County of Santa Barbara

Orcutt Key Site 3

Project Case No. 13GPA-00000-00005, 13RZN-00000-00001, 13TRM-00000-00001, 13DVP-0000-00010

Final Subsequent Environmental Impact Report *Appendices* 14-EIR-07 SCH #2014061015

August 2020

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Environmental Scientists Planners Engineers

Appendix A

Notice of Preparation, Scoping Document, and NOP Responses



County of Santa Barbara
Planning and Development
Glenn S. Russell, Ph.D., Director
Dianne Black, Assistant Director

NOTICE OF PREPARATION

TO: State Clearinghouse
Governor's Office of Planning and Research
1400 Tenth Street
Sacramento, Ca. 95812

FROM: John Zorovich, Senior Planner
County of Santa Barbara
624 W. Foster Road, Suite C
Santa Maria, Ca. 93455
Phone: (805) 934-6297

SUBJECT: **Notice of Preparation of a Draft Environmental Impact Report**

PROJECT NAME: Key Site 3

PROJECT LOCATION: This site is identified as Assessor Parcel Number 129-151-026, located approximately 0.5 miles south of the Clark Avenue /U.S. Highway 101 intersection, Orcutt area, Santa Barbara County

PROJECT CASE #: 13GPA-00005, 13RZN-00000-00001, 13TRM-00000-00001, 13DVP-0000-00010

PROJECT APPLICANT: John Franklin, Franklin Real Estate Development, 3159 Eaglewood Ave., Thousand Oaks, CA 91362

The County of Santa Barbara will be the Lead Agency and will prepare an environmental impact report for the project identified above. We need to know the views of your agency as to the scope and content of the environmental information which is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The project description, location and the potential environmental effects are contained in the Scoping Paper (if attached) or are available on our website at www.sbcountyplanning.org.

A Scoping Meeting has been scheduled to occur on Wednesday, June 23, 2014 at 5:30p.m. at the Board of Supervisors Hearing Room, located at 511 East Lakeside Parkway, Santa Maria, CA. The Scoping Meeting discussion will be limited to environmental concerns, the focus of the environmental document, potential mitigation measures and potential alternatives to the project. The attached Scoping Paper provides a list of potential project environmental impacts identified by P&D staff and will be used as a starting point for discussion during the meeting. Other environmental concerns may be raised by the public at this meeting. P&D staff encourages your participation in this process; please pass on this information to others you feel would be interested in attending this meeting. Copies of the Scoping Paper will be available at the meeting as well.

Note: The County of Santa Barbara CEQA Guidelines provide that if the applicant requests to review the Administrative Draft EIR (ADEIR), the document must be made available to members of the public. The Scoping Meeting provides an opportunity for public members to notify staff so they may be contacted should the applicant request to review the ADEIR.

Due to the time limits mandated by State law, your response must be received at the earliest possible date but not later than 30 days after receipt of this notice (by 5:00 p.m. on July 7, 2014).

Please send your response to John Zorovich, Senior Planner at the address shown above. We will need the name of a contact person in your agency.

Date: June 4, 2014 Planner: John Zorovich

Division: Development Review

Telephone: (805 934-6297

cc: Clerk of the Board (please post for 30 days)

Attachments:

Attachment 1- Vicinity map
Attachment 2- Scoping Paper

ATTACHMENT 1
Vicinity Map



COUNTY OF SANTA BARBARA

Planning and Development

www.sbcountyplanning.org

Attachment 2
EIR Scoping Paper
Key Site 3

13GPA-00005, 13RZN-00000-00001, 13TRM-00000-00001, 13DVP-0000-00010

June 4, 2014



Owner/Applicant	**Agent**
Ernie Mansi SB Clark, LLC 300 Esplanade Drive, Suite 1550, Oxnard, CA 93036	John Franklin Franklin Real Estate Development 3159 Eaglewood Avenue Thousand Oaks, CA 91362

1.0 INTRODUCTION

Pursuant to State CEQA Guidelines Sections 15063 and 15168 as well as Article V, Section E, 4 of the County of Santa Barbara Guidelines for the Implementation of the California Environmental Quality Act of 1970, as Amended (Last Revised 11/22/05) ("County CEQA Guidelines"), the County of Santa Barbara Planning & Development Department [i.e. the "Lead Agency"] has determined that the proposed request to develop 125 residential units at Key Site 3 will require the preparation of a Subsequent Project Environmental Impact Report (Subsequent Project EIR).

2.0 PROJECT DESCRIPTION/REQUEST

The proposed project is a request by John Franklin, as agent for the owners, for approval of a Vesting Tentative Tract Map (VTTM), General Plan Amendment, Rezone, and Development Plan entitlements for the 138.6-acre Key Site 3 (the VTTM request includes the 8-acre portion that was rezoned to MR-O as part of the Focused Rezone Program). The project proposes to develop 125 single-family units in a variety of product (small lot, detached cluster homes, and larger single family residences) on the northern portion of the site. In addition, approximately 106 acres (76%) of the site is proposed as open space. The open space area includes the upper mesa bluff area, Orcutt Creek, private parks and trails, public multi-use and hiking trails, landscaped basins, and natural and restored habitat on hillsides and along the creek.

The VTM proposes a total of 138 lots to be created on the site, as shown in Table 1. Two of the proposed lots are for the MR-O zoned portion of the Key Site 3 property. Each of the project components is described in greater detail below.

Table 1
Vesting Tentative Tract Map Proposed Lots

Use	Number of Lots
Roadway	3
Private Open Space	7
Public Open Space	1
Condominium (MR-O)	2
Single-family Cluster Homes (Mesa PRD)	125
Total	**138**

Multi-Family Residential Orcutt Zone (MR-O). In February 2009, the County Board of Supervisors approved the Housing Element Focused Rezone Program and amended the OCP, the Land Use Development Code, and Santa Barbara County Zoning Map to change an approximately 8-acre portion of KS-3 to Residential 20 land use designation with MR-O zoning, 160 multi-family units and "by-right" entitlement. The 160 units in the MR-O portion of the property are not included with this application. However, the subdivision of the MR-O area into 2 lots is part of the proposed project. The permit application for the construction of the 160 units

will be submitted under a separate application. The project VTTM depicts the proposed sheet grading of the MR-O property and roads and related infrastructure to (but not within) the MR-O portion of the property as part of the overall "master plan" plan for development of KS-3.

The General Plan Amendment is necessary to make technical clarifications to bring the proposed project consistent with the intent of the OCP to allow (under certain conditions which the project meets) up to 125 residential dwelling units and clarify the secondary access point per County staff direction. Consistent with the GPA, the proposed project would change the Land Use Designation of Residential Ranchette with corresponding Zoning of RR-10 to Planned Development with corresponding Zoning of Planned Residential Development (PRD-125). The Rezone application proposes to establish a PRD zone on 131 acres. The proposed Key Site 3 Planned Residential Development Zone Standards are summarized in Table 2 below.

Table 2
Proposed PRD Development Standards

Development Feature	**Mesa** **Clustered Homes**
Area of Neighborhood/ Number of Units Planned	35 acres/125 units
Minimum Lot Size	3,200 S.F.
Setbacks: *Front*	Average 13' Minimum 2'
Side	Minimum One Side 7' Minimum Opposite Side 0'
Rear	Minimum 9'
Accessory Structures	CC&Rs to be consistent w/ Co LUDC Sect 35.42.020
Building Separation	Minimum 10'
Site Coverage	45% maximum
Height Limit[1]	35'[3]
Parking	Covered Parking 2 spaces/unit Visitor Parking on Street
Road Network	Primary access to Clark Ave.; secondary emergency access to Stillwell/Chancellor Rd. (see Development Plan Maps for precise connection points)
Utility Service[4]	Water - Golden State Sewer - LCSD Cable TV-Comcast

[1] Units limited to single story immediately adjacent to northerly and westerly perimeter of Mesa, Mesa bluff and along U. S. Highway101 frontage.

Development Feature	Mesa Clustered Homes
	Phone-Verizon Power-PG&E

The applicant also includes technical text amendments to three Orcutt Community Plan (OCP) policies and development standards to meet the intent of the OCP regarding increased density and clarify the secondary access location. The requested OCP amendments are presented in Table 3 below. The first change is to OCP Policy KS 3-1 and implements the allowed increase in residential density to 125 dwelling units per OCP Policy KS 3-2. OCP Policy KS 3-2 allows the Mesa area of KS-3 to be re-designated or re-zoned if the open space area is dedicated to the County and the property owner is in compliance with OCP Action SCH-O-1.3 regarding school impacts. The project meets these two conditions with (1) the required open space being dedicated to the County per the project VTTM and (2) the property owner previously entering into an agreement with the Orcutt Unified School District that will mitigate any impacts of the project on the area schools. The second change is to OCP Policy KS 3-6 and 3-7 per county staff direction correcting the secondary access road to the project from Oakbrook Lane to Chancellor Street. With the current allowed density, Oakbrook Lane (a private road) did not have the easements or road width necessary to support the project traffic requirements.

Table 3
Proposed Orcutt Community Plan Amendments

OCP Policy	Proposed Text Amendment
Policy KS3-1	Key Site 3 (APN 129-151-26) is designated ~~Res Ranch and~~ PD, Residential 20.0, and Open Space and zoned ~~RR-10 and~~ PRD-125, MR-O. Any proposed development on Key Site 3 shall comply with the following development standards.
DevStd KS3-6	No development, other than a secondary access road ~~from Oakbrook Lane~~ to Chancellor Street, shall occur within 100 feet of the dripline of the vegetation in the southwest corner of the northern mesa, or within a 25 foot-buffer from the top of bluff of the canyon in the northeast corner of the site.
DevStd KS3-7	Primary access to the site shall be from the frontage road along US Hwy 101. The existing easement over Site 2 shall be renegotiated to accommodate development of Site 2 and to align with the "preferred access point" intersection. The developer shall coordinate with P&D, Public Works Transportation Division, and the Fire Department to ensure appropriate secondary access from ~~Oakbrook Lane.~~ Chancellor Street using developer's existing Chancellor Street easement.

A. Project Components.

An application for a Development Plan has been submitted pursuant to Section 35.82.080 of the County Land Use and Development Code. The Development Plan provides the necessary details of site development in the area proposed to be rezoned Planned Residential Development and developed with 125 single family homes. Each of the project components is described in greater

detail below. This section describes the proposed Key Site 3 project components, including residential zones and parks and trails.

Mesa Neighborhood. The existing MR-O zone on the upper mesa is retained as previously approved. The remaining upper mesa is designed for the development of a total of 125 single family detached homes along with parks, trails, and other supporting improvements. Of the 125 homes, 45 will be single story homes located on the project perimeter adjacent to the existing mobile home park to the north, single family homes to the west, bluff edge and adjacent to Hwy 101 on the east. The remaining 80 homes will be one- and two-story homes ranging in size from about 1,460 square feet to 3,200 square feet. All of the single family homes will have enclosed garage parking for two vehicles and meet all current parking standards.

Parks and Trails. The entire project totals approximately 139 acres. Of this, about 106 acres (76%) is open space, 10 acres (7%) roads and shared driveways, and 15 acres (11%) building lots and private yard areas. The open space area includes the upper mesa bluff area, Orcutt Creek, private parks and trails, public multi-use and hiking trails, landscaped basins, and natural and restored habitat on hillsides and along the creek.

The proposed project includes recreational amenities such as an entrance park, bluff top parks and trails, dual use park/detention basins, and the portion of the OCP trail system within the project boundary. The Developer will construct all the trails depicted on the project site including those proposed in the open space areas. The project as designed meets and exceeds the public multipurpose trail requirements of the OCP. Additional features for the public include a bicycle and vehicle parking and trail head staging area for added convenience, safety and accessibility. All the public trails, bike paths, and the public multi-purpose recreational trail will be owned and maintained by the County. The County will have a perpetual easement over the private trails and roads necessary for the public to access the public trails, paths and parking areas.

Affordable Housing. The project is planned to fully comply with County Affordable Housing Zoning requirements by paying In-Lieu Fees.

Fencing. The project will use a number of different fencing design and materials. The sound wall along the eastern edge of the project will be constructed of split-face concrete block. Privacy fencing along the rears and side yards of the homes will be wood. Tubular steel fences will be placed in park areas along tops of slopes. A post and rail fence with wire mesh will be used around the drainage basins. Additional fence details and specific location s can be found in the project booklet and development plans

B. Infrastructure/Access Components. This section describes infrastructure (including roadways and grading) proposed within the project area.

Roadway Access. In accordance with the OCP, primary access to the site will be provided via a new road off of Clark Avenue and through Key Site 2 to the north. In addition, a second road new access road will be linked to Chancellor Street (a private road) which connects to Stillwell

Rd. (The project has an easement over Chancellor Street for public access and public utility purposes.) All roads in the project will be private roads maintained by the project HOA. All roads would be two-lane roads with ROWs varying from 28 feet to 52 feet in width. Roads would have a 24-foot pavement width, with sidewalks or a trail on either or both sides of the road, in most cases. Shared driveways serving the Mesa area cluster homes would be between 20 and 26 feet in width, and sidewalks would be provided in the courtyard areas for 74 of the 80 cluster homes.

Water Infrastructure. There is no existing water infrastructure on Key Site 3. Water utility connections to existing off-site infrastructure would be planned in two places along the project's western boundary (at Oakbrook Lane and Chancellor Street) with the existing Golden State water system. The proposed water system for the project would consist of a 12-inch diameter supply main through the northern portion of the project site, effectively completing an 8-inch diameter piping system for residential service. All water lines would be located under the public right-of-way, residential streets, or contained within public utility easements traversing the property.

Wastewater Infrastructure. There is no existing wastewater infrastructure on Key Site 3. Existing nearby infrastructure includes the 10-inch diameter Solomon Creek Trunk Sewer. Sewer service for the project would be supplied to the proposed project through a connection to existing Laguna County Sanitation District (LCSD) facilities.

The proposed sewer collection system would consist of 6-inch and 8-inch PVC pipes and routed to a 10-inch PVC pipe which would carry all site flow across Orcutt Creek to Chancellor Street. Offsite flow would continue along Chancellor Street via a new 10-inch PVC pipe. This 10-inch collector pipe would then connect to the 10-inch Solomon Creek Trunk Sewer at Stillwell Road and Orcutt Creek.

The proposed collection system would conform to LCSD Standard Specifications for the Construction of Sanitary Sewers. Proposed improvements would be dedicated to LCSD for management and future maintenance.

Drainage Infrastructure. The vast majority of the site drains to the basin near the center of the property while a small portion at the westerly edge drains to the basin near Chancellor (see Tentative Map for exact locations). All drainage from the site is collected with catch basins, routed with storm drain pipes and stored in the basins. Ultimately, all runoff is directed to Orcutt Creek, consistent with the current undeveloped drainage pattern. In accordance with Santa Barbara County Flood Control Standards, drainage generated from development on the site is being attenuated through detention basins prior to outletting to Orcutt Creek. Additionally, basins have been designed to infiltrate the 95th percentile storm event for water quality purposes as suggested by the Regional Water Quality Control Board.

Grading. The proposed project would require extensive grading operations. Nearly all areas within the project site that would be developed with either access roads or residences would require some level of grading. Grading would also be required for the new primary access road through Key Site 2, and where Stillwell Road turns into Chancellor Street in order to

accommodate emergency vehicles. On a development-wide basis, grading operations would result in approximately 290,950 cubic yards (168,450 cubic yards of cut and 122,500 cubic yards of fill). The excess cut generated from the grading would be used as additional fill to offset the anticipated shrinkage and compaction of cut material. No offsite hauling of excess material is anticipated.

C. Project Phasing. The proposed project is designed to be developed in one phase.

3.0 PROJECT LOCATION

This site is identified as Assessor Parcel Number 129-151-026, located approximately 0.5 miles south of the Clark Avenue /U.S. Highway 101 intersection, Orcutt area. The site is located in the Fourth Supervisorial District.

Figure 1

Aerial view of Key Site 3



Table 4 Site Information	
Site Information	
Comprehensive Plan Designation	Residential Ranchette /Residential (10-acre minimum)
Ordinance, Zone	Land Use Development Code, RR-10/MR-O
Site Size	138.6

Table 4 Site Information	
Site Information	
Present Use & Development	Grazing/Vacant
Surrounding Uses/Zone(s)	North: Mobile Home Park/ MHP South: Agriculture/ AG-II-100 East: Highway 101; Agricultural Production, A-II-100 West: Single Family Residential/ 1-E-1; RR-5
Access	Clark Ave. through Key Site 2; Chancellor St. from the west.
Public Services	Water Supply: Golden State Water Company/ City of Santa Maria Sewage: Laguna County Sanitation District Fire: SB Co., Station 22

4.0 ENVIRONMENTAL SETTING

The project site is located on the west side of U.S. Highway 101 (U.S. 101) approximately ¼ mile south of Clark Avenue in the southeastern section of the Orcutt Planning Area in the unincorporated Santa Barbara County. The site is bounded by U.S. 101 on the east, the Sunny Hills mobile home park on the north, rural density ranchettes to the west, and the undeveloped Solomon Hills to the south.

The project site is currently undeveloped and a portion is used for cattle and horse grazing. The property contains a variety of landforms: hillsides, steep bluffs, Orcutt creek, and its associated floodplain terrain. The predominant land use surrounding the property is agriculture, which exists to the east (across U.S. 101) and to the south of the project site. Other surrounding uses consist of medium density residential immediately to the north; general commercial further to the north; and low density residential development and 5-20 acre ranchettes to the west.

Key Site 3 consists of 138.6 acres of vacant land that is currently used for livestock grazing. It contains two relatively level areas north of Orcutt Creek, a northern mesa of approximately 32 acres separated by a bluff with an average slope of 20-25% from a central low-lying area of approximately 33 acres. Orcutt Creek and its associated floodplain extend from east to west across the southern edge of the central low-lying area along the base of the Solomon Hills. South of the Creek, approximately 50 acres of the site ascends into the foothills to elevations between 620 and 780 feet. This area is characterized by steep slopes, some in excess of 30%.

Nine habitat types were identified within Key Site 3: Central Maritime Chaparral, Central (Lucian) Coastal Scrub, Central Dune Scrub, Central Coast Live Oak Riparian Forest, Coast Live Oak Woodland, Non-native Grassland, Seasonal Wetland, Dry Wash, and Planted Trees. The northern mesa contains non-native grasslands currently used for livestock grazing. The central low lying area was cultivated until the early 1980s, but has since been re-colonized by coyote bush and non-native grasses. The Central Maritime Chaparral, Central Dune Scrub, Coast Live Oak Woodland habitats were found south of Orcutt Creek. Central Coast Live Oak Riparian Forest habitat was found along the majority of Orcutt Creek. The areas along Orcutt Creek and extending to the site's southern boundary have not been exposed to significant disturbances, and continue to support a wide variety of plant and wildlife species.

5.0 PREVIOUS ENVIRONMENTAL REVIEW

5.1 Orcutt Community Plan EIR

The Orcutt Community Plan Program EIR (95-EIR-01) identified Class I unavoidable significant impacts with full buildout under the Community Plan in the areas of: Land Use, Biology, Agriculture, Geology, Flooding & Drainage, Water Supply/Groundwater Resources, Archaeology, Historical Resources, Traffic & Circulation, Noise, Air Quality, Risk of Upset/Polluting Sources, Wastewater, Fire Protection, Police Protection, Solid Waste, Library Services, Visual/Aesthetics, Parks Recreation & Trails, and Schools. Mitigation measures identified to minimize impacts were incorporated as Policies and Development Standards in the Board of Supervisors-adopted Orcutt Community Plan.

The project site was among those for which a "mini-EIR" was conducted in the OCP EIR, and received an expanded level of environmental review along with the other designated Key Sites in the OCP planning area.

The OCP EIR considered a project of 212 residential units for Key Site 3 with alternatives ranging from No Project (existing zoning) with 17 units, Low Buildout with 184 units, up to High Buildout with up to 444 units. The expanded level of review in the OCP EIR identified and evaluated fourteen (14) site-specific impacts that could occur should the site be developed, and identified. The OCP EIR also discussed both general and site specific mitigation measures for each environmental issue identified.

5.2 Housing Element Focused Rezone Program EIR

The OCP EIR analyzed the development of 212 units and designated the southern half of the site as subject to the Open Space Overlay. However, the development in the current proposal, when included with the 160-unit multi-family residential development on a portion of the Key Site 3 property in the recently-approved 2008 Santa Barbara County Housing Element Focused Rezone Program (State Clearinghouse #2008061139, hereinafter, Focused Rezone Program), is greater in scale and geographic extent than the development evaluated in the OCP EIR.

The Focused Rezone Program was carried forth to comply with the California Department of Housing and Community Development requirements to demonstrate adequate housing capacity to meet the targets established for the County. In February 2009, the County Board of Supervisors approved the Housing Element Focused Rezone Program and amended the OCP, the Land Use Development Code, and Santa Barbara County Zoning Map to change an approximately 8-acre portion of Key Site 3 to Residential-20 land use designation with Multifamily Residential-Orcutt (MR-O) zoning for the future development of 160 high-density multi-family townhome units as part of the Focused Rezone Program. The MR-O zoned portion of the Key Site 3 property is located in the north-central portion of the property and is surrounded by the balance of the Key Site 3 development (Attachment B). The 160 units in the MR-O portion of the property are not part of the proposed project evaluated in this project SEIR; however, the subdivision of the MR-O area into two lots is part of the proposed project. The environmental impacts associated with the development for the 8-acre portion of Key Site 3

under the MR-O zoning was evaluated in the Focused Rezone Program EIR (State Clearinghouse #2008061139, Santa Barbara County, 2008) and should be part of the cumulative development analyzed in this project EIR.

Insofar as the site specific applications now being reviewed could result in new or substantially greater significant environmental impacts than those identified and adequately analyzed in the OCP EIR and Focused Rezone Program EIR, a Subsequent Project EIR must be prepared to analyze such new or substantially greater impacts in accordance with Section 15168 of the California Environmental Quality Act (CEQA) Guidelines, as well as Article V, Section E, 4 of the County of Santa Barbara Guidelines for the Implementation of the California Environmental Quality Act of 1970, as Amended (Last Revised 11/22/05). To the extent that the OCP EIR and Focused Rezone Program EIR adequately analyzed environmental impacts from the development of Key Site 30, the Subsequent Project EIR may rely on that analysis and/or incorporate it by reference, thus focusing on effects not analyzed adequately in the OCP EIR and Focused Rezone Program EIR for Key Site 3.

The impacts identified in the OCP EIR, Focused Rezone Program EIR, and Notice of Preparation (NOP) process and Environmental Document Scoping meeting will be utilized as a baseline in determining potential impacts of the proposed project that must be analyzed in the Subsequent Project EIR.

6.0 ENVIRONMENTAL REVIEW

Below is a summary of staff's preliminary identification of potentially new or substantially greater significant environmental impacts from those adequately analyzed in the OCP and Focused Rezone Program EIRs.

The prospective EIR consultants must propose a Scope of Work for a Subsequent Project EIR that, at a minimum, includes these impact areas:

AESTHETICS/VISUAL RESOURCES

Impact Discussion:

Key Site 3 is identified as a "gateway parcel" in the OCP because of its location at a principal entryway to the community of Orcutt and because it provides an important semi-rural context to the community. Key Site 3 is in the foreground of the first views of the Santa Maria Valley and Orcutt for northbound travelers on U.S. 101. Views of the site from U.S. 101 consist of open grazing land in the foreground and relatively steep slopes of the Solomon Hills in the background. As the southern boundary of the Santa Maria Valley, the Solomon Hills are visible and significant public viewsheds are identified as such in the OCP. The hills are characterized by steep slopes, canyon drainages, oak woodlands and eucalyptus groves, chaparral, and non-native grasslands.

Existing visual and aesthetic resources and potential impacts relating to development of the Key Site 3 property with 212 residential units were analyzed in Sections 5.15, *Visual Resources/Open*

Space, and in the *Key Site 3: Site Specific Impact Analysis,* Section B.13, *Visual/Aesthetic Resources*, of the OCP EIR. Several of these measures were incorporated into the Final OCP as mitigation measures. The OCP EIR concluded that impacts related to increased night lighting (VIS-2), unmaintained stormwater detention basins (VIS-3), and intrusion of fire-breaks into open space (VIS-6) were potentially significant but mitigable. Impacts related to transformation from a semi-rural to urban area (VIS-1), degradation of views along gateway roads to the community (VIS-5), removal of natural scenic resources (VIS-7), open space fragmentation-loss of scenic natural resources (VIS-13), expansion of urban activities into existing rural open space (VIS-17), degradation of views from designated scenic corridors (VIS-18), and change in visual character of the site (Impacts KEY SITE 3-VIS-1) were determined to be potentially significant. The OCP EIR proposed mitigation measures VIS 1a, 1b, 1c, 2, 3, 5, 6, 7 and 9.

The OCP EIR also identified a need for two site-specific development standards to be applied to Key Site 3: Mitigation Measures KEY SITE 3-VIS-1 and KEY SITE 3-VIS-2. Mitigation KEY SITE 3-VIS-1 sets forth the Open Space Overlay to apply to the southern portion of the site, as well as a 75-foot buffer along the property's eastern frontage. Mitigation KEY SITE 3-VIS-2 limits homes on the northern and northwestern perimeter of the development site to one-story as these are closest to existing residential development. Together, these Plan Area-wide and site-specific mitigation measures were found to reduce impacts VIS-2, -3 and -6 to a less than significant level. However, regardless of mitigation, impacts VIS-1, -5, -7, -13, -17, and -18 would remain significant and unavoidable. Also noteworthy, the 2008 Housing Element Focused Rezone Program EIR analyzed the impact of rezoning an 8-acre portion of Key Site 3 to MR-O (Multi-family residential Orcutt) to allow for the development of 160 multi-family residential units. The Focused Rezone Program EIR determined that this action would result in significant and unavoidable impacts to the visual character of the site.

The proposed project would allow the development of up to 125 single family residential units in a 38.0-acre northern mesa area that is currently undeveloped. The visual character of the surrounding area is primarily urban since the site bordered by high density residential development to the north, but lower density residential development to the west. Development of 125 additional residential units in the allowable buildable area of the site could potentially alter the existing neighborhood and vicinity character. Residential development, landscape and hardscape associated with the proposed project could contribute incrementally to cumulative impacts to aesthetics/visual resources associated with increasing development within the Orcutt area and the continuing loss of open or undeveloped landscapes.

Lighting associated with the project could create glare off-site, light spillage and/or increased night sky light pollution, thereby resulting in potentially significant impacts to the nighttime character of the surrounding area, although the existing extent of development in the area has already resulted in a degraded night sky. With respect to light and glare, the site currently has no street lighting, lighted nighttime activity, or structures that would produce glare.

Scope of EIR:

- Identify the existing visual resources of Key Site 3 and its surroundings, including the site's physical attributes, its relative visibility from area roads, trails, and residences, and assess

potential impacts to these resources from development of the proposed project including future residences and accessory structures.

- Identify the existing character of public views across, into, and out of the site and assess potential impacts to these views from residential development on the proposed lots.
- Peer review the visual simulations to aid in the analysis of visual impacts of the proposed project, including potential future residential development.
- Identify the night time setting and character of the site and surrounding area and assess the potential impacts to this nighttime character from proposed development.
- Identify any impacts to the existing character of the project site and the integrity of the site's visual character from proposed development.
- Analyze cumulative impact levels and the contribution of the proposed project to these cumulative impacts.
- Identify mitigation measures as necessary and residual impacts.

AGRICULTURAL RESOURCES

A search of historical aerial photographs conducted for the Orcutt Community Plan revealed that on-site level areas north of Orcutt Creek were intermittently utilized for crop production until the early 1980s. This previous agricultural use appears to be limited to dry row crop farming, with the nearest irrigated agricultural operations being across U.S. 101 to the east. The site is zoned Residential Ranchette (RR-10) and Multi-Family Residential Orcutt (MR-O), and is designated on State Department of Conservation's 2008 farmland maps as grazing and other land. The majority of the 138.6-acre site is currently used for seasonal cattle and horse grazing. Livestock are periodically brought onto the site, which is fenced at the property line, and grazing is concentrated on the areas north of Orcutt Creek. Property to the northeast, east, and southeast across U.S. 101 is planted in rotational crops, strawberries, and grapes. Property to the south is used for grazing and oil and gas development. The Key Site 3 property is not subject to a Williamson Act agricultural preserve contract.

The County of Santa Barbara *Environmental Thresholds and Guidelines Manual* describes prime soils as those with a Land Capability Class of 1 or 2. On-site soil types, including their Land Capability Class and Storie Index Rating, are described in Table 5

Table 5 Soil Classification

Name	Capability Class		Storie Index	Approximate Acreage
	Irrigated	Non-Irrigated		
Arnold sand, 15 to 45% slopes (ArF)	6	6	Grade 4	47.5
Betteravia loamy sand, dark variant, 0 to 5% slopes, eroded (BnB2)	3	3	Grade 4	9.5
Betteravia loamy sand, dark variant, 5 to 15% slopes, eroded (BnD2)	3	3	Grade 4	11.2
Elder sandy loam, 2 to 9% slopes, eroded (EdC2)	2	3	Grade 2	0.5
Garey sandy loam, 2 to 9% slopes, eroded (GaC2)	3	3	Grade 1	17.7
Marina sand, 2 to 9% slopes (MaC)	3	6	Grade 3	5.6

Table 5 Soil Classification

Name	Capability Class		Storie Index	Approximate Acreage
	Irrigated	Non-Irrigated		
Marina sand, 9 to 30% slopes, severely eroded (MaE3)	3	6	Grade 3	23.0
Sandy alluvial land (Sh)	7	7	Not Rated	14.1

A total of 8 soil types occur on Key Site 3. Of these soils, one (Elder sandy loam, 2-9% slopes) is considered prime in accordance with this definition. The 2004 Soil Survey Geographic (SSURGO) database identifies approximately 0.5 acres of Elder sandy loam soil, 2-9% slope. These soils located on the eastern edge of the upper terrace along Orcutt Creek (Figure 4.2-1), are eroded, not farmed, and considered prime soils only when irrigated.

The Orcutt Community Plan (OCP) EIR examined the agricultural setting of the project region and the potential impacts resulting from development of the region. The OCP EIR concluded that impacts involving the conversion of agricultural land (AG-1), as well as the site-specific conversion of 54 acres of Class 3 and 34 acres of Class 4 farmland to urban use (KS3-AG-1) were potentially significant. However, an analytical basis for this significance determination, such as what is currently conducted in the agricultural lands suitability evaluation, was not provided. OCP EIR Mitigation Measure AG-1 required County land use planning efforts to include use of higher density zone districts (6 units per acre and above) to retain the maximum amount of agricultural land, and OCP EIR Mitigation Measure AG-2 required fencing to reduce land use conflicts. In the OCP EIR, this measure was determined to be unable to fully mitigate or lessen the extent of the impacts of conversion; therefore, these impacts remained Class I, significant and unavoidable.

The County's *Environmental Thresholds and Guidelines Manual* Agricultural Resources section (approved by the Board of Supervisors, August 1993) describes a methodology, the weighted point system, for determining the agricultural productivity and suitability of a parcel. As a general guideline, an agricultural parcel of land should be considered to be viable if it is of sufficient size and capability to support an agricultural enterprise independent of any other parcel. The weighted point system is a preliminary screening tool to determine whether the project's impact on loss or impairment of agricultural resources could be potentially significant. The point system assigns values to nine physical characteristics of a site including parcel size, soil classification, water availability, agricultural suitability, existing and historic land use, comprehensive plan designation; adjacent land uses, agricultural preserve potential, and combined farming operations. According to the Guidelines, if the tabulated points total 60 or more, the parcel is agriculturally viable. Conversion of an agriculturally viable parcel to a non-agricultural use is considered to be a significant impact.

Based upon the County's agricultural suitability formula, the project site receives a total of 54 points.

Table 6 Agricultural Suitability

Agricultural Threshold Factors	Possible Points	Project Site Points
Parcel Size		
100 -500 acres	11 to 12	11
Soil Classification		
Class 3 (based on predominant soil types on-site)	8 to 10	8
Water Availability		
Land has an adequate water supply for crops or grazing.	12 to 15	12
Agricultural Suitability		
Grazing:		
Highly suitable for pasture or range.	6 to 10	8
Land Use		
In maintained range/pasture	5	5
Comprehensive Plan		
RR-10	2	2
Adjacent Land Uses		
Partially surrounded by agriculture/open space with some urban uses adjacent, in a region with adequate agricultural support uses.	7 to 8	7
Agricultural Preserve Potential		
Cannot qualify.	0	0
Combined Farming Operation[1]		
Provides small component of combined farming operations.	1	1
TOTAL POINTS (60+ is potentially significant)		**54**

Source: Santa Barbara County Environmental Thresholds and Guidelines Manual, October 2008.
[1]Combined farming operation refers to more than one separate parcel managed as a single agricultural operation.

Because the project site scores below the County's 60-point significance threshold, impacts would be adverse, but less than significant. The site is not under agricultural production, not zoned for agriculture, and is immediately next to residences. The site is highly constrained, and farming potential is low.

The absence of prime soils and an Important Farmland designation further support the conclusion that impacts to agricultural resources are considered *adverse, but less than significant* and no further evaluation in the EIR is necessary. Mitigation measures would not be required.

Scope of EIR: No further environmental analysis is recommended.

AIR QUALITY

Impact Discussion:

The Orcutt Community Plan (OCP) EIR examined the air quality setting of the project region and the potential impacts resulting from development under the OCP. The OCP EIR concluded that impacts related to the generation of ozone precursors (Impact AQ-1), dust and PM_{10} (Impact AQ-2), and Clean Air Plan consistency (Impact AQ-3) were potentially significant. Mitigation Measures AQ-1 through AQ-11 was noted as applying to future development on Key Site 3. These included: SBCAPCD pollution control measures; the application of SBCAPCD Best Available Control Technology (BACT); expansion of the existing Santa Maria Area Transit (SMAT) system; access to retail, commercial, recreational, and educational facilities via transit; park-and-ride facilities; Transportation Demand Management (TDM) measures; revision of the off-site road impact fee to a Transportation Impact fee; long-range commuter service; land-use planning techniques to encourage alternative transportation; an incentive-based emissions reduction program; dust control measures; and energy conservation measures. These mitigation measures would mitigate Impact AQ-2 to a Class II level. However, impacts AQ-1 and AQ-3 would remain Class I.

The OCP EIR also concluded that there would be potential for a site-specific, potentially significant impact related to short-term construction-related emissions (Impact KS3-AQ-1) and long-term operational emissions (Impact KS3-AQ-2). Impact KS3-AQ-1 was noted as being mitigated by the above mitigation measures, and Impact KS3-AQ-2 was noted as remaining significant and unavoidable.

Development of the project would potentially result in construction-related air quality impacts, including dust generation from grading for the access roads and building pads, and air pollution emissions from construction equipment and construction vehicles. Short-term emissions of ozone precursors (NOx and ROC) during project construction would result primarily from the on-site use of heavy earthmoving equipment. Due to the limited period of time that grading activities would occur on the project site, construction-related emissions of NOx and ROC would not be significant on a project-specific or cumulative basis. However, due to the nonattainment status of the air basin for ozone, the project should implement measures recommended by the APCD to reduce construction-related emissions of ozone precursors to the extent feasible. The implementation of the County's standard dust control measures would be in place prior to grading commencement. These standards are required on all new development.

The Key Site 3 property is adjacent to U.S. Highway 101, and the easternmost portion of the proposed residential development would occur within 500 feet of the freeway alignment. Winds in the project region are variable, but are predominantly from the west or northwest, which when westerly, would have a mitigating effect on hazardous pollutant levels at the project site. During the fall and winter these winds are replaced by periods of Santa Ana wind conditions, which generally blow from the northeast, and would carry emissions from Highway 101 toward the project site. Thus, the project could result in long-term air quality impacts due to exposure to hazardous air pollutants to the proposed residences closest to Highway.

Scope of EIR:

APCD's guidance document, *Scope and Content of Air Quality Sections in Environmental Documents* (updated March 2014) should be referenced for general guidance in assessing air quality impacts in the SEIR. The document is available online at www.sbcapcd.org/apcd/landuse.htm.

- Briefly update current air quality setting as necessary.
- Assess air quality impacts associated with grading, and construction and long-term operational activities from development of 125-unit residential project, including an evaluation of the Greenhouse Gas (GHG) emissions and climate change impacts. The assessment should include a quantification of emissions from project sources, direct and indirect, as applicable.
- Assess long term air quality impacts and health risks associated with air toxics related to Highway 101 on prospective residents of the proposed project.
- Identify mitigation measures as necessary, including standard emission control conditions applied by the Santa Barbara Air Pollution Control District.
- Assess whether the proposed project is consistent with the regional growth assumptions in the 2010 Clean Air Plan.
- Assess cumulative air quality impacts as well as the project's contribution to those impacts.
- Assess any residual impacts of the project.

BIOLOGICAL RESOURCES

The OCP EIR identified General Impacts as BIO-8 (trail construction and use), BIO-9 (paved bicycle paths), BIO-15 (creek maintenance and emergency work), BIO-17 (vegetation clearing in response to increased fire risk in foothills), BIO-18 (fire suppression), BIO-19 (elimination of 2,000 acres of habitat/habitat fragmentation, BIO-28 (elimination of riparian communities), and BIO-38 (flood control policies) listed in Section 5.2 of Volume I. (OCP EIR, Vol. II at p. 3-6.) The site specific impacts identified in the OCP EIR are KS3-BIO-1 (reduction in habitat due to grading and clearing, including loss of 70-80 acres of non-native grassland and coyote brush scrub, adverse impacts to 60 acres of oak woodland/scrub habitat south of Orcutt Creek, and loss of 0.7 acre of sage scrub habitat south of Orcutt Creek on the western site boundary), KS3-BIO-2 (loss of approximately 4.07 acres of riparian vegetation in northern portion of site and disruption of riparian woodland resulting from extension of sewer lines along the creek), KS3-BIO-3 (impacts to wildlife due to domestic animals, nuisances to wildlife such as light and noise, and disruption of wildlife migration routes mainly due to construction and habitation of 48 units on the central low-lying portion of Key Site 3 north of and adjacent to the Orcutt Creek riparian corridor), and KS3-BIO-4 (potential contamination of Orcutt Creek due to urban run off).

Mitigation measures included in the OCP EIR include both General Mitigation Measures BIO 1, 2, 3, 9, 13, 14, 15, 16, 17a, 17b, 17c, 20, 21, 24, 25, 26, and 28 listed in Section 5.2 of Volume I, as well as Specific Mitigation Measures KS3-BIO-1 through KS3-BIO-7. With implementation of these measures, loss or riparian vegetation would be reduced to less than significant, but impacts to wildlife and loss of habitat would remain significant and unavoidable.

Impact Discussion:

Construction and development activities associated with the revised project could result in direct loss of non-native grassland, coastal scrub, oak woodland, oak riparian, and central dune scrub habitats. According to the ARCADIS May 21, 2003 Impact Assessment memorandum, impacts to sensitive species from the proposed development would be approximately 3.36 acres. Species impacts would be Central Maritime Chaparral, (0.04 ac.) Central Dune Scrub (0.11 ac.), Central Coast Live Oak Riparian Forest (0.34 ac) Central Coast Arroyo Willow Riparian Scrub Forest (0.02 ac.) and temporarily flooded swale area (2.78 ac.), which has been previously identified as a potential wetland. The project would also impact approximately 29.65 acres of non-native grasses and 4.89 acres of Central (Lucian) Coastal Scrub. In addition, the project would include the construction of a bridge for secondary site access off of Chancellor Road, which would result in impacts to the Orcutt Creek riparian corridor.

Loss of onsite vegetation / habitat, indirect impacts to offsite vegetation / habitat, impact to onsite drainages, creeks, riparian habitat, and construction impacts and operational impacts would need to be evaluated in the Subsequent EIR. Specific temporary or long-term impacts to Orcutt Creek itself from the construction of a crossing must be evaluated for potential impacts to riparian habitat and sensitive species.

Fire clearance requirements around structures could further infringe upon biological resources. In addition, development of the project could eliminate foraging habitat for raptors. The open space proposed as part of the project would increase human activity adjacent to the creek which could result in direct and indirect impacts to wildlife and riparian vegetation.

Noise and lighting associated with buildout of the project could disturb wildlife and hinder wildlife activities. Development of the proposed project could result in water quality impacts to the area drainages due to storm water runoff and increased pollutants from typical residential development and activities (e.g. oil, grease, etc.), soil erosion and sedimentation, and construction activities and waste. The use of non-native plant material in landscaping and restoration could result in increased levels of invasive species occurring in native habitats and affect the long-term integrity and persistence of native plant communities in the project area. Lastly, increased use of the open space area by the public with the creation of the new public trails, as well as by new residents within the site could potentially impact sensitive species and habitats. Dogs and cats are significant sources of harassment and/or predation of wildlife, particularly the same prey species on which raptors depend for food. Impacts to these resources are *potentially significant*.

Scope of EIR:

- Ground-truth the plant community mapping included in the ARCADIS May 21, 2013 report.
- Assess and describe current baseline conditions and habitat quality and rarity throughout the site, with particular emphasis on identifying endangered, threatened, rare, and locally sensitive species, habitats, and plant communities within and in close proximity to the proposed development and access roads.

- Assess direct and indirect, short- and long-term impacts to existing biological resources from proposed development, including, but not limited to: loss of habitat, sedimentation from grading and site preparation efforts, and indirect impacts of increased human activity and night lighting.
- Consider impacts to listed species and other regulated resources, if any, and discuss role of other regulatory agencies (e.g. USFWS, CDFG, USACOE, etc.).
- Identify feasible mitigation measures, if any, and identify residual impacts.
- Assess cumulative impacts to biological resources and the project's contribution to those impacts.

Sources of Information:

- *Biological Resources Assessment for Selected Key Sites,* prepared by Katherine Rinlaub, July 1995.
- *Orcutt Community Plan Biological Resources Map.*
- *Sensitive Species and Habitat Survey,* prepared by LFR Inc., June 2006.
- *Supplemental Ecological Assessment (Roads and Infrastructure,* prepared by LFR and ARCADIS, October 2009.
- *Ecological Assessment Update,* prepared by ARCADIS, March 2, 2010.
- *Impact Revisions Assessment,* prepared by ARCADIS, May, 21, 2013.
- *Key Site 3 Habitat Restoration Plan,* prepared by ARCADIS, November 18, 2013.
- *Key Site 3 Field Survey of Revised Plan, April 2014,* prepared by ARCADIS, May 5, 2014

CULTURAL RESOURCES

Impact Discussion:

Several County documents include policies, standards and mitigation measures to help ensure that new development does not have a significant impact on archaeological resources, including the Environmental Thresholds and Guidelines Manual and "Historic and Archaeological Elements of the Santa Barbara County Heritage Management Plan, Cultural Resources Guidelines."

All of Key Site 3, including the focused rezone area and roadway corridors, has been surveyed for cultural resources. Four archaeological sites are recorded within Key Site 3. A Phase 2 subsurface testing program was conducted in order to define the site boundaries and contribute to significance evaluations. Subsurface artifacts were discovered at three of the four sites. These sites are therefore potentially archaeologically significant. As currently proposed, development would not occur on any of the four sites. However, these four sites would have additional exposure as a result of their proximity to the developed areas and increased public access. Given the cultural sensitivity of the site, grading and site preparation could result in potentially significant impacts to unknown archaeological resources.

Scope of EIR

- Incorporate the results of the previous Phase I studies.

- Incorporate into the document the results of the SB 18 Consultation conducted by Santa Barbara County.
- Analyze the impacts of the project and identify mitigation measures as necessary.
- Assess the cumulative impacts to cultural resources and discuss the project's contributions to those impacts.
- Assess any residual impact levels.

Sources of information

- *Phase I Archaeological Survey for the Orcutt Community Plan*, prepared by ISERA Group Inc., June 1995.
- *Phase I Archaeological Surface Survey for the KS-3 Project,* prepared by Thor Conway of Heritage Discoveries Inc. in November of 2009,
- *Phase I Archaeological Surface Survey for Road Corridors at the KS-3 Project,* prepared by Thor Conway of Heritage Discoveries Inc. in December of 2009,
- *Archaeological Subsurface Testing Study,* prepared by Thor Conway of Heritage Discoveries Inc. in September of 2006, and
- *Phase 1 Archaeological Study,* conducted by Robert J. Wlodarski of Historical Environmental Archaeological Research Team (HEART) in November 2006.

ENERGY

Impact Discussion:

Development associated with the proposed project and other related cumulative projects in the Orcutt and Santa Maria areas could result in increased demands on electrical and/or natural gas services and facilities within the Santa Maria Valley. While there are no specific CEQA or County thresholds related to natural gas or electricity impacts, individual future projects would be required to receive a "will serve" letter from the applicable service provider, which would indicate whether adequate electricity and natural gas supplies would be available to each future project. This would ensure that future projects do not over-capacitate existing electricity and natural gas systems. Thus, the project would not result in significant impacts to energy resources and no further evaluation in the EIR is necessary. Mitigation measures would not be required.

Scope of EIR: **No further environmental analysis is recommended.**

FIRE PROTECTION

Impact Discussion:

Primary access to the site would be provided via Sunny Hills Road, which currently connects to Clark Avenue approximately 400 feet west of the Highway 101 Southbound Ramps. The project proposes to realign Sunny Hills Road to connect with Clark Avenue west of its current location. This alignment would be consistent with the preferred alignment identified in the Orcutt Community Plan Final EIR, and would serve as the primary access for the site. A secondary

access road would be provided off of Chancellor Street, which extends to the west from Stillwell Road. Minor widening of the Stillwell Road/Chancellor Street is proposed to provide for improved turning movements for fire trucks and other large vehicles.

The majority of the property consists of flat grazing land and open space, although the southern portion of the property contains a steep north-facing slope at the foot of the Solomon Hills. The County of Santa Barbara has designated the site as a high fire hazard (County of Santa Barbara GIS database, 2005). The construction of residential structures in a designated high fire hazard area would expose additional people to fire hazards and would also introduce additional sources of wildland fire initiation due to conversion of the presently undeveloped area to a populated area.

Fire Station 22 serves the part of Orcutt in which Key Site 3 is located. The road distance between Fire Station 22 and the Key Site 3 property is approximately 0.5 miles, which is within the 5-minute response time goal. Standard Fire Department requirements such as road naming requirements, address number standards, hydrant requirements, and review of site circulation and design of secondary internal Emergency Vehicle Access (EVA) roads would apply and would reduce the risk from wildland fires; however, impacts from the introduction of new residential development into a high fire hazard area would remain potentially significant.

The Fire Department has reviewed proposed project plans and has determined that the access design is acceptable and that payment of impact fees (which are dedicated toward provision, in the Orcutt Community planning area, of a new fire station and/or additional personnel) would reduce cumulative impacts associated with Fire Protection to potentially significant and mitigable.

Scope of EIR:

- Work with Fire Department representatives to confirm adequate water pressure, fire hydrants, emergency access and otherwise comply with the Fire Department's development standards.
- Determine the required extent of defensible space and any necessary vegetative management requirements.
- Identify mitigation measures as necessary to further reduce fire safety impacts to a less than significant level. In part, the mitigation measures should ensure that the applicant's proposed improvements and measures to minimize impacts to fire protection comply with applicable development standards.
- Evaluate cumulative fire protection impacts of the proposed projects and other similar past, present and probable future projects in the area.

- Identify any residual impacts of the proposed projects after implementation of mitigation measures.

GEOLOGY AND SOILS

Impact Discussion:

Impacts analyzed in the OCP EIR included GEO-1 (increased erosion) and GEO-2 (blowing sand) resulting from construction activities, as well as Specific Impacts KS3-GEO-1 (siltation of Orcutt Creek) and KS3-GEO-2 (soil blowing) from removal of vegetation during construction. The OCP EIR for Key Site 3 concluded that General Mitigation Measures GEO-1 through GEO-9, and GEO-12 listed in Section 5.4 of Volume I of the OCP EIR as well as Specific Mitigation Measures KS3-GEO-1 (erosion controls to prevent runoff to the creek channel) and KS3-GEO-2 (wetting exposed areas at the end of each work period) would mitigate the impacts identified to less than significant levels.

The potential for rupture of an earthquake fault, ground shaking, liquefaction, erosion, liquefaction, subsidence, expansive soils remains the same as when the OCP EIR was formulated. The analysis in the Geologic Hazards Report, Orcutt Key Site 3 South of Clark Avenue, West of Highway 101, Orcutt Area, Santa Barbara California (Earth Systems Pacific, dated March 16, 2006) ("GHR") concludes that the primary seismic hazard of ground shaking could be adequately mitigated by design elements in the proposed buildings. (GHR at pp. 5, 7.) The GHR analyzed the risk of liquefaction and the consequent potential total dynamic settlement estimated at less than 1 inch in one localized area next to Orcutt Creek, found a low risk of seismically induced settlement, adequate slope stability, and found no risk of surface ground rupture at Key Site 3.

The County's Seismic Safety and Safety Element indentifies the project site as havening moderate potential for compressible/collapsible soils, and the OCP EIR noted the potential for erosive soils on the site. Based upon the site's moderate hazard rating and the results of the geotechnical studies for the site conducted by Earth Systems Pacific, the potential for impacts relating to collapsible sols on foundations and slabs is considered potentially significant.

Scope of EIR:

- Confirm analysis provided in Earth Systems Pacific Soils Engineering Report (March 16, 2006) for the project site.
- Assess the geologic impacts associated with grading and site preparation for the proposed project.
- Assess the adequacy of recommended mitigation measures in the Earth Systems Pacific Soils Engineering Report (March 2006) and revise, add to, or amplify as necessary.
- Identify residual impact levels of the project after mitigation.

Source of Information:

- *Geologic Hazards Report, Orcutt Key Site 3*, Earth Systems Pacific, March 16, 2006.

HAZARDOUS MATERIALS

Impact Discussion:

An abandoned dry oil well hole is located on the south-westernmost portion of the site. The well was plugged and abandoned in 1904, before the establishment of the current DOGGR abandonment standards. Improperly abandoned wells can result in gasses such as methane and hydrogen sulfide traveling up the casing and accumulating in the overlying soil or releasing to the surface, which would pose a risk of upset hazard for any buildings located atop the well. DOGGR requirements for structural development in close proximity to abandoned oil wells include re-abandonment of wells to existing standards, application of setbacks from the well head location, and other measures to reduce risk of upset hazards.

No structural development is proposed within approximately 2,500 feet of the mapped location of the abandoned well, as depicted in the OCP Oil Activity Map. One of the public trails would be located closer to the mapped location of this well; however, no structures or substantial grading is associated with the trail at this location. Because of the apparent approximately 2,500-foot separation between the well and the building envelope of the nearest estate lot, no significant risk of upset hazards are anticipated.

The presence of other wells in the vicinity, and potential presence of oil-well related sumps is still a potential hazard, as is the likelihood that nearby wells were not abandoned to current DOGGR standards. However, the Orcutt Community Plan stipulates that "in the event that past oil activity or potential hazardous substances are uncovered during grading or construction-related activity, such activity shall be suspended immediately until a Phase II Environmental Site Assessment and appropriate remedial action has been completed (DevStd RISK-O-1.2). Adherence to this existing policy would ensure that construction-related hazards are *less than significant*.

With respect to possible agricultural contamination, Key Site 3 currently consists of undeveloped land with no indication of agriculturally-related environmental conditions that may have adversely affected the site. As a result, project specific hazardous materials impacts on Key Site 3 would be less than significant without mitigation and no further evaluation in the Subsequent EIR is necessary.

Regarding cumulative hazardous material impacts, continued urban development in the Santa-Maria-Orcutt Area will cumulatively increase the potential for exposure to existing hazards associated with hazardous materials. If soil and groundwater contamination is found to be present on sited planned and future development, impacts associated with such contamination would be limited to the individual development site and immediate vicinity and would not contribute to any cumulative health and safety impacts in the community. It is anticipated that any necessary remediation would be completed in accordance with applicable regulatory requirements prior to development of any sites determined to have significant hazards. Hence, the project's contribution to potential cumulative hazardous materials impacts would not be cumulatively considerable and no further evaluation in the Subsequent EIR is necessary.

Scope of EIR: **No further environmental analysis is recommended.**

Source of Information:

Abandon Oil Well Memo, LFR, January 24, 2007.

HISTORIC RESOURCES

Impact Discussion:

No structures or formal landscape features currently exist on the project site. As a result, no impacts to historic resources are anticipated.

Scope of EIR: **No further environmental analysis is recommended.**

LAND USE

Impact Discussion:
The Project seeks to amend the OCP and rezone Key Site 3 in order to eliminate any conflicts with the current density land use policies and/or zoning ordinances. The OCP EIR analyzed the loss of open space for Key Site 3 under Visual/Aesthetic Resources. (*See* OCP EIR, Vol. II at pp. 3-20 – 3-21; *see also* Section I, above.) The OCP EIR evaluated general land use impacts for the OCP in Section 5.1.3 of Volume I. (OCP EIR, Vol. I at pp. 5.1-1 – 5.1-4.)

Extension of new sewer lines to provide service to the project parcel has been planned for in the Key Site No. 3 Sewer Study (Penfield & Smith, dated October, 2006, updated March 14, 2007). Full buildout of the Orcutt Key Site 3 property would accommodate 285 dwelling units, including the 125 units proposed in this project and the 160 units approved as part of the Focused Housing Program. This is in comparison to 212 units assumed in the Orcutt Community Plan (OCP). The proposed project's Mesa Neighborhood consists of 125 single-family homes, with the majority (approximately 70 of these) on small lots: between 3,400-sq ft and 3,900-sq ft in size. Approximately half of the Mesa Neighborhood homes would be 2-story; however, the first row of the small lot homes on the project's northern and northeastern boundaries would be single-story, as would all 10 of the homes closest to the existing homes to the west along Oakbrook Lane. This latter group of homes (Lots 3-12 of the VTM) would have lot sizes of between 8,030 sq ft and 10,954 sq ft. The resultant density would exceed that of the existing surrounding residential development, particularly in comparison to the larger lot residences along Oakbrook Lane and Chancellor Street. This could present potential neighborhood quality of life incompatibilities.

The proposal includes a general plan amendment and rezone from Residential Ranchette (10-acre minimum lot size) to medium density residential. Review and approval of the project by the North County Board of Architectural Review (NBAR) would address the specific project architecture and its compatibility with surrounding neighborhoods; however the design's layout, bulk and height should be addressed both by the NBAR and in the EIR.

The Orcutt Community Plan and other applicable elements of the Comprehensive Plan include environmentally sensitive habitat area provisions, recreational goals, circulation and traffic needs, and other environmentally protective policies. The EIR should review the project for conformance with these policies and propose mitigation where needed to gain consistency with these policies. An exhaustive listing of policies in the Land Use Section is not necessary, but any potential inconsistencies with environmentally protective standards should be addressed.

The proposed project would result in an increase in population in the community, an increase that is consistent with growth projections for the area and within the Orcutt Community Plan (Objective LU-O-1 called for the development of up to 3,751 new dwelling units). The proposed project would utilize existing water, wastewater and solid waste facilities that serve the urban areas of Orcutt. Service would be provided through minor extensions of existing utility infrastructure. No additional infrastructure or facilities beyond those necessary to accommodate the proposed project would be required.

Scope of EIR:

- The Subsequent Project EIR should document consistency with land use policies such as those contained in the Orcutt Community Plan and Comprehensive Plan.
- Assess the character of surrounding land use and development and analyze the compatibility of the proposed project development with that character.
- Identify mitigation measures, if any, to reduce land use impacts and resulting residual environmental effects.
- Assess cumulative impact levels and the contribution of the proposed project to these cumulative impacts.
- Identify residual impact levels of the project after mitigation.

NOISE

Impact Discussion:

The primary transportation noise source in the project area is Highway 101, which runs along the east boundary of the site. Heavy traffic, consisting of long-haul semi tractor-trailer vehicles, agricultural trucks, motorcycles and automobiles are clearly audible along the eastern portion of the site. According to the OCP EIR, a 200-foot wide strip of land along the eastern site boundary of the site is exposed to noise levels in excess of 65 dBA from automobile traffic on Highway 101, and an additional strip extending 200 feet further toward the interior of the site is subject to levels in excess of 60 dBA. The Sound Level Assessment (SLA) conducted by 45dB.com in September 2013 included on-site noise data collection and refined the noise contour mapping. The SLA concluded that an approximately 220-foot strip of land along the eastern site boundary was exposed to noise levels in excess of 65 dBA, with an additional 280 foot strip of land subject to noise levels in excess of 60 dBA. However, the SLA includes mitigation measures for reducing interior and exterior nose levels to acceptable levels. As a result, noise impacts to prospective residents on the project site from adjacent travel corridors remain potentially and mitigable.

Construction of the 125 residential units could expose the existing residents located within 1,600 feet, to short-term construction generated noise levels exceeding the County threshold of 65 dB CNEL. This is considered a potentially significant impact but can be mitigated by standard conditions of approval placed on future development projects.

As described above in the project description, primary access to the site would be provided via a new road off of Clark Avenue and through Key Site 2 to the north. In addition, a second road new access road will be linked to Chancellor Road (a private road) which connects to Stillwell Road. The Traffic and Circulation Study prepared for the project described traffic increases on the Sunny Hills Road and along Chancellor Road. Traffic generated by the project may result in noise level increases along roadways in the project vicinity. In addition, the project would contribute incrementally to cumulative noise impacts in combination with other planned and pending projects in the vicinity.

Scope of EIR

- The Subsequent Project EIR should analyze potentially new or substantially greater environmental impacts due to noise generated by short-term construction and long-term operational noise.
- Verify analysis provided in Sound Level Assessments of 45dB.com project site.
- Assess the adequacy of recommended mitigation measures in the 45dB.com Sound Level Assessment and revise, add to, or amplify as necessary.
- Assess cumulative impact levels and the contribution of the proposed project to these cumulative impacts.
- Identify residual impact levels of the project after mitigation.

Source of Information:

- *Sound Level Assessment*, 45dB.com, (September 4, 2013)

PUBLIC SERVICES

Impact Discussion:

Public Schools: Key Sites 3 is located in the community of Orcutt and are within the Orcutt Union School District (OUSD) and the Santa Maria Joint Union High School District (SMJUHSD). According to the County of Santa Barbara Environmental Thresholds and Guidelines Manual (2006), a significant impact on school service is considered to occur when a project would generate sufficient students to require an additional classroom. This assumes 29 students per classroom for elementary/junior high students, and 28 students per classroom for high school students, based on the lowest student per classroom loading standards of the State school building program. This threshold is applied for those school districts currently approaching, at, or exceeding their current capacity. A project's contribution to cumulative schools impacts will be considered significant if the project specific impact as described above is considered significant. However, the applicant would be required to pay state-mandated school impact fees. Pursuant to Section 65995 (3) (h) of the California Government Code (Senate Bill 50, chaptered August 27, 1998), the payment of statutory fees "...is deemed to be full and

complete mitigation of the impacts of any legislative or adjudicative act, or both, involving, but not limited to, the planning, use, or development of real property, or any change in governmental organization or reorganization." As a result of this statutory limitation on additional mitigation, payment of school impact fees renders impacts less than significant.

Table 7 below shows the students that could be added to the aforementioned school districts as a result of buildout of the project.

Table 7

Projected Students at Orcutt Union School District and Santa Maria Joint Union School District				
Proposed Residential Units	**Student Generation***			
125	**Elementary School**	**Junior High**	**High School**	**Total**
	39	13	24	**76**
**Student generation factors of 0.308 students per unit for elementary school, 0.097 students per unit for junior high school, and 0.19 students per unit for high school. provided by the Orcutt Union School District and Santa Maria Joint Union High School, was used to determine the student generation*				

According to Table 4 above, the proposed residential development on Key Site 3 would add 42 students to the OUSD and 24 students to the SMJUHSD schools. The collection of state-mandated fees is considered full and complete mitigation for impacts to public schools. The proposed project would be required by State law to pay their fair share of impact mitigation fees, and impacts to public schools would be less than significant.

Residential development in the area under cumulative conditions could generate enough new students such that it may exceed the capacity of schools within the OUSD and therefore require new or altered school facilities in the future. Future facilities that would need to be constructed as a result of cumulative development would be subject to subsequent environmental review. As discussed above, the collection of state-mandated fees (pursuant to Section 65995 (3) (h) of the California Government Code) is considered full and complete mitigation for impacts to public schools. Through the payment of impact mitigation fees, potential *cumulative impacts* related to public schools would be *less than significant*.

Solid Waste: The California Integrated Waste Management Act of 1989 (State Assembly Bill 939) required all cities and counties to develop a Source Reduction and Recycling Element (SRRE) for diverting 50% of their solid waste from landfills by the year 2000. City and county governments throughout the state of California responded by adopting waste diversion programs to meet the requirements of AB 939. To comply with the goals set by AB 939, the County of Santa Barbara requires a reduction in solid waste generation for all new development projects in the County.

County waste characterization studies estimate that implementation of a source reduction and recycling program could reduce the total volume of waste generated by new development projects by approximately 50%.[2]

[2] *Santa Barbara County Environmental Thresholds and Guidelines Manual* (1995).

The project consists of the creation of 125 new residential lots. Pursuant to the *County Thresholds and Guidelines Manual*, solid waste generation from those 69 units would equal:

2.74 people/unit x 125 units x 0.95 tons/year = 325.4 tons of solid waste/year

A project is considered to result in significant impacts to landfill capacity if it would generate 196 tons per year of solid waste. Required source reduction, recycling and composting would reduce the waste stream by approximately 50% resulting in a total generation of approximately 162.7 tons of solid waste per year. This is well below the County's 196 tons per year threshold. New pending thresholds for construction and demolition waste would not likely be triggered by the proposed project given the level of proposed development. Nonetheless, application of mitigation measures requiring the recycling of demolition waste would be imposed at the time of future development. Therefore, impacts to solid waste would be *less than significant*. However, according to County thresholds, a project that would generate 40 tons of solid waste per year would be considered cumulatively significant. Since the proposed project would exceed the threshold for cumulative solid waste generation, cumulative impacts would be considered *significant*.

Police Protection:

The increase in population resulting from the development of Key Site 3 under this program would cause the police officer to population ratio to be further exceeded, increasing demand on existing resources. In addition, according to SBCSD, as housing densities increase, demand for police protection service also increases. However, SBCSD has indicated that SBCSD's Orcutt Station could accommodate the additional deputies necessary to provide adequate police protection services. Furthermore, additional outside support is provided through Mutual Aid Agreements with the Santa Maria and Guadalupe Police Departments and the California Highway Patrol. Therefore, the increase in population associated with buildout of Key Site 3 would not require the construction of new or expanded SBCSD facilities, and impacts to police services would be *adverse, but less than significant* and will not be further evaluated in the EIR.

Emergency and Health Care Services:

The additional 343 residents generated by the project could reduce service ratios and response times for AMR ambulance service. However, AMR and health care services within the County would continue to be guided by the authority of Santa Barbara County Public Health Department (SBCPHD). Ambulance service and health care facilities are continually monitored by the SBCPHD to ensure adequate service is being provided to County residents. If ambulance and health services became inadequate as determined by SBCPHD such that new or expanded facilities were needed, the construction of such facilities could result in environmental impacts. However, such projects would be subject to subsequent environmental review. In addition, ambulance services are not dependent upon building facilities as ambulance vehicles are placed strategically throughout the County using a computer data system, which calculates where they should be located throughout the day. Furthermore, Marian Medical Center recently completed an expansion of the hospital that nearly doubled its current patient capacity in order to meet future demand expected through the year 2020. Therefore, impacts related to ambulance service and

health care services would be *adverse, but less than significant* and will not be further evaluated in the EIR.

Water and Sewer Service:

Water and sewer service for the residential developments would be provided by Golden State Water Company and Laguna County Sanitation District (LCSD), respectively. The applicant has provided P&D with a draft contract agreement to obtain supplemental water from the City of Santa Maria that would be used to serve the proposed development. The proposed project would result in the development of 125 single-family residential units. Based on water duty factors of 0.33 AFY per small single-family home (97 clustered homes), 0.94 AFY per year per large single-family home (28 single-family homes) would require approximately 58.3 AFY. On August 15, 2003, the project applicant entered into a long-term Supplemental Water Purchase Agreement with the City of Santa Maria. The agreement stipulates that the City will provide 200 AFY for the purposes of consumptive use for the proposed project. The "supplemental water" is to be either a portion of the State Water Project (SWP) entitlement held by the City or a portion of groundwater rights held by the City. The agreement became effective on August 22, 2006, with payment of the deposit to the City from the applicant. The development shall receive water for the next one hundred (100) years, and thereafter insofar as the City remains in a SWP contract (Supplemental Water Purchase Agreement, 2003). Therefore, adequate water supply would be available for the proposed project.

Currently, the LCSD wastewater treatment plant has the capacity to accommodate up to an additional 0.9 MGD. According to the Sewer Study prepared by Penfield and Smith (May 2013), the project would demand an average daily capacity of 0.046 MGD and a peak capacity of 0.190 MGD. The treatment plant currently receives 2.1 MGD. Existing wastewater plus the wastewater generated by the proposed project would total 2.192 MGD. This is approximately 69% of the total available capacity. The proposed project would not cause the treatment plant to exceed 75% of its current capacity; therefore, project specific impacts are considered *less than significant.*

While the project specific impacts would be reduced to less than significant levels, the project's contribution to cumulative wastewater impacts resulting from buildout under the OCP would remain significant.

Scope of EIR:

- Update information on school populations and capacities
- Confirm the water demand for the project based on proposed development acreage, number of residences, and consumptive use factors that are contained in the *County's Environmental Thresholds Manual.*
- Assess the impacts of the project on solid waste and wastewater and identify additional mitigation measures as necessary.
- Assess the cumulative solid waste and wastewater impacts and the project's contribution to those impacts and identify mitigation measures as necessary**.**

- Identify any residual impacts upon implementation of mitigation**.**

RECREATION

Impact Discussion:

Based on Orcutt's average household size of 2.74 persons per dwelling unit (U.S. Census, 2000) 125 new residential units would generate an estimated 343 residents. Based on the County standard of 4.7 acres of parkland per 1,000 residents, this would generate a need for approximately 1.61 acres of parkland. The majority of the southern portion of the site is identified as open space in the OCP and would be dedicated to the county. Walking trails located along the eastern perimeter as well as traversing the center of the area would provide pedestrian connection between the residential developments on the northern portion of the site. While no new public parklands would be developed as part of the proposed development, developmental impact mitigation fees would be assessed on the new residential development, and these fees would be use to develop new parklands elsewhere in the Orcutt area. Thus, impacts on parks demand from the proposed project would be *less than significant*.

The proposed project provides approximately 91 acres of public open space and additional public trails that are shown on the Parks, Recreation and Trails map of the OCP associated with the Orcutt Creek Trail. The dedication of open space and trails as identified in the OCP would offset the increased parkland demand resulting from the buildout under cumulative conditions. In addition, the payment of Quimby Act park fees would be required and these fees would be used to develop additional public parks serving the OCP area. Cumulative impacts are considered *less than significant* and will not be further evaluated in the EIR.

Scope of EIR: No further environmental analysis is recommended.

TRANSPORTATION/CIRCULATION

Impact Discussion:

Penfield & Smith coordinated with the County of Santa Barbara to produce the Key Site 3 Residential Project Traffic and Circulation Study (Penfield & Smith, dated November 18, 2013) The Traffic and Circulation Study (TCS) described the impacts to traffic and circulation assuming primary access to Key Site 3 would be from Clark Avenue at one signalized intersection between Clark Avenue and a newly aligned Sunny Hills Road, and the "frontage road" across Key Site 2 would be designed to connect to the newly aligned Sunny Hills Road to provide access to both Key Site 2 and Key Site 3 consistent with OCP development standards. (TCS at p. 19.) Proposed extensions of Chancellor Street would provide secondary access by connecting Key Site 3 to Stillwell Road west of the Project.

For project specific impacts, the TCS concludes that Clark Avenue in the vicinity of Key Site 3 would continue to operate at Level of Service ("LOS") A under existing and future conditions. All study-area intersections are predicted to operate at LOS C or better and thus, would not generate any project-specific impacts. With regards to cumulative + project impacts, the project would generate impacts at the Clark Avenue/U.S. 101 interchange during PM peak hour.

Short-term construction-related traffic impacts, potential impacts on public transit system or other alternative transportation were not evaluated in the OCP EIR for Key Site 3. Adequate emergency access is anticipated for Key Site 3 by way of the primary and secondary access routes detailed in the TCS.

The Project should not result in new or substantially greater significant environmental impacts than those identified and evaluated in the OCP EIR for impacts to Clark Avenue. Moreover, the TCS already demonstrates no impact to the study area intersections under existing or predicted future conditions. Nevertheless, the Subsequent Project EIR should evaluate short-term construction-related traffic impacts, potential impacts on public and alternative transportation, and study the adequacy of emergency access to Key Site 3 in light of the specific access plans.

Scope of EIR

- Independently evaluate and explain the results of the traffic study.
- Assess cumulative and buildout impacts to transportation/circulation (intersection and segment analysis) and identify the project's contribution to those impacts.
- Identify mitigation measures to reduce impacts to less than significant levels, if applicable.
- Assess residual impacts of the project after mitigation.

Source of Information:

Traffic and Circulation Study, Penfield & Smith, November 18, 2013

WATER RESOURCES /FLOODING

Impact Discussion:

The 139-acre project site primarily consist of flat grazing land and open space, although the southern portion of the property contains a steep north-facing slope at the foot of the Solomon Hills. The southern portion of the site contains Orcutt Creek and its associated central coast live oak riparian habitat. The remainder of the site drains toward Orcutt Creek, which runs west and northwest towards the Betteravia Lakes region. The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps identify a 100-year flood hazard area on-site associated with Orcutt Creek. No new development is proposed in this area.

The proposed project would result in a substantial increase in impervious surfaces, thus increasing runoff and altering the drainage patterns currently experienced at the site. Increased surface runoff associated with the increase in impervious surfaces results in greater transport of common pollutants into nearby creeks and the storm water system. Oil leaks, grease, brake fluid, detergents and other similar pollutants that are commonly generated from parked cars and residents working on or washing cars could be transported to Orcutt Creek and area storm drains during rain events, resulting in potential water quality impacts. In addition, fertilizers, pesticides, and other common chemicals and nutrients used in residential landscaping could result in water quality impacts to Orcutt Creek or other area water bodies. Impacts from these activities are considered potentially significant.

Grading activities and vegetation removal during construction could result in short-term water quality impacts associated with increased erosion and the potential transport of pollutants into Orcutt Creek. Construction projects of one or more acres are subject to National Pollution Discharge Elimination System Phase II (non-point source) permit regulations, which require development of a Storm Water Quality Management Plan (SWQMP) to minimize water quality degradation through storm water monitoring, establishment of Best Management Practices (BMP), implementation of erosion control measures and implementation of spill prevention and containment measures during the life of the project. In addition, erosion and sediment control measures are required during construction to minimize erosion and associated impacts to water quality. Development of comprehensive plans for both construction and operation of the project would reduce potential effects to surface water quality from pollutant inputs associated with construction and operations.

Scope of EIR:

- Assess long-term impacts to Orcutt Creek and flooding associated with buildout of the proposed project, including water quality, flood hazards, and long term hydrological changes. Include an analysis of short-term impacts due to construction activities.
- Identify mitigation measures necessary to reduce impacts to less than significant levels.
- Evaluate cumulative impacts to water resources and flooding and identify the project's contribution to those impacts.
- Assess residual impacts of the project after mitigation.

Source of Information:

- *Preliminary Drainage Study,* Penfield & Smith, May 2013

5.0 PROJECT ALTERNATIVES

Pursuant to Section 15126.6 of the CEQA Guidelines, the EIR will consider and analyze a reasonable range of alternatives to the proposed project. The alternatives selected should be capable of avoiding or lessening any significant environmental effects of the proposed project. Specific alternatives will be identified early in the EIR process.

6.0 SUMMARY

The scoping described above is intended to provide the public and responsible agencies with a summary of the preliminarily identified environmental issue areas concerning the project. P&D staff will be responsible for identifying all potential environmental impacts of the project and developing mitigation measures/conditions of approval to meet current standards to address project specific impacts and the project's contribution to cumulative impacts as appropriate for each of the impact areas outlined above.

The application, project plans and technical reports in reference to the applicant's request are available and may be reviewed at the County of Santa Barbara Planning & Development Department located at 624 West Foster Road, Suite C, Santa Maria, CA 93455-3623.

If you have questions about this project, please contact EIR project manager, John Zorovich at (805) 934-6297.

7.0 ATTACHMENTS

A. Proposed Development Plan
B. Proposed Vesting Tentative Tract Map
C. Vicinity Map

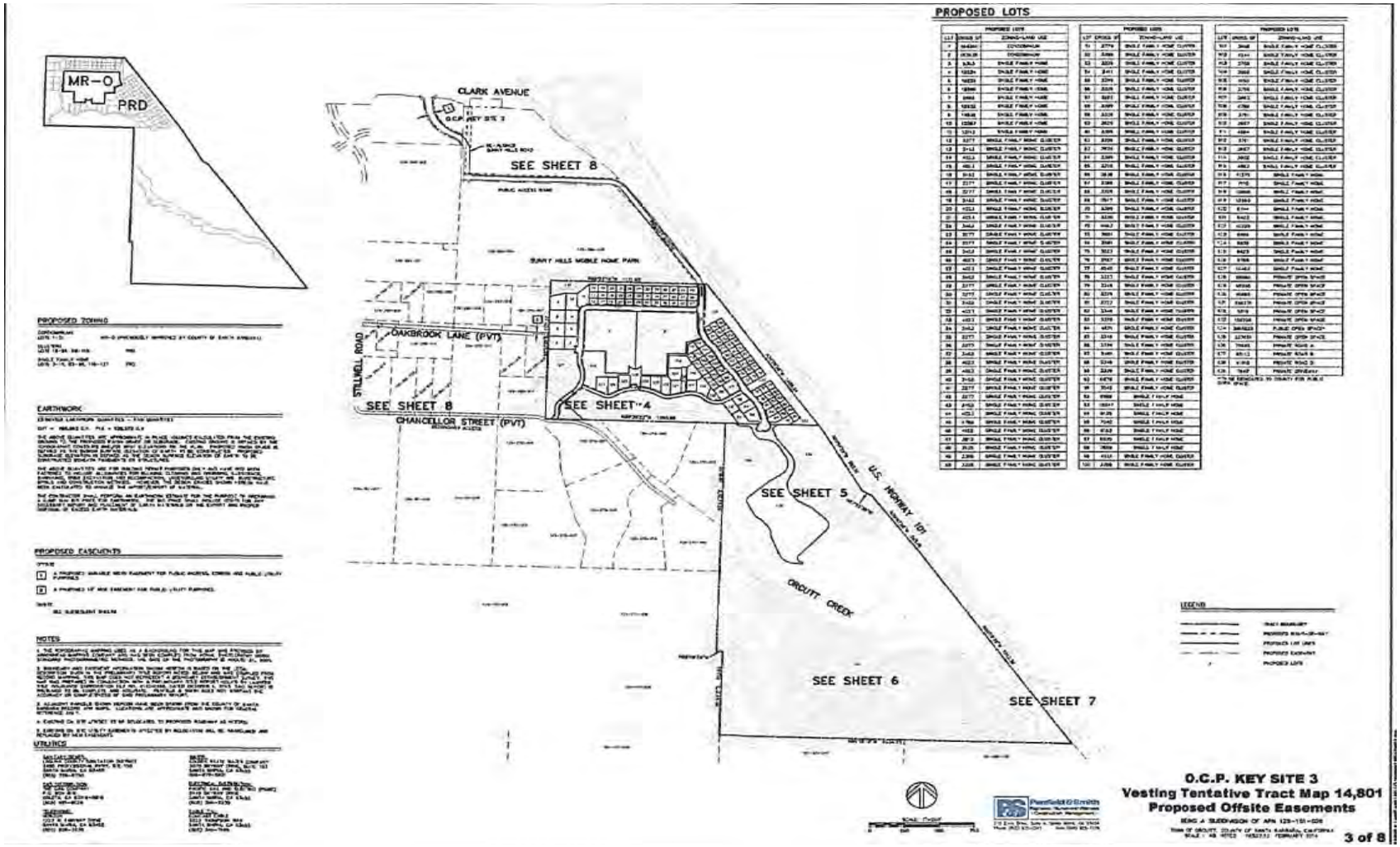
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ATTACHMENT A
PROPOSED KEY SITE 3 DEVELOPMENT PLAN



Illustrative Site Plan- Full Site

ATTACHMENT B
KEY SITE 3
PROPOSED VESTING TENTATIVE TRACT MAP



Santa Barbara County
Air Pollution Control District

RECEIVED
JUL 03 2014
S.B. COUNTY (NORTH)
PLANNING & DEVELOPMENT

July 1, 2014

John Zorovich
Santa Barbara County
Planning and Development
624 W. Foster Road
Santa Maria, CA 93455

Re: APCD Response to Notice of Preparation of an Environmental Impact Report for the Key Site 3 Project, 13DVP-00000-00010, 13GPA-00000-00005, 13RZN-00000-00001, 13TRM-00000-00001

Dear Mr. Zorovich:

The Santa Barbara County Air Pollution Control District (APCD) appreciates the opportunity to provide comments on the Notice of Preparation (NOP) of a Draft Environmental Impact Report (EIR) for the Key Site 3 project, which consists of the development of 125 single family units in a variety of product types (small lot, detached cluster homes and large family homes). Grading associated with the proposed project includes 163,000 cubic yards of cut and 116,750 cubic yards of fill, for a total of 279,750 cubic yards. The subject property, a 137-acre parcel zoned Residential Ranchette (RR-10)/ Multi-Family Residential, Open Space (MR-O) and identified in the Assessor Parcel Map Book as APN 129-151-026, is located at the corner of Highway 101 and Clark Avenue in the community of Orcutt. The site is within the Orcutt Community Plan and is referred to as Key Site 3. This application proposes to rezone the Mesa area to Planned Residential Development (PRD-125), and MR-O.

APCD staff reviewed the Initial Study and NOP of a Draft EIR, and concurs that air quality impacts will be potentially significant. APCD's guidance document, entitled *Scope and Content of Air Quality Sections in Environmental Documents* (updated March, 2014), is available online at www.sbcapcd.org/apcd/landuse.htm. This document should be referenced for general guidance in assessing air quality impacts in the Draft EIR. The EIR should evaluate the following potential impacts related to the Key Site 3 project:

1. **Proximity to Highway 101.** APCD staff recommends that sensitive land uses, such as residential, should not be sited within 500 feet of the highway. This is based on guidance from the California Resources Board (*Air Quality and Land Use Handbook: A Community Health Perspective,* CARB, April 2005) and supplemented by information gathered by APCD, summarized in the attached "Public Health and High Traffic Roadways".

This recommendation is based on a number of proximity studies that were conducted in areas throughout the state. The studies link traffic-related air pollutant emissions to a number of health effects, such as increased cancer risk, reduced lung function, increased asthma and bronchitis, and increased medical visits. The studies are not based on specific pollutants or dose-response relationships, and no mitigation or threshold is identified that can reduce the proximity-related impacts other than increasing the distance between the sensitive receptors and the road. This is not intended to discourage mitigation measures such as particulate filters in household ventilation systems.

Siting of sensitive receptors within 500 feet of the freeway would potentially increase the occurrence of respiratory illness for future residents in the project area, and should be discussed in the Air Quality section of the environmental document.

The APCD acknowledges that this project has been designed to meet Orcutt Community Plan consistency requirements and that relocating residences outside of the 500 foot "buffer" may prove problematic and

could increase other environmental impacts. Therefore, if the project cannot be sited at least 500 feet from the highway, we recommend that all feasible mitigation measures be applied to the project, including but not limited to: siting residences as far away as possible from the freeway, best available particulate filters in household ventilation systems, building and air intake design that avoids infiltration of air from freeway side, and physical barriers between source and receptor (i.e., freeway and residences) such as sound walls and/or vegetative plantings.

2. Attainment Status and Consistency with the APCD Clean Air Plan (CAP). The APCD has posted the most up-to-date attainment status for the County on the APCD website www.sbcapcd.org/sbc/attainment.htm and the most recent Clean Air Plan is available at www.sbcapcd.org/cap.htm. The website should be consulted for the most up-to-date air quality information prior to the release of the Public Draft EIR.

The 2010 CAP used the 2007 regional growth factors for land use and population projections provided by the Santa Barbara County Association of Governments (SBCAG), along with on-road emissions forecasts provided by the California Air Resources Board (ARB) as a basis for vehicle emissions forecasting. The EIR should examine whether the proposed project will be consistent with the growth assumptions in the 2010 CAP.

3. Increase in Emissions from Proposed Project. The EIR should present significance thresholds for ozone precursor emissions (reactive organic compounds [ROC], and oxides of nitrogen [NO_X]) and particulate matter and determine whether the proposed project will produce emissions in excess of the thresholds. APCD's *Scope and Content* document contains the APCD Board-adopted criteria for evaluating the significance of adverse air quality impacts for APCD projects. In the absence of locally-adopted thresholds, APCD recommends that these thresholds be used to determine significance of air quality impacts.

The proposed project will involve air quality impacts associated with motor vehicle trips from the residential population of the project. The air quality impact analysis for mobile source emissions should be based on project-specific information and supported by a traffic study whenever possible. In addition to motor vehicle emissions, the analysis should include emissions associated with unpermitted stationary sources such as residential and commercial heating and cooling equipment. These emissions (termed "area source" emissions) should be included in the operational phase emission evaluation.

If the proposed project exceeds the significance thresholds for air quality, mitigation should be applied to reduce those emissions to below the levels of significance. Section 6 of APCD's *Scope and Content* document offers ideas for air quality mitigation. However, project-specific measures should be developed that are pertinent to the specific project and are enforceable by the lead agency.

4. Construction Impacts. The EIR should include a description and quantification of potential air quality impacts associated with construction activities for the proposed project. APCD's March, 2014 *Scope and Content* document, Section 6, presents recommended mitigation measures for fugitive dust and equipment exhaust emissions associated with construction projects. Construction mitigation measures should be enforced as conditions of approval for the project. The EIR should include a Mitigation Monitoring and Reporting Plan that explicitly states the required mitigation and establishes a mechanism for enforcement.

5. Global Climate Change/Greenhouse Gas impacts. Greenhouse gas (GHG) emissions and global climate change impacts should be addressed in the CEQA document. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases.

CEQA documents should include a quantification of GHG emissions from all project sources, direct and indirect, as applicable. In addition, we recommend that climate change impacts be mitigated to the extent reasonably possible, whether or not they are determined to be significant. The discussion of climate change

impacts can be included under cumulative air quality impacts or in its own section. At a minimum, the project should include any feasible greenhouse gas reduction measures as applicable from the following sector-based list:

- Energy use (energy efficiency, low carbon fuels, renewable energy)
- Transportation (reduce vehicle miles traveled, compact and transit-oriented development, pedestrian- and bicycle-friendly communities)
- Water conservation (improved practices and equipment, landscaping)
- Waste reduction (material re-use/recycling, composting, waste diversion, waste minimization)
- Architectural features (green building practices, cool roofs)

For guidance regarding greenhouse gas analysis for CEQA environmental documents, please refer to the *CAPCOA CEQA & Climate Change* document. CAPCOA has also published *Quantifying Greenhouse Gas Mitigation Measures*, an extensive sector-by-sector compendium of project-specific mitigation measures, including quantification methods to calculate GHG reductions. Both of these documents are available online at www.capcoa.org.

6. Transportation Measures to Reduce Air Quality Impacts. The Key Site 3 project and the associated EIR should include measures that promote the use of alternate modes of transportation and focus on reducing vehicle miles traveled, vehicle trips, and peak-hour travel. Because the Key Site 3 project involves a substantial amount of new residential development in undeveloped areas, the EIR should evaluate whether existing transit services and routes will be adequate to serve the project population, or if additional transit services, enhancements to existing services and schedules, or additional routes should be considered for the project area and surrounding community.

We hope you find our comments useful. We look forward to reviewing the Draft EIR. Please contact me at (805) 961-8890 or by e-mail at cvw@sbcapcd.org if you have questions.

Sincerely,

Carly Wilburton

Carly Wilburton,
Air Quality Specialist
Technology and Environmental Assessment Division

Attachments: Public Health and High Traffic Roadways

cc: John Franklin
SB Clark, LLC
Project File
TEA Chron File

Public Health and High Traffic Roadways

California Air Resources Board Recommended Policy:
Sensitive land uses such as residences, schools, day care centers, playgrounds, and medical facilities should not be sited within 500 feet of:

- A freeway
- Urban roads with 100,000 or more vehicles/day
- Rural roads with 50,000 or more vehicles/day

(Ref. *"Air Quality and Land Use: A Community Health Perspective."* California Air Resources Board. April 2005)

Reason for the Policy:
Many studies show that living in proximity to freeways and other high traffic roadways leads to adverse health effects beyond those associated with regional air pollution. A number of studies that focused on children have found slower lung development and significant increases in the incidence of lung disease, such as asthma, bronchitis, and decreased lung function, in children who live or attend school near heavily travelled roadways. In addition to children, seniors, and people with heart and lung conditions are considered particularly sensitive to effects of air pollution. Residence in high-traffic areas has been shown to increase the risk of mortality within a cohort of male veterans.

Health Studies:
The results of health studies suggests that it is important to avoid exposing children and other sensitive populations to the elevated air pollution levels near freeways and other high traffic roads. While particulate pollution is suspected as contributing the most to the adverse health effects, studies have not yet determined which specific pollutants and sources (cf. diesel particulate, re-entrained roadway dust particulate, NO2 vehicle exhaust, diesel trucks vs. gasoline cars, &c.) are responsible. Additional studies are underway. While significant adverse health effects were observed in children who lived within 1,500 feet of a freeway (Gauderman, 2007), the studies indicate a substantial benefit to a 500 foot separation (McConnell, 2006).

Key Findings:
- Reduced lung function in children is associated with traffic density within 1,000 feet and the strongest association is within 300 feet of the roadway. (Brunekreef, 1997)
- Children living within 550 feet of heavy traffic have more medical visits than children who live further away from traffic. (English, 1999)
- Increased asthma hospitalizations are associated with living within 650 feet of heavy traffic. (Lin, 2000)
- Asthma symptoms increase with proximity to roadways and the risk is greatest within 300 feet. (Venn, 2001)
- Asthma and bronchitis symptoms in children are associated with proximity to high traffic in a community with good overall regional air quality. (Kim, 2004)
- Children living within 150 – 200 meters (~450 feet – 600 feet) of heavy traffic have higher rates of asthma than children living further away from traffic. (McConnell, 2006)
- Children living within 500 meters (~1,500 feet) of heavy traffic have significantly slower lung development than children living further away from traffic. (Gauderman, 2007)
- Survival of members of the Washington University-EPRI Veterans Cohort is strongly and robustly associated with county-average levels of traffic related air pollution and mortality relationships are stronger in the counties with higher levels of traffic density. (Lipfert et al, 2009)

Applicability to Santa Barbara County:
The studies covered children in a variety of urban environments living in proximity to roadways covering a wide spectrum of traffic volumes. The adverse health effects were measured at traffic volumes as low as 41,000 vehicles per day (English) and between 80,000 and 150,000 vehicles per day (Brunekreef). Highway 101, through Santa Barbara County, experiences traffic volumes within the range where health effects have been observed. Also, some parts of Highway 101 see over 7000 diesel trucks per day

(SBCAG). Furthermore, running parallel to Highway 101 through the southern portion of Santa Barbara County is a rail corridor that contributes significantly to the pollution levels near the highway (cf., rail contributes an additional 10% or 0.07 tons per day to mobile source generated PM10 emissions in Santa Barbara County).

2012 Average Daily Traffic (ADT) Volumes for Highway 101 (Caltrans):
US 101 at Storke = 63,600 ADT (Back)
US 101 at Highway 150 = 64,000 ADT
US 101 at Las Positas/Route 225 = 130,000 ADT
US 101 at Highway 166, Santa Maria = 57,400 ADT

Conclusion:
In order to protect the public health, especially the health of children, from the adverse effects of air pollutants generated by traffic on Highway 101, land use policies should prohibit the construction of new residences, schools, day care centers, playgrounds, and medical facilities within 500 feet of Highway 101. No other roadways in Santa Barbara County currently have estimated traffic volumes at the magnitude for which the proximity studies have identified adverse health effects.

References:

"Air Quality and Land Use: A Community Health Perspective." California Air Resources Board. (April 2005).
W. James Gauderman, et al. ***"Effect of exposure to traffic on lung development from 10 to 18 years of age: A cohort study."*** The Lancet. Volume 369, Issue 9561. 17 February 2007 – 23 February 2007: Pages 571-577.
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English P., Neutra R., Scalf R. Sullivan M. Waller L. Zhu L. ***"Examining Associations between Childhood Asthma and Traffic Flow Using a Geographic Information System."*** (1999) Environmental Health Perspectives 107(9): 761-767.
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"2007 Travel Trends Report for Santa Barbara County." Santa Barbara County Association of Governments. (December 2007)
Lipfert, F. et al. **"Air Pollution and Survival within the Washington University-EPRI Veterans Cohort: Risks Based on Modeled Estimates of Ambient Levels of Hazardous and Criteria Air Pollutants."** Journal of the Air & Waste Management Association. Vol. 59 April 2009, pp. 473-487.

State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
South Coast Region
3883 Ruffin Road
San Diego, CA 92123
(858) 467-4201
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

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PLANNING & DEVELOPMENT

July 21, 2014

John Zorovich, Senior Planner
Santa Barbara County
624 W. Foster Road, Suite C
Santa Maria, CA 93455
jzoro@co.santa-barbara.ca.us

Subject: Comments on the Notice of Preparation of a Draft Subsequent Environmental Impact Report for the Key Site 3 Project, Santa Barbara County; SCH #2014061015

Dear Mr. Zorovich:

The California Department of Fish and Wildlife (Department) has reviewed the above-referenced Notice of Preparation (NOP) for the Key Site 3 Project (Project) Draft Subsequent Environmental Impact Report (DSEIR). The following statements and comments have been prepared pursuant to the Department's authority as Trustee Agency with jurisdiction over natural resources affected by the Project (California Environmental Quality Act, [CEQA] Guidelines § 15386) and pursuant to our authority as a Responsible Agency under CEQA Guidelines section 15381 over those aspects of the proposed project that come under the purview of the California Endangered Species Act (Fish and Game Code § 2050 *et seq.*) and Fish and Game Code section 1600 *et seq.*

The proposed Project site is located on the west side of U.S. Highway 101, approximately ¼ mile south of Clark Avenue in the southeastern section of the Orcutt Planning Area, within unincorporated Santa Barbara County (County). The Project site is currently undeveloped, and the northern portion of the site is used for cattle and horse grazing.

The Project proposes development of 125 single-family units on the northern portion of the site. Approximately 106 acres (76%) of the site is proposed as open space. The Project also proposes text amendments to three Orcutt Community Plan (OCP) policies and development standards to meet the intent of the OCP.

The Department offers the following comments and recommendations to assist the County in avoiding or minimizing potential project impacts on biological resources.

Specific Comments

The Department has previously commented on a Draft Environmental Impact Report prepared by the County for the Project. The comments were contained in a letter submitted to the County dated August 13, 2010. Those comments included discussions of impacts to jurisdictional drainages, sensitive biological resources, the urban-wildlife interface, and consistency with existing OCP policies. The discussions included recommendations for minimization and mitigation of impacts.

General Comments

1. The Department has responsibility for wetland and riparian habitats. It is the policy of the Department to strongly discourage development in wetlands or conversion of wetlands to uplands. We oppose any development or conversion which would result in a reduction of wetland acreage or wetland habitat values or function, unless, at a minimum, project mitigation assures there will be "no net loss" of either wetland habitat values, function, or acreage. Development and conversion include but are not limited to conversion to subsurface drains, placement of fill or building of structures within the wetland, and channelization or removal of materials from the streambed. All wetlands and watercourses, whether intermittent or perennial, should be retained and provided with substantial setbacks which preserve the riparian and aquatic values and maintain their value to on-site and off-site wildlife populations. Mitigation measures to compensate for impacts to mature riparian corridors must be included in the DSEIR and must compensate for the loss of function and value of a wildlife corridor.

   a) The project area supports aquatic, riparian, and wetland habitats; therefore, a jurisdictional delineation of the creeks and their associated riparian habitats should be included in the DSEIR. The delineation should be conducted pursuant to the U. S. Fish and Wildlife Service wetland definition adopted by the Department.[1] Please note that some wetland and riparian habitats subject to the Department's authority may extend beyond the jurisdictional limits of the U.S. Army Corps of Engineers.

   b) The Department also has regulatory authority over activities in streams and/or lakes that will divert or obstruct the natural flow, or change the bed, channel, or bank (which may include associated riparian resources) of a river or stream, or use material from a streambed. For any such activities, the project applicant (or "entity") must provide written notification to the Department pursuant to section 1600 *et seq.* of the Fish and Game Code. Based on this notification and other information, the Department determines whether a Lake and Streambed Alteration Agreement (LSA) with the applicant is required prior to conducting the proposed activities. The Department's issuance of a LSA for a project that is subject to CEQA will require CEQA compliance actions by the Department as a Responsible Agency. The Department as a Responsible Agency under CEQA may consider the local jurisdiction's (lead agency) Negative Declaration or Environmental Impact Report for the project. To minimize additional requirements by the Department pursuant to section 1600 *et seq.* and/or under CEQA, the document should fully identify the potential impacts to the stream or riparian resources and provide adequate avoidance, mitigation, monitoring and reporting commitments for issuance of the LSA.[2]

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[1] Cowardin, Lewis M., et al. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service.

[2] A notification package for a LSA may be obtained by accessing the Department's website at www.wildlife.ca.gov/habcon/1600.

2. The Department considers adverse impacts to a species protected by the California Endangered Species Act (CESA), for the purposes of CEQA, to be significant without mitigation. As to CESA, take of any endangered, threatened, or candidate species that results from the project is prohibited, except as authorized by state law (Fish and Game Code, §§ 2080, 2085.) Consequently, if the Project, Project construction, or any Project-related activity during the life of the Project will result in take of a species designated as endangered or threatened, or a candidate for listing under CESA, the Department recommends that the project proponent seek appropriate take authorization under CESA prior to implementing the project. Appropriate authorization from the Department may include an Incidental Take Permit (ITP) or a consistency determination in certain circumstances, among other options (Fish and Game Code §§ 2080.1, 2081, subds. (b), (c)). Early consultation is encouraged, as significant modification to a project and mitigation measures may be required in order to obtain a CESA Permit. Revisions to the Fish and Game Code, effective January 1998, may require that the Department issue a separate CEQA document for the issuance of an ITP unless the project CEQA document addresses all project impacts to CESA-listed species and specifies a mitigation monitoring and reporting program that will meet the requirements of an ITP. For these reasons, biological mitigation monitoring and reporting proposals should be of sufficient detail and resolution to satisfy the requirements for a CESA ITP.

3. To enable the Department to adequately review and comment on the proposed project from the standpoint of the protection of plants, fish and wildlife, we recommend the following information be included in the DSEIR.

   a) A complete discussion of the purpose, need for, and description of the proposed project, including all staging areas and access routes to the construction and staging areas.

   b) A range of feasible alternatives to ensure that alternatives to the proposed project are fully considered and evaluated; the alternatives should avoid or otherwise minimize impacts to sensitive biological resources. Specific alternative locations should be evaluated in areas with lower resource sensitivity where appropriate.

<u>Biological Resources within the Project's Area of Potential Effect</u>

4. To provide a complete assessment of the flora and fauna within and adjacent to the project area, with particular emphasis upon identifying endangered, threatened, sensitive, and locally unique species and sensitive habitats, the DSEIR should include the following information:

   a) Per CEQA Guidelines, section 15125(c), information on the regional setting that is critical to an assessment of environmental impacts, with special emphasis placed on resources that are rare or unique to the region.

   b) A thorough, recent floristic-based assessment of special status plants and natural communities, following the Department's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (see http://www.dfg.ca.gov/habcon/plant/). The Department recommends that floristic, alliance- and/or association-based mapping and vegetation impact assessments be

conducted at the Project site and neighboring vicinity. The Manual of California Vegetation, second edition, should also be used to inform this mapping and assessment (Sawyer et al. 2008). Adjoining habitat areas should be included in this assessment where site activities could lead to direct or indirect impacts offsite. Habitat mapping at the alliance level will help establish baseline vegetation conditions.

c) A current inventory of the biological resources associated with each habitat type on site and within the area of potential effect. The Department's California Natural Diversity Data Base in Sacramento should be contacted at www.wildlife.ca.gov/biogeodata/ to obtain current information on any previously reported sensitive species and habitat, including Significant Natural Areas identified under Chapter 12 of the Fish and Game Code.

d) An inventory of rare, threatened, and endangered, and other sensitive species on site and within the area of potential effect. Species to be addressed should include all those which meet the CEQA definition (see CEQA Guidelines, § 15380). This should include sensitive fish, wildlife, reptile, and amphibian species. Seasonal variations in use of the project area should also be addressed. Focused species-specific surveys, conducted at the appropriate time of year and time of day when the sensitive species are active or otherwise identifiable, are required. Acceptable species-specific survey procedures should be developed in consultation with the Department and the U.S. Fish and Wildlife Service.

