the introduction of new infrastructure such as major roadways, water supply systems, or utilities to the area. The access road would be within the Valle De Oro Community Plan Area, and the proposed access road would not divide that or any other established community. Therefore, construction of the access road on the site would not divide an established community.

b. **Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to, a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?**

No Impact. The site is zoned M-52 (Industrial). Extension of a roadway would be allowed within the M-52 zone. In addition, as discussed in other sections of this initial study, the access road impacts on biological resources associated with the project would be limited to 0.12 acre of sensitive vegetation communities and would be mitigated through preservation of habitat within the San Miguel HMA. No other significant impacts on the environment have been identified. As a result, the construction of the access road would not conflict with any applicable County plans or regulations.

c. **Conflict with any applicable habitat conservation plan or natural community conservation plan?**

No Impact. The only applicable habitat conservation plan for the project area is the San Diego County MSCP, Biological Mitigation Ordinance, and the County Resource Protection Ordinance. As discussed at Section 3.4, "Biological Resources," impacts on biological resources associated with the project would be limited to 0.12 acre of sensitive vegetation communities and would be mitigated through preservation of habitat within the San Miguel HMA. In addition, construction of the access road would not adversely impact wildlife movement or result in any direct significant impacts on animal or plant species. Therefore, the proposed project would not conflict with the MSCP, the Biological Mitigation Ordinance, or the Resource Protection Ordinance.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
11.	**MINERAL RESOURCES.** Would the project:				
a.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
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?	☐	☐	☐	☒

3.11 Mineral Resources

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?**

No Impact. The area proposed for the access road has been classified by the California Department of Conservation – Division of Mines and Geology (California Division of Mines and Geology 1996) as an area of "Potential Mineral Resource Significance" (MRZ-3). Also, the area proposed for the access road is near an area identified as MRZ-1 (area where no potential mineral deposits are present). However, the project site is surrounded by densely developed land uses, including residential housing to the north and west, Cuyamaca Community College to the east, existing water reservoirs to the south, and Skyline Wesleyan Church to the southwest, which are incompatible with future extraction of mineral resources on the project site. A future mining operation at the project site would likely create a significant impact on neighboring properties for issues such as noise, air quality, traffic, and possibly others. Therefore, implementation of the project would not result in the loss of availability of a known mineral resource that would be of value because the mineral resource has already been lost due to incompatible land uses.

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?**

No Impact. See response to 11a. The project site is zoned M-52 (Industrial) by the general plan and is part of the Valle De Oro Community Plan. None of these plans indicate that the proposed project would be located on a site or have any impacts associated with the loss of availability of a locally important mineral resource recovery site. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
12.	**NOISE.** Would the project:				
a.	Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?	☐	☐	☒	☐
b.	Expose persons to or generate excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c.	Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d.	Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e.	Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f.	Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

3.12 Noise

a. **Expose persons to or generate noise levels in excess of standards established in a local general plan or noise ordinance or applicable standards of other agencies?**

Less-than-Significant Impact. ICF International assessed and analyzed potential noise impacts from the proposed project. The calculations used for this analysis are presented in Appendix E. The analysis utilized information provided by the District, topographical and aerial maps, and the Federal Highway Administration's Roadway Construction Noise Model (RCNM) to evaluate the worst-case noise-generating operations and activities associated with the project. Findings indicate the project would comply with the County of San Diego noise standards.

Applicable Regulations. The San Diego County Noise Ordinance (Title 3, Division 6, Chapter 4, Section 36.404, General Sound Level Limits) has established maximum noise levels at the boundary of various land uses. Regarding construction noise, San Diego County Noise Ordinance Section 36.409, Sound Level Limits, states:

> Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7 a.m. and 7 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

Short Term Construction Noise. Noise from construction of the proposed project is not anticipated to exceed County Noise Ordinance limits. Construction of the proposed access road would take approximately 2 months. The contractor for the project would comply with all construction activity time limits required by the County Noise Ordinance. The project would also adhere to all construction noise regulations of the County Noise Ordinance.

The nearest Noise-Sensitive Land Use (NSLU) is the Cuyamaca College campus, located to the northeast of the project. The nearest extent of the proposed construction work would be approximately 600 feet from the campus property line, and the farthest extent of the construction work would be approximately 1,100 feet away. The second-nearest NSLUs consist of existing single-family residences located to the northwest of the project. The nearest extent of the proposed construction work would be approximately 2,200 feet from the closest residential property line, and the farthest extent of the construction work would be approximately 2,500 feet away. In addition to the relatively far distances, the nearest NSLUs would also be shielded from a direct line-of-sight of the construction work by intervening terrain. The shielding from the terrain would provide estimated noise reduction levels conservatively estimated to range from 7 to 12 decibels or more.[1]

The construction equipment for the project is anticipated to consist of the following: a grader, a dozer, a dump truck, a backhoe, a paver, a roller, a miscellaneous heavy truck, and several pickup trucks. Not all of these equipment types would necessarily be on site at one time on a typical day, and if they were, it is unlikely that all would be operating simultaneously. However, as a conservative measure, the RCNM analysis assumed the operation of the full complement listed above, for the college campus (Receptor #1) and the nearest residences (Receptor #2). The summary table below (Table 4) lists the resultant, predicted construction noise levels with the terrain shielding accounted for. As shown, the levels from construction noise are estimated to be approximately 54 dBA Leq at the nearest NSLU (the college campus) and approximately 40 dBA Leq at the next-nearest NSLU (residences to the northwest). The estimated construction noise levels would be well below the County's Noise Ordinance limit for construction noise of 75 dBA Leq (8-hour). Therefore, the impact from construction noise would be less than significant.

[1] Terrain shielding calculations were carried out using the alignment of the proposed road, and surrounding horizontal and vertical distances and elevations, within a spreadsheet application based upon the Fresnel equation (Beranek 1971) for shielding attenuation. The input and output data for these estimates is provided in Appendix E.

Table 4. Roadway Construction Noise Model Impact Summary (dBA)

	Receptor #1		Receptor #2	
Equipment	**Leq**	**Lmax[1]**	**Leq**	**Lmax[1]**
Grader	49.9	53.9	35.6	39.6
Dozer	46.6	50.6	32.2	36.2
Dump Truck	41.4	45.4	27	31
Backhoe	42.5	46.5	28.1	32.1
Paver	43.1	46.1	28.8	31.8
Roller	41.9	48.9	27.6	34.6
Pickup Truck	39.9	43.9	25.6	29.6
Pickup Truck	39.9	43.9	25.6	29.6
Pickup Truck	39.9	43.9	25.6	29.6
Pickup Truck	39.9	43.9	25.6	29.6
Flat Bed Truck	39.2	43.2	24.8	28.8
Total	**54.1**	**53.9**	**39.8**	**39.6**

[1]Calculated Lmax is the maximum root-mean-squared (RMS) noise level.

Long Term Operational Noise. Operations noise associated with the proposed project would consist of District staff accessing the Station and San Miguel Fire District vehicles accessing the Heartland Regional Training Facility located within the District Regulatory site. District Staff vehicles as well future vehicles accessing the San Miguel Regional Training Facility would generate 46 ADT, with 19 (13 inbound/6 outbound) trips during the AM peak hour and 19 (6 inbound/13 outbound) trips during the PM peak hour (Otay Water District, August 2010). The speeds along the access road would be relatively low, with a posted speed limit of 15 miles per hour. Because of the low travel speeds and the small number of vehicles (approximately 19 vehicles during each of the AM and PM peak hours), vehicle noise along the access road would be negligible at the nearest NSLUs located at least 600 feet away. Therefore, exposure of persons to or generation of noise levels in excess of noise ordinance standards would not occur, and noise impacts as a result of the project would be less than significant.

b. **Expose persons to or generate excessive groundborne vibration or groundborne noise levels?**

Less-than-Significant Impact. The proposed project is not expected to create excessive groundborne vibrations or groundborne noise levels. During construction, there could be a potential for the creation of short-term vibrations related to the use of construction equipment in the project area. However, because high-impact type methods would not be used (i.e., no pile-driving or blasting), the potential for excessive groundborne vibrations and noise levels would be significantly reduced. The contractor for the project would comply with all construction activity time limits required by the County Noise Ordinance. In addition, the closest noise- and vibration-sensitive land uses are approximately 600 feet from the project site. Vibrations dissipate relatively quickly through typical soils. As a result, vibration from construction activities would be well below thresholds of perceptibility at the nearest noise- and vibration-sensitive land uses. Therefore, the impact from construction groundborne vibration and groundborne noise would be less than significant.

c. **Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?**

Less-than-Significant Impact. See response to 12a. Operations noise associated with the proposed project would comply with the 1-hour average daytime sound level limit of 50 dBA and nighttime dBA at the property line in accordance with County noise standards. As discussed in response 12a, potential noise impacts from the operation of the proposed project would be minimal because of the low volume of project traffic and the low travel speeds. Therefore, impacts related to a substantial permanent increase in ambient noise would be less than significant.

d. **Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?**

Less-than-Significant Impact. See response to 12a.

e. **Be located within an airport land use plan area, or, where such a plan has not been adopted, within two miles of a public airport or public use airport and expose people residing or working in the project area to excessive noise levels?**

No Impact. The project site is not within an airport land use plan area or within 2 miles of a public airport or public use airport. Therefore, no impacts would occur.

f. **Be located in the vicinity of a private airstrip and expose people residing or working in the project area to excessive noise levels?**

No Impact. There are no private airstrips in the project vicinity, so no one residing or working in the project area would be exposed to excessive noise levels. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
13.	**POPULATION AND HOUSING.** Would the project:				
a.	Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b.	Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c.	Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

3.13 Population and Housing

a. **Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?**

No Impact. The proposed access road would connect the existing Regulatory Site to the under-construction County Sheriff Station and to an existing paved roadway that connects to SR-94. No utilities would be extended into the roadway. Therefore, extension of the road would not induce population growth. No impacts would occur.

b. **Displace a substantial number of existing housing units, necessitating the construction of replacement housing elsewhere?**

No Impact. There are no existing housing units on the proposed project site. The project would not displace existing housing, and no impact would occur.

c. **Displace a substantial number of people, necessitating the construction of replacement housing elsewhere?**

No Impact. The proposed project would not displace a substantial number of people because there are no residential uses on the project site. Therefore, no impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
14.	**PUBLIC SERVICES.** Would the project:				
a.	Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a 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 following public services:				
	Fire protection?	☐	☐	☐	☒
	Police protection?	☐	☐	☐	☒
	Schools?	☐	☐	☐	☒
	Parks?	☐	☐	☐	☒
	Other public facilities?	☐	☐	☐	☒

3.14 Public Services

a. **Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or a 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 following public services:**

Fire protection?

No Impact. Impacts of the project on fire service would be beneficial. The proposed access road would be designed to allow for access by San Miguel Fire Protection District vehicles to the regional training facilities that are planned to be built on the District Regulatory Site. The access road would also serve as a secondary emergency access route to and from the Regulatory Site and the County Sheriff Station.

Police protection?

No Impact. Implementation of the proposed project would not increase the demand for or impact response times of police protection services. Impacts of the project on police service would be beneficial. The access road would serve as a secondary emergency access route to and from the Regulatory Site and the County Sheriff Station for both fire and police vehicles.

Schools?

No Impact. The access road would not generate a demand for public school services. No impacts would occur.

Parks?

No Impact. Implementation of the proposed project would not generate a demand for parks or park services. Therefore, no impacts would occur.

Other public facilities?

No Impact. No other public facilities would be affected. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
15.	**RECREATION.** Would the project:				
a.	Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b.	Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒

3.15 Recreation

a. **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?**

No Impact. The proposed access road would not provide access to existing neighborhood parks, regional parks, or other recreational facilities. Therefore, substantial physical deterioration of these facilities would not occur or be accelerated. No impact would occur.

b. **Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?**

No Impact. The proposed project does not include the construction of new recreational facilities or the expansion of existing recreational facilities. The construction or expansion of recreational facilities would not be required. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
16.	**TRANSPORTATION/TRAFFIC.** Would the project:				
a.	Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b.	Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d.	Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐
e.	Result in inadequate emergency access?	☐	☐	☒	☐
f.	Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

3.16 Transportation and Traffic

a. **Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?**

Less-than-Significant Impact. The access road would be used by District staff as well as San Miguel Fire District vehicles accessing the Heartland Regional Training Facility located within the District Regulatory Site. Currently, district staff vehicles utilize an existing right-turn-in/-out only driveway on SR-94. The access road would be an alternate route for District staff as well as an alternate route

for San Miguel Fire Protection District vehicles that will access the Heartland Regional Training Facility, which is currently being constructed within the District Regulatory Site. District Staff vehicles as well as future San Miguel Fire Protection District vehicles accessing the Heartland Regional Training Facility would generate 46 ADT, with 19 (13 inbound/6 outbound) trips during the AM peak hour and 19 (6 inbound/13 outbound) trips during the PM peak hour (Appendix G). A portion of these trips would egress and ingress from Campo using the existing driveway shown in Figure 2. It is anticipated that a majority of the San Miguel Fire District vehicles would utilize the proposed access road to access the Heartland Regional Training Facility.

The direct and cumulative impacts of vehicles and trips that would utilize the proposed access road were evaluated as a part of the 2012 traffic analysis completed for the proposed Heartland Regional Training Facility (Appendix G). With the added project traffic for the District staff accessing the Regulatory Site and San Miguel Fire Protection District staff accessing the Heartland Regional Training Facility, it was determined as a part of the 2012= analysis that roadway facilities—both the Jamacha Boulevard/Campo Road intersection and Campo Road/Jamacha Road intersection—would continue to operate at their existing level of service (LOS) of LOS D or better, during both AM and PM peak traffic hours. Based on the County of San Diego's "Guidelines for Determining Significance," adopted and revised effective June 30, 2009, no significant direct traffic impacts from the project were calculated. While the proposed Heartland Regional Training Facility project itself would not result in exceedance of the LOS standards established by the County, Linscott, Law & Greenspan, Engineers (LLG) performed a conservative analysis assuming 15% ambient growth based on one known cumulative project. This cumulative analysis found that the study area intersections are calculated to operate at acceptable LOS D or better during both the AM and PM peak traffic hours, with the exception of the Jamacha Boulevard/Campo Road intersection during the PM peak hour (LOS F). Local and regional cumulative impacts would be significant but the proposed project would be subject to the County Transportation Impact Fee (TIF) ordinance, and payment of the County's TIF would provide the compensation required to reduce traffic impacts to a less-than-significant level. In addition, improvements on SR-94 at the existing project driveway to improve access to the project site are proposed to be completed when the Heartland Regional Training Facility is in operation.

With construction of the proposed access road, a portion of the 46 ADT—with 19 (13 inbound/6 outbound) trips during the AM peak hour and 19 (6 inbound/13 outbound) trips generated by District Staff vehicles as well future San Miguel Fire Protection District vehicles accessing the Heartland Regional Training Facility—would utilize the SR-94/Jamacha Boulevard intersection to access the Heartland Regional Training Facility as an alternate to the existing driveway. The SR-94/Jamacha Boulevard intersection, including the access to Skyline Church, is a signalized intersection. The study completed for the under-construction County Sheriff Station concluded that the addition of the 1,000 ADT associated with County vehicles using this intersection would not result in a decrease in the level of service at this intersection (County of San Diego 2009). Considering 1,000 ADT would not decrease the intersection to an unacceptable level of service, it is not anticipated that the addition of 46 total ADT with 19 peak hour trips to this intersection would be substantial enough to decrease the level of service at the intersection to unacceptable levels. The study area intersections are projected to operate at acceptable LOS D or better during both the AM and PM peak hours. Both intersections would operate at acceptable LOS D or better because they will have an average delay of less than 55 seconds per vehicle. Therefore, the proposed redistribution of trips to the access road would not result in significant direct impacts on level of service at the SR-94/Jamacha Boulevard intersection.

It is anticipated that County Sheriff vehicles may use the access road as a secondary access. However, use of the access road by County vehicles would be very infrequent considering the Sheriff Station circulation system was designed to allow for the primary access to be the Sheriff Station driveway shown in Figure 3. As a result, use of the access road by County vehicles would not result in a redistribution of planned traffic that would adversely impact levels of service at intersections or roadways in the project vicinity.

Special events, including County-wide fire training or use of the site as a staging/meeting area during fires, could occur infrequently, likely once or twice a year. The proposed access road could be used for these events. These special events would result in more project trips, but because the special events would occur so infrequently, it was determined based on the traffic analysis conducted for the Regional Training Facility that the special events would not create a traffic impact (Appendix G).

In addition, the proposed access road would not change or impede any established policies, plans, or programs that support alternative forms of transportation. The number of District staff that maintain the Regulatory Site is minimal, and alternative transportation is not necessary. The San Miguel Fire Protection District anticipates that buses will be used to minimize car trips that access the Heartland Regional Training Facility.

b. **Conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?**

Less-than-Significant Impact. See response to Section 16a. The impacts of vehicles and trips that would utilize the proposed access road were evaluated as a part of the 2010 traffic analysis completed for the proposed Heartland Regional Training Facility, which showed that the access road would not be a source of new vehicle trips within the local circulation network. Therefore, implementation of the proposed access road would not result in any conflicts with an applicable congestion management program or adversely impact County level of service standards for intersections or roadways in the project vicinity.

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?**

No Impact. The proposed access road would not create any change in air traffic patterns. No impact would occur.

d. **Substantially increase hazards because of a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**

Less-than-Significant Impact. The proposed access road would be designed to allow for access between the District Regulatory Site/Heartland Regional Training Facility and the County Sheriff Station. As shown in Figure 2, the access road would not provide any direct access from SR-94. In addition the access road would replace an existing dirt road with a paved roadway designed to County standards. Therefore, extension of the access road would not create new hazards associated with any design features.

e. **Result in inadequate emergency access?**

Less-than-Significant Impact. Impacts of the project on fire service would be beneficial. The proposed access road would be designed to allow for access by San Miguel Fire Protection District vehicles to the regional training facilities that are planned to be built on the District Regulatory Site. The access road would also serve as a secondary emergency access route to and from the Regulatory Site and the County Sheriff Station.

f. **Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?**

No Impact. Use of the proposed access road would not change or impede any established policies, plans, or programs that support alternative forms of transportation. No impact would occur.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
17.	**UTILITIES AND SERVICE SYSTEMS** Would the project:				
a.	Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
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?	☐	☐	☒	☐
c.	Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?	☐	☐	☐	☒
e.	Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g.	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

3.17 Utilities and Service Systems

a. **Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?**

No Impact. No utilities would be extended within the proposed access road. Therefore, no impact related to wastewater treatment requirements would occur.

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?**

Less-than-Significant Impact. No utilities would be extended within the proposed access road. Therefore, no impact related to the construction of new water or wastewater treatment facilities would occur.

As shown in Figure 4, the proposed access road would cross an existing 50-foot San Diego County Water Authority (CWA) pipeline easement. The proposed access road alignment was designed to minimize the amount of roadway that would be located within the easement. In addition, the roadway would be designed with adequate pavement width. The recommendations regarding pavement thickness, compaction of fill under-pavement, and the asphalt concrete type from the geotechnical report would be included as a part of the proposed project and would ensure that vehicles utilizing the roadway would not damage the underlying CWA pipeline.

c. **Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

Less-than-Significant Impact. The proposed access road would include storm water drainage facilities that would be designed to connect with the system that is under construction within the County Sheriff Station. The existing system would be adequate for the proposed quantity of flow. The design of the roadway would include BMPs that comply with requirements of the County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance. Therefore, construction of the access road would not result in significant environmental impacts.

d. **Have sufficient water supplies available to serve the project from existing entitlements and resources, or would new or expanded entitlements be needed?**

No Impact. No utilities would be extended within the proposed access road. Therefore, no impact related to water supplies would occur.

e. **Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?**

No Impact. No utilities would be extended within the proposed access road. Therefore, no impact related to wastewater treatment requirements would occur.

f. **Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?**

Less-than-Significant Impact. Solid waste would be generated during construction of the access road that would be disposed of in accordance with the appropriate regulations. No long-term waste disposal would be associated with operation of the proposed access road. Therefore, no impact related to landfill capacity would occur.

g. **Comply with federal, state, and local statutes and regulations related to solid waste?**

Less-than-Significant Impact. See response to 17f.

		Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less-than-Significant Impact	No Impact
18.	**MANDATORY FINDINGS OF SIGNIFICANCE.**				
a.	Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b.	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.)	☐	☒	☐	☐
c.	Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

3.18 Mandatory Findings of Significance

a. **Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?**

Less than Significant with Mitigation Incorporated. Based on evaluations, technical studies, and discussions in this Initial Study, the proposed project has limited potential to degrade the quality of the environment. To reduce potential impacts on biological resources to less-than-significant levels, the project would implement mitigation measures to protect sensitive vegetation communities and wildlife (see Section 3.4, "Biological Resources"). In addition, the project would comply with policies in accordance with state regulations if unknown buried archaeological or paleontological resources are found (see Section 3.5, "Cultural Resources"). Therefore, with mitigation incorporated, the proposed project would not significantly affect the quality of the environment.

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.)**

Less than Significant with Mitigation Incorporated. The proposed project could result in cumulative impacts on biological resources; however, mitigation measures presented below are proposed to reduce all impacts to below a level of significance. With implementation of the proposed mitigation, impacts would be less than significant.

Biological Resources

Mitigation Measure BIO-1: Biological Monitoring. Due to the observed presence of coast horned lizard, orangethroat lizard, and the coastal California gnatcatcher, a biological monitor will be present during removal of vegetation to avoid potential impacts on these species.

Mitigation Measure BIO-2: San Miguel HMA. Impacts on the 0.12 acre of sensitive vegetation communities, consisting of 0.04 acre of Diegan coastal sage scrub, 0.04 acre of disturbed Diegan coastal sage scrub, and 0.04 acre of baccharis-dominated Diegan coastal sage scrub, will be mitigated at a ratio of 2:1 through the use of available credits at the District's San Miguel Habitat Management Area (HMA) or through the creation of Diegan coastal sage scrub within the HMA.

Mitigation Measure BIO-3: Onsite Revegetation. Impacts to sensitive vegetation communities, consisting of Diegan coastal sage scrub will also be mitigated on-site through revegetation of impact areas outside of the road width with Diegan coastal sage scrub species. Revegetation will be done with a mix of container plants and seeding. The extent of the revegetation areas are indicated in Figure 5 and will cover 0.12 acre, of which 0.015 acre is previously disturbed area outside of the project limits, within County easement area.

Mitigation Measure BIO-4: Construction Not to Occur during Coastal California Gnatcatcher Breeding Season. Prior to any construction activity, all contractual agreements with the District will ensure that the following project requirements regarding sensitive wildlife species are completed.

- No clearing, grubbing, or grading of vegetation will occur between February 15 and August 31, the breeding season of the coastal California gnatcatcher. However, if construction is proposed during the breeding season for the gnatcatcher, the following requirements will have to be met to the satisfaction of the County:
  - U.S. Fish and Wildlife Service protocol surveys will be required in order to determine species' presence or absence.
  - If no gnatcatchers are detected within 300 feet of the proposed grading/construction, then no restriction on grading will be necessary.
  - If gnatcatchers are present, measures to minimize noise impacts will be required and should include temporary noise walls and/or berms.
  - If the survey is not performed and construction is proposed during the species' breeding season, presence will be assumed and a temporary wall/berm will be required.

- Noise levels from grading/construction activities during the breeding season should not exceed 60 dBA hourly LEQ at the edge of the occupied habitat, or the ambient noise level if noise levels already exceed 60 dBA hourly LEQ.

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

Less than Significant with Mitigation Incorporated. Construction and operation of the proposed project would be within the District-owned property designated for such uses. As discussed further in this Initial Study, the proposed project would not have environmental effects that would cause direct or indirect adverse effects on humans. As discussed further in the response to 18b, the proposed project could result in cumulative impacts on biological resources; however, mitigation measures are proposed to reduce all impacts to below a level of significance. With implementation of the proposed mitigation, impacts would be less than significant.

19.	**EARLIER ANALYSIS.** Earlier analyses may be used where, pursuant to tiering, program EIR, or other CEQA process, one or more effects have been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a discussion should identify the following on attached sheets:
a.	**Earlier analyses used**. Identify earlier analyses and state where they are available for review.
b.	**Impact adequately addressed.** Identify which effects from the above checklist were within the scope of and adequately analyzed in the 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 "potentially significant unless mitigated," 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.

3.19 Earlier Analysis

a. **Earlier analyses used.** Identify earlier analyses and state where they are available for review**.**

Final Mitigated Negative Declaration for the Otay Water District 640-1 and 640-2 Reservoirs (SCH No 2005111026). 2006. This document is available for review at the Otay Water District, 2554 Sweetwater Springs Boulevard, Spring Valley, California 91978. Also see Appendices C, D, and F of this MND.

Final Mitigated Negative Declaration for the San Miguel Regional Training Facility (SCH#2010081058). 2010. This document is available for review at the Otay Water District, 2554 Sweetwater Springs Boulevard, Spring Valley, California 91978.

Final Mitigated Negative Declaration for the County of San Diego Rancho San Diego Sheriff's Station Project, SCH# 2008121024). 2009. This document is available for review at the County of San Diego Department of General Services 5555 Overland Avenue, Suite 2201 San Diego, California 92123-1294.

b. **Impact adequately addressed.** Identify which effects from the above checklist were within the scope of and adequately analyzed in the earlier document pursuant to applicable legal standards and state whether such effects were addressed by mitigation measures based on the earlier analysis.

Not Applicable.

c. **Mitigation measures.** For effects that are "potentially significant unless mitigated," 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**.**

Not Applicable.

Section 4
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Appendix A

URBEMIS Model Outputs

Air Quality and Greenhouse Gas Emission Calculations

OWD Regulatory Site Access Road

San Diego County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric
Other Asphalt Surfaces	43.2	1000sqft

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Utility Company**
Climate Zone	13	**Precipitation Freq (Days)**	40	

1.3 User Entered Comments

Project Characteristics -

Land Use - 1800 feet length (x) 24 feet wide = 43,200 ft2

Construction Phase - construction overlaps, but CalEEMod doesn't allow overlap. Will overlap in emissions sheet.

Off-road Equipment - all equipment that is not grading default was assumed to be active 8 hours per day

Trips and VMT - 4 workers, 2 trips each/day, 54 asphalt trucks/day (2700 tons of asphalt/10 ton capacity / 5 days)

Grading - assume 1.5 acre disturbed. no soil import or export

Off-road Equipment - all equipment that is not paving default was assumed to be active 8 hours per day

Vehicle Trips - 36 ADT / 43.2 1000sf = 0.83 ADT/day. Assumed the same rate 7 days a week. Assumed 100% trips primary and default non-res commercial/worker trip length of 9.5 miles/trip.

Vechicle Emission Factors - >1 ton = LDA, <1 ton = HHDT. of 36 ADT, 16 are <1 ton, 20 < 1 ton. Fleet mix adjusted to reflect this.

Vechicle Emission Factors - >1 ton = LDA, <1 ton = HHDT. of 36 ADT, 16 are <1 ton, 20 < 1 ton. Fleet mix adjusted to reflect this.

Vechicle Emission Factors - >1 ton = LDA, <1 ton = HHDT. of 36 ADT, 16 are <1 ton, 20 < 1 ton. Fleet mix adjusted to reflect this.

Road Dust - default

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					
2011	6.89	59.06	27.11	0.06	1.65	2.84	4.31	0.42	2.84	3.08	0.00	6,385.92	0.00	0.62	0.00	6,398.87
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

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					
2011	6.89	59.06	27.11	0.06	1.55	2.84	4.21	0.42	2.84	3.08	0.00	6,385.92	0.00	0.62	0.00	6,398.87
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

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	1.20	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	0.70	6.70	4.78	0.01	0.42	0.23	0.65	0.03	0.23	0.26		886.70		0.03		887.41
Total	**1.90**	**6.70**	**4.78**	**0.01**	**0.42**	**0.23**	**0.65**	**0.03**	**0.23**	**0.26**		**886.70**		**0.03**	**0.00**	**887.41**

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	1.20	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Energy	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Mobile	0.70	6.70	4.78	0.01	0.42	0.23	0.65	0.03	0.23	0.26		886.70		0.03		887.41
Total	**1.90**	**6.70**	**4.78**	**0.01**	**0.42**	**0.23**	**0.65**	**0.03**	**0.23**	**0.26**		**886.70**		**0.03**	**0.00**	**887.41**

3.0 Construction Detail

3.1 Mitigation Measures Construction

3.2 Grading - 2011

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					1.55	0.00	1.55	0.41	0.00	0.41						0.00
Off-Road	6.83	58.99	26.50	0.06		2.66	2.66		2.66	2.66		6,305.24		0.61		6,318.07
Total	**6.83**	**58.99**	**26.50**	**0.06**	**1.55**	**2.66**	**4.21**	**0.41**	**2.66**	**3.07**		**6,305.24**		**0.61**		**6,318.07**

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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	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
Worker	0.06	0.07	0.61	0.00	0.10	0.00	0.11	0.00	0.00	0.01		80.67		0.01		80.80
Total	**0.06**	**0.07**	**0.61**	**0.00**	**0.10**	**0.00**	**0.11**	**0.00**	**0.00**	**0.01**		**80.67**		**0.01**		**80.80**

3.2 Grading - 2011

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					1.55	0.00	1.55	0.41	0.00	0.41						0.00
Off-Road	6.83	58.99	26.50	0.06		2.66	2.66		2.66	2.66	0.00	6,305.24		0.61		6,318.07
Total	**6.83**	**58.99**	**26.50**	**0.06**	**1.55**	**2.66**	**4.21**	**0.41**	**2.66**	**3.07**	**0.00**	**6,305.24**		**0.61**		**6,318.07**

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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	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
Worker	0.06	0.07	0.61	0.00	0.00	0.00	0.01	0.00	0.00	0.01		80.67		0.01		80.80
Total	**0.06**	**0.07**	**0.61**	**0.00**	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**		**80.67**		**0.01**		**80.80**

3.3 Paving - 2011

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	5.31	37.79	17.86	0.04		2.47	2.47		2.47	2.47		3,867.02		0.48		3,877.00
Paving	0.52					0.00	0.00		0.00	0.00						0.00
Total	**5.83**	**37.79**	**17.86**	**0.04**		**2.47**	**2.47**		**2.47**	**2.47**		**3,867.02**		**0.48**		**3,877.00**

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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.97	11.00	6.89	0.01	0.50	0.37	0.86	0.04	0.37	0.40		1,455.78		0.05		1,456.78
Worker	0.06	0.07	0.61	0.00	0.10	0.00	0.11	0.00	0.00	0.01		80.67		0.01		80.80
Total	**1.03**	**11.07**	**7.50**	**0.01**	**0.60**	**0.37**	**0.97**	**0.04**	**0.37**	**0.41**		**1,536.45**		**0.06**		**1,537.58**

3.3 Paving - 2011

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	5.31	37.79	17.86	0.04		2.47	2.47		2.47	2.47	0.00	3,867.02		0.48		3,877.00
Paving	0.52					0.00	0.00		0.00	0.00						0.00
Total	**5.83**	**37.79**	**17.86**	**0.04**		**2.47**	**2.47**		**2.47**	**2.47**	**0.00**	**3,867.02**		**0.48**		**3,877.00**

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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00		0.00		0.00
Vendor	0.97	11.00	6.89	0.01	0.04	0.37	0.40	0.04	0.37	0.40		1,455.78		0.05		1,456.78
Worker	0.06	0.07	0.61	0.00	0.00	0.00	0.01	0.00	0.00	0.01		80.67		0.01		80.80
Total	**1.03**	**11.07**	**7.50**	**0.01**	**0.04**	**0.37**	**0.41**	**0.04**	**0.37**	**0.41**		**1,536.45**		**0.06**		**1,537.58**

4.0 Mobile Detail

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	0.70	6.70	4.78	0.01	0.42	0.23	0.65	0.03	0.23	0.26		886.70		0.03		887.41
Unmitigated	0.70	6.70	4.78	0.01	0.42	0.23	0.65	0.03	0.23	0.26		886.70		0.03		887.41
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	35.86	35.86	35.86	123,990	123,990
Total	35.86	35.86	35.86	123,990	123,990

4.3 Trip Type Information

	Miles			Trip %		
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
Other Asphalt Surfaces	9.50	7.30	7.30	100.00	0.00	0.00

5.0 Energy Detail

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	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
NaturalGas Unmitigated	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

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	lb/day										lb/day					
Other Asphalt Surfaces	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

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	lb/day										lb/day					
Other Asphalt Surfaces	0	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00	0.00	0.00
Total		**0.00**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**	**0.00**	**0.00**

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	1.20	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Unmitigated	1.20	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**

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	0.27					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.92					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**1.19**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

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	0.27					0.00	0.00		0.00	0.00						0.00
Consumer Products	0.92					0.00	0.00		0.00	0.00						0.00
Landscaping	0.00	0.00	0.00	0.00		0.00	0.00		0.00	0.00		0.00		0.00		0.00
Total	**1.19**	**0.00**	**0.00**	**0.00**		**0.00**	**0.00**		**0.00**	**0.00**		**0.00**		**0.00**		**0.00**

Appendix B

Biological Resources Letter Report

November 15, 2012

Ms. Lisa Coburn-Boyd
Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, CA 91978

Subject: Biological Resources Letter Report for the Otay Water District Regulatory Site Access Road Improvements

Dear Ms. Coburn-Boyd:

ICF International (ICF) was retained to conduct biological surveys and prepare a Biological Resources Letter Report for the OWD Regulatory Site Access Road Project. This letter report analyzes potential effects on sensitive biological resources associated with the realignment, widening, and paving of an access road extending from the proposed Sheriff's Station to the Otay Water District (District) Regulatory Site.

1.0 PROJECT DESCRIPTION, LOCATION, AND SETTING

1.1 Project Location

The project site is located within Rancho San Diego, an unincorporated community in San Diego County, California (Figures 1 and 2 in Attachment A). This site is located northwest of the intersection of Campo Road and State Route-94 (SR-94). Nearby streets and developments include Fury Lane to the north, Via Escuda to the northwest, Cuyamaca Community College to the east, SR-94 to the south, and Via Palma to the west. The project site is located on the Jamul Mountains USGS Quadrangle (Figure 2).

1.2 Project Description

The District is proposing to extend an access road from the District Regulatory Site to the terminus of the road that is being built by the County of San Diego (County) for the Sheriff's Substation Project and also extending for approximately 300 feet to a secondary access road and southern entrance connecting with SR-94. This access road would be used by District staff as well as San Miguel Fire District vehicles accessing the San Miguel Regional Training Facility

located within the District Regulatory Site. The access road would be a maximum of 24 feet (ft) in width and would be paved. The proposed alignment would generally conform to the alignment of the existing unpaved access road; however, a portion of the proposed road would be situated within vegetated habitat and would cross an unvegetated drainage. An Arizona crossing has been proposed for crossing this drainage.

The potential exists that extension of the access road may involve vacation of an existing County of San Diego Open Space Easement or placement of a District Road Easement within the existing County Open Space Easement.

1.3 Environmental Setting

The project area is situated south of the fenced limits of the 70-acre District Regulatory site. Surrounding lands support expansive areas of native habitat as well as developed areas (Figure 3 in Attachment A). Developed areas include Cuyamaca College, which is located to the east, SR-94 to the south, the District's 640 Reservoir site to the north, the Western Truck School to the southeast, and undeveloped hillsides occur to the west and north.

The survey area, which includes the project site and a 300-foot buffer, ranges in elevation from 390 ft above mean sea level (MSL) at its lowest point to 540 ft above MSL at its highest point. Two soil types from two different soil series, as defined by the U.S. Department of Agriculture, are mapped within the survey area (USDA 1973; NRCS 2011). These include Friant rocky fine sandy loam (30 to 70 percent slopes) and Placentia sandy loam (2 to 9 percent slopes). The majority of the impact area supports Friant rocky fine sandy loam, with the exception of an approximately 100-foot-segment of southeastern portion of the alignment.

Soils from the Friant series are shallow, well drained sandy loams that form in material weathered from mica schist, quartz schist, and gneiss. Soils from the Placentia series are well drained with a clay subsoil and were formed in granitic alluvium.

2.0 Study Methods

The following section provides information regarding the methods used during surveys conducted for this project, including the general biological survey, jurisdictional delineation, and focused surveys for coastal California gnatcatcher (*Polioptila californica californica*) and Quino checkerspot butterfly (*Euphydryas editha quino*; Quino). The survey area for all surveys included the project alignment and a 300-foot buffer, except for the Quino surveys which included a 500-foot buffer. Survey dates and weather conditions for all surveys conducted for this project are summarized below in Table 1.

Prior to conducting any fieldwork, searches of available literature and databases were conducted to determine sensitive species previously observed, detected or with potential to occur within the survey area as well as the physical characteristics of the site and surrounding areas. Available data that were reviewed included: the California Natural Diversity Database (CNDDB) database (CNDDB 2011; Jamul Mountains, El Cajon, Alpine, Dulzura, Otay Mountain, Otay Mesa, Imperial Beach, National City, and La Mesa quadrangles); California Native Plant Society (CNPS) Online Plant Inventory (CNPS 2011); the USDA soil survey of the area (USDA 1973; NRCS 2011); and U.S. Geologic Survey (USGS) topographic maps to identify potential stream courses and other notable topographic features.

2.1 General Biological Survey

A general biological survey was conducted by Erika Eidson of ICF on August 1, 2011 between the hours of 0830 and 1130. The survey area included the project alignment and a 300-foot buffer. Weather conditions consisted of air temperatures ranging from 74 to 78 degrees Fahrenheit, winds of 1-5 miles per hour, and clear skies. The purpose of this survey was to identify the biological resources present as well as the potential for sensitive species to occur within the survey area.

A second general biological survey was conducted by Cheryl Rustin and Erika Eidson of ICF on November 1, 2012 between the hours of 0845 and 1200. The survey area included the project alignment and a 300-foot buffer. Weather conditions consisted of air temperatures ranging from 65 to 74 degrees Fahrenheit, winds of 1-2 miles per hour, and mostly clear skies. This survey was conducted due to the more than one year lapse since the previous survey. The purpose of this survey was to verify that the conditions within the survey area remained unchanged and to record any changes detected.

The survey area was traversed by walking meandering transects in an effort to accurately categorize vegetation communities and to identify the locations of any sensitive species readily detectable. Vegetation communities occurring in the survey area were mapped according to Holland categories (Holland 1986); with subsequent modifications by Oberbauer (2005), as described in the County of San Diego's Guidelines for Determining Significance (County of San Diego 2010b). Vegetation communities were mapped on a "one-inch equals 250 feet" aerial photograph of the project area in the field and later digitized into a geographic information system (GIS) coverage using ArcGIS software. All plants and wildlife species detected were recorded. Plants that could not be identified in the field were identified later using taxonomic keys including Beauchamp (1986) and Hickman (1993). Wildlife species were detected visually, aurally, and through sign (e.g., scat and tracks). Due to the timing of the surveys, nocturnal wildlife species would not have been readily detected as only daytime surveys were conducted. Annual plant species also would not have been detected as the survey was conducted during a time of year when annual plants would not be present above ground. Complete lists of the plant

and wildlife species observed within the survey area are provided as Attachments B and C, respectively.

Table 1. Survey Dates and Times

Date	Survey Type	Time	Weather Conditions	Surveyor (USFWS Permit #)
February 11, 2011	Quino #1	0915–1200	62/72°F, 0–1 mph, clear skies	E. Eidson (TE-051236)
February 14, 2011	Quino #2	0900–1200	62/67°F, 0–1 mph, clear skies	E. Eidson (TE-051236)
February 28, 2011	Quino #3	0915–1200	62/68°F, 1–2 mph, 5% cloud cover	E. Eidson (TE-051236)
March 8, 2011	Quino #4	1300–1530	72/76°F, 0–3 mph, clear skies	E. Eidson (TE-051236)
March 15, 2011	Quino #5	0845–1100	65/73°F, 0–5 mph, clear skies	E. Eidson (TE-051236)
March 23, 2011	Quino #6	0945–1215	61/69°F, 0–5 mph, clear skies	E. Eidson (TE-051236)
August 1, 2011	General biological	0830-1130	74/78°F, 1–5 mph, clear skies	E. Eidson
July 26, 2011	Wetland Delineation	1400-1700	76°F, 2-4 mph, clear skies	D. Ritenour
July 27, 2011	Coastal California gnatcatcher #1	0830-1200	68/78°F, 0-3 mph, 100%-15% cloud cover	M. Alfaro (TE-051242)
August 3, 2011	Coastal California gnatcatcher #2	0730-1035	72/88°F, 0-3 mph, clear skies	M. Alfaro (TE-051242)
August 10, 2011	Coastal California gnatcatcher #3	0800-1030	67/79°F, 0-2 mph, 100% - 20% cloud cover	M. Alfaro (TE-051242)
November 1, 2012	General biological	0845-1200	68/74°F, 0-2 mph, 10% - 0% cloud cover	C. Rustin, E. Eidson

2.2 Coastal California Gnatcatcher

Protocol surveys for the coastal California gnatcatcher were included the project alignment and a 300-foot buffer. Three surveys were conducted at least one week apart. All surveys were conducted in accordance with U.S. Fish and Wildlife Service protocol requirements (USFWS 1997a). For this project, the surveys consisted of careful, thorough coverage of potential habitat within the survey area. Pre-recorded audiotape playback was used when appropriate. All visits were performed during morning hours prior to 1200, when gnatcatchers are most active, and

were not conducted during inclement weather such as extreme hot or cold temperatures, fog, high winds, or rain.

Three focused surveys were conducted for coastal California gnatcatcher by Monica Alfaro (TE 051242) of ICF on July 27, and August 3 and 10, 2011 (Table 1). The focused coastal California gnatcatcher report is attached as Attachment D.

2.3 Jurisdictional Delineation

Prior to the jurisdictional delineation, a 200-scale (1" = 200') aerial photograph of the project site was prepared and reviewed, In addition, the USDA soil survey map (Bowman 1973) was also reviewed to identify the soil series present onsite. Dale Ritenour of ICF conducted the wetland delineation on July 27, 2011. Methods used for delineating federal wetlands followed the guidelines set forth by the U.S. Army Corps of Engineers (USACE) in the *Arid West Manual* (USACE 2008). Visual observations of vegetation types and landform features were used to locate areas to be evaluated during the jurisdictional delineation. At the evaluation area, several parameters were considered to determine whether the sample point was within a wetland. Three criteria normally must be fulfilled in order to classify an area as a jurisdictional USACE wetland: (1) a predominance of hydrophytic vegetation, (2) the presence of hydric soils, and (3) the presence of wetland hydrology. A pit was dug at the evaluation area to inspect for the presence of hydric soils and the area was evaluated for hydric vegetation and hydrology. The results of this delineation are incorporated in this letter report.

2.4 Quino Checkerspot Butterfly

Erika Eidson (TE-051236) of ICF conducted surveys for adult Quino on February 11, 14, and 28, March 8, 15, and 23, 2011. These surveys were conducted on a weekly basis under acceptable weather conditions as defined in the USFWS protocol (Table 1) (USFWS 2002). Each survey involved slowly walking transects throughout all non-excluded portions of the survey area and stopping periodically to scan for butterfly activity. All flowering plants that provide potential nectar sources for Quino were recorded. A portion of the survey area was inaccessible due to tall fencing and a locked gate. This area was surveyed from outside of the fence with the use of binoculars. The surveys were conducted at an average rate of no more than 9 acres per hour. The surveyor stopped periodically to scan adjacent areas for moving butterflies. The 2011 focused survey report is provided as Attachment E.

3.0 HABITAT AND VEGETATION COMMUNITIES

A total of five vegetation communities were mapped within the survey area, including Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, baccharis-dominated coastal sage scrub, disturbed habitat, and urban/developed areas (Figure 3). Urban/developed areas in the survey

area included the District's 640 Reservoir site, the Western Truck School, and paved and unpaved access roads.

The survey area is situated within the northernmost portion of a wildlife corridor (County of San Diego 2010a). The portion of the wildlife corridor situated north of SR-94 consists of fragments of habitat that are isolated from other wildlife corridors the west, north, and east. Furthermore, the survey area is fragmented by SR-94 from the more expansive area of habitat to the south.

3.1 Coastal Sage Scrub

Three forms of coastal sage scrub were mapped in the survey area, including Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, and baccharis-dominated Diegan coastal sage scrub. All forms of coastal sage scrub are considered sensitive by local, state, and federal agencies and these habitats are known to support the federally-listed coastal California gnatcatcher.

Diegan coastal sage scrub is a vegetation community typically characterized by low, woody subshrubs that grow up to 3 ft in height (Holland 1986). Dominant species within Diegan coastal sage scrub in the survey area included California buckwheat (*Eriogonum fasciculatum*), coast monkey flower (*Mimulus aurantiacus*), San Diego sunflower (*Bahiopsis laciniata*), California encelia (*Encelia californica*), broom baccharis (*Baccharis sarothroides*), and California sagebrush (*Artemisia californica*). Diegan coastal sage scrub within the survey area is predominated by native species and provides suitable habitat for several wildlife species, including coastal California gnatcatcher. Furthermore, this vegetation community is contiguous with a larger area of Diegan coastal sage scrub. Diegan coastal sage scrub in the survey area is considered to be of high ecological value.

Disturbed Diegan coastal sage scrub is distinguished from undisturbed Diegan coastal sage scrub by the abundance of non-native species and the sparse distribution of typically dominant shrub species. Native plant species detected included California buckwheat, broom baccharis, and California sagebrush. Non-native species detected within disturbed Diegan coastal sage scrub included short-pod mustard (*Hirschfeldia incana*), tocalote (*Centaurea melitensis*), and non-native grasses. Non-native grasses were senesced and lacked identifiable features. Disturbed coastal sage scrub in the survey area supports an abundance of non-native species but is contiguous to undisturbed coastal sage scrub and is considered to be of moderate ecological value.

Baccharis-dominated Diegan coastal sage scrub describes a portion of the coastal sage scrub occurring along an unnamed drainage that is predominated by broom baccharis scrub. Other shrub species present in this area included California buckwheat, blue elderberry (*Sambucus mexicana*), and a single red willow (*Salix laevigata*). This habitat type is contiguous with areas of Diegan coastal sage scrub and is considered to be of moderate ecological value.

3.2 Disturbed Habitat

Disturbed habitat describes areas on site that are subject to high levels of disturbance and are consequently dominated by non-native species. Within the survey area, disturbed habitat is dominated by short pod mustard, tocalote, doveweed (*Croton setigerus*), tree tobacco (*Nicotiana glauca*), and salt heliotrope (*Heliotropium curassavicum*). These areas are considered to be of low ecological value and are not considered sensitive by local, state, and federal agencies.

3.3 Urban/Developed Areas

Developed areas on site include the District's 640 Reservoir site, access roads, the Western Truck School, and a trailer storage area. Developed areas are not considered to have ecological value and are not considered sensitive by local, state, and federal agencies.

4.0 SPECIAL-STATUS SPECIES

The following section discusses special-status species detected within the survey area. A special-status plant species is one that is listed by federal or state agencies as threatened or endangered or is considered sensitive by one or more special interest groups, such as the California Native Plant Society (e.g., CNPS List 1, 2, 3, and 4 Plant Species). A special-status wildlife species is one that is listed by federal or state agencies as threatened, endangered or species of special concern. Special-status species detected within the general biological survey area included Palmer's goldenbush (*Ericameria palmeri*), San Diego sunflower, coastal California gnatcatcher, coast horned lizard (*Phrynosoma blainvillii*), and orangethroat whiptail (*Aspidoscelis hyperythra*). San Diego marsh-elder (*Iva hayesiana*) was detected outside of the general biological survey area but within the Quino survey area (Figure 3)

4.1 Special-Status Plant Species

The CNDDB search, CNPS search and field survey identified 93 sensitive plant species that have the potential to occur in the project vicinity (Attachment F). During the general biological surveys, two special-status plant species were detected in the survey area: Palmer's goldenbush and San Diego sunflower. San Diego marsh-elder was detected outside of the general biological survey area but within the Quino survey area. Discussions of the plants species incorporate information from Reiser 1994 and CNPS 2011.

4.1.1 **Palmer's goldenbush** (*Ericameria palmeri* var. *palmeri*)

CNPS List 1B.1

Palmer's goldenbush is an evergreen shrub typically found in mesic coastal sage and chaparral habitats below 1,968 ft above MSL. Two individuals of Palmer's goldenbush were detected within the survey area in Diegan coastal sage (Figure 3). Several individuals were also detected outside of the survey area. The blooming period for this species is from September through November (Reiser 1994). The November 2012 general biological survey was conducted during the blooming period for this species.

4.1.2 San Diego Sunflower (*Bahiopsis laciniata)*

CNPS List 4.2

San Diego sunflower is a shrub commonly found in dry scrub habitats below 914 meters (m; 3000 ft) above MSL. Diegan coastal sage scrub is the preferred habitat of this species, which is often a co-dominant element of the shrub community with California sagebrush. The blooming period for this species is from February through June (Reiser 1994). San Diego sunflower was detected in areas of Diegan coastal sage and developed areas. This species was a major component in Diegan coastal sage scrub in the survey area and was detected throughout this vegetation community, therefore, all areas of Diegan coastal sage scrub in the survey area are mapped as supporting this species. Individuals of San Diego sunflower occurring in areas of developed areas are mapped as points (Figure 3). The general biological survey was conducted outside of the blooming period for this species; however, this species is easily identifiable year-round.

4.1.3 San Diego Marsh-Elder (*Iva hayesiana*)

CNPS List 2.2

San Diego marsh-elder is a perennial herb typically found in creeks, intermittent streambeds, marshes, and playas below 500 m (1,640 ft) above MSL. The blooming period for this species is April through September (Reiser 1994). San Diego marsh-elder was detected outside of the general biological survey area but within the Quino survey area in Diegan coastal sage scrub, situated adjacent to a concrete brow-ditch used to direct run-off from the slope above Cuyamaca Community College (Figure 3). It is presumed that mesic conditions created by overflow from the brow ditch have created conditions suitable for San Diego marsh-elder.

4.2 Special-Status Wildlife Species

The CNDDB search and field survey identified 14 special-status wildlife species that have potential to occur in the survey area (Attachment G). Focused surveys were conducted for coastal California gnatcatcher and Quino checkerspot butterfly. Coastal California gnatcatcher, coast horned lizard, and orangethroat whiptail were the only special-status wildlife species detected on-site.

4.2.1 Coastal California gnatcatcher (*Polioptila californica californica*)

Federally Threatened
State Species of Special Concern

Two adult coastal California gnatcatchers (a mating pair) and two fledglings were detected foraging in Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, and baccharis-dominated Diegan coastal sage scrub. Both adult and fledglings were observed foraging in the survey area during the focused surveys (Figure 3). All areas of Diegan coastal sage scrub, disturbed Diegan coastal sage scrub, and baccharis-dominated Diegan coastal sage scrub provide suitable foraging habitat for this species. The report for California gnatcatcher focused surveys is attached as Attachment D and contains additional discussion on the results of these surveys.

4.2.2 Quino checkerspot butterfly (*Euphydryas editha quino*)

Federally Endangered
State: Endangered

No adult or larval Quino were detected during the 2011 protocol surveys. Overall, potential nectar sources in the survey area were sparse, with only a few areas supporting moderate densities of nectar sources. Additionally, Quino host plants were not detected within the survey area and are not expected to occur. Portions of the survey area were surveyed previously in 2008 and 2009 by ICF Jones and Stokes for the San Miguel Fire Department Regional Training Facility and in 2005 by RC Biological Consulting Inc., for the Otay Water District's 640-1 Reservoir Project. No adult or larval Quino were detected during previous focused surveys. For these reasons, the site is considered to have low potential to support Quino. The report for Quino focused surveys is attached as Attachment E and contains additional discussion on the results of these surveys.

4.2.3 Coast horned lizard (*Phrynosoma blainvillii*)

State Species of Special Concern

The coast horned lizard inhabits a variety of vegetation communities including coastal sage, annual grassland, chaparral, oak woodland, riparian woodland, and coniferous forest (Stebbins 2003). Loose, fine soils with a high sand content, an abundance of prey and open areas with limited overstory typify suitable habitat for this species (Jennings and Hayes 1994). One coast horned lizard was detected in Diegan coastal sage scrub within the survey area (Figure 3).

4.2.4 **Orangethroat whiptail** (*Aspidoscelis hyperythra*)

State Species of Special Concern

The orangethroat whiptail occurs in semi-arid brushy areas including washes, stream sides, rocky hillsides, coastal sage scrub, and chaparral. This species is typically found in areas with loose soil and rocks with patchy brush to provide cover (Stebbins 2003). Two orangethroat whiptails were observed in baccharis-dominated Diegan coastal sage scrub and disturbed coastal sage scrub in the general biological survey area; one in the impact area and the other in close proximity to the impact area. Two other individuals were detected outside of the survey area.

5.0 JURISDICTIONAL WETLANDS AND WATERWAYS

Wetlands and other waters are considered to be sensitive biological resources and are protected by various federal, state, and local regulations. The USACE and the Regional Water Quality Control Board (RWQCB) regulate waters of the U.S., including wetlands, under the authority of Sections 404 and 401, respectively, of the federal Clean Water Act (CWA). The term "waters of the U.S." encompasses many types of waters, including waters currently or historically used in interstate or foreign commerce; all waters subject to the ebb and flow of tides; all interstate waters including interstate wetlands; all other waters such as intrastate lakes, rivers, streams (including ephemeral and intermittent streams), mudflats, sandflats, wetlands, sloughs, etc., the use, degradation or destruction of which could affect interstate or foreign commerce; all impoundments of waters otherwise defined as waters of the U.S.; tributaries of waters of the U.S.; territorial seas; and wetlands adjacent to waters of the U.S. (USACE 1987). Under the Porter-Cologne Act, the RWQCB's jurisdiction also includes isolated wetlands and other waters that are not jurisdictional under the CWA. The California Department of Fish and Game (CDFG) takes jurisdiction over lakes, rivers, and streams under Section 1600 et seq. of the Fish and Game Code.

The USACE defines wetlands as areas that are dominated by hydrophytic plant species, exhibit wetland hydrology, and have hydric soils. Areas that do not meet these criteria but exhibit a defined channel are considered non-wetland waters of the U.S. CDFG jurisdiction extends across the bed, banks, and channel of these features and includes areas beneath a riparian canopy, even if the canopy areas are well away from the stream channel (such as in riparian areas). The RWQCB takes jurisdiction of waters of the U.S. as defined by the USACE as well as other surface waters, which include isolated wetlands (e.g., vernal pools) and stream channels.

The drainage that crosses the proposed road alignment is a non-wetland waters of the U.S. and State streambed (with no riparian vegetation). The stream passes through a 24-inch diameter concrete culvert under the existing gravel road. The streambed is approximately 2 ft wide upstream of the culvert and 4 ft wide below the culvert. The drainage leaves the site and connects

downstream less than a mile away to the Sweetwater River, which drains to the Pacific Ocean. This drainage feature is jurisdictional under the USACE, RWQCB and CDFG.

6.0 SIGNIFICANCE OF PROJECT IMPACTS AND PROPOSED MITIGATION

Potential impacts to vegetation communities, special-status plants, special-status wildlife, and other sensitive resources are discussed in this section as well as an analysis of the significance of the impacts, and anticipated mitigation requirements. The proposed project has been designed to minimize impacts to biological resources by placing the majority of the proposed road alignment along existing roads.

6.1 Impact Definitions

Biological resource impacts can be considered direct, indirect, or cumulative and either permanent or temporary in nature.

- Direct: Occur when biological resources are altered, disturbed, or destroyed during project implementation. Examples include clearing vegetation, encroaching into wetland buffers, diverting surface water flows, and the loss of individual species or their habitats.
- Indirect: Occur when project-related activities affect biological resources in a manner that is not direct. Examples include elevated noise and dust levels, increased human activity, decreased water quality, and the introduction of invasive wildlife (i.e., domestic cats and dogs) and plants.
- Cumulative: Occur when multiple direct and indirect impacts to a biological resource affect the resource additively over time. Individual direct and indirect impacts may not be individually significant, but the additive effect when viewed in connection with the impacts of past, present and future projects may cause the significant loss or degradation of a resource.
- Temporary: Temporary impacts can be direct or indirect and are considered reversible. Examples include the removal of vegetation from areas that will be revegetated, elevated noise levels, and increased levels of dust.
- Permanent: Permanent impacts can be direct or indirect and are not considered reversible. Examples include the removal of vegetation from areas that will have permanent structures or pavement placed on them or landscaping an area with non-native plant species.

6.2 Analysis of Project Effects

Direct and permanent impacts would result from grading the proposed 24-foot-wide road (Figure 4 in Attachment A). The project would result in impacts to a total of 0.80 acre, including 0.12 acre of sensitive vegetation communities, 0.07 acre to disturbed habitat, and 0.61 acre to urban/developed areas. Impacts to sensitive biological resources are discussed below.

6.2.1 Sensitive Vegetation Communities

The project would result in a total of 0.12 acre of impacts to sensitive vegetation communities including 0.04 acre of Diegan coastal sage scrub, 0.04 acre of disturbed Diegan coastal sage scrub, and 0.04 acre of baccharis-dominated Diegan coastal sage scrub (Figure 4). A total of 0.07 acre of the sensitive vegetation communities to be impacted are situated within a County of San Diego Open Space Easement would be impacted, including 0.01 acre of Diegan coastal sage scrub, 0.02 acre of baccharis-dominated Diegan coastal sage scrub and 0.04 acre of disturbed Diegan coastal sage scrub.

6.2.2 Special-Status Plants

Due to the small size of the area to be impacted it is not anticipated that project activities would result in impacts to a regionally significant population of special-status plant species.

Two individuals of Palmer's goldenbush were detected in the survey area; one was detected in Diegan coastal sage scrub immediately adjacent to the impact area (Figure 4). A focused search effort was conducted within the impact area during both general biological surveys; both yielded only one individual. The project will not result in impacts to the two individuals detected within the survey area. These individuals are not considered to represent a regionally significant population.

San Diego sunflower occurs throughout Diegan coastal sage scrub (Figure 4). It is presumed that all impacts to these habitats would result in impact to San Diego sunflower. As this species is still fairly common in San Diego County, the individuals detected do not represent a regionally significant population. Furthermore, due to the small size of the impact area the project would not result in impacts to a regionally significant population of this species.

Several individuals of San Diego marsh-elder were detected in Diegan coastal sage scrub in the outside of the general biological survey area but within the Quino survey area (Figure 4). None of these individuals would be impacted by the project. As only a few individuals were detected in the survey area, they are not considered to represent a regionally significant population.

6.2.3 Special-Status Wildlife

The proposed project would result in direct impacts to suitable coastal sage scrub habitat occupied by the coastal California gnatcatcher and suitable habitat for the coast horned lizard and orangethroat whiptail.

A mating pair and two fledglings of coastal California gnatcatcher were detected utilizing areas of Diegan coastal sage scrub, baccharis-dominated Diegan coastal sage scrub, and disturbed Diegan coastal sage scrub in the survey area. Impacts to 0.04 acre of Diegan coastal sage, 0.04 acre of disturbed Diegan coastal sage, and 0.04 acre of baccharis-dominated Diegan coastal sage scrub are considered direct impacts to coastal California gnatcatcher-occupied habitat.

A single coast horned lizard was detected in Diegan coastal sage scrub in close proximity to the impact area. Impacts to Diegan coastal sage scrub are not anticipated to result in impacts to this species. As this species is still fairly common in San Diego County, the individual detected does not represent a regionally significant population.

Two juvenile orangethroat whiptails were detected in the survey area, one within the impact area and the other in close proximity to the impact area. Impacts resulting from the project are not anticipated to result in impacts to this species. As this species is still fairly common in San Diego County, the two individuals detected do not represent a regionally significant population.

In addition, increased noise during construction could result in potential indirect impacts to the coastal California gnatcatcher or other special-status bird/raptor species or species protected by the Federal Migratory Bird Treaty Act (MBTA), if construction is proposed during the breeding season. The proposed project could potentially result in indirect impacts to wildlife species by creating a deterrent to wildlife movement across the site. However, the proposed road will support limited vehicular traffic and will not include structures or physical barriers that would impede or discourage wildlife movement across the road.

6.2.4 Jurisdictional Waterways

As stated previously, the drainage that crosses the proposed road alignment is a non-wetland waters of the U.S. and unvegetated State Streambed (with no riparian vegetation) that falls under the joint jurisdiction of the USACE, RWQCB, and CDFG. The project is expected to impact approximately 0.002 acre (96 square feet) of non-wetland waters. Permits will be required for this project, and include a CWA Section 404 Nationwide 14 (Linear Transportation Crossing) permit from the USACE, a CWA Section 401 Water Quality Certification from the RWQCB, and a Section 1602 Streambed Alteration Agreement from the CDFG.

6.3 Mitigation Measures and Design Considerations

6.3.1 Sensitive Vegetation Communities

Coastal Sage Scrub

The proposed project has been designed such that the proposed road alignment occurs mostly along existing unpaved access roads, thereby minimizing impacts to biological resources. A biological monitor will be present during all vegetation clearing activities. Impacts to 0.12 acre of sensitive vegetation communities are anticipated and would include 0.04 acre of Diegan coastal sage scrub, 0.04 acre of disturbed Diegan coastal sage scrub, and 0.04 acre of baccharis-dominated Diegan coastal sage scrub. Impacts to 0.12 acre of sensitive vegetation communities would be mitigated at a 2:1 ratio through use of available credits at the District's San Miguel Habitat Management Area (HMA) or through the creation of Diegan coastal sage scrub within the HMA. The HMA supports suitable soils for the creation of this habitat type and existing disturbed areas occur within the HMA that would provide suitable locations for the establishment of additional areas of Diegan coastal sage scrub.

6.3.2 Special-Status Plants

The proposed project would not result in impacts to regionally significant populations of special-status plant species; therefore, no mitigation measures are required. A biological monitor will be present during all vegetation clearing activities.

Palmer's Goldenbush

Palmer's goldenbush, a CNPS 1B.1 species, was detected in Diegan coastal sage scrub in close proximity to the impact area. The project would not result in impacts to this individual or to a regionally significant population; thus, impacts to this species are not anticipated and no mitigation is required.

San Diego Sunflower

San Diego sunflower is a CNPS List 4.2 species that is commonly found in Diegan coastal sage scrub. San Diego sunflower was observed throughout the Diegan coastal sage in the impact area. A total of 0.04 acre of Diegan coastal sage scrub supporting this species would be impacted by the proposed access road. Impacts to this CNPS List 4 species are not considered to be significant as (1) this species is found throughout the Diegan coastal sage scrub located within and immediately adjacent to the survey area and (2) the loss of a total of 0.04 acre supporting this species does not represent the loss of a significant percentage of the population of this species in the area. Therefore, no mitigation for impacts to San Diego sunflower is proposed.

San Diego Marsh-Elder

San Diego marsh-elder, a CNPS 2.2 species, was detected outside of the general biological survey area but within the Quino survey area. The project would not result in impacts to individuals of this species or to a regionally significant population; thus, impacts to this species are not anticipated and no mitigation is required.

6.3.3 Special-Status Wildlife

Coastal California Gnatcatcher

In order to avoid direct impacts to coastal California gnatcatcher, no clearing, grubbing, or grading of vegetation shall occur during the breeding season for this species (February 15 – August 31) and a biological monitor will be present during all vegetation clearing activities. The project would result in impacts to 0.12 acre of coastal California gnatcatcher occupied habitat, including 0.04 acre of Diegan coastal sage scrub, 0.04 acre of disturbed Diegan coastal sage scrub, and 0.04 acre of baccharis-dominated Diegan coastal sage scrub. Habitat-based mitigation would be provided for impacts to 0.12 acre of coastal California gnatcatcher-occupied habitat at a 2:1 ratio through use of available credits at the District's HMA or through the creation of Diegan coastal sage scrub within the HMA. The mitigation area would be situated with designated Critical Habitat for the coastal California gnatcatcher within the District's HMA as part of the mitigation provided for impacts to occupied gnatcatcher habitat.

Indirect impacts to coastal California gnatcatcher would also result from increased noise levels during construction. Indirect impacts to this species shall be minimized by conducting all clearing, grubbing, grading, or other construction activities outside of the breeding season for this species. However, if construction activities are proposed during the breeding season for the gnatcatcher, measures to minimize noise impacts would be required and could include temporary noise walls/berms. Noise levels from construction activities during the breeding season should not exceed 60dBA hourly LEQ at the edge of the occupied habitat, or the ambient noise level if noise levels already exceed 60dBA hourly LEQ.

Coast Horned Lizard

A biological monitor will be present during all vegetation clearing activities. No impacts to coast horned lizard are anticipated, thus, no mitigation is required for this species.

Orangethroat Whiptail

A biological monitor will be present during all vegetation clearing activities. No impacts to orangethroat whiptail are anticipated, thus, no mitigation is required for this species.

6.3.4 Nesting Birds

Impacts to nesting birds protected by the MBTA and similar provisions of the Fish and Game Code can occur if work is conducted during the breeding season (February 15 – August 31). There is potential for raptors and other early nesting species such as hummingbirds to initiate nests as early as January. However, in general, the peak nesting season is February through August. All vegetation, native or non-native, provides habitat that may be used for nesting.

In order to avoid direct impacts to nesting birds, removal of vegetation shall occur outside of the combined breeding season for birds (February 15–August 31). Typically, if a pre-construction nesting bird survey determines that nesting birds do not occur in the vicinity of the site (typically 300 ft for passerine birds and 500 ft for raptors), removal of vegetation can occur within the breeding season for avian species. However, for this project, the presence of coastal California gnatcatcher precludes the removal of vegetation from February 15 through August 31.

If vegetation removal is to occur from January to February 14, a pre-construction nesting bird survey for raptors and other early nesting species must be conducted to determine if any protected birds are nesting within or immediately adjacent to any vegetation within the impact areas. The size of the nesting bird survey area would be determined by a qualified biologist at the time of the survey and would vary according to site conditions and the type of work activities proposed. The pre-construction nesting bird survey would be conducted by a qualified biologist no more than 1 week prior to commencing project activities. If a nest is found, a qualified biologist would identify and flag an appropriate buffer around the nest, and no construction activities would occur within the buffer until the young have fledged or the nest is no longer active. The specific buffer width would be determined by a qualified biologist at the time of discovery and would vary according to the avian species, site conditions, and the type of work activities to be conducted.

6.3.5 Jurisdictional Waterways

The project would result in impacts to 0.002 acre of waters of the U.S. and State streambed. Because total impacts are less than 0.1 acre, the need for mitigation is not anticipated. Permits required for this project include a Nationwide 14 permit from the USACE, a Water Quality Certification from the RWQCB, and a Section 1602 Streambed Alteration Agreement from the CDFG.

6.4 CUMULATIVE IMPACTS

A cumulative impact analysis is an assessment of how the proposed project, whose impacts may not be individually significant, could contribute significantly to the total impacts to sensitive resources occurring in the project vicinity. The proposed project has been designed to minimize

impacts to biological resources by placing the proposed road alignment along existing unpaved roads. Native vegetation impacted as a result of the proposed project would be limited 0.12 acre of sensitive habitats occurring along existing roads. Therefore, the proposed access road would not contribute to any potentially significant cumulative impact to biological resources in the project vicinity.

7.0 CONCLUSIONS

Impacts to 0.04 acre of Diegan coastal sage scrub, 0.04 acre of disturbed Diegan coastal sage scrub, 0.04 acre of baccharis-dominated Diegan coastal sage scrub are anticipated. Impacts to 0.12 acre of sensitive vegetation communities would be mitigated at a 2:1 ratio through use of available credits at the District's San Miguel HMA or through the creation of Diegan coastal sage scrub within the HMA. A biological monitor will be present during all vegetation clearing activities. The project will not result in impacts to regionally significant populations of special-status plants.

The project would result in impacts to 0.12 acre of sensitive vegetation communities occupied by coastal California gnatcatcher. Habitat-based mitigation would be provided to mitigate for impacts to coastal California gnatcatcher-occupied habitat. Habitat-based mitigation would be provided at a 2:1 ratio through use of available credits at the District's HMA or through the creation of Diegan coastal sage scrub within the HMA. In order to further mitigate for impacts to coastal California gnatcatcher occupied habitat, the mitigation area would be situated with designated Critical Habitat for the coastal California gnatcatcher within the District's HMA.

Indirect impacts to coastal California gnatcatcher would also result from increased noise levels during construction. In order to avoid direct impacts to coastal California gnatcatcher, removal of vegetation shall occur outside of the breeding season for this species (February 15 – August 31). Indirect impacts to this species shall be minimized by conducting all project related activities outside of the breeding season for this species. However, if construction activities are proposed during the breeding season for the gnatcatcher, measures to minimize noise impacts would be required and could include temporary noise walls/berms. Noise levels from construction activities during the breeding season should not exceed 60dBA hourly LEQ at the edge of the occupied habitat, or the ambient noise level if noise levels already exceed 60dBA hourly LEQ.

In order to avoid direct impacts to nesting birds, removal of vegetation shall occur outside of the nesting season for birds. Typically, if a nesting bird survey determines that nesting birds do not occur in the vicinity of the site, removal of vegetation can occur within the breeding season for avian species. However, for this project, the presence of coastal California gnatcatcher precludes the removal of vegetation from February 15 through August 31.

If vegetation removal is to occur from January to February 14, a pre-construction nesting bird survey for raptors and other early nesting species must be conducted. If a nest is found, methods need to be implemented to avoid impacts. This would consist of a no-work buffer zone placed around the nest until the adults are no longer using it or the young have fledged. The specific buffer width would be determined by a qualified biologist at the time of discovery. These would vary based on site conditions and type of work to be conducted.

The project would result in impacts to 0.002 acre of waters of the U.S. and state streambed. The proposed impacts are less than 0.1 acre; therefore, the need for mitigation is not anticipated. Permits required for this project include a Nationwide 14 permit from the USACE, a Water Quality Certification from the RWQCB, and a Section 1602 Streambed Alteration Agreement from the CDFG.

If you have any questions regarding the contents of this letter report, please contact me at (858) 578-8964.

Sincerely,

Erika Eidson
Biologist

ATTACHMENTS

Attachment A	Figures 1–4
Attachment B	Plant Species Detected in the Survey Area
Attachment C	Wildlife Species Detected in the Survey Area
Attachment D	Results of Coastal California Gnatcatcher Surveys for the OWD Regulatory Site Access Road Project, San Diego County, California
Attachment E	Results of Quino Checkerspot Butterfly Surveys for the OWD Regulatory Site Access Road Project, San Diego County, California
Attachment F	Special-Status Plant Species with Potential to Occur on the OWD Regulatory Site Access Road Project
Attachment G	Special-Status Wildlife Species with Potential to Occur on the OWD Regulatory Site Access Road Project

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ATTACHMENT A

FIGURES

ICF INTERNATIONAL

Figure 1
Regional Location
OWD Regulatory Site Access Road

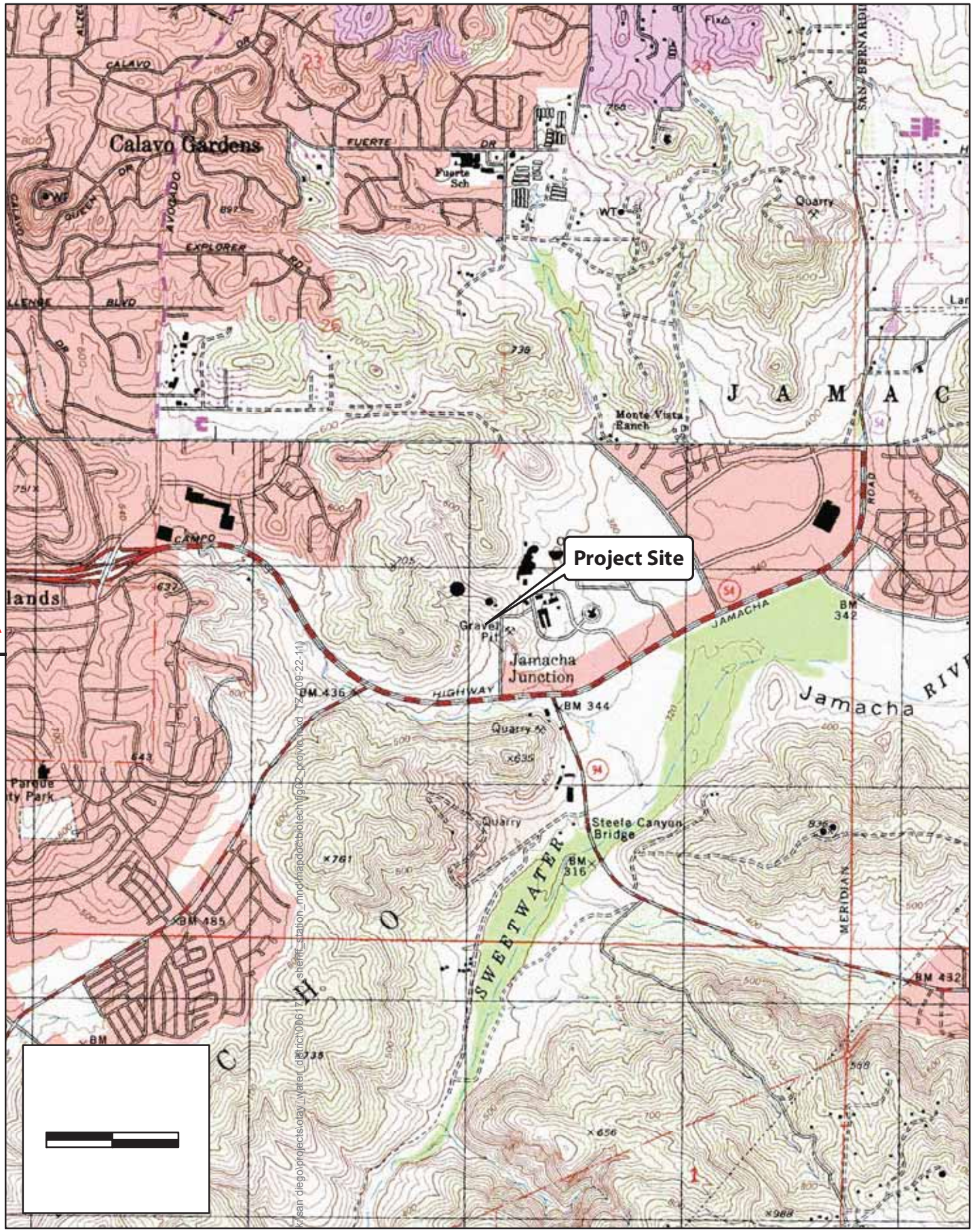

Figure 2
Project Vicinity
OWD Regulatory Site Access Road

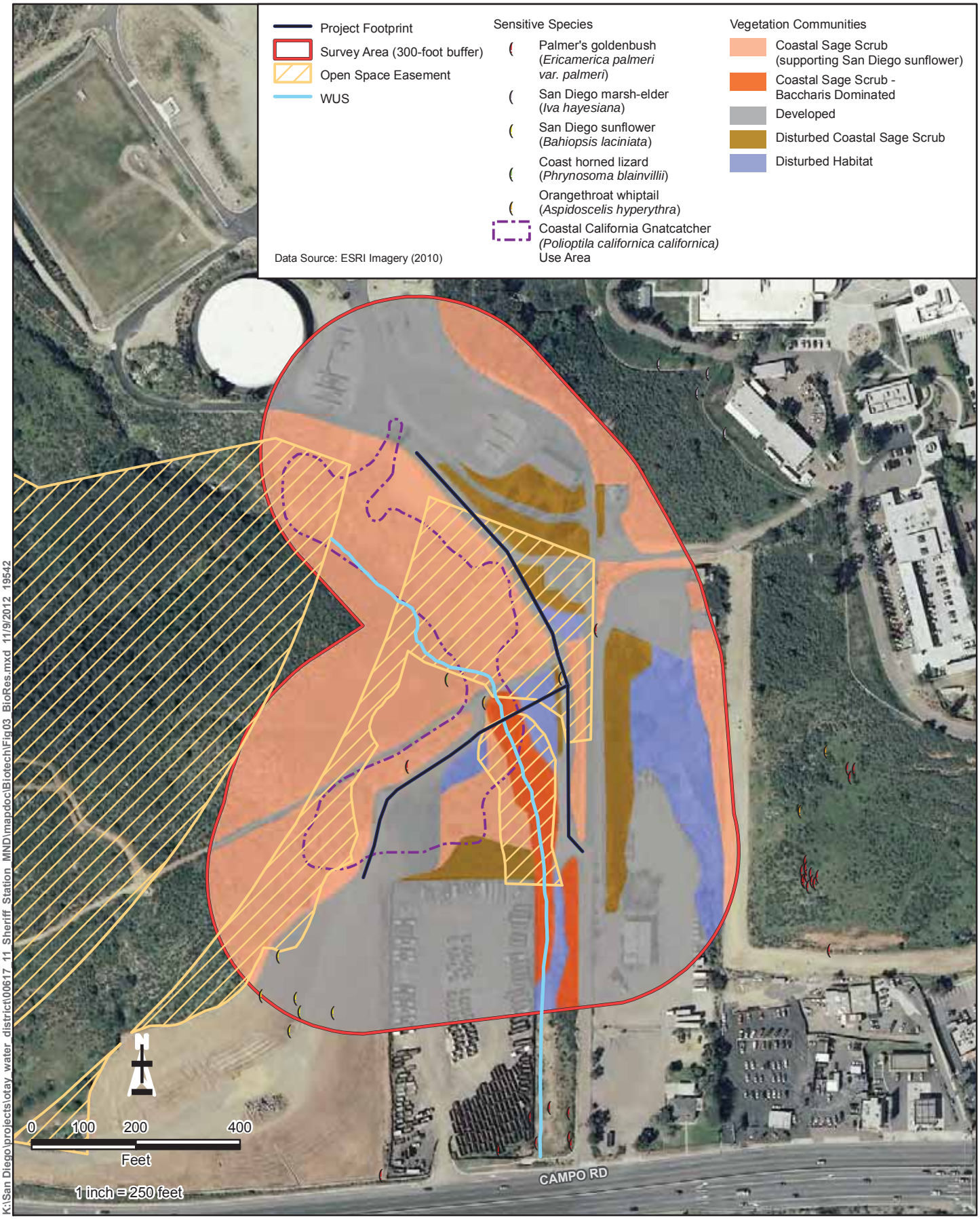

Figure 3
Biological Resources
OWD Regulatory Site Access Road

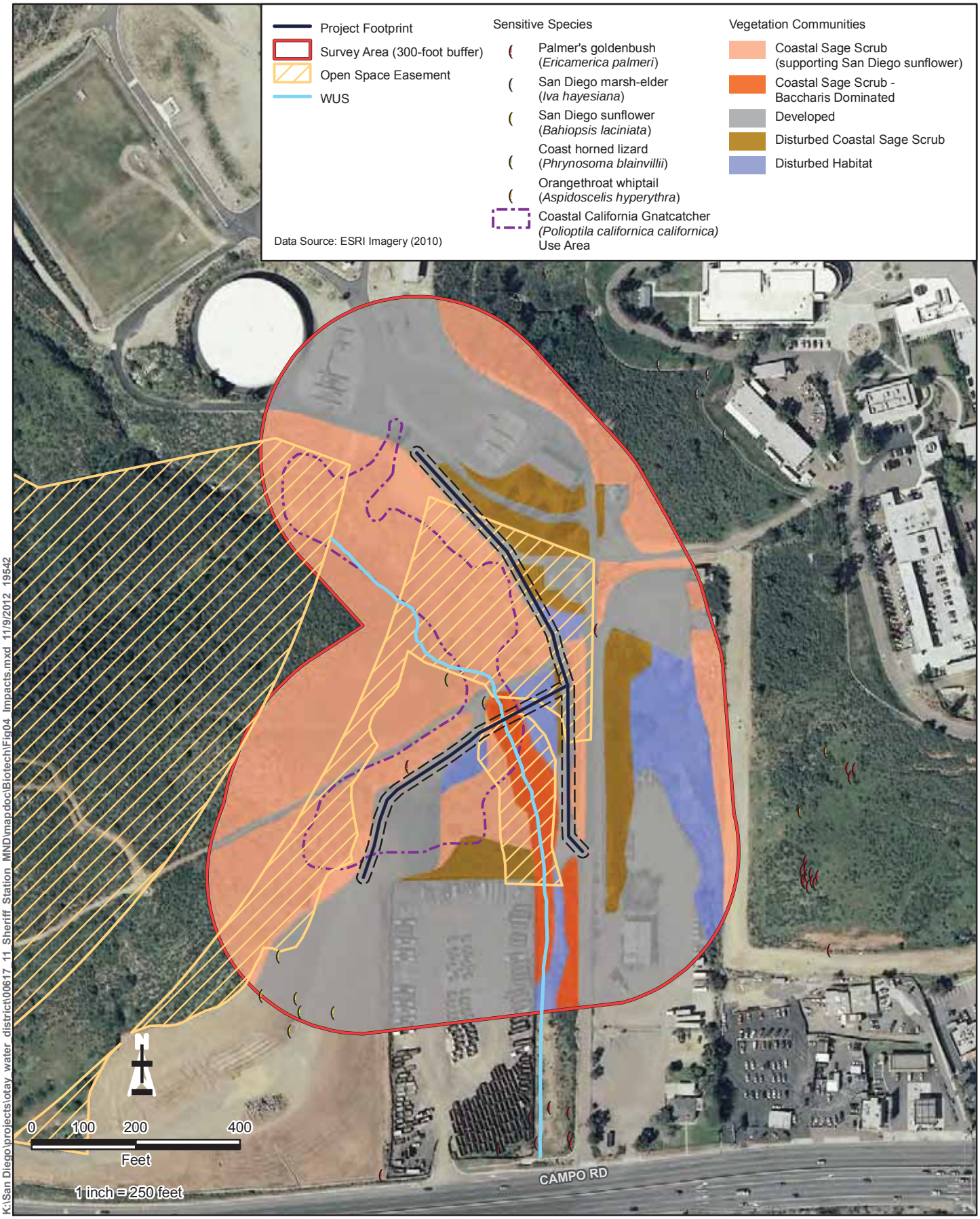

Figure 4
Impacts
OWD Regulatory Site Access Road

ATTACHMENT B

Plant Species Detected in the Survey Area

Attachment B. Plant Species Detected in the Survey Area

Scientific Name	Common Name	Special Status
EUDICOTS		
Adoxaceae - Muskroot family		
Sambucus nigra ssp. caerulea	Blue elderberry	
Anacardiaceae - Sumac Or Cashew family		
Malosma laurina	Laurel sumac	
* *Schinus molle*	Pepper tree	
Apiaceae - Carrot family		
* *Foeniculum vulgare*	Fennel	
Asteraceae - Sunflower family		
Artemisia californica	California sagebrush	
Baccharis pilularis	Coyote brush	
Baccharis salicifolia ssp. salicifolia	Mule fat	
Baccharis sarothroides	Broom baccharis	
Bahiopsis laciniata	San Diego County viguiera	CRPR 4.2
* *Centaurea melitensis*	Tocalote	
Encelia californica	California brittlebush	
Encelia californica x farinosa	California hairy encelia	
Ericameria palmeri var. palmeri	Palmer's goldenbush	CRPR 1B.1
Erigeron canadensis	Horseweed	
Gutierrezia californica	California matchweed	
Hazardia squarrosa	Saw-toothed goldenbush	
Heterotheca grandiflora	Telegraph weed	
Isocoma menziesii	Coastal goldenbush	
* *Lactuca serriola*	Prickly lettuce	
Laennecia coulteri	Coulter's horseweed	
Pseudognaphalium californicum	Ladies' tobacco	
Stephanomeria exigua	Small wire-lettuce	
Boraginaceae - Borage family		
Heliotropium curassavicum var. oculatum	alkali heliotrope	
Brassicaceae - Mustard family		
* *Brassica nigra*	Black mustard	
* *Hirschfeldia incana*	Shortpod mustard	
Cactaceae - Cactus family		
Cylindropuntia prolifera	Coast cholla	
Opuntia littoralis	Coastal prickly-pear	
Chenopodiaceae - Goosefoot family		
* *Chenopodium album*	Lamb's quarters	

Scientific Name	Common Name	Special Status
Convolvulaceae - Morning-glory family		
Cuscuta sp.	Dodder	
Euphorbiaceae - Spurge family		
Croton californicus	California croton	
Croton setigerus	Turkey-Mullein	
* *Ricinus communis*	Castorbean	
Fabaceae - Legume family		
Acmispon glaber	Deerweed	
Lamiaceae - Mint family		
* *Marrubium vulgare*	Horehound	
Salvia apiana	White sage	
Salvia mellifera	Black sage	
Myrtaceae - Myrtle family		
* *Eucalyptus polyanthemos*	Silver dollar gum, red box	
* *Eucalyptus sp.*	Gum	
Melaleuca sp.		
Nyctaginaceae - Four O'clock family		
Mirabilis laevis	Wishbone-bush	
Phrymaceae - Lopseed family		
Mimulus aurantiacus		
Polygonaceae - Buckwheat family		
Eriogonum fasciculatum	California buckwheat	
Rhamnaceae - Buckthorn family		
Rhamnus crocea	Spiny redberry	
Rosaceae - Rose family		
Heteromeles arbutifolia	Toyon	
Salicaceae - Willow family		
Salix laevigata	Red willow	
Scrophulariaceae - Figwort family		
* *Myoporum laetum*	Myoporum, ngaio tree	
Scrophularia californica	California figwort	
Solanaceae - Nightshade family		
* *Nicotiana glauca*	Tree tobacco	
Tamaricaceae - Tamarisk family		
* *Tamarix ramosissima*	Saltcedar	

Scientific Name	Common Name	Special Status

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened

CRPR – California Rare Plant Rank
1A. Presumed extinct in California
1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

Threat Ranks
.1 - Seriously endangered in California
.2 – Fairly endangered in California

ATTACHMENT C

Wildlife Species Detected in the Survey Area

Attachment C. Wildlife Species Detected in the Survey Area

Scientific Name	Common Name	Special Status
INVERTEBRATES		
Moths, Skippers and Butterflies		
Pontia protodice	Checkered White	
Strymon melinus	Gray Hairstreak	
Junonia coenia	Common Buckeye	
VERTEBRATES		
Reptiles		
Phrynosoma blainvillii	Coast Horned Lizard	CSC
Aspidoscelis hyperythra	Orangethroat Whiptail	CSC
Birds		
Zenaida macroura	Mourning Dove	
Calypte anna	Anna's Hummingbird	
Polioptila californica californica	Coastal California Gnatcatcher	FT, CSC
Chamaea fasciata	Wrentit	
Melozone crissalis	California Towhee	
Haemorhous mexicanus	House Finch	
Mammals		
Sylvilagus audubonii	Desert Cottontail	

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
CSC = California Species of Special Concern
CFP = California Fully Protected Species

ATTACHMENT D

Results of Coastal California Gnatcatcher Surveys for the OWD Regulatory Site Access Road Project, San Diego County, California

Results of Coastal California Gnatcatcher Surveys for the OWD Regulatory Site Access Road Project, San Diego County, California

Prepared for:

Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, California 91978-2096

Prepared by:

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September 2011

ICF International. 2011. Results of Coastal California Gnatcatcher Surveys for the OWD Regulatory Site Access Road. September. San Diego County, CA. Prepared for Otay Water District.

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Summary

ICF International was retained by the Otay Water District to conduct protocol surveys for the coastal California gnatcatcher (*Polioptila californica californica*; gnatcatcher) at the OWD Regulatory Site Access Road project site. The site is located northwest of the intersection of Campo Road and State Route-54 in the City of Spring Valley, in San Diego County, California. The project would involve the relocation of approximately 1,200 feet of existing 16-inch potable water pipeline south of the District's Regulatory Reservoir Site, and the improvement of the existing access road from the proposed San Diego County Sheriff's Substation location north to the Regulatory Reservoir Site. For the purposes of this report, the term "project footprint" refers to the portion of the access road to be improved. The survey area, which included the project footprint and a 300-foot buffer, supported coastal sage scrub, disturbed coastal sage scrub, disturbed habitat, and developed areas.

Three weekly surveys were conducted between July 27 and August 10, 2011 by permitted biologist M. Alfaro. All surveys were conducted according to the U.S. Fish and Wildlife Service (USFWS) recommended protocol (USFWS 1997). A total of four gnatcatchers were observed including one adult pair and two fledglings.

Chapter 1
Introduction

ICF conducted protocol surveys to determine presence/absence of the coastal California gnatcatcher (*Polioptila californica californica*; gnatcatcher) for the OWD Regulatory Site Access Road project site. This site is located northwest of the intersection of Campo Road and State Route-54 (SR-54) in the City of Spring Valley, in San Diego County, California (Figures 1 and 2).

In its entirety, the project consists of the relocation of approximately 1,200 feet of existing 16-inch potable water pipeline south of the District's Regulatory Reservoir Site (reservoir site), and the improvement of the existing access road from the proposed San Diego County Sheriff's Substation (substation) location north to the reservoir site. The proposed substation will occupy 13.85 acres and consists of a 25,000-square-foot building and parking areas. Components of the substation are proposed to be located over the existing pipeline. The pipeline will need to be relocated outside of the proposed substation footprint. During pipeline relocation, the existing access road from the substation to the reservoir site will be improved. For the purposes of this report, the term "project footprint" refers to the portion of the access road to be improved. The project footprint consists of developed and disturbed areas; coastal sage scrub and disturbed habitats occur immediately adjacent to the project footprint.

Survey Area

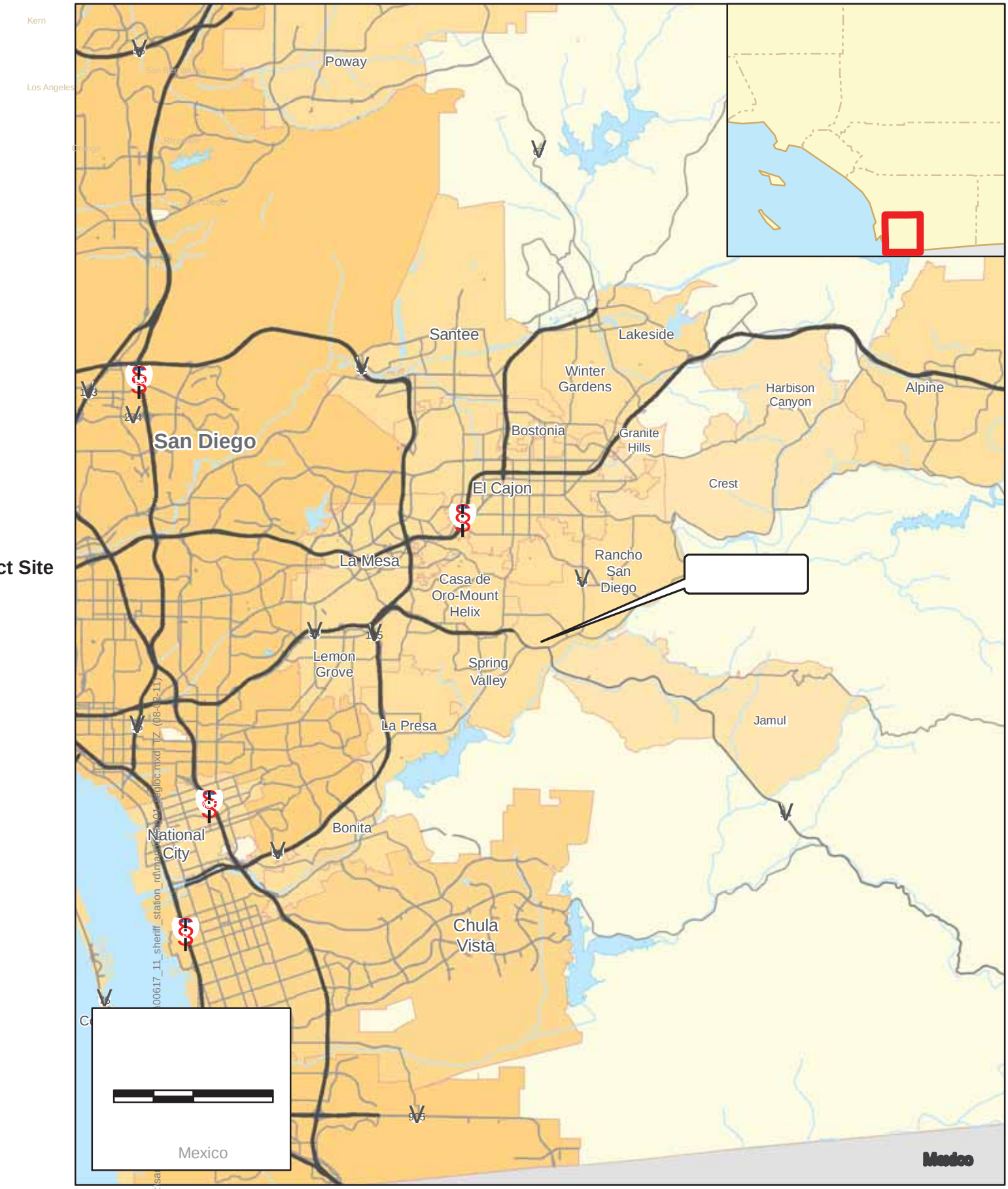
The survey area, which included the project footprint and a 300-foot buffer, supported coastal sage scrub, disturbed coastal sage scrub, disturbed habitat, and developed areas. Developed areas include Cuyamaca College, which is located to the east, SR-54 to the south, Otay Water District Facilities to the north, and undeveloped hillsides to the west.

The survey area ranges in elevation from 380 feet above mean sea level at the southern border to 610 feet within the reservoir site. Soils on site consist of Friant rocky fine sandy loam (30 to 70 percent slopes), Las Posas fine sandy loam (9 to 15 percent slopes, eroded), and Placentia sandy loam (2 to 9 percent slopes). Soils from the Friant series are shallow, well drained sandy loams that form in material weathered from mica schist, quartz schist, and gneiss. The Las Posas series consists of moderately deep, well drained soils that formed in material weathered from basic igneous rocks. Soils from the Placentia series are well drained with a clay subsoil and were formed in granitic alluvium.

California Gnatcatcher Biology

The coastal California gnatcatcher is a small resident insectivorous species whose occurrence is strongly associated with sage scrub habitats found throughout southern California into northern Baja California, Mexico. The U.S. Fish and Wildlife Service listed this species as threatened in 1993. It is also considered a California Department of Fish and Game Species of Special Concern.

Historically, coastal California gnatcatcher's range extended from southern Ventura County southward through Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties, and into Baja California, Mexico, to approximately 30 degrees north latitude near El Rosario (Atwood



ct Site

ICF INTERNATIONAL

Figure 1
Regional Location
OWD Regulatory Site Access Road

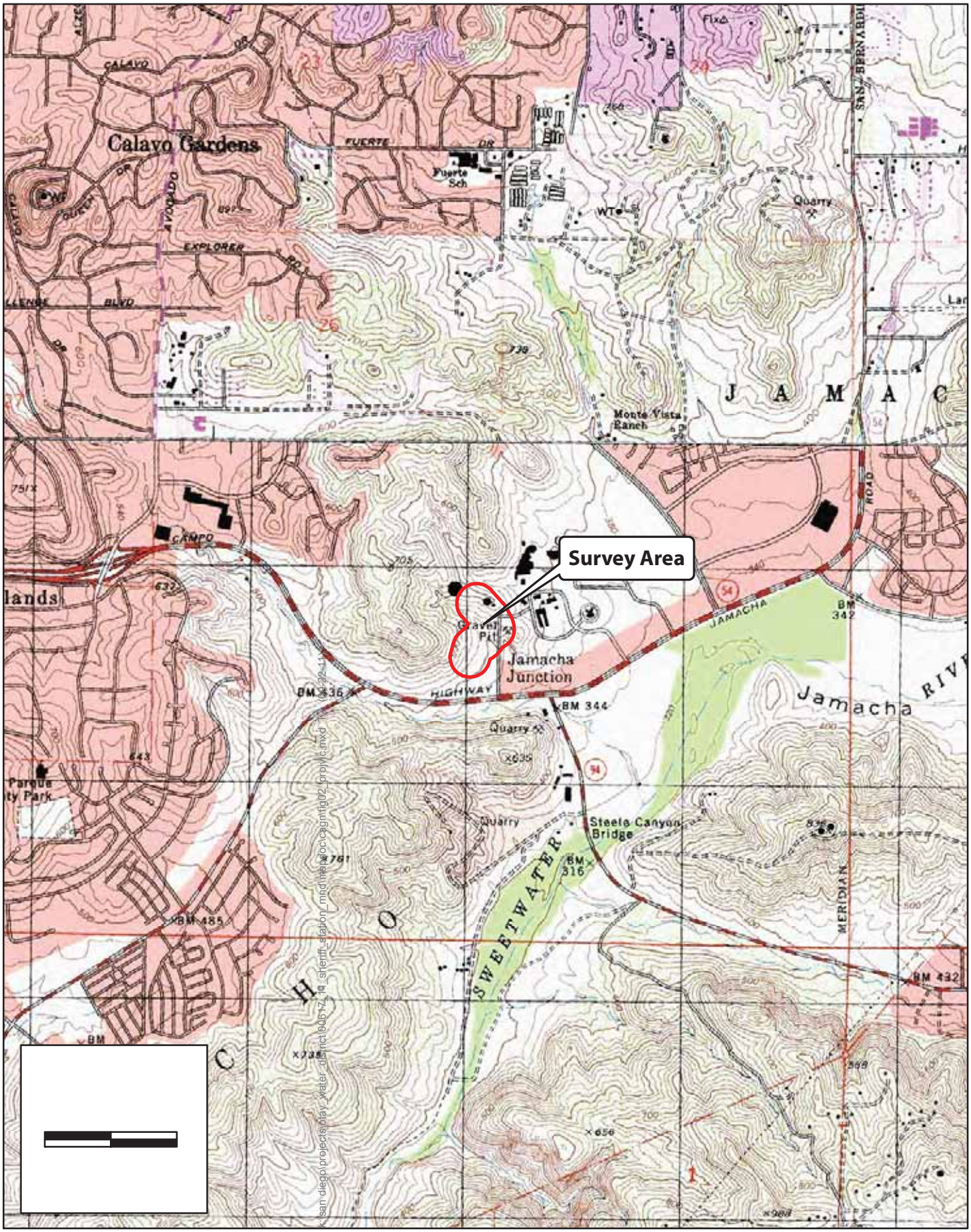
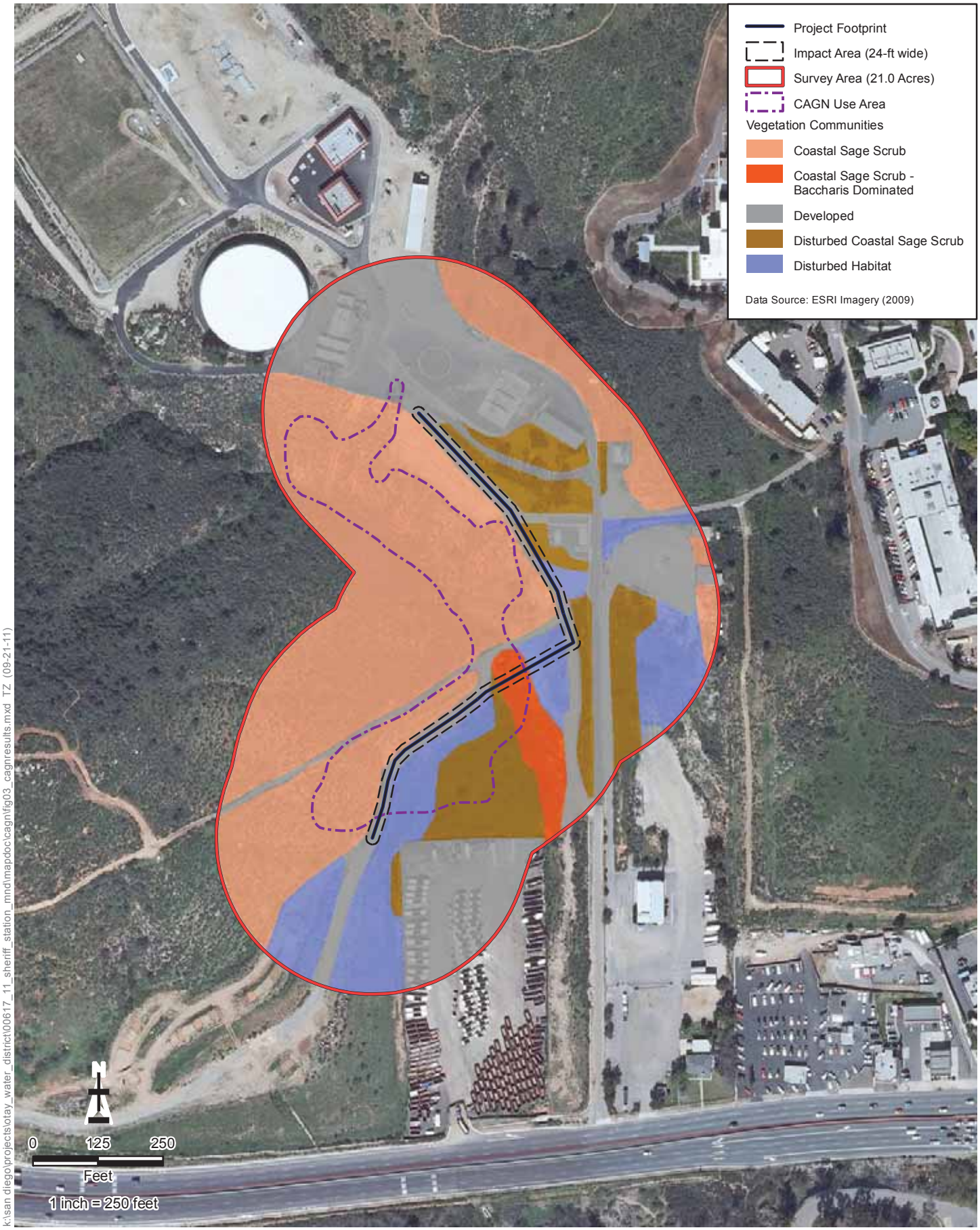


Figure 2
Project Vicinity
OWD Regulatory Site Access Road



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ICF INTERNATIONAL

Figure 3
Coastal California Gnatcatcher Protocol Survey Results 2011
OWD Regulatory Site Access Road

1990). Although gnatcatchers have a close association with sage scrub, this species has also been documented using coastal sage-chaparral scrub, chamise chaparral and other habitat types (Campbell et al. 1998, Bontrager 1991, K. Fischer pers. obs.). Habitat destruction, fragmentation and modification have led to this species' decline (USFWS 1993). Loss of habitat to agriculture and urban development were leading challenges to conserving the species until the interval between 2003 and 2007 when widespread fires consumed one-third of the habitat in the U.S range of the species that the U.S. Fish and Wildlife Service believed to be suitable for the coastal California gnatcatcher (USFWS 2010).

The breeding season of gnatcatcher extends from mid February through mid-August. They build cup-shaped nests approximately one meter (three feet) off the ground (USFWS 2003). The male typically selects the nest site and both sexes build the nest for approximately four to ten days (Atwood and Bontrager 2001, USFWS 2003). Clutch size is typically four eggs but can range from three to five eggs (Atwood and Bontrager 2001). Both sexes incubate the eggs for approximately 14 days and the chicks fledge from the nest around day 14 (Atwood and Bontrager 2001). Juveniles will stay with adults from two to five weeks post-fledging (Atwood and Bontrager 2001, K. Fischer, personal observation).

Chapter 2
Methods

Protocol surveys for the coastal California gnatcatcher within a Natural Community Conservation Plan (NCCP) entail three surveys, at least one week apart. All surveys are to be conducted in accordance with U.S. Fish and Wildlife Service protocol requirements (USFWS 1997). For this project, the surveys consisted of careful, thorough coverage of potential habitat within the project area and 300-foot buffer. Approximately 20 acres was surveyed in a morning.

Attention was given to relevant plant and animal species identifiable either directly or indirectly by sign. Pre-recorded audiotape playback was used when appropriate. All visits were performed during morning hours prior to 1200, when gnatcatchers are most active, and were not conducted during inclement weather such as extreme hot or cold temperatures, fog, high winds or rain.

Coastal California gnatcatcher surveys were conducted by M. Alfaro (USFWS permit TE-051242-2; CDFG SC-010035). Survey dates, personnel and survey conditions are listed in Table 1.

Table 1. Survey Conditions

Date	Start-End Time	Temperature (Start/Stop, °F)	Wind Speed (mph)	% Cloud Cover
July 27, 2011	0830–1200	68/78°F	2–3	100-15
August 3, 2011	0730–1035	72/88°F	2–3	0
August 10, 2011	0915–1200	62/68°F	1–2	5

Chapter 3
Results

One pair of adult gnatcatchers and two fledglings were detected in coastal sage scrub habitat within the survey area (Figure 3). All four were observed foraging during the three surveys. Fledglings were only seen within the northern half of the use area, whereas the pair was observed throughout the entire use area, especially within a narrow, southeast trending drainage, at the western boundary of the gnatcatcher use area. The surveys were conducted during the late summer, when the vegetation on-site, especially on the south west-facing slope, is dry. Vegetation in the drainage may provide better foraging habitat during the dry season.

In total, 2 reptile species, 17 bird species, and 2 mammal species were detected within the gnatcatcher survey area (Table 2). One additional special-status species was detected during the surveys, coast horned lizard (*Phrynosoma blainvillii*), a California Species of Special Concern. One individual horned lizard was observed sunning within the proposed road alignment.

Table 2. Vertebrate Species Detected

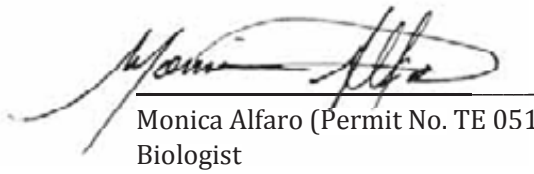
Common Name	Scientific Name	Status
Reptiles		
Western fence lizard	*Sceloporus occidentalis*	
Coast horned lizard	*Phrynosoma blainvillii*	CSC
Birds		
Red-tailed hawk	*Buteo jamaicensis*	
California quail	*Callipepla californica*	
Gull	*Larus* sp.	
Mourning dove	*Zenaida macroura*	
Greater roadrunner	*Geococcyx californianus*	
Anna's hummingbird	*Calypte anna*	
Cassin's kingbird	*Tyrannus vociferans*	
Common raven	*Corvus corax*	
American crow	*Corvus brachyrhynchos*	
Bewick's wren	*Thryomanes bewickii*	
Coastal California gnatcatcher	*Polioptila californica californica*	T, CSC
Wrentit	*Chamaea fasciata*	
Northern mockingbird	*Mimus polyglottos*	
California thrasher	*Toxostoma redivivum*	
California towhee	*Melozone crissalis*	
House finch	*Carpodacus mexicanus*	
Lesser goldfinch	*Carduelis psaltria*	

Table 2. Vertebrate Species Detected

Common Name	Scientific Name	Status
Mammals		
Audubon cottontail	*Sylvilagus audubonii*	
California ground squirrel	*Spermophilus beecheyi*	
STATUS: Federal: T - threatened State: CSC - California species of special concern.		

Chapter 4
Certification

I certify that the information in this survey report and attached exhibits fully and accurately represent my work.



Monica Alfaro (Permit No. TE 051242-2)
Biologist
Author and Field Surveys

September 22, 2011
Date

Chapter 5
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ATTACHMENT E

Results of Quino Checkerspot Butterfly Surveys for the OWD Regulatory Site Access Road Project, San Diego County, California

Results of Quino Checkerspot Butterfly Surveys for the OWD Regulatory Site Access Road Project, San Diego County, California

Prepared for:

Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, California 91978-2096

Prepared by:

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June 2011

ICF International. 2011. Results of Quino Checkerspot Butterfly Surveys for the OWD Regulatory Site Access Road. June. (ICF 00131.11) San Diego, CA. Prepared for Otay Water District.

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Attachment 1 Field Notes

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Summary

ICF International was retained by the Otay Water District to conduct protocol surveys for the Quino checkerspot butterfly (*Euphydryas editha quino*; Quino) at the OWD Regulatory Site Access Road project site. The site is located northwest of the intersection of Campo Road and State Route-54 in the City of Spring Valley, in San Diego County, California. The project would involve the relocation of approximately 1,200 feet of existing 16-inch potable water pipeline south of the District's Regulatory Reservoir Site, and the improvement of the existing access road from the proposed San Diego County Sheriff's Substation location north to the Regulatory Reservoir Site. For the purposes of this report, the term "project footprint" refers to the portion of the access road to be improved. The survey area, which included the project footprint and a 500-foot buffer, supported coastal sage scrub, disturbed coastal sage scrub, disturbed habitat, and developed areas.

A total of six weekly surveys were conducted over the course of the 2011 flight season (approximately February 7 – March 25) by E. Eidson. All surveys were conducted according to the U.S. Fish and Wildlife Service (USFWS) Year 2002 Protocol (USFWS 2002). Quino were not observed during the 2011 protocol surveys. Potential nectar sources were sparse and host plants were absent from the survey area. For these reasons, the site is considered to have low potential to support Quino.

Chapter 1
Introduction

ICF conducted protocol surveys to determine presence/absence of the Quino checkerspot butterfly (*Euphydryas editha quino*) (Quino) for the OWD Regulatory Site Access Road project site. This site is located northwest of the intersection of Campo Road and State Route-54 (SR-54) in the City of Spring Valley, in San Diego County, California (Figures 1 and 2).

In its entirety, the project consists of the relocation of approximately 1,200 feet of existing 16-inch potable water pipeline south of the District's Regulatory Reservoir Site (reservoir site), and the improvement of the existing access road from the proposed San Diego County Sheriff's Substation (substation) location north to the reservoir site. The proposed substation will occupy 13.85 acres and consist of a 25,000-square-foot building and parking areas. Components of the substation are proposed to be located over the existing pipeline. The pipeline will need to be relocated outside of the proposed substation footprint. During pipeline relocation, the existing access road from the substation to the reservoir site will be improved. For the purposes of this report, the term "project footprint" refers to the portion of the access road to be improved.

A total of six weekly surveys were conducted between February 11 and March 23, 2011, in accordance with the U.S. Fish and Wildlife Service (USFWS) Year 2002 Protocol (USFWS 2002). A habitat assessment was conducted by E. Eidson on February 11, 2011. At this time it was determined that 22 acres of non-excluded areas, as defined by the USFWS (USFWS 2002), occurred within the 41.6-acre survey area (includes project footprint and adjacent natural habitat). Excluded areas, not recommended for Quino surveys, are defined as:

- orchards, developed areas or in-fill parcels largely dominated by nonnative vegetation;
- active/in-use agricultural fields without natural or remnant inclusions of native vegetation; or
- closed-canopy forest or riparian area, dense chaparral and small openings completely enclosed within a closed-canopy or dense chaparral area.

The project footprint consists of developed and disturbed areas; coastal sage scrub and disturbed habitat occurs immediately adjacent to the project footprint. The survey area includes the project footprint and a 500-foot buffer along the access road to be improved (Figure 3). While developed areas were excluded from the surveys, disturbed areas with potential to support Quino host plants and located adjacent to coastal sage scrub were included in the survey area. This report documents the results of the 2011 focused surveys conducted in the non-excluded areas.

Physical Characteristics

The survey area supports coastal sage scrub and disturbed habitat and is surrounded by developed and undeveloped areas supporting native and nonnative vegetation (Figure 3). Developed areas include Cuyamaca College, which is located to the east, SR-54 to the south, Otay Water District Facilities to the north, and undeveloped hillsides to the west.