Analyses of the Potential Project-Related Impacts on the Biological Resources

5. To provide a thorough discussion of direct, indirect, and cumulative impacts expected to adversely affect biological resources, with specific measures to offset such impacts, the following should be addressed in the DSEIR:

a) A discussion of potential adverse impacts from lighting, noise, human activity, exotic species, and drainage should be included. The latter subject should address: project-related changes on drainage patterns on and downstream of the project site; the volume, velocity, and frequency of existing and post-project surface flows; polluted runoff; soil erosion and/or sedimentation in streams and water bodies; and post-project fate of runoff from the project site. The discussions should also address the proximity of the extraction activities to the water table, whether dewatering would be necessary, and the potential resulting impacts on the habitat, if any, supported by the groundwater. Mitigation measures proposed to alleviate such impacts should be included.

b) Discussions regarding indirect project impacts on biological resources, including resources in nearby public lands, open space, adjacent natural habitats, riparian ecosystems, and any designated and/or proposed or existing reserve lands. Impacts on, and maintenance of, wildlife corridor/movement areas, including access to undisturbed habitats in adjacent areas, should be fully evaluated in the DSEIR.

c) The zoning of areas for development projects or other uses that are nearby or adjacent to natural areas may inadvertently contribute to wildlife-human interactions. A discussion of possible conflicts and mitigation measures to reduce these conflicts should be included in the DSEIR.

d) A cumulative effects analysis as described under CEQA Guidelines, Section 15130. General and specific plans, as well as past, present, and anticipated future projects, should be analyzed relative to their impacts on similar plant communities and wildlife habitats.

Mitigation for the Project-related Biological Impacts

6. The DSEIR should include mitigation measures for adverse project-related impacts to sensitive plants, animals, and habitats. Mitigation measures should emphasize avoidance and reduction of project impacts. For unavoidable impacts, on-site habitat restoration or enhancement should be discussed in detail. If on-site mitigation is not feasible or would not be biologically viable and therefore not adequately mitigate the loss of biological functions and values, off-site mitigation through habitat creation and/or acquisition and preservation in perpetuity should be addressed.

7. For proposed preservation and/or restoration, the DSEIR should include measures to perpetually protect the targeted habitat values from direct and indirect negative impacts. The objective should be to offset the project-induced qualitative and quantitative losses of wildlife habitat values. Issues that should be addressed include restrictions on access, proposed land dedications, monitoring and management programs, control of illegal dumping, water pollution, increased human intrusion, etc.

8. The Department recommends that measures be taken to avoid project impacts to nesting birds. Migratory nongame native bird species are protected by international treaty under the Federal Migratory Bird Treaty Act (MBTA) of 1918 (Title 50, § 10.13, Code of Federal Regulations). Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take of all birds and their active nests including raptors and other migratory nongame birds (as listed under the Federal MBTA). Proposed project activities (including, but not limited to, staging and disturbances to native and nonnative vegetation, structures, and substrates) should occur outside of the avian breeding season which generally runs from February 1- September 1 (as early as January 1 for some raptors) to avoid take of birds or their eggs. If avoidance of the avian breeding season is not feasible, the Department recommends surveys by a qualified biologist with experience in conducting breeding bird surveys to detect protected native birds occurring in suitable nesting habitat that is to be disturbed and (as access to adjacent areas allows) any other such habitat within 300 feet of the disturbance area (within 500 feet for raptors). Project personnel, including all contractors working on site, should be instructed on the sensitivity of the area. Reductions in the nest buffer distance may be appropriate depending on the avian species involved, ambient levels of human activity, screening vegetation, or possibly other factors.

9. The Department generally does not support the use of relocation, salvage, and/or transplantation as mitigation for impacts to rare, threatened, or endangered species. Studies have shown that these efforts are experimental in nature and largely unsuccessful.

10. Plans for restoration and revegetation should be prepared by persons with expertise in southern California ecosystems and native plant revegetation techniques. Each plan should include, at a minimum: (a) the location of the mitigation site; (b) the plant species to be used, container sizes, and seeding rates; (c) a schematic depicting the mitigation area; (d) planting

schedule; (e) a description of the irrigation methodology; (f) measures to control exotic vegetation on site; (g) specific success criteria; (h) a detailed monitoring program; (i) contingency measures should the success criteria not be met; and (j) identification of the party responsible for meeting the success criteria and providing for conservation of the mitigation site in perpetuity.

We appreciate the opportunity to comment on the referenced NOP. Questions regarding this letter and further coordination on these issues should be directed to Mr. Martin Potter, Environmental Scientist at (805) 640-3677 or Martin.Potter@wildlife.ca.gov.

Sincerely,

Betty J. Courtney

Betty J. Courtney
Environmental Program Manager I
South Coast Region

ec: Ms. Christine Found-Jackson, CDFW, Los Alamitos
Ms. Natasha Lohmus, CDFW, Santa Barbara
Ms. Mary Meyer, CDFW, Ojai
Mr. Martin Potter, CDFW, Ojai
Scott Morgan, State Clearinghouse, Sacramento

Appendix B

CalEEMod Emissions Estimates and
U.S. 101Health Risk Assessment

Orcutt Key Site 3 SEIR

Santa Barbara County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	3.20	Acre	3.20	139,392.00	0
Single Family Housing	125.00	Dwelling Unit	21.80	222,156.00	340

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Utility information from project description.

Land Use - Lot acreage for single family residences includes acreage in Development Plan submitted by applicant classified as: Building Coverage, Private Yards, and Roads, Driveways, Sidewalks, Paths and Swales. Square feet from building coverage.

Construction Phase - Assumed start date of mid-2015.

Grading - "No offsite hauling of excess material is anticipated" Scoping Paper (June 2014).

Vehicle Trips - Average daily trip rate from Traffic Study Penfield & Smith, November 2013 (average of trip generation rate for single family residential and planned unit development).

Woodstoves - No woodstoves in project description.

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseStartDate	2/25/2017	2/27/2017
tblConstructionPhase	PhaseStartDate	8/29/2015	8/31/2015
tblConstructionPhase	PhaseStartDate	7/11/2015	7/13/2015
tblConstructionPhase	PhaseStartDate	1/28/2017	1/30/2017
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblLandUse	LandUseSquareFeet	225,000.00	222,156.00
tblLandUse	LotAcreage	40.58	21.80
tblProjectCharacteristics	OperationalYear	2014	2018
tblVehicleTrips	WD_TR	9.57	7.96
tblWoodstoves	WoodstoveDayYear	82.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.3999	3.6686	2.9459	3.6400e-003	0.2964	0.2031	0.4995	0.1271	0.1891	0.3162	0.0000	330.8207	330.8207	0.0767	0.0000	332.4310
2016	0.5563	4.1748	4.0009	5.5800e-003	0.1433	0.2624	0.4058	0.0385	0.2464	0.2849	0.0000	483.3397	483.3397	0.0853	0.0000	485.1314
2017	5.1526	0.5224	0.4753	7.2000e-004	0.0143	0.0313	0.0456	3.8200e-003	0.0293	0.0331	0.0000	62.2313	62.2313	0.0131	0.0000	62.5071
Total	**6.1087**	**8.3657**	**7.4222**	**9.9400e-003**	**0.4540**	**0.4969**	**0.9509**	**0.1694**	**0.4648**	**0.6343**	**0.0000**	**876.3917**	**876.3917**	**0.1751**	**0.0000**	**880.0695**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.3999	3.6685	2.9459	3.6400e-003	0.2964	0.2031	0.4995	0.1271	0.1891	0.3162	0.0000	330.8204	330.8204	0.0767	0.0000	332.4306
2016	0.5563	4.1747	4.0009	5.5800e-003	0.1433	0.2624	0.4058	0.0385	0.2464	0.2849	0.0000	483.3393	483.3393	0.0853	0.0000	485.1311
2017	5.1526	0.5224	0.4753	7.2000e-004	0.0143	0.0313	0.0456	3.8200e-003	0.0293	0.0331	0.0000	62.2313	62.2313	0.0131	0.0000	62.5070
Total	**6.1087**	**8.3657**	**7.4222**	**9.9400e-003**	**0.4540**	**0.4969**	**0.9509**	**0.1694**	**0.4648**	**0.6343**	**0.0000**	**876.3909**	**876.3909**	**0.1751**	**0.0000**	**880.0687**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.9499	0.0109	0.9347	5.0000e-005		5.1000e-003	5.1000e-003		5.1000e-003	5.1000e-003	0.0000	1.5162	1.5162	1.5000e-003	0.0000	1.5477
Energy	0.0238	0.2032	0.0865	1.3000e-003		0.0164	0.0164		0.0164	0.0164	0.0000	492.5541	492.5541	0.0161	6.7200e-003	494.9765
Mobile	0.6736	1.7120	7.5257	0.0147	1.0935	0.0198	1.1133	0.2929	0.0182	0.3111	0.0000	1,092.9713	1,092.9713	0.0485	0.0000	1,093.9898
Waste						0.0000	0.0000		0.0000	0.0000	28.3538	0.0000	28.3538	1.6757	0.0000	63.5426
Water						0.0000	0.0000		0.0000	0.0000	2.8815	21.9300	24.8114	0.0109	6.4700e-003	27.0466
Total	**2.6472**	**1.9261**	**8.5469**	**0.0160**	**1.0935**	**0.0413**	**1.1349**	**0.2929**	**0.0398**	**0.3326**	**31.2352**	**1,608.9714**	**1,640.2067**	**1.7527**	**0.0132**	**1,681.1033**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	1.9499	0.0109	0.9347	5.0000e-005		5.1000e-003	5.1000e-003		5.1000e-003	5.1000e-003	0.0000	1.5162	1.5162	1.5000e-003	0.0000	1.5477
Energy	0.0238	0.2032	0.0865	1.3000e-003		0.0164	0.0164		0.0164	0.0164	0.0000	492.5541	492.5541	0.0161	6.7200e-003	494.9765
Mobile	0.6736	1.7120	7.5257	0.0147	1.0935	0.0198	1.1133	0.2929	0.0182	0.3111	0.0000	1,092.9713	1,092.9713	0.0485	0.0000	1,093.9898
Waste						0.0000	0.0000		0.0000	0.0000	28.3538	0.0000	28.3538	1.6757	0.0000	63.5426
Water						0.0000	0.0000		0.0000	0.0000	2.8815	21.9300	24.8114	0.0109	6.4600e-003	27.0420
Total	**2.6472**	**1.9261**	**8.5469**	**0.0160**	**1.0935**	**0.0413**	**1.1349**	**0.2929**	**0.0398**	**0.3326**	**31.2352**	**1,608.9714**	**1,640.2067**	**1.7527**	**0.0132**	**1,681.0987**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.08**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/26/2015	5	20	
2	Site Preparation	Site Preparation	6/29/2015	7/10/2015	5	10	
3	Grading	Grading	7/13/2015	8/28/2015	5	35	
4	Building Construction	Building Construction	8/31/2015	1/27/2017	5	370	
5	Paving	Paving	1/30/2017	2/24/2017	5	20	
6	Architectural Coating	Architectural Coating	2/27/2017	3/24/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 0

Residential Indoor: 449,866; Residential Outdoor: 149,955; Non-Residential Indoor: 209,088; Non-Residential Outdoor: 69,696 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	104.00	36.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	21.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Clean Paved Roads

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0451	0.4836	0.3607	4.0000e-004		0.0245	0.0245		0.0229	0.0229	0.0000	37.4413	37.4413	0.0102	0.0000	37.6544
Total	**0.0451**	**0.4836**	**0.3607**	**4.0000e-004**		**0.0245**	**0.0245**		**0.0229**	**0.0229**	**0.0000**	**37.4413**	**37.4413**	**0.0102**	**0.0000**	**37.6544**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4000e-004	1.2500e-003	0.0107	1.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.8000e-004	0.0000	1.1683	1.1683	8.0000e-005	0.0000	1.1700
Total	**7.4000e-004**	**1.2500e-003**	**0.0107**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.1683**	**1.1683**	**8.0000e-005**	**0.0000**	**1.1700**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0451	0.4836	0.3607	4.0000e-004		0.0245	0.0245		0.0229	0.0229	0.0000	37.4412	37.4412	0.0102	0.0000	37.6544
Total	**0.0451**	**0.4836**	**0.3607**	**4.0000e-004**		**0.0245**	**0.0245**		**0.0229**	**0.0229**	**0.0000**	**37.4412**	**37.4412**	**0.0102**	**0.0000**	**37.6544**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4000e-004	1.2500e-003	0.0107	1.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.8000e-004	0.0000	1.1683	1.1683	8.0000e-005	0.0000	1.1700
Total	**7.4000e-004**	**1.2500e-003**	**0.0107**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.1683**	**1.1683**	**8.0000e-005**	**0.0000**	**1.1700**

3.3 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0263	0.2845	0.2132	2.0000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	18.6506	18.6506	5.5700e-003	0.0000	18.7675
Total	**0.0263**	**0.2845**	**0.2132**	**2.0000e-004**	**0.0903**	**0.0154**	**0.1058**	**0.0497**	**0.0142**	**0.0639**	**0.0000**	**18.6506**	**18.6506**	**5.5700e-003**	**0.0000**	**18.7675**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	7.5000e-004	6.4400e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	0.7010	0.7010	5.0000e-005	0.0000	0.7020
Total	**4.5000e-004**	**7.5000e-004**	**6.4400e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.7010**	**0.7010**	**5.0000e-005**	**0.0000**	**0.7020**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0263	0.2845	0.2132	2.0000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	18.6505	18.6505	5.5700e-003	0.0000	18.7675
Total	**0.0263**	**0.2845**	**0.2132**	**2.0000e-004**	**0.0903**	**0.0154**	**0.1058**	**0.0497**	**0.0142**	**0.0639**	**0.0000**	**18.6505**	**18.6505**	**5.5700e-003**	**0.0000**	**18.7675**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	7.5000e-004	6.4400e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	0.7010	0.7010	5.0000e-005	0.0000	0.7020
Total	**4.5000e-004**	**7.5000e-004**	**6.4400e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.7010**	**0.7010**	**5.0000e-005**	**0.0000**	**0.7020**

3.4 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1186	1.3833	0.8897	1.0800e-003		0.0665	0.0665		0.0612	0.0612	0.0000	102.9739	102.9739	0.0307	0.0000	103.6195
Total	**0.1186**	**1.3833**	**0.8897**	**1.0800e-003**	**0.1518**	**0.0665**	**0.2183**	**0.0629**	**0.0612**	**0.1242**	**0.0000**	**102.9739**	**102.9739**	**0.0307**	**0.0000**	**103.6195**

3.4 Grading - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7400e-003	2.9100e-003	0.0250	3.0000e-005	3.2000e-003	3.0000e-005	3.2300e-003	8.5000e-004	2.0000e-005	8.8000e-004	0.0000	2.7261	2.7261	1.9000e-004	0.0000	2.7300
Total	**1.7400e-003**	**2.9100e-003**	**0.0250**	**3.0000e-005**	**3.2000e-003**	**3.0000e-005**	**3.2300e-003**	**8.5000e-004**	**2.0000e-005**	**8.8000e-004**	**0.0000**	**2.7261**	**2.7261**	**1.9000e-004**	**0.0000**	**2.7300**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1518	0.0000	0.1518	0.0629	0.0000	0.0629	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.1186	1.3833	0.8897	1.0800e-003		0.0665	0.0665		0.0612	0.0612	0.0000	102.9737	102.9737	0.0307	0.0000	103.6193
Total	**0.1186**	**1.3833**	**0.8897**	**1.0800e-003**	**0.1518**	**0.0665**	**0.2183**	**0.0629**	**0.0612**	**0.1242**	**0.0000**	**102.9737**	**102.9737**	**0.0307**	**0.0000**	**103.6193**

3.4 Grading - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.7400e-003	2.9100e-003	0.0250	3.0000e-005	3.2000e-003	3.0000e-005	3.2300e-003	8.5000e-004	2.0000e-005	8.8000e-004	0.0000	2.7261	2.7261	1.9000e-004	0.0000	2.7300
Total	**1.7400e-003**	**2.9100e-003**	**0.0250**	**3.0000e-005**	**3.2000e-003**	**3.0000e-005**	**3.2300e-003**	**8.5000e-004**	**2.0000e-005**	**8.8000e-004**	**0.0000**	**2.7261**	**2.7261**	**1.9000e-004**	**0.0000**	**2.7300**

3.5 Building Construction - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1628	1.3363	0.8341	1.1900e-003		0.0942	0.0942		0.0886	0.0886	0.0000	108.5775	108.5775	0.0272	0.0000	109.1496
Total	**0.1628**	**1.3363**	**0.8341**	**1.1900e-003**		**0.0942**	**0.0942**		**0.0886**	**0.0886**	**0.0000**	**108.5775**	**108.5775**	**0.0272**	**0.0000**	**109.1496**

3.5 Building Construction - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0213	0.1375	0.2751	2.5000e-004	6.5400e-003	2.0400e-003	8.5700e-003	1.8700e-003	1.8700e-003	3.7400e-003	0.0000	22.5349	22.5349	2.2000e-004	0.0000	22.5395
Worker	0.0230	0.0384	0.3309	4.6000e-004	0.0423	3.6000e-004	0.0427	0.0113	3.2000e-004	0.0116	0.0000	36.0472	36.0472	2.4500e-003	0.0000	36.0986
Total	**0.0442**	**0.1759**	**0.6060**	**7.1000e-004**	**0.0489**	**2.4000e-003**	**0.0513**	**0.0131**	**2.1900e-003**	**0.0153**	**0.0000**	**58.5820**	**58.5820**	**2.6700e-003**	**0.0000**	**58.6380**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1628	1.3363	0.8341	1.1900e-003		0.0942	0.0942		0.0886	0.0886	0.0000	108.5774	108.5774	0.0272	0.0000	109.1494
Total	**0.1628**	**1.3363**	**0.8341**	**1.1900e-003**		**0.0942**	**0.0942**		**0.0886**	**0.0886**	**0.0000**	**108.5774**	**108.5774**	**0.0272**	**0.0000**	**109.1494**

3.5 Building Construction - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0213	0.1375	0.2751	2.5000e-004	6.5400e-003	2.0400e-003	8.5700e-003	1.8700e-003	1.8700e-003	3.7400e-003	0.0000	22.5349	22.5349	2.2000e-004	0.0000	22.5395
Worker	0.0230	0.0384	0.3309	4.6000e-004	0.0423	3.6000e-004	0.0427	0.0113	3.2000e-004	0.0116	0.0000	36.0472	36.0472	2.4500e-003	0.0000	36.0986
Total	**0.0442**	**0.1759**	**0.6060**	**7.1000e-004**	**0.0489**	**2.4000e-003**	**0.0513**	**0.0131**	**2.1900e-003**	**0.0153**	**0.0000**	**58.5820**	**58.5820**	**2.6700e-003**	**0.0000**	**58.6380**

3.5 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4445	3.7201	2.4151	3.5000e-003		0.2567	0.2567		0.2412	0.2412	0.0000	316.0104	316.0104	0.0784	0.0000	317.6563
Total	**0.4445**	**3.7201**	**2.4151**	**3.5000e-003**		**0.2567**	**0.2567**		**0.2412**	**0.2412**	**0.0000**	**316.0104**	**316.0104**	**0.0784**	**0.0000**	**317.6563**

3.5 Building Construction - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0542	0.3558	0.7434	7.3000e-004	0.0192	4.7300e-003	0.0239	5.4700e-003	4.3400e-003	9.8100e-003	0.0000	65.3759	65.3759	5.6000e-004	0.0000	65.3875
Worker	0.0576	0.0988	0.8424	1.3500e-003	0.1242	9.6000e-004	0.1251	0.0330	8.8000e-004	0.0339	0.0000	101.9534	101.9534	6.3900e-003	0.0000	102.0876
Total	**0.1118**	**0.4547**	**1.5858**	**2.0800e-003**	**0.1433**	**5.6900e-003**	**0.1490**	**0.0385**	**5.2200e-003**	**0.0437**	**0.0000**	**167.3293**	**167.3293**	**6.9500e-003**	**0.0000**	**167.4751**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.4445	3.7201	2.4151	3.5000e-003		0.2567	0.2567		0.2412	0.2412	0.0000	316.0101	316.0101	0.0784	0.0000	317.6560
Total	**0.4445**	**3.7201**	**2.4151**	**3.5000e-003**		**0.2567**	**0.2567**		**0.2412**	**0.2412**	**0.0000**	**316.0101**	**316.0101**	**0.0784**	**0.0000**	**317.6560**

3.5 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0542	0.3558	0.7434	7.3000e-004	0.0192	4.7300e-003	0.0239	5.4700e-003	4.3400e-003	9.8100e-003	0.0000	65.3759	65.3759	5.6000e-004	0.0000	65.3875
Worker	0.0576	0.0988	0.8424	1.3500e-003	0.1242	9.6000e-004	0.1251	0.0330	8.8000e-004	0.0339	0.0000	101.9534	101.9534	6.3900e-003	0.0000	102.0876
Total	**0.1118**	**0.4547**	**1.5858**	**2.0800e-003**	**0.1433**	**5.6900e-003**	**0.1490**	**0.0385**	**5.2200e-003**	**0.0437**	**0.0000**	**167.3293**	**167.3293**	**6.9500e-003**	**0.0000**	**167.4751**

3.5 Building Construction - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0310	0.2641	0.1813	2.7000e-004		0.0178	0.0178		0.0167	0.0167	0.0000	23.9479	23.9479	5.8900e-003	0.0000	24.0717
Total	**0.0310**	**0.2641**	**0.1813**	**2.7000e-004**		**0.0178**	**0.0178**		**0.0167**	**0.0167**	**0.0000**	**23.9479**	**23.9479**	**5.8900e-003**	**0.0000**	**24.0717**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.6900e-003	0.0246	0.0532	6.0000e-005	1.4700e-003	3.1000e-004	1.7800e-003	4.2000e-004	2.8000e-004	7.0000e-004	0.0000	4.9287	4.9287	4.0000e-005	0.0000	4.9296
Worker	3.7300e-003	6.6400e-003	0.0557	1.0000e-004	9.5100e-003	7.0000e-005	9.5800e-003	2.5300e-003	6.0000e-005	2.5900e-003	0.0000	7.5088	7.5088	4.4000e-004	0.0000	7.5180
Total	**7.4200e-003**	**0.0313**	**0.1088**	**1.6000e-004**	**0.0110**	**3.8000e-004**	**0.0114**	**2.9500e-003**	**3.4000e-004**	**3.2900e-003**	**0.0000**	**12.4375**	**12.4375**	**4.8000e-004**	**0.0000**	**12.4475**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0310	0.2641	0.1813	2.7000e-004		0.0178	0.0178		0.0167	0.0167	0.0000	23.9479	23.9479	5.8900e-003	0.0000	24.0717
Total	**0.0310**	**0.2641**	**0.1813**	**2.7000e-004**		**0.0178**	**0.0178**		**0.0167**	**0.0167**	**0.0000**	**23.9479**	**23.9479**	**5.8900e-003**	**0.0000**	**24.0717**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.6900e-003	0.0246	0.0532	6.0000e-005	1.4700e-003	3.1000e-004	1.7800e-003	4.2000e-004	2.8000e-004	7.0000e-004	0.0000	4.9287	4.9287	4.0000e-005	0.0000	4.9296
Worker	3.7300e-003	6.6400e-003	0.0557	1.0000e-004	9.5100e-003	7.0000e-005	9.5800e-003	2.5300e-003	6.0000e-005	2.5900e-003	0.0000	7.5088	7.5088	4.4000e-004	0.0000	7.5180
Total	**7.4200e-003**	**0.0313**	**0.1088**	**1.6000e-004**	**0.0110**	**3.8000e-004**	**0.0114**	**2.9500e-003**	**3.4000e-004**	**3.2900e-003**	**0.0000**	**12.4375**	**12.4375**	**4.8000e-004**	**0.0000**	**12.4475**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8266
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0191**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8266**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	9.6000e-004	8.0300e-003	1.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.0830	1.0830	6.0000e-005	0.0000	1.0843
Total	**5.4000e-004**	**9.6000e-004**	**8.0300e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.0830**	**1.0830**	**6.0000e-005**	**0.0000**	**1.0843**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0191	0.2030	0.1473	2.2000e-004		0.0114	0.0114		0.0105	0.0105	0.0000	20.6934	20.6934	6.3400e-003	0.0000	20.8265
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0191**	**0.2030**	**0.1473**	**2.2000e-004**		**0.0114**	**0.0114**		**0.0105**	**0.0105**	**0.0000**	**20.6934**	**20.6934**	**6.3400e-003**	**0.0000**	**20.8265**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.4000e-004	9.6000e-004	8.0300e-003	1.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.0830	1.0830	6.0000e-005	0.0000	1.0843
Total	**5.4000e-004**	**9.6000e-004**	**8.0300e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.0830**	**1.0830**	**6.0000e-005**	**0.0000**	**1.0843**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	5.0904					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3200e-003	0.0219	0.0187	3.0000e-005		1.7300e-003	1.7300e-003		1.7300e-003	1.7300e-003	0.0000	2.5533	2.5533	2.7000e-004	0.0000	2.5589
Total	**5.0937**	**0.0219**	**0.0187**	**3.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.5533**	**2.5533**	**2.7000e-004**	**0.0000**	**2.5589**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.5000e-004	1.3400e-003	0.0112	2.0000e-005	1.9200e-003	1.0000e-005	1.9400e-003	5.1000e-004	1.0000e-005	5.2000e-004	0.0000	1.5162	1.5162	9.0000e-005	0.0000	1.5181
Total	**7.5000e-004**	**1.3400e-003**	**0.0112**	**2.0000e-005**	**1.9200e-003**	**1.0000e-005**	**1.9400e-003**	**5.1000e-004**	**1.0000e-005**	**5.2000e-004**	**0.0000**	**1.5162**	**1.5162**	**9.0000e-005**	**0.0000**	**1.5181**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	5.0904					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.3200e-003	0.0219	0.0187	3.0000e-005		1.7300e-003	1.7300e-003		1.7300e-003	1.7300e-003	0.0000	2.5533	2.5533	2.7000e-004	0.0000	2.5589
Total	**5.0937**	**0.0219**	**0.0187**	**3.0000e-005**		**1.7300e-003**	**1.7300e-003**		**1.7300e-003**	**1.7300e-003**	**0.0000**	**2.5533**	**2.5533**	**2.7000e-004**	**0.0000**	**2.5589**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.5000e-004	1.3400e-003	0.0112	2.0000e-005	1.9200e-003	1.0000e-005	1.9400e-003	5.1000e-004	1.0000e-005	5.2000e-004	0.0000	1.5162	1.5162	9.0000e-005	0.0000	1.5181
Total	**7.5000e-004**	**1.3400e-003**	**0.0112**	**2.0000e-005**	**1.9200e-003**	**1.0000e-005**	**1.9400e-003**	**5.1000e-004**	**1.0000e-005**	**5.2000e-004**	**0.0000**	**1.5162**	**1.5162**	**9.0000e-005**	**0.0000**	**1.5181**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.6736	1.7120	7.5257	0.0147	1.0935	0.0198	1.1133	0.2929	0.0182	0.3111	0.0000	1,092.9713	1,092.9713	0.0485	0.0000	1,093.9898
Unmitigated	0.6736	1.7120	7.5257	0.0147	1.0935	0.0198	1.1133	0.2929	0.0182	0.3111	0.0000	1,092.9713	1,092.9713	0.0485	0.0000	1,093.9898

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	5.09	5.09	5.09	8,104	8,104
Single Family Housing	995.00	1,260.00	1096.25	2,889,697	2,889,697
Total	1,000.09	1,265.09	1,101.34	2,897,801	2,897,801

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	8.80	4.60	4.60	33.00	48.00	19.00	66	28	6
Single Family Housing	12.30	5.90	6.40	37.50	15.00	47.50	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.488429	0.036082	0.211732	0.154985	0.049882	0.007459	0.020077	0.014399	0.001917	0.002182	0.008131	0.001589	0.003135

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	257.1999	257.1999	0.0116	2.4100e-003	258.1901
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	257.1999	257.1999	0.0116	2.4100e-003	258.1901
NaturalGas Mitigated	0.0238	0.2032	0.0865	1.3000e-003		0.0164	0.0164		0.0164	0.0164	0.0000	235.3541	235.3541	4.5100e-003	4.3100e-003	236.7865
NaturalGas Unmitigated	0.0238	0.2032	0.0865	1.3000e-003		0.0164	0.0164		0.0164	0.0164	0.0000	235.3541	235.3541	4.5100e-003	4.3100e-003	236.7865

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4.41037e+006	0.0238	0.2032	0.0865	1.3000e-003		0.0164	0.0164		0.0164	0.0164	0.0000	235.3541	235.3541	4.5100e-003	4.3100e-003	236.7865
Total		**0.0238**	**0.2032**	**0.0865**	**1.3000e-003**		**0.0164**	**0.0164**		**0.0164**	**0.0164**	**0.0000**	**235.3541**	**235.3541**	**4.5100e-003**	**4.3100e-003**	**236.7865**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	4.41037e+006	0.0238	0.2032	0.0865	1.3000e-003		0.0164	0.0164		0.0164	0.0164	0.0000	235.3541	235.3541	4.5100e-003	4.3100e-003	236.7865
Total		**0.0238**	**0.2032**	**0.0865**	**1.3000e-003**		**0.0164**	**0.0164**		**0.0164**	**0.0164**	**0.0000**	**235.3541**	**235.3541**	**4.5100e-003**	**4.3100e-003**	**236.7865**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	884118	257.1999	0.0116	2.4100e-003	258.1901
Total		**257.1999**	**0.0116**	**2.4100e-003**	**258.1901**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	884118	257.1999	0.0116	2.4100e-003	258.1901
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**257.1999**	**0.0116**	**2.4100e-003**	**258.1901**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	1.9499	0.0109	0.9347	5.0000e-005		5.1000e-003	5.1000e-003		5.1000e-003	5.1000e-003	0.0000	1.5162	1.5162	1.5000e-003	0.0000	1.5477
Unmitigated	1.9499	0.0109	0.9347	5.0000e-005		5.1000e-003	5.1000e-003		5.1000e-003	5.1000e-003	0.0000	1.5162	1.5162	1.5000e-003	0.0000	1.5477

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.5090					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.4120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0288	0.0109	0.9347	5.0000e-005		5.1000e-003	5.1000e-003		5.1000e-003	5.1000e-003	0.0000	1.5162	1.5162	1.5000e-003	0.0000	1.5477
Total	**1.9499**	**0.0109**	**0.9347**	**5.0000e-005**		**5.1000e-003**	**5.1000e-003**		**5.1000e-003**	**5.1000e-003**	**0.0000**	**1.5162**	**1.5162**	**1.5000e-003**	**0.0000**	**1.5477**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.5090					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	1.4120					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0288	0.0109	0.9347	5.0000e-005		5.1000e-003	5.1000e-003		5.1000e-003	5.1000e-003	0.0000	1.5162	1.5162	1.5000e-003	0.0000	1.5477
Total	**1.9499**	**0.0109**	**0.9347**	**5.0000e-005**		**5.1000e-003**	**5.1000e-003**		**5.1000e-003**	**5.1000e-003**	**0.0000**	**1.5162**	**1.5162**	**1.5000e-003**	**0.0000**	**1.5477**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	24.8114	0.0109	6.4600e-003	27.0420
Unmitigated	24.8114	0.0109	6.4700e-003	27.0466

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 3.81274	3.8821	1.8000e-004	4.0000e-005	3.8970
Single Family Housing	8.14425 / 5.13442	20.9293	0.0107	6.4400e-003	23.1496
Total		**24.8114**	**0.0109**	**6.4800e-003**	**27.0466**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 3.81274	3.8821	1.8000e-004	4.0000e-005	3.8970
Single Family Housing	8.14425 / 5.13442	20.9293	0.0107	6.4200e-003	23.1450
Total		**24.8114**	**0.0109**	**6.4600e-003**	**27.0420**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	28.3538	1.6757	0.0000	63.5426
Unmitigated	28.3538	1.6757	0.0000	63.5426

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.28	0.0568	3.3600e-003	0.0000	0.1274
Single Family Housing	139.4	28.2969	1.6723	0.0000	63.4153
Total		**28.3538**	**1.6757**	**0.0000**	**63.5427**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	0.28	0.0568	3.3600e-003	0.0000	0.1274
Single Family Housing	139.4	28.2969	1.6723	0.0000	63.4153
Total		**28.3538**	**1.6757**	**0.0000**	**63.5427**

9.0 Operational Offroad

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

10.0 Vegetation

Orcutt Key Site 3 SEIR

Santa Barbara County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	3.20	Acre	3.20	139,392.00	0
Single Family Housing	125.00	Dwelling Unit	21.80	222,156.00	340

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Utility information from project description.

Land Use - Lot acreage for single family residences includes acreage in Development Plan submitted by applicant classified as: Building Coverage, Private Yards, and Roads, Driveways, Sidewalks, Paths and Swales. Square feet from building coverage.

Construction Phase - Assumed start date of mid-2015.

Grading - "No offsite hauling of excess material is anticipated" Scoping Paper (June 2014).

Vehicle Trips - Average daily trip rate from Traffic Study Penfield & Smith, November 2013 (average of trip generation rate for single family residential and planned unit development).

Woodstoves - No woodstoves in project description.

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseStartDate	2/25/2017	2/27/2017
tblConstructionPhase	PhaseStartDate	8/29/2015	8/31/2015
tblConstructionPhase	PhaseStartDate	7/11/2015	7/13/2015
tblConstructionPhase	PhaseStartDate	1/28/2017	1/30/2017
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblLandUse	LandUseSquareFeet	225,000.00	222,156.00
tblLandUse	LotAcreage	40.58	21.80
tblProjectCharacteristics	OperationalYear	2014	2018
tblVehicleTrips	WD_TR	9.57	7.96
tblWoodstoves	WoodstoveDayYear	82.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	6.8711	79.1946	52.2300	0.0638	18.2346	3.8037	21.3243	9.9753	3.4994	12.8178	0.0000	6,661.7623	6,661.7623	1.9481	0.0000	6,702.6720
2016	4.2004	31.8300	29.3908	0.0430	1.1225	2.0107	3.1332	0.3006	1.8882	2.1888	0.0000	4,104.5684	4,104.5684	0.7206	0.0000	4,119.7016
2017	509.4476	29.3897	27.8291	0.0429	1.1225	1.8185	2.9410	0.3006	1.7072	2.0079	0.0000	4,031.9578	4,031.9578	0.7059	0.0000	4,046.7807
Total	**520.5191**	**140.4144**	**109.4499**	**0.1497**	**20.4797**	**7.6329**	**27.3985**	**10.5766**	**7.0948**	**17.0145**	**0.0000**	**14,798.2885**	**14,798.2885**	**3.3746**	**0.0000**	**14,869.1542**

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					
2015	6.8711	79.1946	52.2300	0.0638	18.2346	3.8037	21.3243	9.9753	3.4994	12.8178	0.0000	6,661.7623	6,661.7623	1.9481	0.0000	6,702.6720
2016	4.2004	31.8300	29.3908	0.0430	1.1225	2.0107	3.1332	0.3006	1.8882	2.1888	0.0000	4,104.5684	4,104.5684	0.7206	0.0000	4,119.7016
2017	509.4476	29.3897	27.8291	0.0429	1.1225	1.8185	2.9410	0.3006	1.7072	2.0079	0.0000	4,031.9578	4,031.9578	0.7059	0.0000	4,046.7807
Total	**520.5191**	**140.4144**	**109.4499**	**0.1497**	**20.4797**	**7.6329**	**27.3985**	**10.5766**	**7.0948**	**17.0145**	**0.0000**	**14,798.2885**	**14,798.2885**	**3.3746**	**0.0000**	**14,869.1542**

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

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	10.8466	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567	0.0000	18.5697	18.5697	0.0184	0.0000	18.9562
Energy	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
Mobile	4.3170	10.5828	46.8304	0.0988	7.3855	0.1307	7.5162	1.9743	0.1203	2.0946		8,102.3421	8,102.3421	0.3536		8,109.7671
Total	**15.2939**	**11.8169**	**57.6902**	**0.1064**	**7.3855**	**0.2774**	**7.6629**	**1.9743**	**0.2671**	**2.2413**	**0.0000**	**9,542.4654**	**9,542.4654**	**0.3992**	**0.0261**	**9,558.9283**

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	10.8466	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567	0.0000	18.5697	18.5697	0.0184	0.0000	18.9562
Energy	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
Mobile	4.3170	10.5828	46.8304	0.0988	7.3855	0.1307	7.5162	1.9743	0.1203	2.0946		8,102.3421	8,102.3421	0.3536		8,109.7671
Total	**15.2939**	**11.8169**	**57.6902**	**0.1064**	**7.3855**	**0.2774**	**7.6629**	**1.9743**	**0.2671**	**2.2413**	**0.0000**	**9,542.4654**	**9,542.4654**	**0.3992**	**0.0261**	**9,558.9283**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/26/2015	5	20	
2	Site Preparation	Site Preparation	6/29/2015	7/10/2015	5	10	
3	Grading	Grading	7/13/2015	8/28/2015	5	35	
4	Building Construction	Building Construction	8/31/2015	1/27/2017	5	370	
5	Paving	Paving	1/30/2017	2/24/2017	5	20	
6	Architectural Coating	Architectural Coating	2/27/2017	3/24/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 0

Residential Indoor: 449,866; Residential Outdoor: 149,955; Non-Residential Indoor: 209,088; Non-Residential Outdoor: 69,696 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	104.00	36.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	21.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Clean Paved Roads

3.2 Demolition - 2015

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	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**		**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0720	0.1110	1.0425	1.5300e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		131.6393	131.6393	8.7500e-003		131.8230
Total	**0.0720**	**0.1110**	**1.0425**	**1.5300e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**131.6393**	**131.6393**	**8.7500e-003**		**131.8230**

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	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858	0.0000	4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0720	0.1110	1.0425	1.5300e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		131.6393	131.6393	8.7500e-003		131.8230
Total	**0.0720**	**0.1110**	**1.0425**	**1.5300e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**131.6393**	**131.6393**	**8.7500e-003**		**131.8230**

3.3 Site Preparation - 2015

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0864	0.1332	1.2510	1.8300e-003	0.1684	1.3900e-003	0.1698	0.0447	1.2500e-003	0.0459		157.9671	157.9671	0.0105		158.1876
Total	**0.0864**	**0.1332**	**1.2510**	**1.8300e-003**	**0.1684**	**1.3900e-003**	**0.1698**	**0.0447**	**1.2500e-003**	**0.0459**		**157.9671**	**157.9671**	**0.0105**		**158.1876**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412	0.0000	4,111.7444	4,111.7444	1.2275		4,137.5224
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**	**0.0000**	**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5224**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0864	0.1332	1.2510	1.8300e-003	0.1684	1.3900e-003	0.1698	0.0447	1.2500e-003	0.0459		157.9671	157.9671	0.0105		158.1876
Total	**0.0864**	**0.1332**	**1.2510**	**1.8300e-003**	**0.1684**	**1.3900e-003**	**0.1698**	**0.0447**	**1.2500e-003**	**0.0459**		**157.9671**	**157.9671**	**0.0105**		**158.1876**

3.4 Grading - 2015

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**8.6733**	**3.8022**	**12.4755**	**3.5965**	**3.4980**	**7.0945**		**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

3.4 Grading - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0960	0.1480	1.3900	2.0400e-003	0.1871	1.5400e-003	0.1886	0.0496	1.3900e-003	0.0510		175.5190	175.5190	0.0117		175.7640
Total	**0.0960**	**0.1480**	**1.3900**	**2.0400e-003**	**0.1871**	**1.5400e-003**	**0.1886**	**0.0496**	**1.3900e-003**	**0.0510**		**175.5190**	**175.5190**	**0.0117**		**175.7640**

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**8.6733**	**3.8022**	**12.4755**	**3.5965**	**3.4980**	**7.0945**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

3.4 Grading - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0960	0.1480	1.3900	2.0400e-003	0.1871	1.5400e-003	0.1886	0.0496	1.3900e-003	0.0510		175.5190	175.5190	0.0117		175.7640
Total	**0.0960**	**0.1480**	**1.3900**	**2.0400e-003**	**0.1871**	**1.5400e-003**	**0.1886**	**0.0496**	**1.3900e-003**	**0.0510**		**175.5190**	**175.5190**	**0.0117**		**175.7640**

3.5 Building Construction - 2015

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	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4197	3.0003	5.0243	5.5800e-003	0.1496	0.0454	0.1950	0.0426	0.0417	0.0843		560.9839	560.9839	5.3200e-003		561.0957
Worker	0.4992	0.7695	7.2280	0.0106	0.9729	8.0100e-003	0.9809	0.2580	7.2400e-003	0.2653		912.6989	912.6989	0.0607		913.9725
Total	**0.9189**	**3.7698**	**12.2523**	**0.0162**	**1.1225**	**0.0534**	**1.1759**	**0.3006**	**0.0489**	**0.3496**		**1,473.6828**	**1,473.6828**	**0.0660**		**1,475.0683**

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	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4197	3.0003	5.0243	5.5800e-003	0.1496	0.0454	0.1950	0.0426	0.0417	0.0843		560.9839	560.9839	5.3200e-003		561.0957
Worker	0.4992	0.7695	7.2280	0.0106	0.9729	8.0100e-003	0.9809	0.2580	7.2400e-003	0.2653		912.6989	912.6989	0.0607		913.9725
Total	**0.9189**	**3.7698**	**12.2523**	**0.0162**	**1.1225**	**0.0534**	**1.1759**	**0.3006**	**0.0489**	**0.3496**		**1,473.6828**	**1,473.6828**	**0.0660**		**1,475.0683**

3.5 Building Construction - 2016

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	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485		2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**		**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3652	2.6487	4.5791	5.5700e-003	0.1497	0.0359	0.1856	0.0426	0.0330	0.0756		554.9753	554.9753	4.6300e-003		555.0725
Worker	0.4290	0.6749	6.3051	0.0106	0.9729	7.3700e-003	0.9802	0.2580	6.7100e-003	0.2647		880.3067	880.3067	0.0540		881.4401
Total	**0.7942**	**3.3237**	**10.8842**	**0.0162**	**1.1225**	**0.0433**	**1.1658**	**0.3006**	**0.0397**	**0.3404**		**1,435.2820**	**1,435.2820**	**0.0586**		**1,436.5125**

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	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485	0.0000	2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**	**0.0000**	**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3652	2.6487	4.5791	5.5700e-003	0.1497	0.0359	0.1856	0.0426	0.0330	0.0756		554.9753	554.9753	4.6300e-003		555.0725
Worker	0.4290	0.6749	6.3051	0.0106	0.9729	7.3700e-003	0.9802	0.2580	6.7100e-003	0.2647		880.3067	880.3067	0.0540		881.4401
Total	**0.7942**	**3.3237**	**10.8842**	**0.0162**	**1.1225**	**0.0433**	**1.1658**	**0.3006**	**0.0397**	**0.3404**		**1,435.2820**	**1,435.2820**	**0.0586**		**1,436.5125**

3.5 Building Construction - 2017

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	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3261	2.3929	4.2278	5.5600e-003	0.1497	0.0304	0.1801	0.0426	0.0280	0.0706		546.0206	546.0206	4.3400e-003		546.1118
Worker	0.3641	0.5912	5.4721	0.0106	0.9729	6.8700e-003	0.9797	0.2580	6.3000e-003	0.2643		846.1319	846.1319	0.0481		847.1420
Total	**0.6903**	**2.9841**	**9.6999**	**0.0161**	**1.1225**	**0.0373**	**1.1598**	**0.3006**	**0.0343**	**0.3349**		**1,392.1525**	**1,392.1525**	**0.0524**		**1,393.2538**

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	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3261	2.3929	4.2278	5.5600e-003	0.1497	0.0304	0.1801	0.0426	0.0280	0.0706		546.0206	546.0206	4.3400e-003		546.1118
Worker	0.3641	0.5912	5.4721	0.0106	0.9729	6.8700e-003	0.9797	0.2580	6.3000e-003	0.2643		846.1319	846.1319	0.0481		847.1420
Total	**0.6903**	**2.9841**	**9.6999**	**0.0161**	**1.1225**	**0.0373**	**1.1598**	**0.3006**	**0.0343**	**0.3349**		**1,392.1525**	**1,392.1525**	**0.0524**		**1,393.2538**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473		2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**		**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0525	0.0853	0.7893	1.5200e-003	0.1403	9.9000e-004	0.1413	0.0372	9.1000e-004	0.0381		122.0383	122.0383	6.9400e-003		122.1839
Total	**0.0525**	**0.0853**	**0.7893**	**1.5200e-003**	**0.1403**	**9.9000e-004**	**0.1413**	**0.0372**	**9.1000e-004**	**0.0381**		**122.0383**	**122.0383**	**6.9400e-003**		**122.1839**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473	0.0000	2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**	**0.0000**	**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0525	0.0853	0.7893	1.5200e-003	0.1403	9.9000e-004	0.1413	0.0372	9.1000e-004	0.0381		122.0383	122.0383	6.9400e-003		122.1839
Total	**0.0525**	**0.0853**	**0.7893**	**1.5200e-003**	**0.1403**	**9.9000e-004**	**0.1413**	**0.0372**	**9.1000e-004**	**0.0381**		**122.0383**	**122.0383**	**6.9400e-003**		**122.1839**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	509.0418					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**509.3741**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.1194	1.1050	2.1300e-003	0.1964	1.3900e-003	0.1978	0.0521	1.2700e-003	0.0534		170.8536	170.8536	9.7100e-003		171.0575
Total	**0.0735**	**0.1194**	**1.1050**	**2.1300e-003**	**0.1964**	**1.3900e-003**	**0.1978**	**0.0521**	**1.2700e-003**	**0.0534**		**170.8536**	**170.8536**	**9.7100e-003**		**171.0575**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	509.0418					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**509.3741**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.1194	1.1050	2.1300e-003	0.1964	1.3900e-003	0.1978	0.0521	1.2700e-003	0.0534		170.8536	170.8536	9.7100e-003		171.0575
Total	**0.0735**	**0.1194**	**1.1050**	**2.1300e-003**	**0.1964**	**1.3900e-003**	**0.1978**	**0.0521**	**1.2700e-003**	**0.0534**		**170.8536**	**170.8536**	**9.7100e-003**		**171.0575**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.3170	10.5828	46.8304	0.0988	7.3855	0.1307	7.5162	1.9743	0.1203	2.0946		8,102.3421	8,102.3421	0.3536		8,109.7671
Unmitigated	4.3170	10.5828	46.8304	0.0988	7.3855	0.1307	7.5162	1.9743	0.1203	2.0946		8,102.3421	8,102.3421	0.3536		8,109.7671

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	5.09	5.09	5.09	8,104	8,104
Single Family Housing	995.00	1,260.00	1096.25	2,889,697	2,889,697
Total	1,000.09	1,265.09	1,101.34	2,897,801	2,897,801

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	8.80	4.60	4.60	33.00	48.00	19.00	66	28	6
Single Family Housing	12.30	5.90	6.40	37.50	15.00	47.50	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.488429	0.036082	0.211732	0.154985	0.049882	0.007459	0.020077	0.014399	0.001917	0.002182	0.008131	0.001589	0.003135

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
NaturalGas Unmitigated	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	12083.2	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
Total		**0.1303**	**1.1136**	**0.4739**	**7.1100e-003**		**0.0900**	**0.0900**		**0.0900**	**0.0900**		**1,421.5536**	**1,421.5536**	**0.0273**	**0.0261**	**1,430.2049**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	12.0832	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
Total		**0.1303**	**1.1136**	**0.4739**	**7.1100e-003**		**0.0900**	**0.0900**		**0.0900**	**0.0900**		**1,421.5536**	**1,421.5536**	**0.0273**	**0.0261**	**1,430.2049**

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	10.8466	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567	0.0000	18.5697	18.5697	0.0184	0.0000	18.9562
Unmitigated	10.8466	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567	0.0000	18.5697	18.5697	0.0184	0.0000	18.9562

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	2.7893					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.7371					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3202	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567		18.5697	18.5697	0.0184		18.9562
Total	**10.8466**	**0.1206**	**10.3859**	**5.4000e-004**		**0.0567**	**0.0567**		**0.0567**	**0.0567**	**0.0000**	**18.5697**	**18.5697**	**0.0184**	**0.0000**	**18.9562**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7893					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.7371					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3202	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567		18.5697	18.5697	0.0184		18.9562
Total	**10.8466**	**0.1206**	**10.3859**	**5.4000e-004**		**0.0567**	**0.0567**		**0.0567**	**0.0567**	**0.0000**	**18.5697**	**18.5697**	**0.0184**	**0.0000**	**18.9562**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Orcutt Key Site 3 SEIR

Santa Barbara County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	3.20	Acre	3.20	139,392.00	0
Single Family Housing	125.00	Dwelling Unit	21.80	222,156.00	340

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2018
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Utility information from project description.

Land Use - Lot acreage for single family residences includes acreage in Development Plan submitted by applicant classified as: Building Coverage, Private Yards, and Roads, Driveways, Sidewalks, Paths and Swales. Square feet from building coverage.

Construction Phase - Assumed start date of mid-2015.

Grading - "No offsite hauling of excess material is anticipated" Scoping Paper (June 2014).

Vehicle Trips - Average daily trip rate from Traffic Study Penfield & Smith, November 2013 (average of trip generation rate for single family residential and planned unit development).

Woodstoves - No woodstoves in project description.

Energy Use -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	PhaseStartDate	2/25/2017	2/27/2017
tblConstructionPhase	PhaseStartDate	8/29/2015	8/31/2015
tblConstructionPhase	PhaseStartDate	7/11/2015	7/13/2015
tblConstructionPhase	PhaseStartDate	1/28/2017	1/30/2017
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblLandUse	LandUseSquareFeet	225,000.00	222,156.00
tblLandUse	LotAcreage	40.58	21.80
tblProjectCharacteristics	OperationalYear	2014	2018
tblVehicleTrips	WD_TR	9.57	7.96
tblWoodstoves	WoodstoveDayYear	82.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	6.8808	79.2155	52.3183	0.0637	18.2346	3.8037	21.3243	9.9753	3.4994	12.8178	0.0000	6,657.7248	6,657.7248	1.9481	0.0000	6,698.6345
2016	4.3314	31.9655	31.6366	0.0427	1.1225	2.0114	3.1339	0.3006	1.8888	2.1895	0.0000	4,077.6998	4,077.6998	0.7208	0.0000	4,092.8365
2017	509.4542	29.5092	29.9247	0.0427	1.1225	1.8191	2.9416	0.3006	1.7078	2.0084	0.0000	4,005.9120	4,005.9120	0.7059	0.0000	4,020.7348
Total	**520.6664**	**140.6902**	**113.8797**	**0.1491**	**20.4797**	**7.6342**	**27.3998**	**10.5766**	**7.0960**	**17.0157**	**0.0000**	**14,741.3366**	**14,741.3366**	**3.3747**	**0.0000**	**14,812.2058**

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					
2015	6.8808	79.2155	52.3183	0.0637	18.2346	3.8037	21.3243	9.9753	3.4994	12.8178	0.0000	6,657.7248	6,657.7248	1.9481	0.0000	6,698.6345
2016	4.3314	31.9655	31.6366	0.0427	1.1225	2.0114	3.1339	0.3006	1.8888	2.1895	0.0000	4,077.6998	4,077.6998	0.7208	0.0000	4,092.8365
2017	509.4542	29.5092	29.9247	0.0427	1.1225	1.8191	2.9416	0.3006	1.7078	2.0084	0.0000	4,005.9120	4,005.9120	0.7059	0.0000	4,020.7348
Total	**520.6664**	**140.6902**	**113.8797**	**0.1491**	**20.4797**	**7.6342**	**27.3998**	**10.5766**	**7.0960**	**17.0157**	**0.0000**	**14,741.3366**	**14,741.3366**	**3.3747**	**0.0000**	**14,812.2058**

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

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	10.8466	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567	0.0000	18.5697	18.5697	0.0184	0.0000	18.9562
Energy	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
Mobile	4.7126	11.3350	52.3074	0.0970	7.3855	0.1314	7.5169	1.9743	0.1210	2.0953		7,956.7137	7,956.7137	0.3538		7,964.1432
Total	**15.6895**	**12.5691**	**63.1671**	**0.1047**	**7.3855**	**0.2781**	**7.6636**	**1.9743**	**0.2677**	**2.2420**	**0.0000**	**9,396.8371**	**9,396.8371**	**0.3994**	**0.0261**	**9,413.3043**

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	10.8466	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567	0.0000	18.5697	18.5697	0.0184	0.0000	18.9562
Energy	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
Mobile	4.7126	11.3350	52.3074	0.0970	7.3855	0.1314	7.5169	1.9743	0.1210	2.0953		7,956.7137	7,956.7137	0.3538		7,964.1432
Total	**15.6895**	**12.5691**	**63.1671**	**0.1047**	**7.3855**	**0.2781**	**7.6636**	**1.9743**	**0.2677**	**2.2420**	**0.0000**	**9,396.8371**	**9,396.8371**	**0.3994**	**0.0261**	**9,413.3043**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/26/2015	5	20	
2	Site Preparation	Site Preparation	6/29/2015	7/10/2015	5	10	
3	Grading	Grading	7/13/2015	8/28/2015	5	35	
4	Building Construction	Building Construction	8/31/2015	1/27/2017	5	370	
5	Paving	Paving	1/30/2017	2/24/2017	5	20	
6	Architectural Coating	Architectural Coating	2/27/2017	3/24/2017	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 0

Residential Indoor: 449,866; Residential Outdoor: 149,955; Non-Residential Indoor: 209,088; Non-Residential Outdoor: 69,696 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	162	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	162	0.38
Grading	Graders	1	8.00	174	0.41
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Grading	Scrapers	2	8.00	361	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	2	8.00	125	0.42
Paving	Paving Equipment	2	8.00	130	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	104.00	36.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	21.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Clean Paved Roads

3.2 Demolition - 2015

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	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**		**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0793	0.1266	1.1088	1.4900e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		128.6112	128.6112	8.7500e-003		128.7948
Total	**0.0793**	**0.1266**	**1.1088**	**1.4900e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**128.6112**	**128.6112**	**8.7500e-003**		**128.7948**

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	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858	0.0000	4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0793	0.1266	1.1088	1.4900e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		128.6112	128.6112	8.7500e-003		128.7948
Total	**0.0793**	**0.1266**	**1.1088**	**1.4900e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**128.6112**	**128.6112**	**8.7500e-003**		**128.7948**

3.3 Site Preparation - 2015

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0951	0.1519	1.3305	1.7900e-003	0.1684	1.3900e-003	0.1698	0.0447	1.2500e-003	0.0459		154.3334	154.3334	0.0105		154.5538
Total	**0.0951**	**0.1519**	**1.3305**	**1.7900e-003**	**0.1684**	**1.3900e-003**	**0.1698**	**0.0447**	**1.2500e-003**	**0.0459**		**154.3334**	**154.3334**	**0.0105**		**154.5538**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412	0.0000	4,111.7444	4,111.7444	1.2275		4,137.5224
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**	**0.0000**	**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5224**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0951	0.1519	1.3305	1.7900e-003	0.1684	1.3900e-003	0.1698	0.0447	1.2500e-003	0.0459		154.3334	154.3334	0.0105		154.5538
Total	**0.0951**	**0.1519**	**1.3305**	**1.7900e-003**	**0.1684**	**1.3900e-003**	**0.1698**	**0.0447**	**1.2500e-003**	**0.0459**		**154.3334**	**154.3334**	**0.0105**		**154.5538**

3.4 Grading - 2015

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980		6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**8.6733**	**3.8022**	**12.4755**	**3.5965**	**3.4980**	**7.0945**		**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

3.4 Grading - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1057	0.1688	1.4784	1.9900e-003	0.1871	1.5400e-003	0.1886	0.0496	1.3900e-003	0.0510		171.4815	171.4815	0.0117		171.7265
Total	**0.1057**	**0.1688**	**1.4784**	**1.9900e-003**	**0.1871**	**1.5400e-003**	**0.1886**	**0.0496**	**1.3900e-003**	**0.0510**		**171.4815**	**171.4815**	**0.0117**		**171.7265**

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					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	6.7751	79.0467	50.8400	0.0618		3.8022	3.8022		3.4980	3.4980	0.0000	6,486.2433	6,486.2433	1.9364		6,526.9080
Total	**6.7751**	**79.0467**	**50.8400**	**0.0618**	**8.6733**	**3.8022**	**12.4755**	**3.5965**	**3.4980**	**7.0945**	**0.0000**	**6,486.2433**	**6,486.2433**	**1.9364**		**6,526.9080**

3.4 Grading - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1057	0.1688	1.4784	1.9900e-003	0.1871	1.5400e-003	0.1886	0.0496	1.3900e-003	0.0510		171.4815	171.4815	0.0117		171.7265
Total	**0.1057**	**0.1688**	**1.4784**	**1.9900e-003**	**0.1871**	**1.5400e-003**	**0.1886**	**0.0496**	**1.3900e-003**	**0.0510**		**171.4815**	**171.4815**	**0.0117**		**171.7265**

3.5 Building Construction - 2015

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	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5244	3.0467	6.9852	5.5500e-003	0.1496	0.0464	0.1960	0.0426	0.0426	0.0852		554.3846	554.3846	5.5100e-003		554.5003
Worker	0.5496	0.8779	7.6875	0.0104	0.9729	8.0100e-003	0.9809	0.2580	7.2400e-003	0.2653		891.7040	891.7040	0.0607		892.9776
Total	**1.0741**	**3.9246**	**14.6727**	**0.0159**	**1.1225**	**0.0544**	**1.1769**	**0.3006**	**0.0499**	**0.3505**		**1,446.0886**	**1,446.0886**	**0.0662**		**1,447.4778**

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	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.5244	3.0467	6.9852	5.5500e-003	0.1496	0.0464	0.1960	0.0426	0.0426	0.0852		554.3846	554.3846	5.5100e-003		554.5003
Worker	0.5496	0.8779	7.6875	0.0104	0.9729	8.0100e-003	0.9809	0.2580	7.2400e-003	0.2653		891.7040	891.7040	0.0607		892.9776
Total	**1.0741**	**3.9246**	**14.6727**	**0.0159**	**1.1225**	**0.0544**	**1.1769**	**0.3006**	**0.0499**	**0.3505**		**1,446.0886**	**1,446.0886**	**0.0662**		**1,447.4778**

3.5 Building Construction - 2016

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	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485		2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**		**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4550	2.6887	6.4704	5.5400e-003	0.1497	0.0366	0.1863	0.0426	0.0337	0.0763		548.4119	548.4119	4.8000e-003		548.5127
Worker	0.4702	0.7705	6.6596	0.0103	0.9729	7.3700e-003	0.9802	0.2580	6.7100e-003	0.2647		860.0014	860.0014	0.0540		861.1348
Total	**0.9252**	**3.4592**	**13.1300**	**0.0159**	**1.1225**	**0.0440**	**1.1665**	**0.3006**	**0.0404**	**0.3410**		**1,408.4134**	**1,408.4134**	**0.0588**		**1,409.6475**

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	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485	0.0000	2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**	**0.0000**	**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4550	2.6887	6.4704	5.5400e-003	0.1497	0.0366	0.1863	0.0426	0.0337	0.0763		548.4119	548.4119	4.8000e-003		548.5127
Worker	0.4702	0.7705	6.6596	0.0103	0.9729	7.3700e-003	0.9802	0.2580	6.7100e-003	0.2647		860.0014	860.0014	0.0540		861.1348
Total	**0.9252**	**3.4592**	**13.1300**	**0.0159**	**1.1225**	**0.0440**	**1.1665**	**0.3006**	**0.0404**	**0.3410**		**1,408.4134**	**1,408.4134**	**0.0588**		**1,409.6475**

3.5 Building Construction - 2017

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	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730		2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**		**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4037	2.4281	6.0678	5.5300e-003	0.1497	0.0310	0.1807	0.0426	0.0285	0.0711		539.5429	539.5429	4.5100e-003		539.6377
Worker	0.3967	0.6754	5.7278	0.0103	0.9729	6.8700e-003	0.9797	0.2580	6.3000e-003	0.2643		826.5637	826.5637	0.0481		827.5738
Total	**0.8004**	**3.1036**	**11.7956**	**0.0159**	**1.1225**	**0.0379**	**1.1604**	**0.3006**	**0.0348**	**0.3354**		**1,366.1067**	**1,366.1067**	**0.0526**		**1,367.2115**

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	3.1024	26.4057	18.1291	0.0268		1.7812	1.7812		1.6730	1.6730	0.0000	2,639.8053	2,639.8053	0.6497		2,653.4490
Total	**3.1024**	**26.4057**	**18.1291**	**0.0268**		**1.7812**	**1.7812**		**1.6730**	**1.6730**	**0.0000**	**2,639.8053**	**2,639.8053**	**0.6497**		**2,653.4490**

3.5 Building Construction - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4037	2.4281	6.0678	5.5300e-003	0.1497	0.0310	0.1807	0.0426	0.0285	0.0711		539.5429	539.5429	4.5100e-003		539.6377
Worker	0.3967	0.6754	5.7278	0.0103	0.9729	6.8700e-003	0.9797	0.2580	6.3000e-003	0.2643		826.5637	826.5637	0.0481		827.5738
Total	**0.8004**	**3.1036**	**11.7956**	**0.0159**	**1.1225**	**0.0379**	**1.1604**	**0.3006**	**0.0348**	**0.3354**		**1,366.1067**	**1,366.1067**	**0.0526**		**1,367.2115**

3.6 Paving - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473		2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**		**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

3.6 Paving - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0572	0.0974	0.8261	1.4900e-003	0.1403	9.9000e-004	0.1413	0.0372	9.1000e-004	0.0381		119.2159	119.2159	6.9400e-003		119.3616
Total	**0.0572**	**0.0974**	**0.8261**	**1.4900e-003**	**0.1403**	**9.9000e-004**	**0.1413**	**0.0372**	**9.1000e-004**	**0.0381**		**119.2159**	**119.2159**	**6.9400e-003**		**119.3616**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9074	20.2964	14.7270	0.0223		1.1384	1.1384		1.0473	1.0473	0.0000	2,281.0588	2,281.0588	0.6989		2,295.7360
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.9074**	**20.2964**	**14.7270**	**0.0223**		**1.1384**	**1.1384**		**1.0473**	**1.0473**	**0.0000**	**2,281.0588**	**2,281.0588**	**0.6989**		**2,295.7360**

3.6 Paving - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0572	0.0974	0.8261	1.4900e-003	0.1403	9.9000e-004	0.1413	0.0372	9.1000e-004	0.0381		119.2159	119.2159	6.9400e-003		119.3616
Total	**0.0572**	**0.0974**	**0.8261**	**1.4900e-003**	**0.1403**	**9.9000e-004**	**0.1413**	**0.0372**	**9.1000e-004**	**0.0381**		**119.2159**	**119.2159**	**6.9400e-003**		**119.3616**

3.7 Architectural Coating - 2017

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	509.0418					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733		281.4481	281.4481	0.0297		282.0721
Total	**509.3741**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**		**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0801	0.1364	1.1566	2.0800e-003	0.1964	1.3900e-003	0.1978	0.0521	1.2700e-003	0.0534		166.9023	166.9023	9.7100e-003		167.1063
Total	**0.0801**	**0.1364**	**1.1566**	**2.0800e-003**	**0.1964**	**1.3900e-003**	**0.1978**	**0.0521**	**1.2700e-003**	**0.0534**		**166.9023**	**166.9023**	**9.7100e-003**		**167.1063**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	509.0418					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3323	2.1850	1.8681	2.9700e-003		0.1733	0.1733		0.1733	0.1733	0.0000	281.4481	281.4481	0.0297		282.0721
Total	**509.3741**	**2.1850**	**1.8681**	**2.9700e-003**		**0.1733**	**0.1733**		**0.1733**	**0.1733**	**0.0000**	**281.4481**	**281.4481**	**0.0297**		**282.0721**

3.7 Architectural Coating - 2017

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0801	0.1364	1.1566	2.0800e-003	0.1964	1.3900e-003	0.1978	0.0521	1.2700e-003	0.0534		166.9023	166.9023	9.7100e-003		167.1063
Total	**0.0801**	**0.1364**	**1.1566**	**2.0800e-003**	**0.1964**	**1.3900e-003**	**0.1978**	**0.0521**	**1.2700e-003**	**0.0534**		**166.9023**	**166.9023**	**9.7100e-003**		**167.1063**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.7126	11.3350	52.3074	0.0970	7.3855	0.1314	7.5169	1.9743	0.1210	2.0953		7,956.7137	7,956.7137	0.3538		7,964.1432
Unmitigated	4.7126	11.3350	52.3074	0.0970	7.3855	0.1314	7.5169	1.9743	0.1210	2.0953		7,956.7137	7,956.7137	0.3538		7,964.1432

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	5.09	5.09	5.09	8,104	8,104
Single Family Housing	995.00	1,260.00	1096.25	2,889,697	2,889,697
Total	1,000.09	1,265.09	1,101.34	2,897,801	2,897,801

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	8.80	4.60	4.60	33.00	48.00	19.00	66	28	6
Single Family Housing	12.30	5.90	6.40	37.50	15.00	47.50	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.488429	0.036082	0.211732	0.154985	0.049882	0.007459	0.020077	0.014399	0.001917	0.002182	0.008131	0.001589	0.003135

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
NaturalGas Unmitigated	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	12083.2	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
Total		**0.1303**	**1.1136**	**0.4739**	**7.1100e-003**		**0.0900**	**0.0900**		**0.0900**	**0.0900**		**1,421.5536**	**1,421.5536**	**0.0273**	**0.0261**	**1,430.2049**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Single Family Housing	12.0832	0.1303	1.1136	0.4739	7.1100e-003		0.0900	0.0900		0.0900	0.0900		1,421.5536	1,421.5536	0.0273	0.0261	1,430.2049
Total		**0.1303**	**1.1136**	**0.4739**	**7.1100e-003**		**0.0900**	**0.0900**		**0.0900**	**0.0900**		**1,421.5536**	**1,421.5536**	**0.0273**	**0.0261**	**1,430.2049**

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	10.8466	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567	0.0000	18.5697	18.5697	0.0184	0.0000	18.9562
Unmitigated	10.8466	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567	0.0000	18.5697	18.5697	0.0184	0.0000	18.9562

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	2.7893					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.7371					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3202	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567		18.5697	18.5697	0.0184		18.9562
Total	**10.8466**	**0.1206**	**10.3859**	**5.4000e-004**		**0.0567**	**0.0567**		**0.0567**	**0.0567**	**0.0000**	**18.5697**	**18.5697**	**0.0184**	**0.0000**	**18.9562**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	2.7893					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	7.7371					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.3202	0.1206	10.3859	5.4000e-004		0.0567	0.0567		0.0567	0.0567		18.5697	18.5697	0.0184		18.9562
Total	**10.8466**	**0.1206**	**10.3859**	**5.4000e-004**		**0.0567**	**0.0567**		**0.0567**	**0.0567**	**0.0000**	**18.5697**	**18.5697**	**0.0184**	**0.0000**	**18.9562**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Greenhouse Gas Emission Worksheet

N20 Mobile Emissions Orcutt Key Site 3 SEIR

From URBEMIS 2007 Vehicle Fleet Mix Output:

Annual VMT: 2,897,801

Vehicle Type	Percent Type	CH4 Emission Factor (g/mile)*	CH4 Emission (g/mile)**	N2O Emission Factor (g/mile)*	N2O Emission (g/mile)**
Light Auto	46.0%	0.04	0.0184	0.04	0.0184
Light Truck < 3750 lbs	10.3%	0.05	0.00515	0.06	0.00618
Light Truck 3751-5750 lbs	23.2%	0.05	0.0116	0.06	0.01392
Med Truck 5751-8500 lbs	12.2%	0.12	0.01464	0.2	0.0244
Lite-Heavy Truck 8501-10,000 lbs	2.1%	0.12	0.00252	0.2	0.0042
Lite-Heavy Truck 10,001-14,000 lbs	0.5%	0.09	0.00045	0.125	0.000625
Med-Heavy Truck 14,001-33,000 lbs	1.0%	0.06	0.0006	0.05	0.0005
Heavy-Heavy Truck 33,001-60,000 lbs	2.9%	0.06	0.00174	0.05	0.00145
Other Bus	0.1%	0.06	0.00006	0.05	0.00005
Urban Bus	0.1%	0.06	0.00006	0.05	0.00005
Motorcycle	1.1%	0.09	0.00099	0.01	0.00011
School Bus	0.1%	0.06	0.00006	0.05	0.00005
Motor Home	0.4%	0.09	0.00036	0.125	0.0005
Total	**100.0%**		**0.05663**		**0.070435**

Total Emissions (metric tons) =
Emission Factor by Vehicle Mix (g/mi) x Annual VMT(mi) x 0.000001 metric tons/g

Conversion to Carbon Dioxide Equivalency (CO2e) Units based on Global Warming Potential (GWP)

CH4	21	GWP
N2O	310	GWP
1 ton (short, US) =	0.90718474	metric ton

Annual Mobile Emissions:

	Total Emissions		Total CO2e units	
N20 Emissions:	0.2041	metric tons N2O	**63.27**	metric tons CO2e
		Project Total:	***63.27 metric tons CO2e***	

References

* from Table C.4: Methane and Nitrous Oxide Emission Factors for Mobile Sources by Vehicle and Fuel Type (g/mile).
in California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
Assume Model year 2000-present, gasoline fueled.

** Source: California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.

*** From URBEMIS 2007 results for mobile sources

Orcutt Key Site 3 - Cumulative

Santa Barbara County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	160.00	Dwelling Unit	8.00	160,000.00	435

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 2008 Santa Barbara County Housing Element Focused Rezone Program FEIR.

Construction Phase - 10 month construction schedule, one for grading, from 2008 Santa Barbara County Housing Element Focused Rezone Program FEIR.

Woodstoves - No woodstoves assumed.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	146.00
tblConstructionPhase	NumDays	20.00	30.00
tblConstructionPhase	PhaseEndDate	4/11/2016	2/24/2016
tblConstructionPhase	PhaseStartDate	8/22/2015	8/24/2015
tblConstructionPhase	PhaseStartDate	7/11/2015	7/13/2015
tblConstructionPhase	PhaseStartDate	3/15/2016	1/28/2016
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblGrading	AcresOfGrading	15.00	10.00
tblLandUse	LotAcreage	10.00	8.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblWoodstoves	WoodstoveDayYear	82.00	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.3406	2.9030	2.4119	3.0100e-003	0.2429	0.1758	0.4188	0.1151	0.1641	0.2792	0.0000	270.3084	270.3084	0.0604	0.0000	271.5772
2016	2.6354	1.0468	0.9273	1.3500e-003	0.0326	0.0664	0.0990	8.7100e-003	0.0623	0.0710	0.0000	117.9933	117.9933	0.0239	0.0000	118.4951
Total	**2.9760**	**3.9498**	**3.3392**	**4.3600e-003**	**0.2756**	**0.2422**	**0.5178**	**0.1238**	**0.2263**	**0.3501**	**0.0000**	**388.3017**	**388.3017**	**0.0843**	**0.0000**	**390.0722**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.3406	2.9030	2.4119	3.0100e-003	0.2429	0.1758	0.4188	0.1151	0.1641	0.2792	0.0000	270.3082	270.3082	0.0604	0.0000	271.5769
2016	2.6354	1.0468	0.9273	1.3500e-003	0.0326	0.0664	0.0990	8.7100e-003	0.0623	0.0710	0.0000	117.9932	117.9932	0.0239	0.0000	118.4950
Total	**2.9760**	**3.9498**	**3.3392**	**4.3600e-003**	**0.2756**	**0.2422**	**0.5178**	**0.1238**	**0.2263**	**0.3501**	**0.0000**	**388.3014**	**388.3014**	**0.0843**	**0.0000**	**390.0719**

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

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9125	0.0140	1.2000	6.0000e-005		6.5200e-003	6.5200e-003		6.5200e-003	6.5200e-003	0.0000	1.9406	1.9406	1.9500e-003	0.0000	1.9815
Energy	0.0168	0.1436	0.0611	9.2000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	366.9467	366.9467	0.0123	4.9300e-003	368.7312
Mobile	0.7433	1.8840	8.3208	0.0148	1.0991	0.0212	1.1203	0.2943	0.0195	0.3139	0.0000	1,132.7100	1,132.7100	0.0533	0.0000	1,133.8287
Waste						0.0000	0.0000		0.0000	0.0000	14.9401	0.0000	14.9401	0.8829	0.0000	33.4818
Water						0.0000	0.0000		0.0000	0.0000	3.6883	23.1013	26.7895	0.0137	8.2400e-003	29.6315
Total	**1.6727**	**2.0416**	**9.5819**	**0.0158**	**1.0991**	**0.0394**	**1.1384**	**0.2943**	**0.0377**	**0.3320**	**18.6284**	**1,524.6986**	**1,543.3269**	**0.9642**	**0.0132**	**1,567.6546**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.9125	0.0140	1.2000	6.0000e-005		6.5200e-003	6.5200e-003		6.5200e-003	6.5200e-003	0.0000	1.9406	1.9406	1.9500e-003	0.0000	1.9815
Energy	0.0168	0.1436	0.0611	9.2000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	366.9467	366.9467	0.0123	4.9300e-003	368.7312
Mobile	0.7433	1.8840	8.3208	0.0148	1.0991	0.0212	1.1203	0.2943	0.0195	0.3139	0.0000	1,132.7100	1,132.7100	0.0533	0.0000	1,133.8287
Waste						0.0000	0.0000		0.0000	0.0000	14.9401	0.0000	14.9401	0.8829	0.0000	33.4818
Water						0.0000	0.0000		0.0000	0.0000	3.6883	23.1013	26.7895	0.0137	8.2200e-003	29.6256
Total	**1.6727**	**2.0416**	**9.5819**	**0.0158**	**1.0991**	**0.0394**	**1.1384**	**0.2943**	**0.0377**	**0.3320**	**18.6284**	**1,524.6986**	**1,543.3269**	**0.9641**	**0.0132**	**1,567.6487**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.01**	**0.15**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/26/2015	5	20	
2	Site Preparation	Site Preparation	6/29/2015	7/10/2015	5	10	
3	Grading	Grading	7/13/2015	8/21/2015	5	30	
4	Building Construction	Building Construction	8/24/2015	3/14/2016	5	146	
5	Paving	Paving	1/28/2016	2/24/2016	5	20	
6	Architectural Coating	Architectural Coating	2/25/2016	3/23/2016	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 324,000; Residential Outdoor: 108,000; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	162	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	1	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	115.00	17.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	23.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0451	0.4836	0.3607	4.0000e-004		0.0245	0.0245		0.0229	0.0229	0.0000	37.4413	37.4413	0.0102	0.0000	37.6544
Total	**0.0451**	**0.4836**	**0.3607**	**4.0000e-004**		**0.0245**	**0.0245**		**0.0229**	**0.0229**	**0.0000**	**37.4413**	**37.4413**	**0.0102**	**0.0000**	**37.6544**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4000e-004	1.2500e-003	0.0107	1.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.8000e-004	0.0000	1.1683	1.1683	8.0000e-005	0.0000	1.1700
Total	**7.4000e-004**	**1.2500e-003**	**0.0107**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.1683**	**1.1683**	**8.0000e-005**	**0.0000**	**1.1700**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0451	0.4836	0.3607	4.0000e-004		0.0245	0.0245		0.0229	0.0229	0.0000	37.4412	37.4412	0.0102	0.0000	37.6544
Total	**0.0451**	**0.4836**	**0.3607**	**4.0000e-004**		**0.0245**	**0.0245**		**0.0229**	**0.0229**	**0.0000**	**37.4412**	**37.4412**	**0.0102**	**0.0000**	**37.6544**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.4000e-004	1.2500e-003	0.0107	1.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.8000e-004	0.0000	1.1683	1.1683	8.0000e-005	0.0000	1.1700
Total	**7.4000e-004**	**1.2500e-003**	**0.0107**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.8000e-004**	**0.0000**	**1.1683**	**1.1683**	**8.0000e-005**	**0.0000**	**1.1700**

3.3 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0263	0.2845	0.2132	2.0000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	18.6506	18.6506	5.5700e-003	0.0000	18.7675
Total	**0.0263**	**0.2845**	**0.2132**	**2.0000e-004**	**0.0903**	**0.0154**	**0.1058**	**0.0497**	**0.0142**	**0.0639**	**0.0000**	**18.6506**	**18.6506**	**5.5700e-003**	**0.0000**	**18.7675**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	7.5000e-004	6.4400e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	0.7010	0.7010	5.0000e-005	0.0000	0.7020
Total	**4.5000e-004**	**7.5000e-004**	**6.4400e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.7010**	**0.7010**	**5.0000e-005**	**0.0000**	**0.7020**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0263	0.2845	0.2132	2.0000e-004		0.0154	0.0154		0.0142	0.0142	0.0000	18.6505	18.6505	5.5700e-003	0.0000	18.7675
Total	**0.0263**	**0.2845**	**0.2132**	**2.0000e-004**	**0.0903**	**0.0154**	**0.1058**	**0.0497**	**0.0142**	**0.0639**	**0.0000**	**18.6505**	**18.6505**	**5.5700e-003**	**0.0000**	**18.7675**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.5000e-004	7.5000e-004	6.4400e-003	1.0000e-005	8.2000e-004	1.0000e-005	8.3000e-004	2.2000e-004	1.0000e-005	2.3000e-004	0.0000	0.7010	0.7010	5.0000e-005	0.0000	0.7020
Total	**4.5000e-004**	**7.5000e-004**	**6.4400e-003**	**1.0000e-005**	**8.2000e-004**	**1.0000e-005**	**8.3000e-004**	**2.2000e-004**	**1.0000e-005**	**2.3000e-004**	**0.0000**	**0.7010**	**0.7010**	**5.0000e-005**	**0.0000**	**0.7020**

3.4 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0956	0.0000	0.0956	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0575	0.6062	0.4001	4.5000e-004		0.0349	0.0349		0.0321	0.0321	0.0000	42.5789	42.5789	0.0127	0.0000	42.8459
Total	**0.0575**	**0.6062**	**0.4001**	**4.5000e-004**	**0.0956**	**0.0349**	**0.1306**	**0.0502**	**0.0321**	**0.0824**	**0.0000**	**42.5789**	**42.5789**	**0.0127**	**0.0000**	**42.8459**

3.4 Grading - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1200e-003	1.8700e-003	0.0161	2.0000e-005	2.0600e-003	2.0000e-005	2.0800e-003	5.5000e-004	2.0000e-005	5.6000e-004	0.0000	1.7525	1.7525	1.2000e-004	0.0000	1.7550
Total	**1.1200e-003**	**1.8700e-003**	**0.0161**	**2.0000e-005**	**2.0600e-003**	**2.0000e-005**	**2.0800e-003**	**5.5000e-004**	**2.0000e-005**	**5.6000e-004**	**0.0000**	**1.7525**	**1.7525**	**1.2000e-004**	**0.0000**	**1.7550**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0956	0.0000	0.0956	0.0502	0.0000	0.0502	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0575	0.6062	0.4001	4.5000e-004		0.0349	0.0349		0.0321	0.0321	0.0000	42.5789	42.5789	0.0127	0.0000	42.8458
Total	**0.0575**	**0.6062**	**0.4001**	**4.5000e-004**	**0.0956**	**0.0349**	**0.1306**	**0.0502**	**0.0321**	**0.0824**	**0.0000**	**42.5789**	**42.5789**	**0.0127**	**0.0000**	**42.8458**

3.4 Grading - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.1200e-003	1.8700e-003	0.0161	2.0000e-005	2.0600e-003	2.0000e-005	2.0800e-003	5.5000e-004	2.0000e-005	5.6000e-004	0.0000	1.7525	1.7525	1.2000e-004	0.0000	1.7550
Total	**1.1200e-003**	**1.8700e-003**	**0.0161**	**2.0000e-005**	**2.0600e-003**	**2.0000e-005**	**2.0800e-003**	**5.5000e-004**	**2.0000e-005**	**5.6000e-004**	**0.0000**	**1.7525**	**1.7525**	**1.2000e-004**	**0.0000**	**1.7550**

3.5 Building Construction - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1720	1.4114	0.8810	1.2600e-003		0.0995	0.0995		0.0936	0.0936	0.0000	114.6773	114.6773	0.0288	0.0000	115.2816
Total	**0.1720**	**1.4114**	**0.8810**	**1.2600e-003**		**0.0995**	**0.0995**		**0.0936**	**0.0936**	**0.0000**	**114.6773**	**114.6773**	**0.0288**	**0.0000**	**115.2816**

3.5 Building Construction - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.0686	0.1372	1.2000e-004	3.2600e-003	1.0200e-003	4.2800e-003	9.3000e-004	9.3000e-004	1.8600e-003	0.0000	11.2393	11.2393	1.1000e-004	0.0000	11.2416
Worker	0.0268	0.0449	0.3865	5.4000e-004	0.0495	4.2000e-004	0.0499	0.0131	3.8000e-004	0.0135	0.0000	42.0992	42.0992	2.8600e-003	0.0000	42.1592
Total	**0.0374**	**0.1135**	**0.5237**	**6.6000e-004**	**0.0527**	**1.4400e-003**	**0.0541**	**0.0141**	**1.3100e-003**	**0.0154**	**0.0000**	**53.3385**	**53.3385**	**2.9700e-003**	**0.0000**	**53.4008**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1720	1.4114	0.8810	1.2600e-003		0.0995	0.0995		0.0936	0.0936	0.0000	114.6772	114.6772	0.0288	0.0000	115.2814
Total	**0.1720**	**1.4114**	**0.8810**	**1.2600e-003**		**0.0995**	**0.0995**		**0.0936**	**0.0936**	**0.0000**	**114.6772**	**114.6772**	**0.0288**	**0.0000**	**115.2814**

3.5 Building Construction - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0106	0.0686	0.1372	1.2000e-004	3.2600e-003	1.0200e-003	4.2800e-003	9.3000e-004	9.3000e-004	1.8600e-003	0.0000	11.2393	11.2393	1.1000e-004	0.0000	11.2416
Worker	0.0268	0.0449	0.3865	5.4000e-004	0.0495	4.2000e-004	0.0499	0.0131	3.8000e-004	0.0135	0.0000	42.0992	42.0992	2.8600e-003	0.0000	42.1592
Total	**0.0374**	**0.1135**	**0.5237**	**6.6000e-004**	**0.0527**	**1.4400e-003**	**0.0541**	**0.0141**	**1.3100e-003**	**0.0154**	**0.0000**	**53.3385**	**53.3385**	**2.9700e-003**	**0.0000**	**53.4008**

3.5 Building Construction - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0886	0.7412	0.4812	7.0000e-004		0.0512	0.0512		0.0481	0.0481	0.0000	62.9599	62.9599	0.0156	0.0000	63.2879
Total	**0.0886**	**0.7412**	**0.4812**	**7.0000e-004**		**0.0512**	**0.0512**		**0.0481**	**0.0481**	**0.0000**	**62.9599**	**62.9599**	**0.0156**	**0.0000**	**63.2879**

3.5 Building Construction - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.1000e-003	0.0335	0.0699	7.0000e-005	1.8000e-003	4.4000e-004	2.2500e-003	5.1000e-004	4.1000e-004	9.2000e-004	0.0000	6.1507	6.1507	5.0000e-005	0.0000	6.1518
Worker	0.0127	0.0218	0.1856	3.0000e-004	0.0274	2.1000e-004	0.0276	7.2700e-003	1.9000e-004	7.4600e-003	0.0000	22.4610	22.4610	1.4100e-003	0.0000	22.4906
Total	**0.0178**	**0.0553**	**0.2555**	**3.7000e-004**	**0.0292**	**6.5000e-004**	**0.0298**	**7.7800e-003**	**6.0000e-004**	**8.3800e-003**	**0.0000**	**28.6117**	**28.6117**	**1.4600e-003**	**0.0000**	**28.6424**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0886	0.7412	0.4812	7.0000e-004		0.0512	0.0512		0.0481	0.0481	0.0000	62.9599	62.9599	0.0156	0.0000	63.2878
Total	**0.0886**	**0.7412**	**0.4812**	**7.0000e-004**		**0.0512**	**0.0512**		**0.0481**	**0.0481**	**0.0000**	**62.9599**	**62.9599**	**0.0156**	**0.0000**	**63.2878**

3.5 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	5.1000e-003	0.0335	0.0699	7.0000e-005	1.8000e-003	4.4000e-004	2.2500e-003	5.1000e-004	4.1000e-004	9.2000e-004	0.0000	6.1507	6.1507	5.0000e-005	0.0000	6.1518
Worker	0.0127	0.0218	0.1856	3.0000e-004	0.0274	2.1000e-004	0.0276	7.2700e-003	1.9000e-004	7.4600e-003	0.0000	22.4610	22.4610	1.4100e-003	0.0000	22.4906
Total	**0.0178**	**0.0553**	**0.2555**	**3.7000e-004**	**0.0292**	**6.5000e-004**	**0.0298**	**7.7800e-003**	**6.0000e-004**	**8.3800e-003**	**0.0000**	**28.6117**	**28.6117**	**1.4600e-003**	**0.0000**	**28.6424**

3.6 Paving - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0209	0.2239	0.1482	2.2000e-004		0.0126	0.0126		0.0116	0.0116	0.0000	21.0138	21.0138	6.3400e-003	0.0000	21.1469
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0209**	**0.2239**	**0.1482**	**2.2000e-004**		**0.0126**	**0.0126**		**0.0116**	**0.0116**	**0.0000**	**21.0138**	**21.0138**	**6.3400e-003**	**0.0000**	**21.1469**

3.6 Paving - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.4000e-004	1.0900e-003	9.3100e-003	1.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1268	1.1268	7.0000e-005	0.0000	1.1283
Total	**6.4000e-004**	**1.0900e-003**	**9.3100e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1268**	**1.1268**	**7.0000e-005**	**0.0000**	**1.1283**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0209	0.2239	0.1482	2.2000e-004		0.0126	0.0126		0.0116	0.0116	0.0000	21.0138	21.0138	6.3400e-003	0.0000	21.1469
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0209**	**0.2239**	**0.1482**	**2.2000e-004**		**0.0126**	**0.0126**		**0.0116**	**0.0116**	**0.0000**	**21.0138**	**21.0138**	**6.3400e-003**	**0.0000**	**21.1469**

3.6 Paving - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.4000e-004	1.0900e-003	9.3100e-003	1.0000e-005	1.3700e-003	1.0000e-005	1.3800e-003	3.6000e-004	1.0000e-005	3.7000e-004	0.0000	1.1268	1.1268	7.0000e-005	0.0000	1.1283
Total	**6.4000e-004**	**1.0900e-003**	**9.3100e-003**	**1.0000e-005**	**1.3700e-003**	**1.0000e-005**	**1.3800e-003**	**3.6000e-004**	**1.0000e-005**	**3.7000e-004**	**0.0000**	**1.1268**	**1.1268**	**7.0000e-005**	**0.0000**	**1.1283**

3.7 Architectural Coating - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.5029					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6800e-003	0.0237	0.0188	3.0000e-005		1.9700e-003	1.9700e-003		1.9700e-003	1.9700e-003	0.0000	2.5533	2.5533	3.0000e-004	0.0000	2.5596
Total	**2.5066**	**0.0237**	**0.0188**	**3.0000e-005**		**1.9700e-003**	**1.9700e-003**		**1.9700e-003**	**1.9700e-003**	**0.0000**	**2.5533**	**2.5533**	**3.0000e-004**	**0.0000**	**2.5596**

3.7 Architectural Coating - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.8000e-004	1.6800e-003	0.0143	2.0000e-005	2.1000e-003	2.0000e-005	2.1200e-003	5.6000e-004	1.0000e-005	5.7000e-004	0.0000	1.7278	1.7278	1.1000e-004	0.0000	1.7300
Total	**9.8000e-004**	**1.6800e-003**	**0.0143**	**2.0000e-005**	**2.1000e-003**	**2.0000e-005**	**2.1200e-003**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**0.0000**	**1.7278**	**1.7278**	**1.1000e-004**	**0.0000**	**1.7300**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	2.5029					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	3.6800e-003	0.0237	0.0188	3.0000e-005		1.9700e-003	1.9700e-003		1.9700e-003	1.9700e-003	0.0000	2.5533	2.5533	3.0000e-004	0.0000	2.5596
Total	**2.5066**	**0.0237**	**0.0188**	**3.0000e-005**		**1.9700e-003**	**1.9700e-003**		**1.9700e-003**	**1.9700e-003**	**0.0000**	**2.5533**	**2.5533**	**3.0000e-004**	**0.0000**	**2.5596**

3.7 Architectural Coating - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.8000e-004	1.6800e-003	0.0143	2.0000e-005	2.1000e-003	2.0000e-005	2.1200e-003	5.6000e-004	1.0000e-005	5.7000e-004	0.0000	1.7278	1.7278	1.1000e-004	0.0000	1.7300
Total	**9.8000e-004**	**1.6800e-003**	**0.0143**	**2.0000e-005**	**2.1000e-003**	**2.0000e-005**	**2.1200e-003**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**0.0000**	**1.7278**	**1.7278**	**1.1000e-004**	**0.0000**	**1.7300**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.7433	1.8840	8.3208	0.0148	1.0991	0.0212	1.1203	0.2943	0.0195	0.3139	0.0000	1,132.7100	1,132.7100	0.0533	0.0000	1,133.8287
Unmitigated	0.7433	1.8840	8.3208	0.0148	1.0991	0.0212	1.1203	0.2943	0.0195	0.3139	0.0000	1,132.7100	1,132.7100	0.0533	0.0000	1,133.8287

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	1,054.40	1,145.60	971.20	2,912,381	2,912,381
Total	1,054.40	1,145.60	971.20	2,912,381	2,912,381

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	12.30	5.90	6.40	37.50	15.00	47.50	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.488515	0.036101	0.211699	0.155053	0.049887	0.007463	0.020047	0.014289	0.001917	0.002185	0.008106	0.001606	0.003132

4.4 Fleet Mix

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	200.6684	200.6684	9.0700e-003	1.8800e-003	201.4409
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	200.6684	200.6684	9.0700e-003	1.8800e-003	201.4409
NaturalGas Mitigated	0.0168	0.1436	0.0611	9.2000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	166.2783	166.2783	3.1900e-003	3.0500e-003	167.2902
NaturalGas Unmitigated	0.0168	0.1436	0.0611	9.2000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	166.2783	166.2783	3.1900e-003	3.0500e-003	167.2902

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	3.11594e+006	0.0168	0.1436	0.0611	9.2000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	166.2783	166.2783	3.1900e-003	3.0500e-003	167.2902
Total		**0.0168**	**0.1436**	**0.0611**	**9.2000e-004**		**0.0116**	**0.0116**		**0.0116**	**0.0116**	**0.0000**	**166.2783**	**166.2783**	**3.1900e-003**	**3.0500e-003**	**167.2902**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Condo/Townhouse	3.11594e+006	0.0168	0.1436	0.0611	9.2000e-004		0.0116	0.0116		0.0116	0.0116	0.0000	166.2783	166.2783	3.1900e-003	3.0500e-003	167.2902
Total		**0.0168**	**0.1436**	**0.0611**	**9.2000e-004**		**0.0116**	**0.0116**		**0.0116**	**0.0116**	**0.0000**	**166.2783**	**166.2783**	**3.1900e-003**	**3.0500e-003**	**167.2902**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	689792	200.6684	9.0700e-003	1.8800e-003	201.4409
Total		**200.6684**	**9.0700e-003**	**1.8800e-003**	**201.4409**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	689792	200.6684	9.0700e-003	1.8800e-003	201.4409
Total		**200.6684**	**9.0700e-003**	**1.8800e-003**	**201.4409**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.9125	0.0140	1.2000	6.0000e-005		6.5200e-003	6.5200e-003		6.5200e-003	6.5200e-003	0.0000	1.9406	1.9406	1.9500e-003	0.0000	1.9815
Unmitigated	0.9125	0.0140	1.2000	6.0000e-005		6.5200e-003	6.5200e-003		6.5200e-003	6.5200e-003	0.0000	1.9406	1.9406	1.9500e-003	0.0000	1.9815

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2503					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6249					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0374	0.0140	1.2000	6.0000e-005		6.5200e-003	6.5200e-003		6.5200e-003	6.5200e-003	0.0000	1.9406	1.9406	1.9500e-003	0.0000	1.9815
Total	**0.9125**	**0.0140**	**1.2000**	**6.0000e-005**		**6.5200e-003**	**6.5200e-003**		**6.5200e-003**	**6.5200e-003**	**0.0000**	**1.9406**	**1.9406**	**1.9500e-003**	**0.0000**	**1.9815**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.2503					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.6249					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0374	0.0140	1.2000	6.0000e-005		6.5200e-003	6.5200e-003		6.5200e-003	6.5200e-003	0.0000	1.9406	1.9406	1.9500e-003	0.0000	1.9815
Total	**0.9125**	**0.0140**	**1.2000**	**6.0000e-005**		**6.5200e-003**	**6.5200e-003**		**6.5200e-003**	**6.5200e-003**	**0.0000**	**1.9406**	**1.9406**	**1.9500e-003**	**0.0000**	**1.9815**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	26.7895	0.0137	8.2200e-003	29.6256
Unmitigated	26.7895	0.0137	8.2400e-003	29.6315

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	10.4246 / 6.57206	26.7895	0.0137	8.2400e-003	29.6315
Total		**26.7895**	**0.0137**	**8.2400e-003**	**29.6315**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	10.4246 / 6.57206	26.7895	0.0137	8.2200e-003	29.6256
Total		**26.7895**	**0.0137**	**8.2200e-003**	**29.6256**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	14.9401	0.8829	0.0000	33.4818
Unmitigated	14.9401	0.8829	0.0000	33.4818

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	73.6	14.9401	0.8829	0.0000	33.4818
Total		**14.9401**	**0.8829**	**0.0000**	**33.4818**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	73.6	14.9401	0.8829	0.0000	33.4818
Total		**14.9401**	**0.8829**	**0.0000**	**33.4818**

9.0 Operational Offroad

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

10.0 Vegetation

Orcutt Key Site 3 - Cumulative

Santa Barbara County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	160.00	Dwelling Unit	8.00	160,000.00	435

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 2008 Santa Barbara County Housing Element Focused Rezone Program FEIR.

Construction Phase - 10 month construction schedule, one for grading, from 2008 Santa Barbara County Housing Element Focused Rezone Program FEIR.