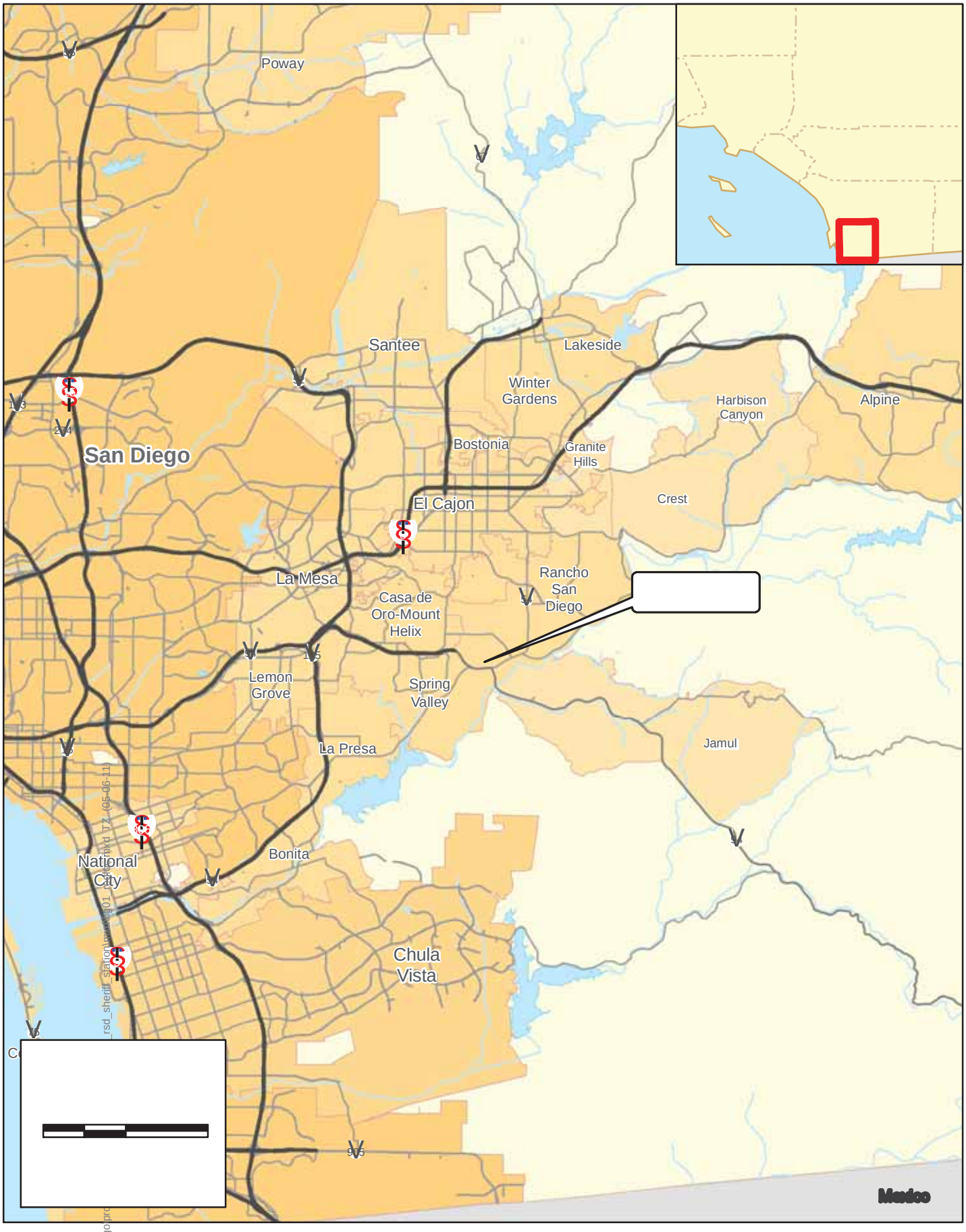

Figure 1
Regional Location
OWD Regulatory Site Access Road Project

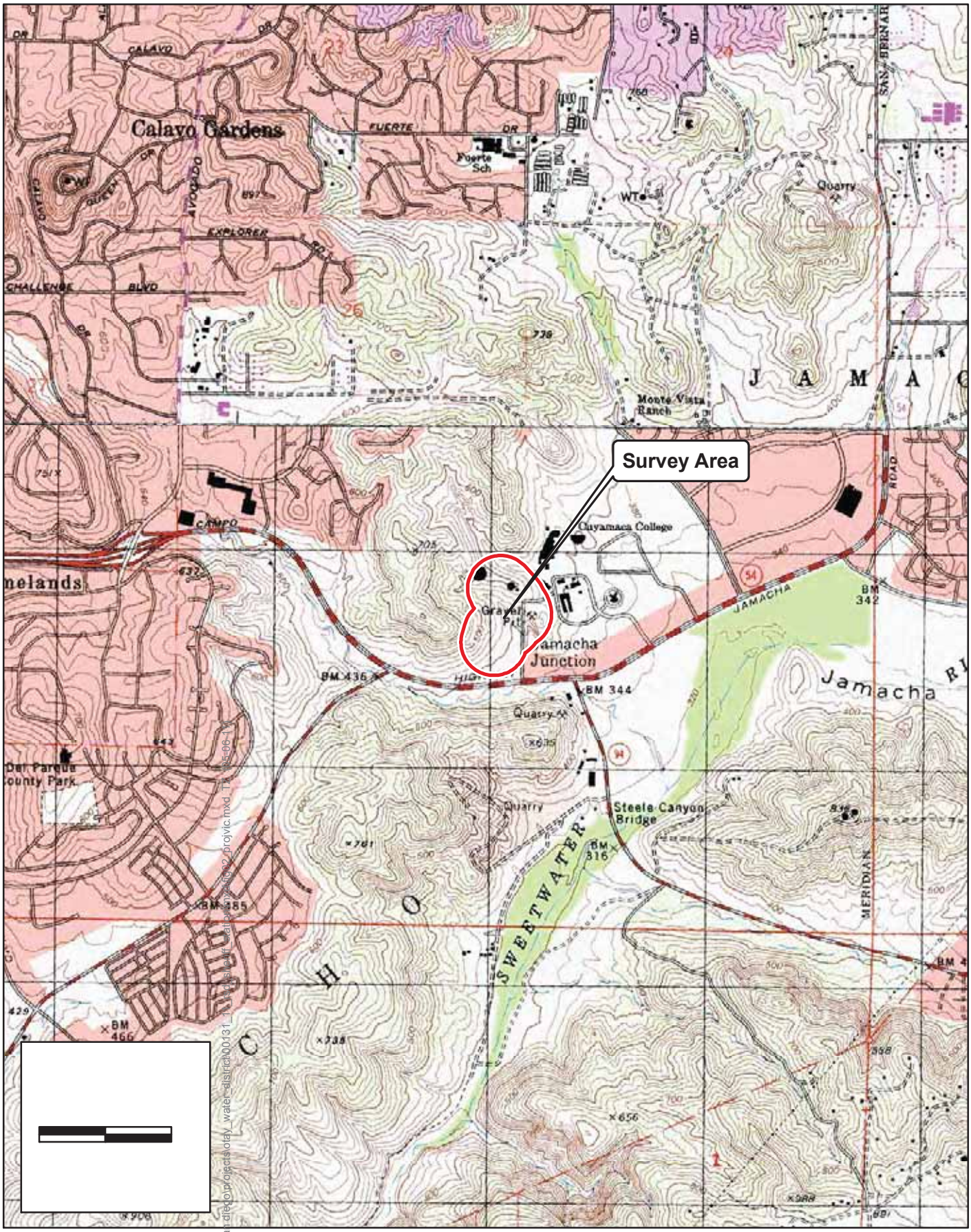

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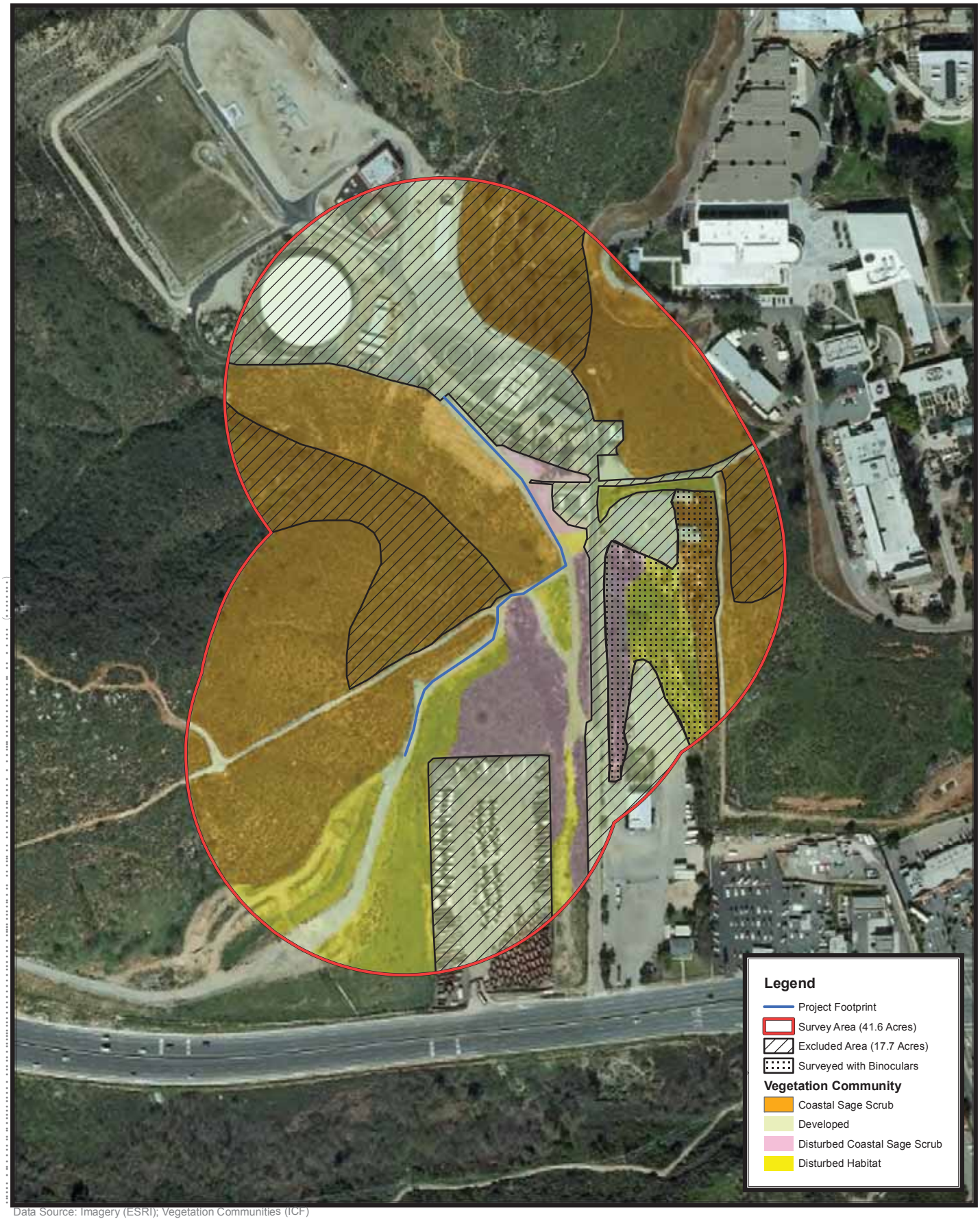
Figure 2
Project Vicinity
OWD Regulatory Site Access Road Project



Data Source: Imagery (ESRI); Vegetation Communities (ICF)

ICF INTERNATIONAL

Figure 3
Quino Checkerspot Butterfly Survey Area
OWD Regulatory Site Access Road Project

1 inch = 300 feet

0 75 150 300 450 Feet

The survey area ranges in elevation from 380 feet above mean sea level at the southern border to 610 feet within the reservoir site. Soils on site consist of Friant rocky fine sandy loam (30 to 70 percent slopes), Las Posas fine sandy loam (9 to 15 percent slopes, eroded), and Placentia sandy loam (2 to 9 percent slopes). Soils from the Friant series are shallow, well drained sandy loams that form in material weathered from mica schist, quartz schist, and gneiss. The Las Posas series consists of moderately deep, well drained soils that formed in material weathered from basic igneous rocks. Soils from the Placentia series are well drained with a clay subsoil and were formed in granitic alluvium.

Chapter 2
Methods

E. Eidson (Permit No. TE-051236-1) of ICF conducted surveys for adult Quino between February 7 and March 23, 2011. These surveys were conducted on a weekly basis under acceptable weather conditions as defined in the USFWS protocol (Table 1) (USFWS 2002). Each survey involved slowly walking transects throughout all non-excluded portions of the survey area. A portion of the survey area was inaccessible due to tall fencing and a locked gate. This area was surveyed from outside of the fence with the use of binoculars (Figure 3). The surveys were conducted at an average rate of no more than 9 acres per hour. The surveyor stopped periodically to scan adjacent areas for moving butterflies. All butterfly species observed were identified and recorded (Table 2). Copies of daily field notes are provided as an attachment to this report (Attachment 1).

Table 1. Survey Conditions

Date	Survey Number	Start-End Time	Temperature (Start/Stop, °F)	Wind Speed (mph)	% Cloud Cover	Name of Surveyor
February 11, 2011	1	0915–1200	62/72°F	0–1	0	E. Eidson (TE-051236-1)
February 14, 2011	2	0900–1200	62/67°F	0–1	0	E. Eidson (TE-051236-1)
February 28, 2011	3	0915–1200	62/68°F	1–2	5	E. Eidson (TE-051236-1)
March 8, 2011	4	1300–1530	72/76°F	0–3	0	E. Eidson (TE-051236-1)
March 15, 2011	5	0845–1100	65/73°F	0–5	0	E. Eidson (TE-051236-1)
March 23, 2011	6	0945–1215	61/69°F	0-5	0	E. Eidson (TE-051236-1)

Table 2. Butterflies Observed Within the Survey Area

Scientific Name	Common Name	Scientific Name	Common Name
Papilio rutulus	Western tiger swallowtail	*Brephidium exile*	Western pygmy-blue
Pontia protodice	Checkered white	*Vanessa atalanta*	Red admiral
Pontia sisymbrii	Spring white	*Vanessa cardui*	Painted lady
Anthocharis sara	Pacific orangetip	*Vanessa annabella*	West coast lady
Colias eurytheme	Orange sulphur	*Danaus plexippus*	Monarch
Callophrys affinis	Western green hairstreak	*Erynnis funeralis*	Funeral duskywing

Reference Site Information

In accordance with the USFWS protocol, Quino surveys, at a minimum, must occur over a 5-week period during the flight season for the given year. The timing of the flight season for Quino typically varies from year to year and between sites. In order to determine the beginning and end of the flight season at each site, biologists assess information provided by the USFWS, which annually monitors a suite of coastal and inland populations. For the 2011 flight season, Quino reference information was obtained from the 2011 USFWS monitoring information web page and by visiting three reference populations. Two of these reference populations (Mother Miguel and San Miguel Saddle) are located within the San Diego National Wildlife Refuge (SDNWR), south of the Sweetwater Reservoir. The third reference population (Rancho Jamul) is located approximately 2.5 miles east of State Route 94 between Jamul and Dulzura in southern San Diego County.

ICF biologists conducted five visits to the San Miguel Saddle and Mother Miguel reference sites and five visits to the Rancho Jamul reference site between February 9 and March 18 during the 2011 flight season. Although no Quino were observed during the surveys at Mother Miguel or San Miguel Saddle, the reference site visits to Rancho Jamul confirmed Quino were actively flying during the survey dates.

Rancho Jamul

The Rancho Jamul reference site is located approximately 2.5 miles east of State Route 94 between Jamul and Dulzura in southern San Diego County. The site was burned during the Otay Fire of October 2003 and again in the Harris Fire of October 2007. The hill-top habitat currently supports coastal sage scrub traversed by a dirt road and trails.

ICF biologists visited the USFWS Rancho Jamul Quino reference site in Jamul on several occasions during the 2011 flight season. All of the surveys were conducted under acceptable weather conditions as defined in the USFWS protocol (USFWS 2002). Each visit involved slowly walking transects throughout the site, focusing on the areas where Quino have historically been observed. Surveyors stopped periodically to scan adjacent areas for moving butterflies. Adult and/or immature Quino were identified and recorded. All information collected during the 2011 season is presented in this report and was provided to USFWS throughout the season to assist in determining the adult flight season.

Quino larvae were first observed in late January at the Rancho Jamul reference site. Both larvae and flying adult Quino were observed throughout the entire month of February. Adult Quino were then observed flying until the fourth week of March. The results of the surveys are consistent with other reference sites in the area reported on the USFWS Quino monitoring website (USFWS 2009). Based on all information available, Quino began emerging at the end of January and the flight season was over by the end of the fourth week of March, with the peak in abundance near the middle of February.

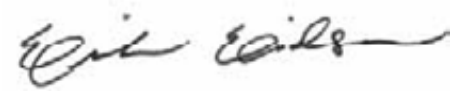
Chapter 3
Results

No adult or larval Quino were detected during the 2011 protocol surveys. Furthermore, no host plants were observed within the survey area. Twelve butterfly species were observed during the six protocol surveys including western tiger swallowtail, checkered white, spring white, pacific orangetip, orange sulphur, western green hairstreak, western pygmy-blue, red admiral, painted lady, west coast lady, monarch, and funereal duskywing (Table 2). Potential nectar sources present and in bloom during the surveys included California encelia (*Encelia californica*), San Diego sunflower (*Viguiera laciniata*), California buckwheat (*Eriogonum fasciculatum*), wishbone plant (*Mirabilis laevis*), fiddleneck (*Amsinckia menziesii*), black mustard (*Brassica nigra*), and golden yarrow (*Eriophyllum confertiflora*).

Overall, potential nectar sources onsite were sparse, with only a few areas supporting moderate densities of nectar sources. Additionally, Quino host plants were not detected within the survey area and are not expected to occur. Portions of the survey area were surveyed previously in 2008 and 2009 by ICF Jones and Stokes for the San Miguel Fire Department Regional Training Facility and in 2005 by RC Biological Consulting Inc., for the Otay Water District's 640-1 Reservoir Project. No adult or larval Quino were detected during previous focused surveys. For these reasons, the site is considered to have low potential to support Quino.

Chapter 4
Certification

I certify that the information in this survey report and attached exhibits fully and accurately represent my work.



_____ June 1, 2011

Erika Eidson (Permit No. TE 051236) Date
Biologist
Author and Field Surveys

Chapter 5
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Attachment 1
Field Notes

Quino Checkerspot Butterfly Survey Form

Project/Location: RSD Sheriff Station Survey Segment: _____

Surveyor: EE Date: 2-11-11 Survey #: 1

Additional Surveyors: —

	Time	% Cloud	Sky Condition			Wind (mph)	Temperature
Start	0915	0	clear	patchy	cloudy	0-1	62°
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	1200	0	clear	patchy	cloudy	0	72°

Habitat Onsite (circle): hilltop, veg openings, bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, DH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments: NONE

Nectar Plants: VERY FEW

Colenc Erifas

Viglac Mirlac

Quino Observed (location, comments, coordinates, photo #):

none

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue			Orange sulfur		
Anise swallowtail			Painted lady		
Behr's metalmark			Pale swallowtail		
Brown elfin			Perplexing hairstreak		
Cabbage white			Pygmy blue		
California patch			**Quino checkerspot**		
California ringlet			Red admiral	/	1
California sister			Sara's orangetip	//	2
Cerranus blue			Southern blue		
Checkered white			Southern dogface		
Common buckeye			Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing			West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt	/	1
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch	/	1			
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: RSD sheriff station Survey Segment: _____

Surveyor: EE Date: 2/14/11 ♡ Survey #: 2

Additional Surveyors: —

Time		% Cloud	Sky Condition			Wind (mph)	Temperature
Start	0900	0%	clear	patchy	cloudy	0	62°
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	1200	0%	clear	patchy	cloudy	0-1	67°

Habitat Onsite (circle): hilltop, veg openings, bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, DH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments: none

Nectar Plants: viglac Erifas
Amsmen Enccal (abundant in veg slope by water tank)

Quino Observed (location, comments, coordinates, photo #):

none

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue			Orange sulfur		
Anise swallowtail			Painted lady	I	1
Behr's metalmark			Pale swallowtail		
Brown elfin			Perplexing hairstreak		
Cabbage white			Pygmy blue		
California patch			**Quino checkerspot**		
California ringlet			Red admiral		
California sister			Sara's orangetip	II	2
Cerranus blue			Southern blue		
Checkered white			Southern dogface		
Common buckeye			Spring white	I	1
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing			West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: RSD Sheriff Station Survey Segment: ____

Surveyor: EE Date: 2-28-11 Survey # 3

Additional Surveyors: —

	Time	% Cloud	Sky Condition			Wind (mph)	Temperature
Start	0915	5	clear	patchy	cloudy	0	62°
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	1200	5	clear	patchy	cloudy	1-2	68°

Habitat Onsite (circle): hilltop, veg openings, bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, OH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments: none

Nectar Plants: Hirinc Viglac Crypt. sp. Lindia Enccal Erifas Phadis Erio con Amsmen Mirlac

Quino Observed (location, comments, coordinates, photo #):

none

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue			Orange sulfur	1	1
Anise swallowtail			Painted lady	1	1
Behr's metalmark			Pale swallowtail		
Brown elfin			Perplexing hairstreak	1	1
Cabbage white			Pygmy blue		
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	1	1
Cerranus blue			Southern blue		
Checkered white			Southern dogface		
Common buckeye			Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing			West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: RSD sheriff Survey Segment: _____

Surveyor: EE Date: 3-8-11 Survey #: 4

Additional Surveyors: —

	Time	% Cloud	Sky Condition			Wind (mph)	Temperature
Start	1300	0 %	(clear)	patchy	cloudy	0-13	72°
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	1530	0%	(clear)	patchy	cloudy	1-3	76°

Habitat Onsite (circle) (hilltop), (veg openings), bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): (CSS), SMC, CSCS, NNG, (DH), MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments: none

Nectar Plants: Pranig, Vij lac, Lin dian, Erio con, Hirine, Erifas, Mirlae, Erc cal, Amsmen, Phadis

Quino Observed (location, comments, coordinates, photo #)

none

Butterflies Observed

Name	Tally	Total	Name	Tally	Total
Acmon Blue			Orange sulfur		
Anise swallowtail			Painted lady		
Behr's metalmark			Pale swallowtail		
Brown elfin			Perplexing hairstreak	II	2
Cabbage white			Pygmy blue	I	1
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	II	2
Cerranus blue			Southern blue		
Checkered white			Southern dogface		
Common buckeye			Spring white	I	1
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing	I	1	West coast lady	I	1
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: RSD Sheriff Survey Segment: _____

Surveyor: EE Date: 3-15-11 Survey #: 5

Additional Surveyors: —

	Time	% Cloud	Sky Condition			Wind (mph)	Temperature
Start			clear	patchy	cloudy		
~~Dawn~~	0845	0	clear	patchy	cloudy	0-1	65°F
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	1100	0	clear	patchy	cloudy	1-5	73°

Habitat Onsite (circle): hilltop, veg openings, bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, DH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments: none

Nectar Plants: Hir inc, Viglac, Eriocal, Erocic, Erifas, Mirlac, Cryp sp., Peclin, Erio con } more abundant than during prev. surveys

Quino Observed (location, comments, coordinates, photo #):

none

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue			Orange sulfur		
Anise swallowtail			Painted lady	/	/
Behr's metalmark			Pale swallowtail		
Brown elfin			Perplexing hairstreak	/	/
Cabbage white			Pygmy blue		
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	///	3
Cerranus blue			Southern blue		
Checkered white	/		Southern dogface		
Common buckeye		/	Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing			West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt		
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

Quino Checkerspot Butterfly Survey Form

Project/Location: RSD Sheriff Survey Segment: _____

Surveyor: CE Date: 3-23-11 Wed Survey #: 6

Additional Surveyors: —

Time		% Cloud	Sky Condition			Wind (mph)	Temperature
Start	0945	0%	clear	patchy	cloudy	0-3	61°
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
			clear	patchy	cloudy		
Stop	1215	0%	clear	patchy	cloudy	2-5	69°

Habitat Onsite (circle): hilltop, veg openings, bare ground, flat land, steep slope, plateau, ridgeline, rock outcrop, other

Veg Type Surveyed (circle): CSS, SMC, CSCS, NNG, DH, MSS

Host Plants(circle): Plantago, Castilleja, Cordylanthus, Collinsia, Antirrhinum

Condition/Comments: none

Nectar Plants: Diglac Cryp sp. Erifas
Eriecal Amsmen
Thrcre Eriaric

Quino Observed (location, comments, coordinates, photo #):

none

Butterflies Observed					
Name	Tally	Total	Name	Tally	Total
Acmon Blue	/		Orange sulfur		
Anise swallowtail			Painted lady		
Behr's metalmark	/		Pale swallowtail		
Brown elfin			Perplexing hairstreak	//	
Cabbage white			Pygmy blue		
California patch			Quino checkerspot		
California ringlet			Red admiral		
California sister			Sara's orangetip	~~////~~	
Cerranus blue			Southern blue		
Checkered white	/		Southern dogface		
Common buckeye			Spring white		
Dainty sulfur			Striated queen		
Desert orange-tip			Variable checkerspot		
Funereal duskywing			West coast lady		
Gabb's checkerspot			Western tailed blue		
Gray hairstreak			Western tiger swallowt	/	
Harford's sulphur			White checkered skipp		
Hermes copper			Unknown blue		
Lorquin's admiral			Unknown lady		
Monarch					
Mourning cloak					
Northern white skip					

ATTACHMENT F

Special-Status Plant Species with Potential to Occur on the OWD Regulatory Site Access Road Project

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Plants					
San Diego thorn-mint (*Acanthomintha ilicifolia*)	FT, SE, CRPR 1B.1	Vernal pools and grassy openings in the chaparral or sage scrub with friable or broken clay soils. Found below 900 m (2952 ft).	April-June	Low	Suitable habitat and soils do not occur in the survey area.
California adolphia (*Adolphia californica*)	2.1	Spiny shrub that is often intermixed with coastal sage scrub, but can occur in peripheral chaparral habitats, particularly hillsides near creeks. Usually found below 300 m (942 ft).	Dec-May	Low	Shrub is conspicuous and would have likely been observed if present.
Shaw's agave (*Agave shawii*)	2.1	Coastal sage scrub and maritime succulent scrub. Below 960 m (3150 ft)	Sept-May	Low	Suitable habitat does not occur in the survey area.
San Diego bur-sage (*Ambrosia chenopodiifolia*)	2.1	Typically grows with Artemisia californica and Salvia mellifera in a low-growing, fairly open sage scrub in Otay Mesa. Found below 150 m (492 ft).	April-June	Low	Shrub is conspicuous and would have likely been observed if present.
Singlewhorl burrobrush (*Ambrosia monogyra*)	2.2	Washes and dry river beds Chaparral. Below 500 m (1640 ft).	Aug-Nov	Low	Shrub is conspicuous and would have likely been observed if present.
San Diego ambrosia (*Ambrosia pumila*)	FE 1B.1	Sandy loam or clay, often in disturbed areas, sometimes alkaline soils in chaparral, coastal scrub, valley and foothill grassland, and vernal pools.	April-Oct	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
Aphanisma (*Aphanisma blitoides*)	1B.2	Sandy soils and coastal bluff scrub, and coastal dunes. 1-305 m (3-1000 ft).	March-June	Low	Suitable habitat does not occur in the survey area.
Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia*)	FE 1B.1	Low- growing chaparral with eroding sandstone as substrate. Below 365 m (1198 ft).	Dec-June	Low	Shrub is conspicuous and would have likely been observed if present.
Otay manzanita (*Arctostaphylos otayensis*)	1B.2	Chaparral or woodlands on volcanic rock outcrops. Found between 500-1700m (1640-5577 ft).	Jan-April	Low	Shrub is conspicuous and would have likely been observed if present.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
San Diego sagewort (*Artemisia palmeri*)	4.2	Occurs along creeks and drainages near the coast; but inland it occurs in mesic chaparral conditions. Below 600 m (1969 ft).	Feb-Sep	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
Dean's milk-vetch (*Astragalus deanei*)	1B.1	Open shrubby slopes typically associated with coastal sage scrub, chaparral, and sandy washes. Found between 250-300 m (820-984 ft).	Feb-May	Moderate	Potentially suitable habitat occurs within the survey area.
San Diego milk-vetch (*Astragalus oocarpus*)	1B.2	Openings in chaparral and oak woodland between 600 and 1500 m (1968-4921 ft).	May-Aug	Low	Suitable habitat does not occur in the survey area.
Coulter's saltbush (*Atriplex coulteri*)	1B.2	In San Diego, sea-bluff habitat is preferred by this rare species but it has been found in Otay Mesa (Reiser 1994). Alkaline or clay soils, open sites and, coastal scrub. Typically found below 50 m (164 ft).	Mar-Oct	Low	Suitable habitat does not occur in the survey area.
South coast saltscale (*Atriplex pacifica*)	1B.2	Dry often mildly disturbed locales. Usually the surrounding vegetation is an open sage scrub dominated by Artemisia californica. Below 100 m (328 ft).	Mar-Oct	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
Encinitas baccharis (*Baccharis vanessae*)	FT, SE 1B.1	Coastal mixed chaparral, central coast and foothills. Found between 60–335 m (197-1099 ft)	Aug-Nov	Low	Shrub is conspicuous and would have likely been observed if present.
San Diego sunflower (*Bahiopsis laciniata*)	4.2	Dry scrub habitats below 3000 ft.	Feb-Aug	High	Detected throughout Diegan coastal sage scrub in the survey area.
Golden-spined cereus (*Bergerocactus emory*)	2.2	Coastal bluff and near Otay Mountain in maritime succulent scrub. Sandy soils, dry hills along coast. Found between 3 and 395 m (10-1296 ft).	May-June	Low	Suitable habitat does not occur in the survey area.
San Diego goldenstar (*Bloomeria clevelandii*)	1B.1	Grasslands typically near vernal pools below 50 m (164 ft).	Apr-May	Low	Suitable habitat does not occur in the survey area.
Orcutt's brodiaea (*Brodiaea orcuttii*)	1B.1	Moist grasslands, near streams and the periphery of vernal pools. Found between 0-1600 m (0-5249 ft).	May-Jul	Low	Suitable habitat does not occur in the survey area.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Round-leaved filaree (*California macrophylla*)	1B.1	Cismontane woodland, valley and foothill grasslands. Found below 1200 m (3937 ft).	Mar-May	Low	Suitable habitat does not occur in the survey area.
Dunn's mariposa lily (*Calochortus dunnii*)	SR 1B.2	Rocky openings in chaparral or grassland/chaparral ecotone. Found between 380-1830 m (1246-6004 ft).	Apr-Jun	Low	Suitable habitat does not occur in the survey area.
Lewis' evening primrose (*Camissonia lewisii*)	3	Sandy or clay soils in coastal bluff scrub, cismontane woodland, coastal dunes, coastal scrub, and valley and foothill grassland. 0-300 m (0-984 ft).	Mar-Jun	Moderate	Potentially suitable habitat occurs within the survey area.
Sal Luis Obispo sedge (*Carex obispoensis*)	1B.2	Often in serpentinite seeps, sometimes gabbro soils; often on clay soils in closed-cone coniferous forest, chaparral, coastal prairie, coastal scrub, and valley and foothill grassland. 10-820 (32-2690 ft).	Apr-Jun	Low	Suitable soils do not occur in the survey area.
Lakeside ceanothus (*Ceanothus cyaneus*)	1B.2	Dry shrubby slopes below 400 m (1312 ft).	Apr-June	Low	Shrub is conspicuous and would have likely been observed if present.
Otay Mountain ceanothus (*Ceanothus otayensis*)	1B.2	Chamise chaparral. In CA, only known from the San Miguel and Otay mountains (CNPS 2006). Found between 600 and 1100 m (1969-3609 ft).	Jan-Apr	Low	Shrub is conspicuous and would have likely been observed if present.
Wart-stemmed ceanothus (*Ceanothus verrucosus*)	2.2	Coastal chaparral intermixed with chamise and mission manzanita. Below 380 m (1247 ft).	Dec-May	Low	Shrub is conspicuous and would have likely been observed if present.
Smooth tarplant (*Centromadia pungens* ssp. *laevis*)	1B.1	Grasslands below 400 m (1312 ft).	Apr-Sep	Low	Suitable habitat does not occur in the survey area.
Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana*)	1B.1	Coastal bluff scrub and coastal dunes. Below 100 m (328 ft).	Jan-Aug	Low	Suitable habitat does not occur in the survey area.
Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*)	FE, SE 1B.2	Salt marshes. Below 30 m (98 ft).	May-Oct	Low	Suitable habitat does not occur in the survey area.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*)	1B.2	Clay lenses, largely devoid of shrubs. Occasionally seen on the periphery of vernal pool habitat and the periphery of montane meadows near vernal seeps. Below 1400 m (4593 ft).	Apr-Jul	Low	Suitable habitat does not occur in the survey area.
Delicate clarkia (*Clarkia delicata*)	1B.2	Oak woodlands and chaparral below 1000 m (3280 ft).	Apr-Jun	Low	Suitable habitat does not occur in the survey area.
Summer holly (*Comarostaphylis diversifolia* ssp. *diversifolia*)	1B.2	Southern mixed chaparral, usually on mesic north-facing slopes. Found between 100-550 m (328-1804 ft).	Apr-Jun	Low	Shrub is conspicuous and would have likely been observed if present.
Small-flowered bird's-beak (*Cordylanthus parviflorus*)	2.3	Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland. 700-2200 m (2296-7216 ft).	Aug-Oct	Low	Suitable habitat does not occur in the survey area.
San Diego sand aster (*Corethrogyne filaginifolia* var. *incana*)	1B.1	Coastal sandy areas. Coastal bluff scrub, chaparral, coastal sage scrub. Below 115 m (377 ft).	Jun-Sep	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
Otay tarplant (*Deinandra conjugens*)	FT, SE 1B.1	Clay soils in grasslands or lightly vegetated coastal sage scrub below 300 m (984 ft).	May-Jun	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present. A reference site in Chula Vista was visited on August 1 to confirm that this species was still in bloom and easily identifiable.
Tecate tarplant (*Deinandra floribunda*)	1B.2	Southern mixed chaparral of the interior valleys and arroyos. Found between 300-700 m (984-2296 ft).	Aug-Oct	Low	Suitable habitat does not occur in the survey area.
Orcutt's bird's-beak (*Dicranostegia orcuttiana*)	2.1	Scrub habitats such as seasonally dry drainages and upland adjacent to riparian habitat. Found below 350 m (1148 ft).	Mar-Sep	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
Orcutt's dudleya (*Dudleya attenuata* ssp. *orcuttii*)	2.1	Openings in coastal sage scrub near the coast. Coastal bluff scrub, chaparral, coastal scrub in rocky or gravelly soils. Below 50 m (164 ft). Only known in San Diego County from Borderfield State Park (CNPS).	May-Jul	Moderate	Potentially suitable habitat occurs within the survey area.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*)	1B.1	Opening in coastal sage scrub near the coast. Coastal bluff scrub, chaparral, coastal sage scrub, valley and foothill grassland/rocky areas, often clay or serpentine. Below 450 m (1476 ft).	Apr-Jun	Moderate	Potentially suitable habitat occurs within the survey area.
Variegated dudleya (*Dudleya variegata*)	1B.2	Openings in sage scrub and chaparral and isolated rocky substrates in open grasslands below 300 m (984 ft).	Apr-Jun	Moderate	Potentially suitable habitat occurs within the survey area.
Palmer's goldenbush (*Ericameria palmeri* var. *palmeri*)	1B.1	Along coastal drainages in chaparral below 600 m (1968 ft).	Sep-Nov	High	Two individuals were detected in the survey area. Several individuals were detected outside of the survey area.
Vanishing wild buckwheat (*Eriogonum evanidum*)	1B.1	Sandy soils in chaparral, cismontane woodland, lower montane coniferous forest, and pinyon and juniper woodland. 1100-2225 m (3608-7298 ft).	Jul-Oct	Low	Suitable habitat does not occur in the survey area.
San Diego button-celery (*Eryngium aristulatum* var. *parishii*)	FE, SE, 1B.1	Vernal Pools or mima mound areas with vernally moist conditions. Found between 0-150 m (0-492 ft).	Apr-Jun	Low	Suitable habitat does not occur in the survey area.
Cliff spurge (*Euphorbia misera*)	2.2	Low growing maritime sage scrub. Below 500 m (1640 ft).	Dec-Aug	Low	Suitable habitat does not occur in the survey area.
San Diego barrel cactus (*Ferocactus viridescens*)	2.1	Coastal sage scrub with sandy or rocky areas. Found between 10-150 m (32-492 ft).	May-Jun	Low	Suitable habitat does not occur in the survey area.
Palmer's frankenia (*Frankenia palmeri*)	2.1	Periphery of salt marsh. Below 450 m (1476 ft).	May-Jul	Low	Suitable habitat does not occur in the survey area.
Chaparral ash (*Fraxinus parryi*)	2.2	Arid, relatively open chaparral in northern Baja California. 213-620 m (699-2034 ft).	Mar-May	Low	Suitable habitat does not occur in the survey area.
Mexican flannelbush (*Fremontodendron mexicanum*)	FE, SR 1B.1	Chamise chaparral between 300 and 1000 m (984-3280 ft).	Mar-Jun	Low	Suitable habitat does not occur in the survey area.
Desert bedstraw (*Galium proliferum*)	2.2	Rocky or carbonate (limestone) soils in Joshua tree woodland, Mojavean desert scrub, and pinyon and juniper woodland. 1190-1570 m (3903-5150 ft).	Mar-Jun	Low	Suitable habitat does not occur in the survey area.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Mission Canyon bluecup (*Githopsis diffusa* ssp. *filicaulis*)	3.1	Mesic chaparral, often in disturbed areas. 450-700 m (1476-2296 ft).	Apr-Jun	Low	Suitable habitat does not occur in the survey area.
San Diego gumplant (*Grindelia hallii*)	1B.2	Chaparral, lower montane coniferous forest, meadows and seeps, valley and foothill grassland. 185-1745 m (606-5724 ft).	July-Oct	Low	Suitable habitat does not occur in the survey area.
Palmer's grapplinghook (*Harpagonella palmeri*)	4.2	Openings on clay soils and burns; coastal and desert. Chaparral, coastal scrub, valley and foothill grassland. Found below 1000m (3280 ft).	Mar-May	Moderate	Potentially suitable habitat occurs within the survey area.
Tecate cypress (*Hesperocyparis forbesii*)	1B.1	Clay, gabbroic or metavolcanic soils in closed-cone coniferous forest and chaparral. 80-1500 (262-4920 ft).	NA	Low	Suitable habitat does not occur in the survey area.
Beach goldenaster (*Heterotheca sessiliflora* ssp. *sessiliflora*)	1B.1	Coastal chaparral, coastal dunes, and coastal sage. 0-1225 (0-4018 ft).	Mar-Dec	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
Ramona horkelia (*Horkelia truncata*)	1B.3	Open chamise chaparral between 400-1300 m (1312-4265 ft).	May-Jun	Low	Suitable habitat does not occur in the survey area.
Otay Mountain lotus (*Hosackia crassifolius* var. *otayensis*)	1B.1	Metavolcanic chaparral, often in disturbed areas. 380-1005 (1246-3296 ft).	May-Aug	Low	Suitable habitat does not occur in the survey area.
Decumbent goldenbush (*Isocoma menziesii* var. *decumbens*)	1B.2	In sandy areas in coastal sage scrub habitat intermixed with grassland and chaparrals. 10-135 m (33-443 ft)	Apr-Nov	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
San Diego marsh-elder (*Iva hayesiana*)	2.2	Creeks or intermittent streambeds. Sandy alluvial embankments with cobbles are frequently utilized. Found below 500 m (1640 ft).	Apr-Oct	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present. Several individuals were detected outside of the survey area along an existing brow ditch that creates mesic conditions during periods of runoff overflow.
Gander's pitcher sage (*Lepechinia ganderi*)	1B.3	Chamise chaparral dominated by chamise and black sage between 400-900 m (1312-2952 ft).	Jun-Jul	Low	Suitable habitat does not occur in the survey area.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Robinson's pepper-grass (*Lepidium virginicum* var. *robinsonii*)	1B.2	Openings in chaparral and coastal sage scrub. Typically found in relatively dry, exposed locales. Found below 885 m (2904 ft).	Jan-Jul	Moderate	Potentially suitable habitat occurs within the survey area.
Sea dahlia (*Leptosyne maritima*)	2.2	Coastal bluff scrub and coastal scrub. 5-150 m (16-492 ft).	Mar-May	Moderate	Potentially suitable habitat occurs within the survey area.
Nuttall's lotus (*Lotus nuttallianus*)	1B.1	Coastal dunes, coastal scrub. Below 10 m (33 ft).	Mar-Jun	Low	Suitable habitat does not occur in the survey area.
Felt-leaved monardella (*Monardella hypoleuca* ssp. *lanata*)	1B.2	Chaparral understory. 300-1000 m (984-3280 ft).	Jun-Aug	Low	Suitable habitat does not occur in the survey area.
Jennifer's monardella (Monardella stoneana)	1B.2	Closed coniferous forest, chaparral, coastal sage scrub, riparian scrub. Usually in rocky intermittent streambeds. Below 790 m (2592 ft). Only known to occur in California in the San Ysidro Mountains.	Jun-Sep	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
Willowy monardella (*Monardella viminea*)	FE, SE 1B.1	Riparian scrub, usually at sandy locales in seasonally dry washes. Below 400 m (1312 ft)	Jun-Aug	Low	Suitable habitat does not occur in the survey area.
Little mousetail (*Myosurus minimus* ssp. *apus*)	3.1	Vernal pools. Below 1500 m (4921 ft).	Mar-Jun	Low	Suitable habitat does not occur in the survey area.
Mud nama (*Nama stenocarpum*)	2.2	Muddy embankments of ponds, lakes and rivers. Below 500 m (1640 ft).	Jan-Jul	Low	Suitable habitat does not occur in the survey area.
Moran's nosegay (*Navarretia fossalis*)	FT 1B.1	Vernal pools and vernal swales. 30-1300 m (98-4265 ft).	Apr-Jun	Low	Suitable habitat does not occur in the survey area.
Prostrate vernal pool navarretia (*Navarretia prostrata*)	1B.1	Vernal pools, coastal scrub, meadows and seeps, valley and foothill grassland. Below 700 m (2297 ft).	Apr-Jul	Moderate	Potentially suitable habitat occurs within the survey area.
Coast woolly-heads (*Nemacaulis denudata* var. *denudata*)	1B.2	Coastal sand dunes below 100 m (328 ft).	Apr-Sep	Low	Suitable habitat does not occur in the survey area.
Slender cottonheads (*Nemacaulis denudata* var. *gracilis*)	2.2	Well-developed sand dunes. Coastal dunes, desert dunes, Sonoran desert scrub. 50-400 m (164-1312 ft).	Mar-May	Low	Suitable habitat does not occur in the survey area.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Dehesa Nolina (*Nolina interrata*)	SE 1B.1	Open southern mixed chaparral and chamise chaparral. 200-700m (656-2296 ft).	Jun-Jul	Low	Suitable habitat does not occur in the survey area.
Snake cholla (*Opuntia californica* var. *californica*)	1B.1	Open coastal sage scrub on xeric hillsides. Below 1600 m (5249 ft).	Apr-May	Low	Succulent plant is conspicuous and would have likely been observed if present.
California Orcutt grass (*Orcuttia californica*)	FE, SE 1B.1	Vernal pools. 15-660 m (49-2165 ft).	Apr-Aug	Low	Suitable habitat does not occur in the survey area.
Baja California birdbush (*Ornithostaphylos oppositifolia*)	SE 2.1	Coast chaparral with mission manzanita and chamise present. 55-800 m (180-2625 ft). Known from one location west of San Ysidro (CNPS 2007).	Jan-Apr	Low	Suitable habitat does not occur in the survey area.
Short-lobed broomrape (*Orobanche parishii* ssp. *brachyloba*)	4.2	Sandy soils in coastal bluff scrub, coastal dunes, and coastal scrub. 3-305 m (10-1000 ft).	April-Oct	Low	Potentially suitable habitat occurs in survey area; however, species would have been detected during biological survey if present.
Gander's ragwort (*Packera ganderi*)	SR 1B.2	Very rare plant usually found in the chaparral understory, often beneath chamise. 400-1200 m (1312-3937 ft)	Apr-Jun	Low	Suitable habitat does not occur in the survey area.
Brand's star phacelia (*Phacelia stellaris*)	FC 1B.1	Sandy openings in coastal sage scrub, coastal dunes. Below 400 m (1312 ft).	Mar-Jun	Moderate	Potentially suitable habitat occurs within the survey area.
San Diego mesa mint (*Pogogyne abramsii*)	FE, SE 1B.1	Vernal pools. 90-200 m (295-656 ft).	Mar-Jul	Low	Suitable habitat does not occur in the survey area.
Otay mesa mint (*Pogogyne nudiuscula*)	FE, SE 1B.1	Vernal pools. 90-250 m (295-820 ft). Known from 6 locations in Otay mesa (CNPS 2007).	May-Jul	Low	Suitable habitat does not occur in the survey area.
Cedros Island oak (*Quercus cedrosensis*)	2.2	Closed-cone coniferous forest, chaparral, coastal scrub. 225-488m (738-1469ft).	Apr-May	Low	Shrub is conspicuous and would have likely been observed if present.
Nuttall's scrub oak (*Quercus dumosa*)	1B.1	Coastal chaparral with a generally open canopy cover. Below 200 m (656 ft).	Feb-Aug	Low	Shrub is conspicuous and would have likely been observed if present.
Moreno currant (Ribes canthariforme)	1B.3	Chamise chaparral. 500-1200m (1640-3937ft).	Feb-Apr	Low	Suitable habitat does not occur in the survey area.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Santa Catalina Island currant (*Ribes viburnifolium*)	1B.2	Low-growing chaparral exposed to ocean breezes. 30-305 m (98-1001 ft).	Feb-Apr	Low	Suitable habitat does not occur in the survey area.
Small-leaved rose (*Rosa minutifolia*)	SE 2.1	Mesas, hiilsides and arroyos near the coast. 150-160 m (492-525 ft). Known from 1 location in Otay mesa (CNPS 2007).	Jan-Jun	Low	Suitable habitat does not occur in the survey area.
Munz's sage (*Salvia munzii*)	2.2	Chaparral and coastal sage scrub. Below 800m (2624 ft).	Feb-Apr	Low	Shrub is conspicuous and would have likely been observed if present.
San Miguel savory (*Satureja chandleri*)	1B.2	Rocky slopes with chamise chaparral. 520-690m (1706-2263ft).	Mar-Jul	Low	Suitable habitat does not occur in the survey area.
Chaparral ragwort (*Senecio aphanactis*)	2.2	Dry alkaline flats in chaparral, cismontane woodlands and coastal sage scrub. Below 400 m (1312 ft).	Jan-Apr	Low	Suitable habitat does not occur in the survey area.
Hammitt's clay-cress (*Sibaropsis hammittii*)	1B.2	Openings in chaparral valley and foothill grasslands. 720-1065 m (2362-3494 ft).	Mar-Apr	Low	Suitable habitat does not occur in the survey area.
Purple stemodia (*Stemodia durantifolia*)	2.1	Sandy dry canyon bottoms or drainages, often in Sonoran desert scrub. Below 300 m (984 ft).	Jan-Dec	Low	Suitable habitat does not occur in the survey area.
Laguna Mountains jewel-flower (*Streptanthus bernardinus*)	4.3	Chaparral and lower montane coniferous forest. 670-2500 m (2198-8200).	May-Aug	Low	Suitable habitat does not occur in the survey area.
Oil nestraw (*Stylocline citroleum*)	1B.1	Coastal scrub and clay soils in the vicinity of oilfields. 50-400 m (164-1312 ft).	Mar-Apr	Low	Suitable habitat does not occur in the survey area.
Estuary seablite (*Suaeda esteroa*)	1B.2	Coastal salt marshes and swamps. Below 5 m (16 ft).	May-Jan	Low	Suitable habitat does not occur in the survey area.
Parry's tetracoccus (*Tetracoccus dioicus*)	1B.2	Chamise chaparral, chaparral, and coastal sage scrub. Below 1000 m (3280 ft).	Apr-May	Low	Shrub is conspicuous and would have likely been observed if present.

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Blooming Period	Potential for occurrence	Rationale
Status: **Federal** FE = listed as endangered under the federal Endangered Species Act. FT = listed as threatened under the federal Endangered Species Act. FC = listed as candidate for listing under the Federal Endangered Species Act. **State** SE = listed as endangered under the California Endangered Species Act. ST = listed as threatened under California Endangered Species Act. SR = listed as rare under California Endangered Species Act. SCE = listed as candidate for listing as endangered under the California Endangered Species Act. CSC = listed as a state species of special concern. **CRPR—California Rare Plant Rank** 1B = Rare, threatened or endangered in California and elsewhere 2 = Rare, threatened or endangered in California but more common elsewhere 3 = May be rare but more research needed to determine true status 4 = Limited distribution and are uncommon but not presently rare or endangered					

ATTACHMENT G

Special-Status Wildlife Species with Potential to Occur on the OWD Regulatory Site Access Road Project

Common Name (Scientific Name)	Sensitivity Code & Status	Habitat Preference/Requirements	Potential for occurrence	Rationale
Invertebrates				
San Diego fairy shrimp (*Branchinecta sandiegonensis*)	FE	Vernal pools. All known localities are below 701m (2,300 ft) and are within 64km (40 miles) of the Pacific Ocean.	Low	Suitable habitat does not occur in the survey area.
Quino checkerspot butterfly (*Euphydryas editha quino*)	FE	Inhabits openings on clay soils within or in the vicinity of shrublands, grasslands, meadows, vernal pools, and lake margins. Closely tied to its larval host plant, dwarf plantain *(Plantago erecta)* or owl's clover (*Orthocarpus purpurescens*).	Low	Focused surveys for this species determined that it is absent from the survey area and that the potential for occurrence of this species in the survey area is low.
Riverside fairy shrimp (*Streptocephalus woottoni*)	FE	Vernal pools. It occurs from Los Angeles County to Baja California. In San Diego County, all populations are within 15 kilometers of the coast.	Low	Suitable habitat does not occur in the survey area.
Reptiles and Amphibians				
Arroyo toad (*Anaxyrus californicus*)	FE, CSC	Exposed shallow pools with a sand or gravel base are used for breeding. Breeding pools must occur in the vicinity (ca. 10-100 m) of a braided sandy channel with shorelines or central bars made of stable, sandy terraces.	Low	Suitable habitat does not occur in the survey area.
Orangethroat whiptail (*Aspidoscelis hyperythra*)	CSC	Semi-arid brushy areas including washes, stream sides, rocky hillsides, coastal sage scrub, and chaparral. Typically prefers loose soil and rocks with patchy brush to provide cover.	High	Two individuals were detected in the survey area.
Green turtle (*Chelonia mydas*)	FT	Inhabits the shallow waters of lagoons, bays, estuaries, mangroves, eelgrass and seaweed beds. Prefers areas with abundant aquatic vegetation, such as pastures of sea grasses and algae, in shallow, protected water.	Low	Suitable habitat does not occur in the survey area.
Coast horned lizard (*Phrynosoma blainvillii*)	CSC	Coastal sage, annual grassland, chaparral, oak woodland, riparian woodland, and coniferous forest. Prefers loose, fine soils with a high sand content.	High	One individual was detected in the survey area.
Birds				
Western snowy plover (*Charadrius alexandrinus nivosus*)	FT, CSC	Sandy beaches and the shores of large alkali lakes with gravelly or friable soils for nesting	Low	Suitable habitat does not occur in the survey area.
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FC, SE,	Nests in riparian forests.	Low	Suitable habitat does not occur in the survey area.

Southwestern willow flycatcher (*Empidonax traillii extimus*)	FE, SE	Breeds in riparian woodlands along rivers, streams, or other wetlands. They usually nest within close proximity of water or very saturated soil.	Low	Suitable habitat does not occur in the survey area.
California black rail (*Laterallus jamaicensis coturniculus*)	ST	Occurs in freshwater marshes, wet meadows, and the shallow margins of saltwater marshes.	Low	Suitable habitat does not occur in the survey area.
Belding's savannah (*Passerculus sandwichensis beldingi*)	SE	Inhabits coastal salt marshes.	Low	Suitable habitat does not occur in the survey area.
Coastal California gnatcatcher (*Polioptila californica californica*)	FT, CSC	Prefer open scrubby habitats such as coastal sage scrub and some forms of chaparral.	High	Two adults and two fledglings were detected in coastal sage scrub habitat in the survey area. Focused surveys were conducted for this species.
Light-footed clapper rail (*Rallus longirostris levipes*)	FE, SE	Occurs in salt marshes where cordgrass and pickleweed are dominant.	Low	Suitable habitat does not occur in the survey area.
California least tern (*Sternula antillarum browni*)	FE, SE	Nests along the coast on sandy beaches.	Low	Suitable habitat does not occur in the survey area.
Least Bell's vireo (*Vireo bellii pusillus*)	FE, SE	Riparian thickets either near water or in dry portions of river bottoms; nests along margins of bushes and forages low to the ground; may also be found using mesquite and arrow weed in desert canyons.	Low	Suitable habitat does not occur in the survey area.
Mammals				
Pacific pocket mouse (*Perognathus longimembris pacificus*)	FE	Inhabits coastal plains; prefers soils of fine alluvial sands near the ocean.	Low	Suitable habitat does not occur in the survey area.

Status:

Federal

FE = listed as endangered under the federal Endangered Species Act.
FT = listed as threatened under the federal Endangered Species Act.
FC = listed as candidate for listing under the Federal Endangered Species Act.

State

SE = listed as endangered under the California Endangered Species Act.
ST = listed as threatened under California Endangered Species Act.
SR = listed as rare under California Endangered Species Act.
SCE = listed as candidate for listing as endangered under the California Endangered Species Act.
CSC = listed as a state species of special concern.

CRPR—California Rare Plant Rank

1B = Rare, threatened or endangered in California and elsewhere
2 = Rare, threatened or endangered in California but more common elsewhere
3 = May be rare but more research needed to determine true status
4 = Limited distribution and are uncommon but not presently rare or endangered

Appendix C

Cultural Resource Survey

ARCHAEOLOGICAL SURVEY REPORT FOR THE OTAY WATER DISTRICT REGULATORY SITE ACCESS ROAD IMPROVEMENTS SAN DIEGO COUNTY, CALIFORNIA

Prepared for:

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September 2011

Acreage Surveyed: < 5 acres

Keywords: Negative Archaeological Survey, State Route 94, Jamacha Junction

USGS 7.5-Minute Quadrangle: *Jamul Mtns., CA*

ICF International. September 2011. Archaeological Survey Report for the OWD Regulatory Site Access Road. San Diego, CA. Prepared for: Otay Water District, Spring Valley, CA. [ICF 00617.11]

Summary of Findings

The Otay Water District (District) is proposing to extend an access road from the District Regulatory Site to the terminus of the road that is being built by the County for the Sheriff's Substation project.

The purpose of this report was to determine of any cultural resources would be adversely affected by the proposed road extension. To determine that a records search was conducted at the South Coastal Information Center to determine if any previously recorded archaeological sites had been recorded adjacent to or within the project footprint. That search came back negative. A review of historical maps and aerial photographs was conducted to look for the potential for historical buildings to have been built in the vicinity, thus providing evidence for possible buried historical archaeological deposits. A review was also conducted of soil and geologic maps to determine if the potential exists for buried cultural deposits of Native American origin to be present in the area. Native American consultation was conducted by contacting the California Native American Heritage Commission and local tribes to determine if they had any concerns over the project affecting their cultural patrimony. Lastly, an archaeological survey of the project area was conducted on September 22, 2011.

The results of the survey were negative, as no cultural remains of any kind were identified within the project footprint. It is standard policy to avoid impacting cultural resources whenever possible. Should remains be found during construction, work should stop in the immediate area until a qualified archaeologist could determine their nature and significance. If human remains were found, then the County Coroner would be contacted immediately.

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Chapter 1 Project Description

[This chapter is abstracted from ICF, International (2011).]

The Otay Water District (District) is proposing to extend an access road from the District Regulatory Site to the terminus of the road that is being built by the County for the Sheriff's Substation project (Figures 1 and 2). Two project alternatives are being considered as shown in Figure 3. The access road would be a maximum of 24 feet in width and would be paved. The specific alignment would be based on minimizing impacts to the environment. The proposed alignment would generally conform to the alignment of the existing unpaved access road that extends to the future Rancho San Diego Sheriff's Substation.

The access road would be used by District staff as well as San Miguel Fire District vehicles accessing the San Miguel Regional Training facility located within the District Regulatory Site. Currently district staff vehicles utilize an existing right-turn-in/-out only driveway on SR-94. The San Miguel Regional Training Facility is currently being constructed within the District Regulatory Site. District Staff vehicles as well as future vehicles accessing the San Miguel Regional Training Facility well would generate 46 average daily trips (ADTs), with 19 (13 inbound/6 outbound) trips during the AM peak hour and 19 (6 inbound/13 outbound) trips during the PM peak hour.

The Rancho San Diego Sheriff's Substation is scheduled to be completed in 2012 through a design-build construction contract. The environmental analysis completed for the Sherriff's Substation did not include the area for the proposed access road. The District and the County have yet to determine if the proposed access road would be constructed by the County to the District Regulatory Site as a part of the Sheriff's Substation undertaking.

The potential exists that extension of the access road may involve vacation of an existing County open space easement or placement of a District Road Easement within the existing County Open Space Easement. The existing easements in the project vicinity are shown in Figure 3.

Chapter 2 Sources Consulted

2.1 INTRODUCTION

ICF conducted a records search at the South Coastal Information Center (SCIC), San Diego State University. ICF also conducted Native American consultation, requesting a review of the Sacred Lands and Most Likely Descendants (MLDs) files maintained by the California Native American Heritage Commission (NAHC), and following that up with contact letters and phones calls or emails to identified tribes and individuals. These efforts are described below.

2.2 CULTURAL RESOURCES LITERATURE AND RECORDS SEARCH

On September 9, 2011, ICF received from the SCIC a literature and records search of the project APE and for an area encompassing a 250-foot buffer around the proposed access road (Attachment 1). The search included a review of the following sources:

- Cultural resources site records
- Historical editions of USGS topographic quadrangles
- Other San Diego County historical maps
- National Archaeological Database (NADb) information on previous archaeological surveys and investigations conducted within the record search boundary

ICF also checked the:

- National Register of Historic Places (1979-2002, et seq.)
- California Register of Historical Resources (1992, et seq.)
- California Inventory of Historic Resources (1976)
- California Historical Landmarks (State of California 1996, et seq.)
- California Points of Historical Interest (State of California 1992, et seq.)
- Quarterly minutes of the California Historical Resources Commission (1980, et seq.)
- Historical aerials available online at: http://www.historicalaerials.com
- 1928 San Diego County Tax Factor aerials on file at the San Diego History Center

The results of the records search indicated that no cultural resources had been previously recorded within the record search area. A number of surveys had been

previously preformed within the record search area, and to such a degree that it appears the project footprint had been surveyed multiple times in the past. While these surveys resulted in the recordation of numerous resources, none of those fell within the record search boundaries. These survey efforts are described in Table 1.

Table 1: Previous Cultural Studies within the Record Search Area

Report Author (Date)	Description
McManus (1977)	Archaeological Survey for the Proposed Widening of State Routes 94 and 54
Heuett (1979)	Preliminary Archaeological Investigations of W-1146
PRC Toups Corporation (1979)	EIR for the Rancho San Diego Specific Plan
Barbolla-Roland (1984)	Archaeological Survey for a Proposed 36' pipeline from the La Pressa Pump Station to the Regulatory Reservoir
Mooney-Lettieri & Associates (1987)	Draft EIR for the Rancho San Diego Specific Plan
Gallegos et al. (1988)	Survey for the Skyline Wesleyan Church Project
WESTEC (1988)	Cultural Resources Survey and Testing for the Skyline Wesleyan Church Project
Jacks and Lacy (1990)	Appendices for Supplemental EIR for the Rancho San Diego Tentative Map
Clevenger (1993)	ASR for Proposed Improvements to State Routes 54 and 94
Clevenger and Crawford (1994)	HPSR for Proposed Improvements to State Routes 54 and 94
Kyle (1995)	Cultural Resources Extended Test and Survey for the Skyline Wesleyan Church Project
U.S. Dept. of Interior (1995)	Draft Environmental Assessment for the Proposed Acquisition of Rancho San Diego
Iversen (2008)	Rancho San Diego Substation Negative Cultural Resources Survey

Iversen's (2008) survey is only three years old and could have been used to satisfy the requirements for the current undertaking; however, that study does not address the footprint for the access road.

2.3 NATIVE AMERICAN CONSULTATION

Native American Heritage Commission (NAHC) consultation was conducted by ICF. A letter was sent to the NAHC on September 13, 2011, requesting a search of the Sacred Lands Database and a list of potentially interested Native American contacts in the area. NAHC responded with a letter dated September 15, 2011. No sacred sites were listed for the project vicinity, but a list of 21 Kumeyaay tribes and other individuals was provided for

further contact. Follow-up letters were sent to all those on the list on September 16, 2011. On October 3, 2011, emails were sent or phone calls were made to each tribal and individual contact identified by the NAHC. Each email or call clearly indicated the nature of the access road work. A few of the emails or letters were returned as undeliverable. Those who did reply indicated they had no concerns regarding the proposed road work, while a few recommended that the work be monitored by a Native American during construction. A recommendation whether or not to monitor the construction activities is discussed in Chapter 5: Study Findings and Conclusions. Those tribes and individuals contacted included:

Mr. Edwin Romero, Chairperson
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Mr. Frank Brown
Kumeyaay Inter-Tribal Cultural
Resources Council
240 Brown Road
Alpine, CA 91901

Ms. Monique LaChappa, Chairperson
Campo Kumeyaay Nation
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Campo, CA 91906

Mr. Virgil Perez, Spokesman
Iipay Nation of the Santa Ysabel of
Mission Indians
PO Box 130
Santa Ysabel, CA 92070

Mr. Kenneth Meza, Chairperson
Jamul Indian Village
PO Box 612
Jamul, CA 91935

Mr. Ron Christman
Kumeyaay Cultural Historic Committee
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Ms. Gwendolyn Parada, Chairperson
La Posta Band of Mission Indians
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Lakeside, CA 92040

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Kumeyaay Cultural Repatriation
Committee
PO Box 1120
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Mesa Grande Band of Mission Indians
PO Box 270
Santa Ysabel, CA 92070

Mr. Allen E. Lawson, Chairperson
San Pasqual Band of Mission Indians
PO Box 365
Valley Center, CA 92082

Mr. Danny Tucker, Chairperson
Sycuan Band of the Kumeyaay Nation
5459 Sycuan Road
El Cajon, CA 92021

Mr. Antony R. Pico, Chairperson
Viejas Band of Kumeyaay Indians
PO Box 908
Alpine, CA 91903

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Campo, CA 91906

Mr. Will Micklin, Executive Director
Ewiiaapaayp Tribal Office
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Alpine, CA 91901

Mr. Michael Garcia, Vice Chairperson
Ewiiaapaayp Tribal Office
4054 Willows Road
Alpine, CA 91901

Mr. M. Louis Guassac
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Alpine, CA 91903

Ms. Rebecca Osuna, Spokesperson
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Mr. Clint Linton, Director of Cultural Resources
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Ms. Bernice Paipa, Vice Spokesperson
Kumeyaay Cultural Repatriation Committee
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Ms. Carmen Lucas
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Mr. Leroy J. Elliot, Chairperson
Manzanita Band of the Kumeyaay Nation
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Boulevard, CA 91905

Chapter 3 Background

3.1 PHYSICAL ENVIRONMENT

The project is in an area of San Diego County known as Jamacha Junction. Jamacha, AKA *Hamacha*, *hemechaa*, or *Xamacha*, is a Kumeyaay word for a gourd that grew in the area (Gudde and Bright 2004:182). The gourd, which is bitter, was not eaten, but was used for soap (Langdon 1975). The project is physically located in Township 18 South, Range 1 West, in an unsectioned portion of the Jamacho (Jamacha) land grant. Jamacho appears on the USGS topographic quadrangle, *Jamul Mtns*. The region is as the edge of the San Diego Metropolitan sphere of influence, with bedroom communities like Rancho San Diego to the north, El Cajon to the north and northeast, Casa de Oro and La Mesa to the northwest, Spring Valley to the west, and La Presa to the southwest (Pryde 2004). To the east, southeast, and south are vast areas of undeveloped land, most of which is in open space easements, National Wildlife Refuges, and mitigation banks. San Miguel Mountain dominates the area to the south, rising to an elevation of 2565' (782 m). Rural Creek parallels State Route 94, which is immediately south of the project area, until it confluences with the Sweetwater River about a half kilometer to the southeast. The project area itself sits at roughly 450' (137 m) above mean sea level.

Vegetation is a mixture of native species in the undeveloped areas, to ruderals and exotics where development has occurred. The natives are mostly part of the coastal sage scrub (CSS) biological community, with oaks and willows dominant along the river. Within the project footprint one can find everything from well developed CSS, to disturbed CSS, to disturbed habitat and graded bare ground, especially along the path of the existing water pipeline and an existing dirt road. Lists of detected plant and animal species currently inhabiting the project area can be found in Attachment ς.

Soils in the project area are dominated by Friant rocky fine sandy loam (USDA 1973:Map 64). The Friant series consists of shallow to very shallow fine sandy loams. The rocky variety exists on steep slopes and is usually less than 12" thick, having been derived from the underlying fine-grained metasedimentary bedrock (USDA 1973:49). The metasedimentary rocks were utilized extensively by the local Native Americans for producing expediently manufactured stone tools. The geology of the region can be characterized as middle to upper Cretaceous age Tonalite, which is roughly 100 million years old (Tan 2002). This disagrees with the soils assessment, which identifies the Friant series as having derived from eroded metasedimentary rock. Tonalite is igneous

(plutonic in origin), while metasedimentary rocks were originally sedimentary, then later subjected to metamorphism. Either way, the geology identifies ancient soils and rocks. The potential for buried prehistoric deposits would be highly unlikely in this context, unless one were situated close enough to water courses, or were far enough away from the slopes where potential landslides or erosion would have allowed for soil accretion.

3.2 CULTURAL SETTING

ETHNOGRAPHY

At the time of historic contact, in the southern portion of San Diego County the Hokan language affiliated Kumeyaay, AKA, Ipai/Tipai/Diegueño, were residing in a large territory stretching into the southern deserts of Imperial County, along the coast to Agua Hedionda and south into northern Baja California. The people known to the Spaniards as the Diegueño, a term later adopted by anthropologists (Kroeber 1925), were separated into the southern and northern Diegueño in an attempt to describe the Yuman-speaking people of San Diego County. Some researchers have separated the groups into the 'Ipai (Northern Diegueño) north of the San Diego River and the Tipai (Southern Diegueño) south of the river and into Baja California (Langdon 1975:64-70; Hedges 1975:71-83). The linguistic and language boundaries as seen by Shipek (1982) subsume the Yuman speakers into a single nomenclature, the Kumeyaay, a name applied previously to the mountain Tipai or Southern Diegueño by Lee (1937), while Almstedt (1974:1) noted that 'Ipai applied to the Northern Diegueño with Tipai and Kumeyaay for the Southern Diegueño. However, Luomala (1978:592) has suggested that while these groups consisted of over 30 patrilineal clans, no singular tribal name was used and she referred to the Yuman-speaking people as 'Ipai/Tipai. Today Kumeyaay is the preferred name for these Native American peoples.

The Kumeyaay are traditionally considered as a hunting-gathering society characterized by central-based nomadism (Binford 1980). While a large variety of terrestrial and marine food sources were exploited, emphasis was placed on acorn procurement and processing, as well as the capture of rabbit and deer. Shipek (1963, 1989) has strongly suggested that the Kumeyaay, or at least some bands of the Kumeyaay, were practicing proto-agriculture at the time of Spanish contact. While the evidence is problematic, the Kumeyaay were certainly adept land and resource managers with a history of intensive plant husbandry, as was practiced throughout

California and elsewhere (Anderson 2005; Calloway 2003; Lewis 1973; Lightfoot and Parrish 2009; Stewart 2002).

As with most hunting-gathering societies (Service 1966:33), Kumeyaay social organization was formed in terms of kinship. More specifically, the Kumeyaay were a patrilocal type of band organization with band exogamy (marriage outside of one's band) and virilocal marital residence (the married couple integrates into the male's band). The band is often considered as synonymous with a village or ranchería, which is a political entity. Almstedt (1980:45) has suggested that the term ranchería be applied to both a social and geographical unit, as well as to the particular population and territory held in common by a native group or band. She also stressed that the territory for a ranchería might comprise a 30-square-mile area.

Many households would constitute a village or ranchería and several villages were part of a much larger social system usually referred to as a consanguineal kin group (cimuL). The cimuL is typically an exogamous, multilocal, patrilineal, consanguineal descent unit, often widely dispersed in local lineage. The members of the cimuL do not intermarry because of their presumed common ancestry, but they maintain close relations and often share territory and resources (Sahlins 1968:23; Service 1971:105-106; Luomala 1963:287-289). Territorial divisions among Kumeyaay residential communities were normally set by the circuit of moves between villages by cimuLs in search in food. As Spier (1923:307) noted, the entire territory was not occupied at one time, but rather the communities moved between resources in such a manner that in the course of a year all of the recognized settlements may have been occupied. While a cimuL could own, or more correctly control a tract of land with proscribed rights (Spier 1923:306; Luomala 1963:285), no one from another *cimuL* was denied access to the resources of nature since no individual owned the resources, they were to be shared.

The Kumeyaay practiced many forms of spiritualism with the assistance of shamans and *cimuL* leaders. Spiritual leaders were neither elected to, nor inherited their position, but achieved status because they knew all the songs involved in ceremonies (Shipek 1991) and had an inclination toward the supernatural (DuBois 1906; cf. Laylander 2004). Important Kumeyaay ceremonies included male and female puberty rites, the fire ceremony, the whirling dance, the eclipse ceremony, the eagle dance and the cremation ceremony, as well as the yearly mourning ceremony (Spier 1923:311-326). The primary ceremonial direction among the Kumeyaay is east with entrance to ceremonial enclosures usually facing this direction (Kroeber 1925:717) and with rock art frequently positioned toward the east. The Kumeyaay are the only California tribe known to possess a color-direction system where white represents east, green-blue the south, black the west, and red the north (Kroeber 1925:717).

The environment inhabited by the Kumeyaay provided its people with large catchments, more sources of freshwater, easier and more productive access to the

coastline, and probably more accessible montane resources (Kelly 1995). Shipek (1995) has posited that Kumeyaay residential units may have moved in a territory covering up to 500 km^2. For example, the seasonal (winter to spring) village of Pa'mu in the Santa Maria Valley near Ramona and the village of *Tekemuk* at Mesa Grande (summer and fall) are 21 km apart, a typical and perhaps average distance for such Kumeyaay residences. If this is an accurate settlement system for the Kumeyaay, then the settlement pattern would reflect a large quantity of dispersed sites across the landscape operated out of more sedentary villages that exploited this catchment system.

Kumeyaay political and social organization reflects more fluidity than the more structured Luiseño to their north. Shipek (1982) and Luomala (1963; 1978) have suggested that Kumeyaay territories, while administered by cimuLs or sibs, allowed for more movement and flexibility in use and procurement. If this difference is accurate, the effect on archaeological site distribution might include development and use of a greater number of sites with repetitive use by the Kumeyaay.

Population size for the Kumeyaay is somewhat conjectural. Carrico (2008:12) has posed a number of 20,000 for the Kumeyaay. The proposed larger population for the Kumeyaay coupled with their bi-polar residences could produce larger settlements and/or more residential settlements and denser more intensively used outliers or satellite camps. Most culture histories for the region, as summarized above, state that the Kumeyaay were in the southern California area by A.D. 500 and perhaps earlier with some researchers suggesting roots extending back into the Archaic era.

PREHISTORY

The following culture history outlines and briefly describes the known prehistoric cultural traditions within the southern California coastal and inland regions.

While some researchers have proposed that the southern California coastal region may have been settled more than 40,000 years ago (cf., Carter 1957; Moriarty and Minshall 1972; Minshall 1976; Moriarty 1987), current evidence can only document human occupation within San Diego County area for at least the last 9,000 years or so. Beginning sometime after 10,000 years ago, during the Early Holocene, three major prehistoric occupation assemblages are documented for the region. The San Dieguito tradition/complex and the Milling Stone Horizon/Encinitas tradition/La Jolla and Pauma complexes occurred during the Early to Middle Holocene or Early Prehistoric Period; and the Shoshonean (San Luis Rey) and Yuman (Cuyamaca) complexes during the Late Holocene or Late Prehistoric Period. These latter two complexes extended in time to historic contact (Warren 1968).

In the coastal area, beginning somewhere north of San Diego and extending to Santa Barbara, a fourth cultural assemblage, variously described as the Intermediate Horizon (Wallace 1955) or Campbell tradition (Warren 1968) has been delineated and

distinguished, following the Encinitas tradition/La Jolla/Pauma complexes (Milling Stone Horizon). The time period of this assemblage is viewed as beginning circa 4,800 years ago and continuing to as late as 1,300 years ago (Warren 1968). The extent of the Intermediate/Campbell cultural assemblage, however, south along the coast, is still a matter of some debate. The cultural manifestations of each are discussed below.

Most of the initial archaeological evidence for the earliest of these traditions is derived from the coastal areas of southern Orange and San Diego counties, not from within the inland areas of the County. In general, most sites within the coastal influence area can be expected to date from either the Archaic or Late Prehistoric periods, but as one progresses further into the interior than most sites date to the Late Prehistoric. Within the Peninsular Ranges sites are almost exclusively Late Prehistoric in age. Only once crosses over into the desert sides of the mountains can Archaic Period artifacts encountered again, and this almost exclusively of isolated dart/spear points.

Early Prehistoric Complexes

The "San Dieguito complex" is the earliest reliably dated occupation of the region. Radiocarbon dates for the San Dieguito Complex range from sometime before 9,030 ± 350 years before present (B.P.) to between 8,490 ± 400 and 7,620 ± 380 years B.P. (Warren 1967, 1968). In the western United States, Davis et al. (1969) identified the San Dieguito complex as part of the “Western Lithic Co-Tradition," and Bedwell (1970) placed the San Dieguito complex within the "Western Pluvial Lakes Tradition.” This assemblage of artifacts, first identified by Rogers (1945, 1966), has been studied and elaborated by Warren and True (1961) and Warren (1967). The complex correlates with Wallace's (1955) "Early Man Horizon,” and Warren (1968) subsequently defined a San Dieguito tradition.

In west central San Diego County, the Harris Site (CA-SDI-149/316/4935B), located along the San Dieguito River, approximately 25 kilometers (15.7 miles) north of the San Diego River, was, according to radiocarbon dates, occupied as early as 9,000 years ago (Warren 1967, 1968; Carrico and Ezell 1978; Carrico et al. 1993). Warren (1966, 1967; Warren and True 1961) considered the earliest component of this site as representative of the San Dieguito complex.

This component of the Harris Site was originally defined as representative of quarry workshop activity, indicative of the manufacture of chipped stone tools for a hunting culture. More recent investigations and analyses, however, suggest that it may be more of a special purpose site (e.g., a secondary workshop for biface and other tool production) that represents only one aspect of a culture with a more diversified subsistence system (Vaughn 1982; Carrico et al. 1993). San Dieguito complex artifacts from the lower levels of the Harris Site include leaf-shaped knives, ovoid bifaces, flake tools, choppers, core and pebble hammerstones, and several types of scrapers, crescents, and short-bladed, shouldered points (Warren and True 1961; Warren 1966).

Some researchers see a San Dieguito complex with a primarily, but not exclusively, hunting subsistence orientation, as distinct from the more gathering oriented complexes of traits that were to follow (Warren 1967, 1968). Others see a more diversified San Dieguito subsistence system as possibly ancestral, or a developmental stage, for the subsequent predominantly gathering oriented complex denoted as the "La Jolla/Pauma complex" (cf. Ezell 1987; Gallegos 1985, 1987, 1991; Koerper et al. 1991).

Archaic Complexes

La Jolla/Pauma complex sites, dating from circa 8,600 to 1,300 years B.P., are considered to be part of Warren's (1968) "Encinitas Tradition" and Wallace's (1955) "Milling Stone Horizon." They are characterized by manos and metates, shell middens, terrestrial and marine mammal remains, inhumations, rock features, cobble-based tools at coastal sites and increased hunting equipment and quarry-based tools at inland sites. Artifacts that can also be associated with these complexes include bone tools, doughnut stones, discoidals, stone balls, plummets, biface points/knives, Elko-eared dart points, and beads made of stone, bone, and shell.

The inland or "Pauma complex" aspect of this culture, as defined by True (1958), lacks shellfish remains, but is otherwise similar to the La Jolla complex and may, therefore, simply represent a non-coastal expression of the La Jolla complex (True 1980; True and Beemer 1982). The presence of some San Dieguito-like hunting tools at sites interpreted as Pauma complex sites has led some investigators, in disagreement with True, to suggest that a derivative connection may exist between this complex and the San Dieguito complex (True 1980:34-35). This assemblage of artifacts at a range of coastal and inland sites appears to indicate that a relatively stable, sedentary, hunting and gathering complex, possibly associated with one people, was present in the coastal and immediately inland areas of San Diego County for more than 7,000 years.

The Encinitas tradition/La Jolla/Pauma complexes (Milling Stone Horizon) are identified by Warren (1968:4) as ending sometime circa 1,300 years ago. The Intermediate Horizon (Wallace 1955) or Campbell tradition (Warren 1968), delineated for the coastal area north of San Diego to Santa Barbara, following the Encinitas tradition/La Jolla/Pauma complexes (Milling Stone Horizon), is viewed as beginning circa 4,800 years ago and continuing to as late as 1,300 years ago (Warren 1968). While evidence for the use of hunting for subsistence does gradually increase through time, in the south coastal San Diego, the subsistence practices and, consequently, the artifact assemblage of the Encinitas tradition/La Jolla/Pauma complexes (Milling Stone Horizon) are seen as, otherwise, continuing largely unchanged up to the beginning of the Late Prehistoric Period with no intervening period reflecting substantial subsistence shifts. The end of the Encinitas tradition/La Jolla/Pauma complexes and the beginning of the Late Period in this area is seen, however, as marked by a number of rather abrupt changes. The magnitude of these changes and the short period of time

within which these changes took place seem to indicate a significant change in subsistence practices in San Diego County circa 1,300 years B.P.; a shift was made from atlatl and dart to the bow and arrow, shellfish gathering was de-emphasized in some areas (possibly due to silting of the lagoons), and storage of crops, such as acorns, was institutionalized by Yuman and Shoshonean peoples. In addition, new traits such as the production of pottery and cremation of the dead were introduced during the Late Prehistoric Period.

Sites with Archaic components found in southern San Diego include the Scripps Estate Site (Shumway et al. 1961), and in the Otay area, sites and assemblages clearly dating to, and associated with, both the early La Jolla complex (i.e., circa 7,000 years B.P.), as well as later La Jolla occupations circa 4,000 to 2,000 years B.P. have been documented (e.g. Pigniolo and Gallegos 1990; Kyle et al. 1990; Robbins-Wade 1990). Until recently, a general paucity of archaeological sites has been noted in north-central San Diego County after 3,000 years B.P. to approximately 1,500 years B.P. This reduction in the number of archaeological sites has been attributed to the siltation of coastal lagoons and a consequent reduction and depletion of shellfish and other lagoon resources (Warren et al. 1961; Warren and Pavesic 1963; Gallegos 1985). However, to the south, archaeological sites dated to the period after 3,000 years B.P. to circa 1,300 B.P. are being found closer to, and around, San Diego Bay (Gallegos 1995; Cooley 1998), where shellfish were still abundant, as predicted by Warren (1964). As such, these sites in the south may represent what can be considered the end of the Archaic Period.

In a recent revision of his chronology, based on some of the new data that have been generated (e.g., as cited above), Warren et al. (1998) have redefined Warren's 1968 sequence for the San Diego area. The period from circa 10,500 B.P. to 8,200 B.P. is termed the Initial Period and represents Paleoindian assemblages or, principally in San Diego, the San Dieguito pattern as well as possibly the earliest occurrences of the La Jolla pattern assemblage. This period is followed by the Transitional Period, from 8,200 B.P. to 7,200 B.P., during which the La Jolla artifact assemblage replaces the San Dieguito assemblage in the archaeological record. The next period is termed the Middle Archaic Period, which extends from 7,200 B.P. to 4,000 B.P.

This period, and the following one, the Final Archaic Period (from 4,000 B.P. to 1,300 B.P.), represent a redefining of the La Jolla pattern into, basically, an early phase and a late phase. During the Middle Archaic, the La Jolla cultural pattern reached its greatest expression and populations were most substantial along the central areas of San Diego coast. During the Final Archaic, populations in this central coastal area decline and migrate, adapting to the loss of the lagoons in that area. Also, during this latter period, Campbell tradition and desert influences also begin to manifest themselves in the La Jolla artifact assemblage, principally in the form of hunting equipment such as large side-notched dart points initially, and then, possibly, by arrow-sized projectile points at

the very end of the period. Subsequent to 1,300 B.P. the Late Prehistoric Period Yuman and Shoshonean complexes supplant the La Jolla pattern in the area.

Late Prehistoric Period Complexes

The Late Prehistoric Period is much better documented in the archaeological record. In the San Diego area, the Late Prehistoric Period has been described as a time characterized by an increased number of sites, and “many technological innovations, and new patterns in material culture and belief systems” (McDonald and Eighmey 1998:III-1). This description, in fact, aptly describes the period for the entire San Diego County area. Changes in tool and ornament types, burial practices, and site location choices, from those documented for the earlier periods, are well documented in the archaeological record.

As with the earlier periods, archaeologists have, based on analysis of artifact assemblages, defined distinctive complexes for the Late Prehistoric Period cultures of the area. Two complexes have been defined for the protohistoric occupants of the area, one, designated as "San Luis Rey,” is identified for southern Orange, western Riverside, and northern San Diego Counties; and the other, the "Cuyamaca," for southern San Diego County (Meighan 1954; True 1966, 1970; True et al. 1974). The San Luis Rey complex is believed to be the progenitor of the Shoshonean-speaking peoples (Luiseño/Juaneño culture) living in the area at the time of historic contact in northern San Diego County (referred to as San Luis Rey of Shoshonean origin) (cf. Koerper 1979). Those of southern San Diego County (Cuyamaca; Yuman), are believed to be the ancestors of the Hokan-speaking Diegueño or Kumeyaay (Ipai/Tipai) occupying southern San Diego County at contact.

Small projectile points are common, including both Cottonwood Triangular and Desert Side-Notched, and both occur in serrated forms and other stylistic variations that might be a matter of cultural influence or lithic material workability. Ceramics were also common throughout San Diego County during the Late Prehistoric Period, with those found in the southern portions of San Diego County occurring earlier in time and more specialized in form. Cuyamaca complex (Diegueño/Kumeyaay) ceramics include a variety of vessel types, rattles, bow pipes, and effigies. During this period ceramics manufactured in the desert make their way to coastal areas through trade or direct acquisition, and there are generally referred to as Colorado Buff Wares, although many varieties age. Steatite and milling stones also are more common in the southern San Diego County sites, and bedrock milling becomes the preferable grinding surface as portable mortars and metates almost completely disappear during this period.

Practices relating to disposal of the dead change from the Archaic from inhumation to cremation. Kumeyaay burial practices consist primarily of cremation and placement of the ashes into urns in which specially made mortuary offerings were also placed

(DuBois 1907; Kroeber 1925). Urns were then usually chased in special places and are very infrequently found in association with midden deposits.

Late Prehistoric cultures went through a dramatic cultural upsurge right before the arrival of Spanish settlers in 1769. Much larger villages were formed, with more complex activities occurring, and possibly even some craft specialization among potters, basket weavers, and projectile point manufacturers. This is an aspect of Kumeyaay culture that has yet to be explored as it has elsewhere within California (Jones and Klar 2007). Certainly the impact of Europeans on the Kumeyaay lifeway was felt long before their arrival and establishment of permanent settlements. It is estimated that introduced diseases may have preceded their arrival by as much as 200 years in some areas of the Americas, and then decimated as much as 95% of the New World's Native populations prior to the arrival of Europeans on the east coast of North America and the Spanish and Russians on the west coast (Mann 2006).

HISTORY

Cultural activities within San Diego County, between the late 1700s and early 1900s provides a record of Spanish, Mexican, and American rule, occupation and land use. An abbreviated history of this area is presented to provide a background on the presence, chronological significance, and historical relationship of cultural resources within the study area.

The Spanish period represents exploration; establishment of the San Diego presidio and the San Diego and San Luis Rey missions; the introduction of horses, cattle, sheep, pigs, corn, wheat, olives and other agricultural goods and implements; and a method of building construction and architectural style. Spanish influence continued beyond the year 1821, when California came under Mexican rule, because the missions continued to operate as they had in the past although with reduced funding and support. Laws governing the distribution of land were also retained for a period of time. Forest lands were only occasionally penetrated during this period because of the relatively small numbers of Spaniards, a colonial settlement pattern that focused on coastal missions and presidios, and the resistance of inland/mountain Kumeyaay to Spanish intrusion.

The Mexican period includes the retention of Spanish laws and practices until shortly before secularization of Mission San Diego de Alcalá in the 1830s, over a decade after Spanish rule had ended. Although several Spanish grants of land were made prior to 1834, after secularization, vast tracts of land were granted and the Rancho era began. Cattle ranching prevailed over other agricultural activities and development of the hide and tallow trade increased during the early part of this period. The Pueblo of San Diego was established, Los Angeles and San Gabriel became major settlements, and transportation routes expanded. The Mexican Period ended as a result of the Mexican-American War in 1846-48. While the Mexican landowners pushed further into the interior hills and mountains than had the Spaniards, settlement and extensive land use

still focused on the coastal plain and nearby inland valleys. In part this was because the Kumeyaay controlled the inland valleys and mountains well into the American period.

The American period began when Mexico ceded California to the United States under the Treaty of Guadalupe Hidalgo. In direct violation of that treaty, the California Lands Commission was created by the State of California in response to the Act of 1851 that provided a means of validating land ownership throughout the state through settlement of land claims. Few Mexican ranchos remained intact because of legal costs and a lack of what Americans considered to be sufficient evidence to provide title claims. Much of the land that once constituted rancho holdings became public land, available for settlement by emigrants to California. The influx of people to California and the San Diego region was the result of various historical and economic forces. These forces include the discovery of gold in the state, conclusion of the Civil War, subsequent availability of free land through passage of the Homestead Act, and importance of the area as an agricultural area supported by the construction of connecting railways.

The growth and decline of towns occurred in response to an increased population and the economic "boom and bust" period of the late 1880s. As the so-called western frontier closed and the once Wild West sprouted cities, ribbons of railroad steel, and harbors teeming with ships, the pressure to develop more interior lands mounted. The former Mission lands that tended thousands of cattle, were slowly being turned into agriculture to feed the ever burgeoning population of the region. [Carrico et al. 2003]

Within the specific project region a unifying theme has followed human occupation: Transportation. The natural corridor along present-day State Route 94 followed a path of least resistance that would have allowed people to start at the Pacific Ocean and continue eastward all the way to Jacumba. At Jamacha Junction there was a naturally occurring meeting of four trail systems running east-west and north-south. What undoubtedly started out as footpaths, these have continued up to the present day as major motorized vehicle arteries.

The 8,881-acre Jamacho Rancho was given to Doña Apolinaria Lorenzana in 1840, after the Mission Period and six years after secularization of the missions by Mexico. The ranch went through a number of ownerships over the years, being piecemealed like so many of the ranchos were. While cattle ranching remained on the land into the late 1960s, other businesses included Isham's Spring, where mineral water was bottled as a cure-all in the 1880s (Moyer 1969:19); other tracts were soon developed for housing, including Rancho San Diego, Monte Vista and Dictionary Hill; Cottonwood Country Club, which opened in 1962; and shopping centers, including the Rancho San Diego Towne Center and Rancho Plaza, just southeast of the project area. Today the region is one of stark contrast between its heavily developed western side, to its mostly undeveloped eastern side.

Chapter 4 Field Methods

A pedestrian field survey of the project was undertaken by Martin D. Rosen on September 19, 2011 (see professional qualifications in Attachment σ). The survey took less than two hours to complete. Most of the proposed access road follows existing graded dirt roads. It begins on the south at the north end of the proposed Sheriff's substation. It follows a dirt road for c. 137 m (450') until it reaches an Otay Water District (OWD) waterline easement. The original access road plan was to have it run along the waterline, but that got nixed in favor of two alternatives that parallel the waterline, one to the north of it and one to the south. The southern alternative would cross coastal sage scrub vegetation for approximately 61 m (200') while it parallels the waterline. This vegetation has been described as either disturbed "coastal sage scrub" or "disturbed habitat" (Eidson 2011). The northern alternative on the other hand would cross through relatively undisturbed coastal sage scrub for roughly the same 61 m (200') distance. Once north of the waterline easement the proposed access road would follow another existing dirt road c. 215 m (705') until it enters the OWD property. At this point it meets up with existing blacktop.

During the course of the survey no cultural materials of any kind, except modern trash, were observed. The proposed impact depth from construction is not expected to exceed 76 cm (2.5'). It is extremely unlikely that any cultural materials would be found during project implementation. Based on my extensive experience working in this part of San Diego County (Rosen 1981, 1982, 1983a, 1983b, 1983c, 1983d, 1984; Rosen and Snyder 1981), the author would not recommend monitoring by an archaeologist or Native American during construction. ASM (Iversen 2008) surveyed the property immediately to the south for the proposed Rancho San Diego Sheriff's Station. No cultural resources were identified. Site CA-SDI-4763 was potentially identified in the records search as extending into the project area; however, based on the extensive disturbances to the land subsequent to previous archaeological investigations (Rosen 1982; Gallegos et al. 1988), ASM determined that the portion of the site extending into the Sheriff's substation property had been destroyed. The final Mitigated Negative Declaration for the project did not recommend monitoring during construction.

Chapter 5 Study Findings and Conclusions

A literature and records search at the SCIC indicated that the access road footprint had probably been surveyed in its entirety in the past, although most recently in 1984. The current survey did not identify any cultural resources within the project area.

The project area is entirely on graded existing dirt slopes, some on raised grade, or on slopes, all above and north of State Route 94 (Figure 3). Giving the existing geology, discussed earlier, and the current highly disturbed on-site conditions, it is exceedingly unlikely that buried cultural deposits would exist within the project footprint.

Although no archaeological resources are anticipated to be encountered, as a condition, the project is required to comply with Section 87.429 of the County's Grading, Clearing and Watercourses Ordinance that requires suspension of grading operations when human remains or Native American artifacts are encountered. In addition, the project must also comply with Section 7050.5 of the Health and Safety Code and Section 5097.98 of the Public Resources Code that requires excavations to be stopped in an area where human remains are found until the County Coroner can determine if they are Native American. The Coroner is required to notify the NAHC if the remains are Native American. The NAHC would then notify the MLD. Further provisions of PRC§5097.98 would be followed as applicable. If artifacts are encountered, then work would stop in the vicinity of the find until a qualified archaeologist could determine their nature and significance.

It is the preferred practice to avoid cultural resources wherever and whenever possible. Further investigations may be needed if unanticipated cultural resources are encountered that cannot be avoided by the project. An additional archaeological survey may be required if the access road footprint changes to include areas not previously surveyed.

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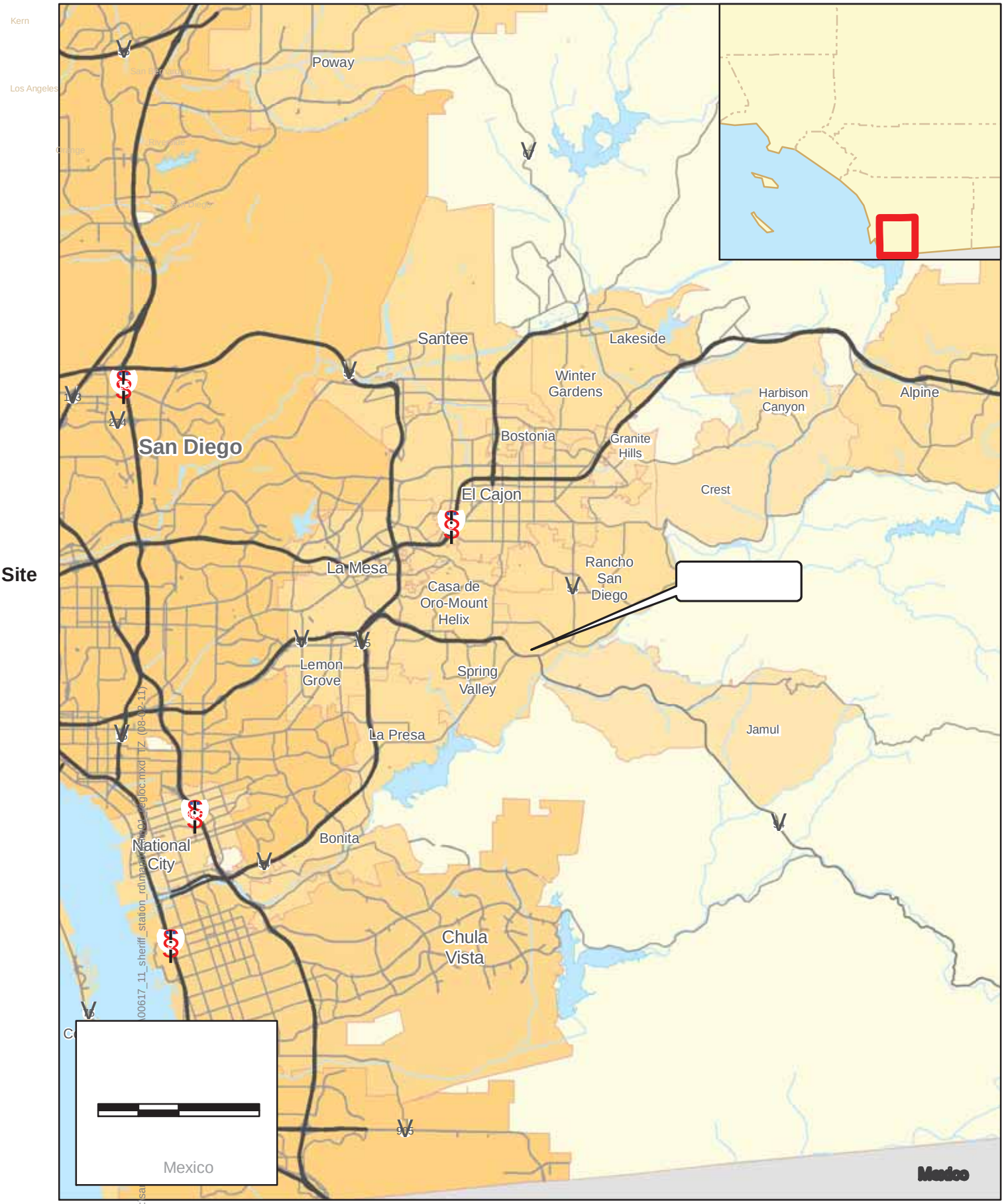
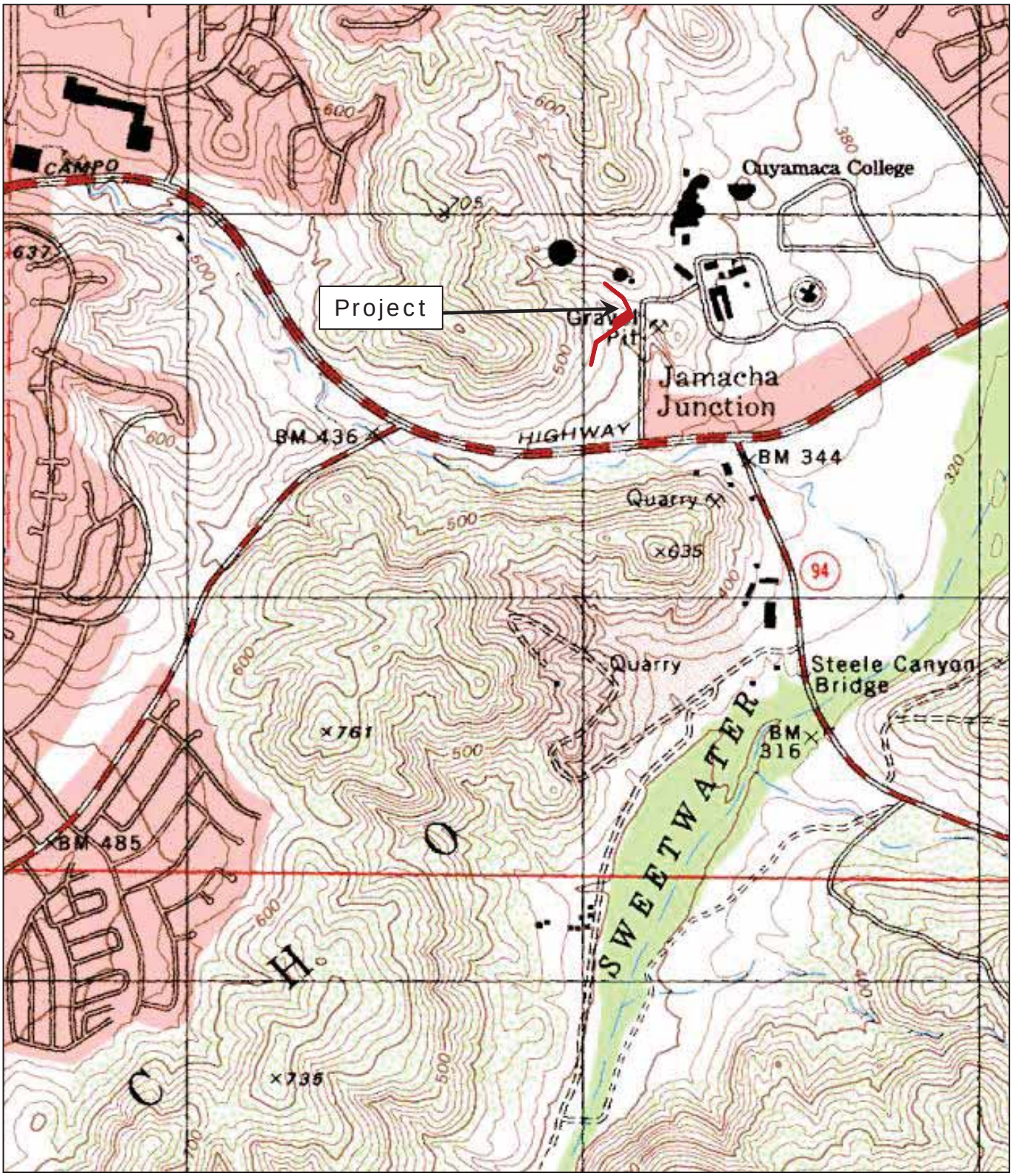


Figure 1
Regional Location
OWD Regulatory Site Access Road



Portion of the *Jamul Mtns.* (1994) 7.5' USGS topographic quadrangle.

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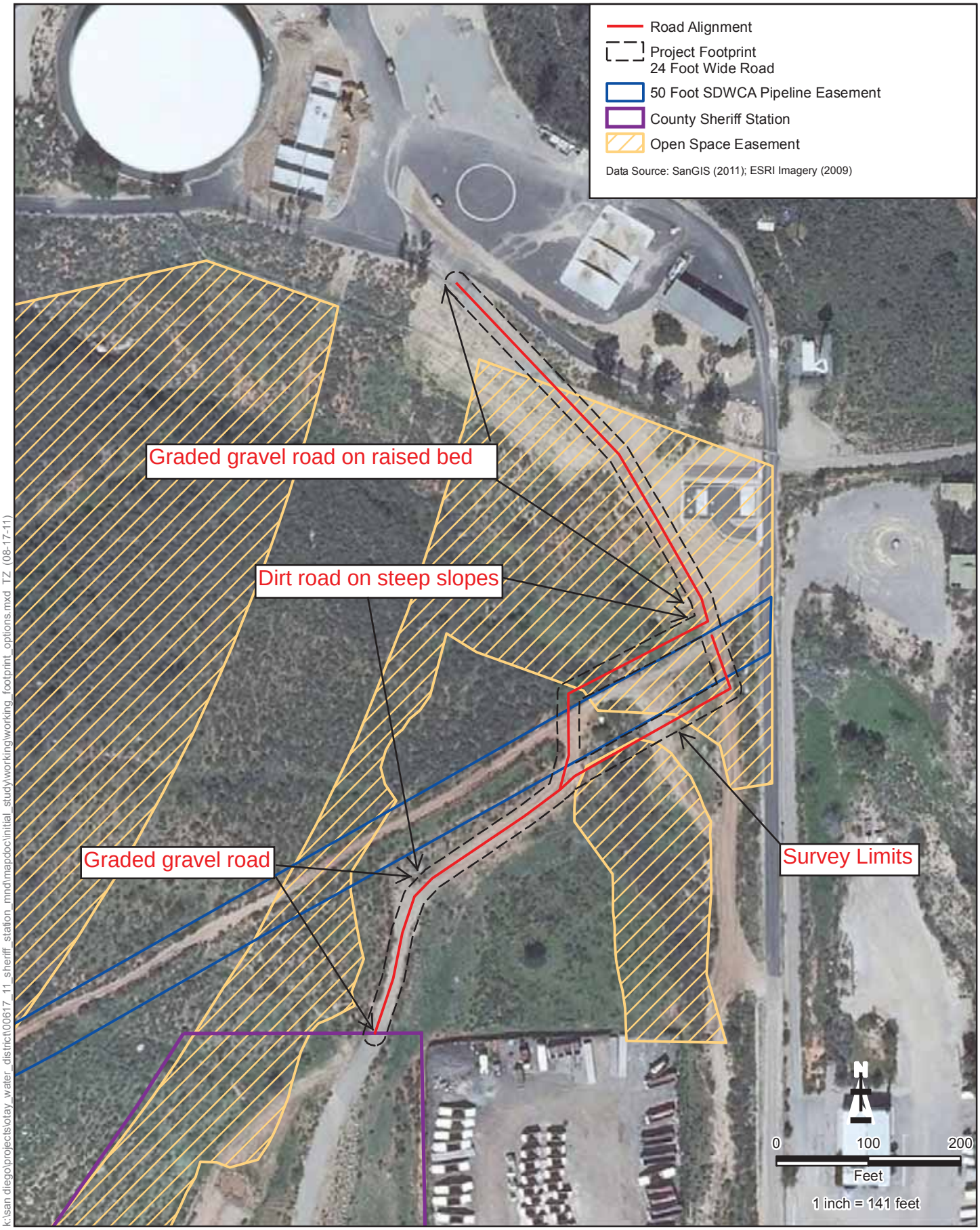
Figure 2
Project Vicinity
OWD Regulatory Site Access Road



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ICF INTERNATIONAL

Figure 3: Project Alternatives North & South of Pipeline Easement

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ATTACHMENT 1

RECORDS SEARCH

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Job # **00617.11**

RECORD SEARCH REQUEST

August 8, 2011

Dear Mr. Caterino,

Would you please have the SCIC GIS staff conduct a search of maps, files, and databases for the occurrence of archaeological resources, including historic resources, within the designated record search area as identified on the accompanying PDFs and GIS shapefile. The OWD Regulatory Site Access Road Project is located in Rancho San Diego within unsectioned portions of Township 16 South, Range 1 West (Jamacho Land Grant). ICF International is requesting that the following be sent:

1. ESRI GIS shape files of each resource located within the designated area,
2. ESRI GIS shape files of each survey/study conducted within the area,
3. a set of DPR forms for each resource located within the designated area,
4. bibliographical info for each survey/study conducted within designated area,
5. digital versions of all historic maps that overlap any portion of the buffer,
6. a list of historic structures and the associated DPR forms for each.

No hard copies are requested. Please, include our **job number** (shown in upper right corner) in all correspondence. Thank you.

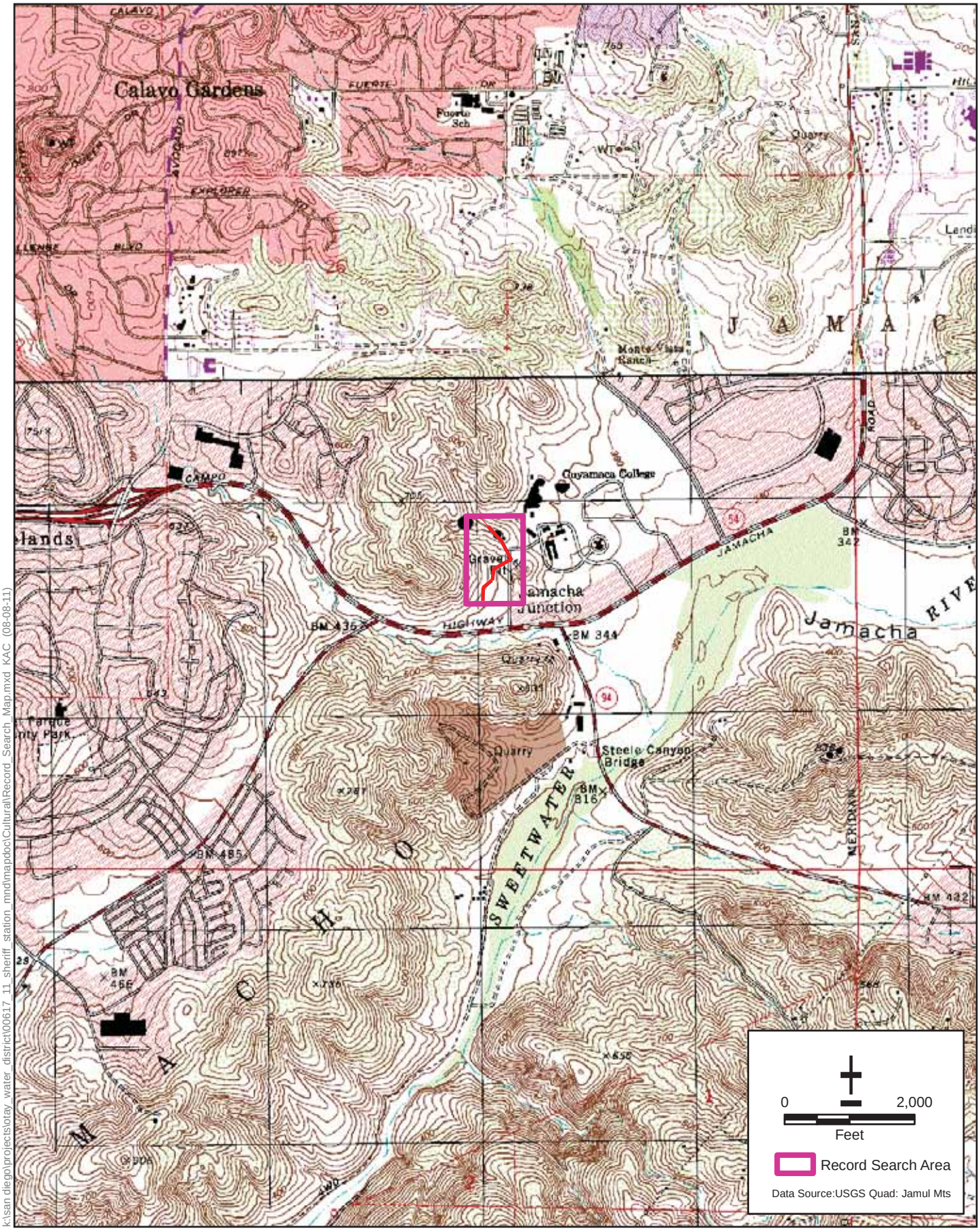
USGS 7.5' Topographic sheet: **Jamul Mtn**, CA

Please send information to: Karolina Chmiel at kchmiel@icfi.com

Thank you,

Karolina Chmiel, Archaeologist
ICF International

9775 Businesspark Avenue, Suite 200 — San Diego, CA 92131 — 858.578.8964 — 858.578.0573 fax — icfi.com



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ICF INTERNATIONAL

Figure 1
Record Search Map
OWD Regulatory Site Access Road

South Coastal Information Center
4283 El Cajon Blvd., Suite 250
San Diego, CA 92105
Office: (619) 594-5682
Fax: (619) 594-4483
scic@mail.sdsu.edu
scic_gis@mail.sdsu.edu

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM RECORDS SEARCH

Company: ICFI

Company Representative: Karolina Chmiel

Date Processed: 9/9/2011

Project Identification: Otay Water District Regulatory Site Access Rd # 00617.11

Search Radius: within designated boundaries

Historical Resources: ND

Trinomial and Primary site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Previous Survey Report Boundaries: ND

Project boundary maps have been reviewed. National Archaeological Database (NADB) citations for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Addresses: ND

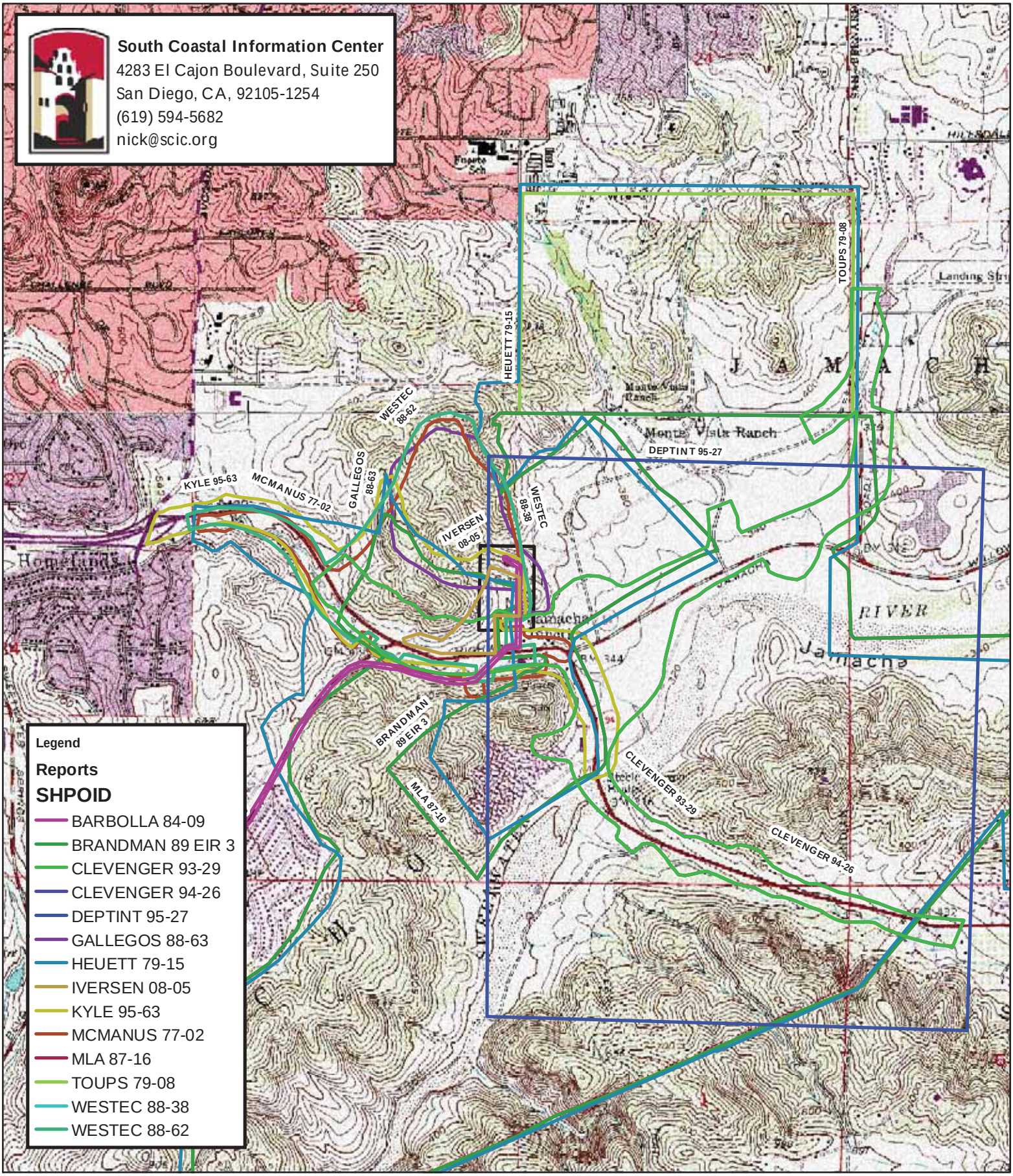
A map and database of historic properties (formerly Geofinder) has been included.

Historic Maps: ND

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Summary of SHRC Approved CHRIS IC Records Search Elements	
Address-Mapped	no
GIS Shapes:	0
GIS Shapes:	14
Searchable Pages:	14
Standard Pages:	0
Aerial Photos:	0
Quads:	1
Hours:	1
RUSH:	no

This is not an invoice. Please pay from the monthly billing statement



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Nick Doose, Sep 09, 2011

Reports

USGS 7.5 Minute Series Topographic Map
Jamul Mountains Quadrangle

ATTACHMENT H

PLANT AND ANIMAL SPECIES IN THE PROJECT AREA

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Attachment: Plant Species Detected in the Survey Area

Scientific Name	Common Name	Special Status
EUDICOTS		
Adoxaceae - Adoxa Family		
Sambucus mexicana	Blue Elderberry	
Anacardiaceae - Sumac Or Cashew Family		
Malosma laurina	Laurel Sumac	
* *Schinus molle*	Peruvian Pepper Tree	
Apiaceae - Carrot Family		
* *Foeniculum vulgare*	Sweet Fennel	
Asteraceae - Sunflower Family		
Artemisia californica	California Sagebrush	
Baccharis pilularis	Chaparral Broom, Coyote Brush	
Baccharis salicifolia	Mule-Fat, Seep-Willow	
Baccharis sarothroides	Broom Baccharis	
Bahiopsis laciniata	San Diego Sunflower	CRPR 4.2
* *Centaurea melitensis*	Tocalote	
Conyza canadensis	Horseweed	
Encelia californica	California Encelia	
Encelia californica x farinosa	California Hairy Encelia	
Ericameria palmeri var. palmeri	Palmer's Goldenbush	CRPR 1B.1
Gutierrezia californica	California Matchweed	
Hazardia squarrosa	Sawtooth Goldenbush	
Heterotheca grandiflora	Telegraph Weed	
Isocoma menziesii	Spreading Goldenbush	
Iva hayesiana	San Diego Marsh-Elder	CRPR 2.2
* *Lactuca serriola*	Prickly Lettuce	
Laënnecia coulteri	Coulter's Horseweed	
Pseudognaphalium californicum	California Everlasting	
Stephanomeria exigua	Small Wirelettuce	
Boraginaceae - Borage Family		
Heliotropium curassavicum	Salt Heliotrope	
Brassicaceae - Mustard Family		
* *Hirschfeldia incana*	Short-Podded Mustard	

Scientific Name	Common Name	Special Status
Cactaceae - Cactus Family		
Cylindropuntia prolifera	Coast Cholla	
Opuntia littoralis	Coast Prickly-Pear	
Chenopodiaceae - Goosefoot Family		
* *Chenopodium album*	Lamb's Quarters	
Convolvulaceae - Morning-Glory Family		
Cuscuta sp.	Dodder	
Euphorbiaceae - Spurge Family		
Croton californicus	California Croton	
Croton setigerus	Doveweed	
* *Ricinus communis*	Castor Bean	
Fabaceae - Legume Family		
Acmispon glaber	Deerweed	
Lamiaceae - Mint Family		
* *Marrubium vulgare*	Common Horehound	
Salvia apiana	White Sage	
Salvia mellifera	Black Sage	
Myrtaceae - Myrtle Family		
* *Eucalyptus sp.*	Gum	
* *Eucalyptus polyanthemos*	Silver Dollar Gum	
* *Melaleuca sp.*	Bottlebrush	
Nyctaginaceae - Four O'clock Family		
Mirabilis laevis	Wishbone Plant	
Phrymaceae - Hopseed Family		
Mimulus aurantiacus	Bush Monkey Flower	
Polygonaceae - Buckwheat Family		
Eriogonum fasciculatum	California Buckwheat	
Rhamnaceae - Buckthorn Family		
Rhamnus crocea	Spiny Redberry	
Rosaceae - Rose Family		
Heteromeles arbutifolia	Toyon	
Salicaceae - Willow Family		
Salix laevigata	Red Willow	
Schrophulariaceae -Figwort Family		
* *Myoporum laetum*	Ngaio	
Scrophularia californica	California Bee Plant	

Scientific Name	Common Name	Special Status
Solanaceae - Nightshade Family		
* *Nicotiana glauca*	Tree Tobacco	
Tamaricaeae - Tamarisk Family		
* *Tamarix ramosissima*	Tamarisk	

Legend

*= Non-native or invasive species

Special Status:

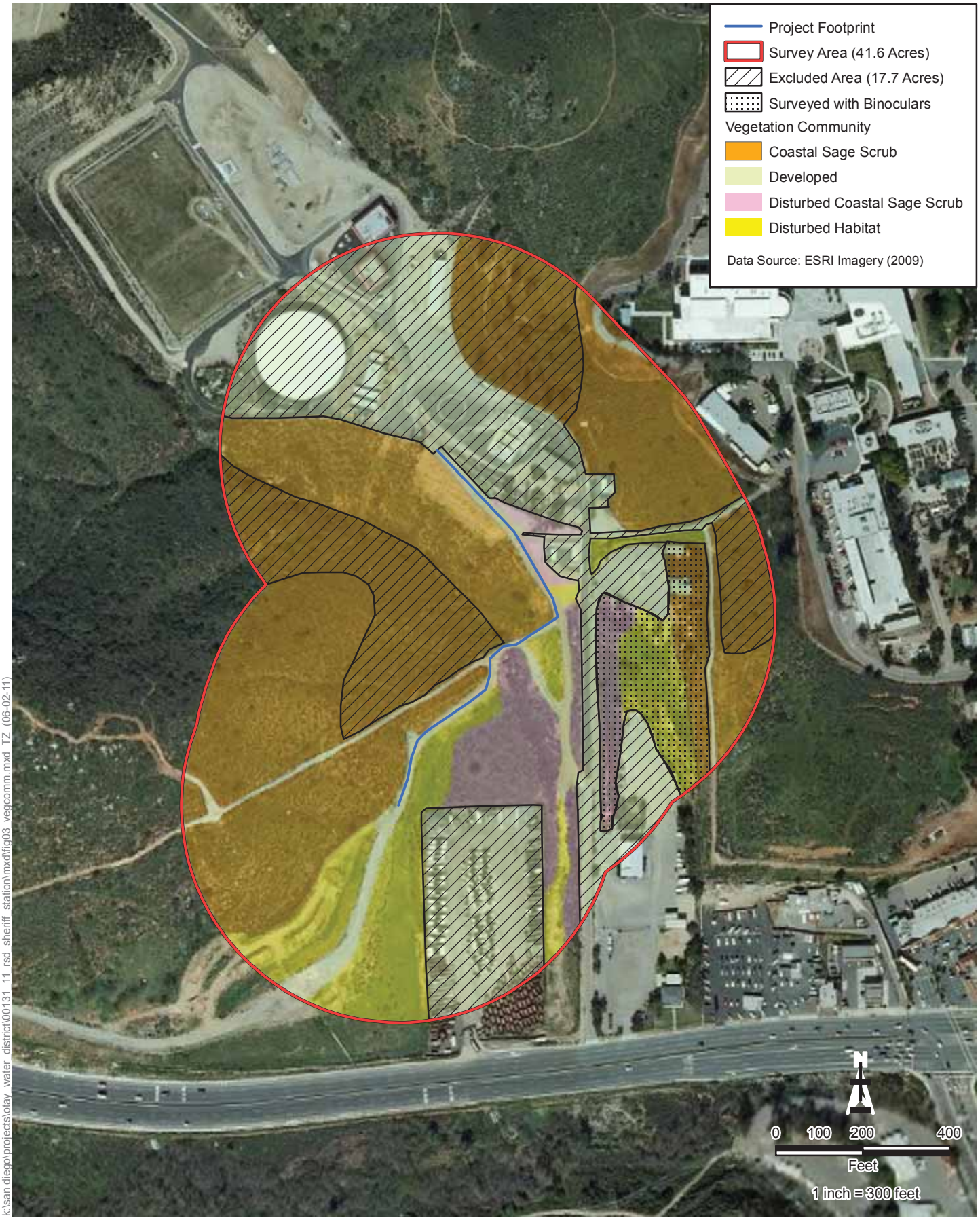
Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
SR = Rare

CRPR – California Rare Plant Rank
1A. Presumed extinct in California
1B. Rare or Endangered in California and elsewhere
2. Rare or Endangered in California, more common elsewhere
3. Plants for which we need more information - Review list
4. Plants of limited distribution - Watch list

Threat Ranks
.1 - Seriously endangered in California
.2 – Fairly endangered in California
.3 – Not very endangered in California

Note that in March, 2010, CDFG changed the name of “CNPS List” or “CNPS Ranks” to “California Rare Plant Rank” (or CRPR). This was done to reduce confusion over the fact that CNPS and DFG jointly manage the Rare Plant Status Review groups that the rank assignments are the product of a collaborative effort and not solely a CNPS assignment.