Woodstoves - No woodstoves assumed.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	146.00
tblConstructionPhase	NumDays	20.00	30.00
tblConstructionPhase	PhaseEndDate	4/11/2016	2/24/2016
tblConstructionPhase	PhaseStartDate	8/22/2015	8/24/2015
tblConstructionPhase	PhaseStartDate	7/11/2015	7/13/2015
tblConstructionPhase	PhaseStartDate	3/15/2016	1/28/2016
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblGrading	AcresOfGrading	15.00	10.00
tblLandUse	LotAcreage	10.00	8.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblWoodstoves	WoodstoveDayYear	82.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	5.3473	57.0228	43.8828	0.0414	18.2346	3.0897	21.3243	9.9753	2.8425	12.8178	0.0000	4,269.7115	4,269.7115	1.2380	0.0000	4,295.7100
2016	254.8064	52.9867	43.3680	0.0650	1.3616	3.2545	4.5413	0.3625	3.0325	3.3752	0.0000	6,348.1182	6,348.1182	1.4304	0.0000	6,378.1561
Total	**260.1537**	**110.0096**	**87.2507**	**0.1064**	**19.5962**	**6.3442**	**25.8656**	**10.3378**	**5.8750**	**16.1930**	**0.0000**	**10,617.8297**	**10,617.8297**	**2.6684**	**0.0000**	**10,673.8661**

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					
2015	5.3473	57.0228	43.8828	0.0414	18.2346	3.0897	21.3243	9.9753	2.8425	12.8178	0.0000	4,269.7115	4,269.7115	1.2380	0.0000	4,295.7100
2016	254.8064	52.9867	43.3680	0.0650	1.3616	3.2545	4.5413	0.3625	3.0325	3.3752	0.0000	6,348.1182	6,348.1182	1.4304	0.0000	6,378.1561
Total	**260.1537**	**110.0096**	**87.2507**	**0.1064**	**19.5962**	**6.3442**	**25.8656**	**10.3378**	**5.8750**	**16.1930**	**0.0000**	**10,617.8297**	**10,617.8297**	**2.6684**	**0.0000**	**10,673.8661**

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

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	5.2106	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724	0.0000	23.7684	23.7684	0.0239	0.0000	24.2693
Energy	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
Mobile	4.2889	10.5073	46.7357	0.0897	6.6995	0.1265	6.8260	1.7909	0.1164	1.9073		7,579.2716	7,579.2716	0.3505		7,586.6324
Total	**9.5916**	**11.4494**	**60.4037**	**0.0954**	**6.6995**	**0.2625**	**6.9620**	**1.7909**	**0.2524**	**2.0433**	**0.0000**	**8,607.3711**	**8,607.3711**	**0.3936**	**0.0184**	**8,621.3452**

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	5.2106	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724	0.0000	23.7684	23.7684	0.0239	0.0000	24.2693
Energy	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
Mobile	4.2889	10.5073	46.7357	0.0897	6.6995	0.1265	6.8260	1.7909	0.1164	1.9073		7,579.2716	7,579.2716	0.3505		7,586.6324
Total	**9.5916**	**11.4494**	**60.4037**	**0.0954**	**6.6995**	**0.2625**	**6.9620**	**1.7909**	**0.2524**	**2.0433**	**0.0000**	**8,607.3711**	**8,607.3711**	**0.3936**	**0.0184**	**8,621.3452**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/26/2015	5	20	
2	Site Preparation	Site Preparation	6/29/2015	7/10/2015	5	10	
3	Grading	Grading	7/13/2015	8/21/2015	5	30	
4	Building Construction	Building Construction	8/24/2015	3/14/2016	5	146	
5	Paving	Paving	1/28/2016	2/24/2016	5	20	
6	Architectural Coating	Architectural Coating	2/25/2016	3/23/2016	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 324,000; Residential Outdoor: 108,000; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	162	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	1	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	115.00	17.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	23.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2015

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	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**		**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0720	0.1110	1.0425	1.5300e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		131.6393	131.6393	8.7500e-003		131.8230
Total	**0.0720**	**0.1110**	**1.0425**	**1.5300e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**131.6393**	**131.6393**	**8.7500e-003**		**131.8230**

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	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858	0.0000	4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0720	0.1110	1.0425	1.5300e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		131.6393	131.6393	8.7500e-003		131.8230
Total	**0.0720**	**0.1110**	**1.0425**	**1.5300e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**131.6393**	**131.6393**	**8.7500e-003**		**131.8230**

3.3 Site Preparation - 2015

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0864	0.1332	1.2510	1.8300e-003	0.1684	1.3900e-003	0.1698	0.0447	1.2500e-003	0.0459		157.9671	157.9671	0.0105		158.1876
Total	**0.0864**	**0.1332**	**1.2510**	**1.8300e-003**	**0.1684**	**1.3900e-003**	**0.1698**	**0.0447**	**1.2500e-003**	**0.0459**		**157.9671**	**157.9671**	**0.0105**		**158.1876**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412	0.0000	4,111.7444	4,111.7444	1.2275		4,137.5224
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**	**0.0000**	**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5224**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0864	0.1332	1.2510	1.8300e-003	0.1684	1.3900e-003	0.1698	0.0447	1.2500e-003	0.0459		157.9671	157.9671	0.0105		158.1876
Total	**0.0864**	**0.1332**	**1.2510**	**1.8300e-003**	**0.1684**	**1.3900e-003**	**0.1698**	**0.0447**	**1.2500e-003**	**0.0459**		**157.9671**	**157.9671**	**0.0105**		**158.1876**

3.4 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3756	0.0000	6.3756	3.3484	0.0000	3.3484			0.0000			0.0000
Off-Road	3.8327	40.4161	26.6731	0.0298		2.3284	2.3284		2.1421	2.1421		3,129.0158	3,129.0158	0.9341		3,148.6328
Total	**3.8327**	**40.4161**	**26.6731**	**0.0298**	**6.3756**	**2.3284**	**8.7039**	**3.3484**	**2.1421**	**5.4905**		**3,129.0158**	**3,129.0158**	**0.9341**		**3,148.6328**

3.4 Grading - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0720	0.1110	1.0425	1.5300e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		131.6393	131.6393	8.7500e-003		131.8230
Total	**0.0720**	**0.1110**	**1.0425**	**1.5300e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**131.6393**	**131.6393**	**8.7500e-003**		**131.8230**

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					6.3756	0.0000	6.3756	3.3484	0.0000	3.3484			0.0000			0.0000
Off-Road	3.8327	40.4161	26.6731	0.0298		2.3284	2.3284		2.1421	2.1421	0.0000	3,129.0158	3,129.0158	0.9341		3,148.6328
Total	**3.8327**	**40.4161**	**26.6731**	**0.0298**	**6.3756**	**2.3284**	**8.7039**	**3.3484**	**2.1421**	**5.4905**	**0.0000**	**3,129.0158**	**3,129.0158**	**0.9341**		**3,148.6328**

3.4 Grading - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0720	0.1110	1.0425	1.5300e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		131.6393	131.6393	8.7500e-003		131.8230
Total	**0.0720**	**0.1110**	**1.0425**	**1.5300e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**131.6393**	**131.6393**	**8.7500e-003**		**131.8230**

3.5 Building Construction - 2015

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	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1982	1.4168	2.3726	2.6400e-003	0.0707	0.0214	0.0921	0.0201	0.0197	0.0398		264.9091	264.9091	2.5100e-003		264.9619
Worker	0.5520	0.8509	7.9925	0.0117	1.0758	8.8500e-003	1.0846	0.2853	8.0100e-003	0.2933		1,009.2344	1,009.2344	0.0671		1,010.6427
Total	**0.7502**	**2.2677**	**10.3651**	**0.0144**	**1.1464**	**0.0303**	**1.1767**	**0.3054**	**0.0277**	**0.3331**		**1,274.1435**	**1,274.1435**	**0.0696**		**1,275.6046**

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	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1982	1.4168	2.3726	2.6400e-003	0.0707	0.0214	0.0921	0.0201	0.0197	0.0398		264.9091	264.9091	2.5100e-003		264.9619
Worker	0.5520	0.8509	7.9925	0.0117	1.0758	8.8500e-003	1.0846	0.2853	8.0100e-003	0.2933		1,009.2344	1,009.2344	0.0671		1,010.6427
Total	**0.7502**	**2.2677**	**10.3651**	**0.0144**	**1.1464**	**0.0303**	**1.1767**	**0.3054**	**0.0277**	**0.3331**		**1,274.1435**	**1,274.1435**	**0.0696**		**1,275.6046**

3.5 Building Construction - 2016

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	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485		2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**		**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1724	1.2508	2.1624	2.6300e-003	0.0707	0.0170	0.0876	0.0201	0.0156	0.0357		262.0717	262.0717	2.1900e-003		262.1176
Worker	0.4744	0.7463	6.9720	0.0117	1.0758	8.1500e-003	1.0839	0.2853	7.4200e-003	0.2927		973.4161	973.4161	0.0597		974.6693
Total	**0.6468**	**1.9971**	**9.1343**	**0.0143**	**1.1464**	**0.0251**	**1.1715**	**0.3054**	**0.0230**	**0.3284**		**1,235.4878**	**1,235.4878**	**0.0619**		**1,236.7869**

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	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485	0.0000	2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**	**0.0000**	**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1724	1.2508	2.1624	2.6300e-003	0.0707	0.0170	0.0876	0.0201	0.0156	0.0357		262.0717	262.0717	2.1900e-003		262.1176
Worker	0.4744	0.7463	6.9720	0.0117	1.0758	8.1500e-003	1.0839	0.2853	7.4200e-003	0.2927		973.4161	973.4161	0.0597		974.6693
Total	**0.6468**	**1.9971**	**9.1343**	**0.0143**	**1.1464**	**0.0251**	**1.1715**	**0.3054**	**0.0230**	**0.3284**		**1,235.4878**	**1,235.4878**	**0.0619**		**1,236.7869**

3.6 Paving - 2016

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	2.0898	22.3859	14.8176	0.0223		1.2610	1.2610		1.1601	1.1601		2,316.3767	2,316.3767	0.6987		2,331.0495
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.0898**	**22.3859**	**14.8176**	**0.0223**		**1.2610**	**1.2610**		**1.1601**	**1.1601**		**2,316.3767**	**2,316.3767**	**0.6987**		**2,331.0495**

3.6 Paving - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0619	0.0974	0.9094	1.5300e-003	0.1403	1.0600e-003	0.1414	0.0372	9.7000e-004	0.0382		126.9673	126.9673	7.7800e-003		127.1308
Total	**0.0619**	**0.0974**	**0.9094**	**1.5300e-003**	**0.1403**	**1.0600e-003**	**0.1414**	**0.0372**	**9.7000e-004**	**0.0382**		**126.9673**	**126.9673**	**7.7800e-003**		**127.1308**

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	2.0898	22.3859	14.8176	0.0223		1.2610	1.2610		1.1601	1.1601	0.0000	2,316.3767	2,316.3767	0.6987		2,331.0495
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.0898**	**22.3859**	**14.8176**	**0.0223**		**1.2610**	**1.2610**		**1.1601**	**1.1601**	**0.0000**	**2,316.3767**	**2,316.3767**	**0.6987**		**2,331.0495**

3.6 Paving - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0619	0.0974	0.9094	1.5300e-003	0.1403	1.0600e-003	0.1414	0.0372	9.7000e-004	0.0382		126.9673	126.9673	7.7800e-003		127.1308
Total	**0.0619**	**0.0974**	**0.9094**	**1.5300e-003**	**0.1403**	**1.0600e-003**	**0.1414**	**0.0372**	**9.7000e-004**	**0.0382**		**126.9673**	**126.9673**	**7.7800e-003**		**127.1308**

3.7 Architectural Coating - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	250.2900					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3685	2.3722	1.8839	2.9700e-003		0.1966	0.1966		0.1966	0.1966		281.4481	281.4481	0.0332		282.1449
Total	**250.6585**	**2.3722**	**1.8839**	**2.9700e-003**		**0.1966**	**0.1966**		**0.1966**	**0.1966**		**281.4481**	**281.4481**	**0.0332**		**282.1449**

3.7 Architectural Coating - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0949	0.1493	1.3944	2.3400e-003	0.2152	1.6300e-003	0.2168	0.0571	1.4800e-003	0.0586		194.6832	194.6832	0.0119		194.9339
Total	**0.0949**	**0.1493**	**1.3944**	**2.3400e-003**	**0.2152**	**1.6300e-003**	**0.2168**	**0.0571**	**1.4800e-003**	**0.0586**		**194.6832**	**194.6832**	**0.0119**		**194.9339**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	250.2900					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3685	2.3722	1.8839	2.9700e-003		0.1966	0.1966		0.1966	0.1966	0.0000	281.4481	281.4481	0.0332		282.1449
Total	**250.6585**	**2.3722**	**1.8839**	**2.9700e-003**		**0.1966**	**0.1966**		**0.1966**	**0.1966**	**0.0000**	**281.4481**	**281.4481**	**0.0332**		**282.1449**

3.7 Architectural Coating - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0949	0.1493	1.3944	2.3400e-003	0.2152	1.6300e-003	0.2168	0.0571	1.4800e-003	0.0586		194.6832	194.6832	0.0119		194.9339
Total	**0.0949**	**0.1493**	**1.3944**	**2.3400e-003**	**0.2152**	**1.6300e-003**	**0.2168**	**0.0571**	**1.4800e-003**	**0.0586**		**194.6832**	**194.6832**	**0.0119**		**194.9339**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.2889	10.5073	46.7357	0.0897	6.6995	0.1265	6.8260	1.7909	0.1164	1.9073		7,579.2716	7,579.2716	0.3505		7,586.6324
Unmitigated	4.2889	10.5073	46.7357	0.0897	6.6995	0.1265	6.8260	1.7909	0.1164	1.9073		7,579.2716	7,579.2716	0.3505		7,586.6324

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	1,054.40	1,145.60	971.20	2,912,381	2,912,381
Total	1,054.40	1,145.60	971.20	2,912,381	2,912,381

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	12.30	5.90	6.40	37.50	15.00	47.50	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.488515	0.036101	0.211699	0.155053	0.049887	0.007463	0.020047	0.014289	0.001917	0.002185	0.008106	0.001606	0.003132

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
NaturalGas Unmitigated	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	8536.82	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
Total		**0.0921**	**0.7867**	**0.3348**	**5.0200e-003**		**0.0636**	**0.0636**		**0.0636**	**0.0636**		**1,004.3312**	**1,004.3312**	**0.0193**	**0.0184**	**1,010.4434**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	8.53682	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
Total		**0.0921**	**0.7867**	**0.3348**	**5.0200e-003**		**0.0636**	**0.0636**		**0.0636**	**0.0636**		**1,004.3312**	**1,004.3312**	**0.0193**	**0.0184**	**1,010.4434**

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	5.2106	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724	0.0000	23.7684	23.7684	0.0239	0.0000	24.2693
Unmitigated	5.2106	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724	0.0000	23.7684	23.7684	0.0239	0.0000	24.2693

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	1.3715					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.4240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4151	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724		23.7684	23.7684	0.0239		24.2693
Total	**5.2106**	**0.1554**	**13.3332**	**7.0000e-004**		**0.0724**	**0.0724**		**0.0724**	**0.0724**	**0.0000**	**23.7684**	**23.7684**	**0.0239**	**0.0000**	**24.2693**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.3715					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.4240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4151	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724		23.7684	23.7684	0.0239		24.2693
Total	**5.2106**	**0.1554**	**13.3332**	**7.0000e-004**		**0.0724**	**0.0724**		**0.0724**	**0.0724**	**0.0000**	**23.7684**	**23.7684**	**0.0239**	**0.0000**	**24.2693**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Orcutt Key Site 3 - Cumulative

Santa Barbara County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Condo/Townhouse	160.00	Dwelling Unit	8.00	160,000.00	435

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2017
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - 2008 Santa Barbara County Housing Element Focused Rezone Program FEIR.

Construction Phase - 10 month construction schedule, one for grading, from 2008 Santa Barbara County Housing Element Focused Rezone Program FEIR.

Woodstoves - No woodstoves assumed.

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	230.00	146.00
tblConstructionPhase	NumDays	20.00	30.00
tblConstructionPhase	PhaseEndDate	4/11/2016	2/24/2016
tblConstructionPhase	PhaseStartDate	8/22/2015	8/24/2015
tblConstructionPhase	PhaseStartDate	7/11/2015	7/13/2015
tblConstructionPhase	PhaseStartDate	3/15/2016	1/28/2016
tblConstructionPhase	PhaseStartDate	6/27/2015	6/29/2015
tblGrading	AcresOfGrading	15.00	10.00
tblLandUse	LotAcreage	10.00	8.00
tblProjectCharacteristics	OperationalYear	2014	2017
tblWoodstoves	WoodstoveDayYear	82.00	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2015	5.3561	57.0416	43.9623	0.0414	18.2346	3.0897	21.3243	9.9753	2.8425	12.8178	0.0000	4,266.0777	4,266.0777	1.2380	0.0000	4,292.0763
2016	254.9034	53.1250	44.7042	0.0647	1.3616	3.2549	4.5416	0.3625	3.0328	3.3755	0.0000	6,319.6372	6,319.6372	1.4305	0.0000	6,349.6768
Total	**260.2595**	**110.1666**	**88.6665**	**0.1061**	**19.5962**	**6.3445**	**25.8659**	**10.3378**	**5.8753**	**16.1933**	**0.0000**	**10,585.7150**	**10,585.7150**	**2.6685**	**0.0000**	**10,641.7531**

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					
2015	5.3561	57.0416	43.9623	0.0414	18.2346	3.0897	21.3243	9.9753	2.8425	12.8178	0.0000	4,266.0777	4,266.0777	1.2380	0.0000	4,292.0763
2016	254.9034	53.1250	44.7042	0.0647	1.3616	3.2549	4.5416	0.3625	3.0328	3.3755	0.0000	6,319.6372	6,319.6372	1.4305	0.0000	6,349.6768
Total	**260.2595**	**110.1666**	**88.6665**	**0.1061**	**19.5962**	**6.3445**	**25.8659**	**10.3378**	**5.8753**	**16.1933**	**0.0000**	**10,585.7150**	**10,585.7150**	**2.6685**	**0.0000**	**10,641.7531**

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

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	5.2106	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724	0.0000	23.7684	23.7684	0.0239	0.0000	24.2693
Energy	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
Mobile	4.7013	11.2597	52.1880	0.0881	6.6995	0.1272	6.8267	1.7909	0.1170	1.9080		7,442.5845	7,442.5845	0.3507		7,449.9493
Total	**10.0039**	**12.2018**	**65.8559**	**0.0938**	**6.6995**	**0.2632**	**6.9628**	**1.7909**	**0.2530**	**2.0440**	**0.0000**	**8,470.6841**	**8,470.6841**	**0.3938**	**0.0184**	**8,484.6621**

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	5.2106	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724	0.0000	23.7684	23.7684	0.0239	0.0000	24.2693
Energy	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
Mobile	4.7013	11.2597	52.1880	0.0881	6.6995	0.1272	6.8267	1.7909	0.1170	1.9080		7,442.5845	7,442.5845	0.3507		7,449.9493
Total	**10.0039**	**12.2018**	**65.8559**	**0.0938**	**6.6995**	**0.2632**	**6.9628**	**1.7909**	**0.2530**	**2.0440**	**0.0000**	**8,470.6841**	**8,470.6841**	**0.3938**	**0.0184**	**8,484.6621**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	6/1/2015	6/26/2015	5	20	
2	Site Preparation	Site Preparation	6/29/2015	7/10/2015	5	10	
3	Grading	Grading	7/13/2015	8/21/2015	5	30	
4	Building Construction	Building Construction	8/24/2015	3/14/2016	5	146	
5	Paving	Paving	1/28/2016	2/24/2016	5	20	
6	Architectural Coating	Architectural Coating	2/25/2016	3/23/2016	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 10

Acres of Paving: 0

Residential Indoor: 324,000; Residential Outdoor: 108,000; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Demolition	Excavators	3	8.00	162	0.38
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Excavators	1	8.00	162	0.38
Building Construction	Cranes	1	7.00	226	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	125	0.42
Paving	Rollers	2	8.00	80	0.38
Demolition	Rubber Tired Dozers	2	8.00	255	0.40
Grading	Rubber Tired Dozers	1	8.00	255	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	174	0.41
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Paving Equipment	2	8.00	130	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	255	0.40
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	115.00	17.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	23.00	0.00	0.00	12.30	4.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2015

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	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858		4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**		**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0793	0.1266	1.1088	1.4900e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		128.6112	128.6112	8.7500e-003		128.7948
Total	**0.0793**	**0.1266**	**1.1088**	**1.4900e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**128.6112**	**128.6112**	**8.7500e-003**		**128.7948**

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	4.5083	48.3629	36.0738	0.0399		2.4508	2.4508		2.2858	2.2858	0.0000	4,127.1934	4,127.1934	1.1188		4,150.6886
Total	**4.5083**	**48.3629**	**36.0738**	**0.0399**		**2.4508**	**2.4508**		**2.2858**	**2.2858**	**0.0000**	**4,127.1934**	**4,127.1934**	**1.1188**		**4,150.6886**

3.2 Demolition - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0793	0.1266	1.1088	1.4900e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		128.6112	128.6112	8.7500e-003		128.7948
Total	**0.0793**	**0.1266**	**1.1088**	**1.4900e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**128.6112**	**128.6112**	**8.7500e-003**		**128.7948**

3.3 Site Preparation - 2015

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412		4,111.7444	4,111.7444	1.2275		4,137.5225
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**		**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5225**

3.3 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0951	0.1519	1.3305	1.7900e-003	0.1684	1.3900e-003	0.1698	0.0447	1.2500e-003	0.0459		154.3334	154.3334	0.0105		154.5538
Total	**0.0951**	**0.1519**	**1.3305**	**1.7900e-003**	**0.1684**	**1.3900e-003**	**0.1698**	**0.0447**	**1.2500e-003**	**0.0459**		**154.3334**	**154.3334**	**0.0105**		**154.5538**

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					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	5.2609	56.8897	42.6318	0.0391		3.0883	3.0883		2.8412	2.8412	0.0000	4,111.7444	4,111.7444	1.2275		4,137.5224
Total	**5.2609**	**56.8897**	**42.6318**	**0.0391**	**18.0663**	**3.0883**	**21.1545**	**9.9307**	**2.8412**	**12.7719**	**0.0000**	**4,111.7444**	**4,111.7444**	**1.2275**		**4,137.5224**

3.3 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0951	0.1519	1.3305	1.7900e-003	0.1684	1.3900e-003	0.1698	0.0447	1.2500e-003	0.0459		154.3334	154.3334	0.0105		154.5538
Total	**0.0951**	**0.1519**	**1.3305**	**1.7900e-003**	**0.1684**	**1.3900e-003**	**0.1698**	**0.0447**	**1.2500e-003**	**0.0459**		**154.3334**	**154.3334**	**0.0105**		**154.5538**

3.4 Grading - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.3756	0.0000	6.3756	3.3484	0.0000	3.3484			0.0000			0.0000
Off-Road	3.8327	40.4161	26.6731	0.0298		2.3284	2.3284		2.1421	2.1421		3,129.0158	3,129.0158	0.9341		3,148.6328
Total	**3.8327**	**40.4161**	**26.6731**	**0.0298**	**6.3756**	**2.3284**	**8.7039**	**3.3484**	**2.1421**	**5.4905**		**3,129.0158**	**3,129.0158**	**0.9341**		**3,148.6328**

3.4 Grading - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0793	0.1266	1.1088	1.4900e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		128.6112	128.6112	8.7500e-003		128.7948
Total	**0.0793**	**0.1266**	**1.1088**	**1.4900e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**128.6112**	**128.6112**	**8.7500e-003**		**128.7948**

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					6.3756	0.0000	6.3756	3.3484	0.0000	3.3484			0.0000			0.0000
Off-Road	3.8327	40.4161	26.6731	0.0298		2.3284	2.3284		2.1421	2.1421	0.0000	3,129.0158	3,129.0158	0.9341		3,148.6328
Total	**3.8327**	**40.4161**	**26.6731**	**0.0298**	**6.3756**	**2.3284**	**8.7039**	**3.3484**	**2.1421**	**5.4905**	**0.0000**	**3,129.0158**	**3,129.0158**	**0.9341**		**3,148.6328**

3.4 Grading - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0793	0.1266	1.1088	1.4900e-003	0.1403	1.1500e-003	0.1415	0.0372	1.0400e-003	0.0383		128.6112	128.6112	8.7500e-003		128.7948
Total	**0.0793**	**0.1266**	**1.1088**	**1.4900e-003**	**0.1403**	**1.1500e-003**	**0.1415**	**0.0372**	**1.0400e-003**	**0.0383**		**128.6112**	**128.6112**	**8.7500e-003**		**128.7948**

3.5 Building Construction - 2015

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	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904		2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**		**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2476	1.4387	3.2986	2.6200e-003	0.0707	0.0219	0.0926	0.0201	0.0201	0.0402		261.7927	261.7927	2.6000e-003		261.8474
Worker	0.6078	0.9707	8.5006	0.0115	1.0758	8.8500e-003	1.0846	0.2853	8.0100e-003	0.2933		986.0188	986.0188	0.0671		987.4271
Total	**0.8554**	**2.4095**	**11.7992**	**0.0141**	**1.1464**	**0.0308**	**1.1772**	**0.3054**	**0.0281**	**0.3336**		**1,247.8115**	**1,247.8115**	**0.0697**		**1,249.2745**

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	3.6591	30.0299	18.7446	0.0268		2.1167	2.1167		1.9904	1.9904	0.0000	2,689.5771	2,689.5771	0.6748		2,703.7483
Total	**3.6591**	**30.0299**	**18.7446**	**0.0268**		**2.1167**	**2.1167**		**1.9904**	**1.9904**	**0.0000**	**2,689.5771**	**2,689.5771**	**0.6748**		**2,703.7483**

3.5 Building Construction - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2476	1.4387	3.2986	2.6200e-003	0.0707	0.0219	0.0926	0.0201	0.0201	0.0402		261.7927	261.7927	2.6000e-003		261.8474
Worker	0.6078	0.9707	8.5006	0.0115	1.0758	8.8500e-003	1.0846	0.2853	8.0100e-003	0.2933		986.0188	986.0188	0.0671		987.4271
Total	**0.8554**	**2.4095**	**11.7992**	**0.0141**	**1.1464**	**0.0308**	**1.1772**	**0.3054**	**0.0281**	**0.3336**		**1,247.8115**	**1,247.8115**	**0.0697**		**1,249.2745**

3.5 Building Construction - 2016

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	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485		2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**		**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2149	1.2697	3.0555	2.6200e-003	0.0707	0.0173	0.0880	0.0201	0.0159	0.0360		258.9723	258.9723	2.2700e-003		259.0199
Worker	0.5199	0.8520	7.3640	0.0114	1.0758	8.1500e-003	1.0839	0.2853	7.4200e-003	0.2927		950.9631	950.9631	0.0597		952.2163
Total	**0.7348**	**2.1216**	**10.4195**	**0.0141**	**1.1464**	**0.0255**	**1.1719**	**0.3054**	**0.0233**	**0.3288**		**1,209.9354**	**1,209.9354**	**0.0620**		**1,211.2362**

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	3.4062	28.5063	18.5066	0.0268		1.9674	1.9674		1.8485	1.8485	0.0000	2,669.2864	2,669.2864	0.6620		2,683.1890
Total	**3.4062**	**28.5063**	**18.5066**	**0.0268**		**1.9674**	**1.9674**		**1.8485**	**1.8485**	**0.0000**	**2,669.2864**	**2,669.2864**	**0.6620**		**2,683.1890**

3.5 Building Construction - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.2149	1.2697	3.0555	2.6200e-003	0.0707	0.0173	0.0880	0.0201	0.0159	0.0360		258.9723	258.9723	2.2700e-003		259.0199
Worker	0.5199	0.8520	7.3640	0.0114	1.0758	8.1500e-003	1.0839	0.2853	7.4200e-003	0.2927		950.9631	950.9631	0.0597		952.2163
Total	**0.7348**	**2.1216**	**10.4195**	**0.0141**	**1.1464**	**0.0255**	**1.1719**	**0.3054**	**0.0233**	**0.3288**		**1,209.9354**	**1,209.9354**	**0.0620**		**1,211.2362**

3.6 Paving - 2016

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	2.0898	22.3859	14.8176	0.0223		1.2610	1.2610		1.1601	1.1601		2,316.3767	2,316.3767	0.6987		2,331.0495
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.0898**	**22.3859**	**14.8176**	**0.0223**		**1.2610**	**1.2610**		**1.1601**	**1.1601**		**2,316.3767**	**2,316.3767**	**0.6987**		**2,331.0495**

3.6 Paving - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0678	0.1111	0.9605	1.4900e-003	0.1403	1.0600e-003	0.1414	0.0372	9.7000e-004	0.0382		124.0387	124.0387	7.7800e-003		124.2021
Total	**0.0678**	**0.1111**	**0.9605**	**1.4900e-003**	**0.1403**	**1.0600e-003**	**0.1414**	**0.0372**	**9.7000e-004**	**0.0382**		**124.0387**	**124.0387**	**7.7800e-003**		**124.2021**

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	2.0898	22.3859	14.8176	0.0223		1.2610	1.2610		1.1601	1.1601	0.0000	2,316.3767	2,316.3767	0.6987		2,331.0495
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.0898**	**22.3859**	**14.8176**	**0.0223**		**1.2610**	**1.2610**		**1.1601**	**1.1601**	**0.0000**	**2,316.3767**	**2,316.3767**	**0.6987**		**2,331.0495**

3.6 Paving - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0678	0.1111	0.9605	1.4900e-003	0.1403	1.0600e-003	0.1414	0.0372	9.7000e-004	0.0382		124.0387	124.0387	7.7800e-003		124.2021
Total	**0.0678**	**0.1111**	**0.9605**	**1.4900e-003**	**0.1403**	**1.0600e-003**	**0.1414**	**0.0372**	**9.7000e-004**	**0.0382**		**124.0387**	**124.0387**	**7.7800e-003**		**124.2021**

3.7 Architectural Coating - 2016

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	250.2900					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3685	2.3722	1.8839	2.9700e-003		0.1966	0.1966		0.1966	0.1966		281.4481	281.4481	0.0332		282.1449
Total	**250.6585**	**2.3722**	**1.8839**	**2.9700e-003**		**0.1966**	**0.1966**		**0.1966**	**0.1966**		**281.4481**	**281.4481**	**0.0332**		**282.1449**

3.7 Architectural Coating - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1040	0.1704	1.4728	2.2900e-003	0.2152	1.6300e-003	0.2168	0.0571	1.4800e-003	0.0586		190.1926	190.1926	0.0119		190.4433
Total	**0.1040**	**0.1704**	**1.4728**	**2.2900e-003**	**0.2152**	**1.6300e-003**	**0.2168**	**0.0571**	**1.4800e-003**	**0.0586**		**190.1926**	**190.1926**	**0.0119**		**190.4433**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	250.2900					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3685	2.3722	1.8839	2.9700e-003		0.1966	0.1966		0.1966	0.1966	0.0000	281.4481	281.4481	0.0332		282.1449
Total	**250.6585**	**2.3722**	**1.8839**	**2.9700e-003**		**0.1966**	**0.1966**		**0.1966**	**0.1966**	**0.0000**	**281.4481**	**281.4481**	**0.0332**		**282.1449**

3.7 Architectural Coating - 2016

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1040	0.1704	1.4728	2.2900e-003	0.2152	1.6300e-003	0.2168	0.0571	1.4800e-003	0.0586		190.1926	190.1926	0.0119		190.4433
Total	**0.1040**	**0.1704**	**1.4728**	**2.2900e-003**	**0.2152**	**1.6300e-003**	**0.2168**	**0.0571**	**1.4800e-003**	**0.0586**		**190.1926**	**190.1926**	**0.0119**		**190.4433**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.7013	11.2597	52.1880	0.0881	6.6995	0.1272	6.8267	1.7909	0.1170	1.9080		7,442.5845	7,442.5845	0.3507		7,449.9493
Unmitigated	4.7013	11.2597	52.1880	0.0881	6.6995	0.1272	6.8267	1.7909	0.1170	1.9080		7,442.5845	7,442.5845	0.3507		7,449.9493

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	1,054.40	1,145.60	971.20	2,912,381	2,912,381
Total	1,054.40	1,145.60	971.20	2,912,381	2,912,381

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Condo/Townhouse	12.30	5.90	6.40	37.50	15.00	47.50	86	11	3

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.488515	0.036101	0.211699	0.155053	0.049887	0.007463	0.020047	0.014289	0.001917	0.002185	0.008106	0.001606	0.003132

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
NaturalGas Unmitigated	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	8536.82	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
Total		**0.0921**	**0.7867**	**0.3348**	**5.0200e-003**		**0.0636**	**0.0636**		**0.0636**	**0.0636**		**1,004.3312**	**1,004.3312**	**0.0193**	**0.0184**	**1,010.4434**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Condo/Townhouse	8.53682	0.0921	0.7867	0.3348	5.0200e-003		0.0636	0.0636		0.0636	0.0636		1,004.3312	1,004.3312	0.0193	0.0184	1,010.4434
Total		**0.0921**	**0.7867**	**0.3348**	**5.0200e-003**		**0.0636**	**0.0636**		**0.0636**	**0.0636**		**1,004.3312**	**1,004.3312**	**0.0193**	**0.0184**	**1,010.4434**

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	5.2106	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724	0.0000	23.7684	23.7684	0.0239	0.0000	24.2693
Unmitigated	5.2106	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724	0.0000	23.7684	23.7684	0.0239	0.0000	24.2693

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	1.3715					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.4240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4151	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724		23.7684	23.7684	0.0239		24.2693
Total	**5.2106**	**0.1554**	**13.3332**	**7.0000e-004**		**0.0724**	**0.0724**		**0.0724**	**0.0724**	**0.0000**	**23.7684**	**23.7684**	**0.0239**	**0.0000**	**24.2693**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	1.3715					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	3.4240					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4151	0.1554	13.3332	7.0000e-004		0.0724	0.0724		0.0724	0.0724		23.7684	23.7684	0.0239		24.2693
Total	**5.2106**	**0.1554**	**13.3332**	**7.0000e-004**		**0.0724**	**0.0724**		**0.0724**	**0.0724**	**0.0000**	**23.7684**	**23.7684**	**0.0239**	**0.0000**	**24.2693**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Vegetation

Greenhouse Gas Emission Worksheet

N20 Mobile Emissions Orcutt Key Site 3 SEIR - MR-O

From URBEMIS 2007 Vehicle Fleet Mix Output:

Annual VMT: 2,912,381

Vehicle Type	Percent Type	CH4 Emission Factor (g/mile)*	CH4 Emission (g/mile)**	N2O Emission Factor (g/mile)*	N2O Emission (g/mile)**
Light Auto	46.0%	0.04	0.0184	0.04	0.0184
Light Truck < 3750 lbs	10.3%	0.05	0.00515	0.06	0.00618
Light Truck 3751-5750 lbs	23.2%	0.05	0.0116	0.06	0.01392
Med Truck 5751-8500 lbs	12.2%	0.12	0.01464	0.2	0.0244
Lite-Heavy Truck 8501-10,000 lbs	2.1%	0.12	0.00252	0.2	0.0042
Lite-Heavy Truck 10,001-14,000 lbs	0.5%	0.09	0.00045	0.125	0.000625
Med-Heavy Truck 14,001-33,000 lbs	1.0%	0.06	0.0006	0.05	0.0005
Heavy-Heavy Truck 33,001-60,000 lbs	2.9%	0.06	0.00174	0.05	0.00145
Other Bus	0.1%	0.06	0.00006	0.05	0.00005
Urban Bus	0.1%	0.06	0.00006	0.05	0.00005
Motorcycle	1.1%	0.09	0.00099	0.01	0.00011
School Bus	0.1%	0.06	0.00006	0.05	0.00005
Motor Home	0.4%	0.09	0.00036	0.125	0.0005
Total	**100.0%**		**0.05663**		**0.070435**

Total Emissions (metric tons) =
Emission Factor by Vehicle Mix (g/mi) x Annual VMT(mi) x 0.000001 metric tons/g

Conversion to Carbon Dioxide Equivalency (CO2e) Units based on Global Warming Potential (GWP)

CH4	21	GWP
N2O	310	GWP
1 ton (short, US) =	0.90718474	metric ton

Annual Mobile Emissions:

	Total Emissions		Total CO2e units	
N20 Emissions:	0.2051	metric tons N2O	**63.59**	metric tons CO2e
		Project Total:	***63.59 metric tons CO2e***	

References

* from Table C.4: Methane and Nitrous Oxide Emission Factors for Mobile Sources by Vehicle and Fuel Type (g/mile).
in California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.
Assume Model year 2000-present, gasoline fueled.

** Source: California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1, January 2009.

*** From URBEMIS 2007 results for mobile sources

US Highway 101
Health Risk Assessment

Orcutt Key Site 3
Santa Barbara County, California

Prepared for:

County of Santa Barbara

Prepared by:

Rincon Consultants, Inc.
September 27, 2008



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September 27, 2008
Project No. 07-61691

Michael Hays, Project Manager
Santa Barbara County Planning and Development Department
Development Review Division
624 W. Foster Road
Santa Maria, California 93455

HEALTH RISK ASSESSMENT
Orcutt Key Site 3
Santa Barbara County, California

Dear Mr. Hays:

Rincon Consultants is pleased to submit the attached Health Risk Assessment (HRA) concerning Orcutt Key Site 3. This analysis was performed to determine the health risks associated with air toxics related to the freeway sources along the project's eastern frontage. The HRA determined that the proposed residential housing nearest to the freeway would be at the marginal location for significance, with an excess cancer risk of about 30 in one million for lifetime residency, which exceeds the Santa Barbara County Air Pollution Control District recommended health risk criteria for excess cancer of 10 in one million. Because people in a residential environment spend the vast majority of time indoors and not outdoors, mitigation recommendations are provided to reduce the concentration of air toxics within the indoor environment and so reduce the overall level of risk to a less than significant level.

If you have any questions regarding these studies, or if we can provide you with other environmental consulting services, please feel free to contact us.

Sincerely,

RINCON CONSULTANTS, INC.

Duane Vander Pluym, D.ESE
Principal

HEALTH RISK ASSESSMENT
US Highway 101
Orcutt Key Site 3

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HEALTH RISK ASSESSMENT
US Highway 101

Orcutt Key Site 3
Santa Barbara County

This health risk assessment analyzes the possible impacts associated with the proposed Orcutt Key Site 3 project in unincorporated Santa Barbara County (Orcutt). The report has been prepared under contract to the County of Santa Barbara and is intended to be used as information in the decision making process regarding land use permits for this site and for environmental documentation under the California Environmental Quality Act.

SUMMARY

The proposed project involves a Comprehensive Plan Amendment, Rezone, Vesting Tentative Tract Map and Development Plan entitlements to subdivide an existing 137.1-acre parcel into 117 parcels and develop 313 single family units in a variety of product types ranging from Town Homes to Ranchettes. The project site is located along the west side of US Highway 101 and the California Air Resources Board (CARB) currently recommends that local agencies avoid siting new sensitive land uses, including residences, within 500 feet of a freeway (CARB, *Air Quality and Land Use Handbook*, April 2005). The primary concern is the effect of diesel exhaust particulates, a toxic air contaminant, on these adjacent sensitive uses. The source of the diesel exhaust particulates are the heavy-duty trucks that utilize the interstate freeway system. The analysis also examined five other vehicle exhaust pollutants of concern: acrolein, acetaldehyde, formaldehyde, benzene, and 1,3-butadiene.

An analysis using the CARB Hotspots Analysis and Reporting Program (HARP) determined that the proposed residences within the site nearest to the freeway would be exposed to an excess cancer risk of about 30 in one million, which exceeds the Santa Barbara County Air Pollution Control District (SBCAPCD) recommended health risk criteria for excess cancer of 10 in one million. This analysis is based on outdoor air concentrations and assumes that interior concentrations would be the same for a conservative "worst case" analysis. This impact is based on a 30-year and lifetime (70 year) residency and that on a child (9-year residency); health effects for the average (50-percentile) residency of 9 years for an adult would be less than 10 per million.

USEPA activity factors show that people in a residential environment spend only a small portion of the day on an average basis outdoors. Therefore, a mitigation measure is recommended that includes forced air ventilation with filter screens on outside air intake ducts to be provided for all residences within 500 feet of the freeway. This would provide a clean interior environment and reduce the future residents' exposure to toxic air contaminants associated with US Highway 101 to below the 10 in one million level.

PROJECT SITE AND DESCRIPTION

The Orcutt Key Site 3 is located on the west side of Highway 101, approximately ¼ mile south of Clark Avenue in the southeastern section of the Orcutt Planning Area within unincorporated Santa Barbara County. The 137.1-acre site is bounded by Highway 101 on the east, which traverses in a northwest-southeast direction adjacent to the site. The Sunny Hills mobile home park borders the site on the north; agriculture borders the site to the northeast, east, and southeast across Highway 101 (including a few agricultural residences); rural density ranchettes border the site to the west; and the undeveloped Solomon Hills and grazing land border the site to the south. Figure 1 shows the regional location of the project site, while Figure 2 shows the site within its local context.

The project would establish three residential zones on 106 acres and one recreation zone on 31.1 acres of the project site. The residential zones would be developed with a total of 313 units. Primary access to the site would be provided via Sunny Hills Road, which currently connects to Clark Avenue approximately 400 feet west of the Highway 101 southbound ramps. The project proposes to realign Sunny Hills Road to connect with Clark Avenue west of its current location. This alignment would be consistent with the preferred alignment identified in the Orcutt Community Plan Final EIR, and would serve as primary access for Key Sites 1, 2 and 3.

AIR QUALITY BACKGROUND

Local Climate and Meteorology

The semi-permanent high pressure system west of the Pacific coast strongly influences California's weather. It creates sunny skies throughout the summer and influences the pathway and occurrence of low pressure weather systems that bring rainfall to the area during October through April. As a result, wintertime temperatures in Santa Barbara County are generally mild, while summers are warm and dry.

Santa Barbara County's air quality is influenced by both local topography and meteorological conditions. Surface and upper-level wind flow varies both seasonally and geographically in the county and inversion conditions common to the area can affect the vertical mixing and dispersion of pollutants. The prevailing wind flow patterns in the county are not necessarily those that cause high ozone values. In fact, high ozone values are often associated with atypical wind flow patterns.

Semi-permanent high pressure that lies off the Pacific Coast leads to limited rainfall (around 18 inches per year), with warm, dry summers and relatively damp winters. Maximum summer temperatures average about 70 degrees Fahrenheit near the coast and in the high 80s to 90s inland. During winter, average minimum temperatures range from the 40s along the coast to the 30s inland. Additionally, cool, humid, marine air causes frequent fog and low clouds along the coast, generally during the night and morning hours in the late spring and early summer. The fog and low clouds can persist for several days until broken up by a change in the weather pattern.

In the northern portion of the County (north of the ridgeline of the Santa Ynez Mountains), the sea breeze (from sea to land) is typically northwesterly throughout the year while the prevailing sea breeze in the southern portion of the county is from the southwest. During summer, these winds are stronger and persist later into the night. At night, the sea breeze weakens and is replaced by light land breezes (from land to sea). The alternation of the land-sea breeze cycle can sometimes produce a "sloshing" effect, where pollutants are swept offshore at night and subsequently carried back onshore during the day. This effect is exacerbated during periods when wind speeds are low.

The terrain around Point Conception, combined with the change in orientation of the coastline from north-south to east-west can cause counterclockwise circulation (eddies) to form east of the Point. These eddies fluctuate temporally and spatially, often leading to highly variable winds along the southern coastal strip. Point Conception also marks the change in the prevailing surface winds from northwesterly to southwesterly.

Santa Ana winds are northeasterly winds that occur primarily during fall and winter, but occasionally in spring. These are warm, dry winds blown from the high inland desert that descend down the slopes of a mountain range. Wind speeds associated with Santa Ana's are generally 15-20 mph, though they can sometimes reach speeds in excess of 60 mph. During Santa Ana conditions, pollutants emitted in Santa Barbara, Ventura County, and the South Coast Air Basin (the Los Angeles region) are moved out to sea. These pollutants can then be moved back onshore into Santa Barbara County in what is called a "post-Santa Ana condition." The effects of the post-Santa Ana condition can be experienced throughout the county. Not all post-Santa Ana conditions, however, lead to high pollutant concentrations in Santa Barbara County.

Upper-level winds (measured at Vandenberg Air Force Base once each morning and afternoon) are generally from the north or northwest throughout the year, but occurrences of southerly and easterly winds do occur in winter, especially during the morning. Upper-level winds from the south and east are infrequent during the summer. When they do occur, they are usually associated with periods of high ozone levels. Surface and upper-level winds can move pollutants that originate in other areas into the county.

Surface temperature inversions (0-500 ft.) are most frequent during the winter, and subsidence inversions (1000-2000 ft.) are most frequent during the summer. Inversions are an increase in temperature with height and are directly related to the stability of the atmosphere. Inversions act as a cap to the pollutants that are emitted below or within them and ozone concentrations are often higher directly below the base of elevated inversions than they are at the earth's surface. For this reason, elevated monitoring sites will occasionally record higher ozone concentrations than sites at lower elevations. Generally, the lower the inversion base height and the greater the rate of temperature increase from the base to the top, the more pronounced effect the inversion will have on inhibiting vertical dispersion. The subsidence inversion is very common during summer along the California coast, and is one of the principal causes of air stagnation.

Poor air quality is usually associated with "air stagnation" (high stability/restricted air movement). Therefore, it is reasonable to expect a higher frequency of pollution events in the southern portion of the county where light winds are frequently observed, as opposed to the northern part of the County where the prevailing winds are usually strong and persistent.

Air Pollutants of Concern

The primary air pollutants of concern in Santa Barbara County are ozone (O_3) and suspended particulates (PM_{10} and $PM_{2.5}$), as described below.

- Ozone. Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_x) and reactive organic compounds (ROC). Nitrogen oxides are formed during the combustion of fuels, while reactive organic gases are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in serious concentrations between the months of May and October. Ozone is a pungent, colorless toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

- Suspended Particulates. PM_{10} is small particulate matter measuring no more than 10 microns in diameter. It is mostly composed of dust particles, nitrates, and sulfates. PM_{10} is a by-product of fuel combustion and wind erosion of soil and unpaved roads, and is directly emitted into the atmosphere through these processes. PM_{10} is also created in the atmosphere through chemical reactions. PM_{10} poses a health concern because they can be inhaled into and accumulate in the respiratory system. Particles less than 2.5 micrometers in diameter ($PM_{2.5}$) are referred to as "fine" particles and are believed to pose the greatest health risks. Because of their small size (approximately 1/30th the average width of a human hair), fine particles can lodge deeply into the lungs. Fine particulate matter is composed primarily as a by-product of combustion, while matter between 2.5 and 10 microns is mostly dust from roads and grinding or crushing operations. Fine particulate matter poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the fine particulate matter that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

An important fraction of the particulate matter emission inventory is that formed by diesel engine fuel combustion. Particulates in diesel emissions are very small and readily respirable. The particles have hundreds of chemicals adsorbed onto their surfaces, including many known or suspected mutagens and carcinogens. The California Office of Environmental Health Hazard Assessment (OEHHA) reviewed and evaluated the potential for diesel exhaust to affect human health, and the associated scientific uncertainties (California EPA, ARB, April 1998). Based on the available scientific evidence, it was determined that a level of diesel PM exposure below

which no carcinogenic effects are anticipated has not been identified. The Scientific Review Panel that approved the OEHHA report determined that based on studies to date that 3×10^{-4} $(\mu g/m^3)^{-1}$ is a reasonable estimate of the unit risk for diesel PM. This means that a person exposed to a diesel PM concentration of 1 $\mu g/m^3$ continuously over the course of a lifetime has a 3 per 10,000 chance (or 300 in one million chance) of contracting cancer due to this exposure. Based on an estimated Year 2000 statewide average concentration of 1.26 $\mu g/m^3$ for indoor and outdoor ambient air, about 380 excess cancers per one million population could be expected if diesel PM concentrations remained the same (CARB, October 2000). Therefore, these particulate emissions have been determined by the CARB to be a toxic air contaminant (TAC).

Compared to other air toxics the CARB has identified and controlled, diesel PM emissions are estimated to be responsible for about 70% of the total ambient air toxics risk. In addition to these general risks, diesel PM can also be responsible for elevated localized or near-source exposures ("hot-spots"). Depending on the activity and nearness to receptors, these potential risks can range from small to 1,500 per million or more (CARB, October 2000). Risk characterization scenarios have been conducted by the ARB staff to determine the potential excess cancer risks involved due to the location of individuals near to various sources of diesel engine emissions, ranging from school buses to high volume freeways. The purpose of the risk characterization was to estimate, through air dispersion modeling, the cancer risk associated with typical diesel-fueled engine or vehicle activities based on modeled PM concentration at the point of maximum impact (PMI). The study included various sources of diesel PM emissions, including idling school buses, truck stops, low and high volume freeways, and other sources. High volume freeways were estimated to cause 800-1,700 per million potential excess cancers, while low volume freeways (similar to US Highway 101 at the site) were estimated to cause about 100 – 200 per million potential excess cancers. Please see further discussion concerning risk levels below in the Analysis Methodology section.

Besides diesel PM, several other pollutants are emitted by vehicle exhausts that are a public health concern. The US Environmental Protection Agency (USEPA) has identified six pollutants of highest priority: diesel particulate matter (DPM), acrolein, acetaldehyde, formaldehyde, benzene, and 1,3-butadiene. The latter five pollutants are part of the total organic gases emitted by vehicles. The following is a brief description of these chemicals:

- Acrolein. Acrolein is the simplest unsaturated aldehyde. It is a widely produced substance with a piercing, disagreeable, acrid smell similar to that of burning fat. Acrolein is an unstable toxic substance that can burn the nose and throat and is a severe pulmonary irritant. It is a flammable and poisonous substance prepared industrially by the oxidation of propene. Small amounts of acrolein are formed and enter the air when trees, tobacco, other plants, gasoline, and oil are burned.

- Acetaldehyde. Acetaldehyde, sometimes known as ethanal, is an organic chemical compound used as an intermediate in the production of acetic acid, certain esters, and a number of other chemicals. It is a flammable liquid with a fruity smell. Acetaldehyde is toxic when applied externally for prolonged periods, an irritant, and a probable carcinogen.

- Formaldehyde. Formaldehyde is an organic chemical compound containing a terminal carbonyl group. It is produced in the atmosphere by the action of sunlight and oxygen on atmospheric methane and other hydrocarbons; thus, it becomes part of smog. Additionally, formaldehyde is an intermediate in the oxidation (or combustion) of methane as well as other carbon compounds including automobile exhaust. Formaldehyde is a flammable substance that can be toxic, allergenic, and a carcinogen. It is naturally made in small amounts in human bodies and is found in small amounts in household sources, such as fiberglass, carpets, permanent press fabrics, paper products, and some household cleaners.

- Benzene. Benzene, or benzol, is an organic chemical compound and a known carcinogen. It is a colorless and highly flammable liquid with a sweet smell and a relatively high melting point. Benzene is an important industrial solvent and precursor in the production of drugs, plastics, synthetic rubber, and dyes. Benzene is a natural constituent of crude oil, and may be synthesized from other compounds present in petroleum, and is found in gasoline, and cigarette smoke. Natural sources of benzene include emissions from volcanoes and forest fires.

- 1,3-Butadiene. 1,3-Butadiene is an important industrial chemical used in the production of synthetic rubber (about 75% of the manufactured 1,3-butadiene), which is then used primarily in the production of automobile tires. It is a colorless gas with a mild gasoline-like odor and small amounts are contained in gasoline and exhausted into the air after the combustion process. It is a carcinogen and highly irritative and flammable.

AIR QUALITY REGULATION

The federal and state governments have established ambient air quality standards for the protection of public health. The U.S. Environmental Protection Agency (USEPA) is the federal agency designated to administer air quality regulation, while the California Air Resources Board (ARB) is the state equivalent in the California Environmental Protection Agency. County-level Air Pollution Control Districts (APCDs) provide local management of air quality. The ARB has established air quality standards and is responsible for the control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has established 14 air basins statewide.

The USEPA has set primary national ambient air quality standards (NAAQS) for ozone, CO, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead (Pb). Primary standards are those levels of air quality deemed necessary, with an adequate margin of safety, to protect public health. In addition, the State of California has established health-based ambient air quality standards for these and other pollutants, some of which are more stringent than the federal standards. Table 1 lists the current federal and state standards for regulated pollutants.

Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standards	California Standard
Ozone	1-Hour	---	0.09 ppm
	8-Hour	0.075 ppm	0.07 ppm
Carbon Monoxide	8-Hour	9.0 ppm	9.0 ppm
	1-Hour	35.0 ppm	20.0 ppm
Nitrogen Dioxide	Annual	0.053 ppm	0.030 ppm
	1-Hour	---	0.18 ppm
Sulfur Dioxide	Annual	0.03 ppm	---
	24-Hour	0.14 ppm	0.04 ppm
	1-Hour	---	0.25 ppm
PM_{10}	Annual	---	20 $\mu g/m^3$
	24-Hour	150 $\mu g/m^3$	50 $\mu g/m^3$
$PM_{2.5}$	Annual	15 $\mu g/m^3$	12 $\mu g/m^3$
	24-Hour	35 $\mu g/m^3$	--
Lead	30-Day Average	---	1.5 $\mu g/m^3$
	3-Month Average	1.5 $\mu g/m^3$	---

ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
Source: California Air Resources Board, September 17, 2008

Orcutt is located in the Santa Barbara County portion of the South Central Coast Air Basin. The Santa Barbara County Air Pollution Control District (SBCAPCD) is the designated air quality control agency in the Santa Barbara County portion of the Basin. Santa Barbara County is currently in attainment of the federal 8-hour ozone standard and the state 1-hour ozone standard. The County does not meet the state 8-hour ozone standard or the state standard for PM_{10}. No federal non-attainment designations are currently applied to Santa Barbara County; however, not enough data exists to determine the County's attainment status for either the federal or state $PM_{2.5}$ standards.

CURRENT AIR QUALITY

The Air Quality Monitoring Station in Santa Maria is the nearest of the seventeen SBCAPCD monitoring stations to the project site. The station is located approximately 4 miles north of Keysite 3 at 908 South Broadway in the City of Santa Maria. The monitoring station measures ozone, CO, $PM_{2.5}$, and PM_{10}. Table 2 summarizes the annual air quality data for the north County local airshed over the past three years for the Santa Maria Station.

Table 2

Ambient Air Quality at the Santa Maria Monitoring Station

Pollutant	**2005**	**2006**	**2007**
Ozone (ppm), Worst Hour	0.063	0.064	0.065
Number of days of State exceedances (>0.09 ppm)	0	0	0
Ozone (ppm), 8-hr average	0.061	0.062	0.054
Number of days of State exceedances (>0.07 ppm)	0	0	0
Number of days of Federal exceedances (>0.075 ppm)	0	0	0
Carbon Monoxide (ppm), Highest 8-Hour Average	0.94	0.72	0.89
Number of days of above State or Federal standard (>9.0 ppm)	0	0	0
Particulate Matter <10 microns, $\mu g/m^3$, Worst 24 Hours	43.0	54.0	58.0
Number of days above State standard (>50 $\mu g/m^3$)	0	1	10
Number of days above Federal standard (>150 $\mu g/m^3$)	0	0	0
Particulate Matter <2.5 microns, $\mu g/m^3$, Worst 24 Hours	29.8	13.7	18.7
Number of days above Federal standard (>65 $\mu g/m^3$)	0	0	0

Source: ARB Top Four Summary available at www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/start

As indicated in the above table, the State standard for PM_{10} was exceeded once in 2006 and ten times in 2007. The exceedances in 2007 are attributable to a May 2007 upgrade of the Santa Maria Monitoring Station to a real-time system that measures ambient air quality every day, rather than once every six days (Joel Cordes, Principal Monitoring Specialist, SBCAPCD, personal communication, July 24, 2008). Therefore, the increase in exceedances from 2006 to 2007 is the result of additional days being monitored, rather than decreased air quality. There have been no exceedances of the federal standards for any of the criteria pollutants in the last three years.

ANALYSIS METHODOLOGY

Mobile source air toxics emissions associated with vehicle traffic on Highway 101 were estimated based on the methodology developed by the UC Davis-Caltrans Air Quality Project "*Estimating Mobile Source Air Toxics Emissions: A Step-By-Step Project Analysis Methodology* (December 2006). This spreadsheet application generates the total amount of the above six pollutants of concern based on EMFAC2007 ROG emission factors and CARB speciation factors and the particulate emissions factors from EMFAC2007. These emission factors are then multiplied against traffic volumes for the segments of concern to obtain total emissions, which for this study, were based on grams per mile. Emissions were based on an average speed of 65 miles per hour; reducing this average speed to 55 mph would reduce emissions by about 20% but would not alter the general conclusions of the analysis. Traffic volumes for US Highway 101 were obtained from Caltrans *2007 Annual Average Daily Traffic Volumes*. According to the Caltrans traffic data (2007) for Highway 101, the Annual Average Daily Traffic (AADT) volume at Clark Avenue (approximately 0.35 miles from the project site) is 31,000 vehicles. Truck traffic is estimated to be 13% of the AADT based on Caltrans 2007 *Annual Average Daily Truck Traffic*; it is noted that the estimate of current truck travel is based on an estimate made by Caltrans in 2003 and has not been updated since that time. Spreadsheet outputs from the UCDavis-Caltrans MSAT model and composite emission rates are contained in the attached appendix.

The HARP (ver. 1.04) program includes a database within which to inventory the geographical location of the sources and receptors. In addition, the database maintains the emissions associated with the sources. The freeway was modeled as a series of area sources 1,237 feet long by 125 feet wide and the emissions data entered into the HARP program database. The HARP program also includes the Industrial Source Complex (ISC3) dispersion model, which was used to calculate the concentrations along the highway resulting from the emissions contained in the database. Specific meteorology for the site was input to the model (Santa Maria, Year 1963). Level terrain was assumed; however, it is noted that the northbound lanes of the freeway are 6-10 feet higher than the southbound lanes, and the southern portion of the site is several feet below the nearest freeway lanes. These relatively minor differences in topography are not expected to have a substantial effect on the calculated concentrations. A scenario modeling the freeway as a series of volume sources was also performed, but the estimated concentrations were not sufficiently different (less than –20%) to alter the general conclusions. It should be noted that ISC3 was not developed to analyze sources that move through an area over time; therefore, the use of the area methodology provides for several simplifying assumptions that may overestimate actual concentrations. In addition, recent examination of the Gaussian plume methodology on which ISC3 is based indicates that, due to underlying assumptions, ISC3 tends to overestimate concentrations by 2.5 to 10 times. Nonetheless, it provides a reasonable estimate of possible impacts for the purposes of the California Environmental Quality Act.

The ISC3 model provides X/Q (CHI/Q = chi/q = χ/q) values, which is the concentration estimated by the air quality model based on an emission rate of one gram per second. X/Q is then used to estimate actual concentration by multiplying this value against the actual emission rate in grams per second. The ISC3 provides X/Q values for each source; these values were summed and then multiplied by the calculated emission rate in grams per second per segment. X/Q values and resultant average concentration at the individual grid and sensitive source receptor locations are contained in the attached appendix.

Because HARP does not have the health risk factors for several of the pollutants of concern, these values were input to a spreadsheet for the calculation of health risk. The chronic and carcinogenic health risk calculations are based on the standardized equations contained in the USEPA Human Health Evaluation Manual (1991). Also, an additional chronic health risk value was calculated using the California Environmental Protection Agency, Office of Environmental Health Hazard Assessment (OEHHA) method of dividing the annual average concentration by the chronic inhalation reference exposure level (REL). Toxicity values for the pollutants of concern were acquired from the OEHHA Toxicity Criteria Database (http://www.oehha.ca.gov/risk/ChemicalDB/index.asp).

Three exposure pathways are considered for health effects: ingestion, dermal contact, and inhalation. The first two generally require direct contact with the contaminated medium (usually soil), while the latter includes the inhalation of vapors and respirable dust (usually in the form of particulate matter less than 10 microns [PM10]). Inhalation is the only available pathway for the exhaust vapors that contain acrolein, acetaldehyde, formaldehyde, benzene, and 1,3-butadiene. Diesel PM is a respirable dust that can potentially be both ingested (oral) or enter the body through contact with contaminated soil. Oral or non-inhalation exposure pathways include the ingestion of soil, fisher caught fish, drinking water from surface waters, mother's milk, homegrown produce, beef, pork, chicken, eggs and cow's milk. With respect to

diesel PM, the oral pathway is available only through ingestion of contaminated soil, similar to the dermal contact. However, OEHHA does not list an oral slope toxicity for diesel PM and nor does the USEPA Integrated Risk Information System (IRIS) as toxicity studies have focused on the inhalation hazard. Therefore, only the inhalation pathway is considered in this risk assessment.

Carcinogenic health risk was based on a stay-at-home adult resident present at the nearest proposed residences for the recommended default time periods of 9, 30, and 70 years. These correspond to the central tendency for the average time spent in a single residence (50th percentile) and high-end estimate for residency time (95th percentile) recommended by the U.S. EPA (August 1997, Volume 3), and a lifetime residency, respectively. The 9-year residency is also used by the OEHHA to calculate risk for child receptors.

The USEPA considers for risk management those pollutants that could cause carcinogenic risks between one in 10,000 (1.0×10^{-4} or 1.0E-04) and one in one million (1.0×10^{-6} or 1.0E-06. Passage of Proposition 65 (encoded in California Health and Safety Code Section 25249.6) in 1986 prohibits a person in the course of doing business from knowingly and intentionally exposing any individual to a chemical that has been listed as known to the state to cause cancer or reproductive toxicity without first giving clear and reasonable warning. For a chemical that is listed as a carcinogen, the "no significant risk" level under Proposition 65 is defined as the level which is calculated to result in not more than one excess case of cancer in 100,000 individuals (1.0E-05) exposed over a 70-year lifetime. The SBCAPCD recommends the use of this risk level (also reportable as 10 in one million) as the significance threshold for toxic air contaminants (SBCAPCD, June 2008). In addition, the SBCAPCD recommends that the non-carcinogenic hazards of toxic air contaminants at ground level should not exceed a hazard index (or chronic hazard quotient) of 1.0 (SBCAPCD, June 2008).

To provide a perspective on risk, it is noted that the American Cancer Society (2007) reports that in the U.S., men have a one in two chance (0.5 probability) and women about one in three chance (0.3) probability of developing cancer during a lifetime, with one in four deaths (0.23) in the U.S. attributed to cancer. Given this background carcinogenic risk level in the general population, application of a 10^{-5} excess risk limit means that the contribution from a toxic hazard should not cause the resultant cancer risk for the exposed population to exceed 0.50001 for men and 0.33001 for women.

RESULTS

Health risks for three sensitive receptors that are proposed to be located nearest the freeway within the site were chosen as the maximum exposed individual residential (MEIR) receptors. These included Lot 49 at the north end of the site, the nearest condominium in the central portion of the site, and Lot 135 at the south end of the site. In addition, health risks for an existing mobile home adjacent to the north end of the tract and a residence on the east side of the freeway were calculated. The exposure point for these residences was the outdoor living area nearest the freeway. The Point of Maximum Impact (PMI), which is typically at the border of the source (freeway fence), was not calculated since it is not relevant to the analysis given the specific location of the proposed land uses. A receptor grid was used to evaluate whether or

not the pattern of exposure appeared to be accurate as illustrated by the contour pattern developed by the HARP software.

As shown in Table 3, the chronic health risk for proposed onsite residences associated with the freeway vehicle exhaust emissions are not significant, as chronic inhalation health hazards are below the SBAPCD threshold hazard index of 1.0. The chemicals most responsible for the chronic inhalation risk are 1,3 butadiene and formaldehyde. However, a significant carcinogenic health risk is present for the child (9-year residency) at the condominium location, and the 30 year and lifetime resident at all three locations. The 9-year adult resident would not be exposed to a significant carcinogenic health risk. Diesel exhaust particulates are the only significant source of this carcinogenic health risk as they are responsible for about 85% of the calculated risk. Please see the appendix for more detailed accounting of the risk at each site per pollutant of concern.

Table 3 Potential Health Risks Within the Proposed Project Site

	OEHHA Chronic Hazard Quotient [1]	Exceed Criterion? (>1)	Excess Cancer Risk	Exceed Criterion? (10^{-5})
Lot 49				
9-year residence				
Adult	0.018	No	3.8E-06	No
Child	--	No	8.8E-06	No
30-year Adult	0.018	No	1.3E-05	Yes
70-year Lifetime	0.018	No	2.9E-05	Yes
Condominium				
9-year residence				
Adult	0.02	No	4.3E-06	No
Child	--	No	1.0E-05	Yes
30-year Adult	0.02	No	1.4E-05	Yes
70-year Lifetime	0.02	No	3.3E-05	Yes
Lot 135				
9-year residence				
Adult	0.016	No	3.5E-06	No
Child	--	No	8.1E-06	No
30-year Adult	0.016	No	1.2E-05	Yes
70-year Lifetime	0.016	No	2.7E-05	Yes

See appendix for complete model results.
[1] Note that chronic risk does not change with increase in years as calculation terms cancel out.

CONCLUSIONS and RECOMMENDATIONS

The proposed residential use of the site would potentially allow onsite residences to be exposed to significant carcinogenic health risks associated with vehicle emissions, specifically diesel exhaust particulates, based upon SBAPCD health risk criteria. The calculated risk is based on exposure to outdoor air 24 hours per day, but the USEPA *Exposure Factors Handbook* indicates that the recommended daily activity pattern includes 16.4 hours per day spent inside and 2 hours per day outside (Volume III, Table 15-176 Summary of Recommended Values for Activity Factors). The remaining daily time is spent offsite. As a simplifying assumption, this analysis presumes that residents would have the windows open sufficiently to equalize the concentration of pollutants between the indoor and outdoor environment. Because the east end of the site is at the margin of the 10 in one million risk zone, reducing the amount of time spent onsite to 18.4 of 24 hours would reduce the calculated risk levels below this criterion for the

child receptor and for the 30 year adult residency at Lots 49 and 135, but not at the condominium receptor.

The CARB Air Quality and Land Use Handbook (April 2005) states that the available data show that exposure is greatly reduced at approximately 300 feet from the freeway, though this report then recommends a buffer of 500 feet. As shown in Figure 1-1 of this handbook, the concentration of diesel particulates drops precipitously within the first 300 feet, with little reduction thereafter. It is noted that the ISC3 model analysis used herein does not account for this faster particulate reduction rate which occurs from greater deposition and depletion than would occur for gaseous pollutants.

Another mitigating factor is that the diesel particulates will settle out to some unknown extent on window screens and other surfaces as outdoor air enters into the indoor air environment, though at least a portion of this settled material would become resuspended during cleaning and other activities. Therefore, it is likely that this analysis over-estimates the carcinogenic health risk. Furthermore, current regulatory action by the CARB is intended to greatly reduce the amount of diesel exhaust particulates associated with on-road diesel trucks in the future (note that the analysis was based on Year 2009 composite emission factors). Conversely, the emissions are based on current traffic estimates and truck traffic growth that may occur in the future along this portion of Highway 101 may result in increased emissions on a per mile basis. Because the carcinogenic health risk for lifetime residency is greater than 10 in one million, it is concluded that the potential effect of exposure to freeway air pollutants is considered significant under CEQA.

Based on the above analysis and the fact that the site is at the margin of the significance criteria for carcinogenic risk, the potential carcinogenic health hazard can be mitigated to a less than significant level (below 10 in one million) by reducing the amount of diesel exhaust particulates that the residents are exposed to in the indoor environment. Therefore, we recommend the following actions:

- Forced air ventilation with filter screens on outside air intake ducts shall be provided for all residences within 300 feet of the centerline of US Highway 101. The filter screens shall be capable of removing at least 85% of the particulate matter including fine particulate matter (PM<2.5 micron).
- A brochure notifying the future residents of the need for maintaining the filter screens shall be prepared and provided at the time of ownership exchange. In addition, a notice of the diesel particulates risk hazard and the need for screen maintenance shall be placed in the property title.
- Windows and doors shall be fully weatherproofed with caulking and weather-stripping that is rated to last at least 20 years.

These mitigation actions would provide for the removal of particulates prior to entering into the indoor environment, thereby reducing the overall exposure of individual residents. The above mitigation actions would apply to the first row of residences west of the freeway. Specifically, it would apply to all residences within the first row of condominium pads west of the freeway and to Lots 47, 48, 49,123, 129, 130, 131, 132, 133, 134, 135, 136, and 137 as numbered on the proposed Site Improvements map dated May 4, 2007. No mitigation is recommended for Lot

167 since the residence structure is anticipated to be located further than 300 feet from the freeway centerline for this lot. Table 4 below indicates the calculated carcinogenic risk associated with this mitigation measure for Lot 49, Lot 135, and the nearest condominium.

Table 4 Mitigated Potential Carcinogenic Health Risks Within the Proposed Project Site

	Excess Cancer Risk	Exceed Criterion? (10^{-5})
Lot 49		
9-year residence		
Adult	3.1E-07	No
Child	7.3E-07	No
30-year Adult	1.0E-06	No
70-year Lifetime	2.4E-06	No
Condominium		
9-year residence		
Adult	3.6E-07	No
Child	8.4-07	No
30-year Adult	1.2E-06	No
70-year Lifetime	2.8E-06	No
Lot 135		
9-year residence		
Adult	2.9E-07	No
Child	6.8E-07	No
30-year Adult	1.9.7E-07	No
70-year Lifetime	2.3E-06	No

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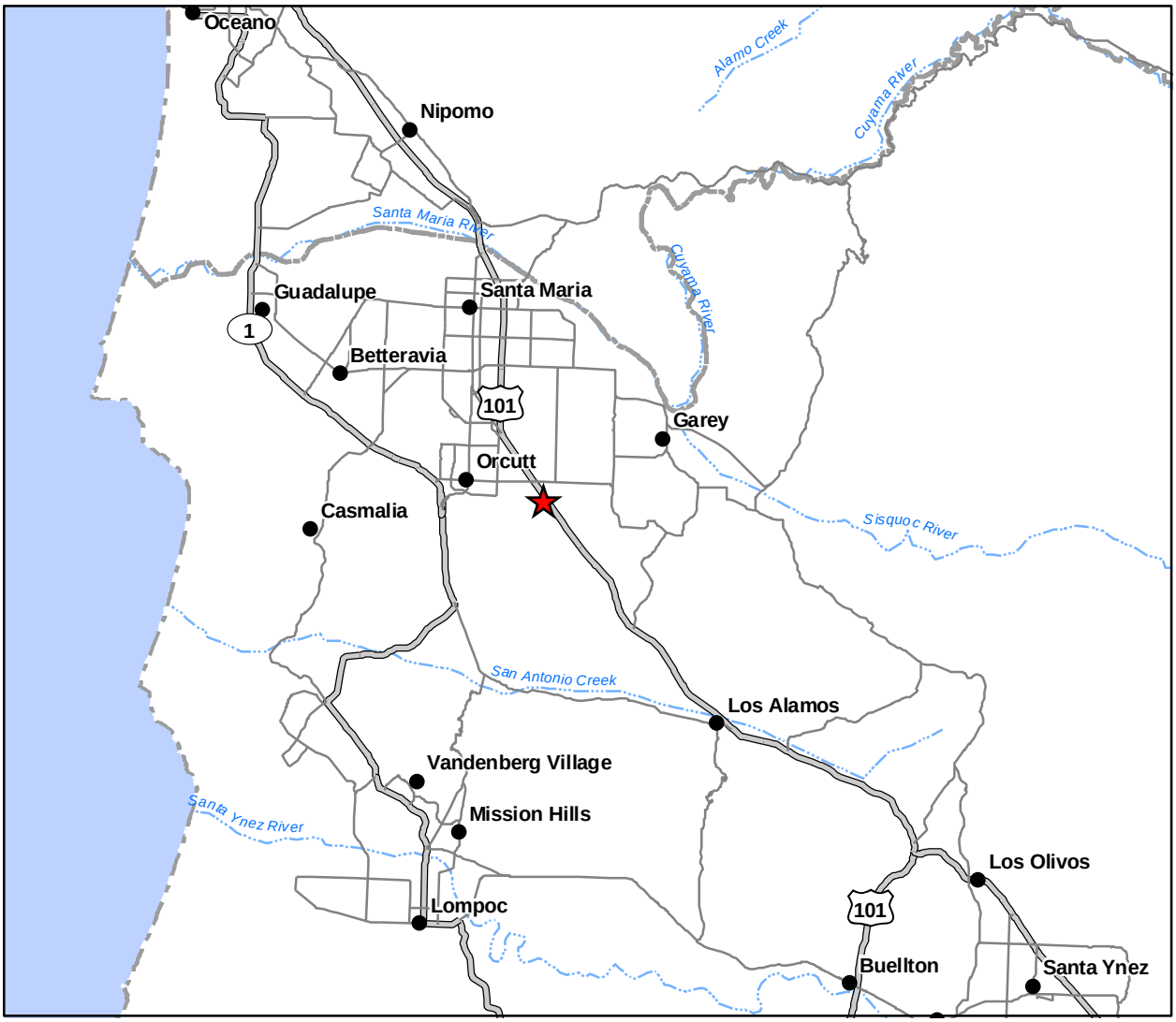
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0 2.5 5 7.5 10 Miles

Site Location

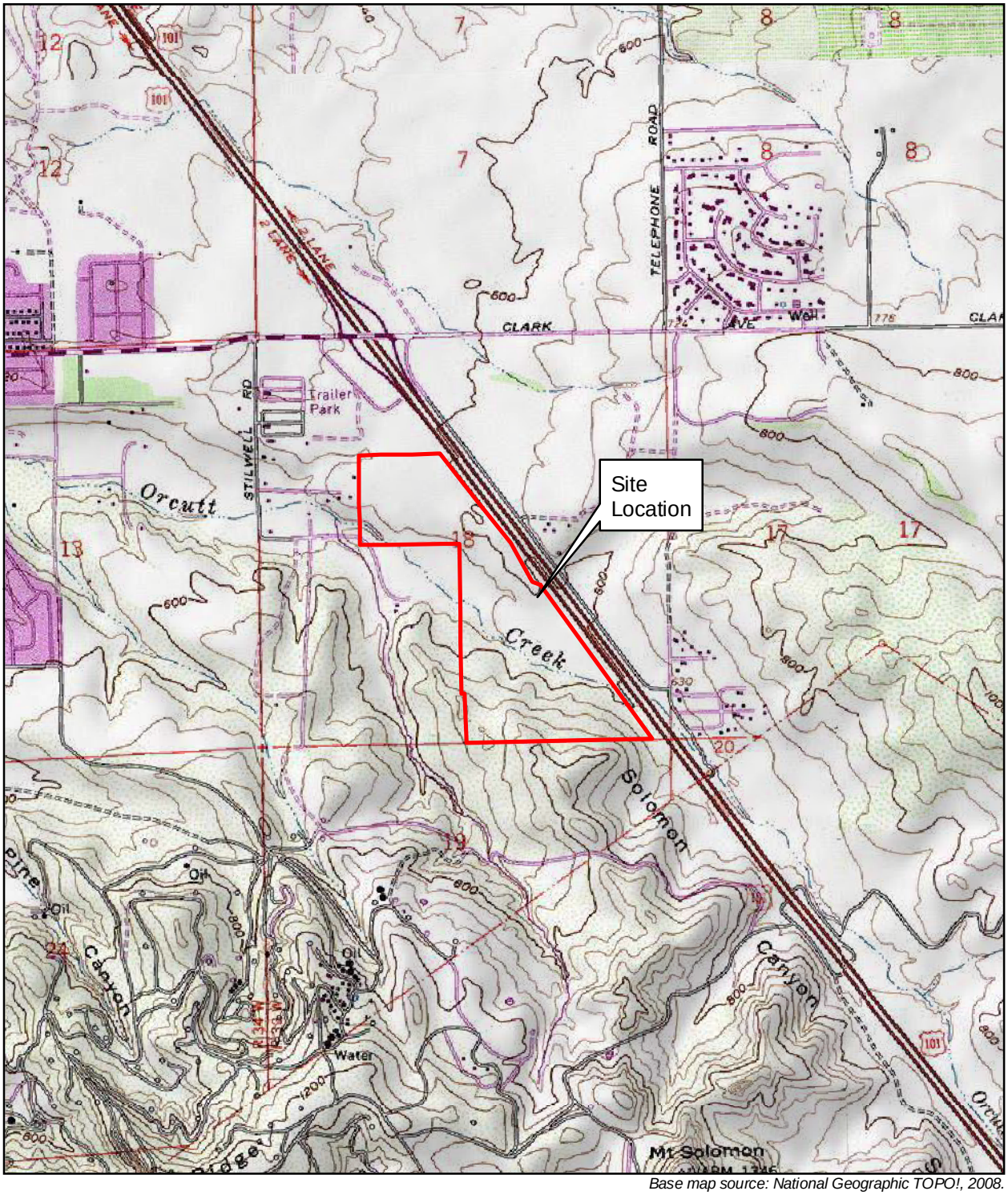
N



Sources: U.S. Bureau of the Census Tiger 2000 data and ESRI, 2002.

Regional Location

Figure 1



Base map source: National Geographic TOPO!, 2008.

Legend

Site Boundary

N

0 1,000 2,000 Feet

Vicinity Map

Figure 2

County of Santa Barbara

Appendix

Spreadsheet Output from MSAT Model
Emission Rate Calculation
X/Q Output from ISC3 and Average Annual Concentration Calculation
Health Risk Calculation Spreadsheets

Project Information

Scenario Title:		**US Highway 101 at Clark Avenue**
Analysis Year:		**2009**
Segment Length (miles):		**1.00**
Total Daily Traffic Volume:		
	Peak Time	**31000**
	Off-Peak Time	**31000**
Total Daily VMT:		
	Peak Time	**31000**
	Off-Peak Time	**31000**
Average Speed (mph):		
	Peak Time	**65**
	Off-Peak Time	**65**
Percent Trucks:		
	Peak Time	**13.0%**
	Off-Peak Time	**13.0%**
Vehicle Travel Time: ***(minute for entire segment)***		
	Peak Time	**1**
	Off-Peak Time	**1**

Table 1: Composite emission factors for use with project-level analysis of DPM and MSAT

			Composite On-Road Emission Factors, Based on Average Travel Speeds During Peak and Off-Peak Periods			
			Diesel vehicles	Diesel vehicles	Non-diesel vehicles	Non-diesel vehicles
		Average Speed	hot stabilized exhaust PM	hot stabilized exhaust TOG	hot stabilized exhaust TOG	evaporative running loss TOG
		(mile/hour)	(grams/mile)	(grams/mile)	(grams/mile)	(grams/minute)
Current Scenario						
2009	Peak	65	0.324100	0.474000	0.282808	0.069613
	Off-peak	65	0.342100	0.474000	0.282808	0.069613

Table to be filled in by project analyst based on (a) EMFAC emission factors for DPM and TOG, and (b) base case and forecasted average peak and off-peak travel speeds on the affected facility.

Table 2: MSAT Speciation Factors

	Speciation Factors, supplied by CARB (personal communication, Dennis Wade, California Air Resources Board). (multiply by Table 1 TOG emission factor to obtain g/mi MSAT factor)														
Analysis Year	Diesel					Non-Diesel									
	Hot Stabilized Exhaust					Hot Stabilized Exhaust					Evaporative Running Loss				
	benzene	1,3-butadiene	Acetaldehyde	Acrolein	Formaldehyde	benzene	1,3-butadiene	Acetaldehyde	Acrolein	Formaldehyde	benzene	1,3-butadiene	Acetaldehyde	Acrolein	Formaldehyde
2004	0.020009	0.001900	0.073526	n/a	0.147133	0.028414	0.006603	0.005511	0.001533	0.021422	0.009999	0.000069	n/a	n/a	n/a
2005	0.020009	0.001900	0.073526	n/a	0.147133	0.028205	0.006551	0.005450	0.001520	0.021200	0.009999	0.000069	n/a	n/a	n/a
2006	0.020009	0.001900	0.073526	n/a	0.147133	0.027938	0.006483	0.005350	0.001510	0.021000	0.009999	0.000069	n/a	n/a	n/a
2007	0.020009	0.001900	0.073526	n/a	0.147133	0.027660	0.006410	0.005250	0.001490	0.020700	0.009999	0.000069	n/a	n/a	n/a
2008	0.020009	0.001900	0.073526	n/a	0.147133	0.027338	0.006326	0.005120	0.001470	0.020300	0.009999	0.000069	n/a	n/a	n/a
2009	0.020009	0.001900	0.073526	n/a	0.147133	0.026849	0.006190	0.004870	0.001450	0.019800	0.009999	0.000069	n/a	n/a	n/a
2010	0.020009	0.001900	0.073526	n/a	0.147133	0.026521	0.006105	0.004750	0.001430	0.019400	0.009999	0.000069	n/a	n/a	n/a
2011	0.020009	0.001900	0.073526	n/a	0.147133	0.026521	0.006105	0.004750	0.001430	0.019400	0.009999	0.000069	n/a	n/a	n/a
2012	0.020009	0.001900	0.073526	n/a	0.147133	0.025656	0.005873	0.004370	0.001380	0.018500	0.009999	0.000069	n/a	n/a	n/a
2013	0.020009	0.001900	0.073526	n/a	0.147133	0.025656	0.005873	0.004370	0.001380	0.018500	0.009999	0.000069	n/a	n/a	n/a
2014	0.020009	0.001900	0.073526	n/a	0.147133	0.025656	0.005873	0.004370	0.001380	0.018500	0.009999	0.000069	n/a	n/a	n/a
2015	0.020009	0.001900	0.073526	n/a	0.147133	0.024349	0.005530	0.003850	0.001310	0.017100	0.009999	0.000069	n/a	n/a	n/a
2016	0.020009	0.001900	0.073526	n/a	0.147133	0.024349	0.005530	0.003850	0.001310	0.017100	0.009999	0.000069	n/a	n/a	n/a
2017	0.020009	0.001900	0.073526	n/a	0.147133	0.024349	0.005530	0.003850	0.001310	0.017100	0.009999	0.000069	n/a	n/a	n/a
2018	0.020009	0.001900	0.073526	n/a	0.147133	0.022182	0.004944	0.002860	0.001190	0.014700	0.009999	0.000069	n/a	n/a	n/a
2019	0.020009	0.001900	0.073526	n/a	0.147133	0.022182	0.004944	0.002860	0.001130	0.014700	0.009999	0.000069	n/a	n/a	n/a
2020	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2021	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2022	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2023	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2024	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2025	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2026	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2027	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2028	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2029	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a
2030	0.020009	0.001900	0.073526	n/a	0.147133	0.021079	0.004659	0.002450	0.001130	0.013600	0.009999	0.000069	n/a	n/a	n/a

2009	0.020009	0.001900	0.073526	n/a	0.147133	0.026849	0.006190	0.004870	0.001450	0.019800	0.009999	0.000069	n/a	n/a	n/a
	Diesel					Non-Diesel									
	Hot Stabilized Exhaust (grams/mile)					Hot Stabilized Exhaust (grams/mile)					Evaporative Running Loss (grams/minute)				
	benzene	1,3-butadiene	Acetaldehyde	Acrolein	Formaldehyde	benzene	1,3-butadiene	Acetaldehyde	Acrolein	Formaldehyde	benzene	1,3-butadiene	Acetaldehyde	Acrolein	Formaldehyde
peak	**0.009484**	**0.000901**	**0.034851**	**n/a**	**0.069741**	**0.007593**	**0.001751**	**0.001377**	**0.000410**	**0.005600**	**0.000696**	**0.000005**	**n/a**	**n/a**	**n/a**
off-peak	**0.009484**	**0.000901**	**0.034851**	**n/a**	**0.069741**	**0.007593**	**0.001751**	**0.001377**	**0.000410**	**0.005600**	**0.000696**	**0.000005**	**n/a**	**n/a**	**n/a**

Calculation of total project emissions

		Traffic Activity				Emissions					
		Diesel volume (veh per day)	Non-Diesel volume (veh per day)	Diesel VMT (daily miles)	Non-Diesel VMT (daily miles)	Diesel PM (grams/day)	Benzene (grams/day)	1,3-Butadiene (grams/day)	Acetaldehyde (grams/day)	Acrolein (grams/day)	Formaldehyde (grams/day)
Current Scenario: 2009											
US Highway 101 at Clark Avenue											
	Peak	1040	29960	1040	29960	337	257	54	78	12	240
	Off-peak	1040	29960	1040	29960	356	257	54	78	12	240
Base Year											
Existing	Peak	926	42274	7693	351299	3726	2691	532	815	121	2450
	Off-peak	1851	84549	15385	702599	9900	6759	1407	2273	319	6712
	Sum	2777	126823	23078	1053898	Sum 13627	9450	1940	3088	440	9162
Operational Year											
No-Build	Peak										
	Off-peak										
	Sum	0	0	0	0	Sum 0	0	0	0	0	0
Operational Year											
Build	Peak										
	Off-peak										
	Sum	0	0	0	0	Sum 0	0	0	0	0	0
RTP Horizon Year											
No-Build	Peak										
	Off-peak										
	Sum	0	0	0	0	Sum 0	0	0	0	0	0
RTP Horizon Year											
Build	Peak										
	Off-peak										
	Sum	0	0	0	0	Sum 0	0	0	0	0	0

Derivation of Emission Rates for Area Sources

Freeway width	125.0	feet
Distance	5280	feet
sq ft/mile	660000	sf
sq m/mile	61347	sqm
Each segment at	1237	feet long

	Emissions					
	Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
grams/mi/day *	337.1	256.6	53.5	77.5	12.3	240.3
grams/mi/sec	0.003901204	0.002969952	0.000619402	0.000897091	0.000142196	0.002781186
grms/sec/sqm	6.3592E-08	4.8412E-08	1.00966E-08	1.46231E-08	2.31788E-09	4.5335E-08

* Total emissions per mile calculated using the UC Davis-Caltrans MSAT spreadsheet.

	Emissions per Area Segment					
	Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
grms/day	79.0	60.1	12.5	18.2	2.9	56.3
grms/hr	3.3	2.5	0.5	0.8	0.1	2.3
grms/sec *	9.139E-04	6.957E-04	1.451E-04	2.101E-04	3.331E-05	6.515E-04
lbs/year	63.54	48.37	10.09	14.61	2.32	45.29
lbs/hour	0.00725	0.00552	0.00115	0.00167	0.00026	0.00517

* Emission factor multiplied by X/Q to obtain concentration.