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ICF INTERNATIONAL

VEGETATION COMMUNITIES IN PROJECT AREA

Attachment: Wildlife Species Detected in the Survey Area

Scientific Name	Common Name	Special Status
INVERTEBRATES		
Moths, Skippers and Butterflies		
Pontia protodice	Checkered White	
Strymon melinus	Gray Hairstreak	
Junonia coenia	Common Buckeye	
VERTEBRATES		
Birds		
Zenaida macroura	Mourning Dove	
Calypte anna	Anna's Hummingbird	
Polioptila californica californica	Coastal California Gnatcatcher	FT, CSC
Chamaea fasciata	Wrentit	
Melozone crissalis	California Towhee	
Carpodacus mexicanus	House Finch	
Mammals		
Sylvilagus audubonii	Desert Cottontail	

Legend

*= Non-native or invasive species

Special Status:

Federal:
FE = Endangered
FT = Threatened

State:
SE = Endangered
ST =Threatened
CSC = California Species of Special Concern
CFP = California Fully Protected Species

ATTACHMENT 4

PROFESSIONAL QUALIFICATIONS OF MARTIN D. ROSEN

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Martin D. Rosen, MA, RPA

Cultural Resources Specialist

Martin Rosen has over 38 years experience as a cultural resource professional where he has worked extensively in southern California, and also in the Great Basin, the Southwest, and in Guatemala. He joined ICF in November 2010 after a 30-year career at Caltrans District 11 (San Diego and Imperial Counties), the last 10 spent as the senior cultural resources specialist. He was the District's Heritage Resources Coordinator from 1988 until his departure. At Caltrans he ran numerous capital projects of every size, from small curve corrections, to major highway construction projects covering dozens of miles.

Prior to that Martin ran the State Office of Historic Preservation's California Historical Resources Information System at the University of California, Los Angeles, from 1975-1980. During that time he also worked on research and compliance projects on Santa Catalina Island; in Santa Barbara, Kern, Inyo, Ventura, Los Angeles, Orange, San Bernardino, Riverside and Mono Counties; worked at the pre-Classic period site of El Balsamo in western Guatemala; and spent parts of three summers working on the Pajarito Plateau of northern New Mexico.

Martin has over two dozen professional publications, and has served as an editor on ten volumes of the Society of California Archaeology's publication, *The Proceedings*. He has delivered dozens of professional papers and presentations, has authored or co-authored over 300 cultural resource compliance documents, and has overseen the work of others on just as many projects, which involved not only archaeology (historical and prehistoric), but the built environment (historic roads, residences, businesses, bridges, water conveyance systems, train depots, beach boardwalks and seawalls).

Project Experience

Infrastructure – Roads, Bridges, and Highways

State Route 125 South—FHWA/Caltrans, San Diego County, California

Cultural Resource Manager and Field Supervisor. The project involved the creation of 11 miles of new freeway on new alignment.

Total Years of Experience

02/1972

Years with ICF

11/2010

Education

MA, Anthropology, University of California, Los Angeles, 1977

BA, Anthropology, University of California, Los Angeles, 1974

Special Training

Section 106

Section 4(f)

NEPA/CEQA

Prehistoric archaeology

Historical archaeology

Geoarchaeology

Historic architecture and historic bridges

Instructional Experience

NEPA/CEQA Environmental Academy, Caltrans

Section 106 Programmatic Agreement, Caltrans, LA Metro

District 11 Environmental Short Course, Caltrans

Professional Memberships

Society for American Archaeology

Society for California Archaeology

San Diego County Archaeological Society

San Diego Archaeological Center

San Diego History Center

Save Our Heritage Organization

Certifications

Registered Professional Archaeologist (RPA), No. 10302

Certified Professional Archaeologist by the County of San Diego, City of San Diego, San Diego Unified Port District, and County of Riverside

Professionally Qualified Staff (PQS) equivalent for Caltrans as a P.I. in Prehistoric Archaeology

He authored many of the reports and provided oversight on consultant field activities and documents. Numerous cultural resources were involved within the project's Area of Potential Effects (APE), including significant archaeological and built environment resources, which ultimately led to data recovery of one site. Sites included everything from a large ethnographic Kumeyaay village, to numerous surface scatters, many campsites, a historic dam, the U.S. Grant Jr. summer residence, and just about every possible resource in-between. Documentation included numerous survey reports, excavations reports, historic property survey reports, finding of effects, and a memorandum of agreement.

Cabrillo Historic Parkway, State Route 163 from "A" Street in downtown San Diego to Interstate 8 in Mission Valley—FHWA/Caltrans/City of San Diego, California

Managed all of the cultural resource work that took place within the historic district, including bridge seismic retrofits, pavement rehabilitation projects, median barrier project, and signage and landscaping projects. The area described above encompasses all of the officially designated Cabrillo Historic Parkway, a National Register eligible historic district, which has also been placed on the California Register of Historical Resources. Contributing elements of the historic district include the roadway, its on- and off-ramps, the landscaping, and all nine of the bridges that connect to or cross over the parkway. The route was designed in the late 1930s, but the advent of World War II prevented its construction from going ahead until 1946. Its design is truly beautiful and lushly vegetated. Proposed projects over the years have threatened to compromise its integrity and eligibility to the historic registers. Working closely with the engineers Mr. Rosen was able to make sure projects would not adversely affect the district; he prepared Section 106 documentation for processing to the State Historic Preservation Officer (SHPO); consulted on Section 4(f) determinations; and helped write portions of environmental documents.

State Route 86—FHWA/Caltrans, Imperial and Riverside Counties, California

Cultural Resource Director for the two-lane widening of SR-86 from SR-78 in Imperial County, to Oasis in Riverside County, a distance of 21 miles. Dozens of archaeological sites occurred within the project's APE, including dune midden deposits, surface lithic and ceramic

scatters, pot drops, rock rings/circles/fish traps, rock art, and cremations. All the fieldwork was performed by Caltrans District 11 staff. Authored all survey and excavation reports, and Section 106 compliance documents. In total, over a year was spent in the field in Imperial and Riverside Counties. Through the analysis of the beads remains at the Elmore Site in the 1990s, a shell bead manufacturing site was identified for the first time in the Colorado Desert. His work also revealed that fish traps occurred at elevations far lower below sea level than previously thought.

State Route 11— FHWA/GSA/Caltrans/City and County of San Diego/ GSA, San Diego County, California

Directed all cultural resource activities, oversaw consultant's work, co-wrote survey and excavation reports, and prepared Section 106 compliance documents. Project involved the construction of three miles of new freeway on new alignment, and the construction of a new Port of Entry on East Otay Mesa. Dozens of archaeological sites were recorded within the project study area, and one proposed alignment was dropped because of the presence of important archaeological remains and sensitive biological habitat.

State Route 905 and Widening of Otay Mesa Road—FHWA/ Caltrans/City of San Diego, San Diego County, California

Directed all cultural resource studies for the widening of Otay Mesa Road, and the extension of State Route 905 on Otay Mesa. The SR-905 extension involved the construction of new freeway on new alignment for a distance of 6.7 miles. Numerous archaeological and historical resources requiring formal evaluation occurred within the project APE. Ultimately, a potential historic cemetery required monitoring during construction, where one empty coffin was recovered, and one significant archaeological was protected by changing the project alignment. A significant outcome of this work involved the creation of the *Otay Mesa Prehistoric Archaeological Management Plan*. The Plan is designed to guide future archaeological investigations on the Mesa, with the goal of focusing on those resources with further research potential, while programmatically dismissing those sites with no further research potential. The Plan has been accepted by the State Office of Historic Preservation.

Historic Bridge Projects in San Diego County—FHWA/Caltrans/City of San Diego/County of San Diego, California

Worked on practically every significant historic bridge project in San Diego County, with all, to date, having been preserved in place. The list includes: The Cabrillo (aka, El Prado) Bridge on SR-163, Bonsall Bridge on SR-76, Steele Canyon Bridge on SR-94, 1st Avenue Bridge over Maple Canyon, Georgia Street Bridge over University Avenue, Black Canyon Road Bridge over Santa Ysabel Creek, Sorrento Overhead in Del Mar, Old Highway Bridges from the Descanso cutoff to Jacumba, and all overcrossing bridges along SR-163 through Balboa Park. Many of the bridges required rehabilitation and/or seismic retrofitting, with the goal to make sure the bridges' integrities were not compromised during the process. Martin directed all the cultural resource efforts and processed the Section 106 documents. He was heavily involved during construction phases to make sure the *Secretary of the Interior's Guidelines* were successfully followed. In a few cases, bridges were being replaced on new alignments, and Martin convinced FHWA that the historically significant bridges should be preserved in place for pedestrian and other non-motorized uses, and then he convinced the County of San Diego to accept liability and future maintenance for these structures.

Chicano Park and the Chicano Park Murals—FHWA/Caltrans/Chicano Park Steering Committee, San Diego, California

The park was created in April 1970 when Chicano activists protested the potential creation of a California Highway Patrol substation under the eastern approach ramps to the San Diego-Coronado Bay Bridge in the Barrio Logan community. The people gathered in human chains and successfully got Caltrans to stop the air space lease. In early 1972 muralists started painting on the columns creating magnificent works of art expressing every facet of Latino culture, history, mythology, iconography, religion, heroes, education and the environment. Martin started working with the community in the mid-1990s when Caltrans announced plans to seismically retrofit the bridges. He successfully lobbied the engineers to find a way to retrofit the bridges without harming the murals. He processed the cultural documentation necessary to satisfy Federal and State requirements, where both the murals and the park were found to be eligible for listing on the National and California historic registers. Then in 2002, applied for and received a $1.6 million grant to restore

a number of murals in the park. He worked with two of the muralists to help create the *Mural Restoration Guidance Manual*.

State Route 76—FHWA/Caltrans, San Diego County, California

Worked on every project along SR-76 from Interstate 5, to well past Interstate 15, a distance of more than 20 miles. Through a succession of projects along the route, he conducted fieldwork at numerous prehistoric sites, and worked at part of the Mission San Luis Rey de Francía, where a previously unknown segment of the Mission's original garden wall was rediscovered. The projects involved significant Luiseño village sites, two rock art loci, a historic bridge, and numerous prehistoric campsites and bedrock milling sites. All work was conducted with Caltrans staff from 1982 to 1992, and then using consultants up to the present. He was responsible for the processing of Section 106 and California PRC§5024 requirements on more than one dozen projects during the above timeframe.

Selected Publications

Rosen, Martin D., and Jennifer Corsiglia. 1981. Stone Artifacts. *The Student's Guide to Archaeological Illustrating*, edited by Brian D. Dillon, pp. 105-114. Archaeological Research Tools No. 1. Institute of Archaeology, University of California, Los Angeles.

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Employment History

Caltrans

1980-2010: Archaeological Field and Report Experience

Martin's career at Caltrans District 11 spanned three decades and covered hundreds of projects. Work was accomplished all over San Diego, Imperial and Riverside Counties, on practically every single

Interstate highway or State Route in those counties. A simple summary must suffice to list all the different kinds of documents he worked on. He authored roughly 97% of the documents himself, with the remaining 3% having been co-authored. Archaeological Survey Reports (ASRs) numbered close to 80. Test excavation documents included another 17 documents, ranging in scale from single site investigations, to those involving 10 or more sites. He worked on two data recovery reports, authored two Memoranda of Agreement (MOAs), co-authored a single Historic American Engineering Report (HAER), prepared a dozen proposals for archaeological excavations, another dozen formal determinations of eligibility and/or adverse effects, compiled 31 seismic retrofit programmatic agreement reports for Sacramento, and analyzed and documented the shell beads and ornaments from another seven projects. Lastly, he prepared over 150 Historic Property Survey Reports (HPSRs), the document that Caltrans uses to formally submit its Section 106 (historic property) findings to the SHPO. Some of the above listed State Routes include those where almost all documents were prepared by Mr. Rosen over his 30-year career, including SR-11, SR-75, SR-76, SR-86, SR-125, SR-163, and SR-905. His knowledge and experience was appreciated by the Headquarters office in Sacramento, and he was frequently invited to participate in training, to help develop protocols, and routinely requested to provide his opinion on numerous aspects of the Caltrans cultural resources compliance process.

IFC International

November 2010 to present

Since coming to ICF Mr. Rosen has managed all or portions of a number of projects, including: Palomar Mountain Fuels Reduction Survey (Section 106), Grossmont Union High School District High School No. 12 (Section 106, CEQA), San Diego Convention Center Phase III expansion EIR (CEQA), San Pasqual Academy expansion (CEQA), San Diego River Park EIR (CEQA), South Santa Fe Avenue (Section 106, CEQA), San Diego County Bridge Preventative Maintenance Projects (Section 106, (CEQA) all in San Diego County; and on the Tukwila trail to shore project in King County, Washington. He serves as Native American advisor for the statewide California High Speed Train project. He is also one of ICF's certified instructors

in Section 106 and Section 4(f) training. He has served as project author or co-author on survey, excavation, historical archaeology, historic architecture, historic property survey reports, data recovery plans, and finding of effect documents for local, state, and federal jurisdictions, and as developer and presenter for Section 4(f) to LA Metro staff.

Appendix D

Geotechnical Report

GEOTECHNICAL INVESTIGATION

Otay Water District Regulatory Site Access Road

OWD Reservoir Site

[illegible] Campo Road

County of San Diego, California

Prepared For:

Otay Water District (OWD)
2554 Sweetwater Springs Blvd.
Spring Valley, California 91978

Prepared By:

[illegible]
[illegible] Ferris Square, Suite [illegible]
San Diego, California [illegible]

Project No. 2069-A08
Log No. 11-1424

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November 16, 2011

Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, California 91978

Project No. 2069-A08
Log No. 11-1424

Attention: Mr. Kevin Cameron

SUBJECT: **Geotechnical Investigation**
Regulatory Site Proposed Access Road
OWD Reservoir Site
11881 Campo Road
County of San Diego, California

Dear Mr. Cameron:

In accordance with your request and authorization we have completed a geotechnical investigation for a Regulatory Site Proposed Access Road at the OWD reservoir site at 11881 Campo Road in the County of San Diego, California. We are pleased to present the following report with our findings, conclusions and recommendations.

Planned construction consists of paving of an existing dirt access road which is west of the existing asphalt paved driveway to the reservoir site. Construction plans were not available during this investigation.

Based on our findings during the course of this investigation, the proposed road construction would be feasible provided the recommendations presented are incorporated into the plans and specifications.

Details related to seismicity, geologic conditions, pavement design, and construction considerations are included in subsequent sections of this report.

We look forward to providing additional consulting services during the planning and construction of the project.

If you have any questions regarding our report, please do not hesitate to contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,
MTGL, Inc.

Eduardo C. Dizon, RCE
Senior Engineer

M.B. (Ben) Lo, RGE
Chief Geotechnical Engineer

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INTRODUCTION

In accordance with your request and authorization, MTGL, Inc. has completed a geotechnical investigation for the proposed access road at the OWD reservoir site at 11881 Campo Road in the County of San Diego, California. The following report presents our findings, conclusions and recommendations based on the results of our investigation, laboratory testing and engineering review.

PROPOSED CONSTRUCTION

Planned construction consists of paving of an existing dirt access road. Construction plans including road width, length and profile were not available during this investigation. It is our understanding that the paved road is designed to meet the County of San Diego public road standards.

SCOPE

The scope of our Geotechnical services included the following:

- Geotechnical investigation consisting of drilling two borings at pre-determined locations to explore subsurface conditions and to obtain samples for laboratory testing.
- Laboratory testing of selected soil samples (See Appendix C).
- Geotechnical engineering review of data and engineering recommendations
- Preparation of this report summarizing our findings and presenting our conclusions and recommendations for the proposed construction.

SITE DESCRIPTION

The existing access road is parallel and west of the existing asphalt concrete paved driveway leading to the OWD reservoir site. Ground surface elevation is approximately 370 feet at Campo Road intersection and 475 feet at the top of the access road. Scattered rock fragments of up to 6 inches in dimension are over the surface of the access road. Active underground water and sewer lines are present within the project site.

FIELD EXPLORATION

The subsurface condition at the site was explored with two test borings at pre-determined locations. The boring locations are shown on the Boring Location Plan (Figure 2). All borings were advanced with a track mounted drill rig equipped with an 6" diameter hollow stem auger. As required, the borings were drilled to depths of 10 feet below existing site grades. Samples were obtained with the Standard Penetration Test (SPT) and CAL Sampler for geotechnical testing. In addition, representative bulk soil samples were obtained from the borings. See Appendix B for further discussion of the field exploration including logs of test borings.

LABORATORY TESTING

The laboratory testing included moisture content for all samples and density for undisturbed samples. The maximum density was determined for compaction and shrinkage calculations. Direct shear was accomplished for soil strength characteristics. Soluble sulfates was determined on selected on-site soil samples to determine its degradation on concrete structure. Resistivity and pH testing were performed on representative soil for corrosion potential of buried metals. Soil index testing including expansion index, gradation, Atterberg limits and sand equivalent were performed on selected soil samples. R-Value testing was performed for pavement recommendations. All laboratory tests were performed in general accordance with ASTM or State of California Standard Methods. The results and expanded explanation of laboratory testing are presented in Appendix C.

GEOLOGY

Regional Geology

The site lies within the Peninsular Ranges province of Southern California. The Peninsular Ranges are a group of mountain ranges, in the Pacific Coast Ranges, which stretch 1500 km from southern California in the United States to the southern tip of Mexico's Baja California peninsula. They are part of the North American Coast Ranges that run along the Pacific coast from Alaska to Mexico. Elevations range from 500 ft to 11,500 ft.

Rocks in the ranges are dominated by Mesozoic granitic rocks, derived from the same massive batholith which forms the core of the Sierra Nevada Mountains in California. They are part of a

geologic province known as the Salinian Block which broke off the North American Plate as the San Andreas Fault and Gulf of California came into being.

According to Kennedy (1975), the Peninsular Ranges province includes two principal rock units. The underlying basement rocks include igneous and metamorphic rocks and the overlying rock units include sedimentary rocks of various types. The basement rocks are structurally complex, metamorphosed volcanics and volcaniclastic rocks and intrusive rocks related in part to emplacement of the Cretaceous age southern California batholith which forms the backbone of the Peninsular Ranges province. The overlying sedimentary rocks were deposited on a high relief surface. Most of the overlying sedimentary rocks are Upper Cretaceous age strata of marine, lagoonal, and nonmarine origin related to two major transgressive and regressive depositional episodes.

The geologic structure of southern California is dominated by right-lateral strike-slip faulting with the movement of two tectonic plates. The San Andreas fault system marks the principal boundary between the Pacific plate and the North American plate. Additional faults that affect the geologic structure of the project vicinity include the Elsinore-Julian Fault and the Rose Canyon Fault.

Local Geology

Based upon available geologic map (Tan, S.S., 2002, Geologic Map of the Jamul Mountains 7.5' Quadrangle), the site is underlain by Cretaceous-aged tonalite, associated with granitic rocks. The tonalite material includes some granodiorite and quartz diorite, which is medium grained, generally dark colored and severely weathered. At boring locations, the material was encountered at depths of 7 feet (B-1) and 4 feet (B-1) below existing grade.

Site Geologic Conditions

A brief discussion of the earth materials encountered in the borings is presented in the following sections. Refer to the boring logs in the Appendix B for a more detailed description of these materials.

Alluvium

Minor alluvium of 1 to 2 feet consisting of light red-brown and yellow-brown silty sand with scattered rock fragments mantles the surface. At the time of investigation the alluvium is dry and loose to medium dense. Soil is non-plastic with expansion potential very low.

Residual Soil

Below the alluvium is residual soil which extend to approximate depths of 7 feet (B-1) and 4 feet (B-2) below existing grade. The residual soil consists of red-brown sandy clay, which was moist and hard at the time of exploration. The residual soil possess a low to very low expansion potential with low plasticity.

Granitic Rock (Tonalite)

The underlying formational material consists of tonalite, associated with granitic rocks. This material was encountered at approximate depths of 7 feet (B-1) and 4 feet (B-2) below existing grade. At the time of exploration the tonalite is highly weathered into clayey sand. The weathered material have mix color of orange-brown, yellow-brown and grey, and predominantly very dense. Weathered material possess a very low expansion potential and low plasticity.

Groundwater

Groundwater was not encountered within boring locations. Static groundwater within the site is estimated to be very deep. However, groundwater levels may be expected to fluctuate seasonally, dependent upon local precipitation, upstream and nearby creeks, landscaping watering, or other unforeseen causes.

Groundwater or seepage is not anticipated to be encountered during excavation or construction.

DISCUSSION OF GEOLOGIC AND SEISMIC HAZARDS

Faulting and Seismicity

Faults are one of the most widespread geologic hazards to development in California. Faults of most concern are those designated as active (less than about 11,000 years since last movement) and

potentially active (11,000 to about 750,000 years). According to Hart and Bryant, (2007) the site is not within a designated earthquake fault zone.

In the event of an earthquake, the closest active fault likely to generate the highest ground accelerations at the site is the Rose Canyon fault, located 11.1 miles west of the site expected to generate a maximum 7.2 magnitude earthquake. The Rose Canyon fault zone is predominantly composed of right-lateral strike-slip faults which extend south-southeast through the San Diego Metropolitan area. A number of other significant faults also occur in the San Diego metropolitan area suggesting that the regional faulting pattern is very complex. Faults such as those offshore are known to be active and any could cause a damaging earthquake.

Other active faults which could cause ground shaking at the site include the offshore Coronado Bank fault, expected to generate a maximum 7.6 magnitude earthquake, located approximately 24.8 miles to the southwest and the Elsinore-Julian fault, expected to generate a maximum 7.1 magnitude earthquake, located approximately 32.7 miles to the northeast.

Ground Motion Parameters

The computer program Earthquake Ground Motion Parameters Version 5.1.0 was used to calculate the CBC site specific design parameters as required by the 2010 California Building Code (CBC). Based upon boring data and SPT values, the site can be classified as Site Class C. The spectral acceleration values for 0.2 second and 1 second periods obtained from the computer program and in accordance with Section 1613.5 of the 2010 California Building Code are tabulated below.

Ground Motion Parameter	Value	2010 CBC Reference
S_S	0.961g	Section 1613.5.1
S_1	0.340g	Section 1613.5.1
Site Class	C	Table 1613.5.2
F_a	1.016	Table 1613.5.3(1)
F_v	1.460	Table 1613.5.3(2)
S_{MS}	0.976g	Section 1613.5.3
S_{M1}	0.497g	Section 1613.5.3
S_{DS}	0.651g	Section 1613.5.4
S_{D1}	0.331g	Section 1613.5.4

Liquefaction Potential

Liquefaction involves the substantial loss of shear strength in saturated soil, when subjected to impact by seismic or dynamic loading. During the lost of strength, the soil mobilizes sufficient to permit both horizontal and vertical movements. Soils that are most susceptible to liquefaction are loose, saturated, uniformly graded and fine sands. Liquefaction potential has been found to be greatest when the groundwater level is less than 50 feet.

Hard sandy clay and very dense weathered rock formation underlie the project site. With these soil conditions and the absence of static groundwater, liquefaction potential at the site is very low.

The State has not yet zoned the San Diego area for liquefaction, as such, official Liquefaction Zone maps are not available. A search of the City and County readily available maps, it appears the site is not located within a liquefaction hazard zone.

Seismic Settlement

Saturated and non-saturated granular soils are subject to densification under strong shaking. The lower the density of the soils, the higher the intensity and duration of shaking, results in greater degree of densification. The project site is underlain by shallow weathered material and hard metavolcanic rocks considered not subject to settlement. Based on the anticipated earthquake effect and the stratigraphy of the site, seismically induced settlement is considered negligible.

Ground Rupture or Subsidence

No known active or potentially active faults, with known surface traces, cross the site. Therefore, the potential for ground rupture due to faulting is considered to be very low. Ground rupture in this context does not refer to ground fissures that may occur as the result of liquefaction, seismically induced settlements or lateral spread. Subsidence in this context does not refer to settlement potentials discussed elsewhere in this report.

Lateral Spreading

Lateral spreading may occur where liquefaction occurs at depth and there is either a nearby free face or there is a general slope of the terrain. The overlying non-liquefiable soils tend to break into

blocks, which then may tilt and move laterally over the liquefiable soils. Given the stated low risk potential for liquefaction, we consider the potential for lateral spreading to be very low.

Landslide Potential

The project site is located in gently rolling and hilly topography. Based upon the Landslide Hazard Map (DMG Open-File Report 95-03), there are no mapped landslide at the site and vicinity area. The site is designated as Area 3-1, which means that slopes within this area are at or near their stability limits due to a combination of weak materials and steep slopes. Although most slopes within Area 3-1 do not currently contain landslide deposits, but they can be expected to fail, locally, when adversely modified.

Tsunamis and Seiches

Given that the site is located a sufficient distance inland from the coast and due to its elevated location, inundation by tsunamis is considered to be nonexistent. Due to the lack of surface water impoundment in the immediate site vicinity, the seiche potential is also considered to be very low to nonexistent.

SUMMARY AND CONCLUSIONS

General Considerations

Given the findings of the investigation, the proposed project appears to be feasible from a geologic and geotechnical standpoint, provided the recommendations presented in this report are fully incorporated into the design and construction of the project. Specific conclusions pertaining to geologic conditions are summarized below:

Excavation Characteristics

The site is mantled by alluvium, underlain by residual soil, in turn, underlain by materials weathered from granitic rocks. These materials can be excavated with conventional heavy duty construction equipment.

The contractor should anticipate different soil conditions to be encountered throughout the proposed access road. Localized large boulders and less weathered formation should be

anticipated to be encountered with difficulty in excavation that may require the use of a heavy-duty rock breaking equipment.

Soil Compressibility

With the exception of the 1 to 2 feet alluvium, the underlying soils including the residual soil and weathered material are not susceptible to compression or consolidation in their current condition. The surficial alluvium is recommended to be excavated, moisture conditioned and recompacted to be suitable for structural support.

Expansion Potential

The soil encountered within boring locations including alluvium, residual soil and weathered material possess a low to very low expansion potential. However, localized highly expansive clayey soil may be present within the residual soil. If encountered within the upper 2 feet of the finish subgrade, expansive clayey soils should be removed and replaced non-expansive material.

Sand Equivalent

Results of sand equivalent testing of the on-site soil range from 13 to 25. With these values the on-site soils would not be considered suitable for use as backfill material for water line trenches per the Water Agencies Standards (WAS), which requires a minimum sand equivalent of 30 . However, unless otherwise specified by OWD or County standards, the on-site material would be suitable for use as backfill material for the trench zone of other underground utilities.

Collapse Potential

Collapsible soils are distinguished by their potential to undergo large decrease in volume upon increase in moisture content even without increase in external loads. The underlying residual soil and weathered material in their current condition are not susceptible to compression. The surficial alluvium are recommended to be removed and recompacted as engineered fill to achieve uniform soil density.

Corrosivity

Corrosion series tests consisting of pH, soluble sulfates, and minimum resistivity were performed on selected sample of the on-site soils see Appendix C for complete results. The soluble sulfate level for the on-site soil ranges from 0.005 to 0.007 percent, indicating a negligible sulfate exposure for concrete structure. As such, no special considerations are required for concrete placed in contact with the on-site soils. However, it is recommended that Type II/V cement to be used for all concrete.

Soluble chlorides range from 0.025 to 0.028 percent. The pH and minimum resistivity test results for the alluvium/residual soil are 6.4 and 1,460 ohm-cm, respectively. The pH value is 6.7 and minimum resistivity is 600 maximum for the weathered material. Underground metal conduits in contact with the on-site soil need to be coated or protected against corrosion. MTGL Inc, does not practice corrosion engineering and we recommend that a corrosion engineer be consulted.

RECOMMEMDATIONS

General

Given the findings of the investigation, the proposed access road is feasible from a geotechnical standpoint, provided the recommendations presented in this report are fully incorporated into the design and construction of the project.

Our recommendations are considered minimum and may be superseded by more conservative requirements of the Otay Water District or County of San Diego. Import soils, if necessary should be a very low expansion potential and should be approved by the Geotechnical Engineer prior to importing to the site.

Grading and Earthwork – Access Road

All earthwork and grading intended for the access road should be accomplished in accordance with the County of San Diego grading standards. Included in Appendix E is recommendation for general earthwork and grading specifications. All site preparation and grading recommendations presented in this report may be superseded by those County of San Diego standard grading specifications.

Prior to the start of grading all vegetation, organic soil and debris should be removed and disposed off site. Clearing and grading should extend laterally at least 10 feet beyond the limits of proposed road construction. Active underground utilities under proposed road construction should be evaluated if need to be relocated or with adequate soil cover below planned pavement surface. Minimum soil cover should be in accordance with the County of San Diego standards.

Construction plans or road profile are not available during this investigation. We anticipate that grading will include minor cut and fill to construct planned road subgrade. Prior to placement of fill the existing surficial 1 to 2 feet alluvium should be removed, moisture conditioned and recompacted as engineered fill. Existing on-site soil with low to very low expansion potential are suitable for use as structural fill provided it is free of rocks greater than 6 inches in dimension. All embankments and structural fill should be placed in lifts of not more than 8 inches; moisture conditioned and compacted to at least 90 percent relative compaction at or slightly over optimum moisture content. The upper 12 inches of subgrade under pavement should be compacted to at least 95 percent relative compaction. This compaction should be obtained just prior to placing aggregate base material. All relative compaction should be based upon ASTM D1557 Test Methods. Moisture content of all fill and backfill should be at or slightly above optimum moisture content.

Import fill should consist of granular soil material with maximum particle size of 3 inches and have an expansion index of less than 20.

Utility Trench Backfill

Soil backfill materials for the pipe and trench zone of water lines should have a minimum sand equivalent of 30 in accordance with the WAS. Unless otherwise specified by the County of San Diego existing on-site material would be suitable for use as backfill for the trench zone of all other underground utilities. All backfill materials should be placed in lifts of not more than 8 inches; moisture conditioned and compacted to at least 90 percent relative compaction per Test Method ASTM D1557. Construction of all underground utilities should be in accordance with the San Diego Area and/or Regional Standard Drawings and utility agencies.

Permanent Slope

For permanent slope that will possess an adequate factor-of safety with respect to surficial and deep seated failure it is recommended that all permanent cut and fill slope be constructed at an

inclination of 2:1 or flatter. All permanent fill slope should be properly constructed with engineered fill. Grading of fill slope should include the construction of key at the toe and benching into natural slope. Cut slopes should be observed during grading to ascertain that no unforeseen geotechnical conditions are present and encountered.

Temporary Excavation

Short term temporary excavations in alluvium and residual soil may be safely made at an inclination of 1:1(horizontal:vertical) or flatter. For weathered materials, the inclination should be 1/2:1 or flatter. If vertical sidewalls are required in excavations greater than 5 in depth, the use of cantilevered or braced shoring is recommended. Excavations less than 5 feet in depth may be constructed with vertical sidewalls without shoring or shielding.

The alluvium and residual soil can be classified as Type C soil, while the weathered materials can be classified as Type B soil.

Shoring Design

Where slopes are not feasible due to spatial or other restrictions, properly designed and constructed shoring should be utilized. Appropriate shoring system may include steel boxes, soldier piles and wood lagging, and internally braced shoring. The actual method of a shoring system should be provided and designed by an engineer/contractor experienced in installing shoring system under similar soil conditions and construction. All trench excavations shall be accomplished in accordance with CAL/OSHA regulations, latest edition.

Shoring should be designed to resist the pressure exerted by the retained soils plus any additional lateral forces due to surcharge loads near the top of excavations. For internally braced shoring, the recommended lateral pressure acting in a uniform load would be 25H, where H is the height of retained soil.

Cantilevered shoring system should be designed for an equivalent fluid weight of 45 pcf. For surcharge load due to equipment and other structures, the shoring should be designed for an additional uniform horizontal pressure of 75 psf. All of the above design parameters assume a level ground surface

It is recommended that the design of a cantilevered shoring system incorporate a passive equivalent fluid weight of 350 pcf for the shoring embedded within relatively undisturbed and competent soil.

Lateral movement of a shored excavation depends on the type and relative stiffness of the shoring system and other soil factors. We anticipate that shoring system be designed for a maximum lateral displacement of not more than one inch.

If other type of shoring system is desired for the project, we should be consulted for the appropriate soil design parameters.

Preliminary Pavement Recommendations

Construction of structural pavement section shall be in conformance with the County of San Diego public road standards. If proposed road grade is 20 percent or above, the pavement section shall be Portland cement concrete. When the longitudinal street grades exceed 10 percent, 0.3 inch of asphalt concrete shall be added to the design thickness (tabulated below) for each 1 percent increase in grade or portion thereof.

The preliminary structural pavement sections are based on the procedures outlined in the Highway Design Manual, California Transportation Department and the County of San Diego. It is recommended that final pavement designs should be evaluated based on R-value tests of the actual subgrade materials after completion of grading. Pavement sections presented below are based on the lowest R-value of 18 of the existing upper on-site soil for the corresponding Traffic Index. The appropriate Traffic Index for the access road should be decided by the County of San Diego.

Asphalt Concrete Pavement

Pavement Area	Traffic Index	AC Thickness	Class II Base Thickness
Car and Small Truck Loading	5.0	3.0 inches	8.0 inches
Standard Truck Loading	6.0	4.0 inches	9.0 inches
Heavy/Fire Truck Loading	7.0	5.0 inches	11.0 inches

Portland Cement Concrete Pavement

Pavement Area	Traffic Index	PCC Thickness	Class II Base Thickness
Car and Small Truck Loading	5.0	6.0 inches	6.0 inches
Standard Truck Loading	6.0	7.0 inches	6.0 inches
Heavy/Fire Truck Loading	7.0	8.0 inches	6.0 inches

All fill under pavement should be compacted to at least 90 percent relative compaction. Prior to the placement of base material, the upper 12 inches of pavement subgrade should be scarified, moisture conditioned and compacted to a minimum 95 percent relative compaction based on Test Method ASTM D1557. Aggregate base material should conform to Caltrans Standard Specifications Section 26 (Class 2) or the Standard Specification for Public Works Construction (Crushed Aggregate Base) and should be compacted to a minimum 95 percent relative compaction based on Test Method ASTM D1557 prior to placement of the asphaltic concrete. If permitted, crushed miscellaneous base could be substituted for crushed aggregate base.

Portland cement concrete pavement sections should incorporate with crack control joints as designed by the project structural engineer. Recommended concrete mix should be at least 3,500 psi.

Recommended asphalt concrete is Type III either Class C2 or Class C3 based on the Standard Specification for Public Works Construction, latest edition or the County of San Diego specifications.

Curb and Gutter

The construction of curb and gutter shall be in conformance with the San Diego Area and/or Regional Standard Drawings. Soil supporting curb and gutter should be graded and compacted similar to that soil under road pavement, compacted to at least 90 percent relative compaction with the upper 12 inches finish subgrade compacted to at least 95 percent relative compaction. Based upon the low to very low expansion potential of the on-site soil, curb and gutter may be constructed directly on subgrade soil.

Geotechnical Observation and Testing

The recommendations provided in this report are based on preliminary design information and subsurface conditions as interpreted from the investigation. Our preliminary conclusion and recommendations should be reviewed and verified during site grading, and revised accordingly if exposed Geotechnical conditions vary from our preliminary findings and interpretations. The Geotechnical consultant should perform Geotechnical observation and testing during the following phases of grading and construction:

- During site grading and excavation.
- During excavation and backfilling of all utility trenches
- During all installation of stabilization material including pipe bedding material.
- When any unusual or unexpected Geotechnical conditions are encountered during any phase of construction.

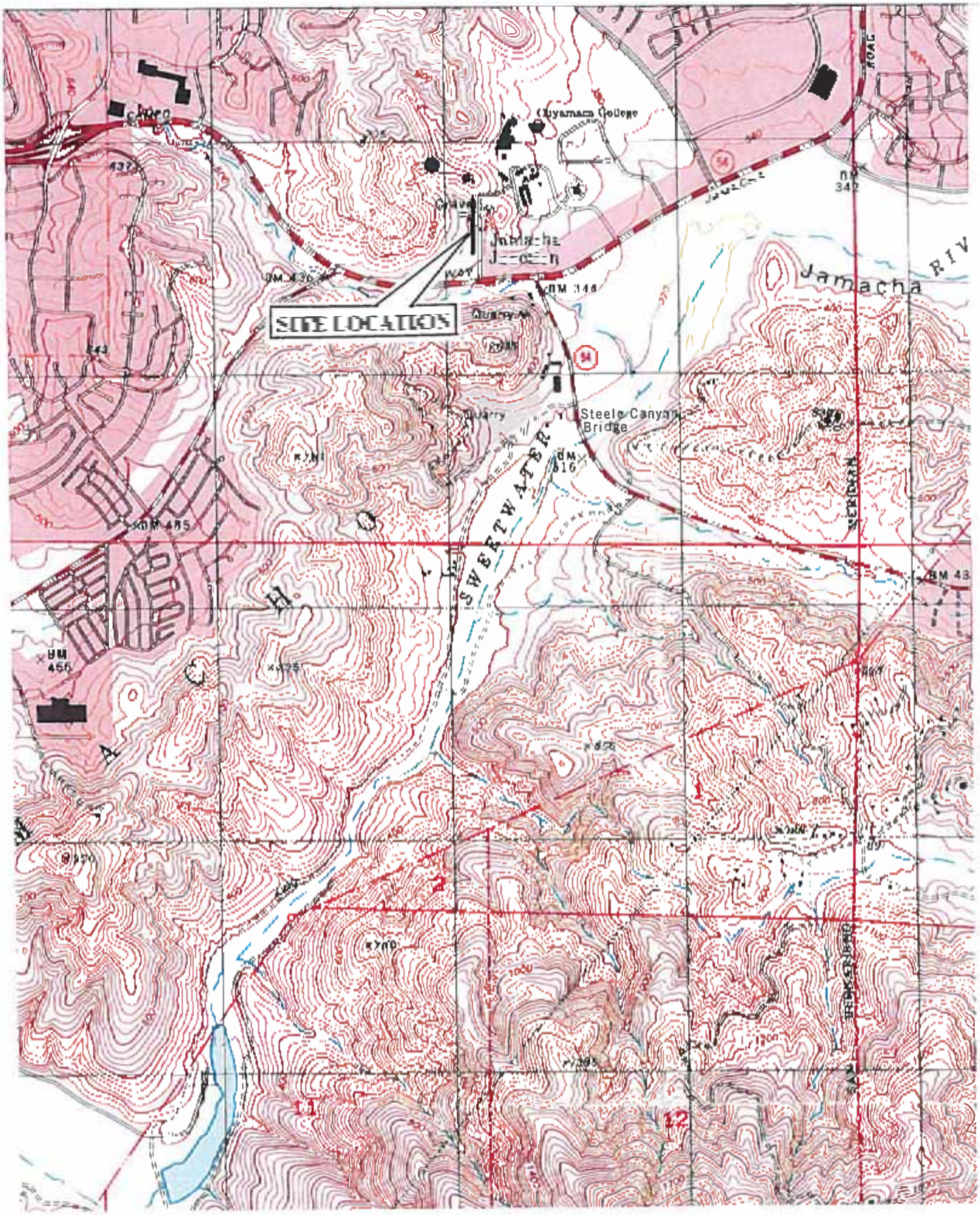
LIMITATIONS

The analyses, conclusions, and recommendations contained in this report are based on site conditions as they existed at the time of our investigation and further assume the explorations to be representative of the subsurface conditions throughout the site. If different subsurface conditions are observed during construction, we should be promptly notified for review and reconsideration of our recommendations.

This report was prepared for the exclusive use and benefit of the owner, architect, and engineer for evaluating the design of the facilities as it relates to geotechnical aspects. It should be made available to prospective contractors for information on factual data only, and not as a warranty of subsurface conditions included in this report.

Our investigation was performed using the standard of care and level of skill ordinarily exercised under similar circumstances by reputable soil engineers and geologists currently practicing in this or similar localities. No other warranty, express or implied, is made as to the conclusions and professional advice included in this report.

FIGURES



SITE LOCATION MAP

REGUALTORY SITE ACCESS ROAD

Project No.	2069-A08	Date:	NOV. 2011	FIGURE 1

MTGL, INC.

Legend:

B-2 Approximate Location of Boring

BORING LOCATION PLAN

REGUALTORY SITE ACCESS ROAD

Project No.	2069-A08	Date:	NOV. 2011	FIGURE 2

MTG, INC.

APPENDIX A

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APPENDIX B

FIELD EXPLORATION PROGRAM

On October 15, 2011, two exploratory borings were drilled using 4-inch diameter hollow stem auger drilled to a depth of 11 feet below existing site grade. Samples were obtained with the Standard Penetration Test (SPT) sampler, CAL Sampler and a bulk sample, as appropriate. The approximate location of the borings are shown on the Boring Location Plan, Figure 2, attached. The field exploration was performed under the supervision of our Geologist/Engineer who maintained a continuous log of the subsurface soils encountered and obtained samples for laboratory testing.

The soils encountered were classified in general accordance with the Unified Soil Classification System (see Key to Logs, Figure B-1). Subsurface conditions are summarized on the Boring Logs, Figures B-1 and B-2. The soils were classified based on field observations and laboratory tests.

DEFINITION OF TERMS

PRIMARY DIVISIONS			SYMBOLS	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS 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, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

GRAIN SIZES

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

200 40 10 4 3/4" 3" 12"

U.S. STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

GROUND WATER LEVEL OR GROUND WATER SEEPAGE.

LOCATION OF SAMPLE TAKEN USING A STANDARD SPLIT TUBE SAMPLER, 2-INCH O.D., 1-3/8-INCH I.D. DRIVEN WITH A 140 POUND HAMMER FALLING 30-INCHES.

LOCATION OF SAMPLE TAKEN USING A MODIFIED CALIFORNIA SAMPLER, 3-1/8-INCH O.D., WITH 2-1/2-INCH I.D. LINER RINGS, DRIVEN USING THE WEIGHT OF KELLY BAR (LARGE DIAMETER BORINGS) OR USING A 140 POUND HAMMER FALLING 30-INCHES (SMALL DIAMETER BORING).

LOCATION OF SAMPLE TAKEN USING A 3-INCH O.D. THIN-WALLED TUBE SAMPLER (SHELBY TUBE) HYDRAULICALLY PUSHED.

LOCATION OF BULK SAMPLE TAKEN FROM AUGER CUTTINGS.

KEY TO LOGS – UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D-2487)

JOB NO.: 2069-A08	DATE: NOV. 2011	FIGURE: B-0

DATE OBSERVED: Oct. 26, 2011 METHOD OF DRILLING: 6" Hollow Stem Auger

LOGGED BY: ECD GROUND ELEVATION: 406' LOCATION: See Figure 2

DEPTH (FEET)	SAMPLE NUMBER	BLOWS/FOOT	DRIVE SAMPLES	BULK SAMPLE	MOISTURE CONTENT (%)	IN-PLACE DRY DENSITY (PCF)	BORING NO. B-1 DESCRIPTION	SOIL TEST
0							**Alluvium:** Silty Sand (SM), light red-brown, dry, loose. **Residual Soil:** Sandy Clay (CL), red-brown, moist, hard, scattered fine gravel.	Sand Equivalent Max. Density R-value Expansion Index Direct Shear Gradation Corrosivity Atterberg Limit
	SD-1	84			8.9	124.9		
5	SS-2	50/6"			10.7	125.3		
							Granitic Rocks (Tonalite): Severly weathered, Clayey Sand (SC), grey, moist, very dense.	
10	SS-1	50/2"			5.3			
							Boring Terminated at 10 Feet. No Groundwater Encountered. Borehole Backfilled on 10/26/2011.	
15								
20								
25								
30								
35								
40								

Project No.: 2069-A08 | LOG OF BORING | Figure B-1

DATE OBSERVED: Oct. 26, 2011 METHOD OF DRILLING: 8" Hollow Stem Auger

LOGGED BY: ECD GROUND ELEVATION: 441' LOCATION: See Figure 2

DEPTH (FEET)	SAMPLE NUMBER	BLOWS/FOOT	DRIVE SAMPLES	BULK SAMPLE	MOISTURE CONTENT (%)	IN-PLACE DRY DENSITY (PCF)	BORING NO. B-2 DESCRIPTION	SOIL TEST
0							**Alluvium:** Silty Sand (SM), light red-brown, dry, loose.	
	SB-1	35		X	13.8	117.4	**Residual Soil:** Sandy Clay (CL), red-brown, moist, very stiff, scattered fine gravel.	Max Density R-value Expansion Index Corrosivity
5	SR-2	50/4"		X	10.5	117.8	**Granitic Rock (Tonalite):** Severly weathered, Clayey Sand (SC), orange-brown & gray, moist, very dense.	Direct Shear Atterberg Limit Sand Equivalent
							Mixed yellow-brown and orange-brown color.	
10	SS-1	109			19.2			
							Boring Terminated at 10 Feet. No Groundwater Encountered. Borehole Backfilled on 10/26/2011.	
15								
20								
25								
30								
35								
40								

Project No.: 2069-A08 | LOG OF BORING | Figure B-2

MTG

APPENDIX C

LABORATORY TESTING PROCEDURES

GENERAL

The results of laboratory testing are discussed and presented in this appendix.

MOISTURE/DENSITY

Determinations of in situ moisture content and dry density were performed on selected undisturbed samples. Soil moisture content determinations were performed according to the ASTM D 2216. The dry density of soil was determined on CAL samples in general accordance with ASTM D2937. Results of these tests are presented on the boring logs, Figures B-1 through B-2, in Appendix B.

CLASSIFICATION

The Unified Soil Classification System was utilized for visual (ASTM D2488) and laboratory (ASTM D2487) classifications of soils encountered.

SIEVE ANALYSIS

Sieve analysis of selected soil samples was performed in accordance with ASTM D422 and results are presented in Figures C-1 to C-3

ATTERBERG LIMITS

Atterberg limits of selected soil samples was performed in accordance with ASTM D4318 and results are as follows. See Figure C-4.

Location of Sample	Liquid Limit	Plastic Limit	Plasticity Index
B-1 @ 1'- 5'	24	9	15
B-2 @ 5'- 7'	20	12	8

MAXIMUM DENSITY

A maximum density test was performed on a representative soils samples derived from the auger operation in accordance with ASTM D1557. The test results are shown below. See Figures C-5 and C-6

Location	Maximum Dry Density (pcf)	Optimum Moisture Content (%)
B-1 @ 1'- 5'	136.5	8.0
B-2 @ 1'- 4'	132.1	9.5

EXPANSION INDEX

Expansion index testing was completed on selected soil samples in accordance with ASTM D4829. Test results are presented in the following table.

Boring No.	Depth (feet)	Expansion Index (EI)	UBC Potential Expansion
B-1	1'- 5'	4	Very Low
B-2	1'- 4'	29	Low

DIRECT SHEAR

Direct shear tests were performed in general accordance with ASTM D3080-98. Direct shear tests were performed on undisturbed soil samples. Test results are as follows. See Figures C-7 and C-8.

Location	Cohesion (PSF)	Angle of Internal Friction (Deg.)
B-1 @ 2'	490	30
B-2 @ 5'	88	44

SAND EQUIVALENT

Sand equivalent testing was performed on selected soil samples in accordance with ASTM D2419. The average results based on three test samples are presented below.

Location	Sand Equivalent (Average of 3 Samples)
B-1 @ 1'-5'	13
B-2 @ 1'-4'	17
B-2 @ 5'	28

CORROSIVITY

Corrosivity Testing in compliance with Caltrans Test Method 417, 422, & 643. Test results are presented below.

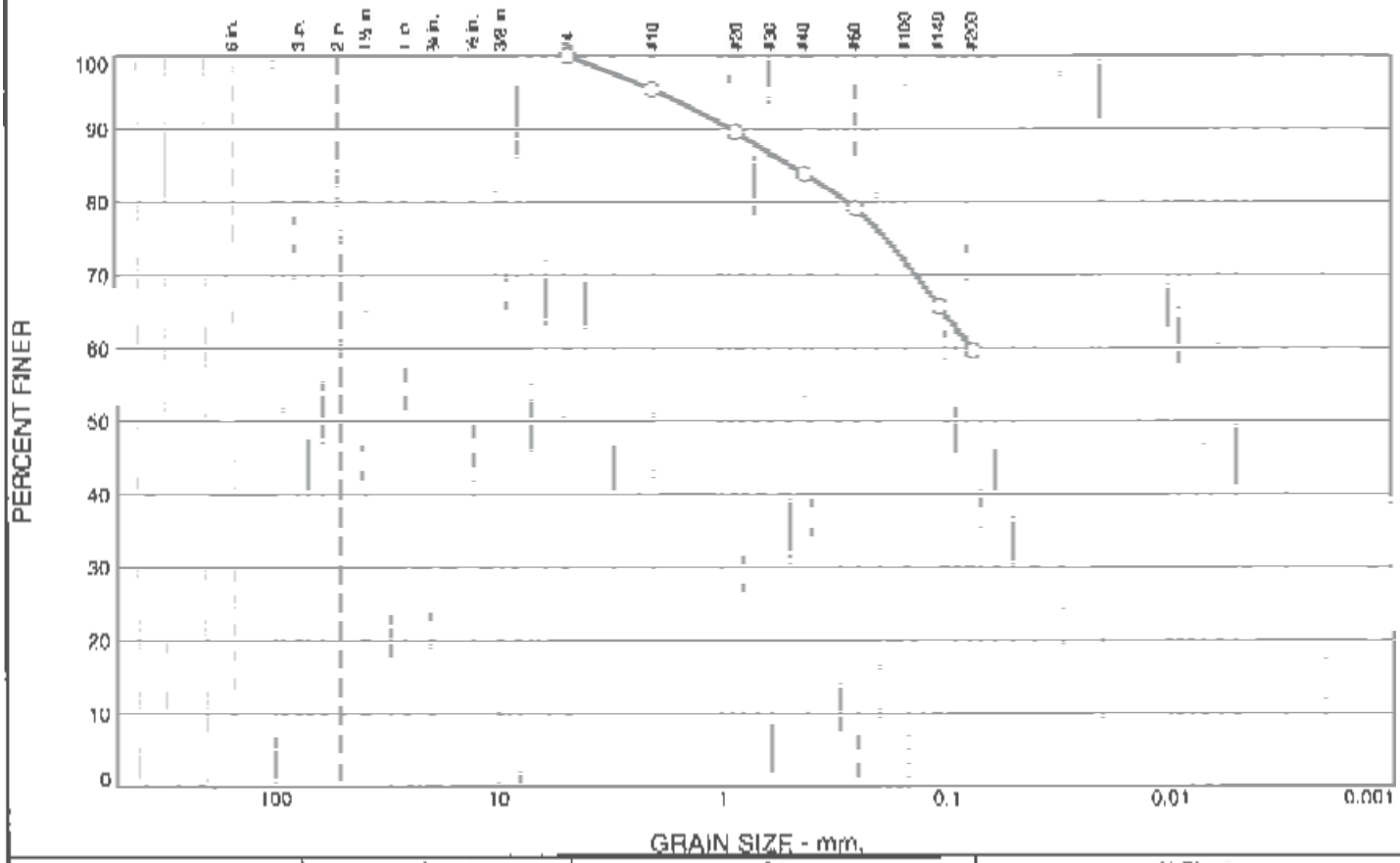
Sample Location	PH	Soluble Sulfates (%)	Soluble Chlorides (%)	Min. Resistivity (ohm-cm)
B-1 @ 1'- 5'	6.4	0.005	0.025	1,460
B-2 @ 5'- 7'	6.7	0.007	0.028	600 MAX

[illegible]

[illegible] testing was performed on [illegible] soil. California Department of Transportation (Caltrans) Test Method [illegible] was used to determine moderate and expansive values. See Figures [illegible] and [illegible].

Location	R-Value
[illegible]	[illegible]
[illegible]	[illegible]

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	4.6	11.6	24.2	59.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	95.4		
#20	89.6		
#40	83.8		
#60	79.1		
#140	65.7		
#200	59.6		

(no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.8993 D_{85}= 0.4930 D_{60}= 0.0766
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample Number: B 1 **Depth:** 2'

Date: 11/11/11

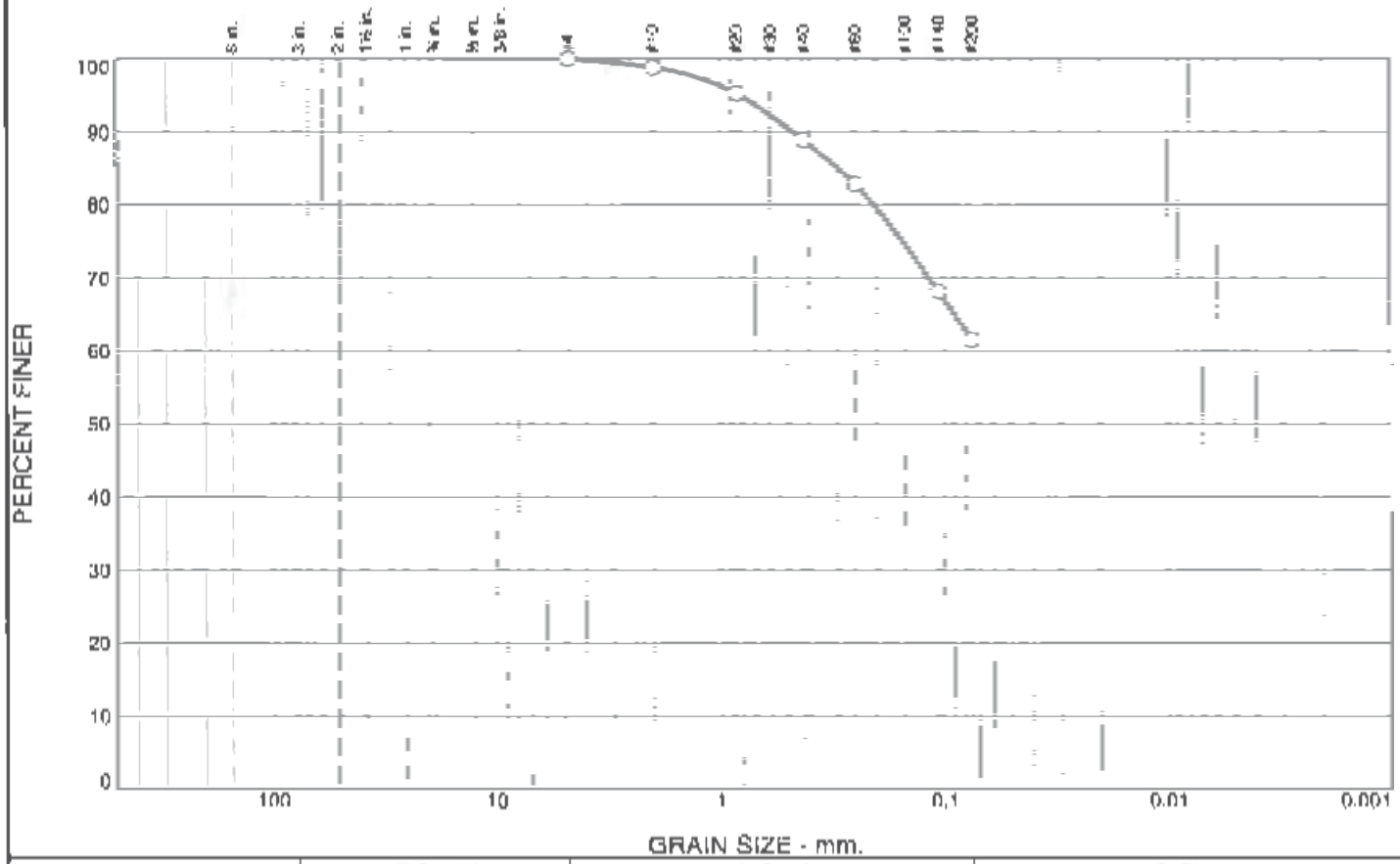
MTGL, Inc.

Anaheim, CA

Client:
Project: REGULATORY SITE ACCESS ROAD
Project No: 2069-A08 **Figure** C-1

Tested By: EP **Checked By:** ED

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	1.2	9.9	27.4	61.5	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	98.8		
#20	95.3		
#40	88.9		
#60	82.9		
#140	68.1		
#200	61.5		

* (no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.4740 D_{85}= 0.2964 D_{60}=
D_{50}= D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample Number: B-1 **Depth:** 5'

Date: 11/11/11

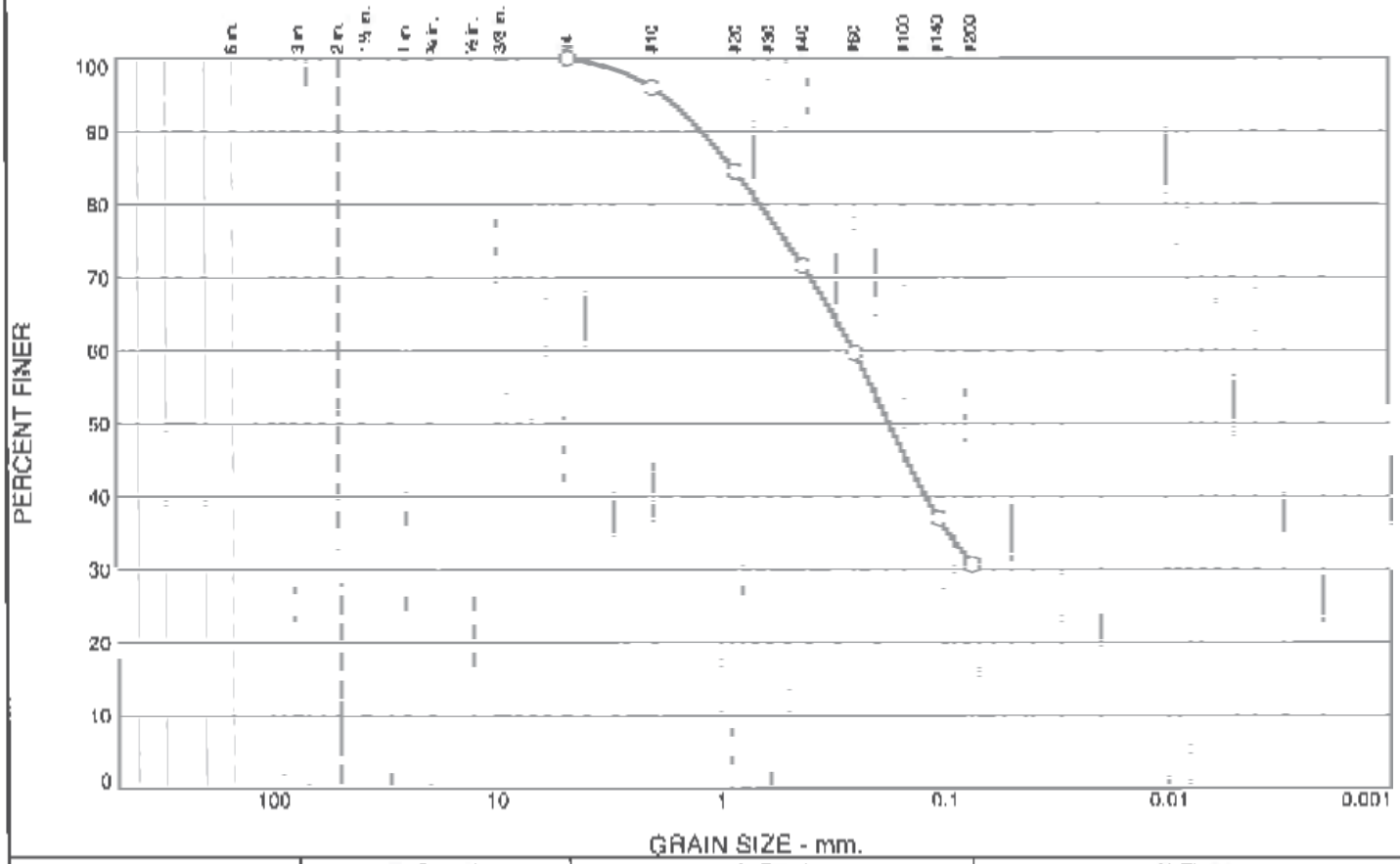
MTGL, Inc.

Anaheim, CA

Client:
Project: REGULATORY SITE ACCESS ROAD
Project No: 2069-A08 **Figure** C-2

Tested By: EP **Checked By:** ED

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	4.0	24.4	40.9	30.7	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	96.0		
#20	84.5		
#40	71.6		
#60	59.7		
#140	37.0		
#200	30.7		

(no specification provided)

Material Description

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 1.2036 D_{85}= 0.8768 D_{60}= 0.2532
D_{50}= 0.1758 D_{30}= D_{15}=
D_{10}= C_u= C_c=

Classification

USCS= AASHTO=

Remarks

Sample Number: B-2 **Depth:** 5'

Date: 11/11/11

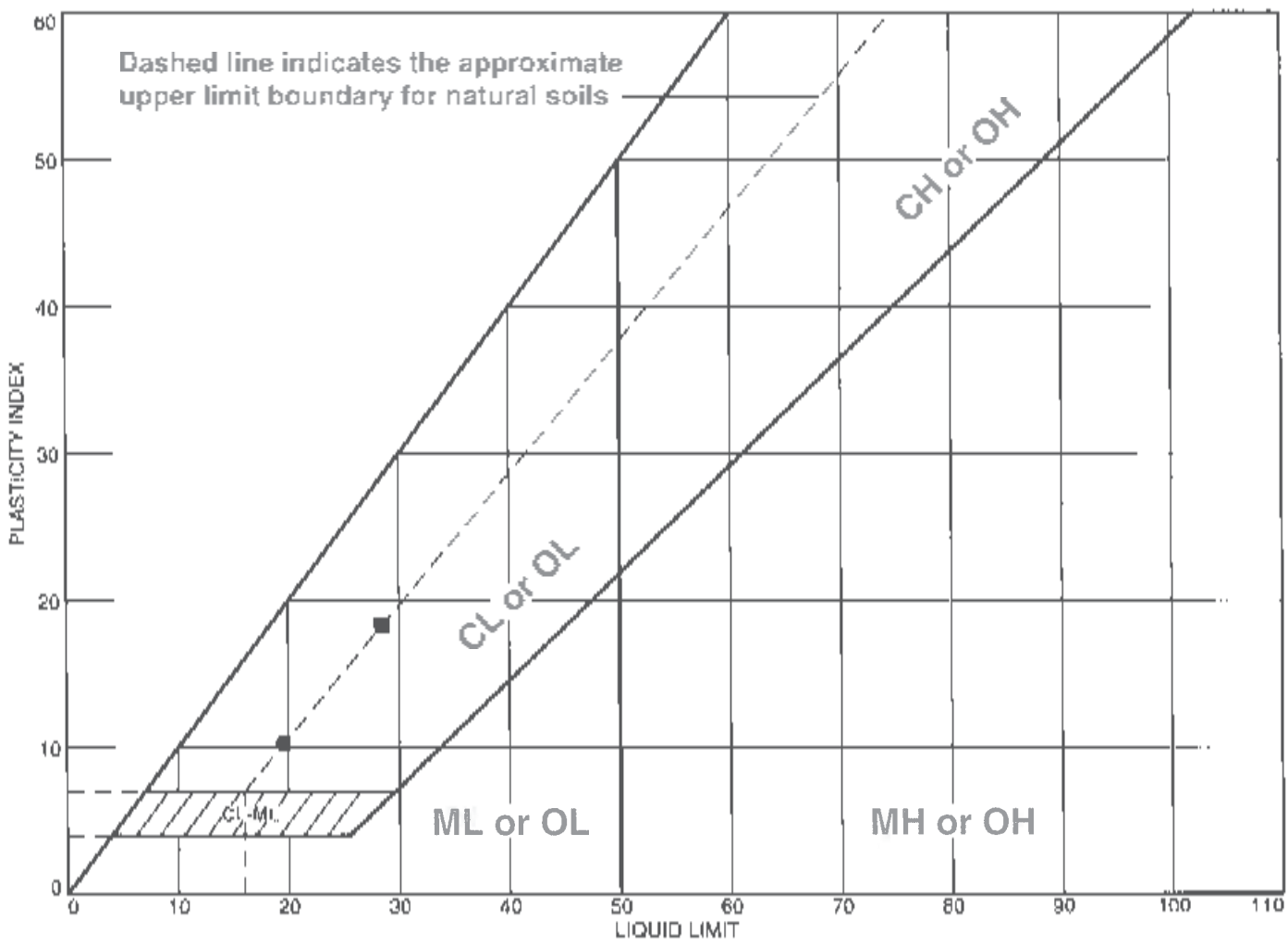
MTGL, Inc.

Anaheim, CA

Client:
Project: REGULATORY SITE ACCESS ROAD
Project No: 2069-A08 **Figure** C-3

Tested By: EP **Checked By:** ED

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	SANDY CLAY (CL)	19.5	9.2	10.3			
■	CLAYEY SAND (SC)	28.5	10.2	18.3			

Project No. 2069 A08 **Client:**

Project: REGULATORY SITE ACCESS ROAD

● **Depth:** 1.5' **Sample Number:** B-1

■ **Depth:** 5-7' **Sample Number:** B-2

Remarks:

MTGL, Inc.

Anaheim, CA

Figure C-4

Tested By: JH **Checked By:** ED

COMPACTION TEST REPORT

Project No.: 2069-A08 **Date:** 11/10/11
Project: REGULATORY SITE ACCESS ROAD
Client:
Sample Number: B-1 **Depth:** 1-5'

Remarks:

MATERIAL DESCRIPTION

Description:

Classifications - **USCS:** **AASHTO:**
Nat. Moist. = **Sp.G. =**
Liquid Limit = 19.5 **Plasticity Index =** 10.3
% < No.200 =

TEST RESULTS
Maximum dry density = 136.7 pcf
Optimum moisture = 8.1 %

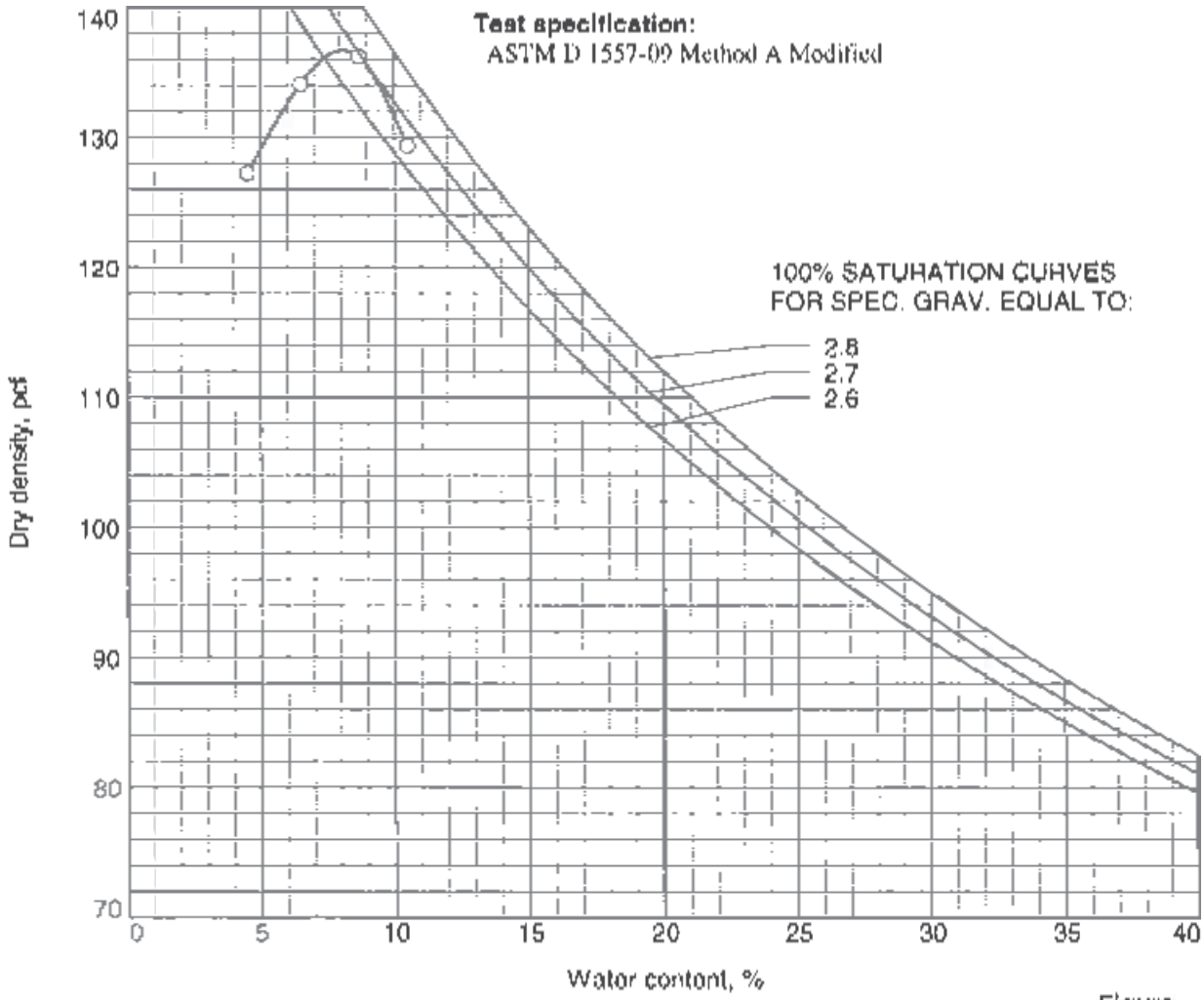


Figure C-5

MTGL, Inc.

Tested By: EP **Checked By:** ED

COMPACTION TEST REPORT

Project No.: 2069-A08 **Date:** 11/10/11
Project: REGULATORY SITE ACCESS ROAD
Client:
Sample Number: B-2 **Depth:** 1-4'

Remarks:

MATERIAL DESCRIPTION

Description:

Classifications - **USCS:** **AASHTO:**
Nat. Moist. = **Sp.G. =**
Liquid Limit = **Plasticity Index =**
% < No.200 =

TEST RESULTS
Maximum dry density = 132.1 pcf
Optimum moisture = 9.1 %

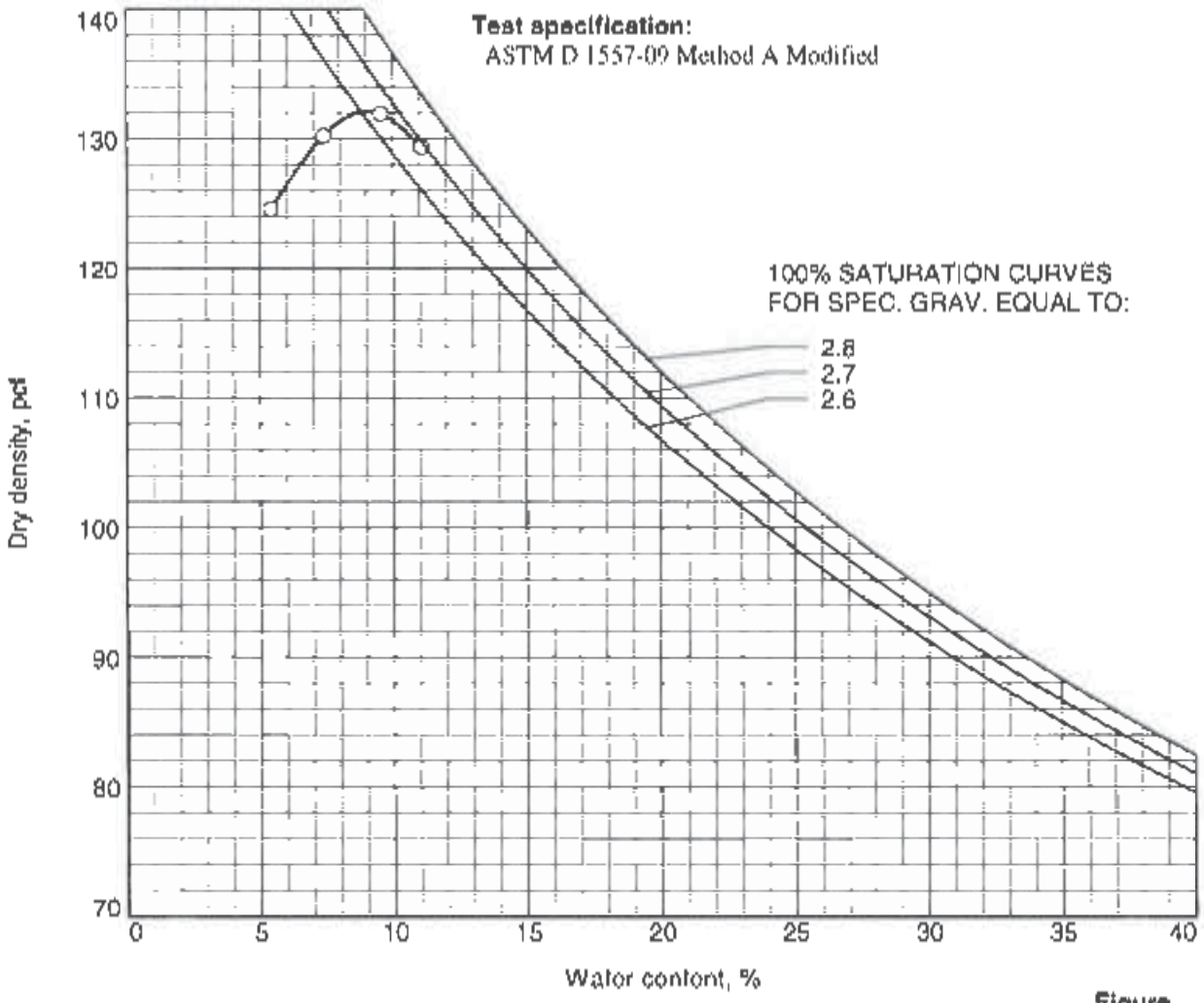
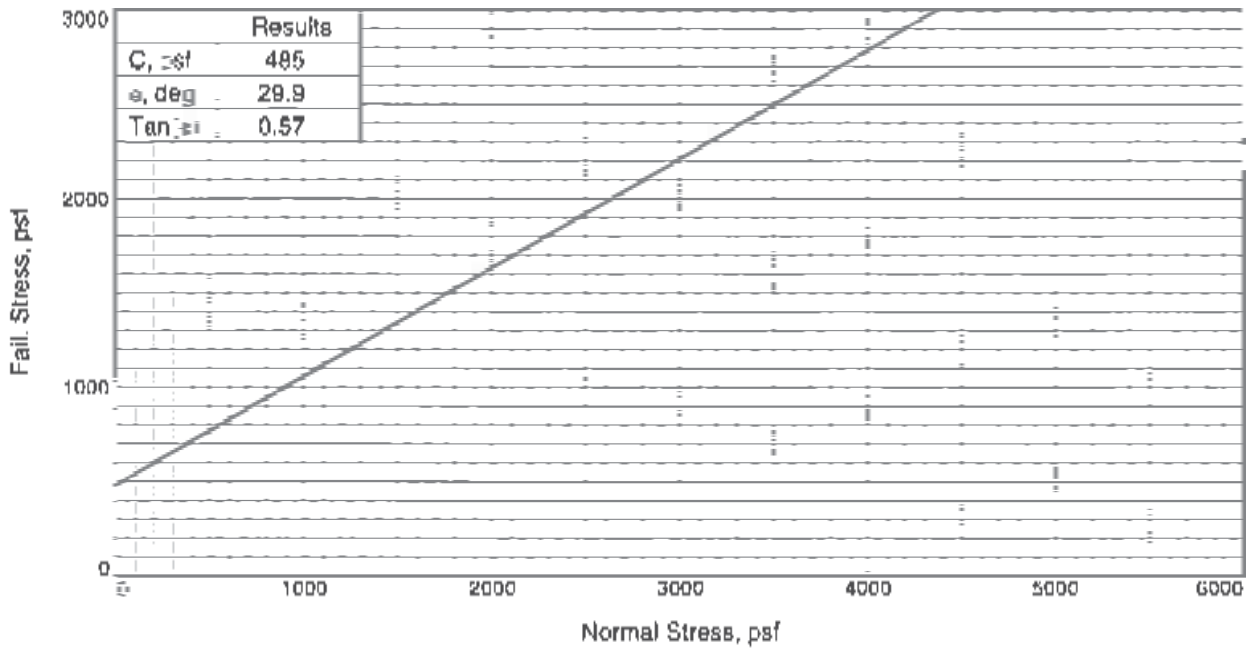
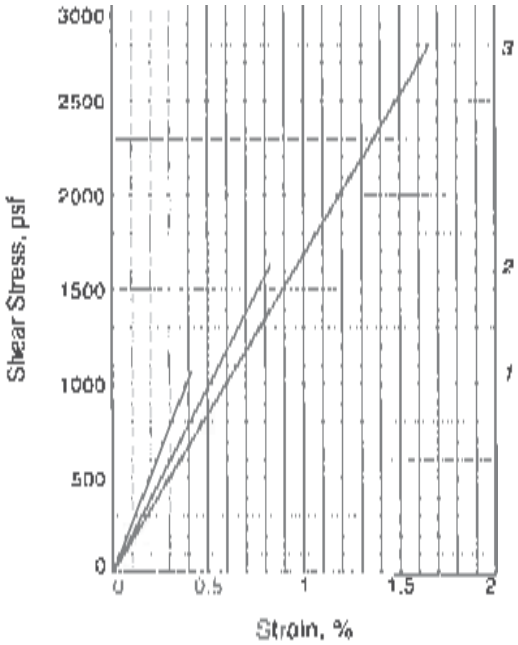


Figure C-6

MTGL, Inc.

Tested By: EP **Checked By:** ED





Sample No.		1	2	3
Initial	Water Content, %	8.8	8.6	8.8
	Dry Density, pcf	124.7	124.7	124.6
	Saturation, %	71.6	70.1	70.9
	Void Ratio	0.3272	0.3263	0.3281
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	12.0	11.7	11.5
	Dry Density, pcf	125.5	126.1	126.6
	Saturation, %	99.7	99.4	99.3
	Void Ratio	0.3179	0.3117	0.3068
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		1000	2000	4000
Fail. Stress, psf		1064	1628	2786
Strain, %		0.4	0.8	1.7
Ult. Stress, psf				
Strain, %				
Strain rate, in./min.		0.01	0.01	0.01

Sample Type:
Description:

Specific Gravity= 2.65
Remarks:

Client:

Project: REGULATORY SITE ACCESS ROAD

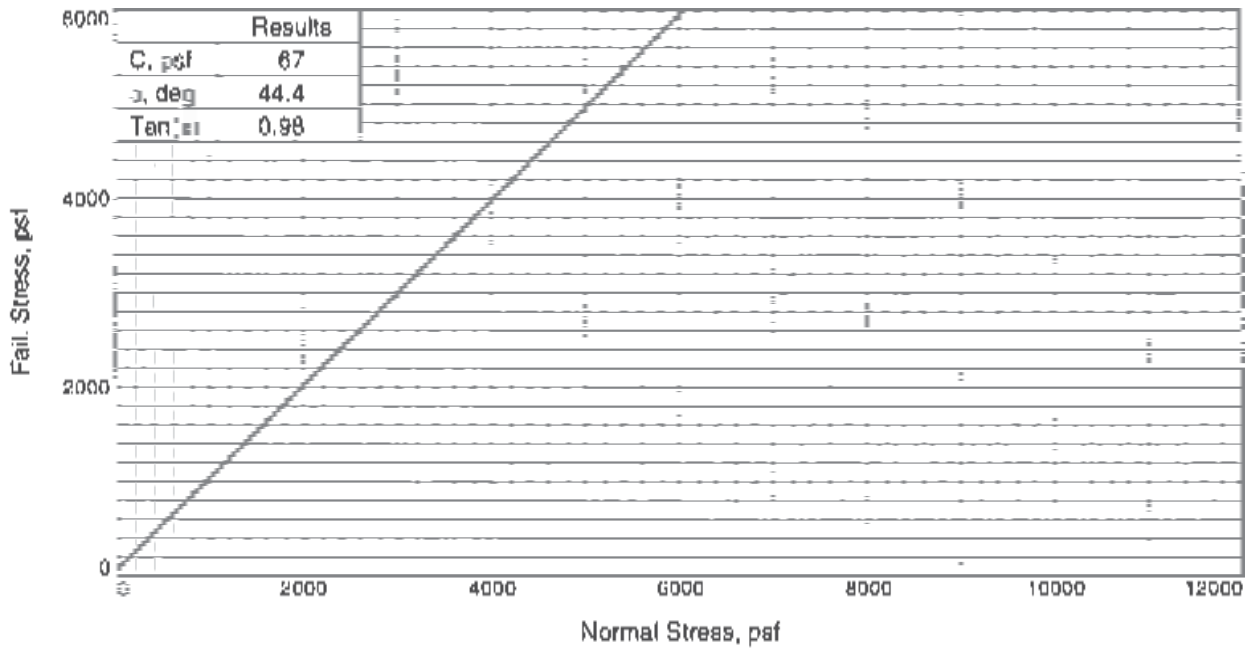
Sample Number: B-1 **Depth:** 2'

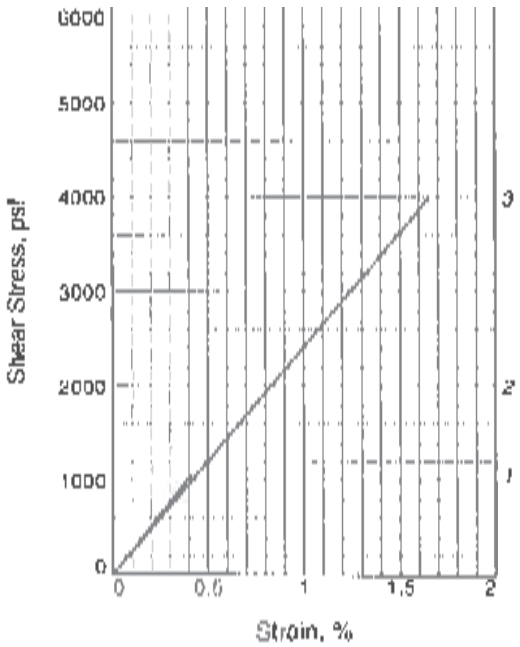
Proj. No.: 2069-A08 **Date Sampled:** 11/11/11

DIRECT SHEAR TEST REPORT
MTGL, Inc.
Anaheim, CA

Figure C-7

Tested By: JH **Checked By:** ED





Sample No.		1	2	3
Initial	Water Content, %	10.4	10.7	10.5
	Dry Density, pcf	118.0	117.4	118.0
	Saturation, %	68.5	69.5	69.0
	Void Ratio	0.4017	0.4086	0.4017
	Diameter, in.	2.42	2.42	2.42
	Height, in.	1.00	1.00	1.00
At Test	Water Content, %	14.7	14.7	14.0
	Dry Density, pcf	119.0	119.1	120.3
	Saturation, %	100.0	99.9	99.2
	Void Ratio	0.3905	0.3889	0.3751
	Diameter, in.	2.42	2.42	2.42
	Height, in.	0.99	0.99	0.98
Normal Stress, psf		1000	2000	4000
Fail. Stress, psf		1064	2001	3995
Strain, %		0.4	0.8	1.7
Ult. Stress, psf				
Strain, %				
Strain rate, in./min.		0.01	0.01	0.01

Sample Type:
Description:

Specific Gravity= 2.65
Remarks:

Figure C-8

Client:

Project: REGULATORY SITE ACCESS ROAD

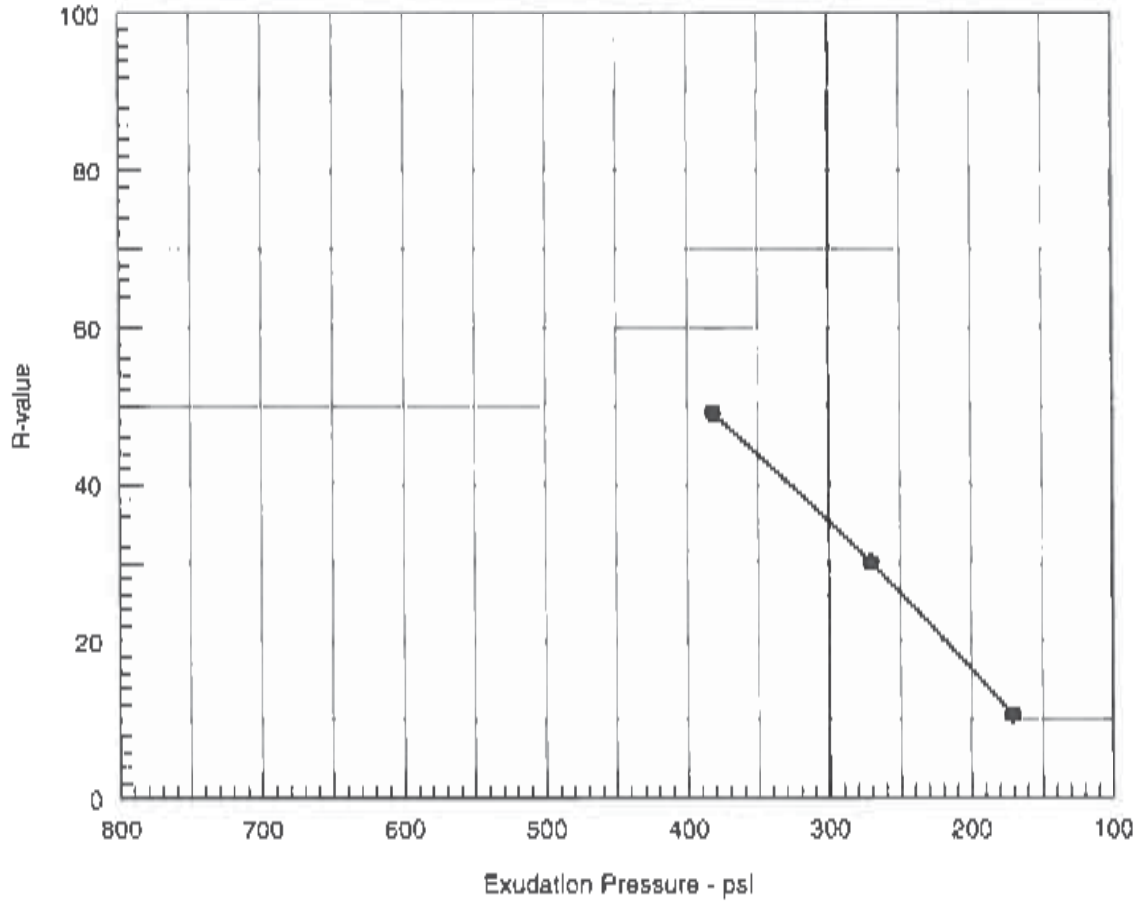
Sample Number: B-2 **Depth:** 5'

Proj. No.: 2069-A08 **Date Sampled:** 11/11/11

DIRECT SHEAR TEST REPORT
MTGL, Inc.
Anaheim, CA

Tested By: JH **Checked By:** ED

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	300	127.8	10.4	0.00	130	2.49	171	11	11
2	350	131.9	9.6	0.00	85	2.50	271	30	30
3	350	133.3	8.7	0.00	55	2.50	382	49	49

Test Results	Material Description
R-value at 300 psi exudation pressure = 35	

Project No.: 2069-A08

Project: REGULATORY SITE ACCESS ROAD

Sample Number: B-1 **Depth:** 1-5'

Date: 11/16/2011

Tested by: JH

Checked by: ED

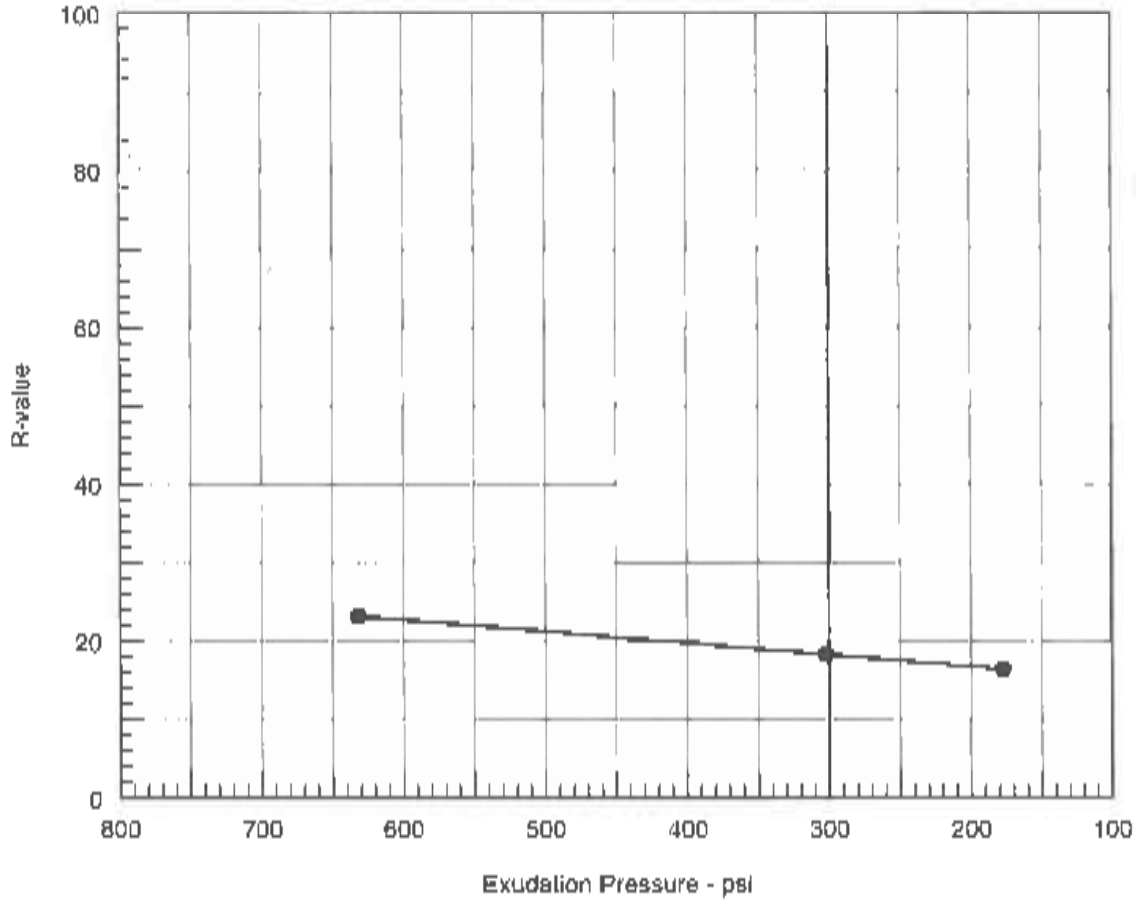
Remarks:

R-VALUE TEST REPORT

MTGL, Inc.

Figure C-9

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	120	126.3	11.7	0.00	110	2.48	632	23	23
2	90	126.1	12.6	0.00	115	2.50	302	18	18
3	80	125.8	13.5	0.00	118	2.50	177	16	16

Test Results	Material Description
R-value at 300 psi exudation pressure = 18	

Project No.: 2069-A08
Project: REGULATORY SITE ACCESS ROAD
Sample Number: B-2 **Depth:** 1-4'
Date: 11/16/2011

Tested by: JH
Checked by: ED
Remarks:

R-VALUE TEST REPORT

MTGL, Inc.

Figure C-10

APPENDIX D

ENGINEERING and SEISMIC ANALYSIS

General

The details of the engineering analyses performed as part of this investigation are discussed in this section.

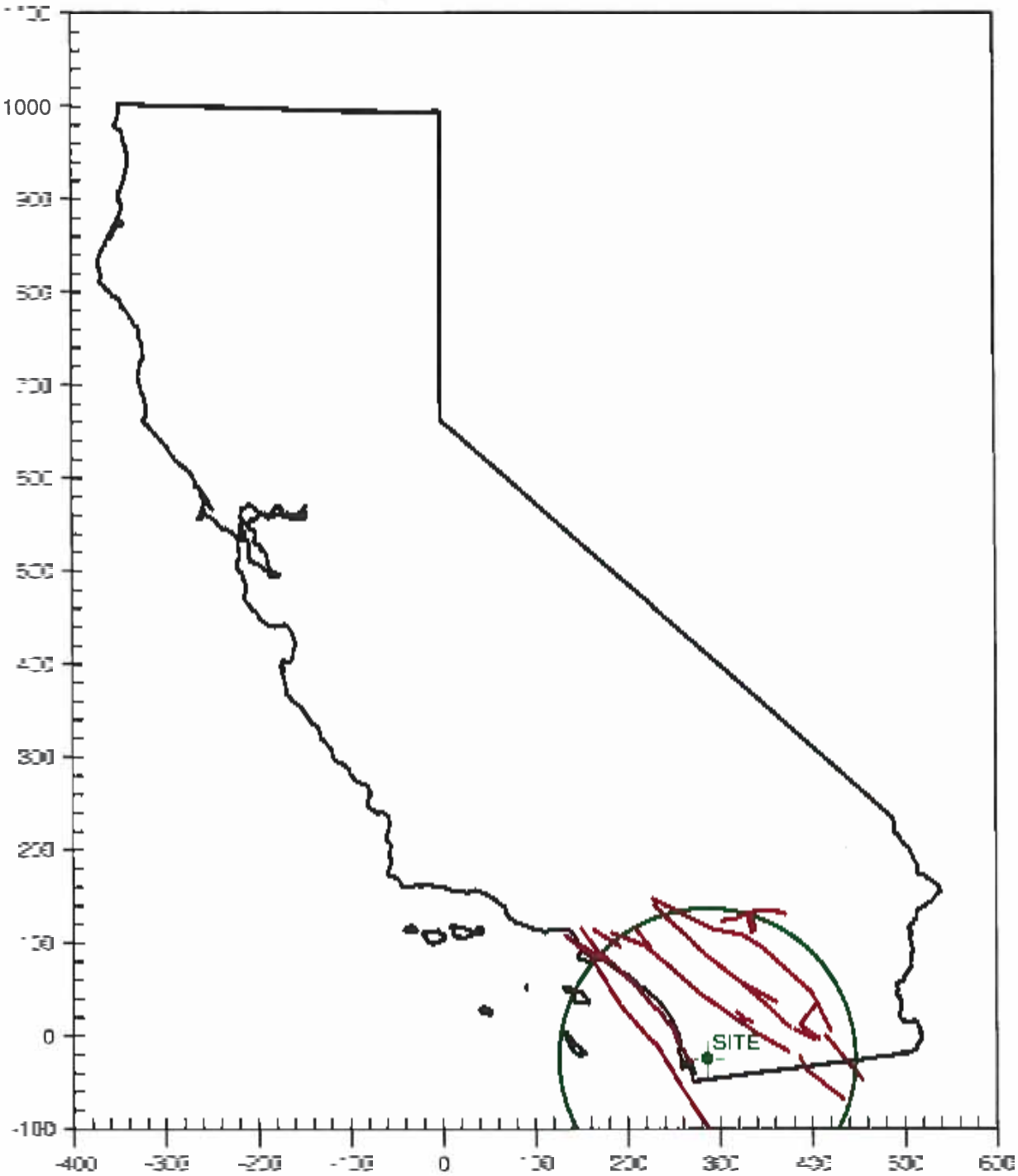
Seismicity

Seismic design values were computed based on site coordinates of 32.74173N and 116.94529W. The nearest active fault computed by the Thomas Blake EQFAULT program is the Rose Canyon Fault, located approximately 11.1 miles southwest of the site. The deterministic analyses are attached.

The ground motion values derived from the California Building Code 2010 (CBC), Title 24 were obtained from the Java Ground Motion Parameter Calculator, Version 5.1.0 and is attached. Based upon the results of the exploratory borings, the project site is assigned to Site Class C.

CALIFORNIA FAULT MAP

Test Run



Conterminous 48 States
2005 ASCE 7 Standard
Latitude = 32.74173
Longitude = -116.94529
Spectral Response Accelerations Ss and S1
Ss and S1 = Mapped Spectral Acceleration Values
Site Class B - Fa = 1.0 ,Fv = 1.0
Data are based on a 0.01 deg grid spacing

Period (sec)	Sa (g)	
0.2	0.961	(Ss, Site Class B)
1.0	0.340	(S1, Site Class B)

Conterminous 48 States
2005 ASCE 7 Standard
Latitude = 32.74173
Longitude = -116.94529
Spectral Response Accelerations SMs and SM1
SMs = Fa x Ss and SM1 = Fv x S1
Site Class C - Fa = 1.016 ,Fv = 1.46

Period (sec)	Sa (g)	
0.2	0.976	(SMs, Site Class C)
1.0	0.497	(SM1, Site Class C)

Conterminous 48 States
2005 ASCE 7 Standard
Latitude = 32.74173
Longitude = -116.94529
Design Spectral Response Accelerations SDs and SD1
SDs = 2/3 x SMs and SD1 = 2/3 x SM1
Site Class C - Fa = 1.016 ,Fv = 1.46