Average Annual Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	UTME	UTMN	ZONE	Annual Average Concentration, ug/cu m					
											Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
1	GRID	4.72E-01	6.09E-01	8.61E-01	1.33E+00	2.05E+00	3.86E+00	737573	3861369	10	8.39E-03	6.39E-03	1.33E-03	1.93E-03	3.06E-04	5.98E-03
2	GRID	5.40E-01	6.45E-01	8.18E-01	1.18E+00	2.05E+00	3.95E+00	737673	3861369	10	8.39E-03	6.39E-03	1.33E-03	1.93E-03	3.06E-04	5.98E-03
3	GRID	6.63E-01	8.12E-01	1.03E+00	1.36E+00	1.98E+00	3.87E+00	737773	3861369	10	8.88E-03	6.76E-03	1.41E-03	2.04E-03	3.24E-04	6.33E-03
4	GRID	7.51E-01	9.49E-01	1.26E+00	1.78E+00	2.79E+00	5.32E+00	737873	3861369	10	1.17E-02	8.94E-03	1.86E-03	2.70E-03	4.28E-04	8.37E-03
5	GRID	7.37E-01	9.13E-01	1.17E+00	1.56E+00	2.24E+00	4.68E+00	737973	3861369	10	1.03E-02	7.86E-03	1.64E-03	2.37E-03	3.76E-04	7.36E-03
6	GRID	5.95E-01	7.07E-01	9.19E-01	1.47E+00	2.82E+00	5.87E+00	738073	3861369	10	1.13E-02	8.61E-03	1.80E-03	2.60E-03	4.12E-04	8.07E-03
7	GRID	5.39E-01	7.64E-01	1.20E+00	1.82E+00	2.97E+00	4.66E+00	738173	3861369	10	1.09E-02	8.32E-03	1.73E-03	2.51E-03	3.98E-04	7.79E-03
8	GRID	6.86E-01	9.56E-01	1.27E+00	1.85E+00	2.82E+00	3.48E+00	738273	3861369	10	1.01E-02	7.70E-03	1.61E-03	2.32E-03	3.68E-04	7.21E-03
9	GRID	7.63E-01	9.33E-01	1.28E+00	1.98E+00	2.09E+00	2.75E+00	738373	3861369	10	8.95E-03	6.82E-03	1.42E-03	2.06E-03	3.26E-04	6.38E-03
10	GRID	7.26E-01	9.53E-01	1.45E+00	1.49E+00	1.82E+00	2.10E+00	738473	3861369	10	7.80E-03	5.94E-03	1.24E-03	1.79E-03	2.84E-04	5.56E-03
11	GRID	7.46E-01	1.10E+00	1.16E+00	1.27E+00	1.63E+00	1.70E+00	738573	3861369	10	6.95E-03	5.29E-03	1.10E-03	1.60E-03	2.53E-04	4.96E-03
12	GRID	8.67E-01	9.66E-01	9.78E-01	1.15E+00	1.31E+00	1.47E+00	738673	3861369	10	6.16E-03	4.69E-03	9.78E-04	1.42E-03	2.25E-04	4.39E-03
13	GRID	8.15E-01	7.61E-01	8.64E-01	1.04E+00	1.09E+00	1.29E+00	738773	3861369	10	5.36E-03	4.08E-03	8.50E-04	1.23E-03	1.95E-04	3.82E-03
14	GRID	6.48E-01	7.19E-01	7.94E-01	9.59E-01	8.65E-01	1.26E+00	738873	3861369	10	4.79E-03	3.65E-03	7.61E-04	1.10E-03	1.75E-04	3.42E-03
15	GRID	5.74E-01	6.25E-01	7.80E-01	8.03E-01	8.02E-01	1.28E+00	738973	3861369	10	4.44E-03	3.38E-03	7.06E-04	1.02E-03	1.62E-04	3.17E-03
16	GRID	5.56E-01	5.84E-01	6.77E-01	6.68E-01	7.88E-01	1.26E+00	739073	3861369	10	4.14E-03	3.15E-03	6.58E-04	9.53E-04	1.51E-04	2.95E-03
17	GRID	4.76E-01	6.04E-01	6.39E-01	5.53E-01	7.02E-01	1.26E+00	739173	3861369	10	3.87E-03	2.95E-03	6.14E-04	8.90E-04	1.41E-04	2.76E-03
18	GRID	4.50E-01	5.28E-01	5.74E-01	5.18E-01	6.28E-01	1.26E+00	739273	3861369	10	3.62E-03	2.75E-03	5.74E-04	8.32E-04	1.32E-04	2.58E-03
19	GRID	4.81E-01	4.79E-01	4.56E-01	5.01E-01	5.79E-01	1.21E+00	739373	3861369	10	3.39E-03	2.58E-03	5.38E-04	7.79E-04	1.23E-04	2.41E-03
20	GRID	4.46E-01	4.77E-01	3.76E-01	4.89E-01	5.62E-01	1.12E+00	739473	3861369	10	3.17E-03	2.41E-03	5.03E-04	7.29E-04	1.16E-04	2.26E-03
21	GRID	3.68E-01	4.30E-01	3.74E-01	4.65E-01	5.69E-01	1.03E+00	739573	3861369	10	2.96E-03	2.25E-03	4.70E-04	6.80E-04	1.08E-04	2.11E-03
22	GRID	3.74E-01	3.31E-01	3.60E-01	4.37E-01	6.10E-01	9.24E-01	739673	3861369	10	2.77E-03	2.11E-03	4.41E-04	6.38E-04	1.01E-04	1.98E-03
23	GRID	3.82E-01	2.75E-01	3.51E-01	3.97E-01	6.62E-01	8.25E-01	739773	3861369	10	2.64E-03	2.01E-03	4.20E-04	6.08E-04	9.63E-05	1.88E-03
24	GRID	3.29E-01	2.77E-01	3.32E-01	3.52E-01	6.96E-01	7.44E-01	739873	3861369	10	2.49E-03	1.90E-03	3.96E-04	5.74E-04	9.09E-05	1.78E-03
25	GRID	2.53E-01	2.77E-01	3.25E-01	3.20E-01	7.11E-01	6.73E-01	739973	3861369	10	2.34E-03	1.78E-03	3.71E-04	5.38E-04	8.52E-05	1.67E-03
26	GRID	5.32E-01	7.34E-01	1.06E+00	1.49E+00	2.35E+00	4.79E+00	737573	3861269	10	1.00E-02	7.62E-03	1.59E-03	2.30E-03	3.65E-04	7.14E-03
27	GRID	5.13E-01	6.64E-01	9.57E-01	1.53E+00	2.45E+00	5.21E+00	737673	3861269	10	1.03E-02	7.88E-03	1.64E-03	2.38E-03	3.77E-04	7.38E-03
28	GRID	6.01E-01	7.25E-01	9.27E-01	1.36E+00	2.48E+00	5.38E+00	737773	3861269	10	1.05E-02	7.98E-03	1.66E-03	2.41E-03	3.82E-04	7.47E-03
29	GRID	7.39E-01	9.24E-01	1.20E+00	1.66E+00	2.50E+00	5.35E+00	737873	3861269	10	1.13E-02	8.61E-03	1.80E-03	2.60E-03	4.12E-04	8.06E-03
30	GRID	8.19E-01	1.05E+00	1.42E+00	2.08E+00	3.43E+00	7.29E+00	737973	3861269	10	1.47E-02	1.12E-02	2.33E-03	3.38E-03	5.36E-04	1.05E-02
31	GRID	7.58E-01	9.32E-01	1.18E+00	1.59E+00	2.75E+00	7.52E+00	738073	3861269	10	1.35E-02	1.02E-02	2.14E-03	3.10E-03	4.91E-04	9.60E-03
32	GRID	5.94E-01	7.46E-01	1.11E+00	1.98E+00	3.45E+00	6.96E+00	738173	3861269	10	1.36E-02	1.03E-02	2.15E-03	3.12E-03	4.94E-04	9.67E-03
33	GRID	6.32E-01	9.50E-01	1.43E+00	2.03E+00	3.69E+00	4.79E+00	738273	3861269	10	1.24E-02	9.41E-03	1.96E-03	2.84E-03	4.50E-04	8.81E-03
34	GRID	7.99E-01	1.05E+00	1.37E+00	2.33E+00	2.68E+00	3.55E+00	738373	3861269	10	1.08E-02	8.19E-03	1.71E-03	2.48E-03	3.92E-04	7.67E-03
35	GRID	8.09E-01	1.00E+00	1.60E+00	1.84E+00	2.24E+00	2.70E+00	738473	3861269	10	9.31E-03	7.09E-03	1.48E-03	2.14E-03	3.39E-04	6.64E-03
36	GRID	7.72E-01	1.16E+00	1.42E+00	1.49E+00	1.96E+00	2.11E+00	738573	3861269	10	8.14E-03	6.20E-03	1.29E-03	1.87E-03	2.97E-04	5.81E-03
37	GRID	8.91E-01	1.14E+00	1.12E+00	1.33E+00	1.51E+00	1.87E+00	738673	3861269	10	7.18E-03	5.47E-03	1.14E-03	1.65E-03	2.62E-04	5.12E-03
38	GRID	9.19E-01	8.78E-01	9.90E-01	1.19E+00	1.27E+00	1.82E+00	738773	3861269	10	6.46E-03	4.92E-03	1.03E-03	1.49E-03	2.35E-04	4.60E-03
39	GRID	7.51E-01	7.94E-01	8.91E-01	1.08E+00	1.01E+00	1.81E+00	738873	3861269	10	5.79E-03	4.41E-03	9.19E-04	1.33E-03	2.11E-04	4.13E-03
40	GRID	6.26E-01	7.04E-01	8.62E-01	8.87E-01	9.67E-01	1.73E+00	738973	3861269	10	5.28E-03	4.02E-03	8.38E-04	1.21E-03	1.92E-04	3.76E-03
41	GRID	6.07E-01	6.41E-01	7.63E-01	7.30E-01	8.86E-01	1.64E+00	739073	3861269	10	4.81E-03	3.66E-03	7.64E-04	1.11E-03	1.75E-04	3.43E-03
42	GRID	5.27E-01	6.57E-01	6.98E-01	6.18E-01	7.67E-01	1.57E+00	739173	3861269	10	4.42E-03	3.37E-03	7.02E-04	1.02E-03	1.61E-04	3.15E-03
43	GRID	4.86E-01	5.75E-01	6.17E-01	5.80E-01	7.20E-01	1.48E+00	739273	3861269	10	4.07E-03	3.10E-03	6.47E-04	9.37E-04	1.48E-04	2.90E-03
44	GRID	5.16E-01	5.31E-01	4.77E-01	5.75E-01	7.09E-01	1.34E+00	739373	3861269	10	3.79E-03	2.89E-03	6.02E-04	8.72E-04	1.38E-04	2.70E-03
45	GRID	4.78E-01	5.12E-01	4.23E-01	5.45E-01	7.21E-01	1.20E+00	739473	3861269	10	3.54E-03	2.70E-03	5.63E-04	8.15E-04	1.29E-04	2.53E-03
46	GRID	3.99E-01	4.50E-01	4.09E-01	5.07E-01	7.66E-01	1.06E+00	739573	3861269	10	3.28E-03	2.50E-03	5.21E-04	7.55E-04	1.20E-04	2.34E-03
47	GRID	4.07E-01	3.43E-01	3.95E-01	4.61E-01	8.10E-01	9.47E-01	739673	3861269	10	3.07E-03	2.34E-03	4.88E-04	7.07E-04	1.12E-04	2.19E-03
48	GRID	4.03E-01	3.00E-01	3.84E-01	4.12E-01	8.40E-01	8.52E-01	739773	3861269	10	2.92E-03	2.22E-03	4.63E-04	6.71E-04	1.06E-04	2.08E-03
49	GRID	3.38E-01	3.06E-01	3.66E-01	3.79E-01	8.40E-01	7.76E-01	739873	3861269	10	2.75E-03	2.09E-03	4.36E-04	6.31E-04	1.00E-04	1.96E-03
50	GRID	2.61E-01	2.99E-01	3.61E-01	3.76E-01	8.01E-01	7.22E-01	739973	3861269	10	2.58E-03	1.96E-03	4.09E-04	5.93E-04	9.39E-05	1.84E-03
51	GRID	6.34E-01	8.63E-01	1.13E+00	1.60E+00	2.98E+00	5.95E+00	737573	3861169	10	1.20E-02	9.15E-03	1.91E-03	2.76E-03	4.38E-04	8.57E-03
52	GRID	5.74E-01	8.05E-01	1.19E+00	1.71E+00	2.97E+00	6.78E+00	737673	3861169	10	1.28E-02	9.76E-03	2.04E-03	2.95E-03	4.67E-04	9.14E-03
53	GRID	5.61E-01	7.30E-01	1.07E+00	1.78E+00	3.00E+00	7.32E+00	737773	3861169	10	1.32E-02	1.01E-02	2.10E-03	3.04E-03	4.82E-04	9.42E-03
54	GRID	6.75E-01	8.24E-01	1.07E+00	1.59E+00	3.08E+00	8.01E+00	737873	3861169	10	1.39E-02	1.06E-02	2.21E-03	3.20E-03	5.08E-04	9.93E-03
55	GRID	8.25E-01	1.06E+00	1.43E+00	2.06E+00	3.33E+00	8.08E+00	737973	3861169	10	1.53E-02	1.17E-02	2.44E-03	3.53E-03	5.59E-04	1.09E-02
56	GRID	8.87E-01	1.15E+00	1.59E+00	2.35E+00	3.97E+00	9.44E+00	738073	3861169	10	1.77E-02	1.35E-02	2.81E-03	4.07E-03	6.46E-04	1.26E-02
57	GRID	7.62E-01	9.31E-01	1.20E+00	1.85E+00	4.14E+00	1.08E+01	738173	3861169	10	1.80E-02	1.37E-02	2.86E-03	4.14E-03	6.56E-04	1.28E-02
58	GRID	6.22E-01	8.73E-01	1.45E+00	2.43E+00	4.61E+00	7.08E+00	738273	3861169	10	1.56E-02	1.19E-02	2.48E-03	3.59E-03	5.68E-04	1.11E-02
59	GRID	7.72E-01	1.14E+00	1.59E+00	2.57E+00	3.65E+00	4.85E+00	738373	3861169	10	1.33E-02	1.01E-02	2.11E-03	3.06E-03	4.85E-04	9.49E-03
60	GRID	8.89E-01	1.12E+00	1.67E+00	2.36E+00	2.83E+00	3.60E+00	738473	3861169	10	1.14E-02	8.67E-03	1.81E-03	2.62E-03	4.15E-04	8.12E-03
61	GRID	8.45E-01	1.19E+00	1.73E+00	1.79E+00	2.38E+00	2.93E+00	738573	3861169	10	9.93E-03	7.56E-03	1.58E-03	2.28E-03	3.62E-04	7.08E-03
62	GRID	8.97E-01	1.31E+00	1.31E+00	1.57E+00	1.80E+00	2.87E+00	738673	3861169	10	8.92E-03	6.79E-03	1.42E-03	2.05E-03	3.25E-04	6.36E-03
63	GRID	1.01E+00	1.04E+00	1.14E+00	1.38E+00	1.49E+00	2.69E+00	738773	3861169	10	8.00E-03	6.09E-03	1.27E-03	1.84E-03	2.91E-04	5.70E-03
64	GRID	8.79E-01	8.84E-01	1.01E+00	1.23E+00	1.24E+00	2.40E+00	738873	3861169	10	6.98E-03	5.32E-03	1.11E-03	1.61E-03	2.55E-04	4.98E-03
65	GRID	6.97E-01	7.98E-01	9.59E-01	9.88E-01	1.15E+00	2.19E+00	738973	3861169	10	6.20E-03	4.72E-03	9.84E-04	1.43E-03	2.26E-04	4.42E-03
66	GRID	6.64E-01	7.10E-01	8.67E-01	8.18E-01	9.81E-01	2.05E+00	739073	3861169	10	5.57E-03	4.24E-03	8.84E-04	1.28E-03	2.03E-04	3.97E-03
67	GRID	5.87E-01	7.19E-01	7.64E-01	6.97E-01	9.26E-01	1.86E+00	739173	3861169	10	5.07E-03	3.86E-03	8.06E-04	1.17E-03	1.85E-04	3.62E-03
68	GRID	5.28E-01	6.32E-01	6.65E-01	6.70E-01	9.24E-01	1.65E+00	739273	3861169	10	4.63E-03	3.53E-03	7.35E-04	1.07E-03	1.69E-04	3.30E-03
69	GRID	5.56E-01	5.89E-01	5.12E-01	6.58E-01	9.41E-01	1.45E+00	739373	3861169	10	4.30E-03	3.27E-03	6.83E-04	9.89E-04	1.57E-04	3.07E-03
70	GRID	5.16E-01	5.50E-01	4.73E-01	5.99E-01	9.70E-01	1.28E+00	739473	3861169	10	4.01E-03	3.05E-03	6.37E-04	9.22E-04	1.46E-04	2.86E-03
71	GRID	4.35E-01	4.72E-01	4.51E-01	5.41E-01	1.01E+00	1.15E+00	739573	3861169	10	3.71E-03	2.82E-03	5.89E-04	8.53E-04	1.35E-04	2.64E-03
72	GRID	4.43E-01	3.58E-01	4.41E-01	4.88E-01	1.02E+00	1.05E+00	739673	3861169	10	3.47E-03	2.64E-03	5.51E-04	7.99E-04	1.27E-04	2.48E-03
73	GRID	4.25E-01	3.36E-01	4.22E-01	4.57E-01	9.80E-01	9.77E-01	739773	3861169	10	3.29E-03	2.50E-03	5.22E-04	7.56E-04	1.20E-04	2.34E-03
74	GRID	3.48E-01	3.34E-01	4.09E-01	4.56E-01	9.11E-01	9.23E-01	739873	3861169	10	3.09E-03	2.35E-03	4.91E-04	7.10E-04	1.13E-04	2.20E-03
75	GRID	2.70E-01	3.25E-01	3.90E-01	4.81E-01	8.36E-01	8.74E-01	739973	3861169	10	2.90E-03	2.21E-03	4.61E-04	6.67E-04	1.06E-04	2.07E-03
76	GRID	7.22E-01	9.05E-01	1.18E+00	2.03E+00	3.31E+00	7.49E+00	737573	3861069	10	1.43E-02	1.09E-02	2.27E-03	3.29E-03	5.21E-04	1.02E-02
77	GRID	6.89E-01	9.53E-01	1.27E+00	1.93E+00	3.62E+00	8.75E+00	737673	3861069	10	1.57E-02	1.20E-02	2.50E-03	3.62E-03	5.73E-04	1.12E-02
78	GRID	6.22E-01	8.88E-01	1.35E+00	1.99E+00	3.86E+00	1.00E+01	737773	3861069	10	1.71E-02	1.30E-02	2.71E-03	3.93E-03	6.23E-04	1.22E-02
79	GRID	6.18E-01	8.08E-01	1.22E+00	2.10E+00	3.87E+00	1.17E+01	737873	3861069	10	1.86E-02	1.41E-02	2.95E-03	4.27E-03	6.77E-04	1.32E-02
80	GRID	7.63E-01	9.50E-01	1.25E+00	1.90E+00	3.98E+00	1.32E+01	737973	3861069	10	2.01E-02	1.53E-02	3.20E-03	4.63E-03	7.34E-04	1.44E-02
81	GRID	9.23E-01	1.21E+00	1.70E+00	2.60E+00	4.70E+00	1.42E+01	738073	3861069	10	2.32E-02	1.76E-02	3.68E-03	5.32E-03	8.44E-04	1.65E-02
82	GRID	9.47E-01	1.24E+00	1.71E+00	2.51E+00	4.46E+00	1.77E+01	738173	3861069	10	2.61E-02	1.99E-02	4.14E-03	6.00E-03	9.52E-04	1.86E-02
83	GRID	7.56E-01	9.41E-01	1.35E+00	2.60E+00	5.65E+00	1.18E+01	738273	3861069	10	2.11E-02	1.61E-02	3.35E-03	4.85E-03	7.69E-04	1.50E-02
84	GRID	7.10E-01	1.11E+00	1.81E+00	2.84E+00	5.20E+00	7.27E+00	738373	3861069	10	1.73E-02	1.32E-02	2.75E-03	3.98E-03	6.31E-04	1.23E-02
85	GRID	9.26E-01	1.28E+00	1.78E+00	3.05E+00	3.70E+00	5.76E+00	738473	3861069	10	1.51E-02	1.15E-02	2.39E-03	3.47E-03	5.49E-04	1.07E-02
86	GRID	9.51E-01	1.24E+00	2.04E+00	2.24E+00	2.95E+00	4.85E+00	738573	3861069	10	1.30E-02	9.93E-03	2.07E-03	3.00E-03	4.75E-04	9.30E-03
87	GRID	9.20E-01	1.45E+00	1.60E+00	1.90E+00	2.24E+00	4.18E+00	738673	3861069	10	1.12E-02	8.55E-03	1.78E-03	2.58E-03	4.09E-04	8.01E-03
88	GRID	1.08E+00	1.26E+00	1.32E+00	1.64E+00	1.81E+00	3.61E+00	738773	3861069	10	9.80E-03	7.46E-03	1.56E-03	2.25E-03	3.57E-04	6.98E-03
89	GRID	1.03E+00	1.00E+00	1.16E+00	1.41E+00	1.53E+00	3.17E+00	738873	3861069	10	8.50E-03	6.47E-03	1.35E-03	1.95E-03	3.10E-04	6.06E-03
90	GRID	7.98E-01	9.06E-01	1.08E+00	1.12E+00	1.33E+00	2.89E+00	738973	3861069	10	7.42E-03	5.65E-03	1.18E-03	1.71E-03	2.71E-04	5.29E-03
91	GRID	7.27E-01	7.93E-01	9.91E-01	9.16E-01	1.25E+00	2.56E+00	739073	3861069	10	6.61E-03	5.03E-03	1.05E-03	1.52E-03	2.41E-04	4.71E-03
92	GRID	6.57E-01	7.91E-01	8.37E-01	8.07E-01	1.27E+00	2.21E+00	739173	3861069	10	6.01E-03	4.57E-03	9.54E-04	1.38E-03	2.19E-04	4.28E-03
93	GRID	5.79E-01	6.99E-01	7.17E-01	7.92E-01	1.26E+00	1.91E+00	739273	3861069	10	5.44E-03	4.14E-03	8.64E-04	1.25E-03	1.98E-04	3.88E-03
94	GRID	6.02E-01	6.53E-01	5.68E-01	7.28E-01	1.25E+00	1.69E+00	739373	3861069	10	5.02E-03	3.82E-03	7.97E-04	1.15E-03	1.83E-04	3.58E-03
95	GRID	5.59E-01	5.91E-01	5.26E-01	6.46E-01	1.26E+00	1.51E+00	739473	3861069	10	4.65E-03	3.54E-03	7.39E-04	1.07E-03	1.70E-04	3.32E-03
96	GRID	4.79E-01	4.95E-01	5.02E-01	5.89E-01	1.23E+00	1.38E+00	739573	3861069	10	4.27E-03	3.25E-03	6.78E-04	9.82E-04	1.56E-04	3.05E-03
97	GRID	4.81E-01	3.83E-01	4.97E-01	5.63E-01	1.15E+00	1.27E+00	739673	3861069	10	3.97E-03	3.02E-03	6.30E-04	9.13E-04	1.45E-04	2.83E-03
98	GRID	4.49E-01	3.76E-01	4.69E-01	5.63E-01	1.05E+00	1.17E+00	739773	3861069	10	3.73E-03	2.84E-03	5.92E-04	8.57E-04	1.36E-04	2.66E-03
99	GRID	3.58E-01	3.64E-01	4.47E-01	5.94E-01	9.52E-01	1.08E+00	739873	3861069	10	3.47E-03	2.64E-03	5.51E-04	7.97E-04	1.26E-04	2.47E-03
100	GRID	2.83E-01	3.54E-01	4.09E-01	6.48E-01	8.50E-01	1.00E+00	739973	3861069	10	3.24E-03	2.47E-03	5.14E-04	7.45E-04	1.18E-04	2.31E-03
101	GRID	7.45E-01	9.14E-01	1.45E+00	2.25E+00	4.02E+00	6.80E+00	737573	3860969	10	1.48E-02	1.13E-02	2.35E-03	3.40E-03	5.39E-04	1.05E-02
102	GRID	7.88E-01	9.94E-01	1.36E+00	2.44E+00	4.37E+00	8.62E+00	737673	3860969	10	1.70E-02	1.29E-02	2.69E-03	3.90E-03	6.19E-04	1.21E-02
103	GRID	7.53E-01	1.06E+00	1.44E+00	2.37E+00	4.68E+00	1.13E+01	737773	3860969	10	1.97E-02	1.50E-02	3.13E-03	4.54E-03	7.20E-04	1.41E-02
104	GRID	6.77E-01	9.88E-01	1.55E+00	2.38E+00	5.10E+00	1.48E+01	737873	3860969	10	2.33E-02	1.77E-02	3.70E-03	5.36E-03	8.49E-04	1.66E-02
105	GRID	6.88E-01	9.06E-01	1.40E+00	2.54E+00	5.32E+00	2.04E+01	737973	3860969	10	2.86E-02	2.17E-02	4.53E-03	6.57E-03	1.04E-03	2.04E-02
106	GRID	8.69E-01	1.11E+00	1.50E+00	2.33E+00	5.43E+00	2.79E+01	738073	3860969	10	3.58E-02	2.72E-02	5.68E-03	8.22E-03	1.30E-03	2.55E-02
107	GRID	1.03E+00	1.40E+00	2.03E+00	3.34E+00	7.03E+00	3.66E+01	738173	3860969	10	4.70E-02	3.58E-02	7.46E-03	1.08E-02	1.71E-03	3.35E-02
108	GRID	9.91E-01	1.29E+00	1.76E+00	2.67E+00	6.90E+00	2.51E+01	738273	3860969	10	3.54E-02	2.69E-02	5.62E-03	8.13E-03	1.29E-03	2.52E-02
109	GRID	7.62E-01	1.04E+00	1.79E+00	3.46E+00	7.52E+00	1.48E+01	738373	3860969	10	2.68E-02	2.04E-02	4.26E-03	6.17E-03	9.78E-04	1.91E-02
110	GRID	8.75E-01	1.39E+00	2.06E+00	3.76E+00	5.15E+00	1.04E+01	738473	3860969	10	2.16E-02	1.64E-02	3.43E-03	4.97E-03	7.87E-04	1.54E-02
111	GRID	1.05E+00	1.39E+00	2.26E+00	2.94E+00	3.80E+00	7.95E+00	738573	3860969	10	1.77E-02	1.35E-02	2.81E-03	4.07E-03	6.46E-04	1.26E-02
112	GRID	1.00E+00	1.53E+00	2.01E+00	2.34E+00	2.86E+00	6.40E+00	738673	3860969	10	1.47E-02	1.12E-02	2.34E-03	3.39E-03	5.38E-04	1.05E-02
113	GRID	1.11E+00	1.53E+00	1.57E+00	1.99E+00	2.27E+00	5.25E+00	738773	3860969	10	1.25E-02	9.55E-03	1.99E-03	2.88E-03	4.57E-04	8.94E-03
114	GRID	1.18E+00	1.16E+00	1.36E+00	1.64E+00	1.89E+00	4.47E+00	738873	3860969	10	1.07E-02	8.14E-03	1.70E-03	2.46E-03	3.90E-04	7.62E-03
115	GRID	9.39E-01	1.03E+00	1.22E+00	1.33E+00	1.81E+00	3.68E+00	738973	3860969	10	9.15E-03	6.96E-03	1.45E-03	2.10E-03	3.33E-04	6.52E-03
116	GRID	8.03E-01	8.96E-01	1.14E+00	1.05E+00	1.82E+00	3.01E+00	739073	3860969	10	7.97E-03	6.07E-03	1.27E-03	1.83E-03	2.90E-04	5.68E-03
117	GRID	7.39E-01	8.77E-01	9.26E-01	9.74E-01	1.75E+00	2.50E+00	739173	3860969	10	7.10E-03	5.40E-03	1.13E-03	1.63E-03	2.59E-04	5.06E-03
118	GRID	6.40E-01	7.81E-01	7.79E-01	9.23E-01	1.65E+00	2.15E+00	739273	3860969	10	6.33E-03	4.82E-03	1.00E-03	1.45E-03	2.31E-04	4.51E-03
119	GRID	6.56E-01	7.23E-01	6.36E-01	7.92E-01	1.58E+00	1.89E+00	739373	3860969	10	5.74E-03	4.37E-03	9.11E-04	1.32E-03	2.09E-04	4.09E-03
120	GRID	6.08E-01	6.39E-01	5.88E-01	7.25E-01	1.50E+00	1.69E+00	739473	3860969	10	5.25E-03	4.00E-03	8.34E-04	1.21E-03	1.92E-04	3.75E-03
121	GRID	5.30E-01	5.19E-01	5.75E-01	7.09E-01	1.38E+00	1.52E+00	739573	3860969	10	4.78E-03	3.64E-03	7.59E-04	1.10E-03	1.74E-04	3.41E-03
122	GRID	5.21E-01	4.25E-01	5.56E-01	7.12E-01	1.24E+00	1.37E+00	739673	3860969	10	4.41E-03	3.36E-03	7.00E-04	1.01E-03	1.61E-04	3.14E-03
123	GRID	4.74E-01	4.14E-01	5.19E-01	7.49E-01	1.10E+00	1.25E+00	739773	3860969	10	4.12E-03	3.13E-03	6.54E-04	9.47E-04	1.50E-04	2.94E-03
124	GRID	3.70E-01	3.98E-01	4.73E-01	7.98E-01	9.75E-01	1.14E+00	739873	3860969	10	3.80E-03	2.89E-03	6.03E-04	8.73E-04	1.38E-04	2.71E-03
125	GRID	3.03E-01	3.89E-01	4.25E-01	8.32E-01	8.76E-01	1.05E+00	739973	3860969	10	3.54E-03	2.70E-03	5.62E-04	8.14E-04	1.29E-04	2.52E-03

Average Annual Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	UTME	UTMN	ZONE	Annual Average Concentration, ug/cu m: Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
126	GRID	7.40E-01	1.08E+00	1.69E+00	2.46E+00	4.92E+00	6.13E+00	737573	3860869	10	1.56E-02	1.18E-02	2.47E-03	3.58E-03	5.67E-04	1.11E-02
127	GRID	8.07E-01	1.03E+00	1.72E+00	2.61E+00	5.35E+00	8.05E+00	737673	3860869	10	1.79E-02	1.36E-02	2.84E-03	4.11E-03	6.52E-04	1.27E-02
128	GRID	8.63E-01	1.10E+00	1.62E+00	2.91E+00	5.77E+00	1.07E+01	737773	3860869	10	2.10E-02	1.60E-02	3.33E-03	4.83E-03	7.65E-04	1.50E-02
129	GRID	8.26E-01	1.19E+00	1.65E+00	2.99E+00	6.54E+00	1.47E+01	737873	3860869	10	2.55E-02	1.94E-02	4.05E-03	5.86E-03	9.29E-04	1.82E-02
130	GRID	7.40E-01	1.11E+00	1.80E+00	2.94E+00	7.17E+00	2.09E+01	737973	3860869	10	3.17E-02	2.41E-02	5.03E-03	7.28E-03	1.15E-03	2.26E-02
131	GRID	7.75E-01	1.03E+00	1.62E+00	3.14E+00	7.84E+00	3.09E+01	738073	3860869	10	4.14E-02	3.15E-02	6.57E-03	9.52E-03	1.51E-03	2.95E-02
132	GRID	9.97E-01	1.32E+00	1.85E+00	3.00E+00	8.00E+00	5.32E+01	738173	3860869	10	6.25E-02	4.76E-02	9.92E-03	1.44E-02	2.28E-03	4.45E-02
133	GRID	1.15E+00	1.60E+00	2.41E+00	4.24E+00	1.04E+01	1.66E+02	738273	3860869	10	1.70E-01	1.29E-01	2.70E-02	3.90E-02	6.19E-03	1.21E-01
134	GRID	1.01E+00	1.30E+00	1.83E+00	3.67E+00	1.13E+01	4.40E+01	738373	3860869	10	5.77E-02	4.39E-02	9.16E-03	1.33E-02	2.10E-03	4.11E-02
135	GRID	8.28E-01	1.31E+00	2.39E+00	4.43E+00	7.97E+00	2.08E+01	738473	3860869	10	3.45E-02	2.62E-02	5.47E-03	7.93E-03	1.26E-03	2.46E-02
136	GRID	1.09E+00	1.61E+00	2.43E+00	4.03E+00	5.27E+00	1.30E+01	738573	3860869	10	2.51E-02	1.91E-02	3.98E-03	5.76E-03	9.14E-04	1.79E-02
137	GRID	1.14E+00	1.59E+00	2.56E+00	2.97E+00	3.90E+00	9.18E+00	738673	3860869	10	1.95E-02	1.48E-02	3.10E-03	4.48E-03	7.11E-04	1.39E-02
138	GRID	1.13E+00	1.80E+00	1.91E+00	2.49E+00	2.98E+00	6.99E+00	738773	3860869	10	1.58E-02	1.20E-02	2.51E-03	3.64E-03	5.76E-04	1.13E-02
139	GRID	1.32E+00	1.40E+00	1.61E+00	1.95E+00	2.89E+00	5.25E+00	738873	3860869	10	1.32E-02	1.00E-02	2.09E-03	3.03E-03	4.80E-04	9.39E-03
140	GRID	1.13E+00	1.18E+00	1.41E+00	1.58E+00	2.73E+00	4.06E+00	738973	3860869	10	1.10E-02	8.41E-03	1.75E-03	2.54E-03	4.03E-04	7.88E-03
141	GRID	9.02E-01	1.02E+00	1.31E+00	1.26E+00	2.47E+00	3.30E+00	739073	3860869	10	9.38E-03	7.14E-03	1.49E-03	2.16E-03	3.42E-04	6.69E-03
142	GRID	8.32E-01	9.81E-01	1.04E+00	1.18E+00	2.23E+00	2.76E+00	739173	3860869	10	8.25E-03	6.28E-03	1.31E-03	1.90E-03	3.01E-04	5.88E-03
143	GRID	7.14E-01	8.83E-01	8.73E-01	1.02E+00	2.09E+00	2.35E+00	739273	3860869	10	7.25E-03	5.52E-03	1.15E-03	1.67E-03	2.64E-04	5.17E-03
144	GRID	7.19E-01	7.98E-01	7.15E-01	9.28E-01	1.92E+00	2.04E+00	739373	3860869	10	6.51E-03	4.95E-03	1.03E-03	1.50E-03	2.37E-04	4.64E-03
145	GRID	6.65E-01	6.93E-01	6.72E-01	9.22E-01	1.71E+00	1.80E+00	739473	3860869	10	5.91E-03	4.50E-03	9.38E-04	1.36E-03	2.15E-04	4.21E-03
146	GRID	5.91E-01	5.47E-01	6.68E-01	9.31E-01	1.50E+00	1.59E+00	739573	3860869	10	5.33E-03	4.05E-03	8.45E-04	1.22E-03	1.94E-04	3.80E-03
147	GRID	5.62E-01	4.79E-01	6.15E-01	9.58E-01	1.32E+00	1.42E+00	739673	3860869	10	4.89E-03	3.72E-03	7.77E-04	1.13E-03	1.78E-04	3.49E-03
148	GRID	5.01E-01	4.56E-01	5.56E-01	9.96E-01	1.18E+00	1.26E+00	739773	3860869	10	4.52E-03	3.44E-03	7.18E-04	1.04E-03	1.65E-04	3.22E-03
149	GRID	3.83E-01	4.41E-01	5.02E-01	1.02E+00	1.07E+00	1.13E+00	739873	3860869	10	4.15E-03	3.16E-03	6.60E-04	9.55E-04	1.51E-04	2.96E-03
150	GRID	3.34E-01	4.29E-01	4.62E-01	9.95E-01	9.91E-01	1.02E+00	739973	3860869	10	3.87E-03	2.94E-03	6.14E-04	8.89E-04	1.41E-04	2.76E-03
151	GRID	8.47E-01	1.30E+00	1.72E+00	3.00E+00	4.99E+00	5.52E+00	737573	3860769	10	1.59E-02	1.21E-02	2.52E-03	3.65E-03	5.79E-04	1.13E-02
152	GRID	8.16E-01	1.26E+00	1.92E+00	3.14E+00	5.91E+00	6.59E+00	737673	3860769	10	1.79E-02	1.37E-02	2.85E-03	4.13E-03	6.54E-04	1.28E-02
153	GRID	8.80E-01	1.18E+00	2.04E+00	3.26E+00	7.13E+00	8.24E+00	737773	3860769	10	2.08E-02	1.58E-02	3.30E-03	4.78E-03	7.57E-04	1.48E-02
154	GRID	9.50E-01	1.23E+00	1.96E+00	3.51E+00	8.40E+00	1.09E+01	737873	3860769	10	2.46E-02	1.87E-02	3.91E-03	5.66E-03	8.98E-04	1.76E-02
155	GRID	9.13E-01	1.35E+00	1.94E+00	3.84E+00	9.63E+00	1.56E+01	737973	3860769	10	3.04E-02	2.31E-02	4.83E-03	6.99E-03	1.11E-03	2.17E-02
156	GRID	8.17E-01	1.26E+00	2.12E+00	3.83E+00	1.12E+01	2.29E+01	738073	3860769	10	3.85E-02	2.93E-02	6.11E-03	8.85E-03	1.40E-03	2.74E-02
157	GRID	8.85E-01	1.19E+00	1.92E+00	4.04E+00	1.27E+01	3.59E+01	738173	3860769	10	5.18E-02	3.94E-02	8.22E-03	1.19E-02	1.89E-03	3.69E-02
158	GRID	1.15E+00	1.58E+00	2.34E+00	4.09E+00	1.36E+01	7.05E+01	738273	3860769	10	8.52E-02	6.49E-02	1.35E-02	1.96E-02	3.11E-03	6.08E-02
159	GRID	1.27E+00	1.79E+00	2.77E+00	5.02E+00	1.61E+01	1.21E+02	738373	3860769	10	1.35E-01	1.03E-01	2.15E-02	3.11E-02	4.93E-03	9.64E-02
160	GRID	1.01E+00	1.34E+00	2.30E+00	5.51E+00	1.39E+01	4.75E+01	738473	3860769	10	6.54E-02	4.98E-02	1.04E-02	1.50E-02	2.38E-03	4.66E-02
161	GRID	1.01E+00	1.73E+00	2.84E+00	5.61E+00	8.12E+00	2.60E+01	738573	3860769	10	4.14E-02	3.15E-02	6.57E-03	9.52E-03	1.51E-03	2.95E-02
162	GRID	1.28E+00	1.77E+00	3.15E+00	3.95E+00	5.96E+00	1.62E+01	738673	3860769	10	2.95E-02	2.25E-02	4.69E-03	6.79E-03	1.08E-03	2.10E-02
163	GRID	1.23E+00	2.01E+00	2.43E+00	3.17E+00	5.03E+00	1.04E+01	738773	3860769	10	2.22E-02	1.69E-02	3.52E-03	5.10E-03	8.08E-04	1.58E-02
164	GRID	1.40E+00	1.74E+00	1.94E+00	2.41E+00	4.34E+00	7.32E+00	738873	3860769	10	1.75E-02	1.33E-02	2.78E-03	4.02E-03	6.38E-04	1.25E-02
165	GRID	1.35E+00	1.38E+00	1.67E+00	1.92E+00	3.75E+00	5.44E+00	738973	3860769	10	1.42E-02	1.08E-02	2.25E-03	3.26E-03	5.17E-04	1.01E-02
166	GRID	1.04E+00	1.19E+00	1.52E+00	1.58E+00	3.25E+00	4.20E+00	739073	3860769	10	1.17E-02	8.89E-03	1.85E-03	2.69E-03	4.26E-04	8.33E-03
167	GRID	9.39E-01	1.11E+00	1.17E+00	1.38E+00	2.95E+00	3.33E+00	739173	3860769	10	9.94E-03	7.57E-03	1.58E-03	2.29E-03	3.62E-04	7.09E-03
168	GRID	8.04E-01	1.01E+00	9.88E-01	1.25E+00	2.64E+00	2.70E+00	739273	3860769	10	8.58E-03	6.53E-03	1.36E-03	1.97E-03	3.13E-04	6.12E-03
169	GRID	7.94E-01	8.81E-01	8.20E-01	1.26E+00	2.30E+00	2.23E+00	739373	3860769	10	7.57E-03	5.76E-03	1.20E-03	1.74E-03	2.76E-04	5.40E-03
170	GRID	7.31E-01	7.56E-01	7.95E-01	1.26E+00	1.98E+00	1.87E+00	739473	3860769	10	6.76E-03	5.14E-03	1.07E-03	1.55E-03	2.46E-04	4.82E-03
171	GRID	6.61E-01	5.94E-01	7.56E-01	1.25E+00	1.74E+00	1.60E+00	739573	3860769	10	6.03E-03	4.59E-03	9.58E-04	1.39E-03	2.20E-04	4.30E-03
172	GRID	6.07E-01	5.34E-01	6.65E-01	1.26E+00	1.55E+00	1.38E+00	739673	3860769	10	5.48E-03	4.17E-03	8.70E-04	1.26E-03	2.00E-04	3.91E-03
173	GRID	5.31E-01	5.06E-01	6.02E-01	1.24E+00	1.41E+00	1.21E+00	739773	3860769	10	5.03E-03	3.83E-03	7.98E-04	1.16E-03	1.83E-04	3.58E-03
174	GRID	4.01E-01	5.00E-01	5.67E-01	1.17E+00	1.30E+00	1.07E+00	739873	3860769	10	4.58E-03	3.48E-03	7.27E-04	1.05E-03	1.67E-04	3.26E-03
175	GRID	3.75E-01	4.75E-01	5.60E-01	1.08E+00	1.20E+00	9.51E-01	739973	3860769	10	4.24E-03	3.23E-03	6.73E-04	9.75E-04	1.55E-04	3.02E-03
176	GRID	1.02E+00	1.37E+00	1.95E+00	3.43E+00	4.27E+00	4.70E+00	737573	3860669	10	1.53E-02	1.16E-02	2.43E-03	3.52E-03	5.58E-04	1.09E-02
177	GRID	9.63E-01	1.47E+00	1.99E+00	3.69E+00	5.24E+00	5.50E+00	737673	3860669	10	1.72E-02	1.31E-02	2.74E-03	3.96E-03	6.28E-04	1.23E-02
178	GRID	9.11E-01	1.47E+00	2.18E+00	3.94E+00	6.43E+00	6.75E+00	737773	3860669	10	1.98E-02	1.51E-02	3.15E-03	4.56E-03	7.22E-04	1.41E-02
179	GRID	9.65E-01	1.38E+00	2.41E+00	4.26E+00	8.05E+00	8.43E+00	737873	3860669	10	2.33E-02	1.77E-02	3.70E-03	5.36E-03	8.49E-04	1.66E-02
180	GRID	1.05E+00	1.40E+00	2.41E+00	4.58E+00	1.05E+01	1.05E+01	737973	3860669	10	2.78E-02	2.12E-02	4.42E-03	6.40E-03	1.01E-03	1.98E-02
181	GRID	1.02E+00	1.54E+00	2.34E+00	4.97E+00	1.37E+01	1.35E+01	738073	3860669	10	3.39E-02	2.58E-02	5.38E-03	7.79E-03	1.23E-03	2.42E-02
182	GRID	9.10E-01	1.45E+00	2.54E+00	5.27E+00	1.86E+01	1.87E+01	738173	3860669	10	4.34E-02	3.30E-02	6.89E-03	9.98E-03	1.58E-03	3.09E-02
183	GRID	1.03E+00	1.40E+00	2.32E+00	5.45E+00	2.56E+01	3.16E+01	738273	3860669	10	6.16E-02	4.69E-02	9.78E-03	1.42E-02	2.25E-03	4.39E-02
184	GRID	1.34E+00	1.92E+00	3.05E+00	6.05E+00	3.27E+01	9.07E+01	738373	3860669	10	1.24E-01	9.44E-02	1.97E-02	2.85E-02	4.52E-03	8.84E-02
185	GRID	1.37E+00	1.94E+00	2.97E+00	6.15E+00	3.04E+01	8.22E+01	738473	3860669	10	1.14E-01	8.70E-02	1.81E-02	2.63E-02	4.16E-03	8.15E-02
186	GRID	1.04E+00	1.61E+00	3.34E+00	7.84E+00	1.66E+01	4.04E+01	738573	3860669	10	6.47E-02	4.93E-02	1.03E-02	1.49E-02	2.36E-03	4.61E-02
187	GRID	1.30E+00	2.09E+00	3.63E+00	5.72E+00	1.12E+01	2.38E+01	738673	3860669	10	4.36E-02	3.32E-02	6.93E-03	1.00E-02	1.59E-03	3.11E-02
188	GRID	1.41E+00	2.14E+00	3.23E+00	4.16E+00	8.40E+00	1.53E+01	738773	3860669	10	3.17E-02	2.41E-02	5.03E-03	7.28E-03	1.15E-03	2.26E-02
189	GRID	1.44E+00	2.19E+00	2.40E+00	3.10E+00	6.75E+00	1.06E+01	738873	3860669	10	2.42E-02	1.84E-02	3.84E-03	5.56E-03	8.82E-04	1.73E-02
190	GRID	1.60E+00	1.65E+00	2.03E+00	2.47E+00	5.49E+00	7.70E+00	738973	3860669	10	1.91E-02	1.46E-02	3.04E-03	4.40E-03	6.97E-04	1.36E-02
191	GRID	1.23E+00	1.39E+00	1.78E+00	1.94E+00	4.67E+00	5.69E+00	739073	3860669	10	1.53E-02	1.16E-02	2.42E-03	3.51E-03	5.56E-04	1.09E-02
192	GRID	1.06E+00	1.27E+00	1.37E+00	1.82E+00	3.89E+00	4.33E+00	739173	3860669	10	1.26E-02	9.56E-03	1.99E-03	2.89E-03	4.58E-04	8.95E-03
193	GRID	9.16E-01	1.17E+00	1.12E+00	1.81E+00	3.17E+00	3.42E+00	739273	3860669	10	1.06E-02	8.07E-03	1.68E-03	2.44E-03	3.87E-04	7.56E-03
194	GRID	8.83E-01	9.77E-01	9.82E-01	1.77E+00	2.63E+00	2.78E+00	739373	3860669	10	9.16E-03	6.97E-03	1.45E-03	2.11E-03	3.34E-04	6.53E-03
195	GRID	8.10E-01	8.26E-01	9.47E-01	1.67E+00	2.23E+00	2.31E+00	739473	3860669	10	8.04E-03	6.12E-03	1.28E-03	1.85E-03	2.93E-04	5.73E-03
196	GRID	7.41E-01	6.63E-01	8.21E-01	1.60E+00	1.95E+00	1.95E+00	739573	3860669	10	7.06E-03	5.37E-03	1.12E-03	1.62E-03	2.57E-04	5.03E-03
197	GRID	6.57E-01	5.98E-01	7.35E-01	1.53E+00	1.74E+00	1.66E+00	739673	3860669	10	6.32E-03	4.81E-03	1.00E-03	1.45E-03	2.30E-04	4.51E-03
198	GRID	5.61E-01	5.74E-01	7.12E-01	1.42E+00	1.56E+00	1.44E+00	739773	3860669	10	5.73E-03	4.36E-03	9.09E-04	1.32E-03	2.09E-04	4.08E-03
199	GRID	4.33E-01	5.66E-01	7.09E-01	1.28E+00	1.41E+00	1.25E+00	739873	3860669	10	5.16E-03	3.93E-03	8.19E-04	1.19E-03	1.88E-04	3.68E-03
200	GRID	4.18E-01	5.29E-01	7.36E-01	1.14E+00	1.28E+00	1.10E+00	739973	3860669	10	4.75E-03	3.62E-03	7.55E-04	1.09E-03	1.73E-04	3.39E-03
201	GRID	1.12E+00	1.36E+00	2.36E+00	3.76E+00	3.67E+00	3.76E+00	737573	3860569	10	1.46E-02	1.12E-02	2.33E-03	3.37E-03	5.34E-04	1.04E-02
202	GRID	1.15E+00	1.50E+00	2.44E+00	4.23E+00	4.51E+00	4.36E+00	737673	3860569	10	1.66E-02	1.27E-02	2.64E-03	3.82E-03	6.06E-04	1.19E-02
203	GRID	1.10E+00	1.66E+00	2.45E+00	4.77E+00	5.72E+00	5.10E+00	737773	3860569	10	1.90E-02	1.45E-02	3.02E-03	4.37E-03	6.93E-04	1.36E-02
204	GRID	1.03E+00	1.72E+00	2.55E+00	5.23E+00	7.47E+00	5.84E+00	737873	3860569	10	2.18E-02	1.66E-02	3.46E-03	5.01E-03	7.94E-04	1.55E-02
205	GRID	1.07E+00	1.64E+00	2.83E+00	5.62E+00	9.90E+00	6.66E+00	737973	3860569	10	2.53E-02	1.93E-02	4.02E-03	5.83E-03	9.23E-04	1.81E-02
206	GRID	1.18E+00	1.61E+00	3.01E+00	6.29E+00	1.34E+01	7.69E+00	738073	3860569	10	3.03E-02	2.31E-02	4.81E-03	6.97E-03	1.11E-03	2.16E-02
207	GRID	1.14E+00	1.78E+00	2.92E+00	7.02E+00	1.90E+01	8.93E+00	738173	3860569	10	3.73E-02	2.84E-02	5.92E-03	8.57E-03	1.36E-03	2.66E-02
208	GRID	1.02E+00	1.68E+00	3.13E+00	7.61E+00	2.74E+01	1.19E+01	738273	3860569	10	4.82E-02	3.67E-02	7.65E-03	1.11E-02	1.76E-03	3.44E-02
209	GRID	1.21E+00	1.69E+00	2.91E+00	7.98E+00	4.54E+01	1.76E+01	738373	3860569	10	7.02E-02	5.34E-02	1.11E-02	1.61E-02	2.56E-03	5.00E-02
210	GRID	1.56E+00	2.34E+00	4.08E+00	9.85E+00	1.35E+02	4.45E+01	738473	3860569	10	1.80E-01	1.37E-01	2.86E-02	4.15E-02	6.57E-03	1.29E-01
211	GRID	1.43E+00	1.99E+00	3.35E+00	1.07E+01	5.82E+01	3.98E+01	738573	3860569	10	1.06E-01	8.03E-02	1.68E-02	2.43E-02	3.85E-03	7.52E-02
212	GRID	1.20E+00	2.22E+00	4.31E+00	9.04E+00	2.45E+01	2.80E+01	738673	3860569	10	6.33E-02	4.82E-02	1.01E-02	1.46E-02	2.31E-03	4.51E-02
213	GRID	1.60E+00	2.37E+00	4.38E+00	5.80E+00	1.44E+01	1.96E+01	738773	3860569	10	4.40E-02	3.35E-02	6.99E-03	1.01E-02	1.60E-03	3.14E-02
214	GRID	1.55E+00	2.67E+00	3.10E+00	4.25E+00	9.93E+00	1.39E+01	738873	3860569	10	3.24E-02	2.46E-02	5.14E-03	7.44E-03	1.18E-03	2.31E-02
215	GRID	1.80E+00	2.05E+00	2.56E+00	3.15E+00	7.52E+00	1.02E+01	738973	3860569	10	2.49E-02	1.90E-02	3.96E-03	5.73E-03	9.09E-04	1.78E-02
216	GRID	1.52E+00	1.65E+00	2.13E+00	2.88E+00	5.66E+00	7.84E+00	739073	3860569	10	1.98E-02	1.51E-02	3.15E-03	4.56E-03	7.22E-04	1.41E-02
217	GRID	1.22E+00	1.48E+00	1.66E+00	2.77E+00	4.33E+00	6.17E+00	739173	3860569	10	1.61E-02	1.23E-02	2.56E-03	3.70E-03	5.87E-04	1.15E-02
218	GRID	1.05E+00	1.36E+00	1.32E+00	2.55E+00	3.47E+00	4.92E+00	739273	3860569	10	1.34E-02	1.02E-02	2.13E-03	3.08E-03	4.89E-04	9.56E-03
219	GRID	9.93E-01	1.10E+00	1.21E+00	2.28E+00	2.89E+00	3.94E+00	739373	3860569	10	1.13E-02	8.64E-03	1.80E-03	2.61E-03	4.13E-04	8.09E-03
220	GRID	9.05E-01	9.19E-01	1.07E+00	2.12E+00	2.45E+00	3.21E+00	739473	3860569	10	9.75E-03	7.43E-03	1.55E-03	2.24E-03	3.56E-04	6.95E-03
221	GRID	8.30E-01	7.40E-01	9.38E-01	1.97E+00	2.12E+00	2.66E+00	739573	3860569	10	8.46E-03	6.44E-03	1.34E-03	1.95E-03	3.08E-04	6.03E-03
222	GRID	7.16E-01	6.77E-01	9.23E-01	1.76E+00	1.86E+00	2.24E+00	739673	3860569	10	7.47E-03	5.69E-03	1.19E-03	1.72E-03	2.72E-04	5.33E-03
223	GRID	5.94E-01	6.69E-01	9.26E-01	1.55E+00	1.64E+00	1.92E+00	739773	3860569	10	6.67E-03	5.08E-03	1.06E-03	1.53E-03	2.43E-04	4.76E-03
224	GRID	4.84E-01	6.32E-01	9.49E-01	1.36E+00	1.46E+00	1.66E+00	739873	3860569	10	5.98E-03	4.55E-03	9.50E-04	1.38E-03	2.18E-04	4.26E-03
225	GRID	4.62E-01	5.71E-01	9.86E-01	1.22E+00	1.30E+00	1.45E+00	739973	3860569	10	5.47E-03	4.17E-03	8.69E-04	1.26E-03	1.99E-04	3.90E-03
226	GRID	1.12E+00	1.61E+00	2.55E+00	3.55E+00	3.82E+00	2.62E+00	737573	3860469	10	1.40E-02	1.06E-02	2.22E-03	3.21E-03	5.09E-04	9.95E-03
227	GRID	1.23E+00	1.59E+00	2.76E+00	4.13E+00	4.48E+00	2.88E+00	737673	3860469	10	1.56E-02	1.19E-02	2.48E-03	3.59E-03	5.69E-04	1.11E-02
228	GRID	1.29E+00	1.67E+00	2.95E+00	4.79E+00	5.28E+00	3.19E+00	737773	3860469	10	1.75E-02	1.33E-02	2.78E-03	4.03E-03	6.39E-04	1.25E-02
229	GRID	1.27E+00	1.87E+00	3.11E+00	5.63E+00	6.28E+00	3.61E+00	737873	3860469	10	1.99E-02	1.51E-02	3.16E-03	4.57E-03	7.25E-04	1.42E-02
230	GRID	1.19E+00	2.02E+00	3.22E+00	6.78E+00	7.73E+00	4.20E+00	737973	3860469	10	2.30E-02	1.75E-02	3.65E-03	5.28E-03	8.37E-04	1.64E-02
231	GRID	1.20E+00	1.99E+00	3.42E+00	8.05E+00	1.01E+01	4.81E+00	738073	3860469	10	2.70E-02	2.06E-02	4.29E-03	6.21E-03	9.85E-04	1.93E-02
232	GRID	1.33E+00	1.91E+00	3.78E+00	9.24E+00	1.42E+01	5.20E+00	738173	3860469	10	3.26E-02	2.48E-02	5.17E-03	7.49E-03	1.19E-03	2.32E-02
233	GRID	1.30E+00	2.09E+00	3.83E+00	1.07E+01	2.07E+01	6.04E+00	738273	3860469	10	4.08E-02	3.11E-02	6.48E-03	9.38E-03	1.49E-03	2.91E-02
234	GRID	1.17E+00	1.99E+00	3.99E+00	1.23E+01	3.15E+01	8.56E+00	738373	3860469	10	5.44E-02	4.14E-02	8.63E-03	1.25E-02	1.98E-03	3.88E-02
235	GRID	1.45E+00	2.10E+00	3.83E+00	1.35E+01	5.62E+01	1.32E+01	738473	3860469	10	8.25E-02	6.28E-02	1.31E-02	1.90E-02	3.01E-03	5.88E-02
236	GRID	1.81E+00	2.84E+00	5.44E+00	1.66E+01	1.83E+02	2.22E+01	738573	3860469	10	2.12E-01	1.61E-01	3.36E-02	4.87E-02	7.72E-03	1.51E-01
237	GRID	1.44E+00	2.16E+00	5.13E+00	1.57E+01	5.79E+01	1.84E+01	738673	3860469	10	9.21E-02	7.01E-02	1.46E-02	2.12E-02	3.36E-03	6.56E-02
238	GRID	1.58E+00	2.86E+00	5.86E+00	9.03E+00	3.00E+01	1.62E+01	738773	3860469	10	5.99E-02	4.56E-02	9.51E-03	1.38E-02	2.18E-03	4.27E-02
239	GRID	1.80E+00	3.07E+00	4.29E+00	6.29E+00	1.83E+01	1.33E+01	738873	3860469	10	4.30E-02	3.27E-02	6.83E-03	9.89E-03	1.57E-03	3.07E-02
240	GRID	1.92E+00	2.65E+00	3.36E+00	5.23E+00	1.16E+01	1.08E+01	738973	3860469	10	3.25E-02	2.47E-02	5.16E-03	7.47E-03	1.18E-03	2.32E-02
241	GRID	1.89E+00	2.00E+00	2.61E+00	4.52E+00	7.98E+00	8.69E+00	739073	3860469	10	2.53E-02	1.93E-02	4.02E-03	5.82E-03	9.22E-04	1.80E-02
242	GRID	1.44E+00	1.76E+00	2.02E+00	3.90E+00	5.85E+00	7.03E+00	739173	3860469	10	2.01E-02	1.53E-02	3.19E-03	4.62E-03	7.33E-04	1.43E-02
243	GRID	1.23E+00	1.61E+00	1.64E+00	3.36E+00	4.48E+00	5.82E+00	739273	3860469	10	1.66E-02	1.26E-02	2.63E-03	3.81E-03	6.04E-04	1.18E-02
244	GRID	1.13E+00	1.24E+00	1.43E+00	3.02E+00	3.53E+00	4.91E+00	739373	3860469	10	1.39E-02	1.06E-02	2.21E-03	3.21E-03	5.08E-04	9.94E-03
245	GRID	1.02E+00	1.06E+00	1.27E+00	2.73E+00	2.85E+00	4.18E+00	739473	3860469	10	1.20E-02	9.12E-03	1.90E-03	2.75E-03	4.37E-04	8.54E-03
246	GRID	9.29E-01	8.41E-01	1.25E+00	2.39E+00	2.34E+00	3.54E+00	739573	3860469	10	1.03E-02	7.85E-03	1.64E-03	2.37E-03	3.76E-04	7.36E-03
247	GRID	7.83E-01	7.96E-01	1.27E+00	2.06E+00	1.96E+00	2.99E+00	739673	3860469	10	9.01E-03	6.86E-03	1.43E-03	2.07E-03	3.28E-04	6.42E-03
248	GRID	6.35E-01	7.77E-01	1.25E+00	1.80E+00	1.67E+00	2.53E+00	739773	3860469	10	7.92E-03	6.03E-03	1.26E-03	1.82E-03	2.89E-04	5.64E-03
249	GRID	5.44E-01	6.85E-01	1.26E+00	1.59E+00	1.43E+00	2.16E+00	739873	3860469	10	7.01E-03	5.34E-03	1.11E-03	1.61E-03	2.55E-04	5.00E-03
250	GRID	5.12E-01	6.16E-01	1.25E+00	1.44E+00	1.25E+00	1.87E+00	739973	3860469	10	6.34E-03	4.83E-03	1.01E-03	1.46E-03	2.31E-04	4.52E-03

Average Annual Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	UTME	UTMN	ZONE	Annual Average Concentration, ug/cu m					
											Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
251	GRID	1.13E+00	1.91E+00	2.87E+00	2.74E+00	3.53E+00	2.13E+00	737573	3860369	10	1.31E-02	9.96E-03	2.08E-03	3.01E-03	4.77E-04	9.32E-03
252	GRID	1.20E+00	1.97E+00	3.09E+00	3.32E+00	3.95E+00	2.37E+00	737673	3860369	10	1.45E-02	1.11E-02	2.31E-03	3.34E-03	5.30E-04	1.04E-02
253	GRID	1.34E+00	1.95E+00	3.35E+00	4.05E+00	4.53E+00	2.54E+00	737773	3860369	10	1.62E-02	1.24E-02	2.58E-03	3.73E-03	5.92E-04	1.16E-02
254	GRID	1.45E+00	1.96E+00	3.62E+00	4.96E+00	5.25E+00	2.79E+00	737873	3860369	10	1.83E-02	1.39E-02	2.91E-03	4.21E-03	6.67E-04	1.30E-02
255	GRID	1.48E+00	2.11E+00	3.87E+00	6.08E+00	6.36E+00	2.94E+00	737973	3860369	10	2.09E-02	1.59E-02	3.31E-03	4.80E-03	7.61E-04	1.49E-02
256	GRID	1.40E+00	2.36E+00	4.17E+00	7.55E+00	7.93E+00	3.01E+00	738073	3860369	10	2.41E-02	1.84E-02	3.83E-03	5.55E-03	8.80E-04	1.72E-02
257	GRID	1.37E+00	2.43E+00	4.50E+00	9.76E+00	9.89E+00	3.23E+00	738173	3860369	10	2.85E-02	2.17E-02	4.52E-03	6.55E-03	1.04E-03	2.03E-02
258	GRID	1.51E+00	2.33E+00	4.84E+00	1.28E+01	1.26E+01	3.96E+00	738273	3860369	10	3.48E-02	2.65E-02	5.52E-03	7.99E-03	1.27E-03	2.48E-02
259	GRID	1.49E+00	2.49E+00	5.23E+00	1.70E+01	1.71E+01	5.15E+00	738373	3860369	10	4.43E-02	3.37E-02	7.03E-03	1.02E-02	1.61E-03	3.16E-02
260	GRID	1.35E+00	2.40E+00	5.39E+00	2.35E+01	2.68E+01	7.35E+00	738473	3860369	10	6.10E-02	4.65E-02	9.69E-03	1.40E-02	2.22E-03	4.35E-02
261	GRID	1.77E+00	2.71E+00	5.40E+00	3.07E+01	6.11E+01	9.55E+00	738573	3860369	10	1.02E-01	7.74E-02	1.61E-02	2.34E-02	3.70E-03	7.25E-02
262	GRID	2.05E+00	3.31E+00	6.69E+00	3.62E+01	1.09E+02	1.26E+01	738673	3860369	10	1.55E-01	1.18E-01	2.46E-02	3.57E-02	5.66E-03	1.11E-01
263	GRID	1.54E+00	2.98E+00	7.69E+00	1.91E+01	4.75E+01	1.08E+01	738773	3860369	10	8.19E-02	6.23E-02	1.30E-02	1.88E-02	2.98E-03	5.84E-02
264	GRID	2.05E+00	3.46E+00	6.41E+00	1.23E+01	2.72E+01	1.02E+01	738873	3860369	10	5.63E-02	4.29E-02	8.94E-03	1.29E-02	2.05E-03	4.01E-02
265	GRID	2.05E+00	3.51E+00	4.57E+00	8.90E+00	1.71E+01	9.33E+00	738973	3860369	10	4.15E-02	3.16E-02	6.60E-03	9.55E-03	1.51E-03	2.96E-02
266	GRID	2.30E+00	2.52E+00	3.38E+00	7.11E+00	1.16E+01	7.91E+00	739073	3860369	10	3.18E-02	2.42E-02	5.05E-03	7.32E-03	1.16E-03	2.27E-02
267	GRID	1.75E+00	2.14E+00	2.61E+00	5.78E+00	8.36E+00	6.70E+00	739173	3860369	10	2.50E-02	1.90E-02	3.97E-03	5.75E-03	9.11E-04	1.78E-02
268	GRID	1.44E+00	1.90E+00	2.02E+00	4.86E+00	6.14E+00	5.78E+00	739273	3860369	10	2.02E-02	1.54E-02	3.21E-03	4.65E-03	7.37E-04	1.44E-02
269	GRID	1.30E+00	1.44E+00	1.84E+00	4.09E+00	4.64E+00	5.02E+00	739373	3860369	10	1.68E-02	1.28E-02	2.66E-03	3.85E-03	6.11E-04	1.19E-02
270	GRID	1.17E+00	1.21E+00	1.81E+00	3.35E+00	3.62E+00	4.40E+00	739473	3860369	10	1.42E-02	1.08E-02	2.26E-03	3.27E-03	5.18E-04	1.01E-02
271	GRID	1.04E+00	9.93E-01	1.79E+00	2.76E+00	2.92E+00	3.87E+00	739573	3860369	10	1.22E-02	9.30E-03	1.94E-03	2.81E-03	4.45E-04	8.71E-03
272	GRID	8.63E-01	9.58E-01	1.70E+00	2.32E+00	2.42E+00	3.42E+00	739673	3860369	10	1.07E-02	8.13E-03	1.69E-03	2.45E-03	3.89E-04	7.61E-03
273	GRID	7.00E-01	8.58E-01	1.62E+00	2.02E+00	2.03E+00	3.01E+00	739773	3860369	10	9.36E-03	7.12E-03	1.49E-03	2.15E-03	3.41E-04	6.67E-03
274	GRID	6.08E-01	7.52E-01	1.55E+00	1.79E+00	1.73E+00	2.64E+00	739873	3860369	10	8.29E-03	6.31E-03	1.32E-03	1.91E-03	3.02E-04	5.91E-03
275	GRID	5.76E-01	7.14E-01	1.45E+00	1.61E+00	1.49E+00	2.31E+00	739973	3860369	10	7.45E-03	5.67E-03	1.18E-03	1.71E-03	2.71E-04	5.31E-03
276	GRID	1.37E+00	1.98E+00	2.93E+00	2.51E+00	2.87E+00	1.80E+00	737573	3860269	10	1.23E-02	9.36E-03	1.95E-03	2.83E-03	4.48E-04	8.77E-03
277	GRID	1.33E+00	2.16E+00	3.27E+00	2.93E+00	3.17E+00	1.91E+00	737673	3860269	10	1.35E-02	1.03E-02	2.14E-03	3.10E-03	4.92E-04	9.62E-03
278	GRID	1.34E+00	2.32E+00	3.65E+00	3.48E+00	3.61E+00	1.95E+00	737773	3860269	10	1.49E-02	1.14E-02	2.37E-03	3.44E-03	5.45E-04	1.07E-02
279	GRID	1.46E+00	2.42E+00	4.09E+00	4.25E+00	4.20E+00	1.95E+00	737873	3860269	10	1.68E-02	1.28E-02	2.67E-03	3.86E-03	6.12E-04	1.20E-02
280	GRID	1.62E+00	2.44E+00	4.62E+00	5.35E+00	4.92E+00	1.97E+00	737973	3860269	10	1.91E-02	1.46E-02	3.04E-03	4.40E-03	6.97E-04	1.36E-02
281	GRID	1.72E+00	2.50E+00	5.12E+00	6.93E+00	5.65E+00	2.08E+00	738073	3860269	10	2.19E-02	1.67E-02	3.48E-03	5.04E-03	7.99E-04	1.56E-02
282	GRID	1.67E+00	2.74E+00	5.51E+00	9.16E+00	6.44E+00	2.39E+00	738173	3860269	10	2.55E-02	1.94E-02	4.05E-03	5.87E-03	9.30E-04	1.82E-02
283	GRID	1.59E+00	3.00E+00	6.06E+00	1.23E+01	7.44E+00	2.82E+00	738273	3860269	10	3.03E-02	2.31E-02	4.82E-03	6.98E-03	1.11E-03	2.16E-02
284	GRID	1.74E+00	2.93E+00	6.87E+00	1.73E+01	8.59E+00	3.57E+00	738373	3860269	10	3.75E-02	2.85E-02	5.95E-03	8.62E-03	1.37E-03	2.67E-02
285	GRID	1.74E+00	3.05E+00	7.39E+00	2.46E+01	1.09E+01	4.86E+00	738473	3860269	10	4.80E-02	3.66E-02	7.62E-03	1.10E-02	1.75E-03	3.42E-02
286	GRID	1.60E+00	2.98E+00	7.97E+00	3.90E+01	1.58E+01	5.56E+00	738573	3860269	10	6.66E-02	5.07E-02	1.06E-02	1.53E-02	2.43E-03	4.75E-02
287	GRID	2.19E+00	3.65E+00	8.43E+00	7.70E+01	3.18E+01	7.94E+00	738673	3860269	10	1.20E-01	9.11E-02	1.90E-02	2.75E-02	4.36E-03	8.54E-02
288	GRID	2.22E+00	3.60E+00	9.52E+00	8.09E+01	4.34E+01	8.18E+00	738773	3860269	10	1.35E-01	1.03E-01	2.14E-02	3.11E-02	4.92E-03	9.63E-02
289	GRID	1.97E+00	4.27E+00	1.00E+01	2.94E+01	3.10E+01	7.33E+00	738873	3860269	10	7.67E-02	5.84E-02	1.22E-02	1.76E-02	2.80E-03	5.47E-02
290	GRID	2.40E+00	4.59E+00	6.49E+00	1.61E+01	2.16E+01	6.88E+00	738973	3860269	10	5.31E-02	4.04E-02	8.42E-03	1.22E-02	1.93E-03	3.78E-02
291	GRID	2.64E+00	3.37E+00	4.59E+00	1.09E+01	1.52E+01	6.73E+00	739073	3860269	10	3.97E-02	3.02E-02	6.30E-03	9.13E-03	1.45E-03	2.83E-02
292	GRID	2.21E+00	2.70E+00	3.42E+00	8.05E+00	1.11E+01	6.16E+00	739173	3860269	10	3.07E-02	2.34E-02	4.88E-03	7.07E-03	1.12E-03	2.19E-02
293	GRID	1.72E+00	2.28E+00	2.89E+00	6.12E+00	8.38E+00	5.37E+00	739273	3860269	10	2.45E-02	1.86E-02	3.88E-03	5.62E-03	8.91E-04	1.74E-02
294	GRID	1.53E+00	1.73E+00	2.81E+00	4.64E+00	6.56E+00	4.66E+00	739373	3860269	10	2.00E-02	1.53E-02	3.18E-03	4.61E-03	7.30E-04	1.43E-02
295	GRID	1.37E+00	1.41E+00	2.63E+00	3.66E+00	5.22E+00	4.11E+00	739473	3860269	10	1.68E-02	1.28E-02	2.67E-03	3.87E-03	6.13E-04	1.20E-02
296	GRID	1.17E+00	1.22E+00	2.34E+00	3.03E+00	4.17E+00	3.71E+00	739573	3860269	10	1.43E-02	1.09E-02	2.27E-03	3.29E-03	5.21E-04	1.02E-02
297	GRID	9.59E-01	1.12E+00	2.16E+00	2.56E+00	3.38E+00	3.38E+00	739673	3860269	10	1.24E-02	9.43E-03	1.97E-03	2.85E-03	4.52E-04	8.83E-03
298	GRID	7.82E-01	9.58E-01	2.02E+00	2.20E+00	2.78E+00	3.09E+00	739773	3860269	10	1.08E-02	8.23E-03	1.72E-03	2.49E-03	3.94E-04	7.71E-03
299	GRID	6.87E-01	9.21E-01	1.82E+00	1.92E+00	2.34E+00	2.81E+00	739873	3860269	10	9.59E-03	7.30E-03	1.52E-03	2.21E-03	3.50E-04	6.84E-03
300	GRID	6.68E-01	9.19E-01	1.61E+00	1.70E+00	1.99E+00	2.54E+00	739973	3860269	10	8.61E-03	6.56E-03	1.37E-03	1.98E-03	3.14E-04	6.14E-03
301	GRID	1.60E+00	2.20E+00	2.46E+00	2.74E+00	2.08E+00	1.45E+00	737573	3860169	10	1.15E-02	8.72E-03	1.82E-03	2.63E-03	4.17E-04	8.16E-03
302	GRID	1.64E+00	2.32E+00	2.90E+00	3.15E+00	2.31E+00	1.41E+00	737673	3860169	10	1.25E-02	9.55E-03	1.99E-03	2.89E-03	4.57E-04	8.94E-03
303	GRID	1.62E+00	2.49E+00	3.40E+00	3.65E+00	2.55E+00	1.40E+00	737773	3860169	10	1.38E-02	1.05E-02	2.19E-03	3.18E-03	5.03E-04	9.84E-03
304	GRID	1.58E+00	2.70E+00	3.97E+00	4.29E+00	2.83E+00	1.39E+00	737873	3860169	10	1.53E-02	1.17E-02	2.43E-03	3.52E-03	5.58E-04	1.09E-02
305	GRID	1.64E+00	2.90E+00	4.59E+00	5.06E+00	3.10E+00	1.52E+00	737973	3860169	10	1.72E-02	1.31E-02	2.73E-03	3.95E-03	6.27E-04	1.23E-02
306	GRID	1.81E+00	3.07E+00	5.37E+00	5.99E+00	3.49E+00	1.61E+00	738073	3860169	10	1.95E-02	1.48E-02	3.10E-03	4.48E-03	7.11E-04	1.39E-02
307	GRID	1.99E+00	3.18E+00	6.44E+00	7.28E+00	4.05E+00	1.83E+00	738173	3860169	10	2.26E-02	1.72E-02	3.59E-03	5.21E-03	8.25E-04	1.61E-02
308	GRID	2.01E+00	3.34E+00	7.71E+00	9.35E+00	4.65E+00	2.10E+00	738273	3860169	10	2.66E-02	2.03E-02	4.23E-03	6.13E-03	9.71E-04	1.90E-02
309	GRID	1.90E+00	3.68E+00	8.91E+00	1.28E+01	5.13E+00	2.63E+00	738373	3860169	10	3.20E-02	2.44E-02	5.09E-03	7.37E-03	1.17E-03	2.28E-02
310	GRID	2.03E+00	3.83E+00	1.03E+01	1.87E+01	5.69E+00	3.34E+00	738473	3860169	10	4.01E-02	3.05E-02	6.37E-03	9.22E-03	1.46E-03	2.86E-02
311	GRID	2.06E+00	3.90E+00	1.19E+01	2.79E+01	7.63E+00	4.00E+00	738573	3860169	10	5.24E-02	3.99E-02	8.33E-03	1.21E-02	1.91E-03	3.74E-02
312	GRID	1.93E+00	3.87E+00	1.33E+01	4.67E+01	1.19E+01	4.64E+00	738673	3860169	10	7.52E-02	5.73E-02	1.19E-02	1.73E-02	2.74E-03	5.36E-02
313	GRID	2.74E+00	5.14E+00	1.55E+01	1.57E+02	2.11E+01	6.75E+00	738773	3860169	10	1.90E-01	1.45E-01	3.02E-02	4.38E-02	6.94E-03	1.36E-01
314	GRID	2.29E+00	4.49E+00	1.75E+01	7.21E+01	1.89E+01	5.80E+00	738873	3860169	10	1.11E-01	8.42E-02	1.76E-02	2.54E-02	4.03E-03	7.89E-02
315	GRID	2.76E+00	5.76E+00	1.04E+01	3.50E+01	1.70E+01	5.40E+00	738973	3860169	10	6.97E-02	5.31E-02	1.11E-02	1.60E-02	2.54E-03	4.97E-02
316	GRID	2.91E+00	4.81E+00	6.77E+00	2.07E+01	1.41E+01	4.98E+00	739073	3860169	10	4.96E-02	3.78E-02	7.87E-03	1.14E-02	1.81E-03	3.54E-02
317	GRID	2.89E+00	3.52E+00	5.53E+00	1.30E+01	1.15E+01	5.00E+00	739173	3860169	10	3.79E-02	2.88E-02	6.01E-03	8.71E-03	1.38E-03	2.70E-02
318	GRID	2.12E+00	2.81E+00	4.70E+00	8.73E+00	9.24E+00	4.83E+00	739273	3860169	10	2.96E-02	2.26E-02	4.71E-03	6.81E-03	1.08E-03	2.11E-02
319	GRID	1.84E+00	2.13E+00	4.05E+00	6.31E+00	7.43E+00	4.45E+00	739373	3860169	10	2.40E-02	1.82E-02	3.80E-03	5.51E-03	8.73E-04	1.71E-02
320	GRID	1.63E+00	1.72E+00	3.49E+00	4.79E+00	6.11E+00	3.97E+00	739473	3860169	10	1.98E-02	1.51E-02	3.15E-03	4.56E-03	7.23E-04	1.41E-02
321	GRID	1.33E+00	1.48E+00	3.10E+00	3.75E+00	5.14E+00	3.51E+00	739573	3860169	10	1.67E-02	1.27E-02	2.66E-03	3.85E-03	6.10E-04	1.19E-02
322	GRID	1.10E+00	1.30E+00	2.82E+00	3.01E+00	4.36E+00	3.11E+00	739673	3860169	10	1.43E-02	1.09E-02	2.28E-03	3.30E-03	5.23E-04	1.02E-02
323	GRID	8.77E-01	1.24E+00	2.48E+00	2.46E+00	3.70E+00	2.83E+00	739773	3860169	10	1.24E-02	9.45E-03	1.97E-03	2.86E-03	4.53E-04	8.85E-03
324	GRID	8.00E-01	1.26E+00	2.15E+00	2.05E+00	3.12E+00	2.64E+00	739873	3860169	10	1.10E-02	8.36E-03	1.74E-03	2.53E-03	4.00E-04	7.83E-03
325	GRID	7.87E-01	1.25E+00	1.86E+00	1.74E+00	2.64E+00	2.47E+00	739973	3860169	10	9.82E-03	7.48E-03	1.56E-03	2.26E-03	3.58E-04	7.00E-03
326	GRID	1.61E+00	2.42E+00	1.90E+00	2.89E+00	1.57E+00	1.08E+00	737573	3860069	10	1.05E-02	7.98E-03	1.66E-03	2.41E-03	3.82E-04	7.47E-03
327	GRID	1.75E+00	2.62E+00	2.20E+00	3.15E+00	1.81E+00	1.06E+00	737673	3860069	10	1.15E-02	8.76E-03	1.83E-03	2.65E-03	4.19E-04	8.20E-03
328	GRID	1.88E+00	2.81E+00	2.61E+00	3.44E+00	2.07E+00	1.06E+00	737773	3860069	10	1.27E-02	9.65E-03	2.01E-03	2.91E-03	4.62E-04	9.04E-03
329	GRID	1.96E+00	3.03E+00	3.14E+00	3.83E+00	2.31E+00	1.13E+00	737873	3860069	10	1.41E-02	1.07E-02	2.23E-03	3.24E-03	5.13E-04	1.00E-02
330	GRID	1.96E+00	3.27E+00	3.83E+00	4.36E+00	2.51E+00	1.23E+00	737973	3860069	10	1.57E-02	1.19E-02	2.49E-03	3.61E-03	5.72E-04	1.12E-02
331	GRID	1.94E+00	3.55E+00	4.69E+00	5.04E+00	2.73E+00	1.28E+00	738073	3860069	10	1.76E-02	1.34E-02	2.79E-03	4.04E-03	6.41E-04	1.25E-02
332	GRID	2.05E+00	3.79E+00	5.75E+00	6.01E+00	2.93E+00	1.45E+00	738173	3860069	10	2.01E-02	1.53E-02	3.19E-03	4.62E-03	7.32E-04	1.43E-02
333	GRID	2.29E+00	4.07E+00	7.09E+00	7.46E+00	3.02E+00	1.65E+00	738273	3860069	10	2.34E-02	1.78E-02	3.71E-03	5.38E-03	8.52E-04	1.67E-02
334	GRID	2.44E+00	4.40E+00	9.07E+00	9.34E+00	3.11E+00	2.03E+00	738373	3860069	10	2.78E-02	2.11E-02	4.41E-03	6.39E-03	1.01E-03	1.98E-02
335	GRID	2.34E+00	4.72E+00	1.19E+01	1.17E+01	3.77E+00	2.39E+00	738473	3860069	10	3.36E-02	2.56E-02	5.34E-03	7.74E-03	1.23E-03	2.40E-02
336	GRID	2.41E+00	5.14E+00	1.56E+01	1.56E+01	4.71E+00	3.13E+00	738573	3860069	10	4.26E-02	3.24E-02	6.76E-03	9.79E-03	1.55E-03	3.04E-02
337	GRID	2.48E+00	5.31E+00	2.16E+01	2.33E+01	6.90E+00	3.17E+00	738673	3860069	10	5.74E-02	4.37E-02	9.11E-03	1.32E-02	2.09E-03	4.09E-02
338	GRID	2.43E+00	5.31E+00	2.90E+01	4.67E+01	8.74E+00	3.75E+00	738773	3860069	10	8.77E-02	6.67E-02	1.39E-02	2.02E-02	3.20E-03	6.25E-02
339	GRID	3.41E+00	7.29E+00	3.73E+01	1.70E+02	1.36E+01	5.34E+00	738873	3860069	10	2.17E-01	1.65E-01	3.44E-02	4.98E-02	7.89E-03	1.54E-01
340	GRID	2.67E+00	7.33E+00	2.23E+01	5.71E+01	1.12E+01	4.38E+00	738973	3860069	10	9.59E-02	7.30E-02	1.52E-02	2.21E-02	3.50E-03	6.84E-02
341	GRID	3.43E+00	7.11E+00	1.35E+01	3.12E+01	1.04E+01	4.20E+00	739073	3860069	10	6.38E-02	4.86E-02	1.01E-02	1.47E-02	2.33E-03	4.55E-02
342	GRID	3.72E+00	4.84E+00	9.64E+00	1.92E+01	9.68E+00	3.82E+00	739173	3860069	10	4.65E-02	3.54E-02	7.39E-03	1.07E-02	1.70E-03	3.32E-02
343	GRID	2.75E+00	3.60E+00	7.56E+00	1.28E+01	8.31E+00	3.86E+00	739273	3860069	10	3.55E-02	2.70E-02	5.64E-03	8.17E-03	1.30E-03	2.53E-02
344	GRID	2.27E+00	2.73E+00	6.12E+00	9.10E+00	7.00E+00	3.86E+00	739373	3860069	10	2.84E-02	2.16E-02	4.51E-03	6.53E-03	1.04E-03	2.02E-02
345	GRID	1.97E+00	2.14E+00	5.08E+00	6.65E+00	6.02E+00	3.68E+00	739473	3860069	10	2.33E-02	1.78E-02	3.71E-03	5.37E-03	8.51E-04	1.66E-02
346	GRID	1.55E+00	1.85E+00	4.31E+00	4.97E+00	5.21E+00	3.41E+00	739573	3860069	10	1.95E-02	1.48E-02	3.09E-03	4.48E-03	7.09E-04	1.39E-02
347	GRID	1.29E+00	1.79E+00	3.54E+00	3.85E+00	4.56E+00	3.08E+00	739673	3860069	10	1.65E-02	1.26E-02	2.63E-03	3.81E-03	6.03E-04	1.18E-02
348	GRID	1.01E+00	1.80E+00	2.90E+00	3.08E+00	4.00E+00	2.76E+00	739773	3860069	10	1.42E-02	1.08E-02	2.26E-03	3.27E-03	5.18E-04	1.01E-02
349	GRID	9.64E-01	1.72E+00	2.43E+00	2.54E+00	3.53E+00	2.46E+00	739873	3860069	10	1.25E-02	9.49E-03	1.98E-03	2.87E-03	4.54E-04	8.89E-03
350	GRID	8.98E-01	1.63E+00	2.09E+00	2.12E+00	3.12E+00	2.25E+00	739973	3860069	10	1.11E-02	8.42E-03	1.76E-03	2.54E-03	4.03E-04	7.89E-03
351	GRID	1.73E+00	2.21E+00	1.85E+00	2.36E+00	1.53E+00	8.29E-01	737573	3859969	10	9.60E-03	7.31E-03	1.52E-03	2.21E-03	3.50E-04	6.85E-03
352	GRID	1.81E+00	2.51E+00	2.11E+00	2.56E+00	1.66E+00	8.38E-01	737673	3859969	10	1.05E-02	7.99E-03	1.67E-03	2.41E-03	3.83E-04	7.48E-03
353	GRID	1.94E+00	2.84E+00	2.42E+00	2.80E+00	1.77E+00	8.78E-01	737773	3859969	10	1.16E-02	8.80E-03	1.84E-03	2.66E-03	4.21E-04	8.24E-03
354	GRID	2.11E+00	3.18E+00	2.81E+00	3.08E+00	1.90E+00	9.49E-01	737873	3859969	10	1.28E-02	9.76E-03	2.04E-03	2.95E-03	4.67E-04	9.14E-03
355	GRID	2.28E+00	3.54E+00	3.32E+00	3.48E+00	1.95E+00	1.03E+00	737973	3859969	10	1.43E-02	1.09E-02	2.26E-03	3.28E-03	5.20E-04	1.02E-02
356	GRID	2.40E+00	3.96E+00	4.01E+00	4.05E+00	1.95E+00	1.06E+00	738073	3859969	10	1.59E-02	1.21E-02	2.53E-03	3.66E-03	5.81E-04	1.14E-02
357	GRID	2.43E+00	4.47E+00	5.00E+00	4.72E+00	1.97E+00	1.18E+00	738173	3859969	10	1.81E-02	1.38E-02	2.87E-03	4.15E-03	6.59E-04	1.29E-02
358	GRID	2.47E+00	4.99E+00	6.44E+00	5.46E+00	2.07E+00	1.36E+00	738273	3859969	10	2.08E-02	1.59E-02	3.31E-03	4.79E-03	7.59E-04	1.48E-02
359	GRID	2.66E+00	5.39E+00	8.47E+00	6.26E+00	2.27E+00	1.61E+00	738373	3859969	10	2.44E-02	1.85E-02	3.87E-03	5.60E-03	8.88E-04	1.74E-02
360	GRID	2.95E+00	5.85E+00	1.13E+01	7.19E+00	2.70E+00	1.82E+00	738473	3859969	10	2.91E-02	2.21E-02	4.62E-03	6.68E-03	1.06E-03	2.07E-02
361	GRID	2.95E+00	6.66E+00	1.57E+01	8.36E+00	3.30E+00	2.41E+00	738573	3859969	10	3.60E-02	2.74E-02	5.71E-03	8.28E-03	1.31E-03	2.57E-02
362	GRID	2.97E+00	7.20E+00	2.23E+01	1.01E+01	4.46E+00	2.36E+00	738673	3859969	10	4.51E-02	3.44E-02	7.17E-03	1.04E-02	1.65E-03	3.22E-02
363	GRID	3.08E+00	7.88E+00	3.37E+01	1.42E+01	5.46E+00	2.86E+00	738773	3859969	10	6.14E-02	4.67E-02	9.75E-03	1.41E-02	2.24E-03	4.38E-02
364	GRID	3.20E+00	7.93E+00	6.05E+01	2.45E+01	6.78E+00	3.48E+00	738873	3859969	10	9.72E-02	7.40E-02	1.54E-02	2.24E-02	3.54E-03	6.93E-02
365	GRID	4.06E+00	9.56E+00	1.27E+02	4.72E+01	8.85E+00	4.17E+00	738973	3859969	10	1.84E-01	1.40E-01	2.91E-02	4.22E-02	6.69E-03	1.31E-01
366	GRID	4.00E+00	1.09E+01	3.66E+01	3.42E+01	7.58E+00	3.47E+00	739073	3859969	10	8.84E-02	6.73E-02	1.40E-02	2.03E-02	3.22E-03	6.30E-02
367	GRID	4.54E+00	7.29E+00	1.84E+01	2.39E+01	6.95E+00	3.40E+00	739173	3859969	10	5.89E-02	4.49E-02	9.36E-03	1.35E-02	2.15E-03	4.20E-02
368	GRID	3.76E+00	4.93E+00	1.20E+01	1.67E+01	6.82E+00	3.08E+00	739273	3859969	10	4.32E-02	3.29E-02	6.86E-03	9.94E-03	1.58E-03	3.08E-02
369	GRID	2.87E+00	3.67E+00	8.65E+00	1.20E+01	6.36E+00	3.07E+00	739373	3859969	10	3.35E-02	2.55E-02	5.31E-03	7.70E-03	1.22E-03	2.39E-02
370	GRID	2.41E+00	2.90E+00	6.61E+00	8.99E+00	5.59E+00	3.14E+00	739473	3859969	10	2.71E-02	2.06E-02	4.30E-03	6.23E-03	9.87E-04	1.93E-02
371	GRID	1.84E+00	2.85E+00	4.99E+00	6.99E+00	4.85E+00	3.06E+00	739573	3859969	10	2.25E-02	1.71E-02	3.57E-03	5.17E-03	8.19E-04	1.60E-02
372	GRID	1.52E+00	2.68E+00	3.89E+00	5.54E+00	4.25E+00	2.91E+00	739673	3859969	10	1.90E-02	1.45E-02	3.02E-03	4.37E-03	6.92E-04	1.35E-02
373	GRID	1.24E+00	2.41E+00	3.18E+00	4.42E+00	3.81E+00	2.71E+00	739773	3859969	10	1.62E-02	1.24E-02	2.58E-03	3.73E-03	5.92E-04	1.16E-02
374	GRID	1.15E+00	2.19E+00	2.68E+00	3.56E+00	3.47E+00	2.47E+00	739873	3859969	10	1.42E-02	1.08E-02	2.25E-03	3.26E-03	5.17E-04	1.01E-02
375	GRID	9.91E-01	2.06E+00	2.29E+00	2.92E+00	3.17E+00	2.24E+00	739973	3859969	10	1.25E-02	9.51E-03	1.98E-03	2.87E-03	4.55E-04	8.91E-03

Average Annual Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	UTME	UTMN	ZONE	Annual Average Concentration, ug/cu m					
											Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
376	GRID	1.99E+00	1.73E+00	2.08E+00	1.79E+00	1.34E+00	6.92E-01	737573	3859869	10	8.79E-03	6.69E-03	1.40E-03	2.02E-03	3.21E-04	6.27E-03
377	GRID	2.09E+00	2.01E+00	2.34E+00	1.89E+00	1.42E+00	7.13E-01	737673	3859869	10	9.56E-03	7.28E-03	1.52E-03	2.20E-03	3.49E-04	6.82E-03
378	GRID	2.18E+00	2.36E+00	2.65E+00	2.04E+00	1.46E+00	7.53E-01	737773	3859869	10	1.05E-02	7.96E-03	1.66E-03	2.40E-03	3.81E-04	7.45E-03
379	GRID	2.28E+00	2.78E+00	3.03E+00	2.25E+00	1.42E+00	8.41E-01	737873	3859869	10	1.15E-02	8.77E-03	1.83E-03	2.65E-03	4.20E-04	8.21E-03
380	GRID	2.44E+00	3.27E+00	3.50E+00	2.49E+00	1.42E+00	8.48E-01	737973	3859869	10	1.28E-02	9.72E-03	2.03E-03	2.94E-03	4.65E-04	9.10E-03
381	GRID	2.64E+00	3.81E+00	4.10E+00	2.77E+00	1.39E+00	8.87E-01	738073	3859869	10	1.43E-02	1.09E-02	2.26E-03	3.28E-03	5.20E-04	1.02E-02
382	GRID	2.84E+00	4.42E+00	4.83E+00	3.02E+00	1.49E+00	9.76E-01	738173	3859869	10	1.61E-02	1.22E-02	2.55E-03	3.69E-03	5.85E-04	1.15E-02
383	GRID	3.02E+00	5.13E+00	5.71E+00	3.39E+00	1.57E+00	1.16E+00	738273	3859869	10	1.83E-02	1.39E-02	2.90E-03	4.20E-03	6.66E-04	1.30E-02
384	GRID	3.15E+00	6.12E+00	6.87E+00	3.90E+00	1.75E+00	1.32E+00	738373	3859869	10	2.11E-02	1.61E-02	3.35E-03	4.86E-03	7.70E-04	1.51E-02
385	GRID	3.27E+00	7.35E+00	8.69E+00	4.49E+00	2.03E+00	1.46E+00	738473	3859869	10	2.49E-02	1.90E-02	3.96E-03	5.73E-03	9.09E-04	1.78E-02
386	GRID	3.57E+00	8.57E+00	1.17E+01	5.07E+00	2.50E+00	1.83E+00	738573	3859869	10	3.04E-02	2.31E-02	4.82E-03	6.99E-03	1.11E-03	2.17E-02
387	GRID	3.83E+00	9.81E+00	1.69E+01	5.52E+00	3.05E+00	2.09E+00	738673	3859869	10	3.77E-02	2.87E-02	5.98E-03	8.66E-03	1.37E-03	2.68E-02
388	GRID	3.82E+00	1.15E+01	2.47E+01	6.98E+00	3.99E+00	2.11E+00	738773	3859869	10	4.85E-02	3.69E-02	7.70E-03	1.12E-02	1.77E-03	3.46E-02
389	GRID	3.98E+00	1.28E+01	3.97E+01	1.08E+01	4.42E+00	2.37E+00	738873	3859869	10	6.77E-02	5.15E-02	1.07E-02	1.56E-02	2.47E-03	4.83E-02
390	GRID	4.49E+00	1.37E+01	8.70E+01	1.68E+01	6.00E+00	3.28E+00	738973	3859869	10	1.20E-01	9.13E-02	1.90E-02	2.76E-02	4.37E-03	8.55E-02
391	GRID	4.54E+00	1.70E+01	9.47E+01	1.98E+01	6.15E+00	3.31E+00	739073	3859869	10	1.33E-01	1.01E-01	2.11E-02	3.06E-02	4.85E-03	9.48E-02
392	GRID	5.55E+00	1.24E+01	4.16E+01	1.77E+01	5.56E+00	2.84E+00	739173	3859869	10	7.83E-02	5.96E-02	1.24E-02	1.80E-02	2.85E-03	5.58E-02
393	GRID	5.31E+00	7.46E+00	2.35E+01	1.50E+01	5.04E+00	2.82E+00	739273	3859869	10	5.40E-02	4.11E-02	8.58E-03	1.24E-02	1.97E-03	3.85E-02
394	GRID	3.77E+00	5.73E+00	1.48E+01	1.22E+01	5.01E+00	2.56E+00	739373	3859869	10	4.03E-02	3.07E-02	6.39E-03	9.26E-03	1.47E-03	2.87E-02
395	GRID	3.00E+00	4.86E+00	9.65E+00	9.82E+00	4.92E+00	2.50E+00	739473	3859869	10	3.18E-02	2.42E-02	5.04E-03	7.30E-03	1.16E-03	2.26E-02
396	GRID	2.29E+00	4.19E+00	6.86E+00	7.87E+00	4.58E+00	2.58E+00	739573	3859869	10	2.59E-02	1.97E-02	4.12E-03	5.96E-03	9.45E-04	1.85E-02
397	GRID	1.84E+00	3.63E+00	5.14E+00	6.43E+00	4.11E+00	2.57E+00	739673	3859869	10	2.17E-02	1.65E-02	3.44E-03	4.98E-03	7.90E-04	1.55E-02
398	GRID	1.54E+00	3.17E+00	4.00E+00	5.37E+00	3.63E+00	2.48E+00	739773	3859869	10	1.85E-02	1.40E-02	2.93E-03	4.24E-03	6.73E-04	1.32E-02
399	GRID	1.34E+00	2.89E+00	3.19E+00	4.56E+00	3.21E+00	2.37E+00	739873	3859869	10	1.60E-02	1.22E-02	2.55E-03	3.69E-03	5.85E-04	1.14E-02
400	GRID	1.24E+00	2.57E+00	2.60E+00	3.86E+00	2.90E+00	2.22E+00	739973	3859869	10	1.41E-02	1.07E-02	2.23E-03	3.23E-03	5.13E-04	1.00E-02
401	GRID	1.94E+00	1.43E+00	2.35E+00	1.24E+00	1.16E+00	5.92E-01	737573	3859769	10	7.96E-03	6.06E-03	1.26E-03	1.83E-03	2.90E-04	5.68E-03
402	GRID	2.15E+00	1.61E+00	2.58E+00	1.36E+00	1.14E+00	6.16E-01	737673	3859769	10	8.64E-03	6.58E-03	1.37E-03	1.99E-03	3.15E-04	6.16E-03
403	GRID	2.36E+00	1.83E+00	2.82E+00	1.53E+00	1.09E+00	6.87E-01	737773	3859769	10	9.43E-03	7.18E-03	1.50E-03	2.17E-03	3.44E-04	6.72E-03
404	GRID	2.57E+00	2.11E+00	3.08E+00	1.73E+00	1.07E+00	7.19E-01	737873	3859769	10	1.03E-02	7.85E-03	1.64E-03	2.37E-03	3.76E-04	7.35E-03
405	GRID	2.76E+00	2.49E+00	3.36E+00	2.01E+00	1.05E+00	7.19E-01	737973	3859769	10	1.13E-02	8.62E-03	1.80E-03	2.60E-03	4.13E-04	8.07E-03
406	GRID	2.96E+00	2.99E+00	3.71E+00	2.24E+00	1.11E+00	7.53E-01	738073	3859769	10	1.26E-02	9.58E-03	2.00E-03	2.89E-03	4.58E-04	8.97E-03
407	GRID	3.20E+00	3.64E+00	4.20E+00	2.47E+00	1.20E+00	8.31E-01	738173	3859769	10	1.42E-02	1.08E-02	2.25E-03	3.27E-03	5.18E-04	1.01E-02
408	GRID	3.47E+00	4.45E+00	4.84E+00	2.66E+00	1.27E+00	9.98E-01	738273	3859769	10	1.62E-02	1.23E-02	2.57E-03	3.72E-03	5.89E-04	1.15E-02
409	GRID	3.72E+00	5.45E+00	5.69E+00	2.90E+00	1.40E+00	1.11E+00	738373	3859769	10	1.85E-02	1.41E-02	2.94E-03	4.26E-03	6.75E-04	1.32E-02
410	GRID	3.98E+00	6.69E+00	7.03E+00	3.01E+00	1.59E+00	1.21E+00	738473	3859769	10	2.15E-02	1.64E-02	3.41E-03	4.94E-03	7.83E-04	1.53E-02
411	GRID	4.31E+00	8.45E+00	8.81E+00	3.02E+00	1.95E+00	1.42E+00	738573	3859769	10	2.56E-02	1.95E-02	4.06E-03	5.88E-03	9.31E-04	1.82E-02
412	GRID	4.61E+00	1.10E+01	1.10E+01	3.55E+00	2.24E+00	1.83E+00	738673	3859769	10	3.13E-02	2.38E-02	4.97E-03	7.19E-03	1.14E-03	2.23E-02
413	GRID	5.03E+00	1.44E+01	1.43E+01	4.43E+00	2.99E+00	1.59E+00	738773	3859769	10	3.91E-02	2.97E-02	6.20E-03	8.98E-03	1.42E-03	2.78E-02
414	GRID	5.25E+00	1.97E+01	2.04E+01	6.33E+00	2.99E+00	1.98E+00	738873	3859769	10	5.18E-02	3.94E-02	8.22E-03	1.19E-02	1.89E-03	3.69E-02
415	GRID	5.40E+00	2.67E+01	3.68E+01	8.20E+00	3.62E+00	2.10E+00	738973	3859769	10	7.57E-02	5.76E-02	1.20E-02	1.74E-02	2.76E-03	5.40E-02
416	GRID	6.73E+00	3.41E+01	1.52E+02	1.30E+01	5.23E+00	2.96E+00	739073	3859769	10	1.96E-01	1.49E-01	3.11E-02	4.50E-02	7.13E-03	1.39E-01
417	GRID	6.56E+00	2.59E+01	7.03E+01	1.16E+01	4.56E+00	2.69E+00	739173	3859769	10	1.11E-01	8.46E-02	1.76E-02	2.56E-02	4.05E-03	7.92E-02
418	GRID	7.59E+00	1.50E+01	3.63E+01	1.06E+01	4.29E+00	2.39E+00	739273	3859769	10	6.96E-02	5.30E-02	1.11E-02	1.60E-02	2.54E-03	4.96E-02
419	GRID	5.29E+00	1.04E+01	2.17E+01	9.97E+00	3.89E+00	2.39E+00	739373	3859769	10	4.90E-02	3.73E-02	7.78E-03	1.13E-02	1.79E-03	3.49E-02
420	GRID	3.89E+00	7.99E+00	1.42E+01	8.72E+00	3.84E+00	2.19E+00	739473	3859769	10	3.73E-02	2.84E-02	5.92E-03	8.58E-03	1.36E-03	2.66E-02
421	GRID	2.91E+00	6.46E+00	9.96E+00	7.33E+00	3.89E+00	2.08E+00	739573	3859769	10	2.98E-02	2.27E-02	4.73E-03	6.86E-03	1.09E-03	2.13E-02
422	GRID	2.33E+00	5.29E+00	7.23E+00	6.28E+00	3.75E+00	2.16E+00	739673	3859769	10	2.47E-02	1.88E-02	3.92E-03	5.68E-03	9.01E-04	1.76E-02
423	GRID	1.88E+00	4.52E+00	5.37E+00	5.43E+00	3.50E+00	2.19E+00	739773	3859769	10	2.09E-02	1.59E-02	3.32E-03	4.81E-03	7.62E-04	1.49E-02
424	GRID	1.79E+00	3.74E+00	4.11E+00	4.73E+00	3.17E+00	2.14E+00	739873	3859769	10	1.80E-02	1.37E-02	2.86E-03	4.14E-03	6.56E-04	1.28E-02
425	GRID	1.80E+00	3.06E+00	3.27E+00	4.14E+00	2.84E+00	2.06E+00	739973	3859769	10	1.57E-02	1.19E-02	2.49E-03	3.61E-03	5.72E-04	1.12E-02
426	GRID	1.63E+00	1.44E+00	2.06E+00	1.14E+00	9.14E-01	5.18E-01	737573	3859669	10	7.04E-03	5.36E-03	1.12E-03	1.62E-03	2.57E-04	5.02E-03
427	GRID	1.86E+00	1.60E+00	2.17E+00	1.30E+00	8.75E-01	5.68E-01	737673	3859669	10	7.65E-03	5.83E-03	1.21E-03	1.76E-03	2.79E-04	5.45E-03
428	GRID	2.13E+00	1.79E+00	2.31E+00	1.48E+00	8.36E-01	6.07E-01	737773	3859669	10	8.36E-03	6.37E-03	1.33E-03	1.92E-03	3.05E-04	5.96E-03
429	GRID	2.43E+00	2.03E+00	2.50E+00	1.63E+00	8.30E-01	6.31E-01	737873	3859669	10	9.19E-03	6.99E-03	1.46E-03	2.11E-03	3.35E-04	6.55E-03
430	GRID	2.75E+00	2.32E+00	2.74E+00	1.73E+00	8.71E-01	6.19E-01	737973	3859669	10	1.01E-02	7.67E-03	1.60E-03	2.32E-03	3.67E-04	7.19E-03
431	GRID	3.08E+00	2.69E+00	3.00E+00	1.87E+00	9.24E-01	6.49E-01	738073	3859669	10	1.12E-02	8.50E-03	1.77E-03	2.57E-03	4.07E-04	7.96E-03
432	GRID	3.44E+00	3.16E+00	3.36E+00	1.94E+00	1.03E+00	7.30E-01	738173	3859669	10	1.25E-02	9.50E-03	1.98E-03	2.87E-03	4.55E-04	8.90E-03
433	GRID	3.83E+00	3.80E+00	3.88E+00	1.96E+00	1.04E+00	8.69E-01	738273	3859669	10	1.41E-02	1.07E-02	2.23E-03	3.23E-03	5.12E-04	1.00E-02
434	GRID	4.32E+00	4.70E+00	4.52E+00	1.97E+00	1.14E+00	9.44E-01	738373	3859669	10	1.61E-02	1.22E-02	2.55E-03	3.70E-03	5.86E-04	1.15E-02
435	GRID	4.85E+00	6.00E+00	5.27E+00	2.04E+00	1.29E+00	1.03E+00	738473	3859669	10	1.87E-02	1.42E-02	2.97E-03	4.30E-03	6.82E-04	1.33E-02
436	GRID	5.28E+00	7.86E+00	6.04E+00	2.17E+00	1.56E+00	1.14E+00	738573	3859669	10	2.20E-02	1.67E-02	3.49E-03	5.05E-03	8.01E-04	1.57E-02
437	GRID	5.68E+00	1.04E+01	6.92E+00	2.59E+00	1.75E+00	1.52E+00	738673	3859669	10	2.64E-02	2.01E-02	4.19E-03	6.06E-03	9.61E-04	1.88E-02
438	GRID	6.42E+00	1.42E+01	8.03E+00	3.08E+00	2.23E+00	1.42E+00	738773	3859669	10	3.23E-02	2.46E-02	5.13E-03	7.43E-03	1.18E-03	2.30E-02
439	GRID	7.05E+00	2.03E+01	9.44E+00	4.06E+00	2.48E+00	1.55E+00	738873	3859669	10	4.10E-02	3.12E-02	6.51E-03	9.43E-03	1.49E-03	2.92E-02
440	GRID	7.70E+00	2.97E+01	1.28E+01	5.36E+00	2.74E+00	1.71E+00	738973	3859669	10	5.48E-02	4.17E-02	8.71E-03	1.26E-02	2.00E-03	3.91E-02
441	GRID	7.91E+00	5.06E+01	1.99E+01	6.37E+00	3.08E+00	2.04E+00	739073	3859669	10	8.22E-02	6.25E-02	1.30E-02	1.89E-02	2.99E-03	5.86E-02
442	GRID	1.04E+01	1.63E+02	5.02E+01	9.42E+00	4.30E+00	2.59E+00	739173	3859669	10	2.19E-01	1.67E-01	3.48E-02	5.04E-02	7.99E-03	1.56E-01
443	GRID	1.11E+01	4.66E+01	3.78E+01	7.79E+00	3.56E+00	2.23E+00	739273	3859669	10	9.97E-02	7.59E-02	1.58E-02	2.29E-02	3.63E-03	7.11E-02
444	GRID	8.24E+00	2.14E+01	2.64E+01	7.06E+00	3.45E+00	2.04E+00	739373	3859669	10	6.27E-02	4.77E-02	9.95E-03	1.44E-02	2.28E-03	4.47E-02
445	GRID	5.40E+00	1.32E+01	1.84E+01	6.88E+00	3.16E+00	2.05E+00	739473	3859669	10	4.49E-02	3.42E-02	7.12E-03	1.03E-02	1.64E-03	3.20E-02
446	GRID	3.99E+00	9.30E+00	1.31E+01	6.55E+00	3.05E+00	1.90E+00	739573	3859669	10	3.46E-02	2.64E-02	5.50E-03	7.96E-03	1.26E-03	2.47E-02
447	GRID	2.99E+00	7.11E+00	9.68E+00	5.81E+00	3.14E+00	1.77E+00	739673	3859669	10	2.79E-02	2.12E-02	4.43E-03	6.41E-03	1.02E-03	1.99E-02
448	GRID	2.85E+00	5.37E+00	7.46E+00	5.04E+00	3.09E+00	1.83E+00	739773	3859669	10	2.34E-02	1.78E-02	3.72E-03	5.39E-03	8.54E-04	1.67E-02
449	GRID	2.72E+00	4.14E+00	5.90E+00	4.40E+00	2.96E+00	1.87E+00	739873	3859669	10	2.01E-02	1.53E-02	3.19E-03	4.62E-03	7.32E-04	1.43E-02
450	GRID	2.49E+00	3.35E+00	4.70E+00	3.92E+00	2.77E+00	1.86E+00	739973	3859669	10	1.74E-02	1.33E-02	2.77E-03	4.01E-03	6.36E-04	1.24E-02
451	GRID	1.29E+00	1.65E+00	1.57E+00	1.13E+00	7.19E-01	4.77E-01	737573	3859569	10	6.25E-03	4.76E-03	9.92E-04	1.44E-03	2.28E-04	4.45E-03
452	GRID	1.45E+00	1.82E+00	1.66E+00	1.25E+00	6.71E-01	5.18E-01	737673	3859569	10	6.73E-03	5.13E-03	1.07E-03	1.55E-03	2.45E-04	4.80E-03
453	GRID	1.67E+00	2.02E+00	1.76E+00	1.33E+00	6.87E-01	5.40E-01	737773	3859569	10	7.32E-03	5.57E-03	1.16E-03	1.68E-03	2.67E-04	5.22E-03
454	GRID	1.93E+00	2.26E+00	1.86E+00	1.40E+00	7.09E-01	5.51E-01	737873	3859569	10	7.96E-03	6.06E-03	1.26E-03	1.83E-03	2.90E-04	5.67E-03
455	GRID	2.26E+00	2.55E+00	1.99E+00	1.46E+00	7.36E-01	5.38E-01	737973	3859569	10	8.71E-03	6.63E-03	1.38E-03	2.00E-03	3.18E-04	6.21E-03
456	GRID	2.66E+00	2.91E+00	2.19E+00	1.43E+00	8.21E-01	5.67E-01	738073	3859569	10	9.67E-03	7.36E-03	1.53E-03	2.22E-03	3.52E-04	6.89E-03
457	GRID	3.13E+00	3.36E+00	2.42E+00	1.42E+00	8.49E-01	6.57E-01	738173	3859569	10	1.08E-02	8.23E-03	1.72E-03	2.49E-03	3.94E-04	7.71E-03
458	GRID	3.66E+00	3.92E+00	2.69E+00	1.40E+00	8.68E-01	7.64E-01	738273	3859569	10	1.22E-02	9.25E-03	1.93E-03	2.80E-03	4.43E-04	8.67E-03
459	GRID	4.25E+00	4.62E+00	2.94E+00	1.46E+00	9.48E-01	8.18E-01	738373	3859569	10	1.37E-02	1.05E-02	2.18E-03	3.16E-03	5.01E-04	9.80E-03
460	GRID	4.92E+00	5.46E+00	3.28E+00	1.56E+00	1.10E+00	8.84E-01	738473	3859569	10	1.57E-02	1.20E-02	2.50E-03	3.62E-03	5.73E-04	1.12E-02
461	GRID	5.82E+00	6.53E+00	3.73E+00	1.70E+00	1.29E+00	9.60E-01	738573	3859569	10	1.83E-02	1.39E-02	2.91E-03	4.21E-03	6.67E-04	1.30E-02
462	GRID	7.00E+00	8.12E+00	4.33E+00	1.97E+00	1.42E+00	1.22E+00	738673	3859569	10	2.20E-02	1.67E-02	3.49E-03	5.06E-03	8.01E-04	1.57E-02
463	GRID	8.24E+00	1.07E+01	4.95E+00	2.32E+00	1.69E+00	1.36E+00	738773	3859569	10	2.67E-02	2.04E-02	4.25E-03	6.15E-03	9.75E-04	1.91E-02
464	GRID	9.41E+00	1.53E+01	5.35E+00	2.85E+00	2.15E+00	1.19E+00	738873	3859569	10	3.31E-02	2.52E-02	5.26E-03	7.62E-03	1.21E-03	2.36E-02
465	GRID	1.10E+01	2.23E+01	6.39E+00	3.83E+00	1.96E+00	1.48E+00	738973	3859569	10	4.29E-02	3.27E-02	6.81E-03	9.87E-03	1.56E-03	3.06E-02
466	GRID	1.24E+01	3.47E+01	9.46E+00	4.07E+00	2.37E+00	1.49E+00	739073	3859569	10	5.89E-02	4.49E-02	9.36E-03	1.36E-02	2.15E-03	4.20E-02
467	GRID	1.33E+01	6.58E+01	1.43E+01	5.15E+00	2.94E+00	2.00E+00	739173	3859569	10	9.46E-02	7.20E-02	1.50E-02	2.17E-02	3.45E-03	6.74E-02
468	GRID	1.59E+01	1.37E+02	2.12E+01	6.65E+00	3.49E+00	2.23E+00	739273	3859569	10	1.70E-01	1.30E-01	2.71E-02	3.92E-02	6.21E-03	1.21E-01
469	GRID	1.43E+01	4.99E+01	1.83E+01	5.65E+00	2.89E+00	1.89E+00	739373	3859569	10	8.49E-02	6.47E-02	1.35E-02	1.95E-02	3.10E-03	6.05E-02
470	GRID	8.32E+00	2.68E+01	1.58E+01	5.15E+00	2.85E+00	1.77E+00	739473	3859569	10	5.55E-02	4.22E-02	8.81E-03	1.28E-02	2.02E-03	3.95E-02
471	GRID	5.95E+00	1.67E+01	1.29E+01	5.01E+00	2.64E+00	1.79E+00	739573	3859569	10	4.11E-02	3.13E-02	6.53E-03	9.45E-03	1.50E-03	2.93E-02
472	GRID	5.02E+00	1.07E+01	1.04E+01	4.98E+00	2.49E+00	1.67E+00	739673	3859569	10	3.22E-02	2.45E-02	5.12E-03	7.41E-03	1.17E-03	2.30E-02
473	GRID	4.36E+00	7.45E+00	8.35E+00	4.70E+00	2.57E+00	1.54E+00	739773	3859569	10	2.65E-02	2.02E-02	4.20E-03	6.09E-03	9.65E-04	1.89E-02
474	GRID	3.77E+00	5.52E+00	6.78E+00	4.24E+00	2.59E+00	1.56E+00	739873	3859569	10	2.24E-02	1.70E-02	3.55E-03	5.14E-03	8.15E-04	1.59E-02
475	GRID	3.26E+00	4.26E+00	5.64E+00	3.76E+00	2.51E+00	1.62E+00	739973	3859569	10	1.92E-02	1.46E-02	3.05E-03	4.42E-03	7.01E-04	1.37E-02
476	GRID	1.12E+00	1.89E+00	1.13E+00	1.06E+00	5.55E-01	4.45E-01	737573	3859469	10	5.67E-03	4.31E-03	9.00E-04	1.30E-03	2.07E-04	4.04E-03
477	GRID	1.24E+00	2.08E+00	1.15E+00	1.12E+00	5.78E-01	4.60E-01	737673	3859469	10	6.06E-03	4.61E-03	9.62E-04	1.39E-03	2.21E-04	4.32E-03
478	GRID	1.38E+00	2.29E+00	1.21E+00	1.15E+00	5.90E-01	4.90E-01	737773	3859469	10	6.50E-03	4.95E-03	1.03E-03	1.49E-03	2.37E-04	4.63E-03
479	GRID	1.56E+00	2.51E+00	1.32E+00	1.15E+00	6.08E-01	4.82E-01	737873	3859469	10	6.97E-03	5.31E-03	1.11E-03	1.60E-03	2.54E-04	4.97E-03
480	GRID	1.77E+00	2.76E+00	1.48E+00	1.10E+00	6.67E-01	4.71E-01	737973	3859469	10	7.54E-03	5.74E-03	1.20E-03	1.73E-03	2.75E-04	5.37E-03
481	GRID	2.03E+00	3.01E+00	1.67E+00	1.08E+00	7.15E-01	5.02E-01	738073	3859469	10	8.23E-03	6.27E-03	1.31E-03	1.89E-03	3.00E-04	5.87E-03
482	GRID	2.38E+00	3.28E+00	1.94E+00	1.04E+00	7.25E-01	5.99E-01	738173	3859469	10	9.11E-03	6.93E-03	1.45E-03	2.09E-03	3.32E-04	6.49E-03
483	GRID	2.85E+00	3.61E+00	2.18E+00	1.10E+00	7.40E-01	6.77E-01	738273	3859469	10	1.02E-02	7.76E-03	1.62E-03	2.34E-03	3.72E-04	7.27E-03
484	GRID	3.45E+00	4.05E+00	2.42E+00	1.17E+00	8.03E-01	7.18E-01	738373	3859469	10	1.15E-02	8.77E-03	1.83E-03	2.65E-03	4.20E-04	8.22E-03
485	GRID	4.22E+00	4.66E+00	2.59E+00	1.27E+00	9.54E-01	7.70E-01	738473	3859469	10	1.32E-02	1.01E-02	2.10E-03	3.04E-03	4.82E-04	9.42E-03
486	GRID	5.17E+00	5.43E+00	2.85E+00	1.36E+00	1.08E+00	8.29E-01	738573	3859469	10	1.53E-02	1.16E-02	2.43E-03	3.51E-03	5.57E-04	1.09E-02
487	GRID	6.33E+00	6.63E+00	2.98E+00	1.54E+00	1.18E+00	9.88E-01	738673	3859469	10	1.80E-02	1.37E-02	2.85E-03	4.13E-03	6.54E-04	1.28E-02
488	GRID	7.90E+00	8.29E+00	3.01E+00	1.85E+00	1.33E+00	1.24E+00	738773	3859469	10	2.16E-02	1.64E-02	3.43E-03	4.96E-03	7.87E-04	1.54E-02
489	GRID	1.03E+01	1.04E+01	3.36E+00	2.15E+00	1.77E+00	1.04E+00	738873	3859469	10	2.65E-02	2.02E-02	4.21E-03	6.10E-03	9.67E-04	1.89E-02
490	GRID	1.34E+01	1.33E+01	4.16E+00	2.78E+00	1.62E+00	1.20E+00	738973	3859469	10	3.33E-02	2.54E-02	5.29E-03	7.66E-03	1.21E-03	2.38E-02
491	GRID	1.80E+01	1.84E+01	5.64E+00	3.06E+00	1.91E+00	1.31E+00	739073	3859469	10	4.42E-02	3.36E-02	7.01E-03	1.02E-02	1.61E-03	3.15E-02
492	GRID	2.46E+01	3.06E+01	7.78E+00	3.58E+00	2.00E+00	1.39E+00	739173	3859469	10	6.39E-02	4.87E-02	1.01E-02	1.47E-02	2.33E-03	4.56E-02
493	GRID	3.11E+01	8.00E+01	1.07E+01	4.73E+00	2.80E+00	1.90E+00	739273	3859469	10	1.20E-01	9.13E-02	1.90E-02	2.76E-02	4.37E-03	8.55E-02
494	GRID	3.18E+01	8.83E+01	1.21E+01	4.87E+00	2.85E+00	1.92E+00	739373	3859469	10	1.30E-01	9.87E-02	2.06E-02	2.98E-02	4.72E-03	9.24E-02
495	GRID	1.69E+01	4.24E+01	1.07E+01	4.34E+00	2.41E+00	1.63E+00	739473	3859469	10	7.16E-02	5.45E-02	1.14E-02	1.65E-02	2.61E-03	5.11E-02
496	GRID	1.13E+01	2.47E+01	1.02E+01	4.01E+00	2.41E+00	1.55E+00	739573	3859469	10	4.95E-02	3.77E-02	7.86E-03	1.14E-02	1.80E-03	3.53E-02
497	GRID	8.42E+00	1.58E+01	9.11E+00	3.83E+00	2.26E+00	1.57E+00	739673	3859469	10	3.75E-02	2.85E-02	5.95E-03	8.61E-03	1.37E-03	2.67E-02
498	GRID	6.80E+00	1.09E+01	7.68E+00	3.91E+00	2.09E+00	1.49E+00	739773	3859469	10	3.00E-02	2.29E-02	4.77E-03	6.91E-03	1.09E-03	2.14E-02
499	GRID	5.54E+00	7.85E+00	6.54E+00	3.80E+00	2.14E+00	1.36E+00	739873	3859469	10	2.49E-02	1.89E-02	3.95E-03	5.72E-03	9.07E-04	1.77E-02
500	GRID	4.71E+00	5.79E+00	5.64E+00	3.58E+00	2.19E+00	1.36E+00	739973	3859469	10	2.13E-02	1.62E-02	3.38E-03	4.89E-03	7.75E-04	1.52E-02