Period (sec)	Sa (g)	
0.2	0.651	(SDs, Site Class C)
1.0	0.331	(SD1, Site Class C)

```
************************
*                      *
*    E Q F A U L T     *
*                      *
*    Version 3.00      *
*                      *
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 2069-A08

DATE: 11-07-2011

JOB NAME: Regulatory Access road

CALCULATION NAME: Test Run Analysis

FAULT-DATA-FILE NAME: CDMGFLTE.DAT

SITE COORDINATES:
SITE LATITUDE: 32.7417
SITE LONGITUDE: 116.9453

SEARCH RADIUS: 100 mi

ATTENUATION RELATION: 21) Sadigh et al. (1997) Horiz. - Rock
UNCERTAINTY (M=Median, S=Sigma): M Number of Sigmas: 0.0
DISTANCE MEASURE: clodis
SCOND: 0
Basement Depth: 5.00 km Campbell SSR: 1 Campbell SHR: 0
COMPUTE PEAK HORIZONTAL ACCELERATION

FAULT-DATA FILE USED: CDMGFLTE.DAT

MINIMUM DEPTH VALUE (km): 0.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

Page 1

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT MAXIMUM EARTHQUAKE MAG.(Mw)	PEAK SITE ACCEL. g	EST. SITE INTENSITY MOD.MERC.
ROSE CANYON	11.1(17.9)	7.2	0.263	IX
CORONADO BANK	24.8(39.9)	7.6	0.146	VIII
ELSINORE-JULIAN	32.7(52.6)	7.1	0.073	VII
EARTHQUAKE VALLEY	36.5(58.7)	6.5	0.039	V
ELSINORE-COYOTE MOUNTAIN	37.2(59.9)	6.8	0.048	VI
NEWPORT-INGLEWOOD (Offshore)	40.1(64.6)	7.1	0.054	VI
ELSINORE-TEMECULA	44.1(70.9)	6.8	0.037	V
SAN JACINTO-COYOTE CREEK	53.1(85.5)	6.8	0.027	V
SAN JACINTO - BORREGO	53.9(86.8)	6.6	0.022	IV
SAN JACINTO-ANZA	55.7(89.7)	7.2	0.035	V
LAGUNA SALADA	61.8(99.5)	7.0	0.025	V
SUPERSTITION MTN. (San Jacinto)	62.0(99.7)	6.6	0.017	IV
ELMORE RANCH	66.4(106.9)	6.6	0.015	IV
ELSINORE-GLEN IVY	66.5(107.1)	6.8	0.018	IV
SUPERSTITION HILLS (San Jacinto)	67.0(107.9)	6.6	0.015	IV
PALOS VERDES	68.8(110.7)	7.1	0.023	IV
SAN JACINTO-SAN JACINTO VALLEY	69.0(111.0)	6.9	0.019	IV
SAN ANDREAS - Southern	80.2(129.0)	7.4	0.023	IV
SAN ANDREAS - Coachella	80.2(129.0)	7.2	0.019	IV
IMPERIAL	81.0(130.3)	7.0	0.016	IV
NEWPORT-INGLEWOOD (L.A.Basin)	82.5(132.8)	7.1	0.017	IV
BRAWLEY SEISMIC ZONE	82.6(133.0)	6.4	0.009	III
CHINO-CENTRAL AVE. (Elsinore)	83.1(133.7)	6.7	0.014	III
SAN ANDREAS - San Bernardino	85.7(138.0)	7.5	0.022	IV
WHITTIER	86.7(139.6)	6.8	0.011	III
BURNT MTN.	89.5(144.0)	6.4	0.007	II
SAN JACINTO-SAN BERNARDINO	89.7(144.4)	6.7	0.010	III
PINTO MOUNTAIN	91.8(147.8)	7.0	0.012	III
EUREKA PEAK	91.8(147.8)	6.4	0.007	II
COMPTON THRUST	92.1(148.3)	6.8	0.012	III
ELYSIAN PARK THRUST	95.2(153.2)	6.7	0.011	III

-END OF SEARCH- 31 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE ROSE CANYON FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 11.1 MILES (17.9 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.2635 g

APPENDIX E

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

APPENDIX E

GENERAL EARTHWORK AND GRADING SPECIFICATIONS

1. GENERAL

These specifications present general procedures and requirements for grading and earthwork as shown on the approved grading plans, including preparation of areas to be filled, placement of fill, installation of subdrains, and excavations. The recommendations contained in the attached geotechnical report are a part of the earthwork and grading specifications and shall supersede the provisions contained herein in the case of conflict. Evaluations performed by the Consultant during the course of grading may result in new recommendations, which could supersede these specifications, or the recommendations of the geotechnical report.

2. EARTHWORK OBSERVATION AND TESTING

Prior to the start of grading, a qualified Geotechnical Consultant (Geotechnical Engineer and Engineering Geologist) shall be employed for the purpose of observing earthwork procedures and testing the fills for conformance with the recommendations of the geotechnical report and these specifications. It will be necessary that the Consultant provide adequate testing and observation so that he may determine that the work was accomplished as specified. It shall be the responsibility of the Contractor to assist the Consultant and keep them apprised of work schedules and changes so that he may schedule his personnel accordingly.

It shall be the sole responsibility of the Contractor to provide adequate equipment and methods to accomplish the work in accordance with applicable grading codes or agency ordinances, these specifications and the approved grading plans.

Maximum dry density tests used to determine the degree of compaction will be performed in accordance with the American Society for Testing and Materials Test Method (ASTM) D1557-91 or later revision.

3. PREPARATION OF AREAS TO BE FILLED

Clearing and Grubbing: All brush, vegetation and debris shall be removed or piled and otherwise disposed of.

Processing: The existing ground which is determined to be satisfactory for support of fill shall be scarified to a minimum depth of 6 inches. Existing ground, which is not satisfactory, shall be overexcavated as specified in the following section.

Overexcavation: Soft, dry, spongy, highly fractured or otherwise unsuitable ground, extending to such a depth that surface processing cannot adequately improve the condition, shall be overexcavated down to firm ground, approved by the Consultant.

Moisture conditioning: Overexcavated and processed soils shall be watered, dried back, blended, and mixed as required to have a relatively uniform moisture content near the optimum moisture content as determined by ASTM D1557.

Recompaction: Overexcavated and processed soils, which have been mixed, and moisture conditioned uniformly shall be recompacted to a minimum relative compaction of 90 percent of ASTM D1557.

Benching: Where soils are placed on ground with slopes steeper than 5:1 (horizontal to vertical), the ground shall be stepped or benched. Benches shall be excavated in firm material for a minimum width of 4 feet.

4. FILL MATERIAL

General: Material to be placed as fill shall be free of organic matter and other deleterious substances, and shall be approved by the Consultant.

Oversize: Oversized material defined as rock, or other irreducible material with a maximum dimension greater than 12 inches, shall not be buried or placed in fill, unless the location, material, and disposal methods are specifically approved by the Consultant. Oversize disposal operations shall be such that nesting of oversized material does not occur, and such that the oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 feet vertically of finish grade or within the range of future utilities or underground construction, unless specifically approved by the Consultant.

Import: If importing of fill material is required for grading, the import material shall meet the general requirements.

5. FILL PLACEMENT AND COMPACTION

Fill Lifts: Approved fill material shall be placed in areas prepared to receive fill in near-horizontal layers not exceeding 6 inches in compacted thickness. The Consultant may approve thicker lifts if testing indicates the grading procedures are such that adequate compaction is being achieved with lifts of greater thickness. Each layer shall be spread evenly and shall be thoroughly mixed during spreading to attain uniformity of material and moisture in each layer.

Fill Moisture: Fill layers at a moisture content less than optimum shall be watered and mixed, and wet fill layers shall be aerated by scarification or shall be blended with drier material. Moisture conditioning and mixing of fill layers shall continue until the fill material is at uniform moisture content at or near optimum.

Compaction of Fill: After each layer has been evenly spread, moisture conditioned, and mixed, it shall be uniformly compacted to not less that 90 percent of maximum dry density in accordance with ASTM D1557. Compaction equipment shall be adequately sized and shall be either specifically designed for soil compaction or of proven reliability, to efficiently achieve the specified degree of compaction.

Fill Slopes: Compacting on slopes shall be accomplished, in addition to normal compacting procedures, by backrolling of slopes with sheepsfoot rollers at frequent increments of 2 to 3 feet as the fill is placed, or by other methods producing satisfactory results. At the completion of grading, the relative compaction of the slope out to the slope face shall be at least 90 percent in accordance with ASTM D1557.

Compaction Testing: Field tests to check the fill moisture and degree of compaction will be performed by the consultant. The location and frequency of tests shall be at the consultant's discretion. In general, these tests will be take at an interval not exceeding 2 feet in vertical rise, and/or 1,000 cubic yards of fill placed. In addition, on slope faces, at least one test shall be taken for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope.

6. SUBDRAIN INSTALLATION

Subdrain systems, if required, shall be installed in approved ground to conform to the approximate alignment and details shown on the plans or herein. The subdrain location or materials shall not be changed or modified without the approval of the Consultant. The Consultant, however, may recommend and, upon approval, direct changes in subdrain line, grade or materials. All subdrains should be surveyed for line and grade after installation and sufficient time shall be allowed for the surveys, prior to commencement of fill over the subdrain.

7. EXCAVATION

Excavations and cut slopes will be examined during grading. If directed by the Consultant, further excavation or overexcavation and refilling of cut areas, and/or remedial grading of cut slopes shall be performed. Where fill over cut slopes are to be graded, unless otherwise approved, the cut portion of the slope shall be made and approved by the Consultant prior to placement of materials for construction of the fill portion of the slope.

Appendix E

Noise Calculations for the Otay Water District Regulatory Site Access Road Improvements

SHIELDING ATTENUATION CALCULATIONS: RAY-TRACE PROGRAM (FOR A POINT-SOURCE)

Uses the Equation: $(A_{sh})_{point}=20*\log[(2*pi*N)^{1/2}/\tanh(2*pi*N)^{1/2}]+5dB$
(Ref. Pg.174, Noise and Vibration Control, L.L. Beranek Editor, 1971 Ed.

Project: OWD Regulatory Site Access Road Improvements
Date: 8/15/2011
By: MGG

Please Enter: Using English (E) units or Metric (M) units ? E

Ray Trace Number/Description	Source-Receiver Distance (ft. or m)	Source Base Elev. (ft. or m)	Source Height above Ground (ft. or m)	Receiver Base Elev. (ft. or m)	Receiver Height above Ground (ft. or m)	Horizontal Barrier Dist. (in ref. to source) (ft. or m)	Barrier Base Elev. (ft. or m)	Barrier Height (ft. or m)	Dominant Freq.(Hz)	Source-Rcvr Straight-Line Dist. (ft. or m)	Source-Top-of-Barrier Dist. (ft. or m)	Receiver-Top-of-Barrier Dist. (ft. or m)	Lambda	N_{max}	$AE_{(barriers)}$ (dB)
1. Source (Const Equip) to nearest NSLU (College Campus, to the northeast) - nearest work	600.0	424.0	12.0	417.0	5.0	400.0	465.0	**0.0**	500.0	600.2	401.0	204.6	2.3	4.8	**19.8**
2. Source (Const Equip) to nearest NSLU (College Campus, to the northeast) - highest work	990.0	479.0	12.0	417.0	5.0	175.0	485.0	**0.0**	500.0	992.4	175.1	817.4	2.3	0.1	**6.8**
3. Source (Const Equip) to nearest NSLU (College Campus, to the northeast) - farthest work	1100.0	433.0	12.0	417.0	5.0	810.0	480.0	**0.0**	500.0	1100.2	810.8	295.7	2.3	5.5	**20.4**
4. Source (Const Equip) to nearest 2nd-nearest NSLU (Residences, to the northwest) - highest (and nearest) work	2180.0	479.0	12.0	541.0	5.0	1590.0	685.0	**0.0**	500.0	2180.7	1601.8	606.2	2.3	24.2	**26.8**
5. Source (Const Equip) to nearest 2nd-nearest NSLU (Residences, to the northwest) - lowest (and farthest) work	2575.0	425.0	12.0	541.0	5.0	1925.0	680.0	**0.0**	500.0	2577.3	1940.3	663.7	2.3	23.6	**26.7**
6. Source (Const Equip) to nearest 2nd-nearest NSLU (Residences, to the northwest) - 2nd-lowest work (just a check)	2410.0	433.0	12.0	541.0	5.0	1500.0	665.0	**0.0**	500.0	2412.1	1516.0	917.7	2.3	19.2	**25.8**

Roadway Construction Noise Model (RCNM),Version 1.1

Report dat 9/16/2011
Case Description:

---- Receptor #1 ----

Descriptior	Land Use	Baselines (dBA) Daytime	Evening	Night
College Car	Residential	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		800	7
Dozer	No	40		81.7	800	7
Dump Truck	No	40		76.5	800	7
Backhoe	No	40		77.6	800	7
Paver	No	50		77.2	800	7
Roller	No	20		80	800	7
Pickup Truck	No	40		75	800	7
Pickup Truck	No	40		75	800	7
Pickup Truck	No	40		75	800	7
Pickup Truck	No	40		75	800	7
Flat Bed Truck	No	40		74.3	800	7

Results

	Calculated (dBA)		Noise Limits (dBA)				
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader	53.9	49.9	N/A	N/A	N/A	N/A	N/A
Dozer	50.6	46.6	N/A	N/A	N/A	N/A	N/A
Dump Truck	45.4	41.4	N/A	N/A	N/A	N/A	N/A
Backhoe	46.5	42.5	N/A	N/A	N/A	N/A	N/A
Paver	46.1	43.1	N/A	N/A	N/A	N/A	N/A
Roller	48.9	41.9	N/A	N/A	N/A	N/A	N/A
Pickup Truck	43.9	39.9	N/A	N/A	N/A	N/A	N/A
Pickup Truck	43.9	39.9	N/A	N/A	N/A	N/A	N/A
Pickup Truck	43.9	39.9	N/A	N/A	N/A	N/A	N/A
Pickup Truck	43.9	39.9	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	43.2	39.2	N/A	N/A	N/A	N/A	N/A
Total	53.9	54.1	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #2 ----

Descriptior	Land Use	Baselines (dBA) Daytime	Evening	Night

Resi's to N\	Residential	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		2350	12
Dozer	No	40		81.7	2350	12
Dump Truck	No	40		76.5	2350	12
Backhoe	No	40		77.6	2350	12
Paver	No	50		77.2	2350	12
Roller	No	20		80	2350	12
Pickup Truck	No	40		75	2350	12
Pickup Truck	No	40		75	2350	12
Pickup Truck	No	40		75	2350	12
Pickup Truck	No	40		75	2350	12
Flat Bed Truck	No	40		74.3	2350	12

	Calculated (dBA)		Results	Noise Limits (dBA)			
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader	39.6	35.6	N/A	N/A	N/A	N/A	N/A
Dozer	36.2	32.2	N/A	N/A	N/A	N/A	N/A
Dump Truck	31	27	N/A	N/A	N/A	N/A	N/A
Backhoe	32.1	28.1	N/A	N/A	N/A	N/A	N/A
Paver	31.8	28.8	N/A	N/A	N/A	N/A	N/A
Roller	34.6	27.6	N/A	N/A	N/A	N/A	N/A
Pickup Truck	29.6	25.6	N/A	N/A	N/A	N/A	N/A
Pickup Truck	29.6	25.6	N/A	N/A	N/A	N/A	N/A
Pickup Truck	29.6	25.6	N/A	N/A	N/A	N/A	N/A
Pickup Truck	29.6	25.6	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	28.8	24.8	N/A	N/A	N/A	N/A	N/A
Total	39.6	39.8	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

---- Receptor #3 ----

		Baselines (dBA)		
Descriptior	Land Use	Daytime	Evening	Night
Ref at 50'	Residential	55	50	45

Description	Impact Device	Usage(%)	Equipment Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Grader	No	40	85		50	0
Dozer	No	40		81.7	50	0

Dump Truck	No	40	76.5	50	0
Backhoe	No	40	77.6	50	0
Paver	No	50	77.2	50	0
Roller	No	20	80	50	0
Pickup Truck	No	40	75	50	0
Pickup Truck	No	40	75	50	0
Pickup Truck	No	40	75	50	0
Pickup Truck	No	40	75	50	0
Flat Bed Truck	No	40	74.3	50	0

			Results				
	Calculated (dBA)			Noise Limits (dBA)			
			Day		Evening		Night
Equipment	*Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax
Grader	85	81	N/A	N/A	N/A	N/A	N/A
Dozer	81.7	77.7	N/A	N/A	N/A	N/A	N/A
Dump Truck	76.5	72.5	N/A	N/A	N/A	N/A	N/A
Backhoe	77.6	73.6	N/A	N/A	N/A	N/A	N/A
Paver	77.2	74.2	N/A	N/A	N/A	N/A	N/A
Roller	80	73	N/A	N/A	N/A	N/A	N/A
Pickup Truck	75	71	N/A	N/A	N/A	N/A	N/A
Pickup Truck	75	71	N/A	N/A	N/A	N/A	N/A
Pickup Truck	75	71	N/A	N/A	N/A	N/A	N/A
Pickup Truck	75	71	N/A	N/A	N/A	N/A	N/A
Flat Bed Truck	74.3	70.3	N/A	N/A	N/A	N/A	N/A
Total	85	85.2	N/A	N/A	N/A	N/A	N/A

*Calculated Lmax is the Loudest value.

Noise Limit Exceedance (dBA)						
Day		Evening		Night		
Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Noise Limit Exceedance (dBA)						
Day		Evening		Night		
Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Noise Limit Exceedance (dBA)						
	Day		Evening		Night	
Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
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N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix F

Preliminary Hydrology and Hydraulics Report

Preliminary Hydrology and Hydraulics Report

June 2012

OWD REGULATORY SITE ACCESS

ROAD IMPROVEMENTS

11880 CAMPO ROAD

SPRING VALLEY, CA

(CIP P2504)

Prepared by

Otay Water District
2554 Sweetwater Springs Boulevard
Spring Valley, California 91978-2004

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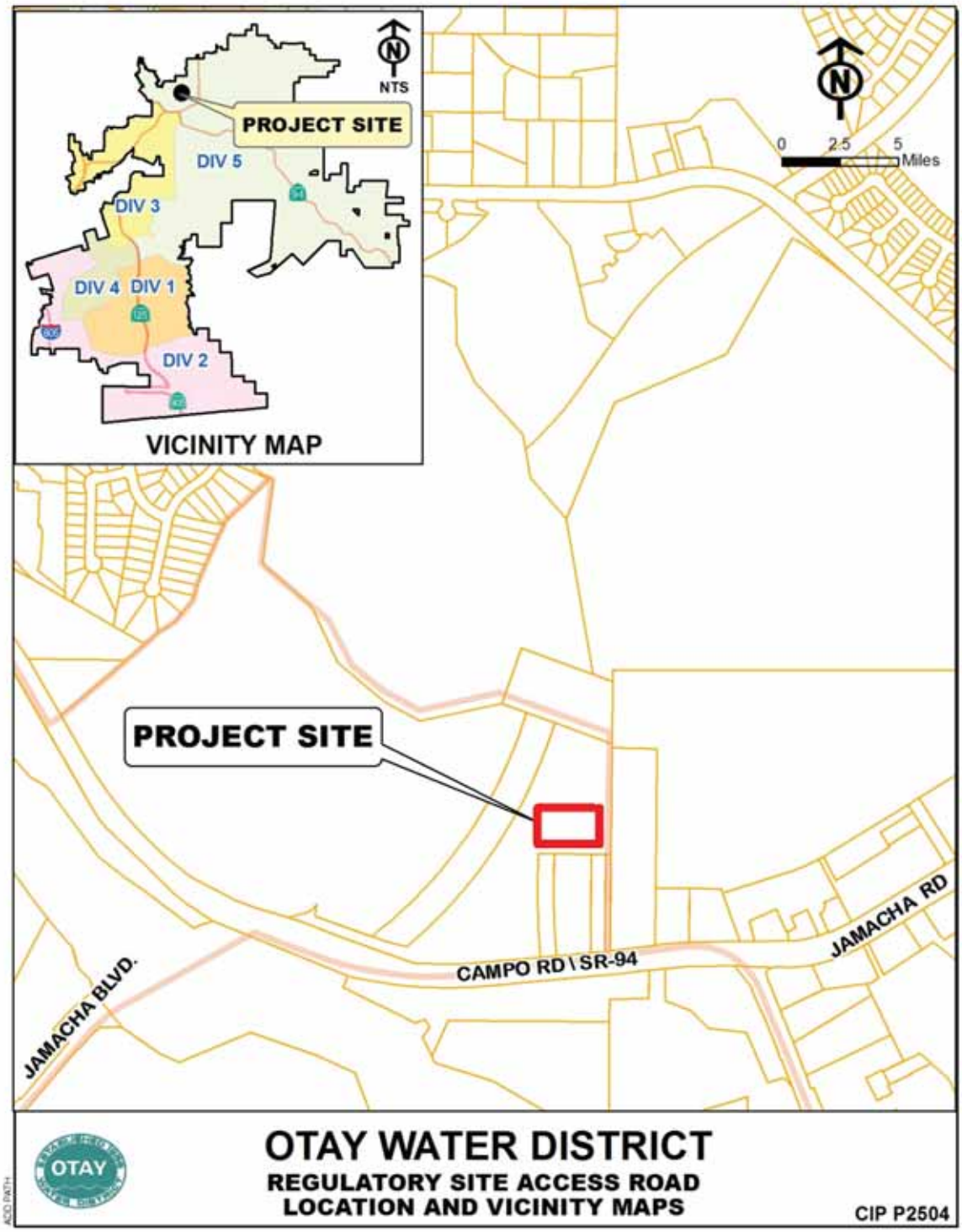
EXHIBITS

Exhibit A: Existing Hydrological Conditions

Exhibit B: Proposed Hydrological Conditions

I. VICINITY MAP



II. SCOPE OF WORK & PROJECT DESCRIPTION

The scope of this study is to provide the hydrology and hydraulic calculations for the Regulatory Site Access Road project. The site is located south of Fury Lane and northwest of the Campo Road/Jamacha Road junction, in the County of San Diego. The project will include grading for a proposed access road, paving of the road, the installation of a 30-inch culvert with headwalls beneath the proposed access road, a curb inlet, and curb & gutter.

III. HYDROLOGIC METHODOLOGY

A hydraulic analysis was made to estimate peak flood flows with return periods of 100-years.

This hydraulic analysis was made by the use of an aerial topographic survey from the following projects; Otay Water District (OWD) 640-1 & 2 Reservoir project, County of San Diego Rancho San Diego Sheriff Substation project, and additional contours from OWD's GIS contour database.

The rational method of runoff computation was used to determine the quantity of storm water runoff.

The basic rational formula is Q= CIA where:

- "Q" Is the peak rate of flow in cubic feet per second (CFS)
- "C" Is a runoff coefficient expressed as that percentage of rainfall, which becomes surface runoff. Soil group "D" was used for this report.
- "I" Is the average rainfall intensity in inches per hour for a storm duration equal to the time of concentration (Tc) of the contributing drainage basins.
- "A" Is the drainage area in acres tributary to design point.
- "c" Is the time of concentration required for runoff to flow from the most remote part of the watershed to the outlet point under consideration.

IV. EXISTING HYDROLOGIC CONDITIONS

The project site area will disturb approximately 2.0 acres. (Total property area pertaining to this hydrology study is 44.9 acres) that is undeveloped. The discharge calculated for the flow at the existing 24-inch culvert (Figure 1) is 50.3 cfs for a 100-year storm. (See basins EX-B1 to EX-B3 on the Existing Hydrology Map). The flow is then combined with an existing flow (basin EX-B4 on the Existing Hydrology Map) and continues southerly, eventually flowing to two (2)-30 inch existing RCP storm drains located under Campo road (Figure 2).

Flow from the existing "A" Basins (EX-A1 to EX-A30) does not affect the hydrology of the proposed design. The "A" basins drain into an existing storm drain system northeast of the proposed project. The flow eventually discharges through a concrete energy dissipater and rip-rap to an existing vegetated channel.

Flow from the "C" Basins (EX-C1 and EX-C2) also has no effect on the proposed design. These basins drain southwards along the District's existing paved access road to Campo road.

The "D" basins (EX-D1 to EX-D12) flow southward to existing pipe culverts located underneath Campo Road west of the project's proposed drainage and have no effect on the proposed hydrology for this project.

Figure 1: Existing Culvert

Figure 2: Existing 2-30” RCP Culvert under Campo Road

V. PROPOSED HYDROLOGIC CONDITIONS

The proposed site shall involve grading and construction of a paved access road, installation of a curb inlet and curb & gutter along the existing northerly dirt access road to the proposed access road, a new storm drain culvert. The site's project hydrology basins (Basins P1 to P6) will continue to discharge from the northwest to the southeast at the proposed culvert area and will then discharge in a southerly direction (same as the existing flow) to the two existing 30 inch storm drains located under Campo Road. The calculated runoff for the flow entering the 30-inch storm drains is approximately 72 cfs for a 100-year storm. The 30-inch storm drains will still be adequate for the proposed quantity of flow.

Flow from the proposed storm drain system adjacent to the existing access road (Basins P2 to P4) will discharge to the outlet of the existing 24-inch culvert. Riprap will be added to the outlet of this culvert on the southern side. A flow of 51.8 cfs for a 100-year storm will enter the proposed culvert located immediately south of the existing culvert. The proposed culvert will be 30-inches in diameter.

As indicated on the exhibits, the overall areas for the basins remain identical between existing and proposed basins for the project area. Any differences in discharge totals when comparing the existing hydrology to the proposed hydrology is due to the C and Tc values assigned to the proposed basins.

Appendix A
2003 County of San Diego Hydrology Graphs and Tables

Note that the Initial Time of Concentration should be reflective of the general land-use at the upstream end of a drainage basin. A single lot with an area of two or less acres does not have a significant effect where the drainage basin area is 20 to 600 acres.

Table 3-2 provides limits of the length (Maximum Length (L_M)) of sheet flow to be used in hydrology studies. Initial T_i values based on average C values for the Land Use Element are also included. These values can be used in planning and design applications as described below. Exceptions may be approved by the "Regulating Agency" when submitted with a detailed study.

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M) & INITIAL TIME OF CONCENTRATION (T_i)

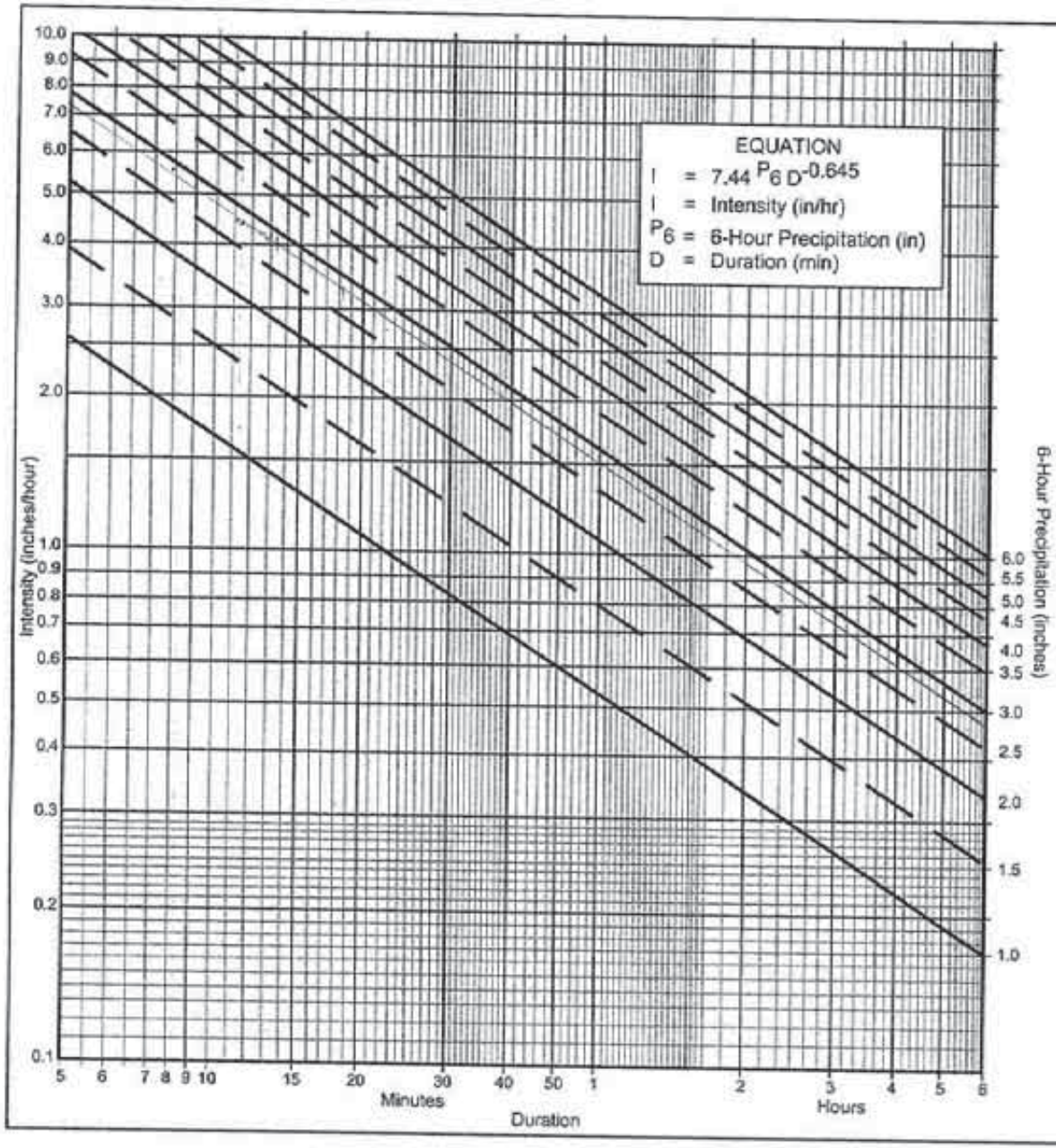
Element*	DU/	.5%		1%		2%		3%		5%		10%	
	Acre	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

*See Table 3-1 for more detailed description

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency _____ year

(b) P_6 = _____ in., P_{24} = _____, $\frac{P_6}{P_{24}}$ = _____ %(2)

(c) Adjusted P_6(2) = _____ in.

(d) t_x = _____ min.

(e) I = _____ in./hr.

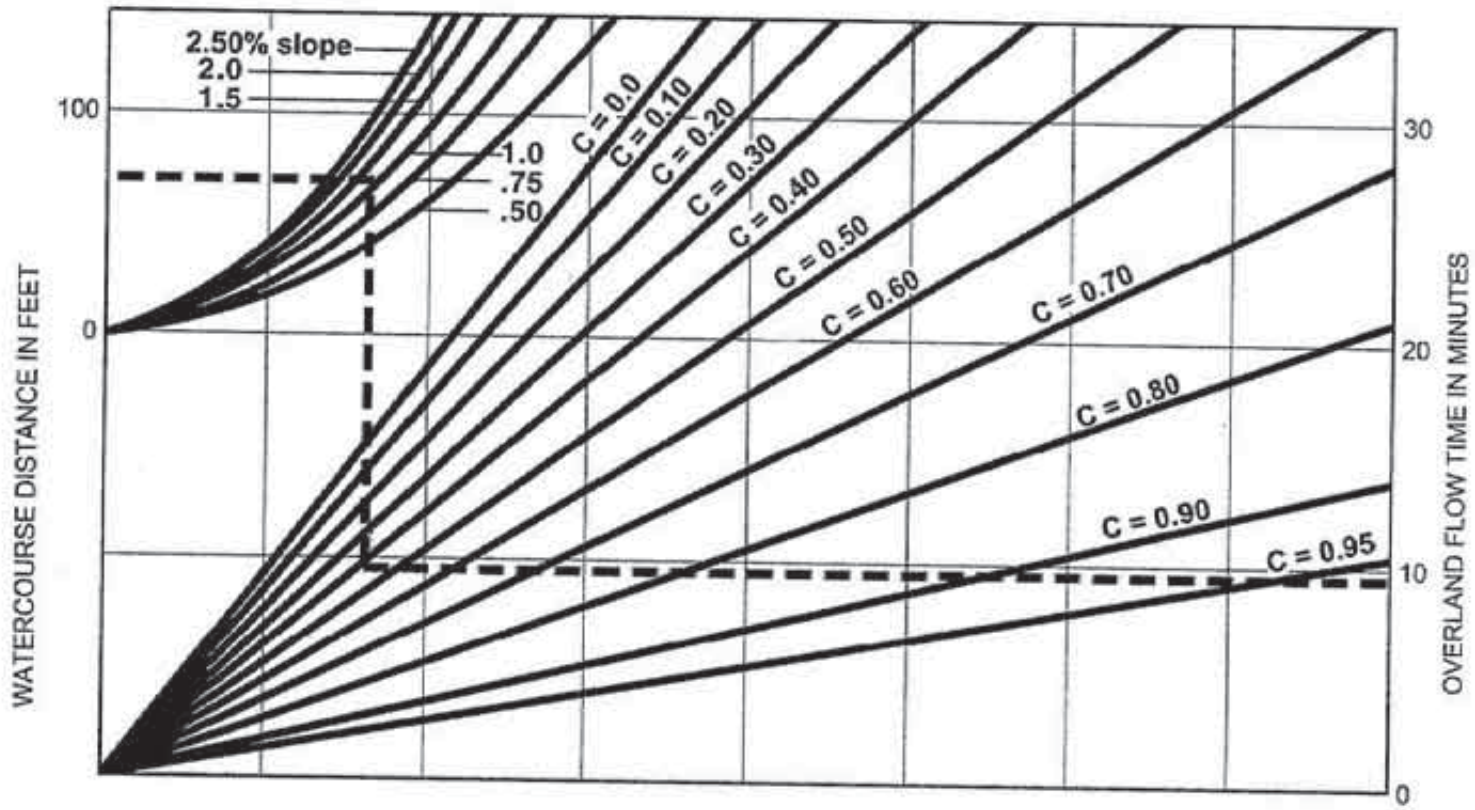
Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE

3-1



EXAMPLE:

Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

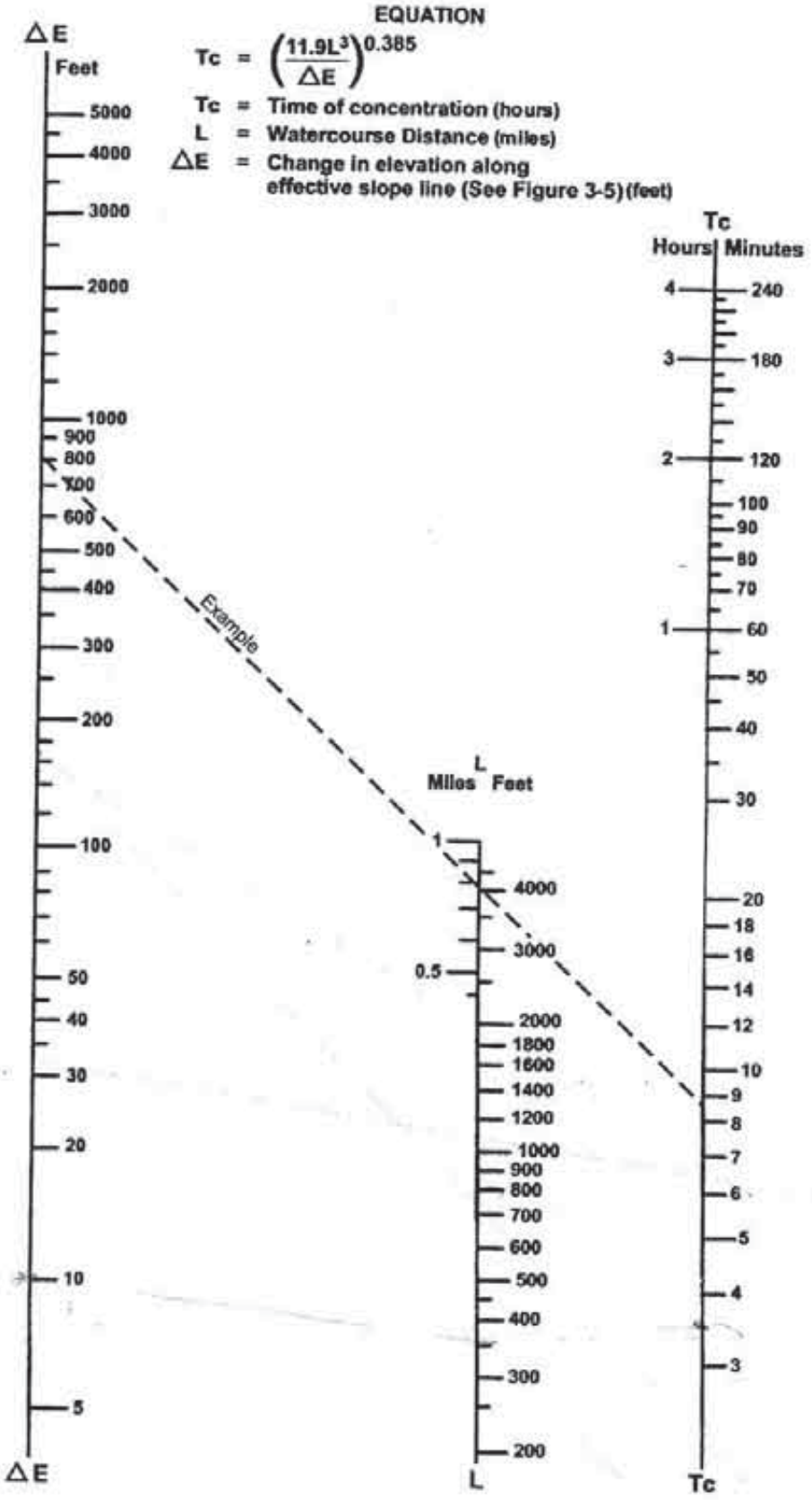
$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Rational Formula - Overland Time of Flow Nomograph

FIGURE

3-3

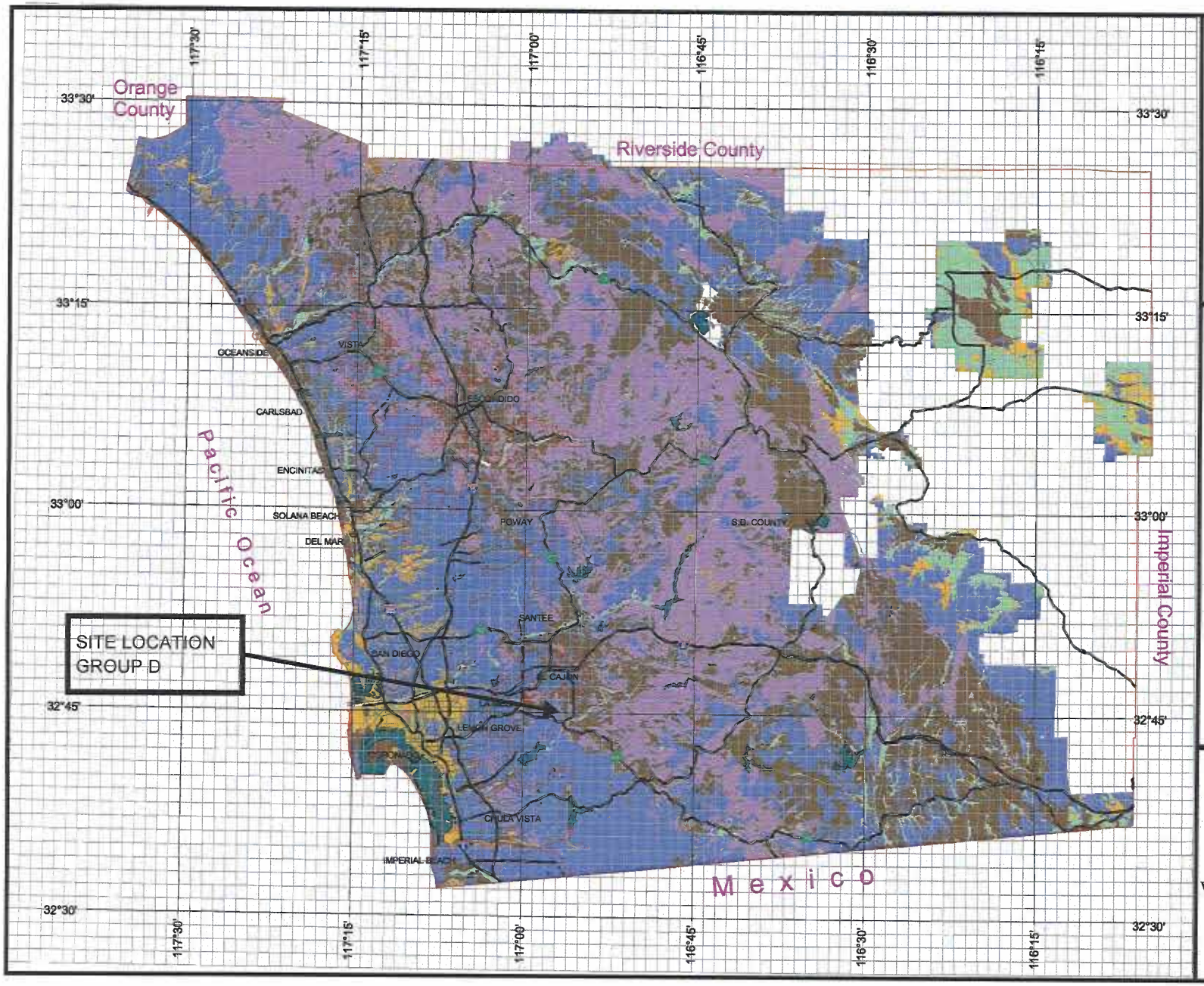


SOURCE: California Division of Highways (1941) and Kirpich (1940)

FIGURE

Nomograph for Determination of
Time of Concentration (Tc) or Travel Time (Tt) for Natural Watersheds

3-4



County of San Diego Hydrology Manual

Soil Hydrologic Groups

Legend

Soil Groups

- Group A
- Group B
- Group C
- Group D
- Undetermined
- Data Unavailable

DPW GIS
Department of Public Works Geographic Information Services

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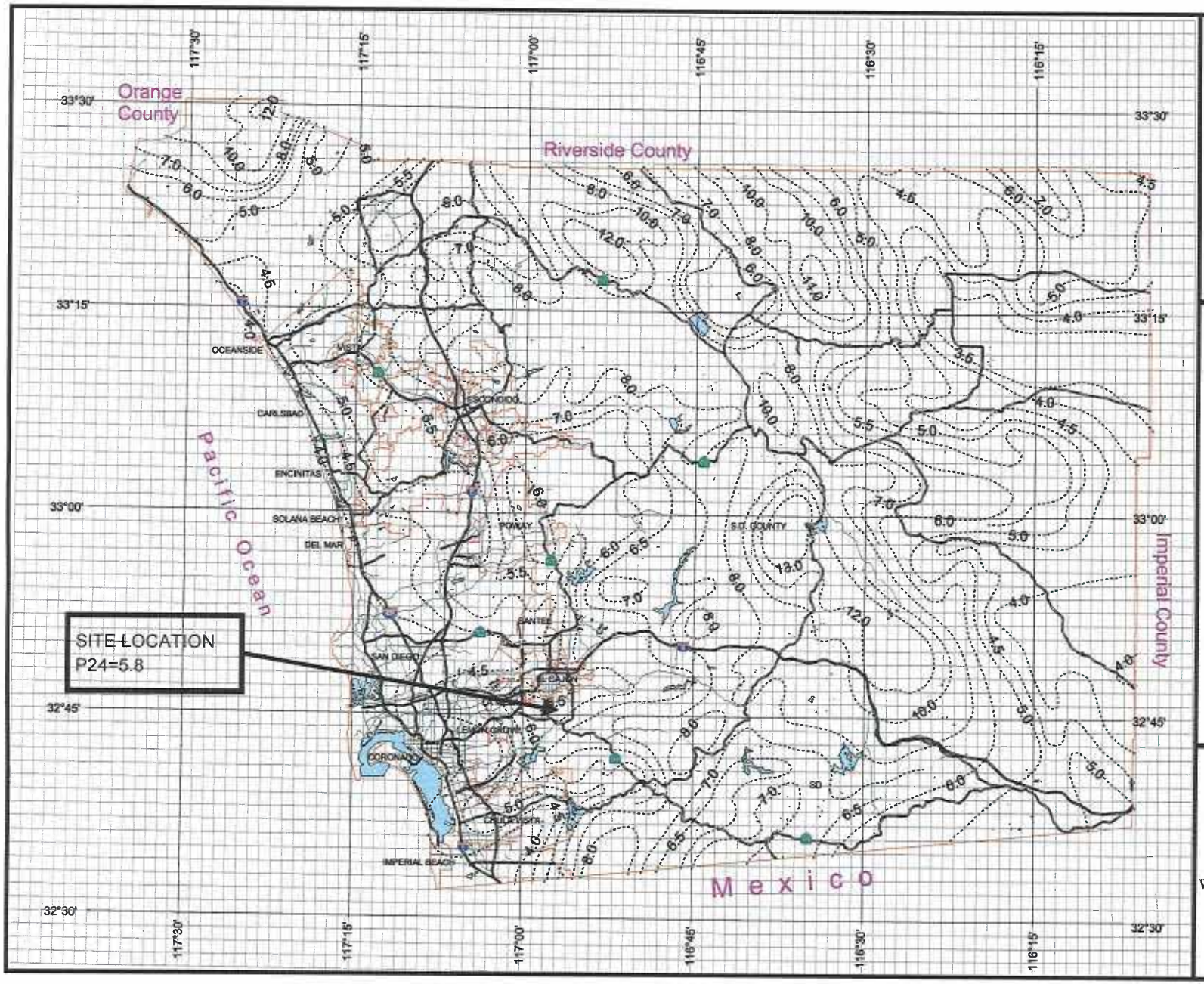

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

DPW GIS
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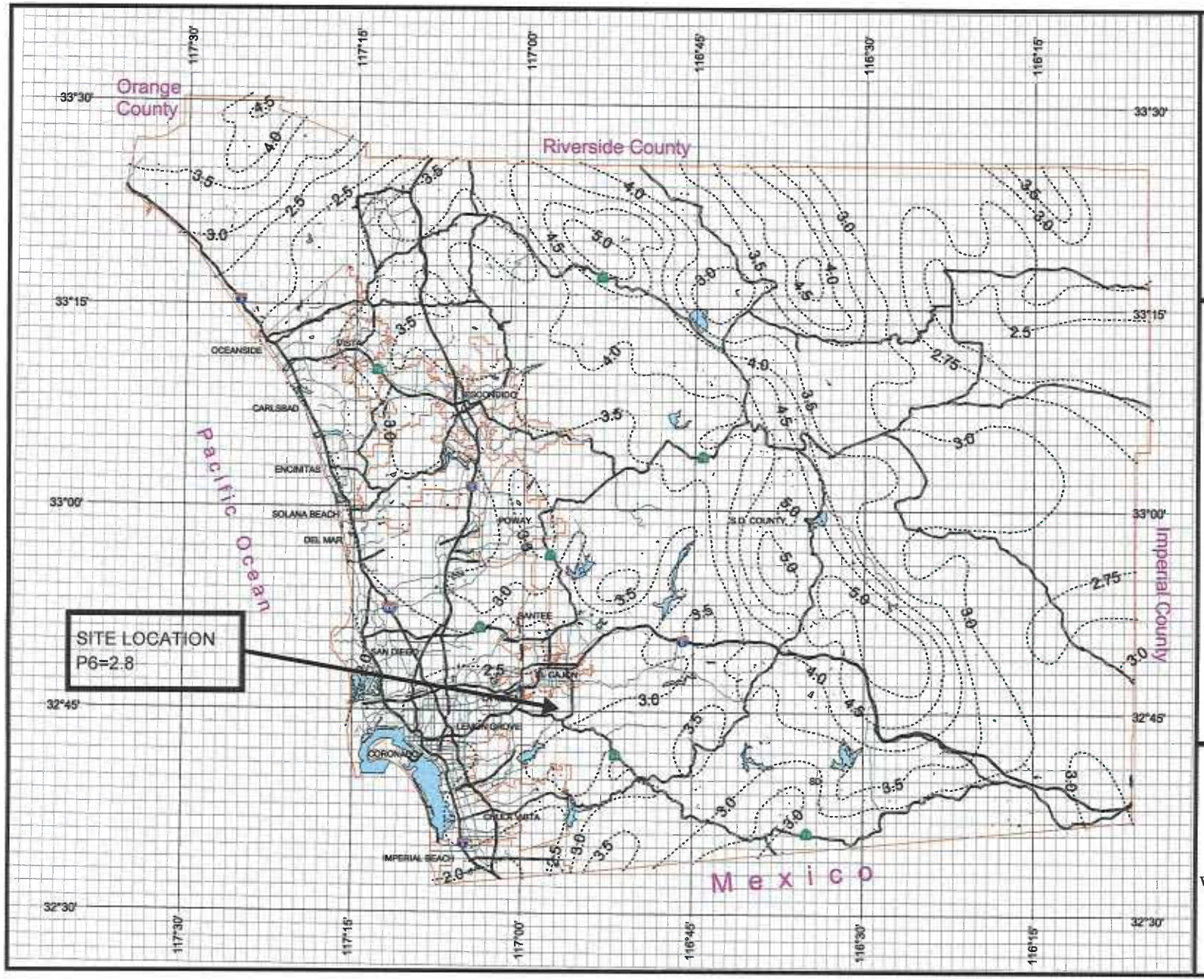

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

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S

3 0 3 Miles

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Appendix B
Calculations

I. Hydrology Calculations – Existing Basins

A. Flow across basin EX-B1 to node 101 (using Rational Method):

5% impervious, type "D" soil

Weighted C Factor per Table 3.1 of the Hydrology Manual = (0.35+0.41)/2 = 0.38

Area EX-B1 = 2.2 Acres

CA = (0.38)(2.2) = 0.84

L= 435 feet (85 feet maximum per Table 3.2 of the Hydrology Manual.)

S = 1.4 %

Ti = 11.2 min (Fig. 3.3 of the Hydrology Manual)

Tt = For remaining 350 feet Tt = 3.5 min (Fig 3.4 of Hydrology Manual)

Tc = Ti + Tt = 11.2 min. + 3.5 min. = 14.7 min.

From isopluvial maps for 100-year storm (Appendix B of the Hydrology Manual),

P_6 = 2.8

P_{24} = 5.8

P_6/ P_{24} = 2.8/5.8 = 0.48 0.45< 0.48< 0.65 P_6 value is ok for calculations.

Using Figure 3.1 of the Hydrology Manual, I_{100} = 3.6 in/hr

Flow (Q) = (CA)I = (0.84)(3.6) = <u>3.0 cfs at node 101</u>

B. Flow across basin EX-B2 to node 201(using Rational Method & Modified Rational Method):

8% impervious, type "D" soil

Weighted C Factor per Table 3.1 of the Hydrology Manual
(0.87)(0.08)+(0.35)(0.92) = 0.39

Area EX-B2 = 3.71 Acres

CA = (0.39)(3.71) = 1.4

L= 825 feet (L = 100 feet maximum per Table 3.2 of the Hydrology Manual-"natural, 10% impervious")

Ti = 6.9 min (Table 3.2 of the Hydrology Manual)

Tt for remaining 725 feet (Figure 3.4 of the Hydrology Manual) = 1 min.

Tc = Ti+Tt = 7.9 min

Using Figure 3.1 of the Hydrology Manual , I_{100} = 5.6

Flow (Q_{B2}) = (CA)I = (1.4)(5.6) = 7.84 CFS

Junction equation using Modified Rational Method:

$T_1 < T_2$

$Q_{T1} = Q_1 + (T_1/T_2)Q_2$ = 7.84 cfs + (7.9 min / 11.2 min)(3.0 cfs) = <u>9.96 cfs</u>

$Q_{T2} = Q2 + (I_2/I_1)Q_1$ = 3.0 cfs + (3.6 / 5.6)(7.84 cfs) = 8.04 cfs

Q = <u>9,96 cfs is selected at node 201.</u>

C. Flow across basin EX-B3 (using Rational Method):

0% impervious, type "D" soil

C = 0.35 per Table 3.1 of the Hydrology Manual

Area EX-B3 = 26.14 Acres

CA = (0.35)(26.14) = 9.1

L= 990 feet (100 feet maximum per Table 3.2 of the Hydrology Manual "natural, 0% impervious, slope =10%".)

S = 10.3 %,

Tt (Fig. 3.4 of Hydrology Manual) = 3.6 min.

$Tc = T_{201} + Tt$ = 7.9 min + 3.6 min = 11.5 min.

I_{100} = 4.4 (Figure 3.1 of the Hydrology Manual)

Flow (Q_{B3}) = $\sum(CA)I$ =[(0.38)(2.20) + (0.39)(3.71) + (0.35)(26.14)] (4.4)

= <u>50.3 cfs at node 301</u>.

D. Flow across basin EX-B4 (using Rational Method):

5% impervious, type "D" soil

Weighted C = 0.38 per Table 3.1 of the Hydrology Manual

Area EX-B4 = 12.85 Acres

CA = (0.38)(12.85) = 4.9

L= 1980'

S = 7.8 %

Tt = 6.7 min (Figure 3.4 of the Hydrology Manual)

$Tc = T_{301} + Tt$ = 11.5 min + 6.7 min = 18.2 min.

I_{100} = 3.4 (Figure 3.1 of the Hydrology Manual)

Flow (Q_{B3}) = $\sum(CA)I$ =[(0.38)(2.20) + (0.39)(3.71) + (0.35)(26.14) + (0.38)(12.85)] (3.4) = <u>55.5 cfs</u>

55.5 cfs flows southerly from the property into two (2) existing 30" RCP pipes aligned under Campo Road. (node <u>401</u>)

II. Hydrology Calculations – Proposed Basins

A. Flow across basin P1

0% impervious, type "D" soil

C = 0.35 per Table 3.1 of the Hydrology Manual

Area P1 = 1.03 Acres

CA = (0.35)(1.03) = 0.36

L= 405 feet (100 feet maximum per Table 3.2 of the Hydrology Manual "natural, 0% impervious, slope =10%".)

S = 15.8 %

$Tc = T_{301} + Tt$

Tt = 1 min (Figure 3.4 of the Hydrology Manual)

Tc= 11.5 min + 1.0 min = 12.5 min

I_{100} = 4.2 in/hr (Figure 3.1 of the Hydrology Manual)

Q=∑ (CA)I = [(0.84) + (1.4) + (9.1) + (0.35)(1.03)](4.2) = <u>49.14 cfs at node P101</u>

A more conservative figure for the total Q of Basins EX-B1 to EX-B3 may be used and added to the Basin P1 Q value: Q= 50.3cfs + (0.35)(1.03)4.2 = <u>51.8 cfs at node P101</u>

This is the total flow at the inlet of the proposed storm drain.

Sizing the proposed storm drain: $D = [(2.16nQ)(\sqrt{So})]^{3/8} = [2.16\ (0.015)(51.8)/0\sqrt{.045}]^{3/8}$

=2.17 feet = 26 inches A 30-inch storm drain may be used.

B. Flow across basin P2

80% impervious, type "D" soil

C = 0.79 per Table 3.1 of the Hydrology Manual

Area P2 = 3.83 Acres

CA = (0.79)(3.83) = 3.02

L= 555 feet (100 feet maximum per Table 3.2 of the Hydrology Manual)

S = 6.6 % P_6 = 2.8, P_{24} = 5.8 (100-year storm)

Ti = 3.5 min (Table 3.2 of the Hydrology Manual)

Tt = 1.5 min (Figure 3.4 of the Hydrology Manual)

Tc = Ti + Tt = 3.5min + 1.5 min = 5.0 min.

I_{100} = 7.3in/hr (Figure 3.1 of the Hydrology Manual)

Flow (Q_{P2}) = (CA)I =(3.02) (7.3) = <u>22.0 cfs at node P102</u>

C. Flow across basin P3

40% impervious, type "D" soil

C = 0.57 per Table 3.1 of the Hydrology Manual

Area P3 = 0.93 Acres

CA = (0.57)(0.93) = 0.53

L= 390 feet (100 feet maximum per Table 3.2 of the Hydrology Manual)

S = 13.7 %

T_{P2} = 5.0 min

Tc = T_{C2} + Tt = 5.0 min + 0 min = 5.0 min

I_{100} = 7.3 in/hr (Figure 3.1 of the Hydrology Manual)

Flow (Q_{P3}) = ∑(CA)I =[(0.79)(3.83) + (0.57)(0.93)] (7.3) = <u>25.96 cfs at node P103.</u>

D. Flow across basin P4

5% impervious, type "D" soil

C = 0.38 per Table 3.1 of the Hydrology Manual

Area P4 = 0.66 Acres

CA = (0.38)(0.66) = 0.25

L= 345 feet (100 feet maximum per Table 3.2 of the Hydrology Manual)

Ti = T_{P3} = 5.0 min

Tt = 0

Tc = T_{P3} + Tt = 5.0 min

I_{100} = 7.3 in/hr (Figure 3.1 of the Hydrology Manual)

Flow (Q_{p4}) = ∑(CA)I =[(3.02) + (0.53)+ (0.25)] (7.3) = <u>27.74 cfs at node P104</u>

E. Flow across basin P5

95% impervious, type "D" soil

C = 0.87 per Table 3.1 of the Hydrology Manual

Area P5 = 0.24 Acres

CA = (0.87)(0.24) = 0.21

L= 293 feet (100 feet maximum per Table 3.2 of the Hydrology Manual)

Ti = 1.9 min (Table 3.2 of the Hydrology Manual)

S=10.2%

Tc = Ti + T_{P4t} = 1.9 min + 5.0 min = 6.9 min

I_{100} = 6.4 in/hr (Figure 3.1 of the Hydrology Manual)

Flow (Q_{p5}) = ∑(CA)I =[(3.02) + (0.53)+ (0.26)+(0.21)] (6.4) = <u>25.7 cfs at node P105.</u>

A more conservative value of Q_{P4} + Q_{P5} is used Q = 27.74 cfs + (0.21)(6.4) = <u>29.1 cfs at node P105.</u>

F. Flow across basin P6

0% impervious, type "D" soil

C = 0.35 per Table 3.1 of the Hydrology Manual

Area P6 = 6.49 Acres

CA = (0.35)(6.49) = 2.27

L= 1110 feet

$T_i = T_{P5}$ = 6.9 min , S=2.9%

Tt = 6.3 min (Figure 3.4 of the Hydrology Manual)

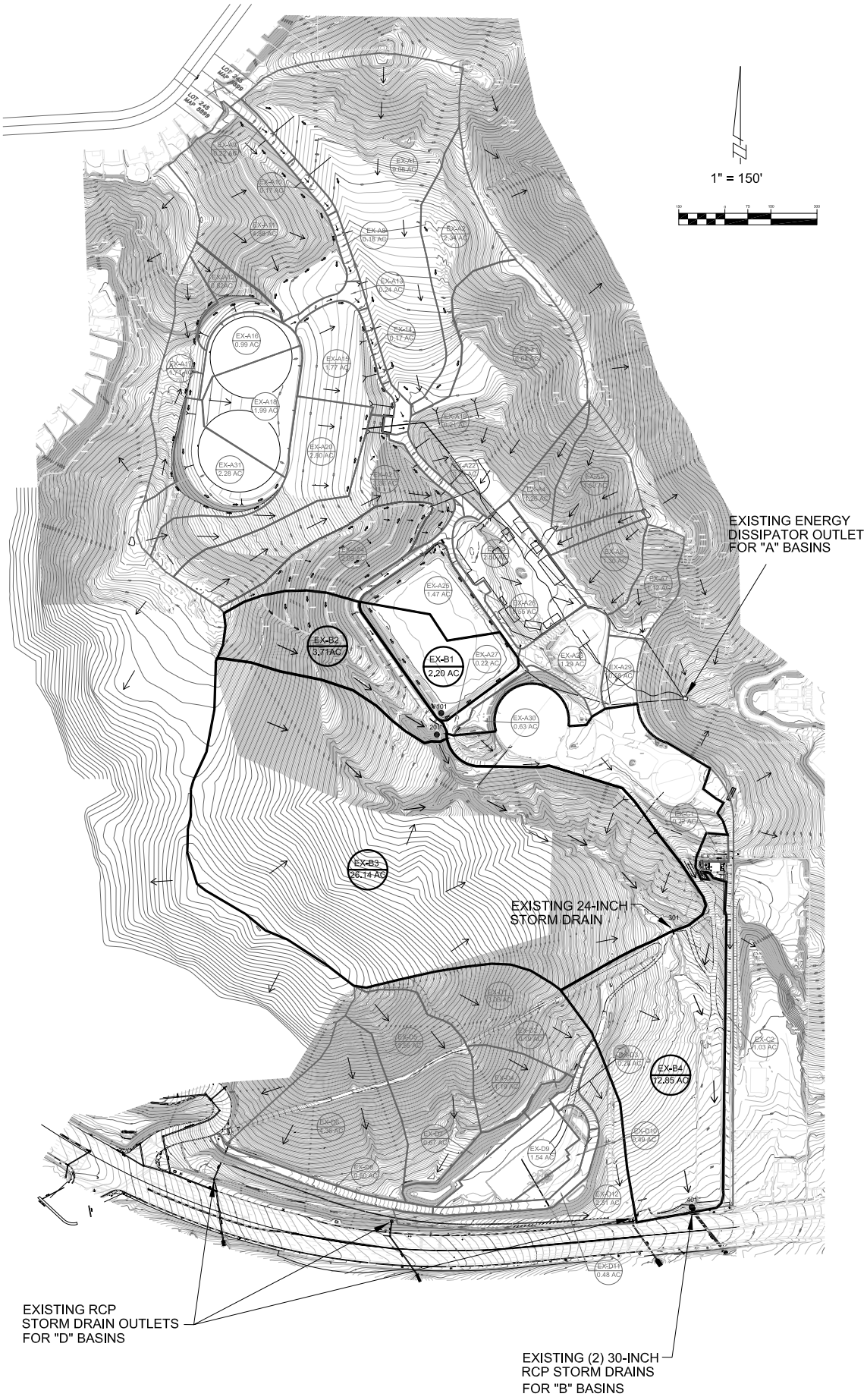
Tc = Ti + Tt = 6.9 min + 6.3 min = 13.2 min

I_{100} = 4.0 in/hr (Figure 3.1 of the Hydrology Manual)

Flow (Q_{p6}) = ∑(CA)I =[(0.84) + (1.4) + (9.1) + (0.36) + (3.02) + (0.53)+ (0.25)+(0.21) + (2.27)] (4.0) = <u>71.9 cfs</u> at node P106.

Sizing for the adequacy of the existing storm drains: $D = [(2.16nQ)(\sqrt{So})]^{3/8} = [2.16 (0.015)(71.9)/ \sqrt{0.02}]^{3/8}$

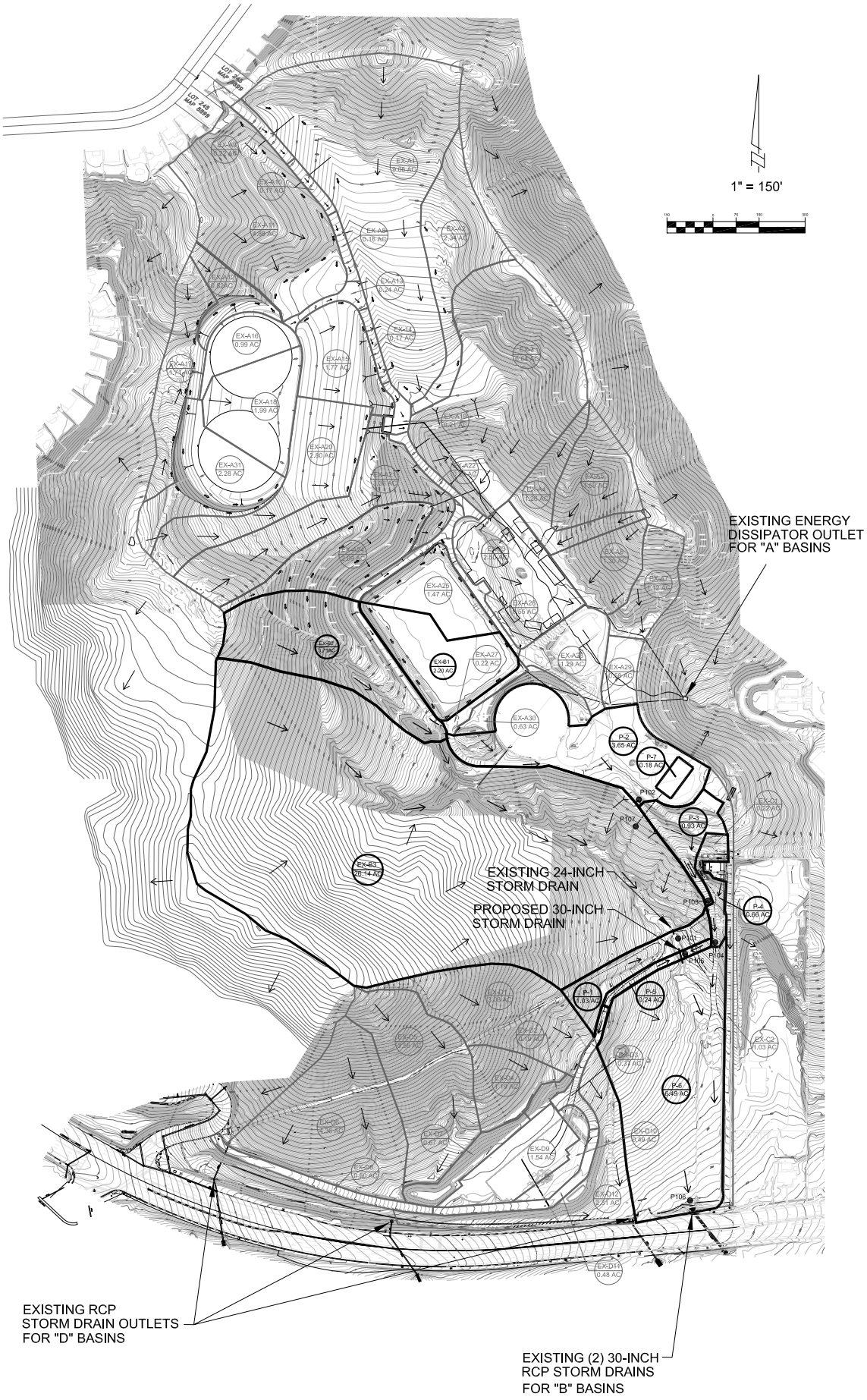
=2.85 feet = 34 inches The two existing 30-inch storm drains may be used.



OTAY WATER DISTRICT

EXISTING HYDROLOGY CONDITIONS - REGULATORY SITE ACCESS ROAD

EXHIBIT A



OTAY WATER DISTRICT

PROPOSED HYDROLOGY CONDITIONS - REGULATORY SITE ACCESS ROAD

EXHIBIT B

Appendix G

Heartland Regional Training Facility – Traffic Letter Report

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Transportation
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Pasadena
Costa Mesa
San Diego
Las Vegas

April 11, 2012

Ms. Lisa Coburn-Boyd
Otay Water District
2554 Sweetwater Spring Boulevard
Spring Valley, CA. 91978-2096

LLG Reference: 3-10-2103

SUBJECT: Heartland Regional Training Facility – Traffic Letter Report

Dear Ms. Coburn-Boyd:

Linscott, Law & Greenspan, Engineers (LLG) has completed this traffic letter report for the Heartland Regional Training Facility. The Heartland Regional Training Facility is a Regional Emergency Services Training Center (RESTC) in partnership with the Otay Water District, the San Miguel Consolidated Fire Protection District (the District) and the Heartland Training Facility Authority (HTFA). The RESTC has secured a long-term lease for 3.5 acres of property from the Otay Water District for the facility. This existing site will be co-used and cohabitated with the working pump site and training location for the Otay Water District. Access to the site is proposed via the existing church driveway which serves as the north leg of the SR 94/Jamacha Boulevard intersection. ***Figure 1*** shows the project vicinity and ***Figure 2*** shows the project area.

Included in this traffic assessment is the following:

- Existing Traffic Conditions;
- Project Trip Generation/Distribution;
- Existing Plus Project Capacity Analysis;
- Existing Plus Project Plus Cumulative Capacity Analysis; and
- Conclusions.

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EXISTING TRAFFIC CONDITIONS