Average Annual Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1)	X/Q (SRC 2)	X/Q (SRC 3)	X/Q (SRC 4)	X/Q (SRC 5)	X/Q (SRC 6)	UTME	UTMN	ZONE	Annual Average Concentration, ug/cu m					
		(ug/m^3)/(g/s)	(ug/m^3)/(g/s)	(ug/m^3)/(g/s)	(ug/m^3)/(g/s)	(ug/m^3)/(g/s)	(ug/m^3)/(g/s)				Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
501	GRID	1.16E+00	1.82E+00	8.40E-01	9.44E-01	4.91E-01	4.00E-01	737573	3859369	10	5.17E-03	3.93E-03	8.21E-04	1.19E-03	1.88E-04	3.68E-03
502	GRID	1.27E+00	1.93E+00	9.48E-01	9.40E-01	5.04E-01	4.23E-01	737673	3859369	10	5.50E-03	4.18E-03	8.73E-04	1.26E-03	2.00E-04	3.92E-03
503	GRID	1.40E+00	2.03E+00	1.10E+00	9.22E-01	5.13E-01	4.39E-01	737773	3859369	10	5.85E-03	4.46E-03	9.29E-04	1.35E-03	2.13E-04	4.17E-03
504	GRID	1.55E+00	2.14E+00	1.25E+00	8.91E-01	5.50E-01	4.23E-01	737873	3859369	10	6.22E-03	4.73E-03	9.87E-04	1.43E-03	2.27E-04	4.43E-03
505	GRID	1.73E+00	2.28E+00	1.43E+00	8.45E-01	6.02E-01	4.17E-01	737973	3859369	10	6.67E-03	5.08E-03	1.06E-03	1.53E-03	2.43E-04	4.76E-03
506	GRID	1.96E+00	2.45E+00	1.60E+00	8.29E-01	6.27E-01	4.52E-01	738073	3859369	10	7.24E-03	5.51E-03	1.15E-03	1.66E-03	2.64E-04	5.16E-03
507	GRID	2.24E+00	2.68E+00	1.70E+00	8.63E-01	6.21E-01	5.49E-01	738173	3859369	10	7.91E-03	6.02E-03	1.26E-03	1.82E-03	2.88E-04	5.64E-03
508	GRID	2.58E+00	2.93E+00	1.83E+00	9.06E-01	6.38E-01	6.04E-01	738273	3859369	10	8.67E-03	6.60E-03	1.38E-03	1.99E-03	3.16E-04	6.18E-03
509	GRID	3.02E+00	3.25E+00	1.93E+00	1.01E+00	6.97E-01	6.35E-01	738373	3859369	10	9.63E-03	7.33E-03	1.53E-03	2.22E-03	3.51E-04	6.87E-03
510	GRID	3.60E+00	3.73E+00	1.97E+00	1.02E+00	8.41E-01	6.78E-01	738473	3859369	10	1.08E-02	8.24E-03	1.72E-03	2.49E-03	3.94E-04	7.71E-03
511	GRID	4.42E+00	4.34E+00	1.97E+00	1.11E+00	9.26E-01	7.28E-01	738573	3859369	10	1.23E-02	9.39E-03	1.96E-03	2.84E-03	4.49E-04	8.79E-03
512	GRID	5.60E+00	5.09E+00	2.00E+00	1.25E+00	9.98E-01	8.16E-01	738673	3859369	10	1.44E-02	1.10E-02	2.29E-03	3.31E-03	5.25E-04	1.03E-02
513	GRID	7.29E+00	5.85E+00	2.11E+00	1.51E+00	1.10E+00	1.08E+00	738773	3859369	10	1.73E-02	1.32E-02	2.75E-03	3.98E-03	6.31E-04	1.23E-02
514	GRID	9.64E+00	6.69E+00	2.47E+00	1.70E+00	1.41E+00	1.00E+00	738873	3859369	10	2.09E-02	1.59E-02	3.32E-03	4.81E-03	7.63E-04	1.49E-02
515	GRID	1.30E+01	7.76E+00	2.93E+00	2.05E+00	1.52E+00	9.39E-01	738973	3859369	10	2.58E-02	1.96E-02	4.09E-03	5.93E-03	9.39E-04	1.84E-02
516	GRID	1.85E+01	8.99E+00	3.75E+00	2.58E+00	1.43E+00	1.15E+00	739073	3859369	10	3.33E-02	2.53E-02	5.28E-03	7.65E-03	1.21E-03	2.37E-02
517	GRID	2.65E+01	1.18E+01	5.11E+00	2.53E+00	1.72E+00	1.15E+00	739173	3859369	10	4.46E-02	3.40E-02	7.08E-03	1.03E-02	1.63E-03	3.18E-02
518	GRID	4.32E+01	1.73E+01	5.92E+00	2.91E+00	1.85E+00	1.37E+00	739273	3859369	10	6.63E-02	5.05E-02	1.05E-02	1.52E-02	2.42E-03	4.73E-02
519	GRID	1.06E+02	4.28E+01	8.97E+00	4.21E+00	2.55E+00	1.75E+00	739373	3859369	10	1.52E-01	1.16E-01	2.41E-02	3.49E-02	5.54E-03	1.08E-01
520	GRID	6.25E+01	4.18E+01	7.97E+00	3.74E+00	2.36E+00	1.66E+00	739473	3859369	10	1.10E-01	8.35E-02	1.74E-02	2.52E-02	4.00E-03	7.82E-02
521	GRID	2.53E+01	2.92E+01	7.22E+00	3.46E+00	2.05E+00	1.42E+00	739573	3859369	10	6.27E-02	4.78E-02	9.96E-03	1.44E-02	2.29E-03	4.47E-02
522	GRID	1.47E+01	2.03E+01	6.91E+00	3.26E+00	2.06E+00	1.38E+00	739673	3859369	10	4.44E-02	3.38E-02	7.05E-03	1.02E-02	1.62E-03	3.17E-02
523	GRID	1.01E+01	1.43E+01	6.69E+00	3.05E+00	1.96E+00	1.40E+00	739773	3859369	10	3.43E-02	2.61E-02	5.44E-03	7.88E-03	1.25E-03	2.44E-02
524	GRID	7.63E+00	1.04E+01	6.03E+00	3.13E+00	1.79E+00	1.33E+00	739873	3859369	10	2.77E-02	2.11E-02	4.40E-03	6.37E-03	1.01E-03	1.97E-02
525	GRID	5.79E+00	7.97E+00	5.24E+00	3.12E+00	1.81E+00	1.22E+00	739973	3859369	10	2.30E-02	1.75E-02	3.65E-03	5.29E-03	8.38E-04	1.64E-02
526	GRID	1.36E+00	1.43E+00	8.81E-01	7.73E-01	4.37E-01	3.65E-01	737573	3859269	10	4.79E-03	3.65E-03	7.61E-04	1.10E-03	1.75E-04	3.42E-03
527	GRID	1.47E+00	1.48E+00	9.97E-01	7.59E-01	4.38E-01	3.90E-01	737673	3859269	10	5.06E-03	3.85E-03	8.03E-04	1.16E-03	1.84E-04	3.61E-03
528	GRID	1.61E+00	1.55E+00	1.10E+00	7.36E-01	4.65E-01	3.94E-01	737773	3859269	10	5.35E-03	4.07E-03	8.50E-04	1.23E-03	1.95E-04	3.81E-03
529	GRID	1.77E+00	1.64E+00	1.22E+00	6.80E-01	5.11E-01	3.71E-01	737873	3859269	10	5.66E-03	4.31E-03	8.98E-04	1.30E-03	2.06E-04	4.03E-03
530	GRID	1.96E+00	1.74E+00	1.31E+00	6.81E-01	5.31E-01	3.72E-01	737973	3859269	10	6.03E-03	4.59E-03	9.57E-04	1.39E-03	2.20E-04	4.30E-03
531	GRID	2.19E+00	1.84E+00	1.38E+00	7.04E-01	5.56E-01	4.16E-01	738073	3859269	10	6.48E-03	4.93E-03	1.03E-03	1.49E-03	2.36E-04	4.62E-03
532	GRID	2.46E+00	1.95E+00	1.45E+00	7.26E-01	5.39E-01	5.04E-01	738173	3859269	10	6.97E-03	5.31E-03	1.11E-03	1.60E-03	2.54E-04	4.97E-03
533	GRID	2.80E+00	2.13E+00	1.45E+00	7.95E-01	5.56E-01	5.43E-01	738273	3859269	10	7.56E-03	5.76E-03	1.20E-03	1.74E-03	2.76E-04	5.39E-03
534	GRID	3.22E+00	2.37E+00	1.42E+00	8.52E-01	6.20E-01	5.67E-01	738373	3859269	10	8.27E-03	6.30E-03	1.31E-03	1.90E-03	3.01E-04	5.90E-03
535	GRID	3.75E+00	2.62E+00	1.40E+00	8.57E-01	7.47E-01	6.02E-01	738473	3859269	10	9.12E-03	6.94E-03	1.45E-03	2.10E-03	3.32E-04	6.50E-03
536	GRID	4.42E+00	2.89E+00	1.42E+00	9.26E-01	8.05E-01	6.47E-01	738573	3859269	10	1.02E-02	7.73E-03	1.61E-03	2.33E-03	3.70E-04	7.24E-03
537	GRID	5.22E+00	3.18E+00	1.54E+00	1.04E+00	8.60E-01	6.96E-01	738673	3859269	10	1.15E-02	8.72E-03	1.82E-03	2.63E-03	4.18E-04	8.17E-03
538	GRID	6.22E+00	3.59E+00	1.65E+00	1.25E+00	9.37E-01	9.01E-01	738773	3859269	10	1.33E-02	1.01E-02	2.11E-03	3.06E-03	4.85E-04	9.48E-03
539	GRID	7.62E+00	4.18E+00	1.89E+00	1.38E+00	1.12E+00	9.73E-01	738873	3859269	10	1.57E-02	1.19E-02	2.49E-03	3.61E-03	5.72E-04	1.12E-02
540	GRID	9.91E+00	4.80E+00	2.18E+00	1.58E+00	1.40E+00	8.03E-01	738973	3859269	10	1.89E-02	1.44E-02	3.00E-03	4.34E-03	6.89E-04	1.35E-02
541	GRID	1.38E+01	5.26E+00	2.73E+00	2.09E+00	1.17E+00	9.57E-01	739073	3859269	10	2.38E-02	1.81E-02	3.77E-03	5.47E-03	8.66E-04	1.69E-02
542	GRID	2.02E+01	5.99E+00	3.57E+00	1.92E+00	1.43E+00	1.04E+00	739173	3859269	10	3.12E-02	2.38E-02	4.95E-03	7.18E-03	1.14E-03	2.22E-02
543	GRID	3.06E+01	8.34E+00	3.96E+00	2.35E+00	1.48E+00	1.04E+00	739273	3859269	10	4.37E-02	3.32E-02	6.93E-03	1.00E-02	1.59E-03	3.11E-02
544	GRID	5.32E+01	1.30E+01	4.75E+00	2.61E+00	1.82E+00	1.36E+00	739373	3859269	10	7.01E-02	5.34E-02	1.11E-02	1.61E-02	2.56E-03	5.00E-02
545	GRID	1.83E+02	2.27E+01	6.95E+00	3.57E+00	2.26E+00	1.58E+00	739473	3859269	10	2.01E-01	1.53E-01	3.19E-02	4.62E-02	7.33E-03	1.43E-01
546	GRID	6.12E+01	1.88E+01	5.72E+00	3.00E+00	1.98E+00	1.44E+00	739573	3859269	10	8.42E-02	6.41E-02	1.34E-02	1.94E-02	3.07E-03	6.00E-02
547	GRID	3.11E+01	1.66E+01	5.31E+00	2.86E+00	1.78E+00	1.26E+00	739673	3859269	10	5.38E-02	4.10E-02	8.55E-03	1.24E-02	1.96E-03	3.84E-02
548	GRID	1.89E+01	1.37E+01	5.01E+00	2.73E+00	1.79E+00	1.23E+00	739773	3859269	10	3.96E-02	3.02E-02	6.29E-03	9.11E-03	1.44E-03	2.82E-02
549	GRID	1.19E+01	1.11E+01	5.02E+00	2.50E+00	1.72E+00	1.25E+00	739873	3859269	10	3.06E-02	2.33E-02	4.86E-03	7.04E-03	1.12E-03	2.18E-02
550	GRID	8.13E+00	8.88E+00	4.80E+00	2.56E+00	1.56E+00	1.21E+00	739973	3859269	10	2.48E-02	1.89E-02	3.94E-03	5.70E-03	9.04E-04	1.77E-02
551	GRID	1.53E+00	1.06E+00	8.74E-01	6.40E-01	3.82E-01	3.42E-01	737573	3859169	10	4.41E-03	3.36E-03	7.01E-04	1.01E-03	1.61E-04	3.15E-03
552	GRID	1.68E+00	1.10E+00	9.49E-01	6.14E-01	4.00E-01	3.57E-01	737673	3859169	10	4.66E-03	3.55E-03	7.40E-04	1.07E-03	1.70E-04	3.32E-03
553	GRID	1.84E+00	1.12E+00	1.04E+00	5.62E-01	4.37E-01	3.52E-01	737773	3859169	10	4.89E-03	3.72E-03	7.76E-04	1.12E-03	1.78E-04	3.49E-03
554	GRID	2.02E+00	1.15E+00	1.11E+00	5.69E-01	4.56E-01	3.29E-01	737873	3859169	10	5.15E-03	3.92E-03	8.17E-04	1.18E-03	1.88E-04	3.67E-03
555	GRID	2.23E+00	1.20E+00	1.15E+00	5.90E-01	4.84E-01	3.36E-01	737973	3859169	10	5.47E-03	4.17E-03	8.69E-04	1.26E-03	2.00E-04	3.90E-03
556	GRID	2.45E+00	1.29E+00	1.16E+00	6.03E-01	4.88E-01	3.87E-01	738073	3859169	10	5.83E-03	4.44E-03	9.25E-04	1.34E-03	2.12E-04	4.16E-03
557	GRID	2.69E+00	1.44E+00	1.12E+00	6.45E-01	4.70E-01	4.63E-01	738173	3859169	10	6.24E-03	4.75E-03	9.91E-04	1.43E-03	2.27E-04	4.45E-03
558	GRID	2.95E+00	1.61E+00	1.08E+00	7.10E-01	4.90E-01	4.92E-01	738273	3859169	10	6.70E-03	5.10E-03	1.06E-03	1.54E-03	2.44E-04	4.78E-03
559	GRID	3.21E+00	1.86E+00	1.05E+00	7.27E-01	5.64E-01	5.10E-01	738373	3859169	10	7.24E-03	5.51E-03	1.15E-03	1.66E-03	2.64E-04	5.16E-03
560	GRID	3.51E+00	2.12E+00	1.07E+00	7.29E-01	6.66E-01	5.39E-01	738473	3859169	10	7.89E-03	6.01E-03	1.25E-03	1.81E-03	2.88E-04	5.62E-03
561	GRID	3.92E+00	2.36E+00	1.15E+00	7.84E-01	7.08E-01	5.78E-01	738573	3859169	10	8.68E-03	6.61E-03	1.38E-03	2.00E-03	3.16E-04	6.19E-03
562	GRID	4.48E+00	2.55E+00	1.25E+00	9.05E-01	7.50E-01	6.10E-01	738673	3859169	10	9.64E-03	7.34E-03	1.53E-03	2.22E-03	3.51E-04	6.87E-03
563	GRID	5.19E+00	2.79E+00	1.31E+00	1.06E+00	8.15E-01	7.48E-01	738773	3859169	10	1.09E-02	8.29E-03	1.73E-03	2.50E-03	3.97E-04	7.76E-03
564	GRID	6.26E+00	2.97E+00	1.49E+00	1.15E+00	9.19E-01	9.06E-01	738873	3859169	10	1.25E-02	9.53E-03	1.99E-03	2.88E-03	4.56E-04	8.92E-03
565	GRID	7.79E+00	3.06E+00	1.72E+00	1.27E+00	1.21E+00	7.66E-01	738973	3859169	10	1.45E-02	1.10E-02	2.29E-03	3.32E-03	5.27E-04	1.03E-02
566	GRID	9.76E+00	3.22E+00	2.09E+00	1.64E+00	1.10E+00	7.69E-01	739073	3859169	10	1.70E-02	1.29E-02	2.70E-03	3.90E-03	6.19E-04	1.21E-02
567	GRID	1.24E+01	3.93E+00	2.54E+00	1.73E+00	1.11E+00	9.30E-01	739173	3859169	10	2.07E-02	1.58E-02	3.28E-03	4.76E-03	7.54E-04	1.47E-02
568	GRID	1.68E+01	5.01E+00	3.16E+00	1.78E+00	1.31E+00	9.27E-01	739273	3859169	10	2.65E-02	2.02E-02	4.21E-03	6.09E-03	9.66E-04	1.89E-02
569	GRID	2.61E+01	7.29E+00	3.38E+00	1.99E+00	1.32E+00	1.00E+00	739373	3859169	10	3.75E-02	2.86E-02	5.96E-03	8.63E-03	1.37E-03	2.68E-02
570	GRID	5.70E+01	9.39E+00	4.08E+00	2.54E+00	1.78E+00	1.32E+00	739473	3859169	10	6.96E-02	5.30E-02	1.10E-02	1.60E-02	2.54E-03	4.96E-02
571	GRID	1.22E+02	1.31E+01	5.22E+00	2.98E+00	1.98E+00	1.43E+00	739573	3859169	10	1.34E-01	1.02E-01	2.13E-02	3.08E-02	4.89E-03	9.56E-02
572	GRID	5.01E+01	1.10E+01	4.35E+00	2.47E+00	1.70E+00	1.27E+00	739673	3859169	10	6.48E-02	4.93E-02	1.03E-02	1.49E-02	2.36E-03	4.62E-02
573	GRID	2.83E+01	1.03E+01	4.14E+00	2.41E+00	1.56E+00	1.12E+00	739773	3859169	10	4.37E-02	3.33E-02	6.94E-03	1.01E-02	1.59E-03	3.12E-02
574	GRID	1.76E+01	9.51E+00	3.82E+00	2.32E+00	1.57E+00	1.11E+00	739873	3859169	10	3.28E-02	2.50E-02	5.21E-03	7.55E-03	1.20E-03	2.34E-02
575	GRID	1.20E+01	8.07E+00	3.90E+00	2.11E+00	1.52E+00	1.13E+00	739973	3859169	10	2.63E-02	2.00E-02	4.17E-03	6.04E-03	9.57E-04	1.87E-02
576	GRID	1.58E+00	7.47E-01	8.41E-01	5.19E-01	3.46E-01	3.18E-01	737573	3859069	10	3.98E-03	3.03E-03	6.31E-04	9.14E-04	1.45E-04	2.83E-03
577	GRID	1.69E+00	7.69E-01	9.13E-01	4.78E-01	3.80E-01	3.27E-01	737673	3859069	10	4.16E-03	3.17E-03	6.61E-04	9.58E-04	1.52E-04	2.97E-03
578	GRID	1.79E+00	8.20E-01	9.43E-01	4.83E-01	3.98E-01	3.12E-01	737773	3859069	10	4.34E-03	3.30E-03	6.89E-04	9.97E-04	1.58E-04	3.09E-03
579	GRID	1.90E+00	9.14E-01	9.42E-01	5.05E-01	4.14E-01	2.94E-01	737873	3859069	10	4.54E-03	3.46E-03	7.21E-04	1.04E-03	1.66E-04	3.24E-03
580	GRID	2.01E+00	1.05E+00	9.29E-01	5.08E-01	4.39E-01	3.08E-01	737973	3859069	10	4.79E-03	3.65E-03	7.61E-04	1.10E-03	1.75E-04	3.42E-03
581	GRID	2.12E+00	1.21E+00	9.03E-01	5.35E-01	4.30E-01	3.64E-01	738073	3859069	10	5.08E-03	3.87E-03	8.07E-04	1.17E-03	1.85E-04	3.62E-03
582	GRID	2.24E+00	1.38E+00	8.55E-01	5.94E-01	4.14E-01	4.26E-01	738173	3859069	10	5.40E-03	4.11E-03	8.57E-04	1.24E-03	1.97E-04	3.85E-03
583	GRID	2.40E+00	1.56E+00	8.31E-01	6.19E-01	4.38E-01	4.47E-01	738273	3859069	10	5.75E-03	4.38E-03	9.13E-04	1.32E-03	2.10E-04	4.10E-03
584	GRID	2.62E+00	1.68E+00	8.50E-01	6.27E-01	5.19E-01	4.61E-01	738373	3859069	10	6.17E-03	4.70E-03	9.80E-04	1.42E-03	2.25E-04	4.40E-03
585	GRID	2.87E+00	1.80E+00	8.90E-01	6.29E-01	5.97E-01	4.85E-01	738473	3859069	10	6.64E-03	5.06E-03	1.05E-03	1.53E-03	2.42E-04	4.74E-03
586	GRID	3.16E+00	1.92E+00	9.73E-01	6.75E-01	6.28E-01	5.21E-01	738573	3859069	10	7.20E-03	5.48E-03	1.14E-03	1.66E-03	2.62E-04	5.13E-03
587	GRID	3.59E+00	1.97E+00	1.02E+00	8.04E-01	6.61E-01	5.45E-01	738673	3859069	10	7.85E-03	5.98E-03	1.25E-03	1.81E-03	2.86E-04	5.60E-03
588	GRID	4.18E+00	1.97E+00	1.08E+00	9.08E-01	7.18E-01	6.28E-01	738773	3859069	10	8.67E-03	6.60E-03	1.38E-03	1.99E-03	3.16E-04	6.18E-03
589	GRID	4.90E+00	1.99E+00	1.21E+00	9.75E-01	7.76E-01	8.09E-01	738873	3859069	10	9.74E-03	7.42E-03	1.55E-03	2.24E-03	3.55E-04	6.94E-03
590	GRID	5.65E+00	2.10E+00	1.42E+00	1.07E+00	1.01E+00	7.58E-01	738973	3859069	10	1.10E-02	8.35E-03	1.74E-03	2.52E-03	4.00E-04	7.82E-03
591	GRID	6.47E+00	2.37E+00	1.65E+00	1.29E+00	1.07E+00	6.51E-01	739073	3859069	10	1.23E-02	9.39E-03	1.96E-03	2.84E-03	4.50E-04	8.80E-03
592	GRID	7.49E+00	2.80E+00	1.90E+00	1.59E+00	9.04E-01	7.87E-01	739173	3859069	10	1.41E-02	1.08E-02	2.24E-03	3.25E-03	5.15E-04	1.01E-02
593	GRID	8.70E+00	3.51E+00	2.52E+00	1.36E+00	1.12E+00	8.56E-01	739273	3859069	10	1.65E-02	1.26E-02	2.62E-03	3.80E-03	6.02E-04	1.18E-02
594	GRID	1.08E+01	4.79E+00	2.37E+00	1.70E+00	1.16E+00	8.36E-01	739373	3859069	10	1.98E-02	1.51E-02	3.14E-03	4.55E-03	7.21E-04	1.41E-02
595	GRID	1.57E+01	5.55E+00	2.88E+00	1.74E+00	1.26E+00	9.97E-01	739473	3859069	10	2.57E-02	1.96E-02	4.08E-03	5.91E-03	9.37E-04	1.83E-02
596	GRID	3.00E+01	7.61E+00	3.84E+00	2.42E+00	1.69E+00	1.26E+00	739573	3859069	10	4.28E-02	3.26E-02	6.79E-03	9.84E-03	1.56E-03	3.05E-02
597	GRID	4.57E+01	8.41E+00	4.00E+00	2.49E+00	1.72E+00	1.28E+00	739673	3859069	10	5.81E-02	4.42E-02	9.23E-03	1.34E-02	2.12E-03	4.14E-02
598	GRID	3.23E+01	7.46E+00	3.46E+00	2.09E+00	1.47E+00	1.12E+00	739773	3859069	10	4.38E-02	3.33E-02	6.95E-03	1.01E-02	1.60E-03	3.12E-02
599	GRID	2.24E+01	6.96E+00	3.36E+00	2.06E+00	1.38E+00	1.01E+00	739873	3859069	10	3.40E-02	2.59E-02	5.39E-03	7.81E-03	1.24E-03	2.42E-02
600	GRID	1.57E+01	6.81E+00	3.06E+00	2.01E+00	1.40E+00	1.01E+00	739973	3859069	10	2.74E-02	2.09E-02	4.35E-03	6.30E-03	9.99E-04	1.95E-02
601	GRID	1.34E+00	6.47E-01	7.96E-01	4.15E-01	3.32E-01	2.95E-01	737573	3858969	10	3.50E-03	2.66E-03	5.55E-04	8.04E-04	1.27E-04	2.49E-03
602	GRID	1.38E+00	7.34E-01	7.94E-01	4.16E-01	3.51E-01	2.99E-01	737673	3858969	10	3.63E-03	2.76E-03	5.77E-04	8.35E-04	1.32E-04	2.59E-03
603	GRID	1.42E+00	8.47E-01	7.77E-01	4.36E-01	3.60E-01	2.78E-01	737773	3858969	10	3.76E-03	2.86E-03	5.97E-04	8.65E-04	1.37E-04	2.68E-03
604	GRID	1.47E+00	9.66E-01	7.62E-01	4.36E-01	3.85E-01	2.65E-01	737873	3858969	10	3.91E-03	2.98E-03	6.22E-04	9.00E-04	1.43E-04	2.79E-03
605	GRID	1.53E+00	1.07E+00	7.46E-01	4.55E-01	3.95E-01	2.86E-01	737973	3858969	10	4.10E-03	3.12E-03	6.50E-04	9.42E-04	1.49E-04	2.92E-03
606	GRID	1.62E+00	1.19E+00	6.93E-01	5.00E-01	3.78E-01	3.43E-01	738073	3858969	10	4.32E-03	3.29E-03	6.85E-04	9.93E-04	1.57E-04	3.08E-03
607	GRID	1.72E+00	1.29E+00	6.75E-01	5.25E-01	3.69E-01	3.92E-01	738173	3858969	10	4.54E-03	3.46E-03	7.21E-04	1.04E-03	1.66E-04	3.24E-03
608	GRID	1.82E+00	1.36E+00	6.98E-01	5.55E-01	3.99E-01	4.09E-01	738273	3858969	10	4.79E-03	3.65E-03	7.60E-04	1.10E-03	1.75E-04	3.41E-03
609	GRID	1.92E+00	1.44E+00	7.19E-01	5.43E-01	4.80E-01	4.20E-01	738373	3858969	10	5.05E-03	3.84E-03	8.01E-04	1.16E-03	1.84E-04	3.60E-03
610	GRID	2.09E+00	1.47E+00	7.69E-01	5.47E-01	5.38E-01	4.40E-01	738473	3858969	10	5.35E-03	4.07E-03	8.49E-04	1.23E-03	1.95E-04	3.81E-03
611	GRID	2.31E+00	1.42E+00	8.50E-01	5.94E-01	5.62E-01	4.71E-01	738573	3858969	10	5.67E-03	4.32E-03	9.01E-04	1.30E-03	2.07E-04	4.04E-03
612	GRID	2.55E+00	1.42E+00	8.52E-01	7.22E-01	5.88E-01	4.93E-01	738673	3858969	10	6.05E-03	4.61E-03	9.61E-04	1.39E-03	2.21E-04	4.32E-03
613	GRID	2.84E+00	1.40E+00	9.04E-01	7.91E-01	6.37E-01	5.39E-01	738773	3858969	10	6.50E-03	4.95E-03	1.03E-03	1.49E-03	2.37E-04	4.63E-03
614	GRID	3.10E+00	1.52E+00	1.00E+00	8.41E-01	6.75E-01	7.00E-01	738873	3858969	10	7.16E-03	5.45E-03	1.14E-03	1.65E-03	2.61E-04	5.11E-03
615	GRID	3.48E+00	1.60E+00	1.20E+00	9.20E-01	8.32E-01	7.39E-01	738973	3858969	10	8.02E-03	6.10E-03	1.27E-03	1.84E-03	2.92E-04	5.71E-03
616	GRID	4.03E+00	1.81E+00	1.35E+00	1.04E+00	1.00E+00	6.09E-01	739073	3858969	10	8.99E-03	6.85E-03	1.43E-03	2.07E-03	3.28E-04	6.41E-03
617	GRID	4.64E+00	2.09E+00	1.50E+00	1.38E+00	8.31E-01	6.46E-01	739173	3858969	10	1.01E-02	7.71E-03	1.61E-03	2.33E-03	3.69E-04	7.22E-03
618	GRID	5.18E+00	2.61E+00	1.95E+00	1.22E+00	8.97E-01	7.69E-01	739273	3858969	10	1.15E-02	8.78E-03	1.83E-03	2.65E-03	4.21E-04	8.23E-03
619	GRID	5.70E+00	3.26E+00	2.01E+00	1.34E+00	1.04E+00	7.72E-01	739373	3858969	10	1.29E-02	9.82E-03	2.05E-03	2.97E-03	4.70E-04	9.20E-03
620	GRID	7.48E+00	4.05E+00	2.24E+00	1.49E+00	1.03E+00	7.84E-01	739473	3858969	10	1.56E-02	1.19E-02	2.48E-03	3.59E-03	5.69E-04	1.11E-02
621	GRID	1.17E+01	4.63E+00	2.42E+00	1.65E+00	1.25E+00	9.97E-01	739573	3858969	10	2.07E-02	1.58E-02	3.29E-03	4.76E-03	7.54E-04	1.48E-02
622	GRID	2.04E+01	6.64E+00	3.47E+00	2.23E+00	1.57E+00	1.18E+00	739673	3858969	10	3.24E-02	2.47E-02	5.15E-03	7.46E-03	1.18E-03	2.31E-02
623	GRID	1.94E+01	5.91E+00	3.17E+00	2.09E+00	1.50E+00	1.15E+00	739773	3858969	10	3.04E-02	2.31E-02	4.82E-03	6.98E-03	1.11E-03	2.16E-02
624	GRID	1.74E+01	5.49E+00	2.85E+00	1.80E+00	1.29E+00	1.00E+00	739873	3858969	10	2.73E-02	2.08E-02	4.33E-03	6.27E-03	9.94E-04	1.94E-02
625	GRID	1.45E+01	5.03E+00	2.80E+00	1.79E+00	1.23E+00	9.22E-01	739973	3858969	10	2.40E-02	1.83E-02	3.81E-03	5.52E-03	8.75E-04	1.71E-02

Average Annual Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	UTME	UTMN	ZONE	Annual Average Concentration, ug/cu m					
											Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
626	Exist House east of HWY 101	1.38E+00	2.65E+00	6.04E+00	1.29E+01	4.34E+01	1.53E+01	738736	3860444	10	7.46E-02	5.68E-02	1.18E-02	1.72E-02	2.72E-03	5.32E-02
627	House at SE corner of tract to north	1.19E+00	1.65E+00	2.47E+00	4.42E+00	1.59E+01	7.41E+01	738295	3860746	10	9.11E-02	6.94E-02	1.45E-02	2.10E-02	3.32E-03	6.50E-02
628	SE corner of tract to north	1.22E+00	1.70E+00	2.58E+00	4.68E+00	1.71E+01	7.95E+01	738309	3860736	10	9.76E-02	7.43E-02	1.55E-02	2.24E-02	3.56E-03	6.96E-02
629	Proposed Lot 49	1.17E+00	1.61E+00	2.39E+00	4.46E+00	1.85E+01	6.29E+01	738296	3860724	10	8.32E-02	6.33E-02	1.32E-02	1.91E-02	3.03E-03	5.93E-02
630	Proposed Condominium	1.40E+00	2.01E+00	3.23E+00	7.62E+00	6.22E+01	2.72E+01	738417	3860580	10	9.47E-02	7.21E-02	1.50E-02	2.18E-02	3.45E-03	6.75E-02
631	Proposed Lot 135	3.01E+00	8.50E+00	4.69E+01	1.68E+01	5.88E+00	2.86E+00	738841	3859954	10	7.67E-02	5.84E-02	1.22E-02	1.76E-02	2.80E-03	5.47E-02

Toxic Air Contaminant Health Risk Analysis

Scenario: Santa Maria Meteorology

Carcinogenic

Cancer Health Risk Risk = Exposure * Slope Factor

$$\text{Exposure} = \frac{CA * Inh * EF * ED}{BW * AT * 1000\ ug/mg}$$

Where:

		Adult Factors	Child Factors
Exposure =	Daily Dose averaged over lifetime (LADD)		
CA =	Concentration in air, ug/cu m		
Inh =	Inhalation rate, m^3/day	20	10
EF =	Exposure frequency in days per year	350	350
ED =	Exposure duration in years	30 or 70	9
AT =	Averaging time (365 * 70 yrs)	25550	25550
BW =	Body Weight, kg	70	15

Note: Fraction absorbed (ABS) assumed to be 100%

$$\text{Cancer Risk Factor} = \frac{Inh * EF * ED}{BW * AT * 1000\ ug/mg}$$

70 yr Risk Factor = 2.74E-04
30 year Risk Factor = 1.17E-04
9 year Risk Factor = 3.52E-05 adult 8.22E-05 child

Cancer Health Risk Criterion: ***1.00E-05***

NonCarcinogenic

Chronic Health Risk Equation: Exposure/Reference Concentration (RfC)

$$\text{Exposure} = \frac{CA * EF * ED * ET}{AT * 1000\ ug/mg}$$

Where:

		Factors
CA =	Concentration in air, ug/cu m	
EF =	Exposure frequency in days per year	350
ED =	Exposure duration in years	30
ET =	Exposure Time, portion of day	1
AT =	Averaging time (365 * 30)	10950

Note: Absorption through lungs assumed at 100%

Risk Factor = 0.0009589

OEHHA Chronic Risk: Annual average concentration/REL

Chronic Health Risk Criterion: ***Equal or greater than 1.0***

	Toxic Air Contaminants							
	Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde	***Summed Total Risk***	***Exceed Criterion?***
Reference Conc. Inhal (RfC), mg/m^3:	5.00E-03	3.00E-02	2.00E-03	9.00E-03	2.00E-05	9.80E-03		
Cancer Slope Factor, Inhl (SFi):	1.10E+00	1.00E-01	6.00E-01	1.00E-02	0.00E+00	2.10E-02		
Chronic Inhalation REL, ug/cu m	5.00	60.00	0.40	9.00	0.06	3.00		
Cancer Health Risk - 70 Year (Lifetime Residency)								
Exist House east of HWY 101	2.25E-05	1.56E-06	1.95E-06	4.70E-08	0.00E+00	3.06E-07	***2.6E-05***	***Yes***
Mobile home at SE corner of tract to north	2.75E-05	1.90E-06	2.38E-06	5.74E-08	0.00E+00	3.74E-07	***3.2E-05***	***Yes***
SE corner of tract to north	2.94E-05	2.04E-06	2.55E-06	6.15E-08	0.00E+00	4.00E-07	***3.4E-05***	***Yes***
Proposed Lot 49	2.51E-05	1.74E-06	2.17E-06	5.24E-08	0.00E+00	3.41E-07	***2.9E-05***	***Yes***
Proposed Condominium	2.85E-05	1.98E-06	2.47E-06	5.97E-08	0.00E+00	3.89E-07	***3.3E-05***	***Yes***
Proposed Lot 135	2.31E-05	1.60E-06	2.00E-06	4.83E-08	0.00E+00	3.15E-07	***2.7E-05***	***Yes***
Cancer Health Risk - 30 Year (Residency at 95th Percentile)								
Exist House east of HWY 101	9.64E-06	6.67E-07	8.35E-07	2.02E-08	0.00E+00	1.31E-07	***1.1E-05***	***Yes***
Mobile home at SE corner of tract to north	1.18E-05	8.15E-07	1.02E-06	2.46E-08	0.00E+00	1.60E-07	***1.4E-05***	***Yes***
SE corner of tract to north	1.26E-05	8.72E-07	1.09E-06	2.63E-08	0.00E+00	1.72E-07	***1.5E-05***	***Yes***
Proposed Lot 49	1.07E-05	7.44E-07	9.30E-07	2.25E-08	0.00E+00	1.46E-07	***1.3E-05***	***Yes***
Proposed Condominium	1.22E-05	8.47E-07	1.06E-06	2.56E-08	0.00E+00	1.67E-07	***1.4E-05***	***Yes***
Proposed Lot 135	9.91E-06	6.86E-07	8.58E-07	2.07E-08	0.00E+00	1.35E-07	***1.2E-05***	***Yes***
Cancer Health Risk - 9 Year Adult Residency (average - 50th percentile)								
Exist House east of HWY 101	2.89E-06	2.00E-07	2.50E-07	6.05E-09	0.00E+00	3.94E-08	***3.4E-06***	***No***
Mobile home at SE corner of tract to north	3.53E-06	2.44E-07	3.06E-07	7.38E-09	0.00E+00	4.81E-08	***4.1E-06***	***No***
SE corner of tract to north	3.78E-06	2.62E-07	3.27E-07	7.90E-09	0.00E+00	5.15E-08	***4.4E-06***	***No***
Proposed Lot 49	3.22E-06	2.23E-07	2.79E-07	6.74E-09	0.00E+00	4.39E-08	***3.8E-06***	***No***
Proposed Condominium	3.67E-06	2.54E-07	3.18E-07	7.67E-09	0.00E+00	5.00E-08	***4.3E-06***	***No***
Proposed Lot 135	2.97E-06	2.06E-07	2.57E-07	6.21E-09	0.00E+00	4.05E-08	***3.5E-06***	***No***
Cancer Health Risk - 9 Year Child Residency								
Exist House east of HWY 101	6.75E-06	4.67E-07	5.84E-07	1.41E-08	0.00E+00	9.18E-08	***7.9E-06***	***No***
Mobile home at SE corner of tract to north	8.24E-06	5.70E-07	7.14E-07	1.72E-08	0.00E+00	1.12E-07	***9.7E-06***	***No***
SE corner of tract to north	8.82E-06	6.11E-07	7.64E-07	1.84E-08	0.00E+00	1.20E-07	***1.0E-05***	***Yes***
Proposed Lot 49	7.52E-06	5.21E-07	6.51E-07	1.57E-08	0.00E+00	1.02E-07	***8.8E-06***	***No***
Proposed Condominium	8.56E-06	5.93E-07	7.42E-07	1.79E-08	0.00E+00	1.17E-07	***1.0E-05***	***Yes***
Proposed Lot 135	6.94E-06	4.80E-07	6.01E-07	1.45E-08	0.00E+00	9.44E-08	***8.1E-06***	***No***
Chronic Health Risk								
Exist House east of HWY 101	1.4E-02	1.8E-03	5.7E-03	1.8E-03	1.3E-01	5.2E-03	***1.6E-01***	***No***
Mobile home at SE corner of tract to north	1.7E-02	2.2E-03	6.9E-03	2.2E-03	1.6E-01	6.4E-03	***1.9E-01***	***No***
SE corner of tract to north	1.9E-02	2.4E-03	7.4E-03	2.4E-03	1.7E-01	6.8E-03	***2.1E-01***	***No***
Proposed Lot 49	1.6E-02	2.0E-03	6.3E-03	2.0E-03	1.5E-01	5.8E-03	***1.8E-01***	***No***
Proposed Condominium	1.8E-02	2.3E-03	7.2E-03	2.3E-03	1.7E-01	6.6E-03	***2.0E-01***	***No***
Proposed Lot 135	1.5E-02	1.9E-03	5.8E-03	1.9E-03	1.3E-01	5.4E-03	***1.6E-01***	***No***
OEHHA Chronic Risk								
Exist House east of HWY 101	1.5E-02	9.5E-04	3.0E-02	1.9E-03	4.5E-02	1.8E-02	***1.1E-01***	***No***
Mobile home at SE corner of tract to north	1.8E-02	1.2E-03	3.6E-02	2.3E-03	5.5E-02	2.2E-02	***1.3E-01***	***No***
SE corner of tract to north	2.0E-02	1.2E-03	3.9E-02	2.5E-03	5.9E-02	2.3E-02	***1.4E-01***	***No***
Proposed Lot 49	1.7E-02	1.1E-03	3.3E-02	2.1E-03	5.1E-02	2.0E-02	***1.2E-01***	***No***
Proposed Condominium	1.9E-02	1.2E-03	3.8E-02	2.4E-03	5.8E-02	2.3E-02	***1.4E-01***	***No***
Proposed Lot 135	1.5E-02	9.7E-04	3.0E-02	2.0E-03	4.7E-02	1.8E-02	***1.1E-01***	***No***

RfC from US EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, July 7,2008;
Cancer slope factors and RELs from OEHHA Toxicity Criteria Database (http://www.oehha.ca.gov/risk/ChemicalDB/index.asp)
Note: No Significant Risk Level (NSRL) used for 1,3 Butadiene REL, Acrolein is not carcinogenic,and has no slope factor.

Toxic Air Contaminant Health Risk Analysis

Scenario: Santa Maria Meteorology; Addition of Filters; Indoor Cleaned Air

Carcinogenic

Cancer Health Risk Risk = Exposure * Slope Factor

$$\text{Exposure} = \frac{CA * Inh * EF * ED}{BW * AT * 1000\ ug/mg}\ mg/kg\text{-}day$$

Where:

		Adult Factors	Child Factors
Exposure =	Daily Dose averaged over lifetime (LADD)		
CA =	Concentration in air, ug/cu m		
Inh =	Inhalation rate, m^3/day	20	10
EF =	Exposure frequency in days per year	350	350
ED =	Exposure duration in years	30 or 70	9
AT =	Averaging time (365 * 70 yrs)	25550	25550
BW =	Body Weight, kg	70	15
EFadj =	Exp. Freq; only 2 hours/day outside	29.2	29.2

Note: Fraction absorbed (ABS) assumed to be 100%

$$\text{Cancer Risk Factor} = \frac{Inh * EF * ED}{BW * AT * 1000\ ug/mg}$$

70 yr Risk Factor =	2.28E-05	
30 year Risk Factor =	9.78E-06	
9 year Risk Factor =	2.94E-06 adult	6.85E-06 child

Cancer Health Risk Criterion: ***1.00E-05***

NonCarcinogenic

Chronic Health Risk Equation: Exposure/Reference Concentration (RfC)

$$\text{Exposure} = \frac{CA * EF * ED * ET}{AT * 1000\ ug/mg}$$

Where:

		Factors
CA =	Concentration in air, ug/cu m	
EF =	Exposure frequency in days per year	350
ED =	Exposure duration in years	30
ET =	Exposure Time, portion of day	1
AT =	Averaging time (365 * 30)	10950
EFadj =	Exp. Freq; only 2 hours/day outside	29.2

Note: Absorption through lungs assumed at 100%

Risk Factor = 7.9909E-05

OEHHA Chronic Risk: Annual average concentration/REL

Chronic Health Risk Criterion: ***Equal or greater than 1.0***

	Toxic Air Contaminants							
	Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde	***Summed Total Risk***	***Exceed Criterion?***
Reference Conc. Inhal (RfC), mg/m^3:	5.00E-03	3.00E-02	2.00E-03	9.00E-03	2.00E-05	9.80E-03		
Cancer Slope Factor, Inhl (SFi):	1.10E+00	1.00E-01	6.00E-01	1.00E-02	0.00E+00	2.10E-02		
Chronic Inhalation REL, ug/cu m	5.00	60.00	0.40	9.00	0.06	3.00		
Cancer Health Risk - 70 Year (Lifetime Residency)								
Proposed Lot 49	2.09E-06	1.45E-07	1.81E-07	4.37E-09	0.00E+00	2.84E-08	***2.4E-06***	***No***
Proposed Condominium	2.38E-06	1.65E-07	2.06E-07	4.97E-09	0.00E+00	3.24E-08	***2.8E-06***	***No***
Proposed Lot 135	1.93E-06	1.33E-07	1.67E-07	4.03E-09	0.00E+00	2.62E-08	***2.3E-06***	***No***
Cancer Health Risk - 30 Year (Residency at 95th Percentile)								
Proposed Lot 49	8.95E-07	6.20E-08	7.75E-08	1.87E-09	0.00E+00	1.22E-08	***1.0E-06***	***No***
Proposed Condominium	1.02E-06	7.06E-08	8.83E-08	2.13E-09	0.00E+00	1.39E-08	***1.2E-06***	***No***
Proposed Lot 135	8.26E-07	5.71E-08	7.15E-08	1.73E-09	0.00E+00	1.12E-08	***9.7E-07***	***No***
Cancer Health Risk - 9 Year Residency (average - 50th percentile)								
Proposed Lot 49	2.69E-07	1.86E-08	2.33E-08	5.62E-10	0.00E+00	3.66E-09	***3.1E-07***	***No***
Proposed Condominium	3.06E-07	2.12E-08	2.65E-08	6.39E-10	0.00E+00	4.16E-09	***3.6E-07***	***No***
Proposed Lot 135	2.48E-07	1.71E-08	2.15E-08	5.18E-10	0.00E+00	3.37E-09	***2.9E-07***	***No***
Cancer Health Risk - 9 Year Child Residency								
Proposed Lot 49	6.27E-07	4.34E-08	5.43E-08	1.31E-09	0.00E+00	8.53E-09	***7.3E-07***	***No***
Proposed Condominium	7.14E-07	4.94E-08	6.18E-08	1.49E-09	0.00E+00	9.71E-09	***8.4E-07***	***No***
Proposed Lot 135	5.78E-07	4.00E-08	5.01E-08	1.21E-09	0.00E+00	7.87E-09	***6.8E-07***	***No***
Chronic Health Risk								
Proposed Lot 49	1.3E-03	1.7E-04	5.3E-04	1.7E-04	1.2E-02	4.8E-04	***1.5E-02***	***No***
Proposed Condominium	1.5E-03	1.9E-04	6.0E-04	1.9E-04	1.4E-02	5.5E-04	***1.7E-02***	***No***
Proposed Lot 135	1.2E-03	1.6E-04	4.9E-04	1.6E-04	1.1E-02	4.5E-04	***1.4E-02***	***No***
OEHHA Chronic Risk								
Proposed Lot 49	1.7E-02	1.1E-03	3.3E-02	2.1E-03	5.1E-02	2.0E-02	***1.2E-01***	***No***
Proposed Condominium	1.9E-02	1.2E-03	3.8E-02	2.4E-03	5.8E-02	2.3E-02	***1.4E-01***	***No***
Proposed Lot 135	1.5E-02	9.7E-04	3.0E-02	2.0E-03	4.7E-02	1.8E-02	***1.1E-01***	***No***

RfC from US EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites, July 7,2008;
Cancer slope factors and RELs from OEHHA Toxicity Criteria Database (http://www.oehha.ca.gov/risk/ChemicalDB/index.asp)
Note: No Significant Risk Level (NSRL) used for 1,3 Butadiene REL, Acrolein is not carcinogenic,and has no slope factor.

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March 12, 2010
Project No. 07-61691

John Zorovich, Project Manager
Santa Barbara County Planning and Development Department
Development Review Division
624 W. Foster Road
Santa Maria, California 93455

HEALTH RISK ASSESSMENT UPDATE
Orcutt Key Site 3
Santa Barbara County, California

Dear Mr. Zorovich:

Rincon Consultants previously conducted a Health Risk Assessment (HRA) concerning Orcutt Key Site 3 (September 27, 2008). This analysis was performed to determine the health risks associated with air toxics related to the freeway sources along the project's eastern frontage. In particular, the California Air Resources Board (CARB) currently recommends that local agencies avoid siting new sensitive land uses, including residences, within 500 feet of a freeway (CARB, *Air Quality and Land Use Handbook*, April 2005). The HRA examined both carcinogenic risk associated with diesel particulates and other carcinogens (benzene, 1.3 butadiene, acetaldehyde, and formaldehyde) and the chronic health risks associated with these toxic air contaminants along with that of acrolein. The September 2008 HRA determined that the proposed residential housing nearest to the freeway would have an excess cancer risk of about 30 in one million for lifetime residency. This excess cancer risk exceeds the Santa Barbara County Air Pollution Control District (SBCAPCD) recommended health risk criteria of 10 in one million. The September 2008 HRA also determined that non-cancer chronic health risks at the nearest exposed proposed residence did not exceed the chronic hazard quotient and so inhalation chronic risk was considered less than significant.

A revised site plan (Penfield & Smith, January 2010) has changed the nearest proposed uses from condominiums to single family residential (cluster), and has moved several of the lots in the northern portion of the site closer to the freeway. However, none of the currently proposed residences are located any nearer to the freeway than the nearest maximally exposed residential lot in the previous site plan used for the 2008 HRA. Consequentially, no change in the determination of health risks for the project as a whole would occur, namely, that residences located within 300 feet of the Highway 101 centerline (200 feet from the edge of the Highway 101 right-of-way) would be potentially exposed to an excess cancer risk greater than that recommended as a threshold by the SBCAPCD.

The calculated risk is based on exposure to outdoor air 24 hours per day, but the USEPA *Exposure Factors Handbook* indicates that the recommended daily activity pattern includes 16.4 hours per day spent inside and 2 hours per day outside (Volume III, Table 15-176 Summary of Recommended

Values for Activity Factors), with the remaining daily time spent offsite. Therefore, providing an indoor air environment from which the diesel particulates have been removed would substantially reduce the potential carcinogenic health risk since about 86% of the calculated excess cancer risk in the HRA is associated with this toxic air contaminant. The following actions were recommended:

- Forced air ventilation with filter screens on outside air intake ducts shall be provided for all residences within 300 feet of the centerline of US Highway 101. The filter screens shall be capable of removing at least 85% of the particulate matter including fine particulate matter (PM<2.5 micron).
- A brochure notifying the future residents of the need for maintaining the filter screens shall be prepared and provided at the time of ownership exchange. In addition, a notice of the diesel particulates risk hazard and the need for screen maintenance shall be placed in the property title.
- Windows and doors shall be fully weatherproofed with caulking and weather-stripping that is rated to last at least 20 years.

These mitigation actions would provide for the removal of particulates prior to entering into the indoor environment, thereby reducing the overall exposure of individual residents. With respect to the revised site plan, these mitigation measures on a conservative basis would apply to all residences located east of Road "A" (Lots 49 - 86), and to Lots 44, 45, 46, 47, 48, 114, and 120 - 128 as numbered on the proposed Vesting Tentative Tract Map 14,716 dated January 15, 2010. These mitigation measures are considered sufficient to reduce the level of excess cancer risk to a less than significant level.

SBCAPCD have opined with respect to the Final EIR for the 2003-2008 Housing Element Focused Rezone Program that the location of residential uses near a freeway should be considered significant and unavoidable because of uncertainties about the causes and nature of health risks associated with transportation corridors. Specifically, concern has been expressed regarding potential non-cancer risks. It is noted that the September 2008 HRA examined possible non-cancer, chronic health risks using the methodology developed by the UC Davis-Caltrans Air Quality Project *Estimating Mobile Source Air Toxics Emissions: A Step-By-Step Project Analysis Methodology* (December 2006), which focused on the six MSAT pollutants identified by the U.S. Environmental Protection Agency (EPA) as being the highest priority. The chronic health risk calculated via this methodology was not significant as indicated in the September 2008 HRA. To determine if an acute health risk might be present, the one hour maximum concentration of the toxic air contaminants of concern were compared to the appropriate reference exposure level (REL), and the acute health risk was also determined to not be significant (see attached).

It is noted that most of the health studies conducted with respect to distance from transportation sources and health effects have occurred primarily in urban areas with higher traffic volumes than those present adjacent to Key Site 3. Measurements of the concentration of benzene along with other air toxics in urban areas far exceed those in a rural area such as the location of the project site (USEPA, February 2007, *Control of Hazardous Air Pollutants from Mobile Sources - Regulatory Impact Analysis*). It is further noted that the CARB recommendations from the *Air Quality and Land Use Handbook* are strictly advisory and not intended to be used as a significance threshold for the purposes of CEQA. Also, US Highway 101 adjacent to the site carries less traffic than the CARB's

guideline of 50,000 average daily traffic volume for rural roadways that was used to establish the 500-foot recommendation.

It is further noted that since the September 2008 HRA, the CARB adopted aggressive DPM control measures. On December 12, 2008, the CARB approved a new regulation to significantly reduce emissions from existing on-road diesel vehicles operating in California. The regulation requires affected trucks and buses to meet performance requirements between 2011 and 2023. By January 1, 2023 all vehicles must have a 2010 model year engine or equivalent. However, the recent recession has affected business economics and resulted in a 10-18% decrease in truck activity since the peak in 2007 (CARB, January 2010, *Truck and Bus Regulation Proposed Amendments Workshop*). Therefore, near term relief of the regulations, particularly for smaller businesses, is currently being considered. However, the requirements for the State Implementation Plan with respect to particulates still must be met, and the current regulations remain the primary method to meet these requirements, though part will occur because of projected decreased truck activity. In addition to these regulations on existing trucks and buses, stricter standards for new heavy-duty diesel-engines and vehicles were adopted in October 2008, and these are not under consideration for relaxation. The net result of these regulations and the decreased truck activity will be a substantial decrease over time in the emissions of hazardous air pollutants (HAPs) from Highway 101 from those used to predict the possible impacts in the modeling conducted for the HRA.

The methodology used to predict potential risks is highly conservative, especially with regard to DPM. The ISC analysis used did not include a settling factor for DPM, which is known to occur and would result in lower exposure estimates than those contained in the 2008 HRA. In addition, the Gaussian plume model that ISC is based on is necessarily simplified and conservative, tending to over-predict concentrations when compared to actual measured values. Further, risk factors developed by the USEPA and the state OEHHA are designed to be conservative. Because of the uncertainties regarding the assumptions that health effects observed at high doses may be applicable to low doses, and that toxicological findings in laboratory animals generally are predictive of human responses, uncertainty factors are used to adjust the estimated risk associated with exposure to HAPs, usually on the order or 1- 3 magnitudes (10 -1000). With respect to diesel exhaust for instance, the US EPA incorporates an uncertainty factor of 30 in the development of its RfC (EPA, May 2002, *Health Assessment Document for Diesel Engine Exhaust*).

In summary with respect to SBAPCD concerns relative to whether or not living adjacent to Highway 101 should be considered a significant and unavoidable effect:

- Calculation of non-cancer acute and chronic risks does not exceed significance thresholds;
- The CARB *Air Quality and Land Use Handbook* (April 2005) advisory recommendation is for urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day, both of which are much higher than local traffic along Highway 101;
- New DPM regulations are in place that will substantially reduce over time the emissions responsible for 86% of the calculated excess cancer risk; and
- The calculation methodology is very conservative and likely overestimates the excess cancer risk by several factors.

Therefore in conclusion, with the incorporation of mitigation measures to reduce the cancer health risk associated with diesel particulate matter, the health risk associated with siting residences in this

rural area near Highway 101 is considered to be reducible to a level similar to that experienced by locations more distant from the freeway. From a California Environmental Quality Act perspective, impacts associated with this residential location should be considered significant, but mitigable.

If you have any questions regarding these studies, or if we can provide you with other environmental consulting services, please feel free to contact us.

Sincerely,

RINCON CONSULTANTS, INC.

Duane Vander Pluym, D.Env.
Vice-President

Attch: *Maximum One Hour Concentration at Receptors Using Santa Maria 1963 Meteorology*
Toxic Air Contaminant Acute Health Risk Analysis

Maximum One Hour Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	One Hour Maximum Concentration, ug/cu m					
								Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
1	GRID	1.17E+02	1.60E+02	1.77E+02	2.52E+02	3.15E+02	4.21E+02	1.32E+00	1.00E+00	2.09E-01	3.03E-01	4.60E-02	9.39E-01
2	GRID	1.31E+02	1.46E+02	1.78E+02	2.61E+02	3.85E+02	5.07E+02	1.48E+00	1.13E+00	2.35E-01	3.41E-01	5.40E-02	1.06E+00
3	GRID	1.25E+02	1.61E+02	2.21E+02	3.01E+02	3.57E+02	6.63E+02	1.67E+00	1.27E+00	2.65E-01	3.84E-01	6.09E-02	1.19E+00
4	GRID	1.35E+02	1.69E+02	2.21E+02	3.06E+02	4.71E+02	8.34E+02	1.95E+00	1.49E+00	3.10E-01	4.49E-01	7.12E-02	1.39E+00
5	GRID	1.46E+02	1.72E+02	2.29E+02	3.46E+02	4.76E+02	9.05E+02	2.06E+00	1.55E+00	3.30E-01	4.78E-01	7.57E-02	1.48E+00
6	GRID	1.53E+02	1.68E+02	2.21E+02	3.56E+02	5.01E+02	7.09E+02	1.93E+00	1.47E+00	3.06E-01	4.43E-01	7.02E-02	1.37E+00
7	GRID	1.52E+02	1.69E+02	2.65E+02	3.65E+02	4.65E+02	4.87E+02	1.77E+00	1.35E+00	2.81E-01	4.06E-01	6.44E-02	1.26E+00
8	GRID	1.57E+02	1.90E+02	2.48E+02	3.26E+02	4.11E+02	3.63E+02	1.55E+00	1.18E+00	2.46E-01	3.56E-01	5.65E-02	1.10E+00
9	GRID	1.63E+02	1.99E+02	2.41E+02	3.22E+02	3.46E+02	2.69E+02	1.43E+00	1.08E+00	2.26E-01	3.28E-01	5.19E-02	1.02E+00
10	GRID	1.69E+02	1.87E+02	2.60E+02	2.80E+02	2.82E+02	2.40E+02	1.30E+00	9.86E-01	2.06E-01	2.98E-01	4.72E-02	9.24E-01
11	GRID	1.51E+02	2.09E+02	2.52E+02	2.68E+02	2.45E+02	2.08E+02	1.22E+00	9.27E-01	1.93E-01	2.80E-01	4.44E-02	8.69E-01
12	GRID	1.64E+02	1.97E+02	2.35E+02	2.36E+02	2.13E+02	1.85E+02	1.12E+00	8.56E-01	1.78E-01	2.59E-01	4.10E-02	8.02E-01
13	GRID	1.71E+02	1.68E+02	2.22E+02	2.15E+02	1.90E+02	1.68E+02	1.04E+00	7.90E-01	1.65E-01	2.39E-01	3.78E-02	7.39E-01
14	GRID	1.68E+02	1.92E+02	1.98E+02	1.92E+02	1.72E+02	1.57E+02	9.65E-01	7.50E-01	1.56E-01	2.27E-01	3.59E-02	7.03E-01
15	GRID	1.66E+02	1.78E+02	1.87E+02	1.76E+02	1.58E+02	1.47E+02	9.25E-01	7.04E-01	1.47E-01	2.13E-01	3.37E-02	6.60E-01
16	GRID	1.56E+02	1.65E+02	1.75E+02	1.61E+02	1.47E+02	1.39E+02	8.63E-01	6.57E-01	1.37E-01	1.98E-01	3.15E-02	6.15E-01
17	GRID	1.49E+02	1.67E+02	1.62E+02	1.50E+02	1.38E+02	1.33E+02	8.21E-01	6.25E-01	1.30E-01	1.69E-01	2.99E-02	5.85E-01
18	GRID	1.39E+02	1.55E+02	1.50E+02	1.40E+02	1.32E+02	1.28E+02	7.71E-01	5.87E-01	1.22E-01	1.77E-01	2.81E-02	5.50E-01
19	GRID	1.45E+02	1.48E+02	1.42E+02	1.33E+02	1.25E+02	1.23E+02	7.46E-01	5.68E-01	1.18E-01	1.72E-01	2.72E-02	5.32E-01
20	GRID	1.40E+02	1.40E+02	1.34E+02	1.26E+02	1.18E+02	1.19E+02	7.07E-01	5.39E-01	1.12E-01	1.63E-01	2.58E-02	5.04E-01
21	GRID	1.27E+02	1.33E+02	1.27E+02	1.20E+02	1.15E+02	1.15E+02	6.74E-01	5.13E-01	1.07E-01	1.55E-01	2.46E-02	4.80E-01
22	GRID	1.26E+02	1.27E+02	1.20E+02	1.15E+02	1.12E+02	1.12E+02	6.51E-01	4.95E-01	1.03E-01	1.50E-01	2.37E-02	4.64E-01
23	GRID	1.23E+02	1.20E+02	1.13E+02	1.11E+02	1.08E+02	1.08E+02	6.25E-01	4.76E-01	9.92E-02	1.44E-01	2.28E-02	4.46E-01
24	GRID	1.19E+02	1.15E+02	1.10E+02	1.07E+02	1.05E+02	1.06E+02	6.06E-01	4.61E-01	9.62E-02	1.39E-01	2.21E-02	4.32E-01
25	GRID	1.14E+02	1.10E+02	1.06E+02	9.25E+01	1.02E+02	1.04E+02	5.75E-01	4.37E-01	9.12E-02	1.32E-01	2.09E-02	4.10E-01
26	GRID	1.32E+02	1.61E+02	1.83E+02	2.36E+02	3.23E+02	3.63E+02	1.28E+00	9.73E-01	2.03E-01	2.94E-01	4.66E-02	9.11E-01
27	GRID	1.20E+02	1.73E+02	1.99E+02	2.81E+02	3.65E+02	4.51E+02	1.45E+00	1.11E+00	2.31E-01	3.34E-01	5.30E-02	1.04E+00
28	GRID	1.46E+02	1.64E+02	1.83E+02	3.17E+02	4.46E+02	5.98E+02	1.89E+00	1.29E+00	2.69E-01	3.89E-01	6.17E-02	1.21E+00
29	GRID	1.46E+02	1.72E+02	2.31E+02	3.45E+02	4.82E+02	8.39E+02	2.03E+00	1.54E+00	3.22E-01	4.66E-01	7.38E-02	1.44E+00
30	GRID	1.45E+02	1.85E+02	2.50E+02	3.63E+02	5.83E+02	1.11E+03	2.41E+00	1.84E+00	3.83E-01	5.54E-01	8.78E-02	1.72E+00
31	GRID	1.46E+02	2.02E+02	2.79E+02	3.45E+02	6.23E+02	1.02E+03	2.39E+00	1.82E+00	3.80E-01	5.50E-01	8.71E-02	1.70E+00
32	GRID	1.42E+02	1.81E+02	2.60E+02	4.10E+02	5.83E+02	6.16E+02	2.03E+00	1.55E+00	3.23E-01	4.67E-01	7.41E-02	1.45E+00
33	GRID	1.74E+02	2.11E+02	2.73E+02	4.02E+02	4.84E+02	4.17E+02	1.79E+00	1.36E+00	2.85E-01	4.12E-01	6.53E-02	1.28E+00
34	GRID	1.76E+02	2.27E+02	2.66E+02	3.75E+02	3.91E+02	3.16E+02	1.62E+00	1.23E+00	2.57E-01	3.72E-01	5.90E-02	1.15E+00
35	GRID	1.72E+02	2.10E+02	2.66E+02	3.35E+02	3.13E+02	2.57E+02	1.42E+00	1.08E+00	2.25E-01	3.26E-01	5.17E-02	1.01E+00
36	GRID	1.61E+02	2.15E+02	2.63E+02	2.95E+02	2.60E+02	2.16E+02	1.29E+00	9.83E-01	2.05E-01	2.97E-01	4.71E-02	9.20E-01
37	GRID	1.60E+02	2.21E+02	2.57E+02	2.49E+02	2.24E+02	1.92E+02	1.21E+00	9.20E-01	1.92E-01	2.78E-01	4.40E-02	8.61E-01
38	GRID	1.63E+02	2.04E+02	2.37E+02	2.25E+02	1.97E+02	1.74E+02	1.10E+00	8.35E-01	1.74E-01	2.52E-01	4.00E-02	7.82E-01
39	GRID	1.77E+02	1.93E+02	2.05E+02	2.00E+02	1.78E+02	1.61E+02	1.02E+00	7.76E-01	1.62E-01	2.34E-01	3.72E-02	7.27E-01
40	GRID	1.68E+02	1.86E+02	1.98E+02	1.82E+02	1.63E+02	1.50E+02	9.66E-01	7.36E-01	1.53E-01	2.22E-01	3.52E-02	6.89E-01
41	GRID	1.72E+02	1.69E+02	1.82E+02	1.67E+02	1.51E+02	1.43E+02	9.00E-01	6.85E-01	1.43E-01	2.07E-01	3.26E-02	6.41E-01
42	GRID	1.58E+02	1.75E+02	1.68E+02	1.54E+02	1.42E+02	1.37E+02	8.54E-01	6.50E-01	1.36E-01	1.96E-01	3.11E-02	6.09E-01
43	GRID	1.41E+02	1.62E+02	1.56E+02	1.44E+02	1.34E+02	1.32E+02	7.95E-01	6.05E-01	1.26E-01	1.83E-01	2.90E-02	5.67E-01
44	GRID	1.51E+02	1.54E+02	1.46E+02	1.34E+02	1.27E+02	1.27E+02	7.67E-01	5.84E-01	1.22E-01	1.76E-01	2.80E-02	5.47E-01
45	GRID	1.45E+02	1.43E+02	1.37E+02	1.27E+02	1.22E+02	1.23E+02	7.29E-01	5.55E-01	1.16E-01	1.68E-01	2.66E-02	5.20E-01
46	GRID	1.30E+02	1.37E+02	1.28E+02	1.22E+02	1.16E+02	1.19E+02	6.91E-01	5.26E-01	1.10E-01	1.59E-01	2.52E-02	4.92E-01
47	GRID	1.29E+02	1.30E+02	1.23E+02	1.17E+02	1.14E+02	1.16E+02	6.67E-01	5.08E-01	1.06E-01	1.53E-01	2.43E-02	4.75E-01
48	GRID	1.28E+02	1.24E+02	1.18E+02	1.13E+02	1.11E+02	1.12E+02	6.44E-01	4.90E-01	1.02E-01	1.48E-01	2.35E-02	4.59E-01
49	GRID	1.20E+02	1.18E+02	1.11E+02	1.02E+02	1.08E+02	1.09E+02	6.10E-01	4.65E-01	9.69E-02	1.40E-01	2.22E-02	4.35E-01
50	GRID	1.17E+02	1.13E+02	1.08E+02	9.17E+01	1.05E+02	1.06E+02	5.55E-01	4.46E-01	9.30E-02	1.35E-01	2.13E-02	4.17E-01
51	GRID	1.41E+02	1.59E+02	1.91E+02	2.28E+02	3.00E+02	3.13E+02	1.22E+00	9.29E-01	1.94E-01	2.81E-01	4.45E-02	8.70E-01
52	GRID	1.43E+02	1.74E+02	2.02E+02	2.60E+02	3.68E+02	3.73E+02	1.41E+00	1.07E+00	2.23E-01	3.23E-01	5.13E-02	1.00E+00
53	GRID	1.22E+02	1.55E+02	2.26E+02	3.15E+02	4.34E+02	4.72E+02	1.60E+00	1.22E+00	2.55E-01	3.69E-01	5.85E-02	1.14E+00
54	GRID	1.60E+02	1.91E+02	2.05E+02	3.57E+02	5.24E+02	6.62E+02	1.92E+00	1.46E+00	3.05E-01	4.41E-01	6.99E-02	1.37E+00
55	GRID	1.65E+02	2.05E+02	2.61E+02	3.75E+02	6.32E+02	1.07E+03	2.48E+00	1.89E+00	3.94E-01	5.70E-01	9.04E-02	1.77E+00
56	GRID	1.71E+02	2.20E+02	3.00E+02	4.27E+02	6.74E+02	1.36E+03	2.88E+00	2.20E+00	4.56E-01	6.63E-01	1.05E-01	2.06E+00
57	GRID	1.77E+02	2.28E+02	2.68E+02	4.50E+02	7.27E+02	8.56E+02	2.47E+00	1.88E+00	3.92E-01	5.68E-01	9.01E-02	1.76E+00
58	GRID	1.52E+02	2.35E+02	3.10E+02	4.62E+02	6.09E+02	4.93E+02	2.07E+00	1.56E+00	3.29E-01	4.76E-01	7.54E-02	1.48E+00
59	GRID	1.68E+02	2.33E+02	2.98E+02	4.33E+02	4.35E+02	3.50E+02	1.76E+00	1.34E+00	2.79E-01	4.04E-01	6.40E-02	1.25E+00
60	GRID	1.64E+02	2.39E+02	3.16E+02	3.65E+02	3.43E+02	2.74E+02	1.57E+00	1.20E+00	2.50E-01	3.62E-01	5.74E-02	1.12E+00
61	GRID	1.95E+02	2.39E+02	3.00E+02	3.24E+02	2.79E+02	2.29E+02	1.43E+00	1.09E+00	2.27E-01	3.29E-01	5.22E-02	1.02E+00
62	GRID	1.88E+02	2.32E+02	2.53E+02	2.76E+02	2.36E+02	2.00E+02	1.27E+00	9.64E-01	2.01E-01	2.91E-01	4.61E-02	9.02E-01
63	GRID	1.96E+02	2.35E+02	2.50E+02	2.37E+02	2.05E+02	1.81E+02	1.19E+00	9.07E-01	1.89E-01	2.74E-01	4.34E-02	8.50E-01
64	GRID	1.81E+02	2.22E+02	2.24E+02	2.09E+02	1.85E+02	1.66E+02	1.08E+00	8.26E-01	1.72E-01	2.49E-01	3.95E-02	7.73E-01
65	GRID	1.55E+02	2.11E+02	2.09E+02	1.88E+02	1.68E+02	1.57E+02	9.94E-01	7.57E-01	1.58E-01	2.29E-01	3.62E-02	7.09E-01
66	GRID	1.79E+02	1.82E+02	1.90E+02	1.71E+02	1.54E+02	1.49E+02	9.37E-01	7.13E-01	1.49E-01	2.15E-01	3.41E-02	6.68E-01
67	GRID	1.74E+02	1.84E+02	1.75E+02	1.58E+02	1.45E+02	1.43E+02	8.95E-01	6.81E-01	1.42E-01	2.06E-01	3.26E-02	6.38E-01
68	GRID	1.45E+02	1.70E+02	1.61E+02	1.47E+02	1.37E+02	1.37E+02	8.24E-01	6.27E-01	1.31E-01	1.89E-01	3.00E-02	5.87E-01
69	GRID	1.56E+02	1.60E+02	1.49E+02	1.36E+02	1.30E+02	1.32E+02	7.93E-01	6.04E-01	1.26E-01	1.82E-01	2.89E-02	5.65E-01
70	GRID	1.52E+02	1.50E+02	1.40E+02	1.31E+02	1.26E+02	1.28E+02	7.54E-01	5.74E-01	1.20E-01	1.73E-01	2.75E-02	5.37E-01
71	GRID	1.34E+02	1.40E+02	1.32E+02	1.25E+02	1.21E+02	1.24E+02	7.08E-01	5.39E-01	1.12E-01	1.63E-01	2.58E-02	5.05E-01
72	GRID	1.37E+02	1.33E+02	1.24E+02	1.19E+02	1.17E+02	1.19E+02	6.85E-01	5.21E-01	1.09E-01	1.58E-01	2.50E-02	4.88E-01
73	GRID	1.31E+02	1.26E+02	1.19E+02	1.12E+02	1.14E+02	1.16E+02	6.55E-01	4.99E-01	1.04E-01	1.51E-01	2.39E-02	4.67E-01
74	GRID	1.20E+02	1.19E+02	1.15E+02	1.04E+02	1.10E+02	1.13E+02	6.22E-01	4.74E-01	9.85E-02	1.43E-01	2.27E-02	4.43E-01
75	GRID	1.18E+02	1.15E+02	1.10E+02	1.07E+02	1.07E+02	1.10E+02	6.09E-01	4.64E-01	9.67E-02	1.40E-01	2.22E-02	4.34E-01
76	GRID	1.40E+02	1.59E+02	1.72E+02	2.61E+02	2.79E+02	2.73E+02	1.17E+00	8.94E-01	1.86E-01	2.70E-01	4.28E-02	8.37E-01
77	GRID	1.52E+02	1.76E+02	2.21E+02	2.62E+02	3.35E+02	3.14E+02	1.35E+00	1.03E+00	2.15E-01	3.11E-01	4.93E-02	9.64E-01
78	GRID	1.56E+02	1.69E+02	2.30E+02	3.26E+02	3.69E+02	3.78E+02	1.53E+00	1.16E+00	2.42E-01	3.51E-01	5.56E-02	1.09E+00
79	GRID	1.24E+02	2.00E+02	2.59E+02	3.57E+02	4.90E+02	4.90E+02	1.75E+00	1.33E+00	2.78E-01	4.03E-01	6.39E-02	1.25E+00
80	GRID	1.72E+02	2.19E+02	2.58E+02	4.00E+02	6.25E+02	7.07E+02	2.16E+00	1.66E+00	3.46E-01	5.00E-01	7.93E-02	1.55E+00
81	GRID	1.60E+02	2.34E+02	3.20E+02	4.61E+02	7.61E+02	1.35E+03	3.02E+00	2.30E+00	4.79E-01	6.94E-01	1.10E-01	2.15E+00
82	GRID	1.87E+02	2.36E+02	3.02E+02	5.14E+02	7.76E+02	1.52E+03	3.23E+00	2.48E+00	5.13E-01	7.44E-01	1.18E-01	2.31E+00
83	GRID	1.90E+02	2.10E+02	3.39E+02	5.16E+02	7.95E+02	8.29E+02	2.45E+00	1.88E+00	3.89E-01	5.63E-01	8.92E-02	1.75E+00
84	GRID	1.99E+02	2.31E+02	3.24E+02	4.92E+02	5.39E+02	3.93E+02	1.99E+00	1.52E+00	3.15E-01	4.56E-01	7.26E-02	1.42E+00
85	GRID	2.06E+02	2.70E+02	3.29E+02	4.30E+02	3.80E+02	2.92E+02	1.75E+00	1.33E+00	2.76E-01	4.03E-01	6.38E-02	1.25E+00
86	GRID	1.68E+02	2.31E+02	3.41E+02	3.65E+02	3.06E+02	2.39E+02	1.54E+00	1.17E+00	2.45E-01	3.53E-01	5.60E-02	1.10E+00
87	GRID	1.71E+02	2.57E+02	3.09E+02	3.01E+02	2.51E+02	2.08E+02	1.37E+00	1.04E+00	2.17E-01	3.14E-01	4.96E-02	9.75E-01
88	GRID	1.88E+02	2.38E+02	2.81E+02	2.54E+02	2.16E+02	1.89E+02	1.25E+00	9.50E-01	1.98E-01	2.87E-01	4.55E-02	8.90E-01
89	GRID	2.07E+02	2.36E+02	2.47E+02	2.20E+02	1.90E+02	1.77E+02	1.17E+00	8.90E-01	1.88E-01	2.69E-01	4.26E-02	8.33E-01
90	GRID	1.90E+02	2.18E+02	2.22E+02	1.96E+02	1.73E+02	1.67E+02	1.06E+00	8.11E-01	1.69E-01	2.45E-01	3.88E-02	7.59E-01
91	GRID	1.84E+02	2.03E+02	1.97E+02	1.77E+02	1.59E+02	1.58E+02	9.66E-01	7.50E-01	1.57E-01	2.27E-01	3.59E-02	7.03E-01
92	GRID	1.68E+02	1.94E+02	1.80E+02	1.62E+02	1.49E+02	1.50E+02	9.35E-01	7.12E-01	1.48E-01	2.15E-01	3.41E-02	6.66E-01
93	GRID	1.66E+02	1.78E+02	1.65E+02	1.50E+02	1.40E+02	1.44E+02	8.63E-01	6.57E-01	1.37E-01	1.98E-01	3.14E-02	6.15E-01
94	GRID	1.65E+02	1.66E+02	1.53E+02	1.40E+02	1.34E+02	1.38E+02	8.19E-01	6.24E-01	1.30E-01	1.88E-01	2.99E-02	5.84E-01
95	GRID	1.59E+02	1.55E+02	1.43E+02	1.33E+02	1.29E+02	1.33E+02	7.79E-01	5.93E-01	1.24E-01	1.79E-01	2.84E-02	5.55E-01
96	GRID	1.42E+02	1.43E+02	1.35E+02	1.27E+02	1.25E+02	1.26E+02	7.30E-01	5.56E-01	1.16E-01	1.68E-01	2.66E-02	5.20E-01
97	GRID	1.43E+02	1.36E+02	1.28E+02	1.21E+02	1.20E+02	1.24E+02	7.05E-01	5.37E-01	1.12E-01	1.62E-01	2.57E-02	5.03E-01
98	GRID	1.33E+02	1.29E+02	1.21E+02	1.15E+02	1.17E+02	1.20E+02	6.71E-01	5.11E-01	1.07E-01	1.54E-01	2.45E-02	4.78E-01
99	GRID	1.26E+02	1.23E+02	1.16E+02	1.13E+02	1.13E+02	1.16E+02	6.46E-01	4.92E-01	1.03E-01	1.49E-01	2.35E-02	4.61E-01
100	GRID	1.23E+02	1.16E+02	1.12E+02	1.09E+02	1.09E+02	1.13E+02	6.23E-01	4.74E-01	9.89E-02	1.43E-01	2.27E-02	4.44E-01
101	GRID	1.35E+02	1.53E+02	2.01E+02	2.41E+02	2.63E+02	2.35E+02	1.13E+00	8.57E-01	1.79E-01	2.59E-01	4.10E-02	8.03E-01
102	GRID	1.53E+02	1.60E+02	2.05E+02	2.77E+02	3.00E+02	2.69E+02	1.27E+00	9.63E-01	2.01E-01	2.91E-01	4.61E-02	9.02E-01
103	GRID	1.84E+02	1.95E+02	2.54E+02	3.22E+02	3.51E+02	3.13E+02	1.48E+00	1.11E+00	2.32E-01	3.36E-01	5.33E-02	1.04E+00
104	GRID	1.71E+02	2.07E+02	2.63E+02	3.70E+02	4.25E+02	3.60E+02	1.66E+00	1.26E+00	2.63E-01	3.82E-01	6.05E-02	1.18E+00
105	GRID	1.37E+02	2.14E+02	2.98E+02	4.06E+02	5.23E+02	4.88E+02	1.80E+00	1.44E+00	3.01E-01	4.36E-01	6.92E-02	1.35E+00
106	GRID	1.80E+02	2.46E+02	3.22E+02	4.44E+02	7.61E+02	7.56E+02	2.45E+00	1.89E+00	3.93E-01	5.70E-01	9.03E-02	1.77E+00
107	GRID	1.85E+02	2.47E+02	3.55E+02	5.61E+02	1.05E+03	2.22E+03	4.22E+00	3.21E+00	6.70E-01	9.71E-01	1.54E-01	3.01E+00
108	GRID	1.63E+02	2.59E+02	3.84E+02	5.04E+02	1.08E+03	9.17E+02	3.05E+00	2.32E+00	4.84E-01	7.01E-01	1.11E-01	2.17E+00
109	GRID	1.71E+02	2.65E+02	3.73E+02	6.09E+02	7.07E+02	4.53E+02	2.35E+00	1.79E+00	3.74E-01	5.42E-01	8.59E-02	1.68E+00
110	GRID	2.05E+02	2.90E+02	3.66E+02	5.03E+02	4.55E+02	3.08E+02	1.94E+00	1.48E+00	3.09E-01	4.47E-01	7.09E-02	1.39E+00
111	GRID	2.11E+02	2.91E+02	3.60E+02	4.00E+02	3.36E+02	2.46E+02	1.70E+00	1.30E+00	2.71E-01	3.92E-01	6.21E-02	1.22E+00
112	GRID	2.28E+02	2.92E+02	3.35E+02	3.30E+02	2.69E+02	2.23E+02	1.53E+00	1.17E+00	2.43E-01	3.53E-01	5.59E-02	1.09E+00
113	GRID	2.27E+02	2.79E+02	2.99E+02	2.73E+02	2.27E+02	2.06E+02	1.38E+00	1.05E+00	2.19E-01	3.16E-01	5.04E-02	9.85E-01
114	GRID	2.06E+02	2.29E+02	2.65E+02	2.32E+02	1.98E+02	1.91E+02	1.21E+00	9.22E-01	1.92E-01	2.78E-01	4.41E-02	8.63E-01
115	GRID	2.19E+02	2.42E+02	2.35E+02	2.04E+02	1.77E+02	1.76E+02	1.15E+00	8.73E-01	1.82E-01	2.64E-01	4.18E-02	8.18E-01
116	GRID	2.10E+02	2.22E+02	2.06E+02	1.83E+02	1.64E+02	1.66E+02	1.05E+00	8.03E-01	1.67E-01	2.43E-01	3.84E-02	7.52E-01
117	GRID	1.96E+02	2.04E+02	1.86E+02	1.67E+02	1.53E+02	1.59E+02	9.73E-01	7.41E-01	1.54E-01	2.24E-01	3.55E-02	6.94E-01
118	GRID	1.84E+02	1.87E+02	1.69E+02	1.54E+02	1.45E+02	1.52E+02	9.05E-01	6.89E-01	1.44E-01	2.08E-01	3.30E-02	6.45E-01
119	GRID	1.72E+02	1.72E+02	1.57E+02	1.44E+02	1.39E+02	1.45E+02	8.48E-01	6.46E-01	1.35E-01	1.95E-01	3.09E-02	6.05E-01
120	GRID	1.66E+02	1.59E+02	1.48E+02	1.36E+02	1.33E+02	1.39E+02	8.04E-01	6.12E-01	1.28E-01	1.85E-01	2.93E-02	5.73E-01
121	GRID	1.51E+02	1.48E+02	1.37E+02	1.30E+02	1.28E+02	1.34E+02	7.55E-01	5.77E-01	1.20E-01	1.74E-01	2.76E-02	5.40E-01
122	GRID	1.48E+02	1.39E+02	1.30E+02	1.23E+02	1.24E+02	1.29E+02	7.24E-01	5.52E-01	1.15E-01	1.67E-01	2.64E-02	5.16E-01
123	GRID	1.39E+02	1.31E+02	1.24E+02	1.19E+02	1.20E+02	1.25E+02	6.93E-01	5.27E-01	1.10E-01	1.59E-01	2.53E-02	4.94E-01
124	GRID	1.32E+02	1.24E+02	1.18E+02	1.15E+02	1.17E+02	1.21E+02	6.65E-01	5.06E-01	1.06E-01	1.53E-01	2.42E-02	4.74E-01
125	GRID	1.25E+02	1.18E+02	1.14E+02	1.12E+02	1.13E+02	1.17E+02	6.38E-01	4.86E-01	1.01E-01	1.47E-01	2.33E-02	4.55E-01
126	GRID	1.35E+02	1.80E+02	2.11E+02	2.39E+02	2.35E+02	2.15E+02	1.11E+00	8.45E-01	1.76E-01	2.55E-01	4.05E-02	7.91E-01