LLG conducted weekday intersection counts during the AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak hours in March 2012 at the Campo Road (SR-94) intersections at Jamacha Boulevard and Jamacha Road. ***Figure 3*** shows the existing lane configurations at the study intersections. ***Figure 4*** shows the existing traffic volumes. ***Appendix A*** contains the manual turning movement count sheets.

PROJECT TRIP GENERATION

As previously mentioned, the site will be used by the Otay Water District and the San Miguel Fire Department. Based on information provided by the client, it is anticipated that the Otay Water District will generate 5 vehicles of one ton or less and approximately 2 vehicles larger than the one-ton rating per day. Similarly, the San Miguel Fire Department is expected to generate 3 vehicles of one ton or less and approximately 3 vehicles larger than the one-ton rating. Multi-passenger vehicles, such as vans or buses, will be utilized to shuttle fire fighters and other training personnel.

Since vehicles larger than one-ton (trucks) tend to have a more significant effect on roadway operations when compared to passenger vehicles, passenger car equivalency factors (PCE's) were applied to convert truck traffic to passenger vehicle equivalents. As specified by the *Highway Capacity Manual*, three-axle trucks should use a PCE factor of 2.0. Therefore, all vehicles larger than one-ton (truck) trips calculated in this analysis were multiplied by 2.0 to derive traffic levels in PCE's. In addition, 10 extra miscellaneous vehicles were assumed to account for other potential trips to the site (i.e. deliveries, trash collection, etc). ***Table 1*** shows the daily and peak hour truck trip generation for the proposed project. The Heartland Regional Training Facility is projected to generate a total of approximately 46 trip-ends per day with 19 (13 inbound/ 6 outbound) vehicles during the AM peak hour and 19 (6 inbound/ 13 outbound) vehicles hour during the PM peak hour.

It should be noted that two discretionary special events including Countywide fire training or use of the site as a staging/meeting area during fires are conditioned to occur no more than twice per year. These special events would involve more trips to and from the site but since they will occur so infrequently, do not require analysis.

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TABLE 1
PROJECT TRIP GENERATION

Land Use	Total Trips (one-way)	ADT	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
Otay Water District Vehicles								
≤ 1 Ton	5	10	2	2	4	2	2	4
> 1 Ton [a]	2	8	2	2	4	2	2	4
Subtotal Otay Water District Vehicles		*18*	*4*	*4*	*8*	*4*	*4*	*8*
San Miguel Fire Department Vehicles								
≤ 1 Ton	3	6	2	1	3	1	2	3
> 1 Ton [a]	3	12	6	0	6	0	6	6
Subtotal Fire Department Vehicles		*18*	*8*	*1*	*9*	*1*	*8*	*9*
Miscellaneous Trips [b]	—	10	1	1	2	1	1	2
TOTAL		**46**	**13**	**6**	**19**	**6**	**13**	**19**

Footnotes:
a. Average Daily Traffic volumes have been adjusted to reflect a 2.0 PCE for vehicles greater than one ton.
b. Miscellaneous trips have been assumed to account for delivery trucks, meeting, or other vehicles that might use the facility.

PROJECT TRIP DISTRIBUTION

The generated project traffic was distributed to the street system based on information provided by the client. The Otay Water District vehicles are expected to originate from the Utility and Maintenance facility (2553 Sweetwater Springs Boulevard, Spring Valley, 91978) with a smaller number of trips coming from other locations. Similarly, the majority of the San Miguel Fire Department vehicle trips will originate from the San Miguel Headquarters (2850 Via Orange Way, Spring Valley, 91978) with a smaller number of trips from surrounding fire districts. ***Figure 5*** represents the estimated Otay Water District vehicle trip distribution and the estimated San Miguel Fire Department vehicle trip distribution.

PROJECT TRIP ASSIGNMENT

Figure 6 presents the assignment of project traffic to the surrounding circulation system based on the estimated distribution (illustrated in *Figure 5*). ***Figure 7*** shows the existing + project traffic assignment.

SIGNIFICANCE CRITERIA

The following criterion was utilized to evaluate potential significant impacts, based on the County's documents "Guidelines for Determining Significance", adopted and revised effective June 30, 2009.

This section provides guidance for evaluating adverse environmental effects a project may have on signalized and unsignalized intersections.

Signalized Intersections—Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on a signalized intersection:

- The additional or redistributed ADT generated by the proposed project will significantly increase congestion on a signalized intersection currently operating at LOS E or LOS F, or will cause a signalized intersection to operate at a LOS E or LOS F as identified in ***Table 2***.

Unsignalized Intersections—The operating parameters and conditions for unsignalized intersections differ dramatically from those of signalized intersections. Very small volume increases on one leg or turn and/or through movement of an unsignalized intersection can substantially affect the calculated delay for the entire intersection. Significance criteria for unsignalized intersections are based upon a minimum number of trips added to a critical movement at an unsignalized intersection.

Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on an unsignalized intersection:

- The additional or redistributed ADT generated by the proposed project will add 20 or more peak hour trips to a critical movement of an unsignalized intersection, and cause an unsignalized intersection to operate below LOS D, or
- The additional or redistributed ADT generated by the proposed project will add 20 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS E, or
- The additional or redistributed ADT generated by the proposed project will add 5 or more peak hour trips to a critical movement of an unsignalized intersection, and cause the unsignalized intersection to operate at LOS F, or
- The additional or redistributed ADT generated by the proposed project will add 5 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS F, or
- Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, it is found that the generation rate is less than those specified above, and would significantly impact the operations of the intersection.

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TABLE 2
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON INTERSECTIONS
ALLOWABLE INCREASES ON CONGESTED INTERSECTIONS

Level of service	Signalized	Unsignalized
LOS E	Delay of 2 seconds	20 peak hour trips on a critical movement
LOS F	Delay of 1 second, or 5 peak hour trips on a critical movement	5 peak hour trips on a critical movement

General Notes:

1. A critical movement is one that is experiencing excessive queues.
2. By adding proposed project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes any trips must mitigate a share of the cumulative impacts.
3. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.

CAPACITY ANALYSIS

Existing

The intersection operation analysis was conducted to assess any potential impacts that could result from the development of the project. ***Table 3*** shows that the study area intersections are currently operating at LOS D or better during the AM and PM peak hours.

Existing + Project

Also shown in *Table 3*, with the addition of the project traffic, the study area intersections are calculated to operate at acceptable LOS D or better during both the AM and PM peak hours.

Existing + Project + Cumulative Projects

Cumulative projects are other projects in the study area that will add traffic to the local circulation system in the near future that would need to be accounted for in the cumulative scenario. As a result, a conservative analysis was conducted assuming 15% ambient growth in addition to one known cumulative project. ***Figure 8*** shows the existing + project traffic + cumulative assignments.

Also shown in *Table 3*, with the addition of the project traffic, the study area intersections are calculated to operate at acceptable LOS D or better during both the AM and PM peak hours, with the exception of the Jamacha Boulevard/ Campo Road intersection during the PM peak hour (LOS E).

Appendix B contains the intersection analysis worksheets.

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TABLE 3
INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project		Δ [c]	Existing + Project + Cumulative Projects		Impact Type
			Delay [a]	LOS [b]	Delay	LOS		Delay	LOS	
1. Jamacha Blvd/ Campo Rd (SR-94)	Signal	AM	20.4	C	20.7	C	0.3	25.4	C	**Cumulative**
		PM	38.4	D	39.5	D	1.1	**71.0**	**E**	
2. Campo Rd/ Jamacha Rd	Signal	AM	38.7	D	38.7	D	0.0	45.6	D	None
		PM	32.9	C	32.9	C	0.0	38.4	D	

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service. See table at right for delay thresholds.
c. **Δ** Denotes change in delay.

General Notes:
Shading and **bold** typeface indicates significant impact.

SIGNALIZED DELAY/LOS THRESHOLDS		UNSIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

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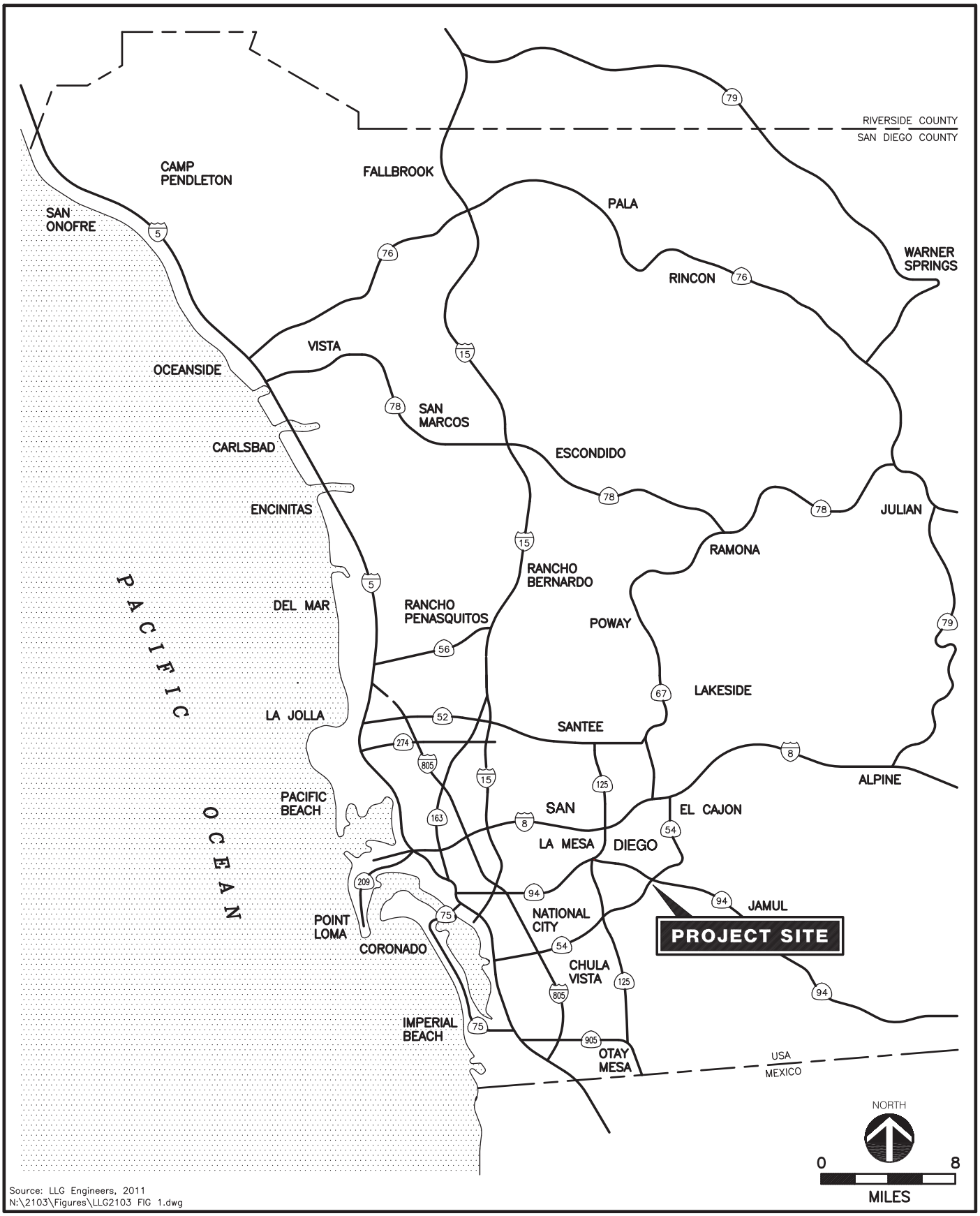
CONCLUSIONS

Based on the County of San Diego significance criteria, no significant direct traffic impacts were calculated due to the project traffic. Therefore, direct mitigation measures are not necessary. However, the project would result in a significant cumulative impact to the Campo Road/ Jamacha Road intersection as outlined in *Table 3*. The land uses associated with the Otay Water District and San Miguel Fire Department would be required to make a County Traffic Impact Fee (TIF) payment to mitigate this impact to below a level of significance. The project falls under the "School and Government/Institutional" fee-rate/land use category as a fire station within the Valle de Oro TIF area as defined in the 2008 TIF report. The total building square footage for the Heartland Training Facility amounts to approximately 8,580 SF. Based on the total payment per square foot of $5,265 for this land use type, the TIF payment required for the project totals $45,174.

Please call us at 858-300-8800 if you would like to discuss.

Sincerely,
Linscott, Law & Greenspan, Engineers

John Boarman, P.E.
Principal



Source: LLG Engineers, 2011
N:\2103\Figures\LLG2103 FIG 1.dwg

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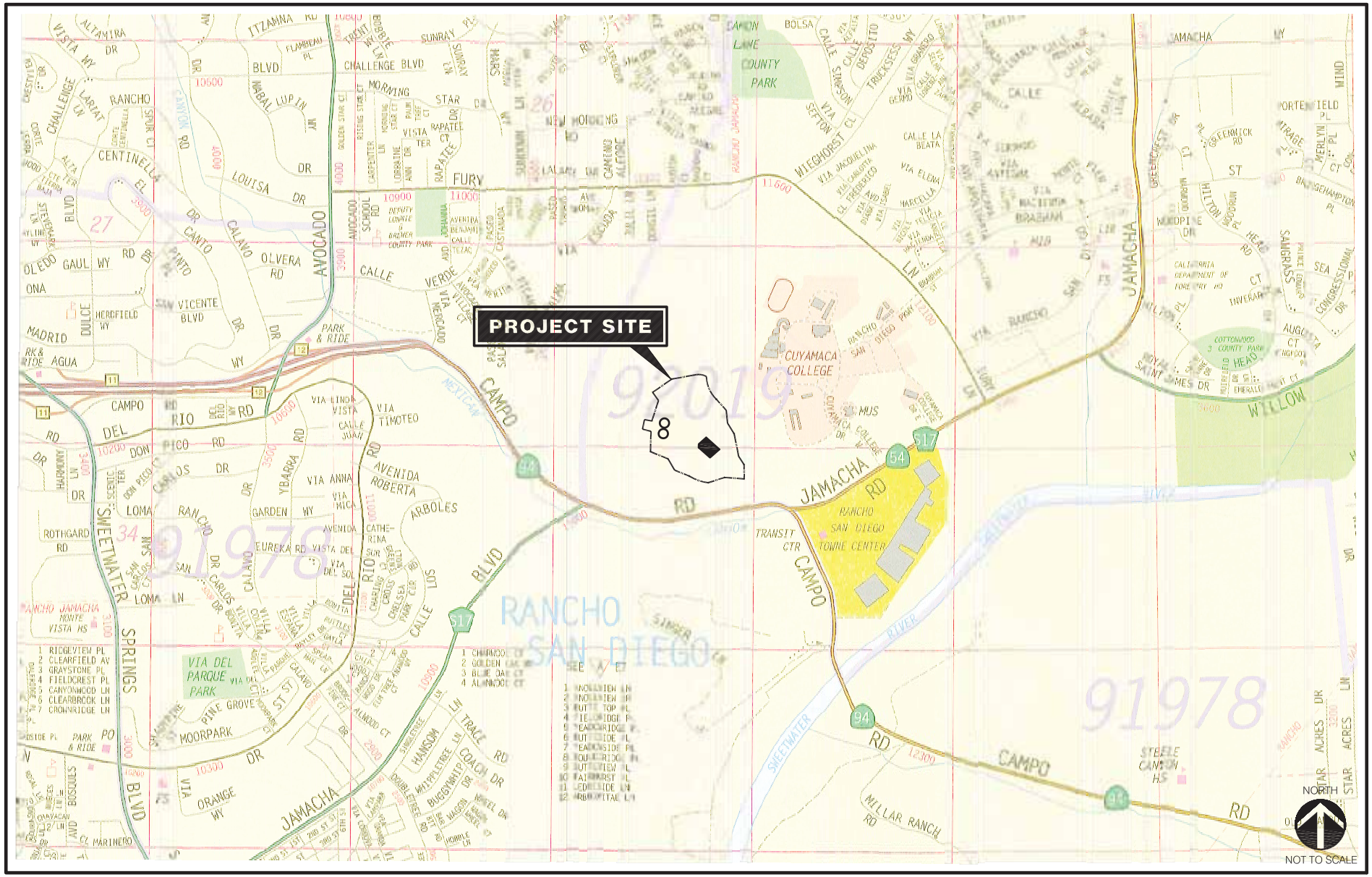
Figure 1

Vicinity Map

San Miguel Regional Training Facility



Source: Thomas Guide, 2011
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Figure 2

Project Area Map

SAN MIGUEL REGIONAL TRAINING FACILITY

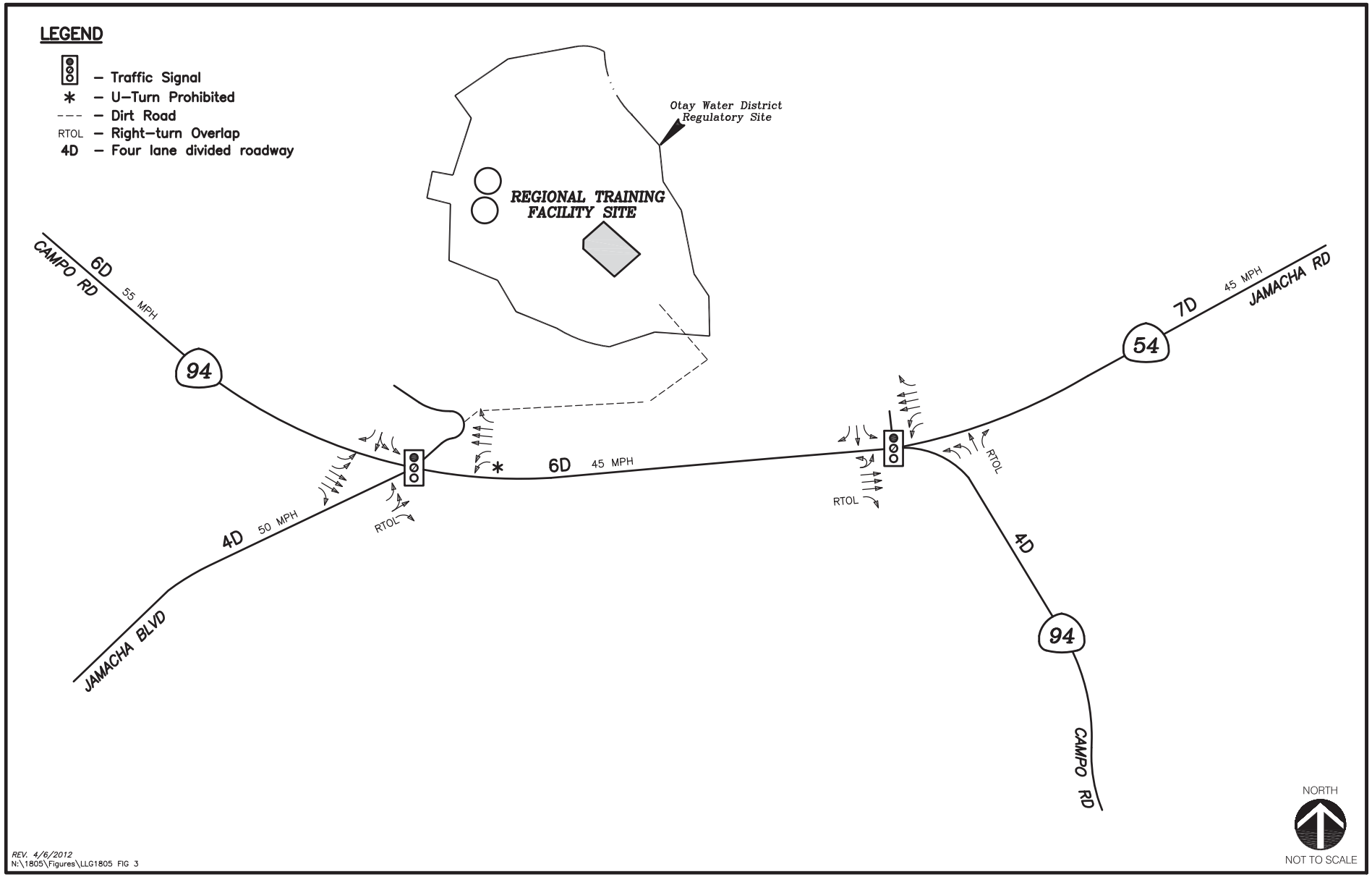

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Figure 3

Existing Conditions Diagram

SAN MIGUEL TRAINING FACILITY

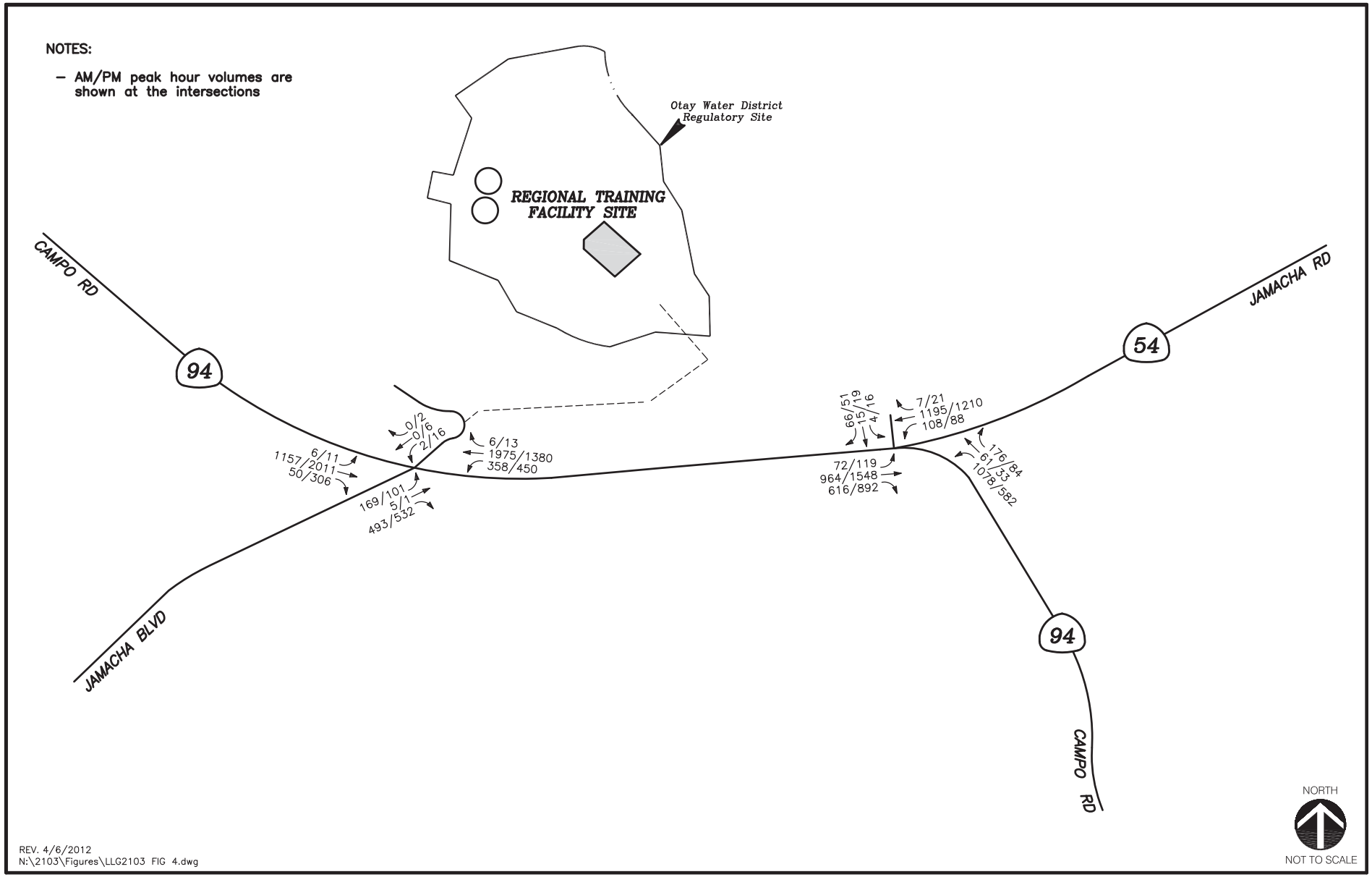

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Figure 4

Existing Traffic Volumes AM/PM Peak Hours

SAN MIGUEL TRAINING FACILITY

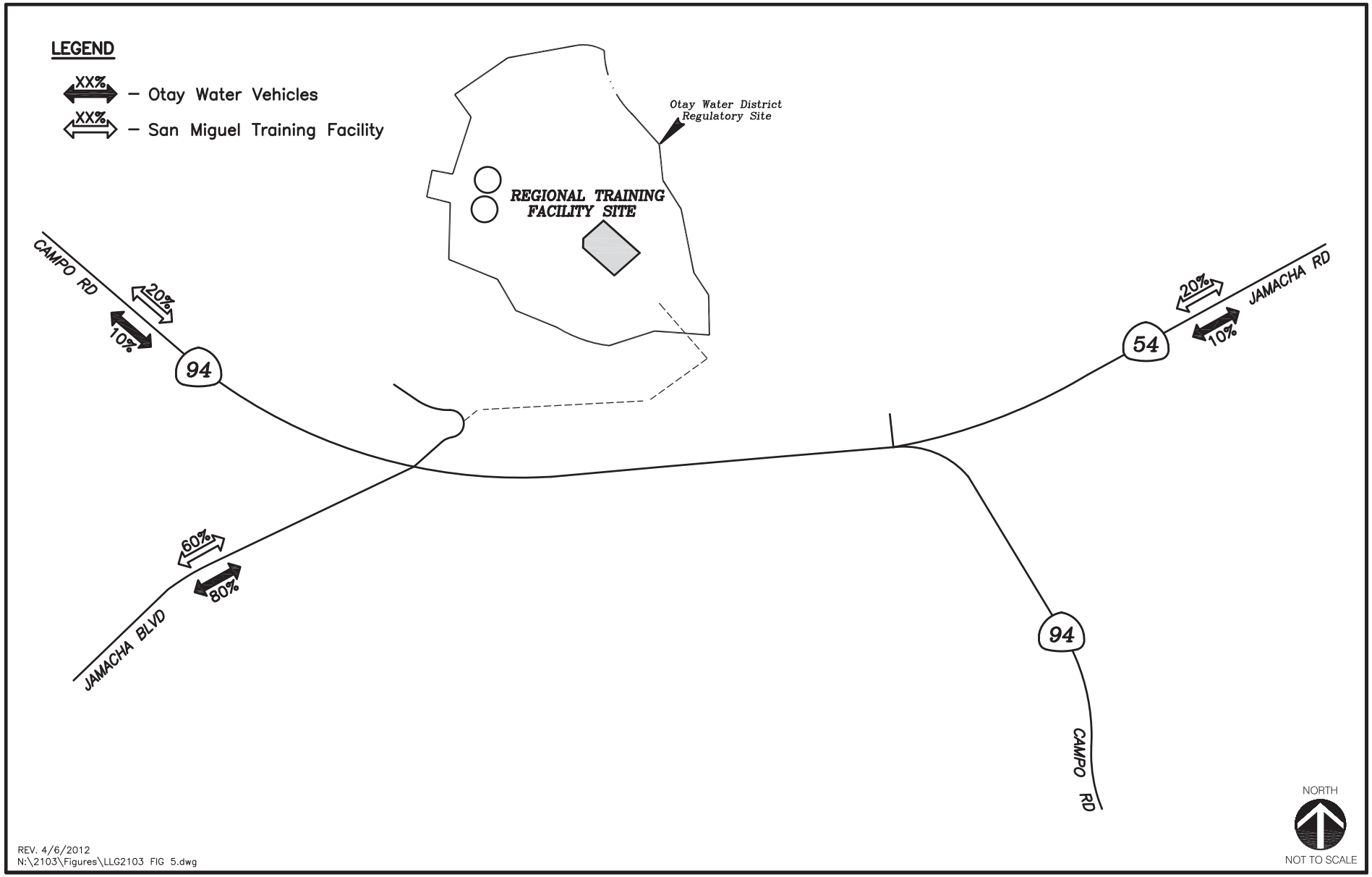

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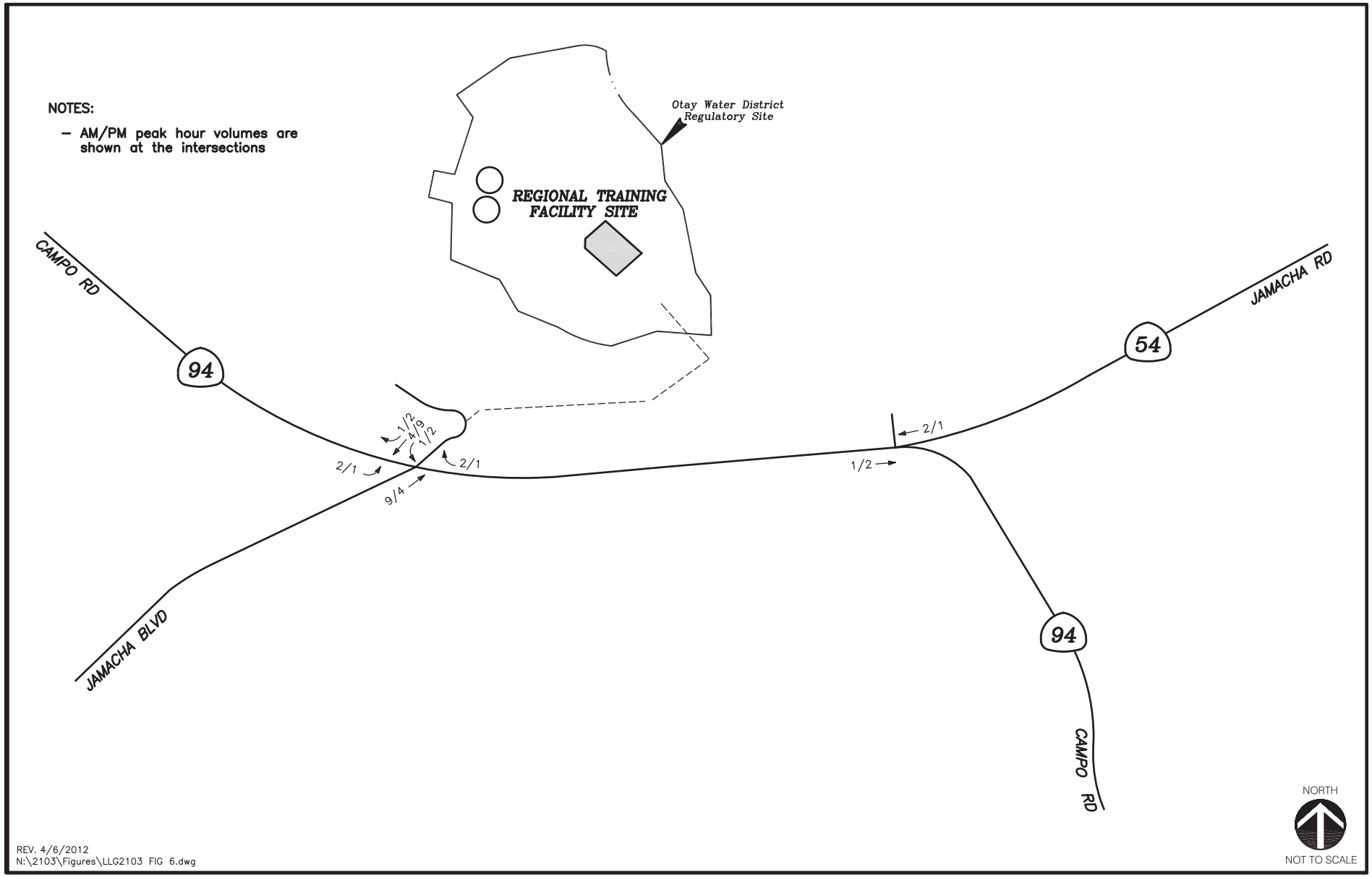
Figure 5

Project Trip Distribution

SAN MIGUEL TRAINING FACILITY



REV. 4/6/2012
N:\2103\Figures\LLG2103 FIG 6.dwg

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Figure 6

Project Traffic Volumes AM/PM Peak Hours

SAN MIGUEL TRAINING FACILITY

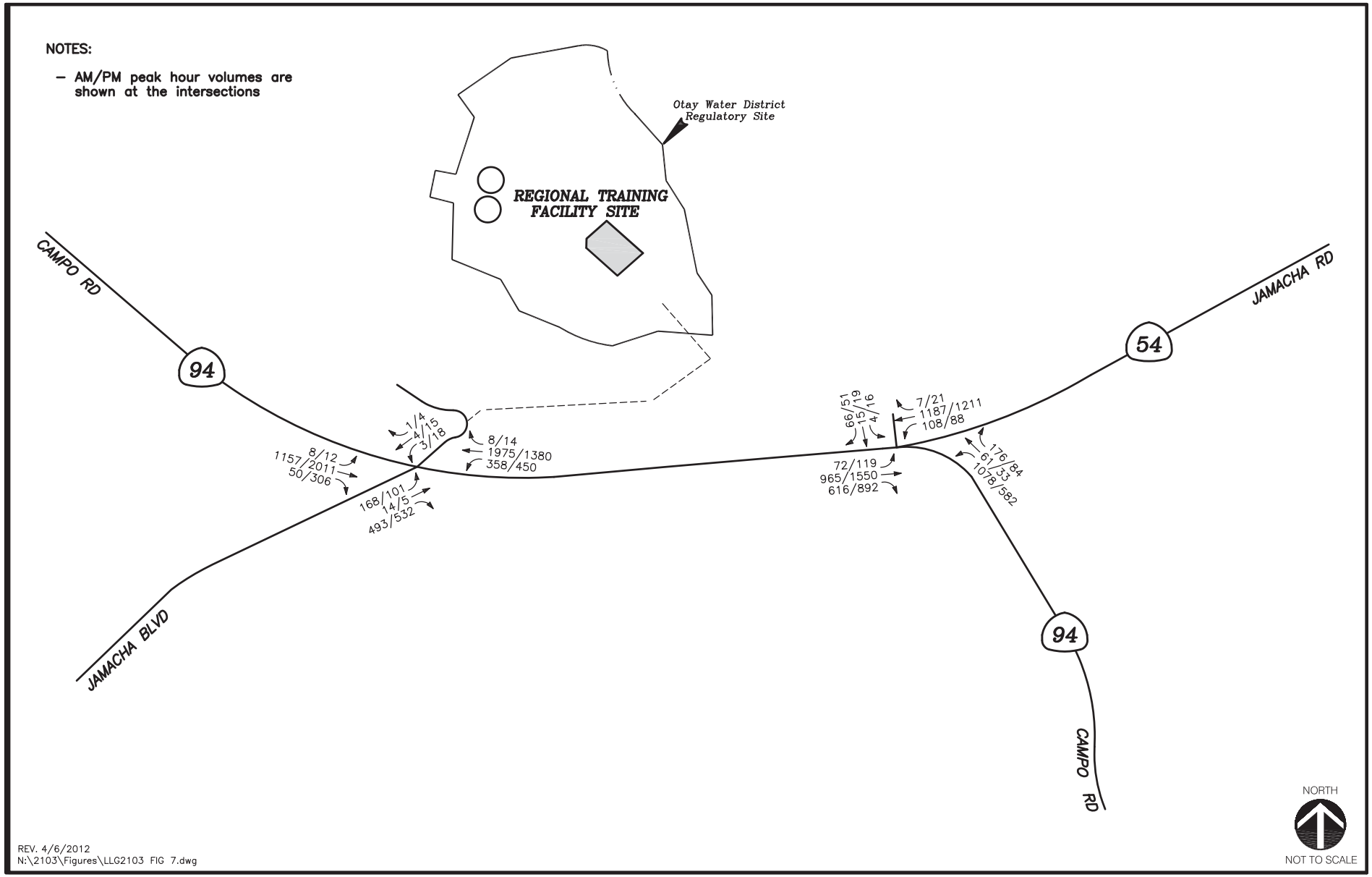

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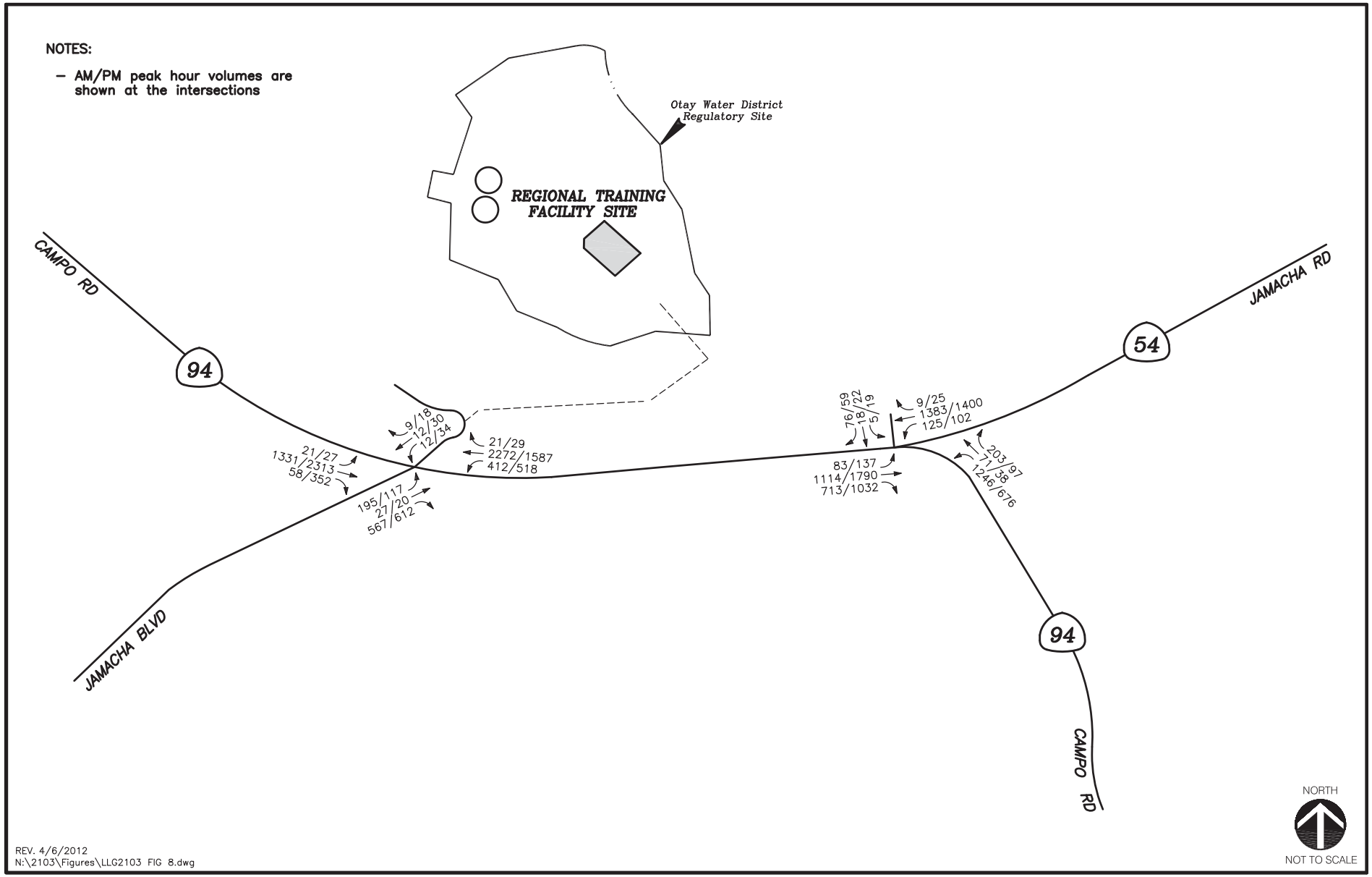
Figure 7

Existing + Project Traffic Volumes AM/PM Peak Hours

SAN MIGUEL TRAINING FACILITY



REV. 4/6/2012
N:\2103\Figures\LLG2103 FIG 8.dwg

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Figure 8

Existing + Project + Cumulative Projects Traffic Volumes AM/PM Peak Hours

SAN MIGUEL TRAINING FACILITY

APPENDIX A

MANUAL TURNING MOVEMENT COUNT SHEETS

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6746

Project #: 12-1053-001

TMC SUMMARY OF Jamacha Blvd & Campo Rd

APPROACH LANES

	1	1	2
TOTAL	2	6	18
PM	2	6	16
MD			
AM	0	0	2

Jamacha Blvd

Campo Rd

Campo Rd

N

APPROACH LANES

	TOTAL	AM	MD	PM
2	17	6		11
3	3044	1157		1887
1	356	50		306

CONTROL SIGNAL

	AM	MD	PM	TOTAL
1	6		13	19
3	1975		1380	3355
2	358		450	808

APPROACH LANES

	PM	MD	AM	TOTAL
2	101	1	532	
1	169	5	493	
	270	6	1025	

Jamacha Blvd

	2	1	1

APPROACH LANES

LOCATION #: 12-1053-001

TURNING MOVEMENT COUNT

Jamacha Blvd & Campo Rd
(Intersection Name)

TUESDAY — Day
03/13/2012 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 700 AM

NOON PEAK HOUR:

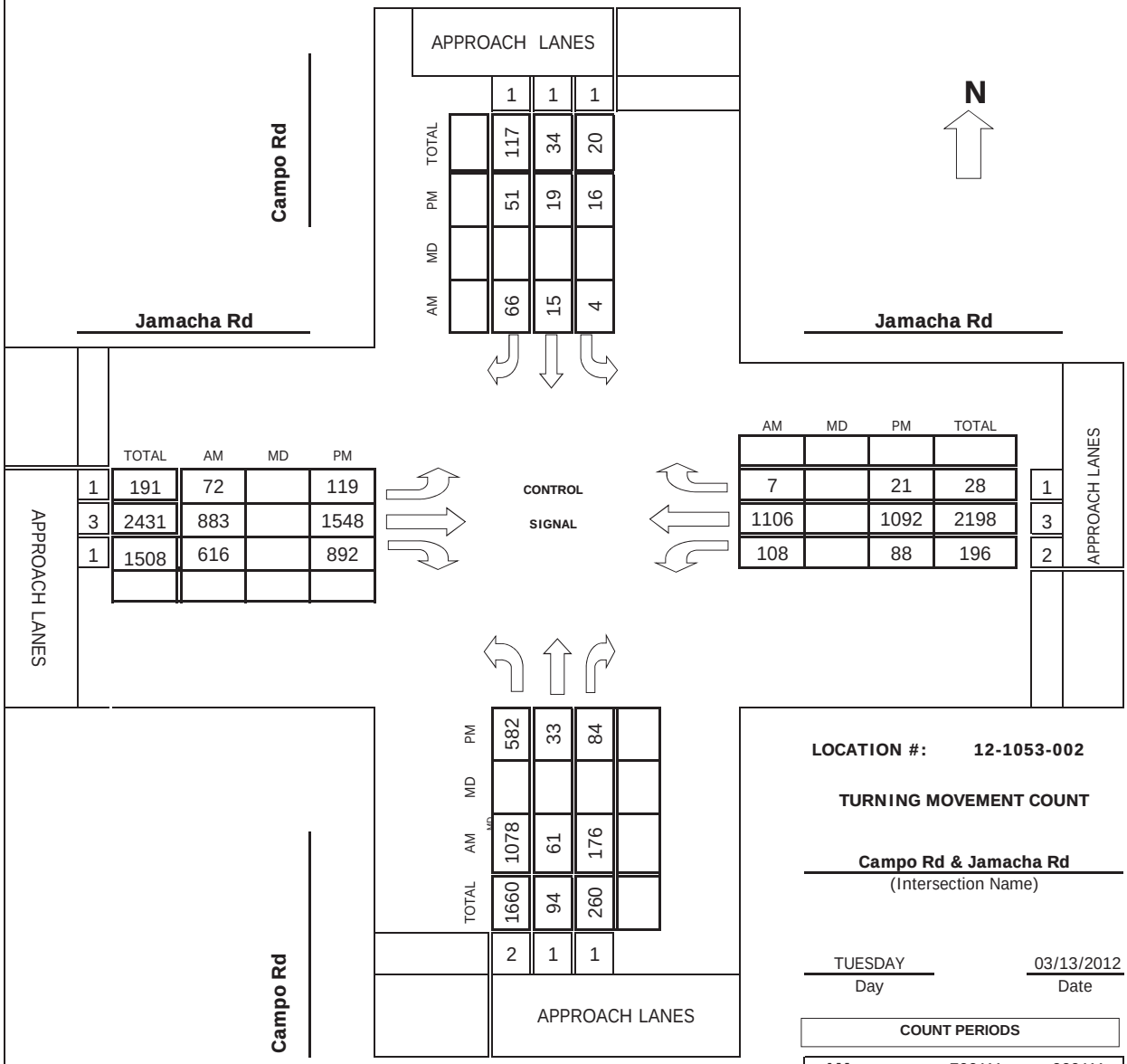
PM PEAK HOUR: 400 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6746

Project #: 12-1053-002

TMC SUMMARY OF Campo Rd & Jamacha Rd



LOCATION #: 12-1053-002

TURNING MOVEMENT COUNT

Campo Rd & Jamacha Rd
(Intersection Name)

TUESDAY — Day
03/13/2012 — Date

COUNT PERIODS

AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR: 700 AM

NOON PEAK HOUR:

PM PEAK HOUR: 445 PM

APPENDIX B

INTERSECTION ANALYSIS WORKSHEETS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	1157	50	358	1975	6	169	5	493	2	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.95	0.95	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1681	1690	1583	1681	1681	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.95	
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1681	1690	1583	1681	1681	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	1258	54	389	2147	7	184	5	536	2	0	0
RTOR Reduction (vph)	0	0	32	0	0	3	0	0	257	0	0	0
Lane Group Flow (vph)	7	1258	22	389	2147	4	94	95	279	1	1	0
Turn Type	Prot		Perm	Prot		Perm	Split		pm+ov	Split		Prot
Protected Phases	7	4		3	8		2	2	3	6	6	6
Permitted Phases			4			8			2			
Actuated Green, G (s)	0.7	36.4	36.4	15.7	51.4	51.4	10.2	10.2	25.9	5.6	5.6	
Effective Green, g (s)	0.7	36.4	36.4	15.7	51.4	51.4	10.2	10.2	25.9	5.6	5.6	
Actuated g/C Ratio	0.01	0.41	0.41	0.18	0.58	0.58	0.12	0.12	0.29	0.06	0.06	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	27	2106	656	613	2973	926	195	196	466	107	107	
v/s Ratio Prot	0.00	0.25		c0.11	c0.42		0.06	0.06	c0.11	c0.00	0.00	
v/s Ratio Perm			0.01			0.00			0.07			
v/c Ratio	0.26	0.60	0.03	0.63	0.72	0.00	0.48	0.48	0.60	0.01	0.01	
Uniform Delay, d1	43.3	20.0	15.3	33.4	13.1	7.6	36.4	36.4	26.5	38.6	38.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.1	0.5	0.0	2.2	0.9	0.0	1.9	1.9	2.1	0.0	0.0	
Delay (s)	48.4	20.5	15.3	35.6	14.0	7.6	38.3	38.3	28.6	38.6	38.6	
Level of Service	D	C	B	D	B	A	D	D	C	D	D	
Approach Delay (s)		20.4			17.3			31.1			38.6	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM Average Control Delay	20.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	87.9	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	72	964	616	108	1195	7	1078	61	176	4	15	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	1048	670	117	1299	8	1172	66	191	4	16	72
RTOR Reduction (vph)	0	0	160	0	0	1	0	0	96	0	0	68
Lane Group Flow (vph)	78	1048	510	117	1299	7	1172	66	95	4	16	4
Turn Type	Prot		pm+ov	Prot		Perm	Split		pm+ov	Split		Perm
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	10.1	43.8	104.1	9.3	43.0	43.0	60.3	60.3	69.6	7.2	7.2	7.2
Effective Green, g (s)	10.1	43.8	104.1	9.3	43.0	43.0	60.3	60.3	69.6	7.2	7.2	7.2
Actuated g/C Ratio	0.07	0.31	0.74	0.07	0.31	0.31	0.43	0.43	0.50	0.05	0.05	0.05
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	127	1584	1228	227	1555	484	1472	799	784	91	95	81
v/s Ratio Prot	c0.04	0.21	0.18	0.03	c0.26		c0.34	0.04	0.01	0.00	c0.01	
v/s Ratio Perm			0.14			0.00			0.05			0.00
v/c Ratio	0.61	0.66	0.41	0.52	0.84	0.01	0.80	0.08	0.12	0.04	0.17	0.05
Uniform Delay, d1	63.4	42.0	6.8	63.5	45.5	34.0	34.8	23.8	19.1	63.4	63.8	63.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	1.1	0.2	2.0	4.1	0.0	3.1	0.0	0.1	0.2	0.8	0.2
Delay (s)	71.9	43.0	7.1	65.4	49.6	34.0	37.9	23.8	19.1	63.6	64.7	63.7
Level of Service	E	D	A	E	D	C	D	C	B	E	E	E
Approach Delay (s)		30.9			50.8			34.7			63.8	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM Average Control Delay	38.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	11	2011	306	450	1380	13	101	1	532	16	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.98	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1681	1687	1583	1681	1733	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.95	1.00	0.95	0.98	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1681	1687	1583	1681	1733	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	2186	333	489	1500	14	110	1	578	17	7	2
RTOR Reduction (vph)	0	0	167	0	0	5	0	0	224	0	0	2
Lane Group Flow (vph)	12	2186	166	489	1500	9	55	56	354	12	12	0
Turn Type	Prot		Perm	Prot		Perm	Split		pm+ov	Split		Prot
Protected Phases	7	4		3	8		2	2	3	6	6	6
Permitted Phases			4			8			2			
Actuated Green, G (s)	0.8	45.1	45.1	11.0	55.3	55.3	8.3	8.3	19.3	6.2	6.2	6.2
Effective Green, g (s)	0.8	45.1	45.1	11.0	55.3	55.3	8.3	8.3	19.3	6.2	6.2	6.2
Actuated g/C Ratio	0.01	0.50	0.50	0.12	0.61	0.61	0.09	0.09	0.21	0.07	0.07	0.07
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	30	2531	788	417	3104	966	154	155	337	115	119	108
v/s Ratio Prot	0.00	c0.43		c0.14	0.29		0.03	0.03	c0.13	c0.01	0.01	0.00
v/s Ratio Perm			0.10			0.01			0.10			
v/c Ratio	0.40	0.86	0.21	1.17	0.48	0.01	0.36	0.36	1.05	0.10	0.10	0.00
Uniform Delay, d1	44.7	20.0	12.8	39.8	9.8	6.9	38.6	38.7	35.6	39.6	39.6	39.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	3.3	0.1	100.4	0.1	0.0	1.4	1.4	62.6	0.4	0.4	0.0
Delay (s)	53.2	23.4	12.9	140.2	9.9	6.9	40.1	40.1	98.3	40.0	40.0	39.3
Level of Service	D	C	B	F	A	A	D	D	F	D	D	D
Approach Delay (s)		22.1			41.7			88.9			39.9	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	90.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	1548	892	88	1210	21	582	33	84	16	19	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	1683	970	96	1315	23	633	36	91	17	21	55
RTOR Reduction (vph)	0	0	173	0	0	5	0	0	56	0	0	52
Lane Group Flow (vph)	129	1683	797	96	1315	18	633	36	35	17	21	3
Turn Type	Prot		pm+ov	Prot		Perm	Split		pm+ov	Split		Perm
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.2	51.4	93.2	6.2	43.4	43.4	41.8	41.8	48.0	7.2	7.2	7.2
Effective Green, g (s)	14.2	51.4	93.2	6.2	43.4	43.4	41.8	41.8	48.0	7.2	7.2	7.2
Actuated g/C Ratio	0.11	0.41	0.74	0.05	0.34	0.34	0.33	0.33	0.38	0.06	0.06	0.06
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	199	2065	1228	168	1743	543	1133	615	600	101	106	90
v/s Ratio Prot	c0.07	c0.33	c0.21	0.03	0.26		0.18	0.02	0.00	0.01	c0.01	
v/s Ratio Perm			0.29			0.01			0.02			0.00
v/c Ratio	0.65	0.82	0.65	0.57	0.75	0.03	0.56	0.06	0.06	0.17	0.20	0.03
Uniform Delay, d1	53.8	33.4	8.4	58.9	36.9	27.7	34.8	29.0	24.9	56.8	56.9	56.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	2.6	1.2	4.6	1.9	0.0	0.6	0.0	0.0	0.8	0.9	0.2
Delay (s)	60.9	36.0	9.6	63.5	38.8	27.7	35.4	29.0	25.0	57.6	57.9	56.6
Level of Service	E	D	A	E	D	C	D	C	C	E	E	E
Approach Delay (s)		27.9			40.3			33.9			57.1	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM Average Control Delay	32.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	8	1157	50	358	1975	8	169	14	493	3	4	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1681	1697	1583	1681	1770	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1681	1697	1583	1681	1770	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	1258	54	389	2147	9	184	15	536	3	4	1
RTOR Reduction (vph)	0	0	32	0	0	4	0	0	254	0	0	1
Lane Group Flow (vph)	9	1258	22	389	2147	5	99	100	282	3	4	0
Turn Type	Prot		Perm	Prot		Perm	Split		pm+ov	Split		Prot
Protected Phases	7	4		3	8		2	2	3	6	6	6
Permitted Phases			4			8			2			
Actuated Green, G (s)	0.7	36.5	36.5	15.7	51.5	51.5	10.5	10.5	26.2	5.8	5.8	5.8
Effective Green, g (s)	0.7	36.5	36.5	15.7	51.5	51.5	10.5	10.5	26.2	5.8	5.8	5.8
Actuated g/C Ratio	0.01	0.41	0.41	0.18	0.58	0.58	0.12	0.12	0.30	0.07	0.07	0.07
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	27	2097	653	609	2959	921	199	201	469	110	116	104
v/s Ratio Prot	0.00	0.25		c0.11	c0.42		0.06	0.06	c0.11	0.00	c0.00	0.00
v/s Ratio Perm			0.01			0.00			0.07			
v/c Ratio	0.33	0.60	0.03	0.64	0.73	0.01	0.50	0.50	0.60	0.03	0.03	0.00
Uniform Delay, d1	43.7	20.3	15.5	33.8	13.4	7.8	36.5	36.5	26.7	38.7	38.7	38.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2	0.5	0.0	2.2	0.9	0.0	2.0	1.9	2.2	0.1	0.1	0.0
Delay (s)	50.8	20.8	15.5	36.0	14.3	7.8	38.5	38.5	28.8	38.8	38.8	38.6
Level of Service	D	C	B	D	B	A	D	D	C	D	D	D
Approach Delay (s)		20.8			17.6			31.5			38.8	
Approach LOS		C			B			C			D	

Intersection Summary			
HCM Average Control Delay	20.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	88.5	Sum of lost time (s)	20.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	72	965	616	108	1197	7	1078	61	176	4	15	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	1049	670	117	1301	8	1172	66	191	4	16	72
RTOR Reduction (vph)	0	0	160	0	0	1	0	0	97	0	0	68
Lane Group Flow (vph)	78	1049	510	117	1301	7	1172	66	94	4	16	4
Turn Type	Prot		pm+ov	Prot		Perm	Split		pm+ov	Split		Perm
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	10.1	43.9	104.2	9.3	43.1	43.1	60.3	60.3	69.6	7.2	7.2	7.2
Effective Green, g (s)	10.1	43.9	104.2	9.3	43.1	43.1	60.3	60.3	69.6	7.2	7.2	7.2
Actuated g/C Ratio	0.07	0.31	0.74	0.07	0.31	0.31	0.43	0.43	0.49	0.05	0.05	0.05
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	127	1587	1229	227	1558	485	1471	798	783	91	95	81
v/s Ratio Prot	c0.04	0.21	0.18	0.03	c0.26		c0.34	0.04	0.01	0.00	c0.01	
v/s Ratio Perm			0.14			0.00			0.05			0.00
v/c Ratio	0.61	0.66	0.41	0.52	0.84	0.01	0.80	0.08	0.12	0.04	0.17	0.05
Uniform Delay, d1	63.4	42.0	6.8	63.5	45.5	34.0	34.9	23.8	19.1	63.5	63.9	63.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	1.0	0.2	2.0	4.0	0.0	3.1	0.0	0.1	0.2	0.8	0.2
Delay (s)	71.9	43.0	7.1	65.5	49.5	34.0	38.0	23.9	19.2	63.7	64.7	63.7
Level of Service	E	D	A	E	D	C	D	C	B	E	E	E
Approach Delay (s)		30.9			50.7			34.8			63.9	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM Average Control Delay	38.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	140.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	77.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	2011	306	450	1380	14	101	5	532	18	15	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	0.99	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1681	1692	1583	1681	1760	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	0.99	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1681	1692	1583	1681	1760	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	2186	333	489	1500	15	110	5	578	20	16	4
RTOR Reduction (vph)	0	0	168	0	0	6	0	0	218	0	0	4
Lane Group Flow (vph)	13	2186	165	489	1500	9	57	58	360	18	18	0
Turn Type	Prot		Perm	Prot		Perm	Split		pm+ov	Split		Prot
Protected Phases	7	4		3	8		2	2	3	6	6	6
Permitted Phases			4			8			2			
Actuated Green, G (s)	0.8	45.1	45.1	11.0	55.3	55.3	8.4	8.4	19.4	6.5	6.5	6.5
Effective Green, g (s)	0.8	45.1	45.1	11.0	55.3	55.3	8.4	8.4	19.4	6.5	6.5	6.5
Actuated g/C Ratio	0.01	0.50	0.50	0.12	0.61	0.61	0.09	0.09	0.21	0.07	0.07	0.07
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	30	2520	785	415	3090	962	155	156	337	120	126	113
v/s Ratio Prot	0.00	c0.43		c0.14	0.29		0.03	0.03	c0.13	c0.01	0.01	0.00
v/s Ratio Perm			0.10			0.01			0.10			
v/c Ratio	0.43	0.87	0.21	1.18	0.49	0.01	0.37	0.37	1.07	0.15	0.14	0.00
Uniform Delay, d1	44.9	20.3	12.9	40.0	9.9	7.0	38.8	38.8	35.8	39.7	39.6	39.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.7	3.4	0.1	102.6	0.1	0.0	1.5	1.5	68.4	0.6	0.5	0.0
Delay (s)	54.6	23.7	13.1	142.6	10.1	7.0	40.3	40.3	104.2	40.2	40.2	39.2
Level of Service	D	C	B	F	B	A	D	D	F	D	D	D
Approach Delay (s)		22.5			42.4			93.6			40.1	
Approach LOS		C			D			F			D	

Intersection Summary			
HCM Average Control Delay	39.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	91.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	87.6%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	119	1550	892	88	1211	21	582	33	84	16	19	51
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	1685	970	96	1316	23	633	36	91	17	21	55
RTOR Reduction (vph)	0	0	173	0	0	5	0	0	56	0	0	52
Lane Group Flow (vph)	129	1685	797	96	1316	18	633	36	35	17	21	3
Turn Type	Prot		pm+ov	Prot		Perm	Split		pm+ov	Split		Perm
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.2	51.4	93.2	6.2	43.4	43.4	41.8	41.8	48.0	7.2	7.2	7.2
Effective Green, g (s)	14.2	51.4	93.2	6.2	43.4	43.4	41.8	41.8	48.0	7.2	7.2	7.2
Actuated g/C Ratio	0.11	0.41	0.74	0.05	0.34	0.34	0.33	0.33	0.38	0.06	0.06	0.06
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	199	2065	1228	168	1743	543	1133	615	600	101	106	90
v/s Ratio Prot	c0.07	c0.33	c0.21	0.03	0.26		0.18	0.02	0.00	0.01	c0.01	
v/s Ratio Perm			0.29			0.01			0.02			0.00
v/c Ratio	0.65	0.82	0.65	0.57	0.76	0.03	0.56	0.06	0.06	0.17	0.20	0.03
Uniform Delay, d1	53.8	33.4	8.4	58.9	36.9	27.7	34.8	29.0	24.9	56.8	56.9	56.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	2.6	1.2	4.6	1.9	0.0	0.6	0.0	0.0	0.8	0.9	0.2
Delay (s)	60.9	36.0	9.6	63.5	38.8	27.7	35.4	29.0	25.0	57.6	57.9	56.6
Level of Service	E	D	A	E	D	C	D	C	C	E	E	E
Approach Delay (s)		28.0			40.3			33.9			57.1	
Approach LOS		C			D			C			E	

Intersection Summary			
HCM Average Control Delay	32.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	126.6	Sum of lost time (s)	15.0
Intersection Capacity Utilization	74.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	21	1331	58	412	2272	21	195	27	567	12	12	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1681	1705	1583	1681	1763	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.96	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1681	1705	1583	1681	1763	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	1447	63	448	2470	23	212	29	616	13	13	10
RTOR Reduction (vph)	0	0	37	0	0	10	0	0	224	0	0	9
Lane Group Flow (vph)	23	1447	26	448	2470	13	121	120	392	12	14	1
Turn Type	Prot		Perm	Prot		Perm	Split		pm+ov	Split		Prot
Protected Phases	7	4		3	8		2	2	3	6	6	6
Permitted Phases			4			8			2			
Actuated Green, G (s)	1.5	39.1	39.1	17.0	54.6	54.6	11.8	11.8	28.8	6.3	6.3	6.3
Effective Green, g (s)	1.5	39.1	39.1	17.0	54.6	54.6	11.8	11.8	28.8	6.3	6.3	6.3
Actuated g/C Ratio	0.02	0.42	0.42	0.18	0.58	0.58	0.13	0.13	0.31	0.07	0.07	0.07
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	55	2111	657	620	2947	918	211	214	484	112	118	106
v/s Ratio Prot	0.01	0.28		0.13	c0.49		0.07	0.07	c0.15	0.01	c0.01	0.00
v/s Ratio Perm			0.02			0.01			0.10			
v/c Ratio	0.42	0.69	0.04	0.72	0.84	0.01	0.57	0.56	0.81	0.11	0.12	0.01
Uniform Delay, d1	45.9	22.5	16.4	36.4	16.2	8.4	38.8	38.8	30.2	41.3	41.3	41.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	0.9	0.0	4.2	2.2	0.0	3.7	3.3	9.7	0.4	0.5	0.0
Delay (s)	51.0	23.5	16.4	40.5	18.4	8.4	42.6	42.1	39.8	41.7	41.8	41.1
Level of Service	D	C	B	D	B	A	D	D	D	D	D	D
Approach Delay (s)		23.6			21.7			40.5			41.6	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	25.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	94.2	Sum of lost time (s)	20.0
Intersection Capacity Utilization	76.7%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	1114	713	125	1383	9	1246	71	203	5	18	76
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	1211	775	136	1503	10	1354	77	221	5	20	83
RTOR Reduction (vph)	0	0	153	0	0	2	0	0	110	0	0	79
Lane Group Flow (vph)	90	1211	622	136	1503	8	1354	77	111	5	20	4
Turn Type	Prot		pm+ov	Prot		Perm	Split		pm+ov	Split		Perm
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	9.0	46.8	111.8	10.2	48.0	48.0	65.0	65.0	75.2	7.5	7.5	7.5
Effective Green, g (s)	9.0	46.8	111.8	10.2	48.0	48.0	65.0	65.0	75.2	7.5	7.5	7.5
Actuated g/C Ratio	0.06	0.31	0.75	0.07	0.32	0.32	0.43	0.43	0.50	0.05	0.05	0.05
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	107	1592	1237	234	1633	508	1493	810	796	89	93	79
v/s Ratio Prot	c0.05	0.24	0.22	0.04	c0.30		c0.39	0.04	0.01	0.00	c0.01	
v/s Ratio Perm			0.17			0.01			0.06			0.00
v/c Ratio	0.84	0.76	0.50	0.58	0.92	0.02	0.91	0.10	0.14	0.06	0.22	0.05
Uniform Delay, d1	69.5	46.3	7.6	67.6	48.9	34.6	39.4	24.9	19.9	67.6	68.2	67.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	41.8	2.2	0.3	3.6	8.9	0.0	8.2	0.1	0.1	0.3	1.2	0.3
Delay (s)	111.4	48.5	7.9	71.2	57.8	34.6	47.7	25.0	19.9	67.9	69.3	67.9
Level of Service	F	D	A	E	E	C	D	C	B	E	E	E
Approach Delay (s)		36.1			58.8			42.9			68.2	
Approach LOS		D			E			D			E	

Intersection Summary			
HCM Average Control Delay	45.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	149.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	86.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	2313	352	518	1587	29	117	20	612	34	30	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	0.97	0.91	1.00	0.97	0.91	1.00	0.95	0.95	1.00	0.95	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	0.99	1.00
Satd. Flow (prot)	3433	5085	1583	3433	5085	1583	1681	1709	1583	1681	1760	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97	1.00	0.95	0.99	1.00
Satd. Flow (perm)	3433	5085	1583	3433	5085	1583	1681	1709	1583	1681	1760	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	29	2514	383	563	1725	32	127	22	665	37	33	20
RTOR Reduction (vph)	0	0	201	0	0	14	0	0	184	0	0	18
Lane Group Flow (vph)	29	2514	182	563	1725	18	74	75	481	33	37	2
Turn Type	Prot		Perm	Prot		Perm	Split		pm+ov	Split		Prot
Protected Phases	7	4		3	8		2	2	3	6	6	6
Permitted Phases			4			8			2			
Actuated Green, G (s)	2.3	43.1	43.1	11.0	51.8	51.8	9.3	9.3	20.3	7.3	7.3	7.3
Effective Green, g (s)	2.3	43.1	43.1	11.0	51.8	51.8	9.3	9.3	20.3	7.3	7.3	7.3
Actuated g/C Ratio	0.03	0.48	0.48	0.12	0.57	0.57	0.10	0.10	0.22	0.08	0.08	0.08
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	87	2416	752	416	2904	904	172	175	354	135	142	127
v/s Ratio Prot	0.01	c0.49		0.16	0.34		0.04	0.04	c0.16	0.02	c0.02	0.00
v/s Ratio Perm			0.11			0.01			0.14			
v/c Ratio	0.33	1.04	0.24	1.35	0.59	0.02	0.43	0.43	1.36	0.24	0.26	0.01
Uniform Delay, d1	43.4	23.8	14.1	39.9	12.6	8.4	38.2	38.2	35.2	39.1	39.2	38.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.3	29.9	0.2	174.1	0.3	0.0	1.7	1.7	178.9	0.9	1.0	0.0
Delay (s)	45.7	53.7	14.3	214.0	13.0	8.4	39.9	39.9	214.1	40.1	40.1	38.4
Level of Service	D	D	B	F	B	A	D	D	F	D	D	D
Approach Delay (s)		48.5			61.7			182.2			39.7	
Approach LOS		D			E			F			D	

Intersection Summary			
HCM Average Control Delay	71.0	HCM Level of Service	E
HCM Volume to Capacity ratio	1.05		
Actuated Cycle Length (s)	90.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	98.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	137	1790	1032	102	1400	25	676	38	97	19	22	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.91	1.00	0.97	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	5085	1583	3433	5085	1583	3433	1863	1583	1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	149	1946	1122	111	1522	27	735	41	105	21	24	64
RTOR Reduction (vph)	0	0	147	0	0	5	0	0	66	0	0	61
Lane Group Flow (vph)	149	1946	975	111	1522	22	735	41	39	21	24	3
Turn Type	Prot		pm+ov	Prot		Perm	Split		pm+ov	Split		Perm
Protected Phases	7	4	2	3	8		2	2	3	6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	15.3	62.5	109.8	6.0	53.2	53.2	47.3	47.3	53.3	7.5	7.5	7.5
Effective Green, g (s)	15.3	62.5	109.8	6.0	53.2	53.2	47.3	47.3	53.3	7.5	7.5	7.5
Actuated g/C Ratio	0.11	0.44	0.77	0.04	0.37	0.37	0.33	0.33	0.37	0.05	0.05	0.05
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	189	2218	1268	144	1888	588	1133	615	589	93	98	83
v/s Ratio Prot	c0.08	c0.38	c0.25	0.03	0.30		0.21	0.02	0.00	0.01	c0.01	
v/s Ratio Perm			0.36			0.01			0.02			0.00
v/c Ratio	0.79	0.88	0.77	0.77	0.81	0.04	0.65	0.07	0.07	0.23	0.24	0.04
Uniform Delay, d1	62.4	36.9	9.5	68.0	40.4	28.7	40.9	32.9	29.0	65.1	65.2	64.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	19.2	4.3	2.9	22.1	2.6	0.0	1.3	0.0	0.0	1.2	1.3	0.2
Delay (s)	81.7	41.2	12.4	90.1	43.0	28.7	42.2	32.9	29.0	66.4	66.5	64.7
Level of Service	F	D	B	F	D	C	D	C	C	E	E	E
Approach Delay (s)		33.0			46.0			40.2			65.4	
Approach LOS		C			D			D			E	

Intersection Summary			
HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	143.3	Sum of lost time (s)	15.0
Intersection Capacity Utilization	83.1%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			