Maximum One Hour Concentration at Receptors Using Santa Maria 1983 Meteorology

Rec Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	One Hour Maximum Concentration, ug/cu m Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
127 GRID	1.51E+02	1.49E+02	2.31E+02	2.70E+02	2.64E+02	2.33E+02	1.19E+00	9.03E-01	1.88E-01	2.73E-01	4.32E-02	8.45E-01
128 GRID	1.67E+02	2.03E+02	2.49E+02	3.05E+02	3.01E+02	2.65E+02	1.36E+00	1.04E+00	2.16E-01	3.14E-01	4.97E-02	9.72E-01
129 GRID	1.78E+02	2.18E+02	2.66E+02	3.35E+02	3.53E+02	3.08E+02	1.53E+00	1.17E+00	2.43E-01	3.52E-01	5.59E-02	1.09E+00
130 GRID	1.87E+02	2.29E+02	3.04E+02	4.02E+02	4.44E+02	3.73E+02	1.77E+00	1.35E+00	2.81E-01	4.07E-01	6.46E-02	1.26E+00
131 GRID	1.64E+02	2.28E+02	3.47E+02	4.67E+02	5.65E+02	4.91E+02	2.09E+00	1.59E+00	3.33E-01	4.82E-01	7.63E-02	1.49E+00
132 GRID	1.81E+02	2.56E+02	3.91E+02	4.84E+02	9.41E+02	8.07E+02	2.61E+00	2.14E+00	4.46E-01	6.45E-01	1.02E-01	2.00E+00
133 GRID	2.00E+02	2.76E+02	4.12E+02	6.98E+02	1.43E+03	2.02E+03	4.60E+00	3.50E+00	7.30E-01	1.06E+00	1.68E-01	3.28E+00
134 GRID	2.23E+02	3.05E+02	3.61E+02	7.19E+02	1.04E+03	5.55E+02	2.93E+00	2.23E+00	4.66E-01	6.75E-01	1.07E-01	2.09E+00
135 GRID	2.14E+02	3.13E+02	4.37E+02	5.87E+02	5.48E+02	3.32E+02	2.22E+00	1.69E+00	3.53E-01	5.11E-01	8.10E-02	1.58E+00
136 GRID	2.42E+02	3.27E+02	3.65E+02	4.88E+02	3.60E+02	2.85E+02	1.91E+00	1.45E+00	3.03E-01	4.40E-01	6.97E-02	1.36E+00
137 GRID	2.32E+02	2.61E+02	3.84E+02	3.87E+02	2.90E+02	2.57E+02	1.65E+00	1.25E+00	2.62E-01	3.79E-01	6.00E-02	1.17E+00
138 GRID	1.99E+02	3.05E+02	3.42E+02	2.93E+02	2.38E+02	2.31E+02	1.47E+00	1.12E+00	2.33E-01	3.35E-01	5.36E-02	1.05E+00
139 GRID	2.43E+02	2.85E+02	2.68E+02	2.48E+02	2.05E+02	2.12E+02	1.35E+00	1.03E+00	2.14E-01	3.11E-01	4.92E-02	9.63E-01
140 GRID	2.16E+02	2.64E+02	2.49E+02	2.14E+02	1.85E+02	1.94E+02	1.21E+00	9.20E-01	1.92E-01	2.78E-01	4.40E-02	8.61E-01
141 GRID	2.20E+02	2.40E+02	2.17E+02	1.90E+02	1.69E+02	1.82E+02	1.11E+00	8.47E-01	1.77E-01	2.56E-01	4.05E-02	7.93E-01
142 GRID	2.05E+02	2.14E+02	1.93E+02	1.72E+02	1.59E+02	1.71E+02	1.02E+00	7.76E-01	1.62E-01	2.34E-01	3.71E-02	7.26E-01
143 GRID	2.00E+02	1.95E+02	1.75E+02	1.58E+02	1.51E+02	1.62E+02	9.51E-01	7.24E-01	1.51E-01	2.19E-01	3.47E-02	6.78E-01
144 GRID	1.62E+02	1.77E+02	1.62E+02	1.48E+02	1.45E+02	1.54E+02	8.84E-01	6.73E-01	1.40E-01	2.03E-01	3.22E-02	6.30E-01
145 GRID	1.74E+02	1.63E+02	1.50E+02	1.39E+02	1.39E+02	1.47E+02	8.33E-01	6.34E-01	1.32E-01	1.92E-01	3.04E-02	5.94E-01
146 GRID	1.60E+02	1.53E+02	1.40E+02	1.32E+02	1.34E+02	1.40E+02	7.84E-01	5.97E-01	1.25E-01	1.80E-01	2.86E-02	5.59E-01
147 GRID	1.52E+02	1.43E+02	1.32E+02	1.27E+02	1.29E+02	1.35E+02	7.47E-01	5.68E-01	1.19E-01	1.72E-01	2.72E-02	5.32E-01
148 GRID	1.43E+02	1.33E+02	1.26E+02	1.22E+02	1.25E+02	1.30E+02	7.13E-01	5.42E-01	1.13E-01	1.64E-01	2.60E-02	5.08E-01
149 GRID	1.35E+02	1.27E+02	1.20E+02	1.18E+02	1.21E+02	1.25E+02	6.82E-01	5.19E-01	1.08E-01	1.57E-01	2.49E-02	4.86E-01
150 GRID	1.28E+02	1.21E+02	1.15E+02	1.14E+02	1.16E+02	1.21E+02	6.54E-01	4.98E-01	1.04E-01	1.50E-01	2.38E-02	4.66E-01
151 GRID	1.53E+02	1.76E+02	2.11E+02	2.22E+02	2.15E+02	1.94E+02	1.07E+00	8.16E-01	1.70E-01	2.46E-01	3.91E-02	7.64E-01
152 GRID	1.34E+02	1.84E+02	2.29E+02	2.46E+02	2.36E+02	2.10E+02	1.13E+00	8.62E-01	1.80E-01	2.60E-01	4.13E-02	8.07E-01
153 GRID	1.58E+02	1.84E+02	2.53E+02	2.71E+02	2.61E+02	2.31E+02	1.25E+00	9.52E-01	1.99E-01	2.87E-01	4.56E-02	8.91E-01
154 GRID	1.82E+02	2.27E+02	2.84E+02	3.16E+02	3.03E+02	2.59E+02	1.44E+00	1.09E+00	2.28E-01	3.30E-01	5.23E-02	1.02E+00
155 GRID	1.93E+02	2.45E+02	3.14E+02	3.81E+02	3.57E+02	2.95E+02	1.63E+00	1.24E+00	2.59E-01	3.76E-01	5.95E-02	1.16E+00
156 GRID	2.05E+02	2.54E+02	3.52E+02	4.16E+02	4.52E+02	3.51E+02	1.66E+00	1.41E+00	2.95E-01	4.27E-01	6.77E-02	1.32E+00
157 GRID	1.96E+02	2.39E+02	4.06E+02	5.53E+02	6.40E+02	4.53E+02	2.27E+00	1.73E+00	3.61E-01	5.23E-01	8.29E-02	1.62E+00
158 GRID	2.20E+02	2.76E+02	4.52E+02	7.04E+02	1.17E+03	7.84E+02	3.30E+00	2.51E+00	5.24E-01	7.58E-01	1.20E-01	2.35E+00
159 GRID	2.42E+02	3.36E+02	4.93E+02	8.66E+02	1.79E+03	1.08E+03	4.39E+00	3.34E+00	6.97E-01	1.01E+00	1.60E-01	3.13E+00
160 GRID	2.46E+02	2.72E+02	5.34E+02	8.47E+02	7.47E+02	5.11E+02	2.68E+00	2.20E+00	4.58E-01	6.63E-01	1.05E-01	2.06E+00
161 GRID	2.61E+02	3.64E+02	4.87E+02	5.97E+02	4.37E+02	3.76E+02	2.30E+00	1.75E+00	3.66E-01	5.30E-01	8.40E-02	1.64E+00
162 GRID	2.45E+02	3.61E+02	4.60E+02	4.23E+02	3.13E+02	3.11E+02	1.83E+00	1.47E+00	3.07E-01	4.44E-01	7.04E-02	1.38E+00
163 GRID	2.68E+02	3.20E+02	3.63E+02	3.25E+02	2.50E+02	2.70E+02	1.64E+00	1.25E+00	2.80E-01	3.77E-01	5.95E-02	1.17E+00
164 GRID	2.56E+02	3.11E+02	3.17E+02	2.63E+02	2.13E+02	2.39E+02	1.46E+00	1.11E+00	2.32E-01	3.36E-01	5.33E-02	1.04E+00
165 GRID	2.58E+02	2.82E+02	2.64E+02	2.24E+02	1.92E+02	2.16E+02	1.31E+00	9.99E-01	2.06E-01	3.02E-01	4.78E-02	9.36E-01
166 GRID	2.07E+02	2.55E+02	2.29E+02	1.97E+02	1.80E+02	1.99E+02	1.18E+00	8.61E-01	1.84E-01	2.66E-01	4.22E-02	8.25E-01
167 GRID	2.31E+02	2.25E+02	2.01E+02	1.76E+02	1.69E+02	1.85E+02	1.08E+00	8.26E-01	1.72E-01	2.49E-01	3.95E-02	7.73E-01
168 GRID	2.14E+02	2.04E+02	1.82E+02	1.63E+02	1.60E+02	1.72E+02	1.00E+00	7.62E-01	1.59E-01	2.30E-01	3.65E-02	7.14E-01
169 GRID	1.95E+02	1.84E+02	1.66E+02	1.52E+02	1.52E+02	1.63E+02	9.25E-01	7.04E-01	1.47E-01	2.13E-01	3.37E-02	6.59E-01
170 GRID	1.82E+02	1.69E+02	1.53E+02	1.42E+02	1.45E+02	1.56E+02	8.66E-01	6.60E-01	1.38E-01	1.99E-01	3.16E-02	6.18E-01
171 GRID	1.68E+02	1.56E+02	1.43E+02	1.35E+02	1.40E+02	1.48E+02	8.14E-01	6.20E-01	1.29E-01	1.87E-01	2.97E-02	5.80E-01
172 GRID	1.56E+02	1.46E+02	1.36E+02	1.30E+02	1.34E+02	1.41E+02	7.70E-01	5.86E-01	1.22E-01	1.77E-01	2.81E-02	5.49E-01
173 GRID	1.47E+02	1.37E+02	1.29E+02	1.26E+02	1.30E+02	1.36E+02	7.34E-01	5.59E-01	1.17E-01	1.69E-01	2.68E-02	5.23E-01
174 GRID	1.36E+02	1.29E+02	1.23E+02	1.21E+02	1.25E+02	1.31E+02	7.01E-01	5.34E-01	1.11E-01	1.61E-01	2.55E-02	5.00E-01
175 GRID	1.30E+02	1.22E+02	1.13E+02	1.18E+02	1.21E+02	1.26E+02	6.68E-01	5.09E-01	1.06E-01	1.54E-01	2.44E-02	4.76E-01
176 GRID	1.54E+02	1.71E+02	2.05E+02	2.08E+02	1.94E+02	1.78E+02	1.01E+00	7.73E-01	1.61E-01	2.33E-01	3.70E-02	7.23E-01
177 GRID	1.65E+02	1.82E+02	1.96E+02	2.29E+02	2.13E+02	1.90E+02	1.07E+00	8.16E-01	1.71E-01	2.47E-01	3.91E-02	7.66E-01
178 GRID	1.35E+02	2.00E+02	2.44E+02	2.53E+02	2.34E+02	2.06E+02	1.17E+00	8.68E-01	1.85E-01	2.68E-01	4.25E-02	8.31E-01
179 GRID	1.86E+02	2.21E+02	2.67E+02	2.87E+02	2.60E+02	2.24E+02	1.32E+00	1.01E+00	2.10E-01	3.04E-01	4.82E-02	9.42E-01
180 GRID	1.99E+02	2.50E+02	2.97E+02	3.31E+02	2.96E+02	2.48E+02	1.48E+00	1.13E+00	2.35E-01	3.41E-01	5.40E-02	1.06E+00
181 GRID	2.12E+02	2.75E+02	3.31E+02	4.01E+02	3.58E+02	2.75E+02	1.66E+00	1.29E+00	2.69E-01	3.89E-01	6.17E-02	1.21E+00
182 GRID	2.26E+02	2.65E+02	4.09E+02	5.06E+02	4.51E+02	3.11E+02	2.00E+00	1.52E+00	3.17E-01	4.60E-01	7.29E-02	1.43E+00
183 GRID	2.33E+02	2.84E+02	4.80E+02	6.79E+02	6.65E+02	4.91E+02	2.56E+00	1.95E+00	4.08E-01	5.89E-01	9.33E-02	1.83E+00
184 GRID	2.57E+02	3.56E+02	5.11E+02	9.75E+02	1.52E+03	1.66E+03	4.83E+00	3.67E+00	7.66E-01	1.11E+00	1.76E-01	3.44E+00
185 GRID	2.58E+02	3.46E+02	6.12E+02	1.06E+03	1.30E+03	9.84E+02	4.16E+00	3.18E+00	6.63E-01	9.60E-01	1.52E-01	2.95E+00
186 GRID	2.13E+02	4.03E+02	6.14E+02	8.12E+02	5.27E+02	5.44E+02	2.65E+00	2.17E+00	4.52E-01	6.54E-01	1.04E-01	2.03E+00
187 GRID	2.83E+02	4.06E+02	5.39E+02	5.01E+02	3.37E+02	3.99E+02	2.25E+00	1.72E+00	3.58E-01	5.18E-01	8.21E-02	1.61E+00
188 GRID	2.76E+02	3.71E+02	4.45E+02	3.60E+02	2.60E+02	3.23E+02	1.86E+00	1.42E+00	2.96E-01	4.26E-01	6.75E-02	1.33E+00
189 GRID	2.71E+02	3.61E+02	3.48E+02	2.83E+02	2.28E+02	2.75E+02	1.61E+00	1.23E+00	2.56E-01	3.71E-01	5.88E-02	1.15E+00
190 GRID	2.69E+02	3.19E+02	2.87E+02	2.36E+02	2.10E+02	2.44E+02	1.43E+00	1.09E+00	2.27E-01	3.29E-01	5.21E-02	1.02E+00
191 GRID	2.84E+02	2.75E+02	2.43E+02	2.04E+02	1.95E+02	2.19E+02	1.28E+00	9.74E-01	2.03E-01	2.94E-01	4.67E-02	9.12E-01
192 GRID	2.45E+02	2.42E+02	2.12E+02	1.83E+02	1.82E+02	2.01E+02	1.16E+00	8.80E-01	1.84E-01	2.66E-01	4.21E-02	8.24E-01
193 GRID	2.26E+02	2.14E+02	1.88E+02	1.67E+02	1.71E+02	1.87E+02	1.05E+00	8.03E-01	1.67E-01	2.42E-01	3.84E-02	7.52E-01
194 GRID	2.09E+02	1.91E+02	1.71E+02	1.55E+02	1.62E+02	1.75E+02	9.71E-01	7.39E-01	1.54E-01	2.23E-01	3.54E-02	6.92E-01
195 GRID	1.91E+02	1.75E+02	1.57E+02	1.47E+02	1.53E+02	1.66E+02	9.04E-01	6.88E-01	1.43E-01	2.08E-01	3.29E-02	6.44E-01
196 GRID	1.76E+02	1.61E+02	1.46E+02	1.41E+02	1.47E+02	1.57E+02	8.48E-01	6.44E-01	1.34E-01	1.95E-01	3.08E-02	6.03E-01
197 GRID	1.62E+02	1.49E+02	1.35E+02	1.35E+02	1.41E+02	1.50E+02	8.00E-01	6.09E-01	1.27E-01	1.84E-01	2.92E-02	5.70E-01
198 GRID	1.49E+02	1.40E+02	1.31E+02	1.30E+02	1.35E+02	1.43E+02	7.57E-01	5.76E-01	1.20E-01	1.74E-01	2.76E-02	5.40E-01
199 GRID	1.42E+02	1.32E+02	1.24E+02	1.25E+02	1.30E+02	1.38E+02	7.22E-01	5.49E-01	1.15E-01	1.66E-01	2.63E-02	5.15E-01
200 GRID	1.34E+02	1.25E+02	1.20E+02	1.21E+02	1.26E+02	1.30E+02	6.91E-01	5.26E-01	1.10E-01	1.59E-01	2.52E-02	4.93E-01
201 GRID	1.55E+02	1.57E+02	1.95E+02	1.96E+02	1.80E+02	1.66E+02	9.59E-01	7.30E-01	1.52E-01	2.21E-01	3.50E-02	6.84E-01
202 GRID	1.66E+02	1.93E+02	2.15E+02	2.12E+02	1.94E+02	1.75E+02	1.06E+00	8.03E-01	1.68E-01	2.43E-01	3.85E-02	7.52E-01
203 GRID	1.69E+02	2.11E+02	2.36E+02	2.28E+02	2.09E+02	1.87E+02	1.13E+00	8.63E-01	1.80E-01	2.61E-01	4.13E-02	8.08E-01
204 GRID	1.66E+02	2.30E+02	2.53E+02	2.56E+02	2.28E+02	2.02E+02	1.22E+00	9.29E-01	1.94E-01	2.81E-01	4.45E-02	8.70E-01
205 GRID	2.03E+02	2.52E+02	2.92E+02	2.90E+02	2.57E+02	2.17E+02	1.38E+00	1.05E+00	2.19E-01	3.18E-01	5.03E-02	9.85E-01
206 GRID	2.16E+02	2.67E+02	3.36E+02	3.40E+02	2.95E+02	2.41E+02	1.55E+00	1.16E+00	2.47E-01	3.57E-01	5.66E-02	1.11E+00
207 GRID	2.35E+02	3.09E+02	3.50E+02	4.12E+02	3.48E+02	2.93E+02	1.78E+00	1.35E+00	2.83E-01	4.10E-01	6.50E-02	1.27E+00
208 GRID	2.49E+02	3.21E+02	4.74E+02	5.47E+02	4.51E+02	4.22E+02	2.25E+00	1.71E+00	3.58E-01	5.16E-01	8.21E-02	1.61E+00
209 GRID	2.71E+02	3.32E+02	5.70E+02	8.22E+02	6.81E+02	7.84E+02	3.16E+00	2.41E+00	5.02E-01	7.27E-01	1.15E-01	2.25E+00
210 GRID	2.79E+02	4.11E+02	6.80E+02	1.32E+03	2.11E+03	2.20E+03	6.40E+00	4.87E+00	1.02E+00	1.47E+00	2.33E-01	4.56E+00
211 GRID	2.65E+02	4.47E+02	6.54E+02	1.24E+03	6.97E+02	9.05E+02	3.68E+00	2.95E+00	6.15E-01	8.91E-01	1.41E-01	2.76E+00
212 GRID	3.14E+02	4.53E+02	6.72E+02	6.35E+02	3.59E+02	5.45E+02	2.72E+00	2.07E+00	4.32E-01	6.26E-01	9.93E-02	1.94E+00
213 GRID	2.90E+02	4.51E+02	5.31E+02	4.16E+02	2.66E+02	4.03E+02	2.18E+00	1.66E+00	3.47E-01	5.02E-01	7.96E-02	1.56E+00
214 GRID	3.13E+02	4.12E+02	3.95E+02	3.07E+02	2.64E+02	3.36E+02	1.64E+00	1.40E+00	2.93E-01	4.24E-01	6.72E-02	1.31E+00
215 GRID	3.04E+02	3.29E+02	3.11E+02	2.51E+02	2.37E+02	2.79E+02	1.56E+00	1.19E+00	2.48E-01	3.59E-01	5.70E-02	1.11E+00
216 GRID	2.88E+02	3.03E+02	2.59E+02	2.14E+02	2.17E+02	2.48E+02	1.40E+00	1.06E+00	2.22E-01	3.21E-01	5.09E-02	9.96E-01
217 GRID	2.68E+02	2.59E+02	2.22E+02	1.90E+02	1.98E+02	2.24E+02	1.24E+00	9.47E-01	1.97E-01	2.85E-01	4.53E-02	8.87E-01
218 GRID	2.41E+02	2.24E+02	1.96E+02	1.74E+02	1.85E+02	2.05E+02	1.12E+00	8.51E-01	1.76E-01	2.57E-01	4.08E-02	7.97E-01
219 GRID	2.22E+02	2.00E+02	1.76E+02	1.62E+02	1.74E+02	1.88E+02	1.02E+00	7.80E-01	1.63E-01	2.36E-01	3.74E-02	7.31E-01
220 GRID	2.00E+02	1.80E+02	1.62E+02	1.53E+02	1.84E+02	1.78E+02	9.48E-01	7.22E-01	1.51E-01	2.18E-01	3.46E-02	6.76E-01
221 GRID	1.83E+02	1.65E+02	1.51E+02	1.46E+02	1.56E+02	1.66E+02	8.83E-01	6.72E-01	1.40E-01	2.03E-01	3.22E-02	6.30E-01
222 GRID	1.68E+02	1.52E+02	1.41E+02	1.40E+02	1.48E+02	1.59E+02	8.30E-01	6.32E-01	1.32E-01	1.91E-01	3.03E-02	5.92E-01
223 GRID	1.54E+02	1.42E+02	1.33E+02	1.35E+02	1.42E+02	1.51E+02	7.83E-01	5.96E-01	1.24E-01	1.80E-01	2.86E-02	5.59E-01
224 GRID	1.44E+02	1.34E+02	1.28E+02	1.30E+02	1.36E+02	1.43E+02	7.46E-01	5.68E-01	1.18E-01	1.71E-01	2.72E-02	5.31E-01
225 GRID	1.36E+02	1.28E+02	1.23E+02	1.26E+02	1.31E+02	1.38E+02	7.14E-01	5.44E-01	1.13E-01	1.64E-01	2.60E-02	5.09E-01
226 GRID	1.67E+02	1.67E+02	1.85E+02	1.62E+02	1.68E+02	1.55E+02	9.27E-01	7.06E-01	1.47E-01	2.13E-01	3.39E-02	6.61E-01
227 GRID	1.65E+02	1.66E+02	2.00E+02	1.94E+02	1.77E+02	1.64E+02	9.93E-01	7.56E-01	1.58E-01	2.28E-01	3.62E-02	7.08E-01
228 GRID	1.65E+02	1.99E+02	2.21E+02	2.09E+02	1.90E+02	1.74E+02	1.06E+00	8.05E-01	1.68E-01	2.43E-01	3.85E-02	7.54E-01
229 GRID	1.76E+02	2.12E+02	2.44E+02	2.29E+02	2.06E+02	1.85E+02	1.15E+00	8.72E-01	1.82E-01	2.63E-01	4.18E-02	8.17E-01
230 GRID	1.98E+02	2.33E+02	2.71E+02	2.54E+02	2.25E+02	2.04E+02	1.27E+00	9.64E-01	2.01E-01	2.91E-01	4.61E-02	9.02E-01
231 GRID	2.16E+02	2.66E+02	3.11E+02	2.89E+02	2.51E+02	2.34E+02	1.43E+00	1.09E+00	2.26E-01	3.30E-01	5.23E-02	1.02E+00
232 GRID	2.39E+02	2.75E+02	3.50E+02	3.41E+02	2.85E+02	2.83E+02	1.62E+00	1.23E+00	2.57E-01	3.72E-01	5.60E-02	1.15E+00
233 GRID	2.62E+02	3.45E+02	4.33E+02	4.21E+02	3.33E+02	3.73E+02	1.96E+00	1.51E+00	3.14E-01	4.55E-01	7.22E-02	1.41E+00
234 GRID	2.75E+02	3.66E+02	5.45E+02	5.73E+02	4.15E+02	5.69E+02	2.51E+00	1.91E+00	3.98E-01	5.76E-01	9.13E-02	1.79E+00
235 GRID	3.05E+02	4.28E+02	6.60E+02	9.61E+02	6.38E+02	1.22E+03	3.87E+00	2.94E+00	6.14E-01	8.89E-01	1.41E-01	2.76E+00
236 GRID	3.07E+02	4.73E+02	8.53E+02	1.64E+03	1.48E+03	1.62E+03	6.01E+00	4.57E+00	9.54E-01	1.38E+00	2.19E-01	4.28E+00
237 GRID	3.35E+02	4.49E+02	8.81E+02	9.30E+02	5.70E+02	8.26E+02	3.65E+00	2.78E+00	5.79E-01	8.38E-01	1.33E-01	2.60E+00
238 GRID	3.20E+02	5.24E+02	6.87E+02	4.91E+02	4.00E+02	5.29E+02	2.68E+00	2.04E+00	4.25E-01	6.16E-01	9.76E-02	1.91E+00
239 GRID	3.39E+02	4.81E+02	4.61E+02	3.35E+02	3.25E+02	3.94E+02	2.13E+00	1.62E+00	3.39E-01	4.91E-01	7.78E-02	1.52E+00
240 GRID	3.51E+02	4.07E+02	3.45E+02	2.84E+02	2.76E+02	3.30E+02	1.80E+00	1.37E+00	2.87E-01	4.15E-01	6.58E-02	1.29E+00
241 GRID	3.26E+02	3.31E+02	2.78E+02	2.22E+02	2.46E+02	2.82E+02	1.54E+00	1.17E+00	2.45E-01	3.55E-01	5.63E-02	1.10E+00
242 GRID	2.96E+02	2.77E+02	2.34E+02	1.98E+02	2.21E+02	2.46E+02	1.35E+00	1.02E+00	2.14E-01	3.10E-01	4.91E-02	9.60E-01
243 GRID	2.66E+02	2.38E+02	2.03E+02	1.83E+02	2.03E+02	2.25E+02	1.20E+00	9.15E-01	1.91E-01	2.76E-01	4.35E-02	8.57E-01
244 GRID	2.36E+02	2.06E+02	1.82E+02	1.71E+02	1.88E+02	2.06E+02	1.09E+00	8.29E-01	1.73E-01	2.50E-01	3.97E-02	7.77E-01
245 GRID	2.11E+02	1.85E+02	1.65E+02	1.62E+02	1.75E+02	1.92E+02	9.96E-01	7.56E-01	1.56E-01	2.26E-01	3.63E-02	7.10E-01
246 GRID	1.90E+02	1.70E+02	1.55E+02	1.54E+02	1.66E+02	1.80E+02	9.27E-01	7.06E-01	1.47E-01	2.13E-01	3.38E-02	6.61E-01
247 GRID	1.73E+02	1.57E+02	1.44E+02	1.47E+02	1.58E+02	1.67E+02	8.64E-01	6.56E-01	1.37E-01	1.99E-01	3.15E-02	6.16E-01
248 GRID	1.60E+02	1.45E+02	1.37E+02	1.41E+02	1.50E+02	1.58E+02	8.15E-01	6.20E-01	1.29E-01	1.87E-01	2.97E-02	5.81E-01
249 GRID	1.49E+02	1.37E+02	1.32E+02	1.36E+02	1.43E+02	1.51E+02	7.74E-01	5.90E-01	1.23E-01	1.78E-01	2.82E-02	5.52E-01
250 GRID	1.39E+02	1.30E+02	1.27E+02	1.31E+02	1.37E+02	1.44E+02	7.35E-01	5.62E-01	1.17E-01	1.70E-01	2.69E-02	5.26E-01
251 GRID	1.44E+02	1.72E+02	1.76E+02	1.69E+02	1.57E+02	1.48E+02	8.81E-01	6.71E-01	1.40E-01	2.03E-01	3.21E-02	6.28E-01
252 GRID	1.60E+02	1.66E+02	1.91E+02	1.80E+02	1.65E+02	1.55E+02	9.45E-01	7.22E-01	1.51E-01	2.18E-01	3.46E-02	6.76E-01

Maximum One Hour Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	One Hour Maximum Concentration, ug/cu m Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
253 GRID	1.68E+02	1.96E+02	1.93E+02	1.91E+02	1.75E+02	1.84E+02	9.95E-01	7.60E-01	1.58E-01	2.29E-01	3.64E-02	7.11E-01
254 GRID	1.89E+02	2.06E+02	2.25E+02	2.08E+02	1.87E+02	1.76E+02	1.09E+00	8.26E-01	1.73E-01	2.50E-01	3.97E-02	7.76E-01
255 GRID	2.07E+02	2.41E+02	2.49E+02	2.28E+02	2.02E+02	1.97E+02	1.21E+00	9.20E-01	1.92E-01	2.78E-01	4.40E-02	8.62E-01
256 GRID	2.25E+02	2.68E+02	2.78E+02	2.53E+02	2.19E+02	2.24E+02	1.34E+00	1.02E+00	2.13E-01	3.08E-01	4.89E-02	9.56E-01
257 GRID	2.28E+02	2.65E+02	3.12E+02	2.87E+02	2.41E+02	2.65E+02	1.49E+00	1.13E+00	2.36E-01	3.42E-01	5.42E-02	1.06E+00
258 GRID	2.60E+02	3.02E+02	3.60E+02	3.40E+02	2.67E+02	3.35E+02	1.72E+00	1.31E+00	2.74E-01	3.96E-01	6.28E-02	1.23E+00
259 GRID	2.95E+02	3.83E+02	4.72E+02	4.26E+02	3.00E+02	4.62E+02	2.14E+00	1.63E+00	3.39E-01	4.91E-01	7.78E-02	1.52E+00
260 GRID	3.00E+02	4.21E+02	6.15E+02	5.90E+02	4.23E+02	7.55E+02	2.84E+00	2.16E+00	4.50E-01	6.52E-01	1.03E-01	2.02E+00
261 GRID	3.25E+02	5.33E+02	8.05E+02	1.10E+03	9.97E+02	1.37E+03	4.68E+00	3.56E+00	7.43E-01	1.08E+00	1.71E-01	3.34E+00
262 GRID	3.80E+02	5.74E+02	1.13E+03	2.15E+03	1.38E+03	1.15E+03	6.16E+00	4.71E+00	9.82E-01	1.42E+00	2.26E-01	4.41E+00
263 GRID	3.31E+02	5.81E+02	9.38E+02	8.24E+02	6.11E+02	7.13E+02	3.47E+00	2.64E+00	5.51E-01	7.98E-01	1.27E-01	2.47E+00
264 GRID	3.84E+02	5.60E+02	5.65E+02	3.71E+02	4.26E+02	5.07E+02	2.57E+00	1.96E+00	4.08E-01	5.91E-01	9.37E-02	1.83E+00
265 GRID	3.61E+02	4.76E+02	3.92E+02	2.75E+02	3.38E+02	3.95E+02	2.04E+00	1.56E+00	3.24E-01	4.70E-01	7.45E-02	1.46E+00
266 GRID	3.62E+02	3.72E+02	3.02E+02	2.32E+02	2.87E+02	3.28E+02	1.72E+00	1.31E+00	2.73E-01	3.96E-01	6.27E-02	1.23E+00
267 GRID	3.02E+02	2.97E+02	2.48E+02	2.15E+02	2.50E+02	2.61E+02	1.45E+00	1.11E+00	2.31E-01	3.35E-01	5.30E-02	1.04E+00
268 GRID	2.65E+02	2.53E+02	2.12E+02	1.99E+02	2.24E+02	2.50E+02	1.30E+00	9.91E-01	2.07E-01	2.99E-01	4.74E-02	9.28E-01
269 GRID	2.50E+02	2.19E+02	1.88E+02	1.65E+02	2.06E+02	2.23E+02	1.16E+00	8.85E-01	1.84E-01	2.67E-01	4.23E-02	8.28E-01
270 GRID	2.22E+02	1.93E+02	1.71E+02	1.74E+02	1.91E+02	2.08E+02	1.06E+00	8.06E-01	1.68E-01	2.44E-01	3.86E-02	7.55E-01
271 GRID	1.98E+02	1.75E+02	1.59E+02	1.84E+02	1.78E+02	1.93E+02	9.75E-01	7.42E-01	1.55E-01	2.24E-01	3.55E-02	6.95E-01
272 GRID	1.78E+02	1.61E+02	1.49E+02	1.55E+02	1.66E+02	1.79E+02	9.05E-01	6.89E-01	1.44E-01	2.08E-01	3.30E-02	6.45E-01
273 GRID	1.64E+02	1.49E+02	1.42E+02	1.45E+02	1.59E+02	1.69E+02	8.51E-01	6.48E-01	1.35E-01	1.96E-01	3.10E-02	6.07E-01
274 GRID	1.52E+02	1.40E+02	1.36E+02	1.42E+02	1.52E+02	1.58E+02	8.05E-01	6.12E-01	1.28E-01	1.85E-01	2.93E-02	5.74E-01
275 GRID	1.42E+02	1.33E+02	1.31E+02	1.37E+02	1.45E+02	1.51E+02	7.66E-01	5.83E-01	1.22E-01	1.76E-01	2.79E-02	5.46E-01
276 GRID	1.50E+02	1.66E+02	1.67E+02	1.59E+02	1.46E+02	1.42E+02	8.51E-01	6.48E-01	1.35E-01	1.96E-01	3.10E-02	6.07E-01
277 GRID	1.66E+02	1.75E+02	1.79E+02	1.67E+02	1.55E+02	1.49E+02	9.06E-01	6.90E-01	1.44E-01	2.08E-01	3.30E-02	6.46E-01
278 GRID	1.52E+02	1.93E+02	1.92E+02	1.76E+02	1.63E+02	1.56E+02	9.48E-01	7.21E-01	1.50E-01	2.18E-01	3.45E-02	6.76E-01
279 GRID	1.90E+02	2.10E+02	2.06E+02	1.90E+02	1.73E+02	1.72E+02	1.04E+00	7.93E-01	1.65E-01	2.40E-01	3.80E-02	7.43E-01
280 GRID	2.03E+02	2.28E+02	2.24E+02	2.04E+02	1.84E+02	1.85E+02	1.12E+00	8.56E-01	1.79E-01	2.59E-01	4.10E-02	8.02E-01
281 GRID	2.18E+02	2.30E+02	2.49E+02	2.23E+02	1.96E+02	2.14E+02	1.22E+00	9.27E-01	1.93E-01	2.80E-01	4.44E-02	8.68E-01
282 GRID	2.39E+02	2.75E+02	2.60E+02	2.49E+02	2.13E+02	2.49E+02	1.38E+00	1.05E+00	2.18E-01	3.16E-01	5.02E-02	9.81E-01
283 GRID	2.30E+02	3.21E+02	3.25E+02	2.83E+02	2.32E+02	3.05E+02	1.55E+00	1.18E+00	2.46E-01	3.56E-01	5.65E-02	1.10E+00
284 GRID	2.81E+02	3.73E+02	3.91E+02	3.34E+02	2.79E+02	3.94E+02	1.88E+00	1.43E+00	2.98E-01	4.31E-01	6.84E-02	1.34E+00
285 GRID	3.34E+02	4.18E+02	5.04E+02	4.17E+02	3.76E+02	5.66E+02	2.39E+00	1.82E+00	3.80E-01	5.50E-01	8.72E-02	1.70E+00
286 GRID	3.25E+02	5.02E+02	7.21E+02	5.69E+02	6.28E+02	9.18E+02	3.37E+00	2.56E+00	5.34E-01	7.74E-01	1.23E-01	2.40E+00
287 GRID	3.95E+02	6.11E+02	1.13E+03	1.32E+03	2.07E+03	1.09E+03	6.06E+00	4.61E+00	9.62E-01	1.39E+00	2.21E-01	4.32E+00
288 GRID	4.10E+02	7.29E+02	1.42E+03	9.72E+02	1.13E+03	7.37E+02	4.93E+00	3.76E+00	7.83E-01	1.13E+00	1.80E-01	3.52E+00
289 GRID	4.56E+02	7.06E+02	7.54E+02	4.11E+02	6.05E+02	6.29E+02	3.26E+00	2.48E+00	5.17E-01	7.49E-01	1.19E-01	2.32E+00
290 GRID	4.23E+02	5.75E+02	4.67E+02	3.09E+02	4.30E+02	4.79E+02	2.44E+00	1.86E+00	3.88E-01	5.61E-01	8.90E-02	1.74E+00
291 GRID	4.06E+02	4.28E+02	3.33E+02	2.72E+02	3.44E+02	3.85E+02	1.95E+00	1.51E+00	3.14E-01	4.55E-01	7.22E-02	1.41E+00
292 GRID	3.72E+02	3.32E+02	2.84E+02	2.44E+02	2.87E+02	3.13E+02	1.66E+00	1.26E+00	2.63E-01	3.81E-01	6.04E-02	1.18E+00
293 GRID	3.16E+02	2.72E+02	2.22E+02	2.22E+02	2.54E+02	2.77E+02	1.43E+00	1.09E+00	2.27E-01	3.28E-01	5.20E-02	1.02E+00
294 GRID	2.65E+02	2.31E+02	1.94E+02	2.03E+02	2.29E+02	2.45E+02	1.25E+00	9.53E-01	1.99E-01	2.88E-01	4.56E-02	8.92E-01
295 GRID	2.34E+02	2.02E+02	1.77E+02	1.88E+02	2.09E+02	2.24E+02	1.13E+00	8.59E-01	1.79E-01	2.59E-01	4.11E-02	8.04E-01
296 GRID	2.08E+02	1.81E+02	1.64E+02	1.76E+02	1.91E+02	2.04E+02	1.03E+00	7.81E-01	1.63E-01	2.36E-01	3.74E-02	7.31E-01
297 GRID	1.85E+02	1.84E+02	1.56E+02	1.66E+02	1.81E+02	1.91E+02	9.53E-01	7.25E-01	1.51E-01	2.19E-01	3.47E-02	6.78E-01
298 GRID	1.69E+02	1.53E+02	1.48E+02	1.58E+02	1.70E+02	1.76E+02	8.89E-01	6.77E-01	1.41E-01	2.04E-01	3.24E-02	6.34E-01
299 GRID	1.56E+02	1.44E+02	1.42E+02	1.50E+02	1.61E+02	1.68E+02	8.41E-01	6.40E-01	1.34E-01	1.93E-01	3.07E-02	6.00E-01
300 GRID	1.45E+02	1.35E+02	1.36E+02	1.44E+02	1.53E+02	1.53E+02	7.92E-01	6.03E-01	1.26E-01	1.82E-01	2.89E-02	5.65E-01
301 GRID	1.53E+02	1.60E+02	1.55E+02	1.49E+02	1.41E+02	1.38E+02	8.21E-01	6.25E-01	1.30E-01	1.89E-01	2.99E-02	5.85E-01
302 GRID	1.59E+02	1.70E+02	1.65E+02	1.57E+02	1.46E+02	1.45E+02	8.61E-01	6.55E-01	1.37E-01	1.98E-01	3.14E-02	6.14E-01
303 GRID	1.67E+02	1.77E+02	1.79E+02	1.65E+02	1.53E+02	1.55E+02	9.10E-01	6.93E-01	1.45E-01	2.09E-01	3.32E-02	6.49E-01
304 GRID	1.87E+02	1.99E+02	1.90E+02	1.75E+02	1.62E+02	1.66E+02	9.85E-01	7.50E-01	1.56E-01	2.26E-01	3.59E-02	7.02E-01
305 GRID	1.82E+02	2.17E+02	2.05E+02	1.66E+02	1.71E+02	1.83E+02	1.04E+00	7.95E-01	1.66E-01	2.40E-01	3.81E-02	7.45E-01
306 GRID	2.15E+02	2.38E+02	2.24E+02	2.02E+02	1.82E+02	2.04E+02	1.16E+00	8.50E-01	1.84E-01	2.66E-01	4.21E-02	8.24E-01
307 GRID	2.36E+02	2.65E+02	2.47E+02	2.19E+02	1.98E+02	2.35E+02	1.28E+00	9.74E-01	2.03E-01	2.94E-01	4.66E-02	9.12E-01
308 GRID	2.56E+02	2.96E+02	2.81E+02	2.43E+02	2.22E+02	2.78E+02	1.44E+00	1.10E+00	2.29E-01	3.31E-01	5.25E-02	1.03E+00
309 GRID	2.64E+02	3.47E+02	3.24E+02	2.75E+02	2.66E+02	3.48E+02	1.67E+00	1.27E+00	2.65E-01	3.83E-01	6.08E-02	1.19E+00
310 GRID	3.11E+02	4.12E+02	3.92E+02	3.20E+02	3.43E+02	4.60E+02	2.04E+00	1.56E+00	3.25E-01	4.70E-01	7.45E-02	1.46E+00
311 GRID	3.82E+02	5.07E+02	5.17E+02	3.90E+02	4.96E+02	6.66E+02	2.70E+00	2.06E+00	4.29E-01	6.22E-01	9.86E-02	1.93E+00
312 GRID	3.44E+02	6.27E+02	8.05E+02	5.50E+02	9.35E+02	8.56E+02	3.76E+00	2.86E+00	5.97E-01	8.65E-01	1.37E-01	2.68E+00
313 GRID	4.60E+02	8.27E+02	1.61E+03	1.38E+03	1.76E+03	8.36E+02	6.30E+00	4.80E+00	1.00E+00	1.45E+00	2.30E-01	4.49E+00
314 GRID	5.02E+02	8.86E+02	1.23E+03	8.73E+02	9.70E+02	6.43E+02	4.49E+00	3.42E+00	7.12E-01	1.03E+00	1.64E-01	3.20E+00
315 GRID	5.24E+02	6.75E+02	5.66E+02	4.32E+02	5.76E+02	5.45E+02	3.04E+00	2.31E+00	4.82E-01	6.98E-01	1.11E-01	2.16E+00
316 GRID	4.31E+02	5.08E+02	3.69E+02	3.41E+02	4.26E+02	4.20E+02	2.26E+00	1.74E+00	3.62E-01	5.25E-01	8.32E-02	1.63E+00
317 GRID	4.26E+02	3.70E+02	2.76E+02	2.67E+02	3.43E+02	3.56E+02	1.89E+00	1.44E+00	2.99E-01	4.34E-01	6.87E-02	1.34E+00
318 GRID	3.47E+02	2.93E+02	2.32E+02	2.53E+02	2.93E+02	3.09E+02	1.55E+00	1.20E+00	2.51E-01	3.63E-01	5.75E-02	1.13E+00
319 GRID	2.89E+02	2.44E+02	2.03E+02	2.27E+02	2.54E+02	2.66E+02	1.36E+00	1.03E+00	2.15E-01	3.12E-01	4.94E-02	9.66E-01
320 GRID	2.47E+02	2.10E+02	1.86E+02	2.06E+02	2.31E+02	2.41E+02	1.21E+00	9.16E-01	1.92E-01	2.78E-01	4.40E-02	8.61E-01
321 GRID	2.16E+02	1.87E+02	1.75E+02	1.92E+02	2.11E+02	2.18E+02	1.10E+00	8.34E-01	1.74E-01	2.52E-01	3.99E-02	7.81E-01
322 GRID	1.82E+02	1.70E+02	1.65E+02	1.78E+02	1.96E+02	1.99E+02	1.00E+00	7.65E-01	1.60E-01	2.31E-01	3.66E-02	7.16E-01
323 GRID	1.74E+02	1.58E+02	1.56E+02	1.68E+02	1.82E+02	1.88E+02	9.38E-01	7.14E-01	1.49E-01	2.15E-01	3.42E-02	6.68E-01
324 GRID	1.59E+02	1.48E+02	1.49E+02	1.60E+02	1.71E+02	1.65E+02	8.69E-01	6.61E-01	1.38E-01	2.00E-01	3.17E-02	6.19E-01
325 GRID	1.48E+02	1.39E+02	1.43E+02	1.52E+02	1.59E+02	1.65E+02	8.27E-01	6.30E-01	1.31E-01	1.90E-01	3.01E-02	5.90E-01
326 GRID	1.49E+02	1.54E+02	1.49E+02	1.41E+02	1.34E+02	1.34E+02	7.59E-01	6.01E-01	1.25E-01	1.81E-01	2.88E-02	5.62E-01
327 GRID	1.53E+02	1.63E+02	1.58E+02	1.48E+02	1.40E+02	1.40E+02	8.25E-01	6.28E-01	1.31E-01	1.90E-01	3.01E-02	5.88E-01
328 GRID	1.70E+02	1.74E+02	1.67E+02	1.55E+02	1.46E+02	1.51E+02	8.75E-01	6.69E-01	1.40E-01	2.02E-01	3.21E-02	6.27E-01
329 GRID	1.78E+02	1.85E+02	1.77E+02	1.63E+02	1.53E+02	1.62E+02	9.33E-01	7.10E-01	1.48E-01	2.14E-01	3.40E-02	6.65E-01
330 GRID	1.88E+02	1.97E+02	1.88E+02	1.73E+02	1.61E+02	1.76E+02	9.90E-01	7.54E-01	1.57E-01	2.28E-01	3.61E-02	7.06E-01
331 GRID	2.10E+02	2.20E+02	2.03E+02	1.84E+02	1.73E+02	1.96E+02	1.08E+00	8.25E-01	1.72E-01	2.49E-01	3.95E-02	7.73E-01
332 GRID	2.30E+02	2.42E+02	2.21E+02	1.97E+02	1.91E+02	2.22E+02	1.19E+00	9.07E-01	1.89E-01	2.74E-01	4.34E-02	8.50E-01
333 GRID	2.55E+02	2.71E+02	2.45E+02	2.14E+02	2.15E+02	2.59E+02	1.34E+00	1.02E+00	2.12E-01	3.07E-01	4.87E-02	9.52E-01
334 GRID	2.91E+02	3.07E+02	2.76E+02	2.35E+02	2.52E+02	3.10E+02	1.53E+00	1.16E+00	2.43E-01	3.51E-01	5.57E-02	1.09E+00
335 GRID	3.24E+02	3.60E+02	3.23E+02	2.60E+02	3.12E+02	3.65E+02	1.60E+00	1.37E+00	2.86E-01	4.15E-01	6.58E-02	1.29E+00
336 GRID	3.71E+02	4.45E+02	3.66E+02	2.91E+02	4.18E+02	5.24E+02	2.23E+00	1.70E+00	3.55E-01	5.14E-01	8.15E-02	1.59E+00
337 GRID	4.41E+02	5.83E+02	5.31E+02	3.69E+02	5.45E+02	8.53E+02	2.94E+00	2.24E+00	4.68E-01	6.77E-01	1.07E-01	2.10E+00
338 GRID	4.45E+02	7.89E+02	8.62E+02	7.27E+02	1.21E+03	8.44E+02	4.30E+00	3.27E+00	6.83E-01	9.89E-01	1.57E-01	3.06E+00
339 GRID	5.52E+02	1.07E+03	2.27E+03	2.20E+03	1.30E+03	8.57E+02	7.38E+00	5.60E+00	1.17E+00	1.69E+00	2.68E-01	5.24E+00
340 GRID	5.96E+02	1.01E+03	7.79E+02	7.01E+02	8.08E+02	5.52E+02	4.06E+00	3.09E+00	6.44E-01	9.33E-01	1.48E-01	2.89E+00
341 GRID	5.52E+02	6.40E+02	4.17E+02	4.55E+02	5.55E+02	4.66E+02	2.82E+00	2.15E+00	4.48E-01	6.49E-01	1.03E-01	2.01E+00
342 GRID	5.04E+02	4.27E+02	2.94E+02	3.57E+02	4.16E+02	3.50E+02	2.15E+00	1.63E+00	3.41E-01	4.94E-01	7.83E-02	1.53E+00
343 GRID	3.87E+02	3.22E+02	2.39E+02	2.99E+02	3.41E+02	3.31E+02	1.78E+00	1.34E+00	2.60E-01	4.05E-01	6.43E-02	1.26E+00
344 GRID	3.18E+02	2.60E+02	2.20E+02	2.55E+02	2.94E+02	2.95E+02	1.56E+00	1.14E+00	2.39E-01	3.46E-01	5.48E-02	1.07E+00
345 GRID	2.63E+02	2.21E+02	2.03E+02	2.30E+02	2.57E+02	2.59E+02	1.31E+00	9.96E-01	2.05E-01	3.01E-01	4.77E-02	9.33E-01
346 GRID	2.27E+02	1.94E+02	1.85E+02	2.11E+02	2.30E+02	2.34E+02	1.18E+00	8.95E-01	1.87E-01	2.70E-01	4.28E-02	8.38E-01
347 GRID	2.00E+02	1.75E+02	1.76E+02	1.95E+02	2.13E+02	2.12E+02	1.07E+00	8.15E-01	1.70E-01	2.46E-01	3.90E-02	7.63E-01
348 GRID	1.80E+02	1.62E+02	1.66E+02	1.81E+02	1.96E+02	1.80E+02	9.83E-01	7.48E-01	1.56E-01	2.26E-01	3.58E-02	7.00E-01
349 GRID	1.84E+02	1.51E+02	1.55E+02	1.71E+02	1.81E+02	1.81E+02	9.19E-01	7.00E-01	1.46E-01	2.11E-01	3.35E-02	6.55E-01
350 GRID	1.52E+02	1.44E+02	1.50E+02	1.61E+02	1.72E+02	1.71E+02	8.68E-01	6.61E-01	1.38E-01	2.00E-01	3.16E-02	6.19E-01
351 GRID	1.46E+02	1.48E+02	1.42E+02	1.35E+02	1.30E+02	1.31E+02	7.58E-01	5.77E-01	1.20E-01	1.74E-01	2.76E-02	5.40E-01
352 GRID	1.45E+02	1.57E+02	1.48E+02	1.40E+02	1.34E+02	1.39E+02	7.90E-01	6.02E-01	1.25E-01	1.82E-01	2.88E-02	5.63E-01
353 GRID	1.60E+02	1.63E+02	1.56E+02	1.46E+02	1.40E+02	1.47E+02	8.34E-01	6.35E-01	1.32E-01	1.92E-01	3.04E-02	5.94E-01
354 GRID	1.75E+02	1.77E+02	1.64E+02	1.53E+02	1.47E+02	1.58E+02	8.90E-01	6.77E-01	1.41E-01	2.05E-01	3.24E-02	6.34E-01
355 GRID	1.90E+02	1.88E+02	1.75E+02	1.61E+02	1.56E+02	1.71E+02	9.51E-01	7.24E-01	1.51E-01	2.19E-01	3.47E-02	6.78E-01
356 GRID	2.02E+02	2.02E+02	1.86E+02	1.70E+02	1.68E+02	1.89E+02	1.02E+00	7.76E-01	1.62E-01	2.35E-01	3.72E-02	7.27E-01
357 GRID	2.18E+02	2.20E+02	2.01E+02	1.80E+02	1.84E+02	2.11E+02	1.11E+00	8.43E-01	1.76E-01	2.55E-01	4.04E-02	7.90E-01
358 GRID	2.36E+02	2.42E+02	2.19E+02	1.94E+02	2.09E+02	2.44E+02	1.23E+00	9.33E-01	1.95E-01	2.82E-01	4.47E-02	8.74E-01
359 GRID	2.76E+02	2.72E+02	2.40E+02	2.09E+02	2.38E+02	2.87E+02	1.39E+00	1.06E+00	2.21E-01	3.20E-01	5.07E-02	9.91E-01
360 GRID	3.04E+02	3.11E+02	2.73E+02	2.25E+02	2.85E+02	3.50E+02	1.60E+00	1.22E+00	2.54E-01	3.68E-01	5.83E-02	1.14E+00
361 GRID	3.61E+02	3.66E+02	3.18E+02	2.62E+02	3.62E+02	4.41E+02	1.93E+00	1.47E+00	3.06E-01	4.43E-01	7.02E-02	1.37E+00
362 GRID	4.29E+02	4.62E+02	3.88E+02	3.42E+02	5.00E+02	5.24E+02	2.42E+00	1.84E+00	3.84E-01	5.56E-01	8.81E-02	1.72E+00
363 GRID	5.17E+02	6.33E+02	5.19E+02	5.34E+02	8.00E+02	6.00E+02	3.29E+00	2.51E+00	5.23E-01	7.57E-01	1.20E-01	2.35E+00
364 GRID	6.05E+02	1.04E+03	9.52E+02	1.30E+03	1.03E+03	5.95E+02	5.05E+00	3.85E+00	8.02E-01	1.16E+00	1.84E-01	3.60E+00
365 GRID	6.77E+02	1.45E+03	1.65E+03	1.56E+03	9.45E+02	5.14E+02	6.21E+00	4.74E+00	9.88E-01	1.43E+00	2.27E-01	4.44E+00
366 GRID	7.31E+02	9.01E+02	4.85E+02	6.85E+02	6.55E+02	4.71E+02	3.59E+00	2.73E+00	5.70E-01	8.25E-01	1.31E-01	2.56E+00
367 GRID	8.18E+02	5.15E+02	3.21E+02	4.63E+02	4.96E+02	3.97E+02	2.57E+00	1.95E+00	4.07E-01	5.90E-01	9.35E-02	1.83E+00
368 GRID	4.59E+02	3.59E+02	2.79E+02	3.62E+02	3.97E+02	3.40E+02	2.01E+00	1.53E+00	3.19E-01	4.62E-01	7.32E-02	1.43E+00
369 GRID	3.53E+02	2.78E+02	2.51E+02	3.02E+02	3.36E+02	3.04E+02	1.67E+00	1.27E+00	2.65E-01	3.84E-01	6.08E-02	1.19E+00
370 GRID	2.85E+02	2.31E+02	2.27E+02	2.63E+02	2.91E+02	2.67E+02	1.42E+00	1.08E+00	2.26E-01	3.27E-01	5.18E-02	1.01E+00
371 GRID	2.40E+02	2.02E+02	2.08E+02	2.34E+02	2.56E+02	2.37E+02	1.26E+00	9.58E-01	2.00E-01	2.89E-01	4.59E-02	8.97E-01
372 GRID	2.06E+02	1.82E+02	1.91E+02	2.13E+02	2.30E+02	2.05E+02	1.12E+00	8.55E-01	1.78E-01	2.58E-01	4.09E-02	8.00E-01
373 GRID	1.86E+02	1.67E+02	1.79E+02	1.96E+02	2.11E+02	2.06E+02	1.05E+00	7.97E-01	1.66E-01	2.41E-01	3.81E-02	7.46E-01
374 GRID	1.69E+02	1.58E+02	1.65E+02	1.84E+02	1.93E+02	1.88E+02	9.69E-01	7.38E-01	1.54E-01	2.23E-01	3.53E-02	6.91E-01
375 GRID	1.55E+02	1.50E+02	1.60E+02	1.73E+02	1.81E+02	1.66E+02	8.95E-01	6.85E-01	1.43E-01	2.07E-01	3.28E-02	6.41E-01
376 GRID	1.39E+02	1.40E+02	1.36E+02	1.29E+02	1.26E+02	1.29E+02	7.30E-01	5.55E-01	1.16E-01	1.68E-01	2.66E-02	5.20E-01
377 GRID	1.50E+02	1.49E+02	1.41E+02	1.34E+02	1.30E+02	1.36E+02	7.67E-01	5.84E-01	1.22E-01	1.76E-01	2.80E-02	5.47E-01
378 GRID	1.55E+02	1.57E+02	1.47E+02	1.39E+02	1.36E+02	1.44E+02	8.02E-01	6.11E-01	1.27E-01	1.85E-01	2.93E-02	5.72E-01

Maximum One Hour Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	One Hour Maximum Concentration, ug/cu m Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
349 GRID	1.69E+02	1.63E+02	1.85E+02	1.44E+02	1.43E+02	1.54E+02	8.48E-01	8.45E-01	1.35E-01	1.85E-01	3.09E-02	6.04E-01
350 GRID	1.68E+02	1.75E+02	1.63E+02	1.51E+02	1.51E+02	1.66E+02	8.90E-01	6.78E-01	1.41E-01	2.05E-01	3.24E-02	6.34E-01
351 GRID	1.95E+02	1.87E+02	1.72E+02	1.59E+02	1.63E+02	1.82E+02	9.67E-01	7.37E-01	1.54E-01	2.22E-01	3.53E-02	6.90E-01
352 GRID	2.11E+02	2.02E+02	1.82E+02	1.68E+02	1.78E+02	2.02E+02	1.04E+00	7.95E-01	1.66E-01	2.40E-01	3.81E-02	7.45E-01
353 GRID	2.29E+02	2.19E+02	1.97E+02	1.79E+02	1.93E+02	2.30E+02	1.14E+00	8.71E-01	1.82E-01	2.63E-01	4.17E-02	8.16E-01
354 GRID	2.54E+02	2.41E+02	2.13E+02	1.92E+02	2.26E+02	2.66E+02	1.27E+00	9.69E-01	2.02E-01	2.93E-01	4.64E-02	9.07E-01
355 GRID	2.74E+02	2.70E+02	2.36E+02	2.16E+02	2.63E+02	3.16E+02	1.44E+00	1.10E+00	2.29E-01	3.31E-01	5.25E-02	1.03E+00
356 GRID	3.30E+02	3.11E+02	2.65E+02	2.53E+02	3.26E+02	3.66E+02	1.69E+00	1.29E+00	2.69E-01	3.89E-01	6.16E-02	1.21E+00
357 GRID	3.88E+02	3.74E+02	3.03E+02	3.17E+02	4.23E+02	4.51E+02	2.06E+00	1.57E+00	3.27E-01	4.74E-01	7.51E-02	1.47E+00
358 GRID	4.74E+02	4.79E+02	3.67E+02	4.44E+02	6.01E+02	4.72E+02	2.56E+00	1.97E+00	4.12E-01	5.96E-01	9.45E-02	1.85E+00
359 GRID	6.14E+02	6.84E+02	4.88E+02	7.48E+02	8.26E+02	5.22E+02	3.55E+00	2.70E+00	5.63E-01	8.16E-01	1.29E-01	2.53E+00
360 GRID	7.76E+02	1.36E+03	9.69E+02	1.73E+03	8.48E+02	4.76E+02	5.65E+00	4.30E+00	8.97E-01	1.30E+00	2.06E-01	4.03E+00
361 GRID	8.57E+02	1.66E+03	8.46E+02	1.16E+03	7.09E+02	4.37E+02	5.19E+00	3.95E+00	8.24E-01	1.19E+00	1.89E-01	3.70E+00
362 GRID	7.65E+02	8.61E+02	4.73E+02	6.49E+02	5.55E+02	4.03E+02	3.22E+00	2.45E+00	5.12E-01	7.41E-01	1.17E-01	2.30E+00
363 GRID	5.63E+02	4.06E+02	3.51E+02	4.55E+02	4.32E+02	3.39E+02	2.34E+00	1.76E+00	3.71E-01	5.37E-01	8.52E-02	1.67E+00
364 GRID	3.89E+02	2.99E+02	3.01E+02	3.62E+02	3.60E+02	3.15E+02	1.88E+00	1.43E+00	2.98E-01	4.32E-01	6.85E-02	1.34E+00
365 GRID	3.10E+02	2.41E+02	2.62E+02	3.05E+02	3.16E+02	2.81E+02	1.57E+00	1.19E+00	2.49E-01	3.60E-01	5.71E-02	1.12E+00
366 GRID	2.56E+02	2.10E+02	2.33E+02	2.55E+02	2.82E+02	2.54E+02	1.35E+00	1.03E+00	2.15E-01	3.11E-01	4.93E-02	9.64E-01
367 GRID	2.18E+02	1.90E+02	2.12E+02	2.35E+02	2.45E+02	2.30E+02	1.22E+00	9.29E-01	1.94E-01	2.81E-01	4.45E-02	8.70E-01
368 GRID	1.93E+02	1.78E+02	1.86E+02	2.17E+02	2.24E+02	2.11E+02	1.11E+00	8.48E-01	1.77E-01	2.56E-01	4.06E-02	7.94E-01
369 GRID	1.74E+02	1.67E+02	1.82E+02	2.00E+02	2.07E+02	1.72E+02	1.01E+00	7.66E-01	1.60E-01	2.31E-01	3.67E-02	7.17E-01
370 GRID	1.61E+02	1.53E+02	1.70E+02	1.85E+02	1.93E+02	1.60E+02	9.56E-01	7.28E-01	1.52E-01	2.20E-01	3.49E-02	6.82E-01
371 GRID	1.36E+02	1.36E+02	1.30E+02	1.24E+02	1.22E+02	1.26E+02	7.07E-01	5.38E-01	1.12E-01	1.63E-01	2.58E-02	5.04E-01
372 GRID	1.42E+02	1.42E+02	1.35E+02	1.29E+02	1.27E+02	1.33E+02	7.38E-01	5.62E-01	1.17E-01	1.70E-01	2.69E-02	5.26E-01
373 GRID	1.53E+02	1.43E+02	1.40E+02	1.33E+02	1.33E+02	1.39E+02	7.73E-01	5.88E-01	1.23E-01	1.78E-01	2.82E-02	5.51E-01
374 GRID	1.59E+02	1.56E+02	1.46E+02	1.35E+02	1.39E+02	1.50E+02	8.11E-01	6.17E-01	1.29E-01	1.86E-01	2.96E-02	5.78E-01
375 GRID	1.72E+02	1.55E+02	1.53E+02	1.44E+02	1.48E+02	1.62E+02	8.62E-01	6.56E-01	1.37E-01	1.98E-01	3.14E-02	6.14E-01
376 GRID	1.83E+02	1.74E+02	1.60E+02	1.51E+02	1.59E+02	1.75E+02	9.15E-01	6.97E-01	1.45E-01	2.10E-01	3.34E-02	6.52E-01
377 GRID	1.96E+02	1.65E+02	1.70E+02	1.59E+02	1.73E+02	1.94E+02	9.84E-01	7.49E-01	1.56E-01	2.26E-01	3.59E-02	7.01E-01
378 GRID	2.14E+02	1.86E+02	1.81E+02	1.70E+02	1.90E+02	2.18E+02	1.07E+00	8.14E-01	1.70E-01	2.46E-01	3.90E-02	7.63E-01
379 GRID	2.34E+02	2.16E+02	1.93E+02	1.86E+02	2.14E+02	2.47E+02	1.18E+00	8.93E-01	1.87E-01	2.71E-01	4.30E-02	8.41E-01
380 GRID	2.61E+02	2.38E+02	2.10E+02	2.03E+02	2.45E+02	2.86E+02	1.32E+00	1.01E+00	2.10E-01	3.04E-01	4.82E-02	9.43E-01
381 GRID	2.95E+02	2.67E+02	2.29E+02	2.41E+02	2.97E+02	3.39E+02	1.53E+00	1.16E+00	2.42E-01	3.51E-01	5.56E-02	1.09E+00
382 GRID	3.47E+02	3.09E+02	2.53E+02	2.93E+02	3.66E+02	3.66E+02	1.79E+00	1.36E+00	2.84E-01	4.11E-01	6.52E-02	1.27E+00
383 GRID	4.15E+02	3.74E+02	2.82E+02	3.81E+02	4.65E+02	3.68E+02	2.11E+00	1.60E+00	3.34E-01	4.84E-01	7.65E-02	1.50E+00
384 GRID	4.98E+02	4.87E+02	3.28E+02	5.56E+02	5.91E+02	4.30E+02	2.64E+00	2.01E+00	4.19E-01	6.07E-01	9.63E-02	1.88E+00
385 GRID	7.41E+02	7.37E+02	5.68E+02	1.04E+03	7.02E+02	3.48E+02	3.78E+00	2.88E+00	6.01E-01	8.70E-01	1.38E-01	2.70E+00
386 GRID	1.01E+03	2.07E+03	2.09E+03	1.37E+03	6.85E+02	4.09E+02	6.98E+00	5.31E+00	1.11E+00	1.60E+00	2.54E-01	4.97E+00
387 GRID	1.06E+03	1.01E+03	8.26E+02	9.19E+02	4.99E+02	3.87E+02	4.30E+00	3.27E+00	6.83E-01	9.89E-01	1.57E-01	3.07E+00
388 GRID	7.26E+02	4.75E+02	4.99E+02	5.91E+02	4.76E+02	3.47E+02	2.65E+00	2.17E+00	4.52E-01	6.55E-01	1.04E-01	2.03E+00
389 GRID	4.70E+02	3.17E+02	3.78E+02	4.47E+02	4.08E+02	2.91E+02	2.11E+00	1.61E+00	3.35E-01	4.86E-01	7.70E-02	1.51E+00
390 GRID	3.46E+02	2.50E+02	3.12E+02	3.52E+02	3.43E+02	2.82E+02	1.72E+00	1.31E+00	2.73E-01	3.96E-01	6.28E-02	1.23E+00
391 GRID	2.75E+02	2.24E+02	2.69E+02	3.05E+02	3.01E+02	2.39E+02	1.47E+00	1.12E+00	2.34E-01	3.39E-01	5.37E-02	1.05E+00
392 GRID	2.30E+02	2.07E+02	2.38E+02	2.87E+02	2.70E+02	2.23E+02	1.31E+00	9.99E-01	2.08E-01	3.02E-01	4.78E-02	9.36E-01
393 GRID	2.01E+02	1.92E+02	2.16E+02	2.39E+02	2.33E+02	2.04E+02	1.17E+00	8.94E-01	1.86E-01	2.70E-01	4.28E-02	8.37E-01
394 GRID	1.78E+02	1.79E+02	1.98E+02	2.17E+02	2.10E+02	1.82E+02	1.06E+00	8.10E-01	1.69E-01	2.45E-01	3.88E-02	7.59E-01
395 GRID	1.65E+02	1.69E+02	1.85E+02	1.99E+02	1.98E+02	1.77E+02	9.99E-01	7.60E-01	1.59E-01	2.30E-01	3.64E-02	7.12E-01
396 GRID	1.31E+02	1.28E+02	1.24E+02	1.20E+02	1.19E+02	1.24E+02	6.82E-01	5.19E-01	1.08E-01	1.57E-01	2.49E-02	4.86E-01
397 GRID	1.33E+02	1.33E+02	1.29E+02	1.24E+02	1.24E+02	1.30E+02	7.06E-01	5.35E-01	1.12E-01	1.62E-01	2.57E-02	5.04E-01
398 GRID	1.43E+02	1.40E+02	1.33E+02	1.28E+02	1.29E+02	1.38E+02	7.42E-01	5.65E-01	1.18E-01	1.71E-01	2.70E-02	5.29E-01
399 GRID	1.54E+02	1.47E+02	1.39E+02	1.33E+02	1.35E+02	1.46E+02	7.82E-01	5.96E-01	1.24E-01	1.80E-01	2.85E-02	5.58E-01
400 GRID	1.62E+02	1.54E+02	1.44E+02	1.39E+02	1.45E+02	1.57E+02	8.24E-01	6.27E-01	1.31E-01	1.89E-01	3.00E-02	5.87E-01
401 GRID	1.73E+02	1.62E+02	1.51E+02	1.45E+02	1.54E+02	1.70E+02	8.73E-01	6.65E-01	1.39E-01	2.01E-01	3.18E-02	6.23E-01
402 GRID	1.83E+02	1.72E+02	1.59E+02	1.54E+02	1.67E+02	1.88E+02	9.33E-01	7.11E-01	1.48E-01	2.15E-01	3.40E-02	6.65E-01
403 GRID	1.98E+02	1.83E+02	1.68E+02	1.64E+02	1.84E+02	2.08E+02	1.01E+00	7.69E-01	1.60E-01	2.32E-01	3.68E-02	7.20E-01
404 GRID	2.16E+02	1.97E+02	1.77E+02	1.79E+02	2.05E+02	2.35E+02	1.10E+00	8.40E-01	1.75E-01	2.54E-01	4.02E-02	7.87E-01
405 GRID	2.33E+02	2.13E+02	1.90E+02	1.99E+02	2.32E+02	2.67E+02	1.22E+00	9.29E-01	1.94E-01	2.81E-01	4.45E-02	8.70E-01
406 GRID	2.62E+02	2.32E+02	2.05E+02	2.28E+02	2.73E+02	3.00E+02	1.37E+00	1.04E+00	2.16E-01	3.15E-01	5.00E-02	9.77E-01
407 GRID	3.00E+02	2.62E+02	2.21E+02	2.72E+02	3.32E+02	3.29E+02	1.57E+00	1.19E+00	2.49E-01	3.60E-01	5.71E-02	1.12E+00
408 GRID	3.49E+02	3.05E+02	2.49E+02	3.40E+02	4.03E+02	3.78E+02	1.85E+00	1.41E+00	2.94E-01	4.25E-01	6.74E-02	1.32E+00
409 GRID	4.36E+02	3.68E+02	3.14E+02	4.56E+02	5.00E+02	3.63E+02	2.23E+00	1.70E+00	3.54E-01	5.12E-01	8.12E-02	1.59E+00
410 GRID	5.84E+02	4.81E+02	4.58E+02	7.06E+02	5.86E+02	3.66E+02	2.92E+00	2.22E+00	4.60E-01	6.71E-01	1.06E-01	2.08E+00
411 GRID	9.07E+02	7.72E+02	9.29E+02	1.04E+03	4.88E+02	3.66E+02	4.14E+00	3.15E+00	6.57E-01	9.51E-01	1.51E-01	2.95E+00
412 GRID	1.38E+03	2.07E+03	2.17E+03	1.02E+03	5.43E+02	3.44E+02	6.68E+00	5.24E+00	1.09E+00	1.56E+00	2.51E-01	4.91E+00
413 GRID	1.11E+03	5.86E+02	7.56E+02	7.41E+02	4.19E+02	3.23E+02	3.53E+00	2.76E+00	5.76E-01	8.35E-01	1.32E-01	2.59E+00
414 GRID	5.81E+02	3.34E+02	5.05E+02	5.39E+02	4.12E+02	3.00E+02	2.44E+00	1.86E+00	3.87E-01	5.61E-01	8.90E-02	1.74E+00
415 GRID	3.87E+02	2.89E+02	3.85E+02	4.29E+02	3.66E+02	2.51E+02	1.93E+00	1.47E+00	3.06E-01	4.43E-01	7.02E-02	1.37E+00
416 GRID	2.97E+02	2.59E+02	3.16E+02	3.52E+02	3.20E+02	2.47E+02	1.84E+00	1.25E+00	2.60E-01	3.76E-01	5.96E-02	1.17E+00
417 GRID	2.43E+02	2.33E+02	2.73E+02	3.01E+02	2.81E+02	1.92E+02	1.35E+00	1.06E+00	2.21E-01	3.20E-01	5.07E-02	9.92E-01
418 GRID	2.09E+02	2.13E+02	2.42E+02	2.66E+02	2.47E+02	2.06E+02	1.26E+00	9.61E-01	2.01E-01	2.90E-01	4.60E-02	9.00E-01
419 GRID	1.87E+02	1.95E+02	2.19E+02	2.38E+02	2.23E+02	1.94E+02	1.15E+00	8.74E-01	1.82E-01	2.64E-01	4.18E-02	8.18E-01
420 GRID	1.70E+02	1.82E+02	2.01E+02	2.17E+02	2.08E+02	1.84E+02	1.06E+00	8.09E-01	1.69E-01	2.44E-01	3.87E-02	7.58E-01
421 GRID	1.28E+02	1.25E+02	1.20E+02	1.17E+02	1.17E+02	1.22E+02	6.65E-01	5.06E-01	1.06E-01	1.53E-01	2.42E-02	4.74E-01
422 GRID	1.34E+02	1.30E+02	1.24E+02	1.20E+02	1.22E+02	1.27E+02	6.91E-01	5.26E-01	1.10E-01	1.59E-01	2.52E-02	4.93E-01
423 GRID	1.39E+02	1.35E+02	1.28E+02	1.24E+02	1.26E+02	1.35E+02	7.18E-01	5.47E-01	1.14E-01	1.65E-01	2.62E-02	5.12E-01
424 GRID	1.46E+02	1.40E+02	1.33E+02	1.29E+02	1.34E+02	1.44E+02	7.54E-01	5.74E-01	1.20E-01	1.73E-01	2.75E-02	5.38E-01
425 GRID	1.55E+02	1.46E+02	1.38E+02	1.34E+02	1.41E+02	1.54E+02	7.92E-01	6.03E-01	1.26E-01	1.82E-01	2.89E-02	5.65E-01
426 GRID	1.61E+02	1.53E+02	1.43E+02	1.41E+02	1.51E+02	1.66E+02	8.36E-01	6.36E-01	1.33E-01	1.92E-01	3.05E-02	5.96E-01
427 GRID	1.71E+02	1.61E+02	1.49E+02	1.49E+02	1.63E+02	1.81E+02	8.90E-01	6.77E-01	1.41E-01	2.05E-01	3.24E-02	6.34E-01
428 GRID	1.84E+02	1.69E+02	1.57E+02	1.60E+02	1.77E+02	1.99E+02	9.57E-01	7.26E-01	1.52E-01	2.20E-01	3.49E-02	6.82E-01
429 GRID	1.98E+02	1.79E+02	1.66E+02	1.73E+02	1.97E+02	2.22E+02	1.04E+00	7.89E-01	1.65E-01	2.38E-01	3.78E-02	7.39E-01
430 GRID	2.13E+02	1.93E+02	1.76E+02	1.92E+02	2.20E+02	2.48E+02	1.14E+00	8.64E-01	1.80E-01	2.61E-01	4.14E-02	8.09E-01
431 GRID	2.34E+02	2.09E+02	1.85E+02	2.16E+02	2.56E+02	2.80E+02	1.26E+00	9.62E-01	2.01E-01	2.90E-01	4.60E-02	9.01E-01
432 GRID	2.58E+02	2.30E+02	2.09E+02	2.53E+02	3.02E+02	3.10E+02	1.43E+00	1.06E+00	2.26E-01	3.26E-01	5.20E-02	1.02E+00
433 GRID	2.99E+02	2.57E+02	2.39E+02	3.07E+02	3.65E+02	3.35E+02	1.65E+00	1.26E+00	2.62E-01	3.79E-01	6.01E-02	1.18E+00
434 GRID	3.51E+02	2.92E+02	2.95E+02	3.91E+02	4.16E+02	3.26E+02	1.90E+00	1.44E+00	3.01E-01	4.36E-01	6.92E-02	1.35E+00
435 GRID	4.45E+02	3.46E+02	3.99E+02	5.43E+02	4.60E+02	3.19E+02	2.32E+00	1.77E+00	3.69E-01	5.34E-01	8.47E-02	1.66E+00
436 GRID	6.21E+02	4.46E+02	6.35E+02	7.50E+02	5.04E+02	3.35E+02	3.03E+00	2.31E+00	4.82E-01	6.95E-01	1.11E-01	2.16E+00
437 GRID	1.11E+03	7.39E+02	1.45E+03	7.47E+02	5.05E+02	2.96E+02	4.48E+00	3.40E+00	7.09E-01	1.03E+00	1.63E-01	3.15E+00
438 GRID	1.78E+03	1.21E+03	1.42E+03	7.23E+02	4.58E+02	3.16E+02	5.40E+00	4.11E+00	8.57E-01	1.24E+00	1.97E-01	3.85E+00
439 GRID	7.97E+02	5.21E+02	7.35E+02	6.09E+02	3.84E+02	2.63E+02	3.02E+00	2.30E+00	4.80E-01	6.95E-01	1.10E-01	2.16E+00
440 GRID	4.53E+02	3.82E+02	4.97E+02	4.91E+02	3.60E+02	2.61E+02	2.23E+00	1.70E+00	3.55E-01	5.14E-01	8.14E-02	1.59E+00
441 GRID	3.21E+02	3.14E+02	3.82E+02	3.87E+02	3.17E+02	2.24E+02	1.78E+00	1.35E+00	2.82E-01	4.09E-01	6.48E-02	1.27E+00
442 GRID	2.55E+02	2.72E+02	3.16E+02	3.36E+02	2.71E+02	2.12E+02	1.52E+00	1.15E+00	2.41E-01	3.50E-01	5.54E-02	1.08E+00
443 GRID	2.17E+02	2.40E+02	2.76E+02	2.87E+02	2.56E+02	1.80E+02	1.33E+00	1.01E+00	2.11E-01	3.06E-01	4.85E-02	9.48E-01
444 GRID	1.94E+02	2.17E+02	2.44E+02	2.60E+02	2.34E+02	1.98E+02	1.23E+00	9.37E-01	1.95E-01	2.83E-01	4.49E-02	8.77E-01
445 GRID	1.81E+02	2.00E+02	2.21E+02	2.34E+02	2.13E+02	1.64E+02	1.13E+00	8.57E-01	1.79E-01	2.59E-01	4.10E-02	8.02E-01
446 GRID	1.22E+02	1.20E+02	1.14E+02	1.13E+02	1.15E+02	1.20E+02	6.44E-01	4.90E-01	1.02E-01	1.48E-01	2.35E-02	4.59E-01
447 GRID	1.27E+02	1.24E+02	1.19E+02	1.17E+02	1.19E+02	1.25E+02	6.68E-01	5.08E-01	1.06E-01	1.54E-01	2.43E-02	4.76E-01
448 GRID	1.34E+02	1.29E+02	1.23E+02	1.21E+02	1.25E+02	1.33E+02	6.98E-01	5.31E-01	1.11E-01	1.60E-01	2.54E-02	4.97E-01
449 GRID	1.40E+02	1.33E+02	1.27E+02	1.26E+02	1.31E+02	1.40E+02	7.29E-01	5.55E-01	1.16E-01	1.68E-01	2.66E-02	5.20E-01
450 GRID	1.46E+02	1.35E+02	1.32E+02	1.31E+02	1.38E+02	1.48E+02	7.63E-01	5.81E-01	1.21E-01	1.75E-01	2.78E-02	5.44E-01
451 GRID	1.53E+02	1.44E+02	1.37E+02	1.37E+02	1.47E+02	1.61E+02	8.05E-01	6.12E-01	1.28E-01	1.85E-01	2.93E-02	5.74E-01
452 GRID	1.62E+02	1.51E+02	1.43E+02	1.46E+02	1.58E+02	1.75E+02	8.54E-01	6.50E-01	1.36E-01	1.96E-01	3.11E-02	6.08E-01
453 GRID	1.70E+02	1.58E+02	1.49E+02	1.55E+02	1.72E+02	1.91E+02	9.10E-01	6.93E-01	1.45E-01	2.09E-01	3.32E-02	6.49E-01
454 GRID	1.82E+02	1.67E+02	1.57E+02	1.69E+02	1.89E+02	2.10E+02	9.82E-01	7.48E-01	1.56E-01	2.26E-01	3.58E-02	7.00E-01
455 GRID	1.93E+02	1.76E+02	1.66E+02	1.85E+02	2.09E+02	2.27E+02	1.06E+00	8.06E-01	1.68E-01	2.43E-01	3.86E-02	7.55E-01
456 GRID	2.12E+02	1.90E+02	1.81E+02	2.06E+02	2.40E+02	2.53E+02	1.17E+00	8.91E-01	1.86E-01	2.69E-01	4.27E-02	8.35E-01
457 GRID	2.32E+02	2.05E+02	2.01E+02	2.35E+02	2.78E+02	2.45E+02	1.28E+00	9.74E-01	2.03E-01	2.94E-01	4.66E-02	9.12E-01
458 GRID	2.58E+02	2.23E+02	2.30E+02	2.82E+02	3.19E+02	2.94E+02	1.47E+00	1.12E+00	2.33E-01	3.38E-01	5.35E-02	1.05E+00
459 GRID	2.93E+02	2.47E+02	2.76E+02	3.48E+02	3.69E+02	3.10E+02	1.68E+00	1.28E+00	2.67E-01	3.87E-01	6.13E-02	1.20E+00
460 GRID	3.54E+02	2.74E+02	3.53E+02	4.44E+02	4.25E+02	2.96E+02	1.96E+00	1.49E+00	3.12E-01	4.51E-01	7.15E-02	1.40E+00
461 GRID	4.45E+02	3.08E+02	4.87E+02	6.05E+02	4.54E+02	3.05E+02	2.39E+00	1.82E+00	3.79E-01	5.49E-01	8.71E-02	1.70E+00
462 GRID	6.44E+02	4.71E+02	6.55E+02	7.12E+02	4.42E+02	2.59E+02	3.09E+00	2.35E+00	4.91E-01	7.11E-01	1.13E-01	2.20E+00
463 GRID	1.35E+03	1.36E+03	1.28E+03	6.65E+02	4.16E+02	2.95E+02	4.91E+00	3.73E+00	7.79E-01	1.13E+00	1.79E-01	3.50E+00
464 GRID	1.46E+03	1.08E+03	1.03E+03	8.22E+02	3.61E+02	2.62E+02	4.41E+00	3.35E+00	6.99E-01	1.01E+00	1.61E-01	3.14E+00
465 GRID	5.56E+02	5.56E+02	8.77E+02	5.11E+02	3.46E+02	2.11E+02	2.61E+00	1.99E+00	4.15E-01	6.01E-01	9.52E-02	1.66E+00
466 GRID	3.47E+02	4.05E+02	4.82E+02	4.24E+02	3.17E+02	2.29E+02	2.01E+00	1.53E+00	3.20E-01	4.63E-01	7.34E-02	1.44E+00
467 GRID	2.64E+02	3.27E+02	3.79E+02	3.66E+02	2.66E+02	2.04E+02	1.65E+00	1.26E+00	2.62E-01	3.80E-01	6.02E-02	1.18E+00
468 GRID	2.28E+02	2.78E+02	3.16E+02	3.06E+02	2.14E+02	1.68E+02	1.40E+00	1.07E+00	2.22E-01	3.22E-01	5.10E-02	9.97E-01
469 GRID	2.11E+02	2.45E+02	2.76E+02	2.72E+02	2.27E+02	1.80E+02	1.29E+00	9.82E-01	2.05E-01	2.97E-01	4.70E-02	9.20E-01
500 GRID	1.96E+02	2.20E+02	2.48E+02	2.25E+02	2.06E+02	1.75E+02	1.17E+00	8.87E-01	1.85E-01	2.68E-01	4.25E-02	8.31E-01
501 GRID	1.18E+02	1.16E+02	1.12E+02	1.11E+02	1.12E+02	1.17E+02	8.27E-01	4.77E-01	9.96E-02	1.44E-01	2.29E-02	4.47E-01
502 GRID	1.22E+02	1.20E+02	1.15E+02	1.14E+02	1.17E+02	1.23E+02	6.50E-01	4.95E-01	1.03E-01	1.50E-01	2.37E-02	4.64E-01
503 GRID	1.27E+02	1.23E+02	1.19E+02	1.18E+02	1.23E+02	1.29E+02	8.75E-01	5.14E-01	1.07E-01	1.55E-01	2.45E-02	4.81E-01
504 GRID	1.32E+02	1.28E+02	1.22E+02	1.23E+02	1.28E+02	1.37E+02	7.04E-01	5.36E-01	1.12E-01	1.62E-01	2.57E-02	5.02E-01

Maximum One Hour Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	One Hour Maximum Concentration, ug/cu m Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
505	GRID	1.35E+02	1.32E+02	1.27E+02	1.26E+02	1.35E+02	1.46E+02	7.35E-01	5.62E-01	1.17E-01	1.70E-01	2.69E-02	5.26E-01
506	GRID	1.45E+02	1.37E+02	1.32E+02	1.33E+02	1.44E+02	1.56E+02	7.74E-01	5.90E-01	1.23E-01	1.78E-01	2.82E-02	5.52E-01
507	GRID	1.53E+02	1.43E+02	1.37E+02	1.42E+02	1.55E+02	1.68E+02	8.20E-01	6.24E-01	1.30E-01	1.89E-01	2.99E-02	5.84E-01
508	GRID	1.60E+02	1.49E+02	1.43E+02	1.52E+02	1.67E+02	1.83E+02	8.72E-01	6.64E-01	1.38E-01	2.00E-01	3.18E-02	6.21E-01
509	GRID	1.69E+02	1.57E+02	1.51E+02	1.64E+02	1.83E+02	1.99E+02	9.35E-01	7.12E-01	1.48E-01	2.15E-01	3.41E-02	6.66E-01
510	GRID	1.80E+02	1.65E+02	1.60E+02	1.79E+02	2.00E+02	2.05E+02	9.95E-01	7.57E-01	1.58E-01	2.29E-01	3.63E-02	7.09E-01
511	GRID	1.93E+02	1.75E+02	1.74E+02	1.89E+02	2.25E+02	2.33E+02	1.10E+00	8.34E-01	1.74E-01	2.52E-01	3.99E-02	7.81E-01
512	GRID	2.06E+02	1.86E+02	1.93E+02	2.26E+02	2.53E+02	2.52E+02	1.21E+00	9.17E-01	1.91E-01	2.77E-01	4.39E-02	8.59E-01
513	GRID	2.27E+02	2.01E+02	2.19E+02	2.60E+02	2.96E+02	2.65E+02	1.34E+00	1.02E+00	2.13E-01	3.09E-01	4.89E-02	9.57E-01
514	GRID	2.55E+02	2.16E+02	2.57E+02	3.14E+02	3.36E+02	2.59E+02	1.50E+00	1.14E+00	2.36E-01	3.44E-01	5.45E-02	1.07E+00
515	GRID	2.92E+02	2.38E+02	3.16E+02	3.91E+02	3.68E+02	2.84E+02	1.73E+00	1.31E+00	2.74E-01	3.97E-01	6.30E-02	1.23E+00
516	GRID	3.44E+02	2.92E+02	4.17E+02	4.87E+02	3.97E+02	2.66E+02	2.02E+00	1.53E+00	3.20E-01	4.63E-01	7.35E-02	1.44E+00
517	GRID	4.43E+02	4.05E+02	6.19E+02	5.67E+02	4.03E+02	2.85E+02	2.49E+00	1.90E+00	3.95E-01	5.73E-01	9.08E-02	1.76E+00
518	GRID	6.50E+02	7.28E+02	9.94E+02	6.09E+02	3.35E+02	2.74E+02	3.28E+00	2.50E+00	5.21E-01	7.55E-01	1.20E-01	2.34E+00
519	GRID	1.93E+03	2.26E+03	1.07E+03	5.74E+02	3.60E+02	2.45E+02	5.94E+00	4.52E+00	9.43E-01	1.37E+00	2.16E-01	4.23E+00
520	GRID	7.71E+02	9.56E+02	8.25E+02	4.85E+02	3.39E+02	2.24E+02	3.29E+00	2.50E+00	5.22E-01	7.56E-01	1.20E-01	2.35E+00
521	GRID	3.74E+02	5.58E+02	5.90E+02	4.35E+02	3.10E+02	1.73E+02	2.23E+00	1.70E+00	3.54E-01	5.13E-01	8.12E-02	1.59E+00
522	GRID	3.00E+02	4.11E+02	4.44E+02	3.52E+02	2.82E+02	2.02E+02	1.82E+00	1.38E+00	2.89E-01	4.18E-01	6.63E-02	1.30E+00
523	GRID	2.65E+02	3.31E+02	3.66E+02	3.10E+02	2.42E+02	1.68E+02	1.56E+00	1.18E+00	2.47E-01	3.58E-01	5.67E-02	1.11E+00
524	GRID	2.39E+02	2.81E+02	3.06E+02	2.91E+02	2.11E+02	1.75E+02	1.38E+00	1.05E+00	2.19E-01	3.17E-01	5.02E-02	9.82E-01
525	GRID	2.18E+02	2.50E+02	2.73E+02	2.81E+02	2.20E+02	1.74E+02	1.28E+00	9.71E-01	2.02E-01	2.93E-01	4.65E-02	9.09E-01
526	GRID	1.15E+02	1.11E+02	1.06E+02	1.06E+02	1.08E+02	1.14E+02	6.06E-01	4.63E-01	9.65E-02	1.40E-01	2.22E-02	4.33E-01
527	GRID	1.19E+02	1.15E+02	1.12E+02	1.12E+02	1.15E+02	1.21E+02	6.35E-01	4.84E-01	1.01E-01	1.46E-01	2.32E-02	4.53E-01
528	GRID	1.24E+02	1.19E+02	1.16E+02	1.16E+02	1.21E+02	1.27E+02	6.66E-01	5.02E-01	1.05E-01	1.52E-01	2.40E-02	4.70E-01
529	GRID	1.26E+02	1.23E+02	1.19E+02	1.20E+02	1.26E+02	1.34E+02	6.88E-01	5.22E-01	1.09E-01	1.58E-01	2.50E-02	4.89E-01
530	GRID	1.33E+02	1.27E+02	1.23E+02	1.25E+02	1.33E+02	1.42E+02	7.15E-01	5.45E-01	1.14E-01	1.65E-01	2.61E-02	5.10E-01
531	GRID	1.38E+02	1.31E+02	1.28E+02	1.32E+02	1.41E+02	1.52E+02	7.51E-01	5.71E-01	1.19E-01	1.73E-01	2.74E-02	5.35E-01
532	GRID	1.44E+02	1.36E+02	1.33E+02	1.39E+02	1.50E+02	1.61E+02	7.89E-01	6.01E-01	1.25E-01	1.81E-01	2.88E-02	5.62E-01
533	GRID	1.51E+02	1.42E+02	1.39E+02	1.47E+02	1.61E+02	1.76E+02	8.36E-01	6.36E-01	1.33E-01	1.92E-01	3.05E-02	5.96E-01
534	GRID	1.58E+02	1.47E+02	1.47E+02	1.58E+02	1.75E+02	1.89E+02	8.80E-01	6.76E-01	1.41E-01	2.05E-01	3.26E-02	6.35E-01
535	GRID	1.67E+02	1.55E+02	1.57E+02	1.73E+02	1.92E+02	1.92E+02	9.48E-01	7.20E-01	1.50E-01	2.18E-01	3.45E-02	6.75E-01
536	GRID	1.77E+02	1.63E+02	1.69E+02	1.91E+02	2.14E+02	2.21E+02	1.04E+00	7.90E-01	1.65E-01	2.39E-01	3.76E-02	7.40E-01
537	GRID	1.89E+02	1.73E+02	1.86E+02	2.15E+02	2.32E+02	2.35E+02	1.12E+00	8.56E-01	1.79E-01	2.59E-01	4.10E-02	8.02E-01
538	GRID	2.05E+02	1.84E+02	2.09E+02	2.45E+02	2.63E+02	2.49E+02	1.24E+00	9.43E-01	1.97E-01	2.85E-01	4.51E-02	8.83E-01
539	GRID	2.24E+02	2.02E+02	2.42E+02	2.85E+02	2.68E+02	2.59E+02	1.35E+00	1.03E+00	2.15E-01	3.11E-01	4.93E-02	9.64E-01
540	GRID	2.49E+02	2.30E+02	2.90E+02	3.44E+02	3.12E+02	2.34E+02	1.52E+00	1.15E+00	2.41E-01	3.49E-01	5.53E-02	1.08E+00
541	GRID	2.83E+02	2.75E+02	3.83E+02	4.14E+02	3.14E+02	2.47E+02	1.73E+00	1.32E+00	2.75E-01	3.99E-01	6.32E-02	1.24E+00
542	GRID	3.30E+02	3.63E+02	4.91E+02	4.49E+02	3.69E+02	2.61E+02	2.06E+00	1.57E+00	3.27E-01	4.74E-01	7.51E-02	1.47E+00
543	GRID	4.10E+02	5.46E+02	6.89E+02	4.95E+02	3.51E+02	2.19E+02	2.48E+00	1.89E+00	3.93E-01	5.69E-01	9.03E-02	1.77E+00
544	GRID	6.12E+02	1.10E+03	8.77E+02	4.63E+02	3.41E+02	2.28E+02	3.31E+00	2.52E+00	5.26E-01	7.62E-01	1.21E-01	2.36E+00
545	GRID	1.43E+03	1.71E+03	7.95E+02	4.55E+02	3.00E+02	2.15E+02	4.48E+00	3.41E+00	7.12E-01	1.03E+00	1.63E-01	3.20E+00
546	GRID	5.85E+02	8.49E+02	6.62E+02	3.65E+02	2.89E+02	2.16E+02	2.72E+00	2.07E+00	4.32E-01	6.26E-01	9.92E-02	1.94E+00
547	GRID	4.05E+02	5.43E+02	4.97E+02	3.76E+02	2.77E+02	1.70E+02	2.07E+00	1.58E+00	3.29E-01	4.77E-01	7.55E-02	1.45E+00
548	GRID	3.28E+02	4.02E+02	4.21E+02	3.21E+02	2.52E+02	1.80E+02	1.74E+00	1.33E+00	2.77E-01	4.01E-01	6.35E-02	1.24E+00
549	GRID	2.60E+02	3.33E+02	3.44E+02	2.48E+02	2.26E+02	1.73E+02	1.47E+00	1.12E+00	2.33E-01	3.37E-01	5.34E-02	1.04E+00
550	GRID	2.48E+02	2.84E+02	3.04E+02	2.51E+02	2.08E+02	1.70E+02	1.34E+00	1.02E+00	2.12E-01	3.07E-01	4.87E-02	9.53E-01
551	GRID	1.11E+02	1.06E+02	1.06E+02	1.08E+02	1.09E+02	1.14E+02	5.93E-01	4.56E-01	9.50E-02	1.38E-01	2.18E-02	4.27E-01
552	GRID	1.15E+02	1.11E+02	1.09E+02	1.10E+02	1.14E+02	1.18E+02	6.18E-01	4.71E-01	9.82E-02	1.42E-01	2.25E-02	4.41E-01
553	GRID	1.19E+02	1.13E+02	1.13E+02	1.14E+02	1.18E+02	1.24E+02	6.39E-01	4.87E-01	1.02E-01	1.47E-01	2.33E-02	4.56E-01
554	GRID	1.23E+02	1.16E+02	1.16E+02	1.18E+02	1.23E+02	1.31E+02	6.66E-01	5.07E-01	1.06E-01	1.53E-01	2.43E-02	4.75E-01
555	GRID	1.27E+02	1.22E+02	1.20E+02	1.23E+02	1.30E+02	1.35E+02	6.92E-01	5.27E-01	1.10E-01	1.59E-01	2.52E-02	4.93E-01
556	GRID	1.32E+02	1.26E+02	1.24E+02	1.29E+02	1.38E+02	1.48E+02	7.29E-01	5.55E-01	1.16E-01	1.68E-01	2.66E-02	5.20E-01
557	GRID	1.37E+02	1.31E+02	1.29E+02	1.36E+02	1.47E+02	1.56E+02	7.65E-01	5.82E-01	1.21E-01	1.76E-01	2.79E-02	5.45E-01
558	GRID	1.43E+02	1.36E+02	1.35E+02	1.45E+02	1.57E+02	1.65E+02	8.03E-01	6.15E-01	1.28E-01	1.86E-01	2.95E-02	5.76E-01
559	GRID	1.49E+02	1.41E+02	1.42E+02	1.55E+02	1.70E+02	1.79E+02	8.55E-01	6.51E-01	1.36E-01	1.97E-01	3.12E-02	6.10E-01
560	GRID	1.56E+02	1.47E+02	1.53E+02	1.68E+02	1.83E+02	1.66E+02	9.06E-01	6.90E-01	1.44E-01	2.08E-01	3.30E-02	6.46E-01
561	GRID	1.65E+02	1.55E+02	1.63E+02	1.84E+02	2.03E+02	2.04E+02	9.81E-01	7.47E-01	1.56E-01	2.26E-01	3.58E-02	7.00E-01
562	GRID	1.75E+02	1.63E+02	1.80E+02	2.05E+02	2.22E+02	2.06E+02	1.05E+00	8.00E-01	1.67E-01	2.42E-01	3.83E-02	7.49E-01
563	GRID	1.86E+02	1.75E+02	2.01E+02	2.32E+02	2.50E+02	2.21E+02	1.16E+00	8.60E-01	1.84E-01	2.66E-01	4.22E-02	8.24E-01
564	GRID	2.01E+02	1.94E+02	2.29E+02	2.63E+02	2.73E+02	2.30E+02	1.27E+00	9.87E-01	2.02E-01	2.92E-01	4.63E-02	9.05E-01
565	GRID	2.18E+02	2.20E+02	2.69E+02	3.11E+02	2.93E+02	2.42E+02	1.42E+00	1.08E+00	2.25E-01	3.25E-01	5.17E-02	1.01E+00
566	GRID	2.40E+02	2.61E+02	3.26E+02	3.66E+02	3.05E+02	2.43E+02	1.59E+00	1.21E+00	2.53E-01	3.66E-01	5.80E-02	1.14E+00
567	GRID	2.66E+02	3.27E+02	4.19E+02	3.91E+02	3.21E+02	2.29E+02	1.79E+00	1.36E+00	2.85E-01	4.11E-01	6.51E-02	1.27E+00
568	GRID	2.98E+02	4.48E+02	5.82E+02	4.21E+02	3.16E+02	2.26E+02	2.08E+00	1.58E+00	3.30E-01	4.78E-01	7.57E-02	1.48E+00
569	GRID	4.03E+02	7.14E+02	8.96E+02	4.32E+02	2.75E+02	2.00E+02	2.49E+00	1.89E+00	3.95E-01	5.72E-01	9.06E-02	1.77E+00
570	GRID	8.93E+02	1.29E+03	6.73E+02	4.28E+02	2.67E+02	2.12E+02	3.44E+00	2.62E+00	5.45E-01	7.90E-01	1.25E-01	2.45E+00
571	GRID	1.58E+03	1.21E+03	6.20E+02	4.05E+02	2.83E+02	2.10E+02	3.94E+00	3.00E+00	6.26E-01	9.06E-01	1.44E-01	2.81E+00
572	GRID	6.29E+02	7.52E+02	5.33E+02	2.91E+02	2.53E+02	2.01E+02	2.44E+00	1.85E+00	3.87E-01	5.60E-01	8.85E-02	1.74E+00
573	GRID	4.34E+02	5.15E+02	4.47E+02	3.29E+02	2.47E+02	1.65E+02	1.95E+00	1.49E+00	3.10E-01	4.49E-01	7.12E-02	1.39E+00
574	GRID	3.40E+02	4.00E+02	3.57E+02	2.94E+02	2.27E+02	1.62E+02	1.63E+00	1.24E+00	2.58E-01	3.74E-01	5.93E-02	1.16E+00
575	GRID	2.90E+02	3.32E+02	3.29E+02	2.48E+02	2.09E+02	1.61E+02	1.43E+00	1.09E+00	2.26E-01	3.30E-01	5.23E-02	1.02E+00
576	GRID	1.07E+02	1.05E+02	1.04E+02	1.04E+02	1.07E+02	1.11E+02	5.84E-01	4.44E-01	9.27E-02	1.34E-01	2.13E-02	4.16E-01
577	GRID	1.11E+02	1.06E+02	1.07E+02	1.08E+02	1.12E+02	1.15E+02	6.04E-01	4.60E-01	9.60E-02	1.39E-01	2.20E-02	4.31E-01
578	GRID	1.15E+02	1.11E+02	1.10E+02	1.12E+02	1.16E+02	1.22E+02	6.27E-01	4.77E-01	9.96E-02	1.44E-01	2.29E-02	4.47E-01
579	GRID	1.19E+02	1.15E+02	1.13E+02	1.13E+02	1.22E+02	1.27E+02	6.47E-01	4.93E-01	1.03E-01	1.49E-01	2.36E-02	4.61E-01
580	GRID	1.22E+02	1.18E+02	1.17E+02	1.21E+02	1.27E+02	1.34E+02	6.76E-01	5.15E-01	1.07E-01	1.55E-01	2.46E-02	4.82E-01
581	GRID	1.26E+02	1.21E+02	1.22E+02	1.27E+02	1.35E+02	1.43E+02	7.07E-01	5.38E-01	1.12E-01	1.63E-01	2.58E-02	5.04E-01
582	GRID	1.31E+02	1.26E+02	1.27E+02	1.33E+02	1.43E+02	1.52E+02	7.41E-01	5.64E-01	1.18E-01	1.70E-01	2.70E-02	5.28E-01
583	GRID	1.36E+02	1.31E+02	1.32E+02	1.42E+02	1.54E+02	1.62E+02	7.92E-01	5.95E-01	1.24E-01	1.80E-01	2.85E-02	5.57E-01
584	GRID	1.41E+02	1.35E+02	1.40E+02	1.51E+02	1.65E+02	1.69E+02	8.24E-01	6.27E-01	1.31E-01	1.90E-01	3.00E-02	5.88E-01
585	GRID	1.47E+02	1.41E+02	1.49E+02	1.63E+02	1.73E+02	1.76E+02	8.70E-01	6.63E-01	1.38E-01	2.00E-01	3.17E-02	6.21E-01
586	GRID	1.55E+02	1.49E+02	1.60E+02	1.77E+02	1.94E+02	1.82E+02	9.29E-01	7.08E-01	1.48E-01	2.14E-01	3.39E-02	6.63E-01
587	GRID	1.63E+02	1.58E+02	1.74E+02	1.97E+02	2.11E+02	2.09E+02	1.01E+00	7.69E-01	1.60E-01	2.32E-01	3.68E-02	7.20E-01
588	GRID	1.72E+02	1.70E+02	1.92E+02	2.20E+02	2.31E+02	1.76E+02	1.08E+00	8.08E-01	1.69E-01	2.44E-01	3.87E-02	7.57E-01
589	GRID	1.83E+02	1.87E+02	2.16E+02	2.45E+02	2.49E+02	2.16E+02	1.19E+00	9.04E-01	1.89E-01	2.73E-01	4.33E-02	8.47E-01
590	GRID	1.97E+02	2.11E+02	2.50E+02	2.84E+02	2.68E+02	2.16E+02	1.30E+00	9.91E-01	2.07E-01	2.99E-01	4.74E-02	9.26E-01
591	GRID	2.12E+02	2.45E+02	2.94E+02	2.97E+02	2.64E+02	1.71E+02	1.37E+00	1.05E+00	2.18E-01	3.16E-01	5.01E-02	9.80E-01
592	GRID	2.29E+02	2.98E+02	3.67E+02	3.49E+02	2.92E+02	2.09E+02	1.54E+00	1.17E+00	2.44E-01	3.54E-01	5.61E-02	1.10E+00
593	GRID	2.73E+02	3.85E+02	4.63E+02	3.36E+02	2.93E+02	2.21E+02	1.80E+00	1.37E+00	2.86E-01	4.14E-01	6.56E-02	1.26E+00
594	GRID	3.64E+02	5.49E+02	5.19E+02	3.61E+02	2.59E+02	2.10E+02	2.07E+00	1.57E+00	3.28E-01	4.75E-01	7.53E-02	1.47E+00
595	GRID	6.04E+02	8.66E+02	5.79E+02	3.56E+02	2.49E+02	2.08E+02	2.53E+00	2.00E+00	4.18E-01	6.05E-01	9.60E-02	1.88E+00
596	GRID	1.82E+03	1.09E+03	5.36E+02	3.66E+02	2.66E+02	2.00E+02	3.90E+00	2.97E+00	6.20E-01	8.95E-01	1.42E-01	2.78E+00
597	GRID	1.23E+03	8.32E+02	5.17E+02	3.16E+02	2.43E+02	1.91E+02	3.05E+00	2.32E+00	4.84E-01	7.01E-01	1.11E-01	2.17E+00
598	GRID	8.23E+02	6.51E+02	4.45E+02	2.76E+02	2.11E+02	1.82E+02	2.18E+00	1.66E+00	3.47E-01	5.02E-01	7.96E-02	1.56E+00
599	GRID	4.35E+02	4.68E+02	3.66E+02	2.91E+02	2.21E+02	1.55E+02	1.82E+00	1.38E+00	2.89E-01	4.18E-01	6.63E-02	1.30E+00
600	GRID	3.49E+02	3.90E+02	3.02E+02	2.67E+02	2.06E+02	1.48E+02	1.52E+00	1.15E+00	2.41E-01	3.49E-01	5.53E-02	1.08E+00
601	GRID	1.05E+02	1.03E+02	1.01E+02	1.03E+02	1.05E+02	1.10E+02	5.73E-01	4.36E-01	9.10E-02	1.32E-01	2.09E-02	4.09E-01
602	GRID	1.08E+02	1.05E+02	1.05E+02	1.06E+02	1.09E+02	1.14E+02	5.91E-01	4.50E-01	9.39E-02	1.36E-01	2.16E-02	4.22E-01
603	GRID	1.10E+02	1.07E+02	1.08E+02	1.07E+02	1.13E+02	1.18E+02	6.06E-01	4.61E-01	9.62E-02	1.39E-01	2.21E-02	4.32E-01
604	GRID	1.14E+02	1.11E+02	1.11E+02	1.14E+02	1.19E+02	1.25E+02	6.35E-01	4.83E-01	1.01E-01	1.46E-01	2.31E-02	4.53E-01
605	GRID	1.18E+02	1.15E+02	1.15E+02	1.19E+02	1.25E+02	1.32E+02	6.60E-01	5.03E-01	1.05E-01	1.52E-01	2.41E-02	4.71E-01
606	GRID	1.22E+02	1.18E+02	1.18E+02	1.24E+02	1.32E+02	1.36E+02	6.87E-01	5.23E-01	1.09E-01	1.58E-01	2.51E-02	4.90E-01
607	GRID	1.26E+02	1.22E+02	1.24E+02	1.31E+02	1.40E+02	1.47E+02	7.21E-01	5.49E-01	1.14E-01	1.66E-01	2.63E-02	5.14E-01
608	GRID	1.30E+02	1.26E+02	1.30E+02	1.38E+02	1.49E+02	1.55E+02	7.57E-01	5.77E-01	1.20E-01	1.74E-01	2.76E-02	5.40E-01
609	GRID	1.35E+02	1.31E+02	1.37E+02	1.45E+02	1.60E+02	1.60E+02	7.96E-01	6.06E-01	1.26E-01	1.83E-01	2.90E-02	5.67E-01
610	GRID	1.40E+02	1.37E+02	1.45E+02	1.59E+02	1.67E+02	1.71E+02	8.40E-01	6.40E-01	1.33E-01	1.93E-01	3.06E-02	5.99E-01
611	GRID	1.45E+02	1.45E+02	1.55E+02	1.72E+02	1.65E+02	1.76E+02	8.97E-01	6.83E-01	1.42E-01	2.06E-01	3.27E-02	6.39E-01
612	GRID	1.52E+02	1.54E+02	1.69E+02	1.89E+02	2.01E+02	1.83E+02	9.53E-01	7.33E-01	1.53E-01	2.21E-01	3.51E-02	6.87E-01
613	GRID	1.61E+02	1.66E+02	1.84E+02	2.09E+02	2.07E+02	1.89E+02	1.02E+00	7.76E-01	1.62E-01	2.34E-01	3.72E-02	7.27E-01
614	GRID	1.70E+02	1.81E+02	2.08E+02	2.34E+02	2.26E+02	1.95E+02	1.11E+00	8.44E-01	1.76E-01	2.55E-01	4.04E-02	7.90E-01
615	GRID	1.82E+02	2.02E+02	2.35E+02	2.63E+02	2.38E+02	2.02E+02	1.21E+00	9.19E-01	1.92E-01	2.78E-01	4.40E-02	8.61E-01
616	GRID	1.94E+02	2.31E+02	2.74E+02	2.94E+02	2.42E+02	2.07E+02	1.32E+00	1.00E+00	2.09E-01	3.03E-01	4.81E-02	9.40E-01
617	GRID	2.21E+02	2.75E+02	3.24E+02	3.23E+02	2.64E+02	2.09E+02	1.49E+00	1.12E+00	2.35E-01	3.40E-01	5.38E-02	1.05E+00
618	GRID	2.62E+02	3.37E+02	3.99E+02	3.48E+02	2.62E+02	1.98E+02	1.65E+00	1.26E+00	2.62E-01	3.79E-01	6.01E-02	1.18E+00
619	GRID	3.30E+02	4.51E+02	4.65E+02	3.23E+02	2.53E+02	1.75E+02	1.83E+00	1.39E+00	2.90E-01	4.20E-01	6.66E-02	1.30E+00
620	GRID	4.60E+02	6.41E+02	5.17E+02	3.35E+02	2.55E+02	1.52E+02	2.17E+00	1.66E+00	3.45E-01	5.00E-01	7.93E-02	1.55E+00
621	GRID	8.65E+02	8.57E+02	4.85E+02	3.19E+02	2.49E+02	1.82E+02	2.70E+00	2.06E+00	4.29E-01	6.22E-01	9.85E-02	1.93E+00
622	GRID	1.82E+03	8.52E+02	4.60E+02	3.19E+02	2.27E+02	1.72E+02	3.54E+00	2.70E+00	5.62E-01	8.15E-01	1.29E-01	2.53E+00
623	GRID	1.02E+03	6.11E+02	4.43E+02	2.93E+02	1.93E+02	1.65E+02	2.49E+00	1.90E+00	3.96E-01	5.73E-01	9.09E-02	1.76E+00
624	GRID	5.96E+02	5.53E+02	3.72E+02	2.60E+02	1.74E+02	1.52E+02	1.93E+00	1.47E+00	3.07E-01	4.45E-01	7.05E-02	1.36E+00
625	GRID	4.36E+02	4.17E+02	3.49E+02	2.59E+02	1.99E+02	1.51E+02	1.65E+00	1.26E+00	2.63E-01	3.80E-01	6.03E-02	1.16E+00
520	Exist House east of HWY 101	3.33E+02	5.13E+02	8.30E+02	6.40E+02	4.98E+02	6.55E+02	3.17E+00	2.41E+00	5.03E-01	7.29E-01	1.16E-01	2.26E+00
827	Mobile home at SE corner of tract to north	2.28E+02	2.94E+02	4.64E+02	7.57E+02	1.22E+03	7.91E+02	3.43E+00	2.61E+00	5.45E-01	7.89E-01	1.25E-01	2.45E+00
828	SE corner of tract to north	2.35E+02	3.10E+02	4.59E+02	8.10E+02	1.30E+03	8.20E+02	3.68E+00	2.80E+00	5.85E-01	8.47E-01	1.34E-01	2.63E+00

Maximum One Hour Concentration at Receptors Using Santa Maria 1963 Meteorology

Rec	Type	X/Q (SRC 1) (ug/m^3)/(g/s)	X/Q (SRC 2) (ug/m^3)/(g/s)	X/Q (SRC 3) (ug/m^3)/(g/s)	X/Q (SRC 4) (ug/m^3)/(g/s)	X/Q (SRC 5) (ug/m^3)/(g/s)	X/Q (SRC 6) (ug/m^3)/(g/s)	One Hour Maximum Concentration, ug/cu m					
								Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde
629	VTTM #14,718 Lot 45 (Jan 2010)	2.14E+02	3.11E+02	4.65E+02	7.07E+02	1.05E+03	7.05E+02	3.17E+00	2.42E+00	5.04E-01	7.30E-01	1.18E-01	2.26E+00
630	VTTM #14,716 Lot 52 (Jan 2010)	2.57E+02	3.71E+02	6.17E+02	1.04E+03	1.02E+03	1.37E+03	4.28E+00	3.26E+00	6.79E-01	9.83E-01	1.56E-01	3.05E+00
631	VTTM #14,716 Lot 128 (Jan 2010)	5.84E+02	8.40E+02	8.72E+02	8.32E+02	9.78E+02	5.47E+02	4.07E+00	3.10E+00	6.45E-01	9.35E-01	1.48E-01	2.90E+00

Toxic Air Contaminant Acute Health Risk Analysis

Scenario: Santa Maria Meteorology, One Hour Maximum

	Toxic Air Contaminants							
	Diesel PM	Benzene	1,3-Butadiene	Acetaldehyde	Acrolein	Formaldehyde		
Acute Inhalation REL, ug/cu m	0.00	1.30E+03	0.00	4.70E+02	2.50E+00	5.50E+01		
OEHHA Methodology Acute Risk Calculation							***Summed Total Risk***	***Exceed Criterion?***
Exist House east of HWY 101	0.00E+00	1.86E-03	0.00E+00	1.55E-03	4.62E-02	4.11E-02	***9.1E-02***	***No***
Mobile home at SE corner of tract to north	0.00E+00	2.01E-03	0.00E+00	1.68E-03	5.00E-02	4.45E-02	***9.8E-02***	***No***
SE corner of tract to north	0.00E+00	2.16E-03	0.00E+00	1.80E-03	5.37E-02	4.77E-02	***1.1E-01***	***No***
VTTM #14,716 Lot 45 (Jan 2010)	0.00E+00	1.86E-03	0.00E+00	1.55E-03	4.63E-02	4.11E-02	***9.1E-02***	***No***
VTTM #14,716 Lot 62 (Jan 2010)	0.00E+00	2.50E-03	0.00E+00	2.09E-03	6.24E-02	5.54E-02	***1.2E-01***	***No***
VTTM #14,716 Lot 126 (Jan 2010)	0.00E+00	2.38E-03	0.00E+00	1.99E-03	5.93E-02	5.27E-02	***1.2E-01***	***No***

Acute Inhalation REL from *Consolidated Table of OEHHA/ARB Approved Risk Assessment Health Values*, February 2009.
Note: Where no information regarding REL is available, no value shown.

Appendix C

Biological Resources Studies



Key Site 3
Orcutt, California
Sensitive Species and Habitat Survey

021-10163-00

June, 2006

(Updated May, 2009)

Prepared for

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1.0 INTRODUCTION

This report presents the findings of the Sensitive Species and Habitat Survey for Key Site 3 (the Site, APN 129-151-26), located in Orcutt, California. This Site comprises approximately 137 acres crossed by Orcutt Creek.

The Site is bordered on the east by Highway 101 and is approximately 1/4 mile south of Clark Avenue in the southeastern portion of the community of Orcutt in unincorporated Santa Barbara County, California (Figure 1). The Site contains more than 40 acres on a relatively flat mesa at the north end of the property, which drops 30 to 50 feet to the floodplain and lowlands surrounding Orcutt Creek. Orcutt Creek, which originates in Solomon Canyon to the southeast of the Site, crosses the property, entering from an outfall under Highway 101 and exiting in a northwesterly direction along the western perimeter of the Site. The creek re-enters and crosses a corner on the property for a short distance along the northwest edge (Figure 2). South of the main creek crossing, the property extends up the north-facing slopes of the Solomon Hills to a maximum elevation of approximately 750 feet. These slopes exceed 30% in places, and include erosional features such as gullies.

The purpose of this analysis was to identify sensitive botanical and wildlife resources, sensitive habitats, or other environmental issues of concern occurring or potentially occurring on the Site. Sensitive resources mapped on the site are indicated on Figure 3. This report also generally discussions potential impact avoidance and minimization options for consideration during project design and implementation.

LFR Inc. (LFR) conducted sensitive species surveys between November, 2005 and December, 2006. In addition, a presence/absence survey for California tiger salamanders following United States Fish and Wildlife Service (USFWS) protocol was conducted by LFR during the 2007/08 and 2008/09 rain seasons. Portions of the wildlife section of this report have been updated to reflect the negative findings of the formal tiger salamander survey. Additionally, the findings regarding potential wetland habitat were updated based on wetland delineation work conducted in August 2008 and April and May 2009. The personnel conducting the surveys consisted of LFR Senior Ecologist Mary Carroll, LFR Wildlife Biologist Mitch Siemens, LFR Botanist Susanne Bernstein, and LFR Spatial Analyst Kevin Doyle. LFR Principal Biologist Greg McGowan also visited the Site on numerous occasions. LFR Senior Associate Geologist, Dr. Steve Beadle visited the Site on one occasion. A summary of formal survey dates is provided below (not all site visits are listed).

Survey Dates

November 7, 2006	Carroll, McGowan
November 15, 2006	Siemens
November 21, 2006	Carroll
May 23, 2007	Carroll

May 24, 2007	Carroll
August 15, 2007	Doyle
August 26, 2008	Carroll, Siemens
April 22, 2009	McGowan, Carroll, Bernstein
March 30, 2009	Siemens, Carroll

2.0 METHODOLOGY

Prior to performing the fieldwork, LFR conducted a review of documents concerning the Site and the surrounding areas, including a search of the California Natural Diversity Database (CNDDB; California Department of Fish and Game [CDFG], 2005) for the U.S.G.S. 7.5 minute series Orcutt, Casmalia, Lompoc, Sisquoc, and Santa Maria topographic quadrangles. The California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular (CNPS, 2005) was also queried for appropriate habitat within the Orcutt Quadrangle and adjacent quadrangles. Other Site-specific environmental documents reviewed for the project included the 1995 Environmental Impact Report for the Orcutt Community Plan (Santa Barbara County, 1995) and the Biological Assessment of Impacts for Proposed Construction Project on SDC-CT, LLC Property in Orcutt, California (Sykes, 2003). Other resources utilized for this assessment included various state and federal regulations, review of other recent ecological reports completed in and around Orcutt, and LFR's direct experience in the region.

Plant and wildlife surveys were conducted as relévé, or meandering, surveys throughout the Site, paying particular attention to drainages, wetlands, rocky outcrops, oak woodland, coastal scrub, and grassland communities existing on the property. All plant species found to be in a recognizable condition during the surveys were recorded and are listed in Table 1. Nomenclature follows the Jepson Online Interchange (Baldwin et al., 2005), which lists updates based on The Jepson Manual (Hickman, 1993). Identification of some plant species was confirmed using specimens housed at the Santa Barbara Botanic Garden, Santa Barbara. It is important to note that the list of vascular plant species on the Site presented in this report may not be comprehensive, however, surveys were conducted in summer, fall, and in spring.

All wildlife species observed at the Site are discussed in Section 4.3. All wildlife species observed or assumed present from sign (e.g., tracks, burrows, scat, nests) during the surveys are listed in Table 2. The list of wildlife species also may not be comprehensive. In order to create a more comprehensive wildlife list, multiple surveys would be required in order to enable observation of species both during the day and at night, during different seasons, and during weather conditions when some species are more likely to be detected.

3.0 HABITAT DESCRIPTION

The central coast occurs in an important biological transition zone between the moister communities of northern California and the more arid communities of southern California. General site characteristics and vegetation communities are described below.

3.1 Site Description

Located within the southeastern section of the Orcutt Planning Area, Key Site 3 is bordered by the Sunny Hills mobile home park to the north, five 20-acre ranchettes to the west, Highway 101 to the east, and undeveloped portions of the Solomon Hills to the south and the southwest. The Site encompasses a portion of the north-facing slopes of the Solomon Hills, which reach 1,346 feet elevation at Mount Solomon directly south of the Site. Access to Key Site 3 includes a proposed entry road leading south from Clark Avenue in an easterly direction across the neighboring Key Site 2 property and continuing between Highway 101 and the northeast side of the mobile home park. The topography of the Site consists of steep to gentle slopes that reach approximately 750 feet in elevation along the southern perimeter of the Site, dropping to about 520 feet at the bottom of the Orcutt Creek drainage. Orcutt Creek, which originates in Solomon Canyon to the south of the Site, crosses the property, entering near its southeastern corner as it passes under Highway 101 and exiting in a northwesterly direction along the western perimeter of the Site. The creek crosses a small portion of the Site a second time farther north (Figure 2). To the north of the main channel, the topography rises to a mesa approximately 30 to 50 feet above the creek bottom. This mesa receives runoff from an agricultural field located on the east side of Highway 101 through a culvert under the freeway. Aerial photographs indicate that the water from east of the highway has historically been directed across the site in this manner (Figure 4).

The Site is located at the southeastern end of the Santa Maria Valley, a valley that contains the most extensive Pleistocene-Holocene dune sheets in California, with Aeolian dune deposits ranging from 6,000 to 200,000 years in age (Hunt, 1993). A number of unusual habitats are found in these dune deposits, along with unique plant and animal species endemic to this region.

Orcutt sand deposits characterize the geology of the entire site, overlying the Paso Robles formation, which consists of non-marine sedimentary deposits with imbedded Monterey Shale pebbles (Dibblee, 1989). Soils at the Site consist of primary of Arnold sand in the foothills south of Orcutt Creek; sandy alluvium in the Orcutt Creek drainage; and a mosaic of Betteravia loamy sand, Botella loam, Marina sand, and Garey sandy loam to the north of Orcutt Creek (Shipman, 1972).

Yearly precipitation is estimated at 12.85 inches (Western Regional Climate Center historic records, Santa Maria Airport: 1948-2004, www.wrcc.dri.edu), falling primarily between October and April. The local weather pattern of mild, wet winters and warm,

dry summers is characteristic of Mediterranean-climate regions, and the effect of the dry summers on plant life is ameliorated somewhat by the presence of summer fog.

Temperatures at the Site are generally mild, with a mean annual temperature of 57.3°F, with an average maximum July temperature of 72.7°F and an average January minimum temperature of 38.9 °F (Western Regional Climate Center historic records, Santa Maria Airport- 1948-2004, www.wrcc.dri.edu).

The Site supports a mosaic of native, weedy, and planted vegetation that will be described more fully in the ensuing sections. The distribution of vegetation types on the Site are dictated by topography, soils and geology, hydrology, slope exposure, climate, and land use history.

A total of six native and two non-native communities were mapped on the Site, supporting approximately 220 species of plants. Approximately 144 species of native plants and 75 species of non-native species were identified at the Site. Spring surveys yielded 45 native species and 12 non-native species that had not been recognizable to the species level during the fall surveys. The following habitats were identified on the Site during the LFR surveys: Central Dune Scrub, Central Coastal Scrub, Central Maritime Chaparral, Non-native Grassland, Coast Live Oak Woodland, Central Coast Arroyo Willow Riparian Scrub, Central Coast Live Oak Riparian Forest, and Plantations and Windbreaks, including blue gum (*Eucalyptus globulus*), Northern California walnut (*Juglans hindsii*), and others.

Site photographs are provide in Appendix A.

3.2 Land Use History

A review of aerial photographs from 1938 to the present (1938, 1943, 1954, 1956, 1967, and 2005; Figure 4) reveals historic disturbances on much of the Site to support agricultural operations. Livestock grazing has resulted in disturbance of both coastal scrub and oak woodland vegetation. The vegetation on the hillside south of Orcutt Creek appears to have been subject to the least amount of disturbance and unlike other portions of the Site there is no evidence that this area has been completely cleared during the past seven decades (see discussions below).

North of Orcutt Creek, clearing of vegetation for farming is visible in several photographs. In 1938, the floodplain north of Orcutt Creek appears to have been cleared for agricultural purposes, along with the flat mesa at the north end of the Site. The slopes that separate the mesa to the north from the floodplain by Orcutt Creek appear to support coastal scrub vegetation in this photograph.

Also visible in 1938 are two small tributaries to Orcutt Creek that join the creek from the north. Each tributary originates east of the highway and traverses the Site in a westerly direction. The northern tributary drains a small slope to the east that had also been cleared

by 1938. As this tributary reaches the northwestern corner of the Site, it drops abruptly from the edge of the mesa into a steep-walled chasm. This steep drainage remains today and the tributary continues to be fed by water coming through a culvert under Highway 101. A second tributary skirts the slope that drops down from the mesa towards Orcutt Creek. The second tributary extends further east than the northern tributary; to the east of the highway, coast live oaks are visible in the same drainage in 1938 and are still visible in current aerial images of the area. This tributary is barely visible today on the Site itself, and is also fed by a culvert under Highway 101.

In 1943 and 1954 all flat areas north of Orcutt Creek appear recently cleared. The slopes between the mesa and the floodplain by Orcutt Creek support coastal scrub vegetation. Vegetation also appears recently cleared in 1956 and 1967, although the poor resolution of these images makes it difficult to interpret the land use patterns adjacent to Orcutt Creek. The slopes between the mesa and lower floodplain appear more heavily disturbed in 1967.

3.3 Upland Communities

The Site supports a mosaic of native, weedy, and planted vegetation that will be described more fully in the ensuing sections. The distribution of vegetation types on the site are determined by topography, soils and geology, hydrology, slope exposure, climate, and land use history. Six upland habitats were identified on the Site during the LFR surveys: Central Dune Scrub, Central Coastal Scrub, Central Maritime Chaparral, Non-native Grassland, Coast Live Oak Woodland, and Plantations and Windbreaks.

3.3.1 Central Dune Scrub

Central dune scrub occurs in sandy soils near the ocean but also on older stabilized dune sheets such as those in the Orcutt area (Holland and Keil, 1995). Woody vegetation predominates, but open sand is easily observed between shrubs. This community is said to be edaphically controlled, occurring only on sandy substrates (Holland and Keil, 1995). Although similar to central coastal scrub, described below, the dominants in this habitat include dune-heather (*Ericameria ericoides*) and dune bush lupine *(Lupinus chamissonis).* Almost immediately inland and upslope, a different bush lupine, *Lupinus albifrons*, replaces the dune bush lupine. Other common shrubs are California sagebrush (*Artemisia californica*) and black sage (*Salvia mellifera*). In addition, subshrubs and herbaceous perennials such as California croton (*Croton californicus*), deerweed (*Lotus scoparius*), California-aster (*Lessingia filaginifolia*), and dune larkspur (*Delphinium parryi* subsp. *blochmaniae*) are scattered in openings between shrubs, along with small-fruited seaside fiddleneck (*Amsinckia spectabilis* var. *microcarpa*), California mucronea (*Mucronea californica*), and few-flowered collinsia (*Collinsia sparsiflora* var. *collina*). The four latter species are all considered sensitive.

Central dune scrub at the Site would be classified as Central Dune Scrub in the CNDDB community classification system (Holland, 1986), and fits best into the Dune Lupine –

Heather Goldenbush series within the CNPS Manual of California Vegetation classification (Sawyer and Keeler-Wolf, 1995).Central Dune Scrub has a global rank of G2 (2,000-10,000 acres) and a state rank of S2.2 (2,000-10,000 acres, threatened), as listed in the CNDDB (2005).

3.3.2 Central (Lucian) Coastal Scrub

Central coastal scrub covers most of the slopes on the southern portion of the Site and, prior to modern agricultural and ranching activities, probably intergraded with riparian scrub along the north side of Orcutt Creek as it does to the south. Central coastal scrub is dominated by drought-tolerant, soft-leaved shrubs from three to six feet tall that are summer dormant and winter active, exhibiting a significant burst of growth in the winter and spring months. Many species are partially or completely summer deciduous. At the Site, coyote bush (*Baccharis pilularis* subsp. *consanguinea*) and California sagebrush (*Artemisia californica*) are the most abundant representatives of this plant community, along with California coffeeberry (*Rhamnus californica*), dune-heather (*Ericameria ericoides*), black sage (*Salvia mellifera*), and Lompoc monkeyflower (*Mimulus aurantiacus* subsp. *lompocensis*), a regional endemic. Poison-oak (*Toxicodendron diversilobum*) also predominates, especially adjacent to ravines and gullies. Occasional individuals of fuchsia-flowered gooseberry (*Ribes speciosum*) and coastal goldenbush (*Isocoma menziesii*) also occur at the Site.

North of Orcutt Creek and in patches south of Orcutt Creek (Figure 2), the central coastal scrub is highly degraded with limited species diversity and relatively sparse vegetative cover. North of the creek, this appears to be the result of continued and long-term grazing. The degraded central coastal scrub habitat also occurs where the access road to the Site from Clark Avenue occurs between Highway 101 and the mobile home park. LFR mapped these disturbed areas separately because the habitat quality is so notably different than in areas where the habitat has not been subject to extended disturbance. In places, the central coastal scrub vegetation is very dense, with little to no openings between shrubs, especially on the steeper slopes and at higher elevations at the southern end of the Site where cattle do not appear to penetrate. Elsewhere on more gentle slopes, the scrub becomes more open and pockets of annuals and herbaceous perennials flourish between shrubs. Native subshrubs such as deerweed (*Lotus scoparius*), California croton (*Croton californicus*), and California-aster occur in exposed openings, along with herbaceous perennials such as green everlasting (*Gnaphalium californicum*), snakeroot (*Sanicula crassicaulis*), coast horkelia (*Horkelia cuneata* subsp. *cuneata*), chaparral zygadene (*Zigadenus fremontii*), and others. In two locations where the coastal scrub appears largely undisturbed, patches of woolly star are present (*Eriastrum densifolium subsp. elongatum*). A population of 50 individuals of California broomrape (*Orobanche californica*) was found in the coastal scrub at the Site in 1994 (Rindlaub,1994).

Native annuals in central coastal scrub habitats include the sensitive California spineflower (*Mucronea californica*), as well as doveweed (*Croton* [*Eremocarpus*] *setigerus*), suncups (*Camissonia* species), holly-leaved navarretia (*Navarretia*

atractyloides), red maids (*Calandrinia ciliata*), and others. Fairy mist (*Pterostegia drymarioides*) and California goosefoot (*Chenopodium californicum*) are tucked in the understory of the shrubs. Sensitive native species and habitats are discussed below in Section 4.0. Non-native weeds common in non-native grasslands are also found in these disturbed openings, especially black mustard (*Brassica nigra*), scarlet pimpernel (*Anagallis arvensis*), sheep sorrel (*Rumex acetocella)*, and a range of weedy grasses. Cattle and associated droppings were observed in these open scrub areas during a visit to the Site by LFR.

Two species, coyote bush and California sagebrush, are particularly tolerant of disturbance and both reinvade sites that have been previously cleared of scrub or grassland vegetation. Coyote bush, which can produced roots 10 to 15 feet long, is unusual in being tolerant of drought as well as a high water table. This species is particularly common in the heavily disturbed floodplain to the north of Orcutt Creek, accompanied by the more shallow-rooted California sagebrush and coastal goldenbush.

In a few places, especially adjacent to drainages and Orcutt Creek, coast live oak (*Quercus agrifolia*) becomes more abundant and is described more fully below in the section describing Coast Live Oak Woodland. Central coastal scrub, coast live oak, and grassland tend to form a mosaic of habitats on the Site, and seldom are the boundaries clearly defined.

This community would be classified as the Central (Lucian) Coastal Scrub in the CNDDB community classification system (Holland, 1986). Areas where California sagebrush is dominant are best described by the California Sagebrush Series within the CNPS Manual of California Vegetation, and where coyote bush dominates as the Coyote Brush Series (Sawyer and Keeler-Wolf, 1995). Central Lucian Coastal Scrub has a global rank of G3 (10,000-50,000 acres) and a state rank of S3.3 (10,000-50,000 acres, no current threats known), as listed in the CNDDB (2005).

3.3.3 Central Maritime Chaparral

Central maritime chaparral, also called sandhill chaparral and in some areas Burton Mesa chaparral, is dominated by evergreen shrubs and scattered multi-trunked coast live oaks (*Quercus agrifolia*) that grow together at varying densities from open stands to almost impenetrable thickets over vast expanses of the historic sand sheets of the Central Coast. The woody chaparral shrub vegetation ranges from one to four meters in height, although low-growing annuals and herbaceous perennials flourish in exposed openings.

Central maritime chaparral in Santa Barbara County is primarily found in the Santa Maria Valley and in the Santa Ynez River Valley on Aeolian sands of the Orcutt formation (Ferren et al. 1984); these sands are underlain at varying depths by bedrock from the Monterey and Paso Robles formations and can include cemented rock and clay lenses (Shipman,1972). Maritime chaparral is an unusual vegetation type found on mostly sandy substrates in a few coastal locations in Santa Barbara, San Luis Obispo, Monterey, and Santa Cruz Counties; often these maritime chaparral associations are dominated by local

endemic species of ceanothus (*Ceanothus*) and manzanita (*Arctostaphylos*) mixed with other widespread and endemic species (Holland, 1986; Holland and Keil, 1995).

Central maritime chaparral often exhibits a pattern of greatest diversity at the highest elevations on the sand sheets, with manzanitas, ceanothus, chamise, coast live oak, and other species predominating. On the lower slopes, which are usually more xeric, the manzanitas and ceanothus gradually are replaced by chamise, and even lower the chamise is replaced by coastal scrub. This pattern was observed at the Site, although the Site lacks the high elevations that support the most diverse maritime chaparral associations.

At the southern border of the Site a maximum elevation of approximately 750 above sea level is reached. In this area, central coastal scrub gives way to chaparral dominated by dense stands of chamise (*Adenostoma fasciculatum*) mixed with clumps of multi-trunked coast live oaks. A few Lompoc ceanothus (*Ceanothus cuneatus* var. *fascicularis*) also occur here and are also found in a few places lower down the north-facing slope towards Orcutt Creek. Mountain-mahogany (*Cercocarpus betuloides*) is also scattered in the chaparral, along with redberry (*Rhamnus crocea*), black sage, Lompoc monkeyflower, and poison-oak. In most chaparral habitats in California dominated by chamise, there are few to no plants growing under the shrub canopy. At the southwestern end of the Site, however, the chamise supports a luxuriant growth of the native perennial thin grass (*Agrostis pallens*) under its branches, along with gold-back fern (*Pentagramma triangularis*) and bird's foot fern (*Pellaea mucronata*). Other native grasses such as needlegrass (*Nassella pulchra* and *N. lepida*) and Coast Range melic (*Melica imperfecta*) are also scattered in the understory of the shrubs. The chamise is gradually replaced by coastal scrub as the elevation drops towards Orcutt Creek.

On the highest rocky knoll at the Site, a small population of shagbark manzanita (*Arctostaphylos rudis*) hugs the rocks. Approximately seven individuals occur among the chamise in this location.

This community would be classified as the Central Maritime Chaparral in the CNDDB community classification system (Holland, 1986). It fits best into the Chamise Series within the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Central Maritime chaparral has a global rank of G2 (2,000-10,000 acres) and a state rank of S2.2 (2,000-10,000 acres, threatened), as listed in the CNDDB (2005).

3.3.4 Coast Live Oak Woodland

Coast live oak woodland dominated by coast live oak trees (*Quercus agrifolia*) occurs on Site along Orcutt Creek, as well as in its tributaries on the north-facing slope of the Solomon Hills on the southern portion of the Site. Coast live oaks vary in density from concentrated bands of oaks along the main corridor of this drainage to scattered trees in coastal scrub, chaparral or grassland habitats.

Coast live oak is an evergreen tree ranging from 20 to 75 feet in height, with a spreading crown, many massive branches, and a dense canopy of thick waxy leaves. Trees can easily live for 300 years or more. Although seemingly ubiquitous in the hills surrounding Orcutt and Santa Maria, coast live oaks
are restricted to a fifty-mile wide swath along the coast from Mendocino County south to northern Baja California. They are completely absent in the Sierra Nevada and other interior ranges; rather, they tend to occur in the maritime belt that receives fog during the summer months.

Coast live oak woodland is most well developed between sea level and 5,000 feet on north-facing slopes, in canyons and along rolling foothills and alluvial terraces adjacent to water courses, where roots can reach moisture at depth. Most healthy stands contain mixed age classes of oak trees, saplings, and seedlings. Although considered drought-tolerant due to their ability to survive the hot dry summer months without rain, coast live oaks tends to occur in areas that receive at least 15 or more inches of rain or that have suitable microenvironments with water available to their roots at depth. Thus, the higher densities of coast live oaks along drainages at the project Site may be a reflection of the local mean annual precipitation of about 13 inches.

In dense coast live oak woodlands, the environment under the oak canopy is very shady. At the Site, shade-tolerant shrubs such as toyon (*Heteromeles arbutifolia*), climbing penstemon (*Keckiella cordifolia*) and poison-oak (*Toxicodendron diversilobum*) are found in oak woodland habitats, especially near the western border at high elevations, which are the least disturbed oak woodlands at the Site. Herbaceous perennials such as hummingbird sage (*Salvia spathacea*), wood mint (*Stachys bullata*), wild cucumber (*Marah fabaceus*), and others also form a dense understory in undisturbed oak woodland.

Much of the oak woodland at the Site has a heavily disturbed understory (due to cattle), however, with occasional cover of native vegetation and a preponderance of invasive non-native weeds. These include Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum marianum*), poison-hemlock (*Conium maculatum*), ripgut brome (*Bromus diandrus*), and others. The native annual fiesta flower (*Pholistoma auritum*), miner's lettuce (*Claytonia perfoliata*), and cleavers (*Galium aparine*) were also observed in the understory.

Along Orcutt Creek, the habitat can be characterized as Central Coast live oak riparian forest (see discussion of wetland communities below). A few distinctive patches of Indian rush (*Juncus textilis*) occur in sandy soil under the canopy of the coast live oak near Orcutt Creek. Indian rush is classified as an obligate wetland indicator species by the US Fish and Wildlife Service (1996), meaning that it almost always occurs in wetlands (99% or more of the time). The juxtaposition of this wetland species in the understory of coast live oak creates an unusual association that has a limited distribution in Santa Barbara County, including a few occurrences at La Purisima Mission State Historic Park and in the nearby Burton Mesa Ecological Reserve near Vandenberg Village.

This community would be classified as the Coast Live Oak Woodland Community in the CNDDB community classification system (Holland, 1986), and as the Coast Live Oak

Series within the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Coast Live Oak Woodland has a global rank of G4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat) and a state rank of S4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat), as listed in the CNDDB (2005).

Although not listed as a rare community by the California Department of Fish and Game, oak trees and oak woodlands are specifically addressed as sensitive habitat by Santa Barbara County through habitat-specific impact assessment guidelines (County of Santa Barbara, 1995). Coast live oak trees and oak woodlands of varying densities exist throughout the Site, particularly on ridgetops and north-facing slopes.

3.3.5 Non-native Grassland

Portions of the Site are dominated primarily by non-native grasses and other weedy annual species, especially north of Orcutt Creek. The presence of non-native grassland usually suggests prior clearing of native perennial vegetation, which then is largely replaced by invasive non-native grasses and forbs.

Among the non-native grasses are invasive annual Mediterranean grasses such as slender wild oats (*Avena barbata*), rip-gut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), red brome (*Bromus madritensis* subsp. *rubens*), foxtail barley (*Hordeum murinum*), and annual fescues (*Vulpia* species). Associated with these grasses are weedy mustards (*Brassica rapa, B. nigra*, and *Hirshfeldia incana*) and filaree (*Erodium cicutarium, E. botrys*) along with patches of Italian thistle, milk thistle, poison-hemlock, sheep sorrel (*Rumex acetocella)*, and others. The thistles are most abundant in low-lying drainages and under coast live oak trees that have been cleared of understory vegetation.

Many native annual grassland herbs have been documented and these are included in Table 1. Although the survey was conducted just a few weeks after the first rain and well before the spring blooming season, the LFR survey identified purple owl's-clover (*Castilleja exserta*), bicolored lupine (*Lupinus bicolor*), farewell-to-spring (*Clarkia* species), red maids (*Calandrinia ciliata*), small sun-cups (*Camissonia micrantha*), coast tarweed (*Madia sativa*), and many other native wildflowers scattered in patches of grasslands amongst coastal scrub vegetation south of Orcutt Creek. Also present in these sandy soils are the native perennials California croton, California aster, and others.

North of Orcutt Creek, among the most abundant native species in the heavily grazed grassland areas are the coast tarplant (*Deinandra increscens* subsp. *increscens*) and doveweed. A temporarily flooded swale area occurs in the non-native grassland on the mesa north of Orcutt Creek. This area receives moisture from an agricultural field on the east side of Highway 101 through a culvert under the freeway. The area supports the weedy annual bluegrass (*Poa annua*), Bermuda-grass (*Cynodon dactylon*), curly dock (*Rumex crispus*). These species are present in lower numbers near the second tributary below the slope that separates the mesa from the floodplains adjacent to Orcutt Creek.

In general, the grassland areas would be classified as Non-Native Grasslands in the CNDDB community classification system (Holland, 1986) and as California Annual Grassland Series within the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Non-native Grassland has a global rank of G4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat) and a state rank of S4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat), as listed in the CNDDB (2005).

3.3.6 Plantations and Windbreaks

Introduced species have been planted at the Site, most especially blue gum eucalyptus (*Eucalyptus globulus*) by Orcutt Creek. One individual of ribbon gum (*E. viminalis*) occurs along the eastern edge of Orcutt Creek near Highway 101 along with several large Northern California walnuts (*Juglans hindsii*), a species widely planted along the Central Coast but not native to the area. This plant was incorrectly identified as Southern California Black Walnut (*Juglans californica* subsp. *californica*), a sensitive plant species, in Sykes 2003. In addition, three planted Monterey pines (*Pinus radiata*) occur along the eastern boundary of the site adjacent to Highway 101. A few Aleppo pines (*Pinus halepensis*) are also planted in the northwestern corner of the site adjacent to homes.

Eucalyptus trees were introduced into California from Australia beginning in the 1850s. Blue gum (*Eucalyptus globulus*) was the most common species planted, and has now become naturalized throughout much of California. A grove can spread three to six meters in diameter a year, displacing native species as it colonizes areas (Keil and Holland, 1998). Blue gum eucalyptus is listed on List A-1 for the most invasive wildland pest plants by California Exotic Pest Plant Council (1999 list, caleppc.org). Naturalization of eucalyptus into several native plant communities, including maritime chaparral, vernal pools, riparian zones, and grasslands, has occurred at the nearby Vandenberg Air Force Base. Eucalyptus seedlings have been noted to outgrow and displace maritime chaparral (Keil and Holland, 1998).

The eucalyptus may be used by wintering monarch butterflies, although no roosts were observed during the wildlife surveys and the surveys were conducted during the appropriate time of year. A variety of migratory and resident songbirds, as well as raptors such as turkey vultures and a variety of hawks are known to use the eucalyptus. However, overall wildlife habitat value for this community is low because of the poorly developed understory, which eliminates heavy use by amphibians, reptiles, and small mammals.

The tree plantings of eucalyptus can best be described by the Eucalyptus Series within the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995); there is no corresponding CNDDB classification. Although Monterey pines are native to California, they do not naturally occur on the Site. As part of non-native stands, these and other planted species are not treated in either the CNDDB or CNPS classification.

3.4 Wetland Communities

Areas with standing or flowing water or with seasonally or permanently saturated soils commonly support wetland communities. Freshwater wetlands are extremely complex and variable, and their species composition and overall structure are dependent on a number of factors. Water depth, seasonal fluctuations in water levels, rate of water movement, water and sediment chemistry (including salinity, pH, and quantity of organic matter), depth and texture of bottom sediments, amount of sunlight, and water and air temperatures are among the most important variables affecting overall wetland dynamics. Along rivers and streams, fine-grained alluvial soils settle in the bottom of the drainages, and annual inundation after rains provide a tremendous of nutrients, soil, and new germination sites.

Two wetland habitats are found at the Site, both associated with Orcutt Creek. A jurisdictional wetland delineation was conducted by LFR during the field surveys. The findings are presented under separate cover (LFR 2009).

3.4.1 Central Coast Arroyo Willow Riparian Scrub

Central coast arroyo willow riparian scrub occurs in a few areas along Orcutt Creek at the Site (Figure 2). The creek enters the Site through a channel under Highway 101 in the southeastern corner of the Site. In this area a few large clumps of arroyo willow occur scattered along the creek banks, with the more abundant coast live oak and occasional Mexican elderberry (*Sambucus mexicana*). Coyote bush (*Baccharis pilularis*) and mulefat (*B. salicifolius*) are also present, along with locally common patches of native poison-oak, mugwort (*Artemisia douglasiana*), and other native species. One individual of sandbar willow (*Salix exigua*) was also observed.

Orcutt Creek leaves the Site at the western boundary below the rise leading to the upper mesa near Chancellor Street, and crosses a small portion of the Site again to the northwest. This stretch of Orcutt Creek also supports Central coast riparian scrub, and arroyo willow, mulefat, Mexican elderberry, and scattered coast live oak predominate.

In the CNDDB community classification system (Holland, 1986), the vegetation along Orcutt Creek is part of both the Central Coast Riparian Scrub Community and the Central Coast Live Oak Riparian Forest Community. The Central Coast Riparian Scrub Community comprises the Arroyo Willow Series in the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Central Coast Riparian Scrub has a global rank of G3 (10,000-50,000 acres) and a state rank of S3 (10,000-50,000 acres), as listed in the CNDDB (2005). Central Coast Arroyo Willow Riparian Forest has a global rank of G3 (10,000-50,000 acres) and a state rank of S3.2 (10,000-50,000 acres, threatened), as listed in the CNDDB (2005).

3.4.2 Central Coast Live Oak Riparian Forest

For most of the passage of Orcutt Creek through the Site, coast live oak predominates along the drainage, with only a few arroyo willows here and there. Although contiguous with coast live oak woodland on nearby slopes, this vegetation can be characterized as central coast live oak riparian forest due to the dense cover of oaks and riparian associates such as mulefat, mugwort (*Artemisia douglasiana*), California blackberry, poison-oak, Indian rush, and other native species, along with non-native weeds. As described above in the section on coast live oak woodland, a distinctive association of coast live oak with Indian rush occurs in a couple of places near Orcutt Creek.

The center of the creek corridor is sandy and mostly devoid of woody vegetation, although many annuals and herbaceous perennials were observed, along with occasional sand bars supporting coast live oaks and other shrubs and herbs. Due to the intermittent burst of high velocity and/or high volume flow in Orcutt Creek during significant winter rain events, this area is likely to be cleared of vegetation naturally on an annual basis.

In the CNDDB community classification system (Holland,1986), the vegetation along Orcutt Creek is part of both the Central Coast Riparian Scrub Community and the Central Coast Live Oak Riparian Forest Community. The Central Coast Live Oak Riparian Forest Community would comprise the Coast Live Oak Series in the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Central Coast Live Oak Riparian Forest has a global rank of G3 (10,000-50,000 acres) and a state rank of S3.2 (10,000-50,000 acres, threatened), as listed in the CNDDB (2005).

3.4.3 Potentially Jurisdictional Waters of the United States

Orcutt Creek through the Site was dry at the time of the LFR field surveys. However, evidence in the field (sand deposits, rafted debris, erosion) and common experience suggests that the creek transports flowing water for brief periods following heavy and prolonged rain events. The stream channel through the Site averages approximately three to five meters across and the banks are of varying heights and aspect. Through most of the Site, the banks are approximately one meter (three feet) high except in locations where the stream cuts into the hillside on the west side of the property and in the area near the northwest corner of the Site where the creek re-enters and crosses the a short portion of the Site. The sides of the creek tend to be steeper and higher in these locations. The ordinary high water mark (OHWM) is estimated to be approximately six to ten inches.

The regulatory standing of Orcutt Creek has been disputed in terms of jurisdiction under the federal Clean Water Act. Based on a lack of natural connectivity to a jurisdictional water body (in this case the Santa Maria River), arguments have been made that Orcutt Creek is not a jurisdictional water body. However, agricultural practices in the area move water mechanically throughout the area and in some cases facilitate connectivity to the Santa Maria River. In prior legal action (United States of America vs. Adam Brothers Farming), the court supported a determination that Orcutt Creek is a jurisdictional Water

of the United States. This case was settled so the determination was not formalized, but it is assumed for purposes of this analysis that Orcutt Creek is considered a jurisdictional water. As such, impacts to Orcutt Creek are regulated by the Army Corps of Engineers under Section 404 of the Clean Water Act, and by the California Regional Water Quality Control Board under Section 401 of the Clean Water Act.

Orcutt Creek is also a Water of the State and impacts are regulated under Section 1602 of the California Fish and Game Code. Any and all crossings or encroachments on Orcutt Creek related to build out of the property will require permit approval by all three of these agencies.

As noted in the discussion of annual grassland on the upper mesa portion of the Site, a temporarily flooded swale area occurs. This area receives moisture from an agricultural field on the east side of Highway 101 via a culvert under the freeway. The area supports the weedy annual bluegrass (*Poa annua*), Bermuda-grass (*Cynodon dactylon*), and curly dock (*Rumex crispus*). This area was not found to meet the three parameters (hydric soils, positive hydrology, dominance of facultative or wetland plant species) that define a federally jurisdictional wetland. However, the area seasonally meets the County of Santa Barbara's less restrictive one-parameter criteria. A formal wetland delineation was conducted by LFR between August 2008 and March 2009. The results are presented under separate cover.

3.5 Weeds

Sensitive species and habitats are subject to competition and/or displacement by aggressive non-native weeds. Several weedy species found at the Site are listed by the California Exotic Pest Plant Council as Wildland Pest Plants (California Exotic Pest Plant Council, 1999 list, caleppc.org) – see Table 4. Because disturbance during construction can create optimal conditions for weed establishment, guidelines for monitoring and eliminating the most aggressive invasive species should be incorporated into the overall management plan for the Site.

4.0 FINDINGS

The Sections below describe the habitat and species-specific findings of the field surveys.

4.1 Sensitive Habitats

The following plant communities have a California state ranking of S3.2 or higher, which are considered to be "threat" ranks by the California Department of Fish and Game Natural Diversity Database (CDFG, 2005). The state ranking system for S3 and above includes the estimated number of existing acres for the sensitive habitat, as well as a

threat ranking from .1 (very threatened) to .3 (no current threats known). Sensitive habitats for this report are defined as S3.2 and above for habitats with an identified threat.

- Central Dune Scrub (S2.2 - 2,000-10,000 acres, threatened)
- Central Maritime Chaparral (S2.2 - 2,000-10,000 acres, threatened)
- Central Coast Arroyo Willow Riparian Forest (S3.2 - 10,000-50,000 acres, threatened); Central Coast Riparian Scrub (S3 – 10,000-50,000 acres)
- Central Coast Live Oak Riparian Forest (S3.2 - 10,000-50,000 acres, threatened)

Habitats of Local Concern in Santa Barbara County

- Coast live oak woodland
- Riparian drainage
- Central maritime chaparral

4.2 Sensitive Plants

No state or federally listed threatened or endangered botanical species were observed on the Site by LFR. A total of eight sensitive plants were observed. Five of these species are listed by the California Native Plant Society and three are considered to be a plant of local concern in Santa Barbara County (Wiskowski, 1988; Dieter Wilken, Santa Barbara Botanic Garden, personal communication). Of the five CNPS listed species, two are on List 1B for plants considered rare in California; the other three species are on List 4 a watch list as further described below. The discussion below addresses the sensitive species observed on the Site and also includes species that were not observed on the Site but are known from the general area.

Additional sensitive species may be identified during other surveys. The CNDDB and CNPS Electronic Inventory search, as well as a review of the 1995 Rindlaub survey, point to a larger list of plant species whose presence has been reported in the Orcutt and adjacent quadrangles, or that may potentially occur in the habitat present at the Site. All sensitive species observed at the Site or which have been reported from the area using the CNDDB and CNPS Electronic Inventory search are included in Table 2.

4.2.1 Observed Sensitive Botanical Species

The following descriptions identify the sensitive species observed on the Site and shown in Figure 3.

Shagbark manzanita (*Arctostaphylos rudis*)

Shagbark manzanita, also called sand mesa manzanita, is an evergreen shrub that reaches two meters in height and produces a basal burl, from which arise numerous stems. Shagbark manzanita occurs on the Aeolian sands of Santa Barbra County, although it ranges a bit further north into southern San Luis Obispo County on the Nipomo Mesa blooming from November to February. It is found in the Purisima, Solomon, and Casmalia Hills, on Point Sal Ridge, on the Burton Mesa and Vandenberg Air Force Base, and in Bishop Pine forest along Arguello Road (Keil and Holland 1998). It also occurs south into Lompoc and La Salle Canyons and west to Buellton.

It is categorized as CNPS 1B.2, a plant of limited distribution that is fairly endangered in California. CNPS indicates that development threatens the species through direct removal of plants as well as by fragmentation of natural populations, which alters ecosystem function and fire regimen. Clearing natural populations for fire control is an additional threat. Infrequent burn cycles favor the larger Purisima manzanita and coast live oak over time, and frequent burning can deplete nutrient stores in burls and reduce their health and vigor (Keil and Holland, 1998).

Presence on the Site: Shagbark manzanita occurs in the relatively small stand of central maritime chaparral at the Site on a rocky knoll in an area that is not anticipated for direct disturbance but that would occur on private property. It occurs with chamise and black sage, as well as nearby coast live oak.

Dune larkspur (*Delphinium parryi* subsp. *blochmaniae*)

Dune larkspur is a regional endemic herbaceous perennial that is restricted to stabilized dunes from San Luis Obispo County south to northern Santa Barbara County. It is also found in one location near Camarillo. This variety of *Delphinium parryi* is distinguished by its lack of basal leaves when the plant is flowering and the clear blue sepals and petals, which are larger than the more widespread forms. At flowering, the plants reach 50 to 70 cm in height.

It is categorized as CNPS 1B.2, a plant of limited distribution that is fairly endangered in California. The primary threat to this species is urban development in the coastal region where it occurs.

Presence on the Site: Dune larkspur occurs in central dune scrub south of Orcutt Creek on the eastern half of the Site. A total of 12 individuals were observed during the spring survey in this area, growing with black sage, dune-heather, rattlesnake weed (*Daucus pusillus*), and other spring flowers.

Lompoc (Coast) Ceanothus (*Ceanothus cuneatus* var. *fascicularis*)

Lompoc ceanothus, also called coast ceanothus, is an endemic variety of the more wide-ranging buckbrush ceanothus (*Ceanothus cuneatus* var. *cuneatus*) that rarely exceeds two meters in height, though prostrate forms have been observed at Point Sal (Smith,1998). Lompoc ceanothus has narrow leaves in clusters along the stems and lilac-colored flowers, in contrast to the wider, less clustered leaves of the widespread white-flowered varieties.

Lompoc ceanothus is scattered to abundant in Burton Mesa chaparral on Burton Mesa north in the Purisima, Solomon, and Casmalia Hills to Pt. Sal, Nipomo Mesa, and Morro Bay, where it occurs with the Morro manzanita (*A. morroensis*) as well as sand almond *(Prunus fasciculata var. punctata*). It occurs south to the hills behind Lompoc and northeast of Buellton.

The Lompoc ceanothus is listed on CNPS List 4.2, which is a watch list for species with a limited distribution in California.

Presence on the Site: Lompoc ceanothus is found in the central maritime chaparral on the Site at the southern end of the parcel. A few individuals also occur on the north-facing slope of the Solomon Hills on Site near the western perimeter and extending from the central ridge that extends southwards from the Site.

San Luis Obispo wallflower (*Erysimum capitatum* var. *lompocense*)

San Luis Obispo wallflower, also called the Lompoc wallflower, is a perennial herb that occurs on sandy hillsides, mesas and back dunes with central dune scrub and maritime chaparral at elevations less than 500 meters. It produces yellow flowers in spring and tends to be much taller than the more common subspecies.

San Luis Obispo wallflower is endemic to sandy hills around Lompoc (Mission La Purisima, Burton Mesa), inland to Solomon Hills and Nipomo Mesa (Smith, 1998). It is threatened by habitat destruction, and weedy, non-native species may also compete with the San Luis Obispo wallflower in its historic habitat. San Luis Obispo wallflower is on CNPS List 4.2, which is a watch list for species with a limited distribution in California.

Presence on the Site: San Luis Obispo wallflower is found in central dune scrub, coastal scrub habitat, and maritime chaparral south of Orcutt Creek in sandy soil. Never common at the Site, it often occurs in sandy openings adjacent to larger shrubs.

California spineflower (*Mucronea californica*)

California spineflower is a distinctive reddish annual. It branches low to the ground and rarely exceeds 30 cm in height. Large triangular awn-tipped reddish bracts arise from the

slender stems and support the smaller white to pink flowers. California spineflower begins blooming in spring but is readily visible long into autumn.

This annual herb is known from sandy soils from Santa Barbara, Buellton to Lompoc, Point Sal, Los Alamos, Santa Maria, and the Nipomo Mesa. It is on CNPS List 4.2, which is a watch list for species with a limited distribution that are fairly endangered in California.

Presence on the Site: California spineflower is found in many sandy openings in central dune scrub, central coastal scrub, and maritime chaparral on the southern portion of the site in the foothills of the Solomon Hills.

Small-seeded fiddleneck (*Amsinckia spectabilis* var. *microcarpa*)

The small-seeded fiddleneck is an annual member of the borage family that produces yellow-orange flowers in spring. It had been considered for inclusion in the fifth edition of the CNPS Inventory, but was rejected because it is too common (California Native Plant Society, 1994). However, it is still considered to be a species of local concern within Santa Barbara County (Wiskowski, 1988). It is commonly scattered as an endemic to the sandy hills and brushy mesas of stabilized dunes from the Buellton area to Lompoc, Purisima Hills, Surf, Burton Mesa, San Antonio Creek Area, Point Sal, and the Nipomo Mesa and Santa Maria area (Smith, 1998).

Presence on the Site: Small-seeded fiddleneck is found scattered in central dune scrub and coastal scrub habitats on Site, especially in moister areas.

Few-flowered collinsia (*Collinsia sparsiflora* var. *collina*)

Few-flowered collinsia is a spring annual that produces a few bluish flowers with a unique shape. Among its distinguishing characteristics are the hairs of the filaments of the stamens and the size of the flowers. This species is endemic to California and known primarily from San Luis Obispo County north. It was collected once by the early 20th century botanist Ralph Hoffmann by Refugio Pass in 1928, and has not been reported since then until its sighting at Key Site 3. As such, it should be considered a species of local concern (Dieter Wilken, Santa Barbara Botanic Garden, personal communication).

Presence on the Site: Few-flowered collinsia occurs in central dune scrub south of Orcutt Creek on the eastern half of the Site. A few individuals were observed during the spring survey in this area, growing with cream cups (*Platystemon californicus*), dune larkspur, and other spring flowers.

Lompoc monkeyflower (*Mimulus aurantiacus* subsp. *lompocensis*)

The Lompoc monkeyflower is recognized by some taxonomists as a distinctive subspecies of the more widespread *Mimulus aurantiacus* and is regarded as a local species of concern by the County of Santa Barbara (Rindlaub, et al., 1995; Wiskowski,

1988). It is endemic to coastal scrub, chaparral and woodlands from Gaviota Pass and Pojoaque Falls into southern San Luis Obispo County.

Presence on the Site: Lompoc monkeyflower is common in central dune scrub, central coastal scrub, and maritime chaparral at the Site. Although most individuals are concentrated in scrub habitats south of Orcutt Creek, a few individuals also occur north of Orcutt Creek.

4.2.2 Sensitive Botanical Species Not Observed on Site

The following plants were not found by LFR at the Site but are known to occur in the general area and are discussed here for reference.

Black-flowered figwort (*Scrophularia atrata*)

The black-flowered figwort is a perennial herb found in closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub and riparian scrub of San Luis Obispo and Santa Barbara Counties. In Santa Barbara County, it is best developed on diatomaceous and calcareous hills around Lompoc; however, it is also scattered in coastal sage scrub and other plant communities from Point Conception to Burton Mesa, bishop pine forests around Lompoc, north to Coralville's Canyon near Point Sal, and south to Coal Oil Point, Goleta (Smith, 1998).

It is the Sacramento Fish and Wildlife Office list of species of concern (USFWS, 2004). It is categorized as CNPS 1B.2, a plant of limited distribution that is fairly endangered in California. It is threatened by energy development and mining.

Presence on the Site: The black-flowered figwort was not located by LFR during the surveys. It has been found nearby in the riparian scrub in a tributary to Orcutt Creek (Pine Canyon Creek) and in other locations.

Mesa horkelia (*Horkelia cuneata* subsp. *puberula)* and Kellogg's horkelia (*Horkelia cuneata* subsp. *sericea*)

Mesa horkelia and Kellogg's horkelia are both subspecies of the more widespread herbaceous perennial, coast horkelia (*Horkelia cuneata* var. *cuneata*). They are distinguished by characteristics of leaf and stem hairs as well as diagnostic features found in the flowers. Mesa horkelia is known from San Luis Obispo County to San Diego County, while the distribution of Kellogg's horkelia encompasses sites in San Mateo, Santa Cruz, San Luis Obispo, and Santa Barbara counties, but has been extirpated in the San Francisco Bay area. Numerous populations of mesa and Kellogg's horkelia have been eliminated by development, particularly in the northern part of its range. Both species bloom from April to September, and each is listed separately on CNPS List 1B.1 for species that are seriously endangered in California

Presence on the Site: Mesa horkelia and Kellogg's horkelia are reported from the Orcutt Creek drainage, but no specimens collected at the Site during the LFR surveys were determined to be this subspecies.

Sand almond (*Prunus fasciculata* var. *punctata*)

Sand almond is an intricately branched shrub that ranges from 2 to 3 feet in height, although it may sometimes be taller. This winter-deciduous shrub has narrow leaves to 0.5 - 0.75 inches in length with punctuate (sunken) glands on the surface. The tiny white flowers appear in spring and are followed by small, round pubescent fruits. Unlike its desert relative, *Prunus fasciculata* var. *fasciculata*, a desert species native to washes and rocky soils of the western desert regions, sand almond is confined to sandy substrates in coastal Santa Barbara and San Luis Obispo Counties.

Sand almond occurs in Graciosa Canyon on the northern flanks of the Purisima Hills south of Orcutt northwest of Los Alamos, on San Antonio Terrace (Smith, 1998), and in the Solomon Hills in Santa Barbara County. Keil and Holland (1998) also report sand almond on San Antonio Terrace in mixed chaparral and in disturbed areas surrounded by grasses, as well as in the Casmalia Hills north of Barka Slough. One outlying population of sand almond lies far to the east of these more coastal populations, on the eastern most extent of the Purisima Hills west of Ballard Canyon (Smith 1998, Philbrick *pers. comm.*). Sand almond also extends north into San Luis Obispo County on Nipomo Mesa and in maritime chaparral south of Morro Bay. Unlike the more inland Santa Barbara County populations, the sand almond population at Morro Bay occurs within close proximity of the Bay, right near the coast. Sand almond is listed on is on CNPS List 4.3, which is a watch list for species with a limited distribution that are not very endangered in California.

Presence on the Site: Sand almond was not found at the Site during the LFR survey. However, it was previously reported during a 1994 survey of the Site just outside the southern boundary (Rindlaub,1994).

Santa Barbara ceanothus (*Ceanothus impressus* var. *impressus*)

Santa Barbara ceanothus ranges from three to eight feet in height at maturity, with small warty leaves and intense blue flowers in early spring. This subspecies is found in Santa Barbara County, especially in stands that are less than ten years old and that have shallow soils (Davis et al. 1988).

The Santa Barbara ceanothus is endemic to sandy substrates around Lompoc, east towards Buellton and west to Point Sal (Smith, 1998). It is considered to be a species of local concern in Santa Barbara County (Wiskowski, 1988).

Presence on the Site: Santa Barbara ceanothus was not found at the site, although it is known from nearby areas. However, it is most common the first ten years

after a fire, and seeds may be present in the seed bank of central maritime chaparral.

4.2.3 Critical Habitat

The Site is outside any designated critical habitat. However, designation of critical habitat for three of the plant species listed in Table 2 has been proposed nearby in the Orcutt Hills (United States Fish and Wildlife Service, 2001). The proposed critical habitat does not include the Site. The Lompoc yerba santa (*Eriodictyon capitatum*) is known from Orcutt Hill, and the proposed critical habitat in the Solomon Hills Unit includes watersheds from the ridgelines, downslope to the bottoms of the nearest drainages. The portion of proposed critical habitat directly south of the Rice Ranch development is one of four known locations of the Lompoc yerba santa. Areas directly upslope and downslope from known populations may serve as potential habitat for this species, as Lompoc yerba santa appears to spread primarily through vegetative reproduction. The margins of chaparral on the Site could serve as potential habitat for this species. However, the Lompoc yerba santa would have been recognizable during plant surveys, and it was not identified.

The proposed critical habitat designation for the other two plant species (La Graciosa thistle and Gaviota tarplant) is located farther from the Site. La Graciosa thistle (*Cirsium loncholepis*) is historically known from the old La Graciosa community where the town of Orcutt is currently located, and was likely to have had a widespread distribution in the present-day agricultural areas of Santa Maria Valley. It is currently known from one inland location at the headwaters of San Antonio Creek, at Canada de las Flores, but the majority of the species occur within the Guadalupe Dune Complex Base (United States Fish and Wildlife Service, 2001). LFR specifically searched for the La Graciosa thistle at the Site, but no marshy areas were located. The Gaviota tarplant is known from marine terraces in the vicinity of Gaviota, as well as westward along the coast from Gaviota and in the Santa Ynez Mountains to Point Arguello and Vandenberg Air Force Base. It was not located at the Site.

4.3 Sensitive Wildlife

No state or federally listed threatened or endangered species were identified during the November 2005 surveys. The Site provides potentially suitable habitat for a variety of sensitive wildlife species. Several of these species are state and/or federally listed species, or are federal or State Species of Special Concern (FSC/CSC; Table 3). Listed species include the federally-listed (endangered) Santa Barbara County distinct population segment of the California tiger salamander (*Ambystoma californiense*; CTS) and the federally-listed (threatened) California red-legged frog (*Rana aurora draytoni;* CRLF). An initial habitat assessment for the CTS was conducted by Dr. Steve Sykes (2003) and is discussed below. His report is included as an appendix to this report. LFR reviewed the findings of the Sykes report for consistency with current Site conditions and found that the conclusions remain valid and accurately reflect the conditions on the Site.

Some of the sensitive species listed in the CNDDB for the Orcutt and surrounding quadrangles are not discussed below due to the lack of species-specific habitat needs present on the Site. Species such as the unarmored threespine stickleback *(Gasterosteus aculeatus williamsoni*) and southern steelhead trout (*Oncorhynchus mykiss irideus*) are examples of species whose habitat requirements are not met by the existing conditions on the Site

Several raptor species utilize the Site and are discussed here because they could nest on or near the Site. Raptor species that were observed on the Site by LFR include the red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter Cooperii*), merlin (*Falco columbarius*), great horned owl (*Bubo virginianus*) and American kestrel (*Falco sparvarious*). A potentially active red-tailed hawk nest was observed at the Site. Other raptor species are expected to use the Site on a consistent basis. These species include the barn owl (*Tyto alba*), western screech owl (*Otus kennicottii*), red-shouldered hawk (*Buteo lineatus*) and white-tailed kite (*Elanus leucurus*). The loggerhead shrike (*Lanius ludovicianus*) may also nest on the Site. Species such as the northern harrier (*Circus cyaneus*), merlin, prairie falcon (*Falco mexicanus*), ferruginous hawk (*Buteo regalis*), and golden eagle (*Aquila chrysaetos)* may utilize or occur inconsistently on the Site but are not expected to nest on the Site. All raptors and their active nests are protected under the California Fish and Game code (Section 3503.5) and the federal Migratory Bird Treaty Act (MBTA).

All birds included on the federal list of migratory non-game birds, and their active nests, are protected by law under the federal MBTA. This includes all of the birds observed on the Site and listed in Table 2 with the exception of the European starling (*Sturnus vulgaris*).

The species accounts included in this section are a summary of listed or sensitive wildlife species known from the Orcutt Quadrangle or neighboring quadrangles, and occurring or potentially occurring on the Site. The sensitivity status of each species is provided through the use of codes, defined as the following:

United States Fish and Wildlife Service (USFWS)
- FE – Federally Endangered
- FT – Federally Threatened
- FSC – Federal Special Concern Species

California Department of Fish and Game (CDFG)
- CE – California Endangered
- CT – California Threatened
- CSC – California Species of Concern

4.3.1 Potentially Occurring Sensitive Wildlife Species

The following is a summary of sensitive wildlife species occurring or potentially occurring on the Site.

California Tiger Salamander (*Ambystoma californiense*)

The information in this paragraph is adapted from the Federal Register: 65 FR 57242 (Endangered and Threatened Wildlife and Plants; final rule to List the Santa Barbara County distinct Population of the California Tiger Salamander as Endangered; Final rule) and from Western Reptiles and Amphibians (Stebbins, 1985). The California tiger salamander is a member of the family Ambystomatidae. It was formerly considered a subspecies (*Ambystoma tigrinum californiense*) of the *A. tigrinum* complex, but was recognized as a distinct species in 1991. The range of this species is limited to the Central Valley and coast of California. It is a large, stout salamander (7.5-16.2 cm) with small eyes, and a rounded snout. It lacks parotoid glands and has tubercles on the underside of both front and back feet. Color varies greatly within the species, but the California tiger salamander is basically dark with large yellow or off-white blotches.

The California tiger salamander inhabits grassland and open woodland areas, breeding in the still or slow-moving waters of vernal pools, reservoirs, and streams. Adults spend the majority of their time in burrows of ground squirrels and pocket gophers, emerging during the first significant rains of the wet season and possibly traveling as far as 1.2 miles to reach breeding areas. Females lay from 400 to 1300 eggs per breeding season, which they deposit individually or in small clusters on submergent vegetation or other stationary debris. Eggs hatch in 10 to 14 days. Initially, larval salamanders feed on algae, small crustaceans, and mosquito larvae. Gradually they include larger prey items such as tadpoles and smaller salamander larvae. Tiger salamander larvae reach maturity in 60 to 94 days.

The Site is within the known historic range of the CTS as mapped by USFWS, but the Site does not have aquatic habitat that would be considered suitable for breeding by CTS. Orcutt Creek where it crosses through the Site was dry at the time of the LFR surveys and is not known to provide the type of aquatic conditions necessary for CTS breeding (standing water for ten weeks extending into April). There are no other suitable aquatic habitats known to exist on the Site. The upland habitat on the Site (open grassland) is suitable for the CTS if they are breeding within 1.2 miles (the distance established by USFWS as the maximum migratory distance from a breeding pond). There are three ponds (ORCU-2, ORCU-3, ORCU-4) designated as potentially suitable CTS breeding ponds to the south of the Site on the south side of the Solomon Hills (County of Santa Barbara 2001). The nearest of these ponds is slightly less than one mile from the Site though they are separated by the steep ridge line. In 2007, one of these ponds; ORCU-3, was confirmed to support CTS.

A previous habitat assessment of the Site was conducted in March of 2003 in which suitability of the Site for tiger salamanders was investigated by Dr. Steve Sykes. Dr. Sykes is a 10(A)(1)(a) permitted biologist approved by USFWS to handle and conduct protocol surveys for CTS. The investigation stated that “no breeding sites for California tiger salamanders are present on the subject property. Three potential CTS breeding ponds and one recently confirmed California tiger salamander breeding pond are present within 5 Km (3.1 miles) to the south of the subject property; however the closest of these ponds is 4,750 feet from the development area. This distance, along with dense chaparral

and steep topography found in the southern portion of the property likely prevent any California tiger salamanders that may be using these potential ponds from entering the development area. Therefore, no California tiger salamanders should be impacted by this proposed development" (Sykes 2003, Appendix B).

Following the relatively recent discovery of CTS breeding in ORCU-3 in 2007, LFR began a two year upland presence/absence study on the Site following USFWS protocol. No CTS were found during the study.

Presence on the Site: Not observed during LFR general surveys or during the habitat assessment conducted by Dr. Sykes. The species was also not found during subsequent USFWS protocol upland presence/absence surveys for CTS conducted by LFR in the 2007/08 and 2008/09 rain seasons. The Site has potentially suitable upland habitat for CTS, however; the terrain separating the Site from potential and known CTS breeding ponds likely precludes the use of the Site by this species.

Least Bell's Vireo (*Vireo bellii* spp. *pusillus*)

The least Bell's vireo (FE/CE) is a migratory passerine that typically arrives on the Central California coast from Mexico in early April, and departs by late August (Lehman, 1982). This species prefers to nest in extensive, multi-canopy, riparian corridors, especially those dominated by willow and/or cottonwood trees. A normal clutch consists of four eggs incubated for two weeks, with young fledging in 10-12 days (Franzreb, 1987). Parasitism by the brown-headed cowbird and loss of riparian habitat are thought to be the major reasons for the decline of this species.

The isolated riparian habitat along Orcutt Creek through the Site is unlikely to support breeding least Bell's vireo. Typically, the species nests in riparian corridors having greater vegetative density and overall size.

Presence on the Site: The Least Bell's vireo was not observed or heard during LFR surveys (this is a migratory species typically detected on the central coast in the spring and summer). No suitable nesting habitat for the Least Bell's vireo exists on the Site.

Southwestern Willow Flycatcher (*Empidonax traillii* ssp.*extimus*)

The southwestern willow flycatcher (FE/CE) is small sparrow sized bird with large eyes, prominent wing bars, and comparatively large head common to flycatchers. The willow flycatcher lacks the prominent eye ring possessed by similar flycatchers. The species is generally dull gray to greenish on the back, with a light throat and light yellow flanks and undertail coverts. Their song is described as a sneezy *fitz-bew* and is diagnostic of the species in the field. The southwestern willow flycatcher is often found in or near aquatic habitats such as swamps and willow riparian corridors. During the breeding season they form a cup shaped nest in which they lay from two to four eggs. Incubation lasts 12 – 13

days and young fledge in 12 – 14 days. Insects make up the bulk of their diet (Ehrlich, 1988).

The riparian habitat along Orcutt Creek through the Site is not considered to be suitable breeding habitat for the southwestern willow flycatcher. The species nests in riparian corridors having greater vegetative density and overall size than that found on the Site.

Presence on the Site: The southwestern willow flycatcher was not observed or heard during LFR surveys (this is a migratory species typically detected on the central coast in the spring and summer). The existing habitat along Orcutt Creek through the Site is considered to be of marginal suitability for the southwestern willow flycatcher.

California red-legged Frog (*Rana aurora* ssp. *draytonii*)

The California red-legged frog (CRLF; FT/ CSC) is a comparatively large frog, though not as big as the bullfrog, and measures up to 13.1 cm in length. The lower abdomen and underside of the hind legs are red and this frog usually has a dark mask bordered by a white jaw stripe. The legs have dark bands and the back has many small dark flecks and larger, irregular dark blotches (some individuals lack blotches and are more uniform in color). Dorsal lateral folds on this frog are prominent. The eyes are turned outward and are well covered by the lids when viewed from above. Juveniles sometimes show yellow on the underside of hind legs (Stebbins, 1985).

The red-legged frog's historical range extended from the vicinity of Point Reyes National Seashore, Marin County, California, coastally, and from the vicinity of Redding, Shasta County, California, inland, south to northwestern Baja California, Mexico (United States Fish and Wildlife Service [USFWS], 2000).

Breeding for the California red-legged frog takes place from late November to late April. Males usually show up at breeding pools two to four weeks ahead of females and commence vocalizations. Egg masses containing from 2000 to 5000 dark, reddish brown eggs are laid in pools among emergent vegetation. Eggs hatch in 6-14 days and tadpoles metamorphose in 3.5-7 months. Juvenile frogs reach maturity in 3-4 years. California red-legged frogs may live up to ten years (Storer, 1925; Jennings and Hayes, 1990).

Red-legged frogs reside in and around deep, cold, still or slow moving water of ponds, reservoirs, marshes, streams, and other typically permanent bodies of water, especially where cattails or other plants provide good cover (Stebbins, 1985). The absence of bullfrogs and non-native predatory fish is essential in order for these microhabitats to sustain viable populations of red-legged frogs (Hayes and Jennings, 1988).

Presence on the Site: The California red-legged frog was not observed by LFR during wildlife surveys. Aquatic habitat of the type necessary to support the California red-legged frog does not exist on the Site though Orcutt Creek may offer seasonally suitable habitat if pools persist on the Site.

Southwestern Pond Turtle (*Clemmys marmorata* ssp. *pallida*)

The southwestern pond turtle is a CDFG State Species of Special Concern. This species inhabits permanent or nearly permanent bodies of water in a variety of habitat types. Lakes, rivers, streams, and ponds are typical habitats where the southwestern pond turtle can be found. It requires basking sites such as rock islands, partially submerged logs, vegetation mats, or open mud banks. The southwestern pond turtle feeds primarily on insects, worms, fish, and carrion. A clutch of 3-11 eggs is laid April through August in soft, sandy soils near waterways (Stebbins, 1985).

Site location information contained in the CNDDB for the southwestern pond turtle has been classified as "sensitive" and therefore suppressed from the records. However, southwestern pond turtles are closely associated with perennial water bodies such as ponds, lakes, and streams. Orcutt Creek through the Site is an ephemeral creek that remains dry for most of the year.

Presence on the Site: The southwestern pond turtle was not observed during LFR surveys. The Site does not have aquatic habitat to support the southwestern pond turtle.

Western Spadefoot Toad (*Scaphiopus hammondii*)

The western spadefoot toad has been classified as a CDFG, Species of Special Concern. This amphibian prefers habitat where the soil is sandy or gravelly, and vegetation is short and open. Typically, habitat types include grasslands, pine-oak woodlands, open chaparral, and scrubland. Dry periods are spent in self-made burrows, or those of small rodents such as gophers, kangaroo rats, and ground squirrels. Spadefoot toads are active mainly at night during spring and summer rains. Breeding and egg laying occur almost exclusively in shallow, temporary pools, formed by late winter and spring rains during January through May (Stebbins, 1985).

Western spadefoot toads have been found within two miles of the Site. LFR found no aquatic habitat on the Site to support breeding by the western spadefoot toad. However, upland habitat on the Site is considered suitable for this species.

Presence on the Site: The western spadefoot toad was not observed during LFR surveys. The Site does not have aquatic habitat to support breeding by the western spadefoot toad. However, there is suitable upland habitat on the Site to support the western spadefoot toad during estivation.

California Horned Lizard (*Phrynosoma coronatum frontale*)

The California horned lizard is a CDFG Species of Special Concern that is found in a variety of habitats including grassland, oak woodland, and maritime chaparral. The California horned lizard requires loose sandy soils, preferably in the presence of low shrubs that provide cover from predators. Additional requirements are open areas used

for sunning, and the presence of ants and other insect prey. Eggs are laid in sandy soils from April through June (Stebbins, 1985).

All of the aforementioned habitat requirements for this species exist at the Site. The species was observed within a mile of the Site on May 14, 2002. Encroachment of non-native plants resulting in the loss of open sandy areas favored by California horned lizards may preclude this species from occurring on the Site.

Presence on the Site: California horned lizards were observed on the Site in 2009 by LFR. Three juvenile horned lizards were found in central dune scrub habitat approximately one hundred and fifty meters upslope and west of Orcutt Creek while conducting USFWS protocol presence/absence surveys for California tiger salamanders on the Site in 2009. A CNDDB field survey form describing the observation was submitted to the CDFG. Habitat existing on the Site is suitable for the California horned lizard.

Western Burrowing Owl (*Athene cunicularia* ssp. *hypugaea*)

The burrowing owl inhabits open country of grasslands, prairies, and fields. It uses burrows of ground squirrels and prairie dogs for hiding and nesting. It is a nocturnal raptor, but can often be observed roosting outside of burrow entrances during the day. The burrowing owl feeds mainly on insects, small mammals, and reptiles. Adult burrowing owls are heavily barred and spotted while the juveniles show more of a contiguous buffy pattern below. The burrowing owls long legs separate it from all other owls of its size.

Presence on the Site: The burrowing owl was not observed during LFR surveys. The Site has suitable habitat for the western burrowing owl including an adequate amount of ground squirrel burrows which are commonly utilized by burrowing owls for cover.

White-tailed Kite (*Elanus leucurus*)

The CDFG "fully protected" and CSC white-tailed kite requires large open fields and relatively undisturbed oak woodland, grassland, and/or coastal sage scrub for successful breeding. Small mammals are the normal prey item of this species. Eggs are laid as early as mid-March and as late as the end of May. White-tailed kite habitat usually requires a stretch of riparian corridor in which to nest (particularly cottonwoods, but including eucalyptus, willows, and live oaks), and adjacent fields in which to hunt. Nests are usually well hidden in the tree canopy (Dixon et al., 1957).

White-tailed kites are known to occur on property surrounding the Site and are expected to occur on the Site itself. Kites favor the open terrain of grassland, oak woodland, and coastal scrub. Habitat existing on the Site is considered of optimal suitability to support the white-tailed kite.

Presence on the Site: The white-tailed kite was not observed on the Site during LFR surveys. The Site has suitable foraging and nesting habitat for the white-tailed kite.

Golden Eagle (*Aquila chrysaetos*)

The Golden eagle (-/CSC; "Fully Protected") is a fairly common raptor preferring open country of foothills and mountainsides. Nests are typically built in tall trees as well as on cliffs and power line towers. The golden eagle generally feeds on medium sized mammals such as cottontail rabbits, ground squirrels, and jackrabbits, as well as on snakes and carrion. It is a large dark bird. Adult eagles have a brownish or tawny wash on the back of their head and neck. The tail is faintly banded on a dark background. Juveniles have no wash on the head and neck, white wing patches on the ventral side of the wing, and a white tail with a thick terminal band. Incubation of typically two eggs lasts approximately 44 days and young eaglets fledge in 66-75 days (Ehrlich et al., 1988).

Golden eagles are regularly observed in the Santa Maria Valley. Rabbits and California ground squirrels observed on the Site present suitable foraging opportunities for the golden eagle.

Presence on the Site: Golden eagles have been observed foraging on the Site by LFR. The Site contains good foraging habitat for this species.

Prairie Falcon (*Falco mexicanus*)

The prairie falcon (-/CSC) is a large falcon of the open country and prairies. It hunts small birds and mammals, and typically nests on cliff ledges and potholes in sandstone rock faces. This falcon is basically solid brown on the back and light on the front with brown streaking or spots on the chest and wings. Two brown stripes under and behind the eye are conspicuous. It exhibits the typical falcon characteristics of long pointed wings and somewhat short tail.

The prairie falcon is a year round resident of the Santa Maria Valley. Conditions at the Site present suitable foraging habitat for the prairie falcon, however the species would not be expected to nest on the Site due to the lack of suitable cliff nesting locations.

Presence on the Site: The prairie falcon has been observed foraging on the Site by LFR. The prairie falcon may occur occasionally as a transient through the Site.

Merlin (*Falco columbarius*)

The merlin (-/CSC) is a small falcon similar in size to the American kestrel. Unlike the kestrel, the merlin does not hover when it hunts, and is a strong flyer. It often catches small birds (the bulk of its diet) in flight. The merlin nests in the open country and sparsely wooded prairies of the North Western United States, Canada, and Alaska. There are three sub-species of merlin each with a distinct variation in plumage. In general,

merlins have brown, gray-blue, or dark backs with dark streaking patterns on the ventral side, banded tail, and indistinct malar stripe under the eye.

The merlin is a regular visitor to the Santa Maria Valley during fall and spring migration. The open grassland and hillsides at the Site present suitable foraging habitat for the merlin.

Presence on the Site: A merlin was observed during surveys by LFR. The merlin is likely to occur occasionally as a transient through the Site during migration.

Loggerhead Shrike (*Lanius ludovicianus*)

The loggerhead shrike (FSC/CSC) is found in dry open habitat types including the grassland/chaparral interface. The loggerhead shrike is known for its habit of impaling prey items such as lizards, small mice, and large insects on the spines of thorn bushes or on barbed wire fencing. It generally hunts from low perches such as fence posts, wires, and the tops of low bushes. Shrikes lay five to six eggs in an open cup shaped nest well hidden in the crotch of a tree branch. Egg laying commonly begins in April and young fledge in about 34 days (Ehrlich et al., 1988).

Presence on the Site: The Loggerhead shrike was observed on the Site during LFR surveys. The Site has suitable habitat to support the Loggerhead shrike and the species may breed on the Site.

Cooper's Hawk (*Accipiter cooperii*)

The Cooper's hawk (-/CSC) is a crow-sized raptor with relatively short-rounded wings and a long tail. It feeds predominantly on small to medium sized birds, but will also take mammals such as wood rats, small rabbits, and reptiles. The breeding season for the Cooper's hawk begins in mid March to early April. Nests are typically built in the upper canopy of a dense stand of trees such as live oak or cottonwood. Nests are occasionally built atop a wood rat or squirrel nest (Meng & Rosenfield, 1988 in Roberson and Tenney, 1993). The Cooper's hawk is generally considered a secretive species, but commonly breeds within urban settings.

The Cooper's hawk was observed on the Site during surveys by LFR. The Cooper's hawk is expected to utilize the Site for foraging purposes on a year-round basis and may nest on the Site.

Presence on the Site: The Cooper's hawk was observed on the Site during surveys by LFR. The Site offers excellent foraging and nesting habitat for the Cooper's hawk.

Yellow Warbler (*Dendroica petechia* spp *brewsteri*)

The yellow warbler (-/CSC) is a migratory passerine that arrives on the central coast from South America in April and May. Breeding may start as early as late April and as late as

early July. Nests are usually well hidden near the ground among dense vegetation of riparian corridors, especially those containing dense stands of sycamore, cottonwood, or willow trees. Eggs are incubated for 10-12 days. Nestlings remain in the nest for just over a month (Ehrlich et al., 1988). Decline of this species is attributed primarily to parasitism by the brown-headed cowbird (*Molothrus ater*) and loss of riparian habitat.

Habitat existing on the Site is not the preferred habitat type for the yellow warbler.

Presence on the Site: The yellow warbler was not observed or heard during LFR surveys (this is a migratory species typically detected on the central coast in the spring and summer). The Site lacks dense riparian habitat which is preferred by the yellow warbler.

Tricolored Blackbird (*Agelaius tricolor*)

The tricolored blackbird (FSC/CSC) is endemic to California. Statewide the population has declined by almost 90% over the last 50 years to about 51,600 adults. Where colonies of 150,000 pairs were once reported during the 1930s, there is currently no colonies known to exist with more than 5,000 pairs (Beedy et al., 1991). The tricolored blackbird is found in freshwater marshy areas, farm and other ponds, with cattails, tules, and rushes. The species close association with freshwater ponds and marshes makes it susceptible to drought and drainage of wetlands. Tricolored blackbirds nest in colonies that usually consist of a least 50 or more pairs. Breeding takes place from April through June and may include more than one clutch of young. Fledging of young occurs 11-14 days after the two-week incubation period (Roberson and Tenney, 1993)

Presence on the Site: The tricolored blackbird was not observed during LFR surveys. The Site does not have habitat that would support a breeding colony of tricolored blackbirds.

Ferruginous Hawk (*Buteo regalis*)

The ferruginous hawk (FSC/CSC) is a large raptor that is often observed perched on the ground in open fields, on power poles, or in trees while it searches for prey species (usually small to medium sized mammals). It has longer, more pointed wings than the red-tailed hawk, and its wings form more of a dihedral when soaring. It is not uncommon for this species to hunt from a high soar, or to hover for brief periods when hunting. It is generally found in dry, open fields and grasslands. Adults have rufous colored feathers extending down the tarsi to the ankle, crescent shaped white wing patches on the dorsal surface of the wings, and a large gape to the mouth which extends under the eye. The tail is generally off-white or gray with a faint terminal band.

Ferruginous hawks are known to winter in the Santa Maria Valley. Habitat existing at the Site represents suitable foraging habitat for the ferruginous hawk.

Presence on the Site: The ferruginous hawk has been observed foraging on the Site by LFR. The Site contains good foraging habitat for this species.

California Thrasher (*Toxostoma redivivum*)

The California thrasher (FSC) is found almost exclusively in coastal scrub and chaparral habitats. The species nests low to the ground in the dense shrubs and low trees within these habitat types. The diet of the California thrasher consists mainly of insects supplemented with seeds and some fruit. Incubation of three to four eggs occurs generally in March to May, but may take place as late as August. California thrashers may raise two broods in a season (Ehrlich et al., 1988).

Presence on the Site: California thrashers were expected but not observed on the Site during LFR surveys. The Site has suitable habitat to support the California thrasher and the species may breed on Site.

Horned Lark (*Eremophila alpestris*)

The horned lark (-/CSC) is a widespread passerine that is found throughout the United States. It is a ground nesting bird typically observed in open terrain such as grassland, tundra, and agricultural fields. Farming operations are thought to be responsible for the destruction of many horned lark nests. This species can be found throughout the year on the central coast. The horned lark is a short grass specialist whose population, unlike most species, appears to be benefiting from grazing, cultivation, and deforestation practices (Ehrlich et al., 1988, in Roberson and Tenney, 1993).

Presence on the Site: The horned lark was not observed during LFR surveys. The Site does have open grassland habitat of suitable size that could be utilized as foraging habitat by this species.

American Badger (*Taxidea taxus*)

The American badger (-/CSC) is found in open grassland, coastal scrub, chaparral, and oak woodland. Ground squirrels and other small rodents, such as the kangaroo rat, are common prey items of the badger. The American badger is generally nocturnal, but is sometimes observed active in the daytime. Burrow openings of this species are elliptical and approximately 8-12 inches wide. Young are born in March and April (Whitaker, 1996).

The presence of California ground squirrels at the Site presents a favored prey base for the badger. Scratch marks, honeycomb, and tailings observed at the entrance to some of the ground squirrel burrows may have been the result of a foraging badger.

Presence on the Site: The American badger was not observed during LFR surveys. American badgers are known to occur in the Santa Maria Valley. The Site has suitable habitat for the American badger.

Monarch Butterfly (*Danaus plexippus*)

The monarch butterfly does not have federal or state listing status, but is included as a sensitive species in the CNDDB. Winter roost sites have been found from Northern Mendocino County to Baja California, Mexico with several known sites on the central coast. The listing by CDFG is based on the limited wintering roost sites within the central coast portion of the butterfly's West Coast wintering range. The monarch butterfly can be found in a variety of habitats, especially those supporting milkweed plants (*Asclepias* species), the primary food source of the caterpillars. These butterflies frequent grasslands, prairies, meadows, and wetlands, but avoid dense forests. In the winter, monarchs cluster together in large numbers in eucalyptus, cypress, and Monterey pine trees, often on the edge of open areas.

The closest CNDDB reports of wintering monarch butterflies come from the vicinity of Waller Park in Santa Maria. The reports did not confirm a wintering cluster; the observations were of flying butterflies in the park, indicating the possibility of a wintering roost site. However, the Orcutt Community Plan states that the Site is the only known Monarch butterfly autumnal roosting site in the Orcutt planning area.

Presence on the Site: There was no indication of a monarch butterfly wintering roost present on the Site during the LFR winter wildlife survey. No indications of roosting butterflies were observed. There are suitable stands of eucalyptus trees offering potential roost sites for wintering monarch butterflies on the Site.

5.0 IMPACTS

The following sections discuss potential ecological impacts anticipated for a development project at this Site. This analysis is based on the most current development design as of September 2006. The Orcutt Community Plan EIR considered development on all portions of Key Site 3. However, the Orcutt Community Plan itself restricted the development area to the 40-acre upper mesa. The discussion below addresses all portions of the Site.

5.1 Direct Loss of Vegetation, Wildlife Habitat, and Sensitive Species

No direct impacts to state or federally-listed threatened or endangered species are anticipated. Expected direct impacts associated with the project involve the loss of native plants and portions of plant communities, as well as loss of open foraging ground for wildlife and loss of fossorial wildlife species present on the Site during clearing. The area of impact by habitat type is presented in Table 4.

5.1.1 Orcutt Creek and Riparian Habitat Impacts

A small area of impact to the arroyo willow riparian scrub forest (0.02 acre) is anticipated associated with the discharge infrastructure for stormwater generated on the Site. Final engineering designs have not been developed for the stormwater infrastructure so disturbance areas are estimates and the actual locations are unknown. This report assumes that approximately 1200 square feet of arroyo willow riparian forest scrub will be impacted by project activities (e.g., headwalls and energy dissipation), though this number must be validated based on actual infrastructure designs.

An additional impact to Orcutt Creek is anticipated in association with the bridge crossing to access the eastern ranchettes south of the creek. The proposed bridge location does not impact riparian botanical resources as it was intentionally located in a gap in the riparian corridor in an area supporting non-native grassland. Depending on the bridge design (e.g., clear-span vs. culvert crossing), temporary and/or permanent impacts to the creek itself may be anticipated. The total disturbance area at the creek would be approximately 1100 square feet based on the width of the creek at the crossing location and the width of the proposed bridge as shown on the current project design plan. This potential impact is not identified uniquely on Table 4 but is included in the impact of non-native grassland.

With the exception of the stormwater outlet(s) and the bridge, the project maintains a minimum 50-foot setback from the outer edge of the riparian corridor (further in areas where the floodway extends beyond the riparian canopy). This area is to be restricted from development with the exception of a meandering unpaved footpath. No landscaping is proposed in this area, though the use of locally collected native species would be acceptable. The development also includes an additional 10-foot setback associated with the edge of the expected grading for some or all of the lots adjacent to Orcutt Creek. It is our understanding that this 10-foot area will be landscaped with native species.

5.1.2 Upland Habitat Impacts

No direct impacts to sensitive native upland habitats are anticipated though native central coastal scrub habitat will be impacted as is discussed below. The historic agricultural use of the area north of Orcutt Creek in combination with current grazing has significantly reduced the existing habitat quality in this area and no sensitive resources were mapped north of Orcutt Creek. However, if the cattle were removed and no further clearing was conducted, the central coastal scrub habitat on the lower mesa north of Orcutt Creek would likely improve in quality through native recruitment based on the density of existing native vegetation in the area.

Nesting and foraging habitat for birds favoring grassland and coastal scrub communities would be lost through development.

On the steep slopes south of Orcutt Creek, the habitat quality is significantly better than elsewhere on the Site, though cattle have significantly affected large areas even on the

slopes. This habitat is contiguous with similar high quality native habitat extending south and west into the Soloman Hills. The proposed development in this area would restrict the disturbance envelopes to an area of high quality central coastal scrub habitat (impacting approximately 5.8 acres; Table 4).

The proposed lots in this area would collectively include all of the parcel south of Orcutt Creek, and as such, all of the ecological resources would occur on private property. All of the areas outside the designated building envelopes would be established as private natural open space. No direct impacts to resources in the habitat outside the disturbance envelopes have been included on Table 4 in this assessment; however, as is discussed in the Section below, protection of habitat and habitat quality that occurs on private property is difficult to enforce in perpetuity, particularly as the properties are repeatedly purchased and sold. It is our understanding that detailed Conditions, Covenants, and Restrictions (CC&Rs) would be established to protect the sensitive habitat within the private natural open space on each of these lots. These would include conditions to prevent modifications or disturbance to the habitat outside the development envelope, to prohibit the use of invasive non-native species for landscaping and to prohibit fencing along property lines that border native habitat (to allow continued wildlife movement through the area), among others. These issues are discussed further in Section 6.0 below.

The development design largely protects the east/west connectivity and avoids direct impacts to the wildlife corridor function of Orcutt Creek, though, as is discussed below, indirect impacts associated with the encroachment of the development are anticipated. Site development, particularly the development south of Orcutt Creek, would result in fragmentation of native habitat resulting in barriers to wildlife movement. This development area may also serve as a weed source degrading the surrounding high quality habitat. No significant impacts on KeySite 2 are expected where the access road for KeySite 3 crosses that parcel.

5.2 Indirect Loss of Vegetation and Wildlife Habitat

Indirect losses to vegetation are anticipated to occur as a result of construction or in association with ultimate build-out and occupancy of the development project. An increase in noise, artificial light, human activity, vehicle traffic, domestic pets, and weed invasion are anticipated to result from this project. These changes diminish the ability of existing natural habitat to support wildlife, and typically lead to a reduction in the carrying capacity of the habitats resulting in the decline or potential extirpation of local populations of certain native plant and wildlife species.

In addition to the impacts listed above, the development south of Orcutt Creek poses a number of potentially occurring indirect impacts over the long term that are difficult to accurately characterize or quantify at this time. The development in this area is anticipated to slowly degrade the quality of the surrounding native habitat through use by pets increasing predation on small mammals, reptiles, and birds; escape of ornamental plants; and other expected activities associated with a residential use. As noted above, the

habitat quality in this area is higher than on other portions of the Site, though large areas have been disturbed by cattle grazing.

The effects of many of these issues can be ameliorated through development designs and restrictions such as screening of light from open space areas, limitations on landscaping, appropriate fencing, and others. Many of these measures are discussed below.

6.0 POTENTIAL IMPACT AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

All development plans benefit from offering a variety of measures to effectively avoid, minimize, and mitigate potential impacts associated with the project. Several of these are described below for consideration during the development of subsequent environmental review documents.

6.1 Avoidance & Minimization Measures

Avoidance of impacts is the preferred approach to decision-making during the development design review. The following measures should be considered to avoid impacts.

- Limit disturbance of upland habitat – The portion of the Site designated for development in the Orcutt Community Plan is limited to the upper mesa. Protection of the southern portion of the Site, particularly the slopes south of Orcutt Creek would substantially reduce project impacts to high quality native habitat, though as currently designed, the project avoids direct impacts to sensitive resources. All of the sensitive resources mapped on the Site occur south of Orcutt Creek with the exception of the short section of Orcutt Creek crossing the northwest portion of the Site below the existing cattle corral. Disturbed native habitat occurs north of Orcutt Creek on the lower floodplain, and disturbed non-native grassland covers the upper mesa.

- Limit disturbance of riparian habitat – Development should be kept as far back from the banks of Orcutt Creek and the associated drainages as possible. The hydrologic regimen of these areas of the Site should be protected to avoid changes in the volume or duration of flooding, and to maintain or improve habitat and water quality conditions if feasible. The proposed buffer of 50-feet is suitable. No disturbance to the buffer should be allowed with the exception of the proposed bridge, stormwater infrastructure, and the meandering multipurpose trail. Landscaping should be restricted to locally-collected native species only.

- Installation of the stormwater infrastructure and bridge at Orcutt Creek and within the riparian corridor should be conducted when the drainage is dry. The area of impact should be clearly delineated prior to any disturbance and a pre-

construction reconnaissance level survey should be conducted to quantify the number of mature native trees to be impacted (if any) and to survey for sensitive species.

- LFR recommends that construction activities near Orcutt Creek cease during rainy weather when amphibian species such as CRLF, CTS, and spadefoot toads are more likely to be found above ground and dispersing to aquatic habitats (though none of these species are expected to occur on the Site). Silt fencing is recommended along the edge of the disturbance area adjacent to all drainages through the Site. The fencing can help prevent amphibians such as western spadefoot toads from entering the work area, delineate the work area for construction personnel, and help prevent erosion into the creek.

- In recognition of the continued long-term use of the public and private natural open space areas by wildlife, development restrictions (e.g., CC&Rs/HOA restrictions) should require screening of lights to prevent glare into natural open space areas, particularly along Orcutt Creek and in the area south of Orcutt Creek. Motion sensor lights should only cover areas immediately adjacent to structures and should also be shielded from shining into open space areas.

- Strict restrictions on use the of the private natural open space occurring outside the disturbance envelope but within the property lines for the proposed lots south of Orcutt Creek should be formalized and tied permanently to each lot. An open space habitat management plan should be included in the CC&Rs for these lots and should be written specifically to protect the natural functions of the area for botanical and wildlife resources. Specific conditions should at a minimum include:

    - Prohibition of the use of invasive species for landscaping

    - Prohibition of fences along property lines through the undeveloped portions of the lots. Fences that do not preclude movement by wildlife could be acceptable and would avoid the potential impact to wildlife movement, however, the impacts associated with installation would likely be significant (direct removal of sensitive vegetation as well as potential for weed invasion in sensitive habitats) and these potential impacts are not addressed in this assessment.

    - Prohibition of any native vegetation removal or construction of any structures or infrastructure within the undeveloped portions of the lots.

    - Limitations on fuel management activities (all fuel modification should be restricted to the development area only).

    - Requirement of fencing around disturbance envelope (not the property lines) to prevent pets and other access to the undisturbed areas (Note: it is

recognized that individual property owners will maintain the right to access any portion of their property).

- Clear standards for consistency with the open space habitat management plan for these lots.

- Maintain connectivity across the Site – Orcutt Creek and the adjacent upland areas on the Site provide connectivity with the parcels adjacent to the Site (south and west) and to different areas within the Site. Road crossings, particularly the access road to the proposed lots south of Orcutt Creek should be designed to allow wildlife movement through these corridors and should require wildlife crossing signage. The bridge design should incorporate wildlife movement as a priority design parameter with a preference for a clear-span crossing if feasible.

- Avoid impacts to nesting birds - All initial disturbance activities in shrub and tree dominated areas should avoid the bird breeding season (March 1 to August 15). If initial construction activities are proposed during this period, pre-construction nesting bird surveys of the Site should be conducted two weeks prior to the start of ground clearing or grading activity. Construction activities that involve disturbances within 500-feet of an active nest should be avoided. Construction personnel should be aware of the importance of staying out of Orcutt Creek and any associated minor tributaries as they represent an important habitat type commonly used for nesting purposes by many bird species.

- Pre-construction wildlife surveys are recommended prior to initial ground clearing activities in order to identify any active American badger dens or other burrowing wildlife species occurring on the Site. Detection of active burrows well in advance (at least two weeks) of scheduled construction work is necessary in order to adequately exclude badgers from the Site prior to the start of clearing activities.

- All disturbance areas should be clearly delineated in the field with fencing prior to any site disturbance activities including grading, grubbing, and clearing.

6.2 Mitigation Measures

The anticipated impacts associated with the project could include the loss of upland and riparian habitat resources as well as the potential loss of individual botanical and wildlife resources. LFR recommends that, during the ongoing environmental review for the project, consideration of permanent protection of natural open space through easement or fee dedication be considered. This could include permanent protection of particular resources (e.g., riparian scrub, central maritime chaparral), mitigation for specific losses, or more generalized consideration of protected habitat to offset loss of other less specific habitat resources. The dedication should include a management plan describing allowable and prohibited use of the open space areas as well as any required activities (e.g., maintenance or monitoring) if not specifically addressed in the development plan for the

project. If active measures are required to replace habitat losses, the Site supports large areas of degraded habitat suitable for habitat restoration where native conditions could be effectively enhanced through maintenance (e.g., weed abatement) or habitat replacement. If habitat restoration and replacement are proposed, they should include a formal restoration implementation plan including quantifiable performance criteria and long-term maintenance and monitoring requirements.

7.0 CONCLUSIONS

The findings of the LFR Sensitive Species and Habitat Survey for the Key Site 3 Project Site indicate that four rare communities and several sensitive species occur on the Site. No state or federally listed threatened or endangered species were observed at the Site during the surveys. Central dune scrub and central maritime chaparral occur on the north-facing slopes of the Solomon Hills south of Orcutt Creek, with the maritime chaparral replacing coastal scrub at higher elevations. Central coast arroyo willow riparian scrub occurs in a few patches along Orcutt Creek. Central coast live oak riparian forest predominates along Orcutt Creek. Coast live oak woodland is found on the north-facing slopes on the southern portion of the Site, especially adjacent to ravines and slopes leading to Orcutt Creek. Coast live oaks are considered a sensitive species in Santa Barbara County.

Eight other sensitive plant species were observed at the Site; these include shagbark manzanita, dune larkspur, Lompoc ceanothus, California spineflower, San Luis Obispo wallflower, small-seeded seaside bird's beak, small-flowered collinsia, and Lompoc monkeyflower. Several other sensitive species may be present, however, that may be more recognizable later because they bloom later in the summer or in early fall.

The limits of disturbance should be clearly delineated and fenced prior to any Site clearing or grading activities.

Conditions existing on the Site provide potentially suitable habitat for sensitive wildlife species such as the California horned lizard, western spadefoot toad, loggerhead shrike, Cooper's hawk, white-tailed kite, and American badger; all of which have been observed on or near the Site. Several raptor species are known to utilize the Site either on a year round basis, intermittently, or seasonally and may nest on the Site. Development of the Site will significantly change the existing Site conditions and will impact wildlife resources.

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TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3

(Compiled from LFR November 2005 and May 2006 field surveys)

Scientific Name	Common Name
TREES	
Eucalyptus viminalis	ribbon gum
Eucalyptus globulus	blue gum eucalyptus
Juglans hindsii	Northern California walnut
Pinus halepensis	Aleppo pine
Pinus radiata	Monterey pine
Quercus agrifolia	**coast live oak**
Salix lasiolepis	**arroyo willow**
SHRUBS	
Adenostoma fasciculatum	**chamise**
Arctostaphylos rudis	**shagbark manzanita, sand mesa manzanita**
Artemisia californica	**California sagebrush**
Baccharis pilularis subsp. consanguinea	**coyote bush**
Baccharis salicifolius	**mule fat**
Ceanothus cuneatus subsp. fascicularis	**Lompoc ceanothus**
Cercocarpus betuloides var. betuloides	**mountain-mahogany**
Ericameria ericoides	**dune-heather**
Eriophyllum confertiflorum	**golden yarrow**
Heteromeles arbutifolia	**toyon**
Isocoma menziesii	**Coastal goldenbush**
Juniper communis	prostrate juniper, common juniper
Keckiella cordifolia	**climbing penstemon**
Lantana montevidensis	lantana
Lonicera subspicata var. denudata	**chaparral honeysuckle**
Lotus scoparius	**deerweed**
Lupinus chamissonis	**silver bush lupine**
Mimulus aurantiacus subsp. lompocensis	**Lompoc sticky monkeyflower**
Nicotiana glauca	tree tobacco
Opuntia ficus-indica	Misssion cactus
Pyracantha species	firethorn
Rhamnus californica	**coffee berry**
Rhamnus crocea	**redberry**
Ribes speciosum	**fuchsia-flowered gooseberry**
Rubus ursinus	**California blackberry**
Salix exigua	**sandbar willow**
Salvia mellifera	**black sage**
Sambucus mexicana	**Mexican elderberry**
Senecio flaccida	**bush groundsel**
Solanum douglasii	**Douglas' nightshade**
Toxicodendron diversilobum	**poison-oak**
HERBS (annuals, biennials, and herbaceous perennials)	
Acourtia microcephala	**sacapellote**
Agrostis pallens	**thin grass**
Aira caryophyllea	silver hair grass

TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3

(Compiled from LFR November 2005 and May 2006 field surveys)

Scientific Name	Common Name
Amaranthus species	amaranth
Ambrosia psilostachya	**western ragweed**
Amsinckia spectabilis var. microcarpa	**small-fruited seaside fiddleneck**
Anagallis arvensis	scarlet pimpernel
Apiastrum angustifolium	**wild celery**
Aptenia cordifolia	ice plant
Artemisia douglasiana	**mugwort**
Asclepias fascicularis	**narrow-leaved milkweed**
Avena barbata	slender wild oat
Bowlesia incana	**hoary bowlesia**
Brassica nigra	black mustard
Brassica rapa	field mustard
Bromus carinatus	**California brome**
Bromus catharticus	rescue grass
Bromus diandrus	ripgut brome
Bromus hordeaceus	soft chess brome
Bromus madritensis subsp. rubens	red brome
Calandrinia ciliata	**red maids**
Calystegia macrostegia subsp. cyclostegia	**chaparral morning glory**
Camissonia campestris subsp. campestris	**field sun-cup**
Camissonia intermedia	**sun-cup**
Camissonia micrantha	**small sun-cup**
Carduus pycnocephalus	Italian thistle
Carex globosa	**round-fruited sedge**
Carpobrotus edulis	ice plant
Castilleja exserta subsp. exserta	**purple owl's clover**
Centaurea melitensis	tocalote
Cerastium glomeratum	mouse-eared chickweed
Chamaesyce albomarginata	**rattlesnake weed**
Chamomilla suaveolens	pineapple weed
Chenopodium californicum	**California goosefoot**
Chenopodium murale	nettle-leaved goosefoot
Chlorogalum pomeridianum subsp. pomeridianum	**soap plant, amole**
Chorizanathe diffusa	**diffuse spineflower**
Chrysanthemum coronarium	garland chrysanthemum
Cirsium occidentale var. occidentale	**cobweb thistle**
Cirsium vulgare	bull thistle
Clarkia epilobioides	**canyon clarkia**
Clarkia purpurea subsp. quadrivulnera	**farewell-to-spring**
Claytonia parviflora subsp. parviflora	**narrow-leaved miner's lettuce**
Claytonia perfoliata	**miner's lettuce**
Collinsia sparsiflora var. collina	**few-flowered collinsia**
Conium maculatum	poison-hemlock
Conyza bonariensis	flax-leaved fleabane
Conyza canadensis	**horseweed**
Cotula australis	Australian brass buttons
Crassula connata	**pygmy weed**
Croton [Eremocarpus] setigerus	**dove weed**
Croton californicus	**California croton**

TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3

(Compiled from LFR November 2005 and May 2006 field surveys)

Scientific Name	Common Name
Cryptantha clevelandii	**Cleveland's cryptantha**
Cryptantha intermedia	**white forget-me-not**
Cuscuta californica	**California dodder**
Cynodon dactylon	Bermuda grass
Daucus pusillus	**rattlesnake weed, wild carrot**
Deinandra [Hemizonia] increscens subsp. increscens	**coast tarweed**
Delphinium parryi subsp. blockmaniae	**Blochman's larkspur**
Dudleya lanceolata	**live-forever**
Ehrharta calycina	veldt grass
Epilobium canum	**California fuchsia**
Epilobium ciliatum	**willow herb**
Eriastrum densifolium subsp. elongatum	**woolly-star**
Erigeron foliosus var. foliosus	**leafy daisy**
Eriogonum gracile subsp. gracile	**slender buckwheat**
Eriophyllum multicaule	**branched woolly sunflower**
Erodium botrys	storkbill filaree
Erodium cicutarium	redstem filaree
Erysimum capitatum subsp. lompocense	**San Luis Obispo wallflower**
Eucrypta chrysanthemifolia var. chrysanthemifolia	**common eucrypta, fairy eucrypta**
Euphorbia peplus	spotted spurge
Filago californica	**California filago**
Filago gallica	Mediterranean filago
Foeniculum vulgare	fennel, sweet anise
Galium aparine	**goose-grass, cleavers**
Gazania species	gazania
Geranium dissectum	cut-leaved geranium
Gnaphalium bicolor	**bicolored everlasting**
Gnaphalium californicum	**California everlasting**
Gnaphalium canescens subsp. microcephalum	**white everlasting**
Gnaphalium ramosissimum	**pink everlasting**
Gnaphalium stramineum	**cotton-batting everlasting**
Gnaphalium luteo-album	cudweed everlasting
Helianthemum scoparium	**rush-rose**
Heterotheca grandiflora	**telegraph weed**
Hirschfeldia incana	Mediterranean mustard, summer mustard
Hordeum murinum	Mediterranean barley
Horkelia cuneata subsp. cuneata	**coast horkelia**
Hypochaeris glabra	smooth cat's ear
Hypochaeris radicata	hairy cat's ear
Iva axillaris subsp. robustior	**poverty weed**
Juncus bufonius	**toad rush**
Juncus patens	**common rush**
Juncus textilis	**Indian rush**
Koeleria macrantha	**June grass**
Lastarriaea coriacea	**leather spineflower**
Lavatera cretica	Cretan mallow
Layia glandulosa	**white layia**

TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3

(Compiled from LFR November 2005 and May 2006 field surveys)

Scientific Name	Common Name
Layia hieracioides	**tall layia**
Lepidium nitidum var. nitidum	**peppergrass**
Lessingia filaginifolia	**California aster**
Lessingia glandulifera var. glandulifera	**sticky lessingia**
Leymus condensatus	**giant rye**
Leymus triticoides	**creeping ryegrass, alkali rye**
Linaria canadensis var. texana	**blue toad-flax**
Lonicera subspicata var. denudata	**chaparral honeysuckle, southern honeysuckle**
Lotus purshianus	**Spanish clover**
Lotus strigosus	**hairy lotus, Bishop's lotus**
Lotus wrangelianus	**Chilean lotus**
Lupinus bicolor	**miniature lupine**
Lupinus nanus	**sky lupine**
Lupinus truncatus	**blunt-leaved lupine**
Madia exigua	**least tarweed**
Madia sativa	**coast tarweed**
Malva parviflora	cheeseweed
Marah fabaceus	**wild cucumber**
Marrubium vulgare	horehound
Medicago polymorpha	burclover
Melica imperfecta	**Coast Range melic**
Micropus californica	**slender cottonplant**
Mucronea californica	**California spineflower**
Nassella cernua	**nodding needlegrass**
Nassella lepida	**foothill needlegrass**
Nassella pulchra	**purple needlegrass**
Navarretia atractyloides	**holly-leaved navarretia**
Oxalis corniculata	creeping wood-sorrel
Oxalis pes-caprae	Bermuda-buttercup
Paeonia californica	**California peony**
Pedicularis densiflora	**Indian warrior**
Phacelia distans	**wild heliotrope**
Phacelia douglasii	**Douglas' phacelia**
Phacelia ramosissima	**caterpillar phacelia**
Pholistoma auritum	**fiesta flower**
Picris echioides	bristly ox-tongue
Piptatherum miliaceum	smilo grass
Plantago erecta	**California plantain**
Platystemon californicus	**cream cups**
Plantago lanceolata	English plantain
Poa annua	annual bluegrass
Polygonum arenastrum	common knotweed
Polycarpon depressum	**California polycarp**
Polycarpon tetraphyllum	four-leaved all seed
Polypogon monspeliensis	rabbitsfoot grass
Pterostegia drymarioides	**fairy mist**
Raphanus sativus	radish

TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3

(Compiled from LFR November 2005 and May 2006 field surveys)

Scientific Name	Common Name
Rumex acetosella	sour dock
Rumex salicifolia	**willow dock**
Rumex pulcher	fiddle dock
Rumex crispus	curly dock
Salvia columbariae	**chia sage**
Salvia spathacea	**hummingbird sage**
Sanicula crassicaulis	**snakeroot**
Silene gallica	windmill pink
Silybum marianum	milk thistle
Sisymbrium officinale	hedge mustard
Solanum sarrachoides	hairy nightshade
Solidago californica	**California goldenrod**
Sonchus oleraceus	common sow-thistle
Spergularia rubra	red spurrey
Stachys bullata	**wood mint, hedge-nettle**
Stephanomeria virgata	**wire-lettuce**
Stellaria media	chickweed
Stylocline gnaphalioides	**everlasting nest-straw**
Trifolium ciliolatum	**foothill clover**
Trifolilum hirtum	rose clover
Uropappus lindleyi	**silver puffs**
Urtica urens	dwarf nettle
Verbena lasiostachys	**western verbena**
Vicia villosa subsp. varia	smooth vetch
Vicia villosa subsp. villosa	woolly vetch
Vulpia microstachys	**small fescue**
Vulpia myuros	rattail fescue
Vulpia octoflora	**six-weeks fescue**
Xanthium spinosum	**spiny-leaved clotbur**
Xanthium strumarium	**cockle-bur**
Zigadenus fremontii var. fremontii	**chaparral zygadene**
FERNS and FERN ALLIES	
Dryopteris arguta	**coastal wood fern**
Pellaea mucronata	**bird's foot fern**
Pentagramma triangularis subsp. triangularis	**gold-back fern**
Polypodium californicum	**California polypody**

Note: native species are in **bold** print

TABLE 2
OBSERVED OR EXPECTED WILDLIFE SPECIES AT KEYSITE 3

Compiled from LFR November 2005 field surveys

Scientific Name	Common Name
MAMMALS	
Canis latrans	**Coyote**
Lynx rufus	**Bobcat**
Mephitis mephitis	Striped skunk
Microtis californicus	California vole
Mustela frenata	Long-tailed weasel
Neotoma fuscipes	**Dusky-footed woodrat**
Odocoileus hemionus	**Black-tailed deer**
Spermophilus beecheyi	**California ground squirrel**
Procyon lotor	Raccoon
Sus scrofa	Feral pig
Thomomys bottae	**Botta's pocket gopher**
REPTILES AND AMPHIBIANS	
Batrachoseps pacificus	Pacific slender salamander
Bufo boreas	Western toad
Ensatina eschscholtzii	Ensatina salamander
Gerrhonotus coeruleus	Northern alligator lizard
Hyla regilla	**Pacific treefrog**
Lampropeltis getulus	Common kingsnake
Phrynosoma coronatum	California horned lizard
Pituophis melanoleucus	Gopher snake
Sceloporus occidentalis	**Western fence lizard**
Uta stansburiana	Side-blotched lizard
BIRDS	
Aphelocoma californica	**Western scrub jay**
Accipiter cooperii	**Cooper's hawk**
Baeolophus inornatus	**Oak titmouse**
Bubo virginianus	**Great horned owl**
Buteo lineatus	Red-shouldered hawk
Buteo Jamaicensis	**Red-tailed hawk**
Callipepla californica	**California quail**
Calypte anna	**Anna's hummingbird**
Carpodacus mexicanus	**House finch**
Cathartes aura	**Turkey vulture**
Chamaea fasciata	**Wrentit**
Chondestes grammacus	**Lark sparrow**
Corvus brachyrhynchos	**American crow**
Corvus corax	**Common raven**
Dendroica coronata	**Yellow-rumped warbler**
Dendroica townsendi	**Townsend's warbler**
Euphagus cyanocephalus	**Brewer's blackbird**
Falco columbarius	**Merlin**
Falco sparverius	**American kestrel**
Lanius ludovicianus	**Loggerhead shrike**
Passerculus sandwichensis	**Savannah sparrow**
Picoides nuttallii	**Nuttall's woodpecker**
Picoides villosus	**Hairy woodpecker**

TABLE 2
OBSERVED OR EXPECTED WILDLIFE SPECIES AT KEYSITE 3

Scientific Name	Common Name
Pipilo crissalis	**California towhee**
Pipilo maculatus	**Spotted towhee**
Psaltriparus minimus	**Bushtit**
Regulus calendula	**Ruby-crowned kinglet**
Sayornis nigricans	**Black phoebe**
Sayornis saya	**Say's phoebe**
Sialia mexicana	**Western bluebird**
Sturnus vulgaris	**European starling**
Sturnella neglecta	**Western meadowlark**
Toxostoma redivivum	California thrasher
Thryomanes bewickii	**Bewick's wren**
Troglodytes aedon	**House wren**
Vermivora celata	**Orange-crowned warbler**
Zenaida macroura	**Mourning dove**
Zonotrichia leucophrys	**White-crowned sparrow**
Zonotrichia atricapilla	**Golden-crowned sparrow**

***** Species in bold print were observed during LFR December survey

TABLE 3
PRESENT OR CNDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY
FOR THE KEYSITE 3 PROPERTY AND SURROUNDING AREA

Based on CNPS Inventory of Rare and Endangered Plants (online edition, v6-04b; 2005) and CNDDB (2005) search results for the Orcutt, Casmalia, Sisquoc, Santa Maria, and Lompoc quadrangles; and LFR 2005 field surveys.

Name	Common Name	Status	Occurrence of Element on Project Site
Natural Communities		**CDFG**	
	Central Coast Arroyo Willow Riparian Forest	**Threatened**	**Present**
	Central Coast Live Oak Riparian Forest	**Threatened**	**Present**
	Central Maritime Chaparral	**Threatened**	**Present**
	Central Foredunes	Very Threatened	Not present
	Central Dune Scrub	**Threatened**	**Present**
	Native Grassland	Very Threatened	Not present
	Coastal and Valley Freshwater Marsh	Very Threatened	Not present
	Southern California Steelhead Stream	Status not defined	Not present
	Southern California Threespine Stickleback Stream	Status not defined	Not present
	Southern Vernal Pool	Status not defined	Not present
Amphibians		**USFWS / CDFG**	
Ambystoma californiense	California tiger salamander	FE / CSC	Not observed; potentially suitable upland habitat present. Site isolated from known breeding locations
Rana aurora draytonii	California red-legged frog	FT / CSC	Not observed; no suitable habitat present
Scaphiopus hammondii	Western spadefoot toad	FSC / CSC	Not observed; potentially suitable upland habitat present
Birds		**USFWS / CDFG**	
Accipiter cooperii	**Cooper's hawk**	**- / CSC**	**Observed; May nest on the Site**
Agelaius tricolor (nesting colony)	Tricolored blackbird	FSC / CSC	Not observed; no suitable habitat present
Aquila chrysaetos (wintering and nesting)	Golden eagle	- / CSC	Not observed; suitable foraging habitat present
Athene cunicularia (burrow sites)	Western burrowing owl	FSC, MNBMC / CSC	Not observed; suitable habitat present
Buteo regalis (wintering)	Ferruginous hawk	FSC / CSC	Not observed; suitable foraging habitat present
Dendroica petechia brewsteri (nesting)	Yellow warbler	- / CSC	Not observed; no suitable riparian habitat present
Empidonax traillii extimus (nesting)	Southwestern willow flycatcher	FE / -	Not observed; no suitable riparian habitat present
Elanus leucurus (nesting)	White-tailed kite	MNBMC / CSC, nesting (fully protected)	Not observed; suitable foraging and nesting habitat present
Eremophila alpestris	California horned lark	- / CSC	Not observed; limited suitable habitat present
***Falco columbarius* (wintering)**	**Merlin**	**- / CSC**	**Observed; suitable foraging habitat present**
Falco mexicanus (nesting)	Prairie falcon	- / CSC	Not observed; suitable foraging habitat present
Lanius ludovicianus	**Loggerhead shrike**	**- / CSC**	**Observed; suitable nesting and foraging habitat present**
Vireo bellii pusillus (nesting)	Least Bell's vireo	FE / SE	Not observed; no suitable riparian habitat present

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Based on CNPS Inventory of Rare and Endangered Plants (online edition, v6-04b; 2005) and CNDDB (2005) search results for the Orcutt, Casmalia, Sisquoc, Santa Maria, and Lompoc quadrangles; and LFR 2005 field surveys.

Name	Common Name	Status	Occurrence of Element on Project Site
Fish			
Gasterosteus aculeatus williamsoni	Unarmored threespine stickleback	FE / SE	Not observed; no suitable habitat present
Oncorhynchus mykiss irideus	southern steelhead trout	FE / CSC	Not observed; no suitable habitat present
Invertebrates			
Danaus plexippus	**Monarch butterfly**	**- / -**	**Observed; marginal roosting habitat present**
Mammals			
Taxidea taxus	American badger	- / -	Not observed; suitable habitat present
Reptiles			
Anniella pulchra pulchra	Silvery legless lizard	FSC / CSC	Not observed; marginal habitat present
Clemmys marmorata pallida	Southwestern Pond Turtle	FSC / CSC	Not observed; no suitable aquatic habitat present
Phrynosoma coronatum ssp. frontale	Coast horned lizard	FSC / CSC	Not observed; suitable habitat present
Thamnophis hammondii	Two-striped garter snake	- / CSC	Not observed; no suitable aquatic habitat present
Plants		**USFWS / CDFG / CNPS**	
Agrostis hooveri	Hoover's bent grass	- / - / 1B.2	Not observed; potential suitable grassland habitat present, although the hardpan soils with which it is associated were largely absent.
Amsinckia spectabilis* var. *microcarpa	**Small-seeded fiddleneck**	**Local Concern**	**Present commonly in central dune scrub, central coastal scrub, and maritime chaparral south of Orcutt Creek.**
Aphanisma blitoides	Aphanisma	SOC / - / 1B.2	Not found; unlikely to occur in coastal scrub as far inland as project site.
Arctostaphylos purissima	La Purisima manzanita	- / - / 1B.1	Not found; occurs nearby in maritime chaparral.
A. rudis	**shagbark manzanita**	**- / - / 1B.2**	**Present in maritime chaparral in one location.**
A. tomentosa ssp. e*astwoodiana*	Eastwood's manzanita	- / - / 1B.1	Not observed; suitable soils (diatomaceous) not observed.
Astragalus didymocarpus var. *milesianus*	Mile's milk-vetch	- / - / 1B.2	Not observed; suitable coastal scrub habitat with clay soils not present.
Atriplex serenana var. *davidsonii*	Davidson's saltscale	- / - / 1B.2	Not found; possible habitat in alkaline soils of coastal scrub.
Calandrinia breweri	Brewer's calandrinia	- / - / 4.2	Not found; unlikely to occur in disturbed coastal scrub on site; outside known range.
Calycadenia villosa	dwarf calycadenia	- / - / 1B.1	Not observed; known from chaparral, cismontane woodlands, meadows and seeps, and rocky valley and foothill grasslands; suitable grassland habitat present.
Ceanothus cuneatus var. fascicularis	**Lompoc ceanothus**	**- / - / 4.2**	**Present in maritime chaparral.**
Ceanothus impressus var. *impressus*	Santa Barbara/Coast ceanothus	Local Concern	Not found; suitable maritime chaparral habitat present (but not recently burned).
Chorizanthe angustifolia var. *eastwoodiae*	Eastwood's spineflower	Local Concern	Not present; suitable sandy soils of coastal scrub present.

TABLE 3
PRESENT OR CNDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY
FOR THE KEYSITE 3 PROPERTY AND SURROUNDING AREA

Based on CNPS Inventory of Rare and Endangered Plants (online edition, v6-04b; 2005) and CNDDB (2005) search results for the Orcutt, Casmalia, Sisquoc, Santa Maria, and Lompoc quadrangles; and LFR 2005 field surveys.

Name	Common Name	Status	Occurrence of Element on Project Site
Chorizanthe blakleyi	Blakely's spineflower	- / - / 1B.3	Not observed; suitable habitat not present, found further inland.
Chorizanthe palmeri	Palmer's spineflower	- / - / 4.2	Not found; unlikely on project site; suitable serpentine or serpentine derived soils absent.
Chorizanthe rectispina	Straight-awned spineflower	SOC / - / 1B.3	Not found; unlikely on project site; suitable rocky, heavy clay or serpentine derived soils absent.
Circium loncholepis	La Graciosa thistle	FE / CT / 1B.1	Not found; suitable brackish marsh habitat absent.
Cirsium rhothophilum	Surf thistle	SOC / CT(2/90) / 1B.2	Not found; unlikely on project site; suitable coastal dune and coastal bluff scrub habitat absent
Collinsia sparsiflora var. collina	**few-flowered collinsia**	**Local Concern**	**Present; only known location in Santa Barbara County. Known from further north. One specimen from Santa Barbara County collected in 1928 by Ralph Hoffmann.**
Cordylanthus rigidus ssp. *littoralis*	seaside bird's-beak	- / CE / 1B.1	Not observed; appropriate sandy (often disturbed) coastal scrub, coastal dunes, oak woodland, maritime chaparral, present
Deinandra increscens ssp. *villosa*	Gaviota tarplant	FE (3/20/00) / CE (1/90) / 1B.1	Not found; possible in coastal scrub and grassland habitat on site.
Delphinium parryi* ssp. *blochmaniae	**dune larkspur**	**- / - / 1B.2**	**Present in central dune scrub and central coastal scrub.**
Dichondra occidentalis	Western dichondra	- / - / 4.2	Not found; possible in oak woodlands, coastal scrub or grasslands on site, but not known from Orcutt area.
Dithyrea maritima	Beach spectaclepod	SOC / CT (2/90) / 1B.1	Not found; unlikely on project site; occurs closer to coast.
Dudleya blochmaniae ssp. *blochmaniae*	Blochman's dudleya	SOC / - / 1B.1	Not found; unlikely on project site; suitable rocky soils present but heavy clay or serpentine derived soils absent.
Erigeron blochmaniae	Blochman's leafy daisy	- / - / 1B.2	Not found; unlikely on project site; suitable coastal dune scrub habitat absent.
Erigeron sanctarum	Saint's daisy	- / - / 4.2	Not found; suitable coastal scrub and oak woodland habitat present. May appear following fire or disturbance.
Eriodictyon capitatum	Lompoc yerba santa	FE / CR / 1B.2	Not observed; suitable sandy maritime chaparral present.
Erysimum capitatum* ssp. *lompocense	**San Luis Obispo wallflower**	**- / - / 4.2**	**Present in central dune scrub and central coastal scrub**
Erysimum insulare ssp. *suffrutescens*	Suffrutescent wallflower	- / - / 4.2	Not found; possible in coastal scrub habitat, but typically found closer to coast.
Galium cliftonsmithii	Santa Barbara bedstraw	- / - / 4.3	Not found; suitable oak woodland habitat present.
Hordeum intercedens	Vernal barley	- / - / 3.2	Not found; unlikely on project site.
Horkelia cuneata ssp. *sericea*	Kellogg's horkelia	- / - / 1B.1	Not found, but suitable potential habitat in sandy or gravelly soil of coastal scrub or oak woodlands with well developed understory. Very uncommon south of San Luis Obispo County.
Horkelia cuneata ssp. *puberula*	mesa horkelia	- / - / 1B.1	Not found; suitable sandy or gravelly coastal scrub, cismontane woodland, chaparral habitats present.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	SOC / - / 1B.1	Not found; wet valley grassland, vernal wetlands and vernal pool habitat absent.
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	- / - / 1B.2	Not found; possible habitat in coastal scrub.
Leptodactylon californicum ssp. *tomentosum*	Fuzzy prickly phlox	- / - / 4.2	Not found; coastal dunes and coastal strand habitat absent.

TABLE 3
PRESENT OR CNDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY
FOR THE KEYSITE 3 PROPERTY AND SURROUNDING AREA

Based on CNPS Inventory of Rare and Endangered Plants (online edition, v6-04b; 2005) and CNDDB (2005) search results for the Orcutt, Casmalia, Sisquoc, Santa Maria, and Lompoc quadrangles; and LFR 2005 field surveys.

Name	Common Name	Status	Occurrence of Element on Project Site
Lupinus ludovicianus	San Luis Obispo County lupine	SOC / - / 1B.2	Not found; unlikely on project site; outside of known range.
Mimulus aurantiacus* var. *lompocensis	**Lompoc monkeyflower**	**Local Concern**	**Present in central dune scrub, central coastal scrub, and maritime chaparral habitat.**
Monardella crispa	Crisp monardella	SOC / - / 1B.2	Not found; unlikely on coastal dunes as far inland as project site; suitable open back dune habitat not present.
Monardella frutescens	San Luis Obispo monardella	SOC / - / 1B.2	Not found; unlikely on coastal dunes as far inland as project site.
Monardella undulata	Curly-leaved monardella	- / - / 4.2	Not found; suitable coastal scrub habitat present.
Mucronea californica	**California spineflower**	**- / - / 4.2**	**Present in sandy soils in coastal scrub.**
Prunus fasciculata var. *punctata*	Sand almond	- / - / 4.3	Not observed, suitable sandy soils in coastal scrub present.
Quercus parvula var. *parvula*	Santa Cruz Island oak	- / - / 4.2	Not found, marginally suitable habitat present.
Rorippa gambelii	Gambel's water cress	FE / - / 1B.1	Not found, suitable freshwater marsh habitat absent.
Sanicula hoffmannii	Hoffmann's sanicle	- / - / 4.3	Not found; unlikely on sandy soils of project site; usually in clay or serpentine soils.
Scrophularia atrata	black-flowered figwort	SOC / - / 1B.2	Not observed; suitable coastal scrub, oak woodland, and riparian scrub habitat present.
Senecio aphanactis	Rayless ragwort	- / - / 2.2	Not found; possible habitat in oak woodland or coastal scrub on alkaline soils.
Senecio blochmaniae	Blochman's groundsel	- / - / 4.2	Not found; suitable coastal dune scrub habitat present.

Status Codes

United States Fish and Wildlife Service (USFWS)
FE Federal Endangered
FT Federal Threatened
SOC Species of Concern as listed by Sacramento Office (USFWS, 2004)
MNBMC Migratory nongame bird of management concern
FSC Federal special concern species
BCC Birds of Conservation Concern

California Department of Fish and Game (CDFG)
CE California Endangered
CT California Threatened
CR California Rare
CSC California Species of Concern

California Native Plant Society (CNPS)
Lists
List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3: Plants About Which We Need More Information - A Review List

Extensions to List Categories
.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

TABLE 4
APPROXIMATE ACREAGE OF HABITATS AND DIRECT IMPACTS

	DIRECT IMPACT AREA (acres)	TOTAL EXISTING (acres)	IMPACTED AREA (%)
Sensitive Habitats			
Central Coast Arroyo Willow Riparian Scrub Forest	<0.1	3.3	**<1**
Coast Live Oak Woodland	0.1	8.0	**1.5**
Central Maritime Chaparral	0.0	11.6	**0.0**
Central Dune Scrub	0.00	4.7	**0.0**
Central Coast Live Oak Riparian Forest	0.0	5.7	**0.0**
Non-Sensitive Habitats			
Central (Lucian) Coastal Scrub	9.3	19.5	**47.7**
Disturbed Coastal Scrub	16.7	27.9	**59.9**
Non-native Grassland	33.9	55.9	**60.5**
Planted Trees	0.01	0.4	**3.1**
SENSITIVE HABITAT TOTALS	**0.12**	**33.3**	**0.4**
NON-SENSITIVE HABITAT TOTALS	**59.9**	**103.6**	**57.8**
TOTAL ACRES	**60.0**	**136.9**	**43.8**

Note 1: Impact assessment assumes that native resources on private property south of Orcutt Creek will be protected in perpetuity

Note 2: Impacts calculated based on 2007 Development Design

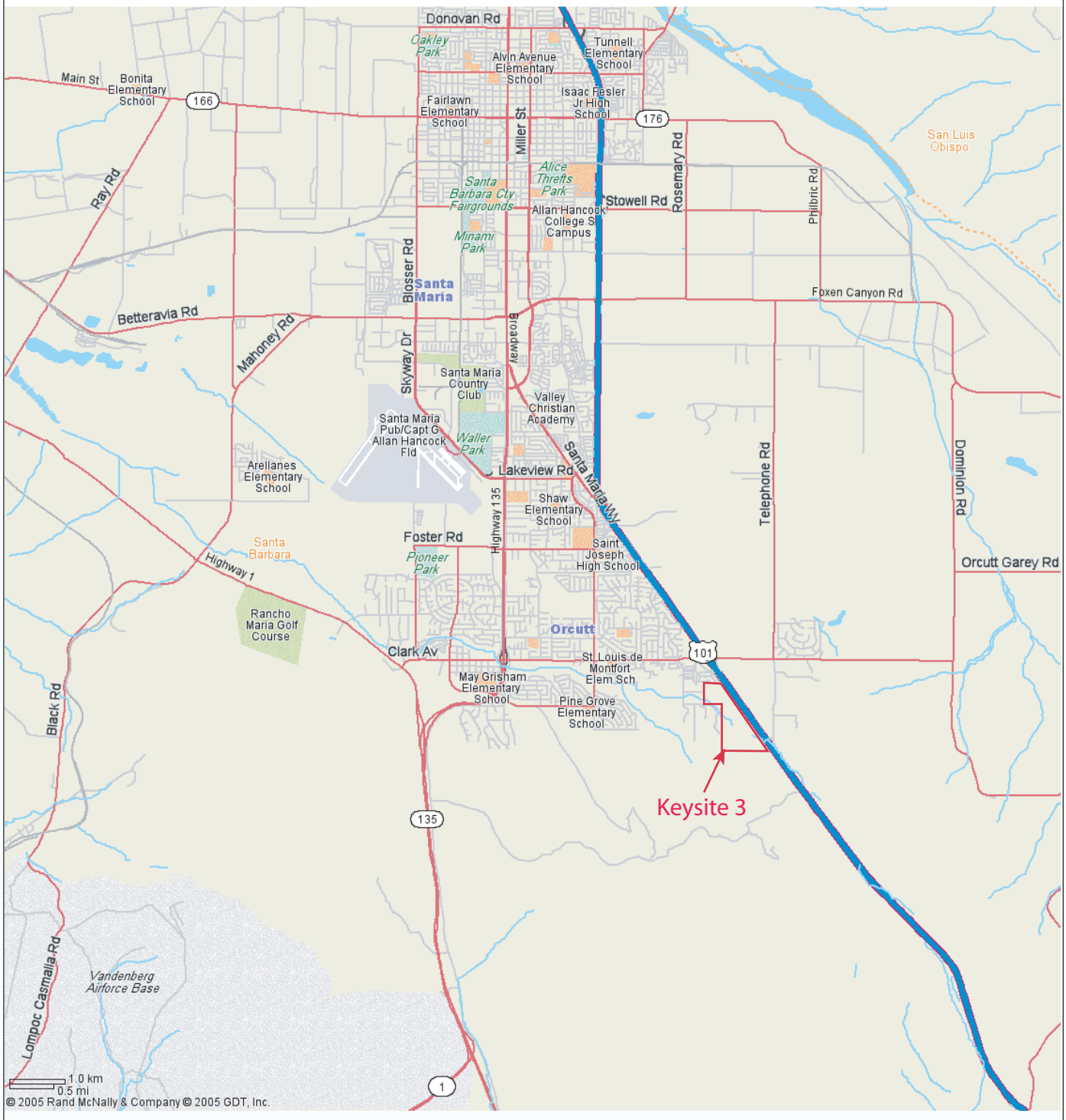
TABLE 5
INVASIVE WILDLAND PEST PLANTS LISTED BY CALIFORNIA INVASIVE PLANT COUNCIL (Cal-IPC)
CURRENTLY FOUND AT THE KEY SITE 3 SITE

Common Name	Scientific Name	CAL-IPC Rating
silver hair grass	*Aira caryophyllea*	under consideration
scarlet pimpernel	*Anagallis arvensis*	List B
slender wild oat	*Avena barbata*	under consideration
black mustard	*Brassica nigra*	List B
field mustard	*Brassica rapa*	under consideration
ripgut brome	*Bromus diandrus*	under consideration
soft chess brome	*Bromus hordeaceus*	under consideration
red brome	*Bromus madritensis* ssp. *rubens*	List A-2
Italian thistle	*Carduus pycnocephalus*	List B; CA DFA List C
tocalote	*Centaurea melitensis*	List B
mouse-eared chickweed	*Cerastium glomeratum*	List B
nettle-leaved goosefoot	*Chenopodium murale*	not listed
poison hemlock	*Conium maculatum*	List B
flax-leaved fleabane	*Conyza bonariensis*	not listed
Bermuda grass	*Cynodon dactylon*	under consideration
orchard grass	*Dactylis glomerata*	under consideration
veldt grass	*Ehrharta calycina*	List A-2
storkbill filaree	*Erodium botrys*	under consideration
redstem filaree	*Erodium cicutarium*	under consideration
filago	*Filago gallica*	no listing
fennel	*Foeniculum vulgare*	List A-1
cudweed everlasting	*Gnaphalium luteo-album*	no listing
Mediterranean mustard	*Hirshfeldia incana*	under consideration
foxtail	*Hordeum murinum*	under consideration
smooth cat's ear	*Hypochaeris glabra*	under consideration
horehound	*Marrubium vulgare*	under consideration
burclover	*Medicago polymorpha*	under consideration
sweet clover	*Melilotus albus, M. indicus*	under consideration
Bermuda-buttercup	*Oxalis pes-caprae*	under consideration
bristly ox-tongue	*Picris echioides*	under consideration
smilo grass	*Piptatherum miliaceum*	under consideration

TABLE 5
INVASIVE WILDLAND PEST PLANTS LISTED BY CALIFORNIA INVASIVE PLANT COUNCIL (Cal-IPC)
CURRENTLY FOUND AT THE KEY SITE 3 SITE

Common Name	Scientific Name	CAL-IPC Rating
annual bluegrass	*Poa annua*	not listed
common knotweed	*Polygonum arenastrum*	not listed
rabbitsfoot grass	*Polypogon monspeliensis*	under consideration
wild radish	*Raphanus sativus*	under consideration
sour dock, sheep sorrel	*Rumex acetosella*	under consideration
curly dock	*Rumex crispus*	under consideration
fiddle dock	*Rumex pulcher*	under consideration
windmill pink	*Silene gallica*	not listed
milk thistle	*Silybum marianum*	under consideration
common sow-thistle	*Sonchus oleraceus*	under consideration
common chickweed	*Stellaria media*	not listed
rose clover	*Trifolium hirtum*	under consideration
rat-tail fescue	*Vulpia myuros*	under consideration

Cal-IPPC weed ratings:	**California Dept. of Food and Agriculture weed**
List A-1: Most invasive wildland pest plants; widespread List A-2: Most invasive wildland pest plants; regional List B: Wildland pest plants of lesser invasiveness Need More Info: More information is needed to make a determenation Under Consideration: Plants currently being considered for listing in 2005	List A - Eradication, containment, rejection, or other holding action at the state-county level. List B - More widespread species, eradication policy at discretion of local agricultural List C - Eradication ordered by agricultural commissioner when found in a nursery or in crop



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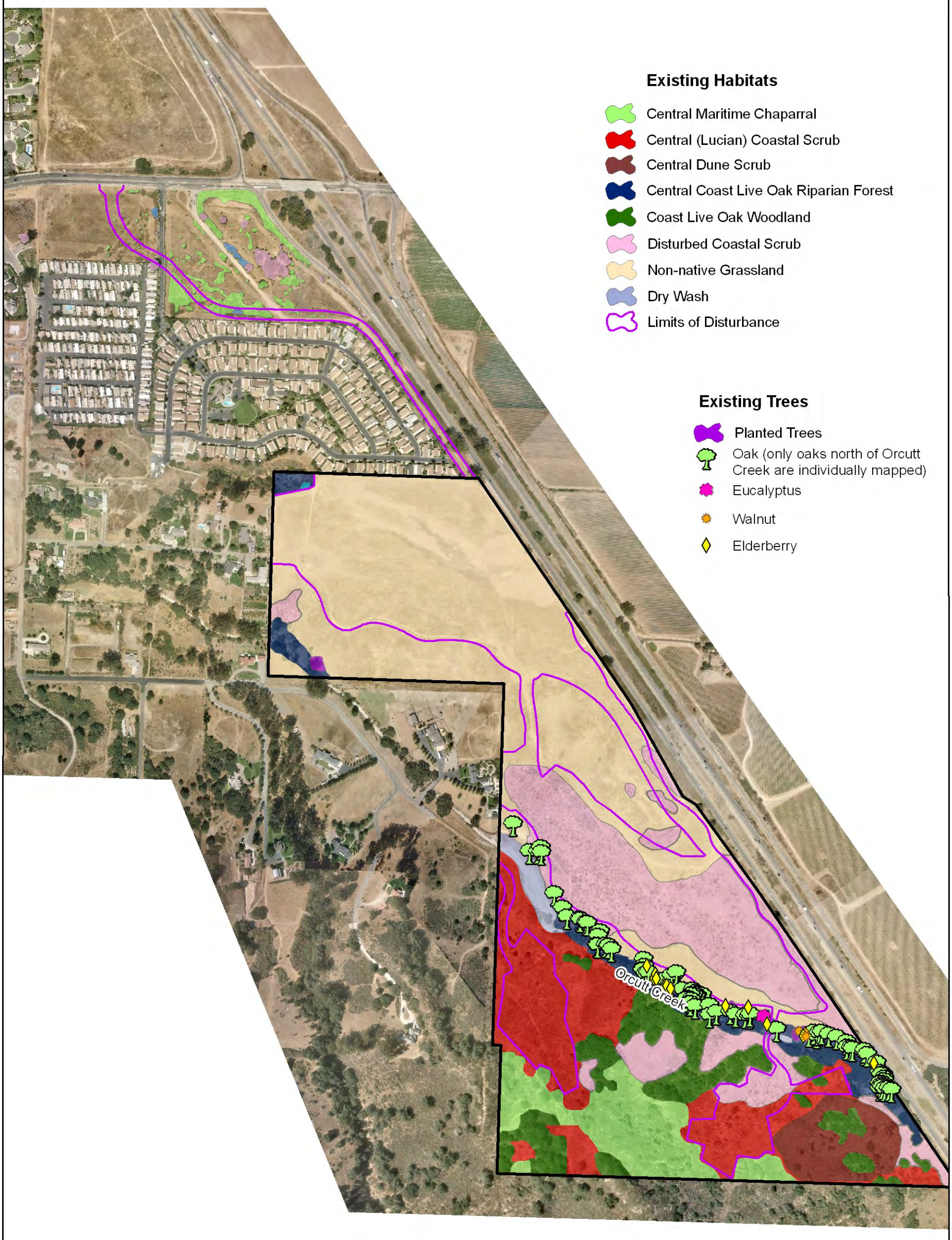
0 2 miles

Site Location Map

SB Clark / Key Site 3

LFR

Figure 1



Existing Habitat

SB Clark / Key Site 3

LFR

Figure 2

Sensitive Habitats

- Central Maritime Chaparral
- Central Coast Arroyo Willow Riparian Scrub
- Central Coast Live Oak Riparian Forest
- Coast Live Oak Woodland
- Central Dune Scrub

Sensitive Plants

- Coast live oak (*Quercus agrifolia*) (only oaks north of Orcutt Creek are individually mapped)
- Shagbark manzanita (*Arctostaphylos rudis*)
- Lompoc ceanothus (*Ceanothus cuneatus* subsp. *fascicularis*)
- Blochman's larkspur (*Delphinium parryii* subsp. *blochmaniae*)
- San Luis Obispo wallflower (*Erysimum capitatum* subsp. *lompocense*)
- California spineflower (*Mucronea californica*) (Individual)
- California spineflower (*Mucronea californica*)
- Indian rush (*Juncus textilis*)
- Limits of Disturbance

Two species of local concern, Lompoc sticky monkeyflower (*Mimulus aurantiacus* subsp. *lompocensis*) and small-fruited seaside fiddleneck (*Amsinckia spectabilis* var. *microcarpa*), are widespread south of Orcutt Creek and not included on this map.

Orcutt Creek

N

0 200 400 800

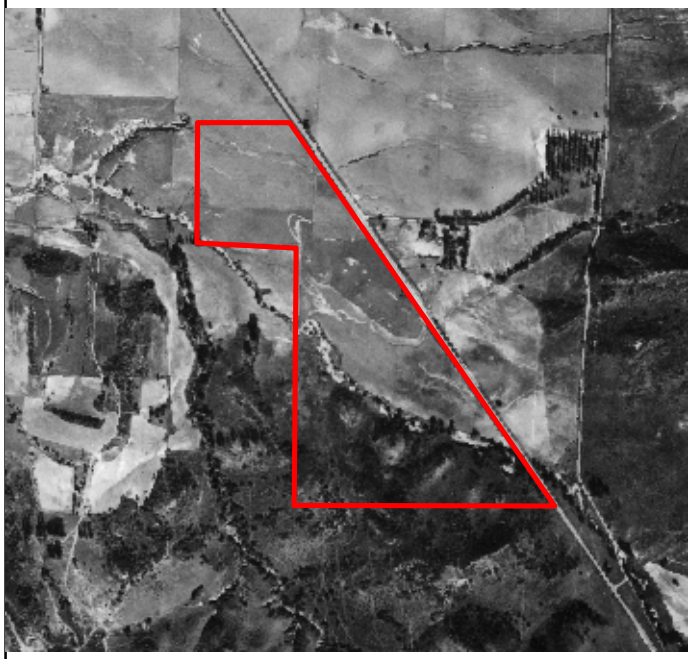
Feet

Sensitive Habitat and Sensitive Species Locations

SB Clark / Key Site 3

LFR

Figure 3



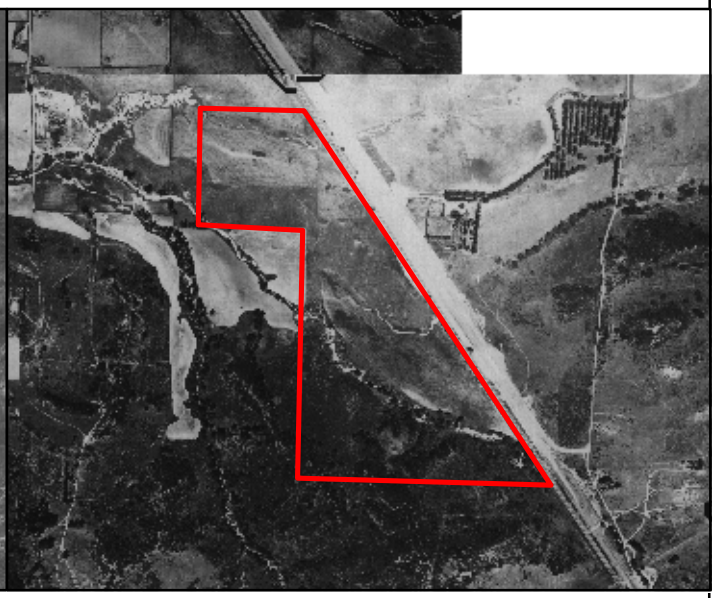
1938



1943



1954



1956

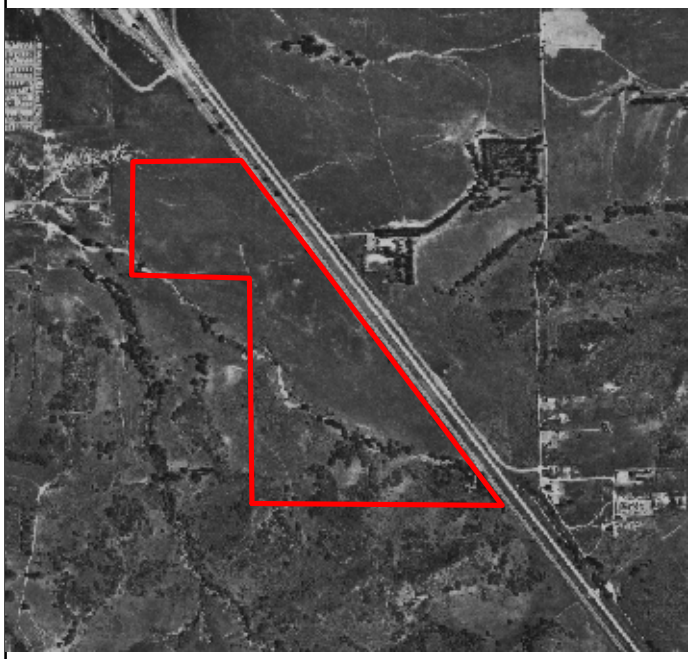
Historic Aerial Photographs

SB Clark / Key Site 3

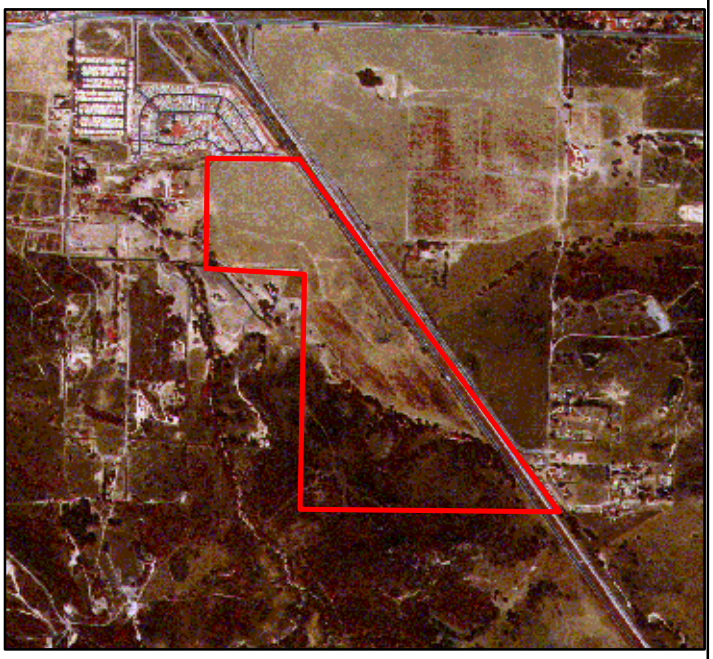
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Figure 4

H:\Client Files\S-U\SB Clark (KeySite-3)\KeySite 3\Figures\GIS\Figure 4 Historic Aerial Photographs.mxd - 9/9/2008 @ 12:09:04 PM



1967



1989



2006

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Historic Aerial Photographs

SB Clark / Key Site 3

LFR

Figure 4



View of Key Site 3 with non-native grassland in foreground, Solomon Hills in background. Looking south.

November 21, 2005

Photo # 1010011

LFR



Coyote bush in floodplains by Orcutt Creek. Looking northwest.

November 21, 2005

Photo # 1010089

LFR



Dense central coastal scrub vegetation on slopes of Solomon Hills. Looking south.

November 7, 2005

Photo # 1010138

LFR



Disturbed central coastal scrub. Looking east.

November 21, 2005

Photo # 1010084

LFR



Mosaic of central coastal scrub and oak woodland vegetation with non-native grassland in background. Looking north.

November 7, 2005

Photo # 1010159

LFR



Coast live oak woodland with disturbed understory.

November 7, 2005

Photo # 1010142

LFR



Central maritime chaparral at north end of Site. Looking east.

November 7, 2005

Photo # 1010056

LFR



Non-native grassland on northern mesa. Looking west.

November 21, 2005

Photo # 1010009

LFR



Quercus agrifolia – Juncus textilis association.

November 7, 2005

Photo # 1010069

LFR



Central Coast riparian scrub adjacent to Orcutt Creek at east end of Site.

November 7, 2005

Photo # 1010075

LFR



Orcutt Creek at east end of Site near culvert under Highway 101.

November 7, 2005

Photo # 1010176

LFR



Central Coast riparian scrub along Orcutt Creek at west end of Site. Looking north.

November 21, 2005

Photo # 1010022

LFR

CENTEX HOMES

CENTRAL COAST DIVISION
735 TANK FARM ROAD, #100
SAN LUIS OBISPO, CA 93401
805-548-0333
FAX: 805-548-0444

FACSIMILE TRANSMITTAL SHEET

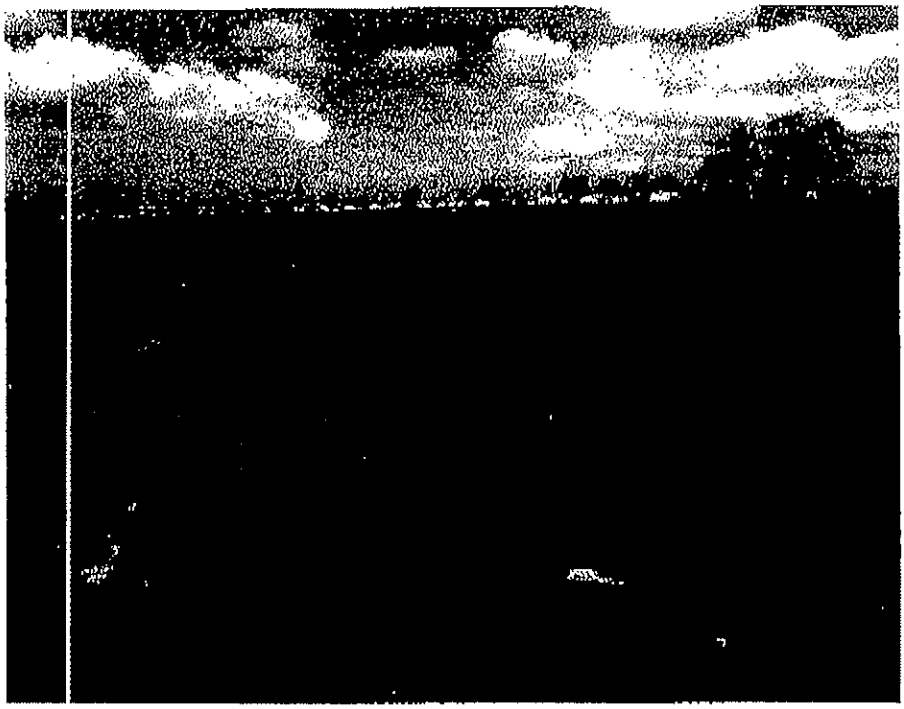
TO: GREG MCGOWAN	FAX: 805- 349-7176
COMPANY: LFR	DATE 11/04/05
FROM: URBAN G. MCLELLAN	
RE: ORCUTT KS-3	TOTAL PAGES INCLUDING COVER: 20

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

Greg,
Attached is the full report from Sykes re CTS and KS-3 FYI.
Urban

CONFIDENTIAL

Biological Assessment of Impacts for Proposed Construction Project on SDC-CT, LLC Property in Orcutt, California



Prepared for:
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Prepared by:
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14 March 2005

About the Author

Stephen A. Sykes is a graduate student at the University of California, Santa Barbara, conducting research under the direction of Dr. Samuel Sweet. His research is aimed at gathering an understanding of the terrestrial ecology of the California tiger salamander. His field sites are at the Santa Maria Airport, where he is using methods such as drift fence trapping, radio tracking, and burrow searches with a 3 meter long video scope to capture and track California tiger salamanders into the upland habitat.

In addition to his academic research, he has been involved with several biological consulting projects with the California tiger salamander. He was hired to prepare a biological assessment for a proposed construction project at the Clos Pepe Vineyards in Lompoc. He was also the principal biological consultant for a California tiger salamander drift fence study conducted on Bradley Land Company property in Santa Maria during the 2002-2003 rainy season.

Stephen Sykes' research at the Santa Maria Airport and biological consulting activities are conducted under US Fish and Wildlife Permit TE-025732-1.

1.0 EXECUTIVE SUMMARY

SDC-CT, LLC has proposed the construction of a residential development on their property in Orcutt, California. Approximately 25 acres of the 146.49 acre parcel is proposed for development, with the remaining 121 acres to be deeded to Santa Barbara County or an approved land management organization to be maintained as open space. The 25 acres proposed for development consist of relatively flat grassland habitat, while the southern portion of the property consists of coastal scrub habitat, riparian areas along Orcutt Creek, and oak woodland/sandhill chaparral.

No breeding sites for California tiger salamanders are present on the subject property. Four potential California tiger salamander breeding ponds are present within 5 km (3.1 miles) to the south of the subject property, however the closest of these ponds is 4,750 feet from the development area. This distance, along with dense chaparral and steep topography found in the southern portion of the property likely prevent any California tiger salamanders that may be using these potential ponds from entering the development area. Therefore, no California tiger salamanders should be impacted by this proposed development.

The southern portion of 121 acres may provide important breeding, foraging, or roosting sites for animals listed as California Species of Special Concern. These include western spadefoot toad (*Scaphiopus hammondii*), coast horned lizard (*Phrynosoma coronatum*), silvery legless lizard (*Anniella pulchra pulchra*), burrowing owl (*Speotyto cunicularia*), Cooper's hawk (*Accipiter cooperi*), white-tailed kite (*Elanus leucurus*), and golden eagle (*Aquila chrysaetos*). Preservation of the southern portion of the property will likely benefit these listed species and other "common" species that utilize this property.

Horned lizards are known from the vicinity of this property and are highly likely on the subject property, including the area to be developed. Pre-construction surveys should be conducted to capture and relocate any wildlife encountered (including horned lizards) to the southern portion of the property. Additionally, a biologist should be present during the initial grading of the site to capture and remove horned lizards from the construction footprint.

2.0 INTRODUCTION

This report summarizes the results of a site assessment of the SDC-CT, LLC property (Parcel # 129-151-26) in Orcutt, California as potential habitat for the California tiger salamander (*Ambystoma californiense*). This parcel is located in the southeastern region of Orcutt, immediately west of U.S. Highway 101 (Figure 1). Residential development has been proposed for the northern portion of this property at a density of approximately 4-5 units per acre. The proposed development area would occupy approximately 25 acres of this 146.49 acre parcel, with the remaining southern portion to be deeded as open space. This property has been designated Key Site #3 in the Orcutt Community Plan (Austin, personal communication).

This site is within the designated range of the California tiger salamander (USFWS, July 2001), therefore a site assessment is necessary to evaluate potential impacts to this species. The California tiger salamander is a federally listed endangered species that occurs in northern Santa Barbara County. This species was listed in early 2000 as a result of rapid development of its habitat to intensive agriculture and residential development (USFWS, 2000).

3.0 METHODS

I surveyed the entire property on foot between 0900 and 1600 on 26 February 2003. The weather was partly to mostly cloudy at times, with a 10-15 mph wind. The maximum ambient air temperature during the survey was 60 degrees F. Almost ½ inch of rain had fallen over the two days preceding my visit.

Only a portion of the basin (see Photo 2) in the northwest corner of the site is included in the SDC-CT, LLC property, and extremely steep sides (40 feet) and landowner access restrictions only allowed a visual survey from the southeastern edge of this basin. Binoculars were used to survey this area as best as possible and identify plant species observed.

Methodology for conducting site assessments for the California tiger salamander was taken from the *Standard Protocol for Site Assessment and Field Surveys for Determining Presence or Absence of the California Tiger Salamander* (USFWS and CDFG, 2002). The suitability of the subject property as habitat for California tiger salamanders was determined by evaluating and comparing existing habitat components with that of confirmed California tiger salamander habitat elsewhere in Santa Barbara County. Vegetative types and communities, hydrological conditions, topography, soil characteristics, proximity to known and potential California tiger salamander breeding pools, and terrestrial habitat components were used to evaluate the property as potential California tiger salamander habitat. Plant species were identified using dichotomous keys including (Hickman, 1993).

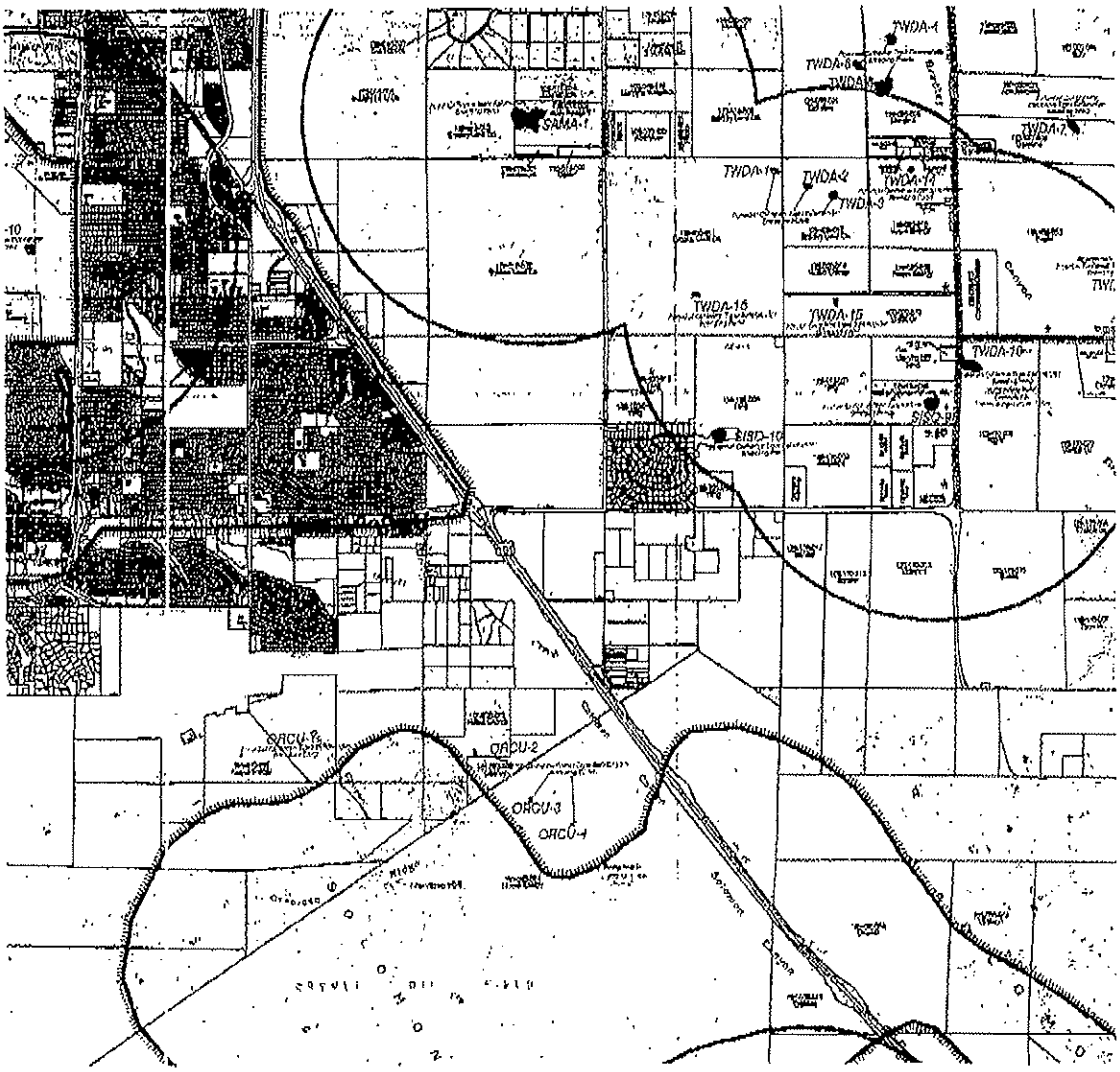


Figure 1. California tiger salamander habitat map showing the SDC-CT, LLC property in yellow. Potential and known California tiger salamander breeding ponds are shown in blue. The red line depicts a 1.2 mile buffer around known California tiger salamander breeding ponds. The green line depicts California tiger salamander range. Source: Santa Barbara County Planning and Development. August 31, 2001.

4.0 HABITAT DESCRIPTION

This 146.49 acre property can be divided into a northern and southern region by continuing the southern boundary of the northern region west to US Highway 101 (Figure 2 and Figure 3). The northern parcel ("Mesa Area") of 25 acres has been proposed for residential development, while the southern parcel has been proposed to remain as open space. This region of the property will be deeded to either Santa Barbara County or another land management entity approved by the county (Austin, personal communication).

4.1 Northern Portion (Mesa Area)

The Mesa Area in the northern portion of the property has relatively flat topography and is dominated by grasses and forbs including thistles, lupine (*Lupinus* spp.), burclover (*Medicago* spp.), and filaree (*Erodium spp.*) (Photo #1 and cover photo). The topography slopes downward in the southern region of this portion to Orcutt Creek (Figure 3). This area is currently grazed by cows. Numerous California ground squirrels (*Spermophilus beecheyi*) were observed in the Mesa Area and other grassland areas north of Orcutt Creek.

A small area of coastal scrub is present in the southwestern portion of the property, dominated by coyote bush (*Baccharis pilularis*), California sage brush (*Artemisia californica*), blue elderberry (*Sambucus mexicana*), and coffeberry (*Rhamnus californica*).

A basin is present in the northwest corner of the Mesa Area, and this was evaluated as a potential California tiger salamander breeding site (Figure 3). This basin is characterized by highly eroded, steep sides (30-40 feet) (Photo #2). Runoff from the Mesa Area flows into this basin through large drains. However, no standing water was observed in this basin during my site visit. Vegetation observed in and around this basin includes the following:

Common Name	Scientific Name
California sage brush	*Artemisia californica*
Coyote Bush	*Baccharis pilularis*
Mustard	Brassicaceae
Iceplant	*Carpobrotus edulis*
Blue Gum	*Eucalyptus globulus*
Tree Tobacco	*Nicotiana glauca*
Coffeberry	*Rhamnus californica*
Willow	*Salix* spp.
Western Poison Oak	*Toxicodendron diversilobum*

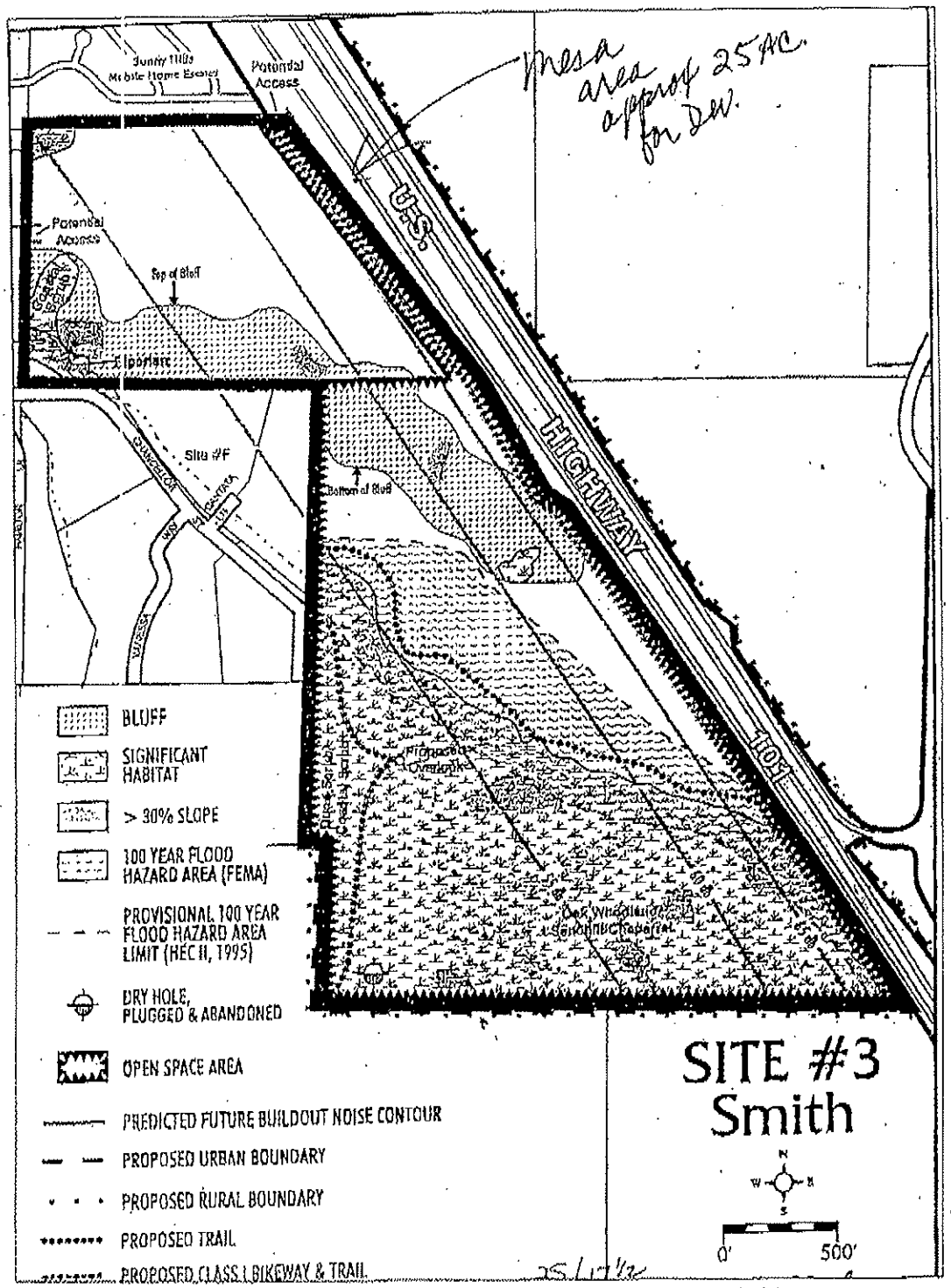


Figure 2. Map of subject property showing planned development area and habitat types present.

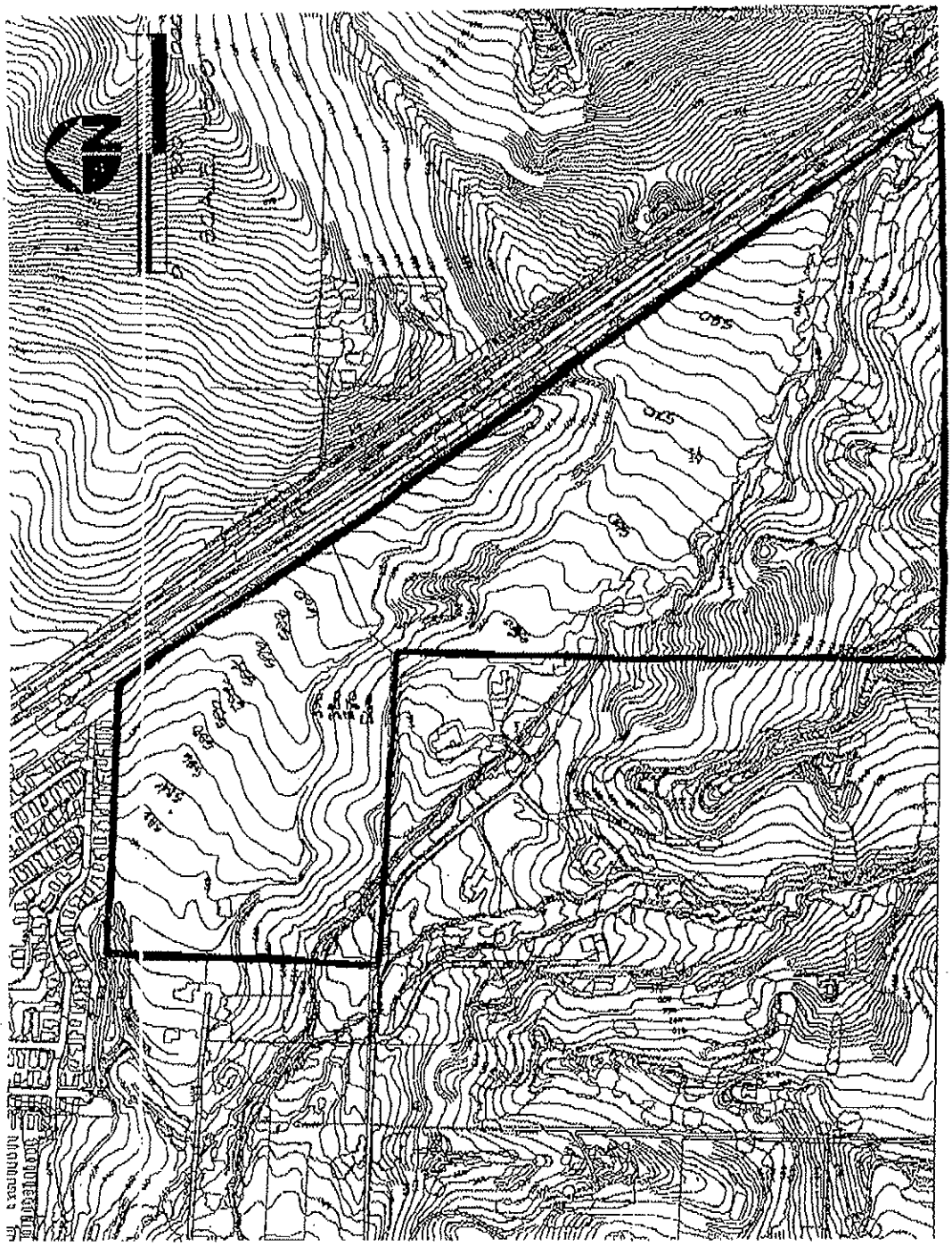


Figure 3. Topographical map of subject property.



Photo 1. Northern portion (Mesa Area) of SDC-CT, LLC property, looking southeast. Note three cars driving on U.S. Highway 101 on the left.



Photo 2. Steep sided basin in northwest corner of SDC-LLC property, looking northwest.

4.2 Southern Portion

Orcutt Creek runs through the southwestern portion of the northern parcel and through the southern region, crossing under US Highway 101 to the east (Figure 3). The creek was dry during my site visit, but it was apparent it can experience heavy water flow during heavy rains (Photo 3). No pools of standing water were present in or along the creek corridor that could serve as potential breeding sites for amphibians. Numerous mature coast live oaks (*Quercus agrifolia*) were observed along the stream corridor. Other plant species observed along the stream corridor include the following:

Common Name	Scientific Name
Mule Fat	*Baccharis salicifolia*
Miner's Lettuce	*Claytonia* spp.
Blue Gum	*Eucalyptus globulus*
Southern California Black Walnut	*Juglans californica californica*
Bermuda Buttercup	*Oxalis pes-caprae*
Willow	*Salix* spp.
Blue Elderberry	*Sambucus mexicana*
Nightshade	*Solanum douglasii*
Western Poison Oak	*Toxicodendron diversilobum*



Photo 3. Orcutt Creek in southwest corner of Mesa Area, looking southeast.

The relatively flat habitat on the northern side of Orcutt Creek is coastal scrub with shrubs such as coyote bush (*Baccharis pilularis*), California sage brush (*Artemisia californica*) scattered among grasses and various forbs. The topography becomes much steeper south of Orcutt Creek (Figure 3). This habitat consists of oak woodland/sandhill chaparral (Photo 4). Vegetation observed here includes the following:

Common Name	Scientific Name
Chamise	*Adenostoma fasciculatum*
Fiddleneck	*Amsinckia* spp.
Mountain Mahogany	*Cercocarpus betuloides*
Croton	*Croton californicus*
Coast Live Oak	*Quercus agrifolia*
Bush Lupine	*Lupinus* spp.
Tree Tobacco	*Nicotiana glauca*
Peony	*Paeonia californica*
Coffeberry	*Rhamnus californica*
Spiny Redberry	*Rhamnus crocea*
Black Sage	*Salvia mellifera*
Western Poison Oak	*Toxicodendron diversilobum*

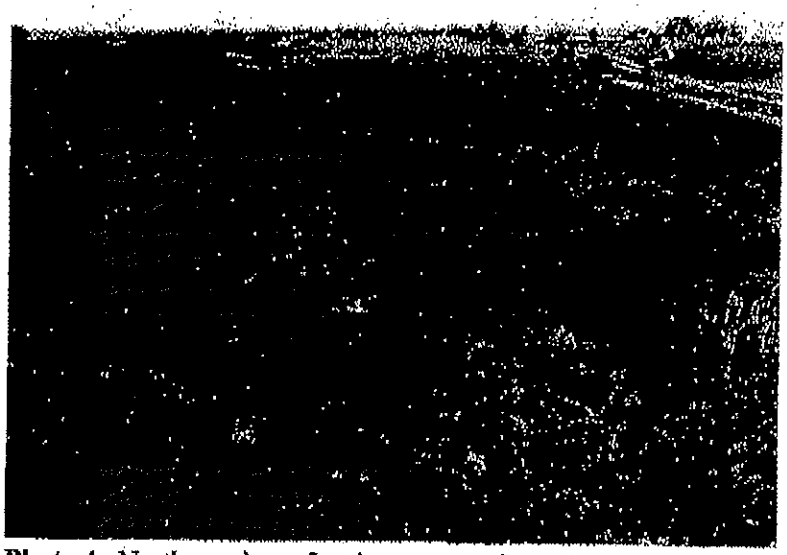


Photo 4. Northern view of entire property from chaparral in southern portion. Note U.S. Highway 101 on the right and Sunny Hills Mobile Home Estates just below the horizon in the center of the photo.

5.0 BIOLOGICAL ASSESSMENT OF IMPACTS

5.1 Amphibian Breeding Habitat

No vernal pools were observed on the subject property that could serve as potential breeding habitat for amphibian species. Although rainfall totals for January and February were well below average, heavy rains in November and December of 2002 have filled most ponds in Santa Barbara County with enough water to allow California tiger salamanders and other vernal pool breeding amphibians opportunity to breed.

No water was observed in the basin in northwest corner of the property, however steep sides and landowner access restrictions only allowed a visual survey with binoculars. No water was observed from my vantage point during my site visit, but this basin may hold water for a period after heavy rains. The steep sides of this basin (30-40 feet) would likely prevent any amphibians that were able to breed in this basin from dispersing southeast onto the subject property. The topography is less steep to the west of this basin, and this could be a possible migration corridor for any dispersing amphibians that could be breeding in this basin.

5.2 California Tiger Salamander

5.2.1 Known and Potential Aquatic Breeding Sites Within 5 km (3.1 miles)

The subject property is within the range of the California tiger salamander as designated by US Fish and Wildlife Service (SB County Planning and Development, 2001).

Listed in the tables below are the known and potential California tiger salamander breeding ponds within 5 kilometers (3.1 miles) of the subject property. US Highway 101 is likely a barrier to salamander movement, so I have split this table into ponds on the east and west sides of Highway 101. The subject property is on the west side of Highway 101, and it is highly unlikely salamanders could move to the subject property from the east side of Hwy. 101.

I have further broken this down into northern and southern regions of the property because only the northern portion has been proposed for development. Distances listed are from the pond edge to the closest boundary of the subject property.

Known and potential California tiger salamander breeding ponds within 5 km (west side of US Highway 101) (Figure 1).

Pond Number	Status	Distance to Northern Portion	Distance to Southern Portion
ORCU-2	Potential	4,750 feet (0.90 mile)	2,125 feet (.40 mile)
ORCU-3	Potential	6,000 feet (1.14 miles)	3,375 feet (.64 mile)
ORCU-4	Potential	7,000 feet (1.33 miles)	4,250 feet (.80 mile)
ORCU-1	Potential	8,250 feet (1.56 miles)	8,500 feet (1.61 miles)
SAMA-10	Known	16,250 feet (3.08 miles)	18,250 (3.46 miles)

Source: Santa Barbara County Planning and Development, California tiger salamander habitat map, August 31, 2001

Known and potential California tiger salamander breeding ponds within 5 km (east side of US Highway 101) (Figure 1).

Pond Number	Status	Distance to Northern Portion	Distance to Southern Portion
SISQ-10	Potential	7,250 feet	7,250 feet
TWDA-16	Potential	9,750 feet	10,250 feet
TWDA-15	Known	12,500 feet	13,500 feet
SISQ-9	Known	12,750 feet	13,250 feet
SAMA-1	Known	13,000 feet	14,250 feet
TWDA-1	Potential	14,250 feet	14,750 feet
TWDA-2	Potential	14,500 feet	14,750 feet
TWDA-10	Potential	14,750 feet	14,750 feet
TWDA-3	Potential	14,750 feet	15,000 feet

Source: Santa Barbara County Planning and Development, California tiger salamander habitat map, August 31, 2001

5.2.2 Potential California Tiger Salamander Habitat Within 2 km (1.24 miles)

5.2.2.1 Aquatic Breeding Habitat

Since the portion of the property proposed for development (northern portion) is bordered by US Highway 101 on the west and residential development to the north and west, any potential salamander dispersal to the property could only come from the south. Only two potential California tiger salamander breeding ponds lie within 2 km (1.24 miles) of the northern portion of the property, both located to the south. These ponds are ORCU-2 and ORCU-3. ORCU-2 is a very small pond on the border between the Nuevo Energy and Bonney Properties. ORCU-3 is a larger pond further south on the Nuevo Energy property. ORCU-2 and ORCU-3 are 4,750 and 6,000 feet south of the portion of the property proposed for development, respectively. Both of these ponds are well outside the 2,200 foot buffer to development that has been proposed for confirmed breeding ponds by the California tiger salamander recovery team (Fahey, personal communication). Even if ORCU-2 and ORCU-3 are confirmed as California tiger salamander breeding ponds in the future, this proposed development project would lie more than twice the recommended buffer from those ponds.

Potential breeding ponds ORCU-2 and ORCU-3 lie 2,125 feet and 3,375 feet from the southern portion the property, respectively. Although this is within the possible dispersal distance for California tiger salamanders, the proposed development plan for this property includes a provision to preserve the southern portion of the property (approximately 121 acres) as open space. However, the steep topography coupled with dense chaparral habitat and few mammal burrows south of Orcutt

Creek may not provide preferable upland habitat for California tiger salamanders. California tiger salamanders typically reside in ground squirrel and gopher burrows during the dry portion of the year (Loredo and Van Vuren, 1996). Trenham (2001) indicates open grassland areas are used preferentially to continuous woody areas (i.e. chaparral). I have made similar observations of radio tracked animals at the Santa Maria Airport this year (Sykes, unpublished data).

5.2.2.2 Upland Habitat

Numerous ground squirrel burrows were observed on the northern portion of the subject property that could provide suitable upland habitat for California tiger salamanders. However, at this site, distance coupled with steep topography present in the southern portion and habitat fragmentation from Highway 101 would likely prevent any tiger salamanders in potential ponds south of the property (if they are present) from dispersing onto the subject property. Additionally, few small mammal burrows were observed in the oak woodland/sand hill chaparral habitat in the southern portion of the southern parcel that could provide upland habitat for California tiger salamanders during the dry portion of the year.

5.3 Other Species

Several animal species listed as California Species of Special Concern may occur on the subject property. These species include the western spadefoot toad (*Scaphiopus hammondii*), coast horned lizard (*Phrynosoma coronatum*), silvery legless lizard (*Anniella pulchra pulchra*), burrowing owl (*Speotyto cunicularia*), Cooper's hawk (*Accipiter cooperi*), white-tailed kite (*Elanus leucurus*), golden eagle (*Aquila chrysaetos*), or American badger (*Taxidea taxus*), although none of these species were observed on the subject property during my surveys.

Western Spadefoot Toad

Western spadefoot toads are unlikely from the northern portion of the property, but possible in the southern portion. This amphibian requires aquatic habitat for breeding, and the closest possible breeding habitat appears to be south of the southern portion, at the ponds discussed previously as potential California tiger salamander breeding pools, although the closest of these ponds is over 2,000 feet away.

Coast Horned Lizard

Although horned lizards were hibernating during my site visit, there is a high potential for their occurrence on the property. These lizards have been observed near the subject property, south of Orcutt Creek on the east side of U.S. Highway 101 (Hunt, personal communication). Horned lizards are typically found in open shrubby habitats including coastal sage scrub and chaparral, but have been known to use grazed grasslands as well (Hunt, personal communication). The chaparral habitat south of Orcutt Creek appears to be highly potential habitat for this species, and the grazed habitat present in the Mesa Area could also support this reptile.

To mitigate any potential effects of the development on horned lizards, a pre-construction survey should be conducted to capture and remove any horned lizards in the development footprint to the suitable habitat south of Orcutt Creek. Additionally, a construction monitor should be present onsite during the initial grading to move any horned lizards out of the construction path. Monitoring activities should be conducted during April and October when these animals are active.

Silvery Legless Lizard

Legless lizards are typically associated with scrub or chaparral habitats. Although suitable habitat is present in the southern portion of the property, the Mesa Area consists of grassland and therefore has low potential as legless lizard habitat.

Burrowing Owl

Burrowing owls are typically associated with grassland areas, where they use and enlarge abandoned California ground squirrels. Numerous ground squirrel burrows are present in the Mesa Area, however no enlarged burrows were observed. Additionally, the relatively small parcel of grassland present on the property and disturbance from U.S. Highway 101 and surrounding residential developments have likely degraded the onsite habitat for this species. However, this habitat may be used occasionally as foraging habitat of transient or wintering birds.

Cooper's Hawk, White-tailed Kite, and Golden Eagle

Although these species were not observed on the property, grassland areas in the Mesa Area and riparian areas along Orcutt Creek may provide foraging habitat for these birds. Numerous mature oaks and eucalyptus trees are present in the southern portion of the property that may provide nesting habitat. All mature oak and eucalyptus trees on the property will be protected on the southern portion of the property, and this will preserve any potential nesting sites for these species.

American Badger

Badgers typically use grassland and scrub habitat for foraging and den construction. Badger have been observed near the subject property (Hunt, personal communication), however, no badger or their sign was observed on the property. The grassland habitat present in the Mesa Area is likely foraging habitat for this mammal.

6.0 CONCLUSIONS

It is likely no California tiger salamanders would be impacted by development of approximately 25 acres in the northern portion of the property. Aquatic breeding habitat is not present on the subject property. The proposed development area is 4,750 feet from the closest potential California tiger salamander breeding pond (ORCU-2). Numerous ground squirrel burrows were observed in the proposed development area, however distance, dense chaparral, and steep topography likely prevent any salamanders that may use the potential ponds south of the property from using the upland habitat in the development area.

Approximately 121 acres of coastal sage scrub, riparian, and oak woodland/sandhill chaparral habitat will be deeded as open space as mitigation for this proposed development. These habitats in the southern portion of the property are important habitat for many non-listed plants and animals, but may also provide valuable breeding, foraging, or roosting habitat for several California Species of Special Concern. Coast horned lizards are likely present on the property, and may utilize the open grazed land in the Mesa Area for foraging habitat. Pre-construction surveys should be conducted to capture and relocate horned lizards in the construction path, as well as surveys during the initial grading of the site to remove animals that are disturbed by heavy machinery. Non-listed species should also be salvaged and moved from the construction path during these construction monitoring activities.

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Supplemental Ecological Assessment
(Roads and Infrastructure)
Key Site 3
Orcutt, California

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1.0 INTRODUCTION

This report provides the findings of a supplemental ecological assessment conducted for Key Site 3 in Orcutt, California (Figure 1; "the Site"). This supplemental report is intended to be reviewed with the Key Site 3 Sensitive Species and Habitat Survey Report originally prepared by LFR Inc. in June 2006 and updated in May 2009. This supplemental report addresses the anticipated ecological impacts of several development design elements not previously assessed including off-site connections to Clark Avenue, Oakbrook Lane, and Chancellor Drive, an internal Emergency Vehicle Access road between the southern development envelopes, revised infrastructure and trail alignment, and two potential modifications to the Clark Avenue/Highway 101 interchange. This report does not reiterate comprehensive habitat descriptions and other technical information already provided in the primary sensitive species and habitat report except where relevant. However, this report does quantify comprehensive project impacts for the entire project and the impact assessment tables from this report should replace the previously produced tables. The figures have also been updated to show all of the project elements.

LFR has been involved in the ecological assessment and characterization of Key Site 3 since 2004 and LFR biologists, botanists and ecologists have visited the Site on numerous occasions. LFR an ARCADIS Company (LFR) conducted sensitive species surveys of the road alignments and other areas on August 19, September 4, and September 30, 2009. The personnel conducting the surveys consisted of LFR Principal Biologist Greg McGowan and LFR Senior Ecologist Mary Carroll.

2.0 METHODS

Prior to performing the fieldwork, LFR conducted a review of documents concerning the Site and the surrounding areas, including a search of the California Natural Diversity Database (CNDDB; California Department of Fish and Game [CDFG], 2009) for the U.S.G.S. 7.5 minute series Orcutt, Casmalia, Lompoc, Sisquoc, and Santa Maria topographic quadrangles. The California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular (CNPS, 2009) was also queried for appropriate habitat within the Orcutt Quadrangle and adjacent quadrangles. Other Site-specific environmental documents reviewed for the project included the 1995 Environmental Impact Report for the Orcutt Community Plan (Santa Barbara County, 1995), the Housing Element Update EIR (Santa Barbara County, 2009), and LFR's direct experience on the Site and in the region.

In order to document existing conditions, LFR conducted detailed field surveys on Site in the supplemental study areas including those areas that had previously been assessed as part of the earlier work. LFR botanical field surveys encompass the gathering of information on species composition, abundance, relative distribution, and community composition (including dominants, associates, and uncommon elements). Physiographic

features are noted and correlated with plant distributions, with special attention paid to accessible drainages and wetlands, changes in soil type, and native and introduced communities existing on Site and in adjacent areas, for comparative purposes.

All plant species found to be in a recognizable condition during the LFR surveys were recorded and are listed in Table 1. Nomenclature follows the Jepson Online Interchange (Baldwin et al., 2009), which lists updates based on The Jepson Manual (Hickman, 1993). In addition, pertinent volumes of the Flora of North America (Flora of North America Editorial Committee, eds. 1993+) were also utilized for plant identification. Identification of some plant species was confirmed using specimens housed at the Santa Barbara Botanic Garden in Santa Barbara. It is important to note that the list of vascular plant species on the Site presented in this report may not be all inclusive due to timing of the Fall 2009 surveys and does not represent an inventory of all plants on the Site. Plants that bloom earlier or later may not have been in recognizable condition during the fall, and due to the limited rainfall of the 2008/2009 winter, some annual and herbaceous perennial species may not have emerged successfully or in all locations. However, LFR has previously conducted surveys during all seasons over several years on all locations except the Clark Avenue/Highway 101 interchange and the two short offsite connections to Chancellor Drive.

3.0 HABITAT DESCRIPTION

Key Site 3 occurs in an important biological transition zone between the moister communities of central and northern California and the more arid communities of southern California. General site characteristics and vegetation communities are described below, with an emphasis on the supplemental survey areas.

3.1 Site Description

Located within the southeastern section of the Orcutt Planning Area, Key Site 3 is bordered by the Sunny Hills mobile home park to the north, five 20-acre ranchettes to the west, Highway 101 to the east, and undeveloped portions of the Solomon Hills to the south and the southwest. The Site encompasses a portion of the north-facing slopes of the Solomon Hills, which reach 1,346 feet elevation at Mount Solomon directly south of the Site. The topography of the Site consists of steep to gentle slopes that reach approximately 750 feet in elevation along the southern perimeter of the Site, dropping to about 520 feet above sea level at the bottom of the Orcutt Creek drainage. Orcutt Creek, which originates in Solomon Canyon to the south of the Site, crosses the property, entering near its southeastern corner as it passes under Highway 101 and exiting in a northwesterly direction along the western perimeter of the Site. The creek crosses a small portion of the Site a second time farther northwest (Figure 2). To the north of the main channel, the topography rises to a mesa approximately 30 to 50 feet above the creek bottom. This mesa receives runoff from an agricultural field located on the east side of Highway 101 through a culvert under the freeway. Aerial photographs indicate that this was historically a natural drainage pathway.

The Site supports a mosaic of native, weedy, and planted vegetation that will be described more fully in the ensuing sections. The distribution of vegetation types on the Site are dictated by topography, soils and geology, hydrology, slope exposure, climate, and land use history.

A total of seven native and two non-native communities were mapped on the Site in August 2009, supporting approximately 93 species of plants. Approximately 66 species of native plants and 27 species of non-native species were identified at the Site in the supplemental study areas in August 2009. The following habitats were identified in the road realignment areas during the LFR surveys (in order of acreage highest to lowest): Non-native Grassland, Central Coastal Scrub, Coast Live Oak Woodland, Central Maritime Chaparral, Central Coast Live Oak Riparian Forest, Central Dune Scrub, Dry Wash, Plantations and Windbreaks, including blue gum (*Eucalyptus globulus*), Northern California walnut (*Juglans hindsii*), and others, and Central Coast Arroyo Willow Riparian Scrub.

Existing habitats are shown on Figure 2. Sensitive resources are shown on Figure 3. Site photographs are provide in Appendix A.

3.2 Upland Communities

The Site supports a mosaic of native, weedy, and planted vegetation that will be described more fully in the ensuing sections. The distribution of vegetation types on the site are determined by topography, soils and geology, hydrology, slope exposure, climate, and land use history. Six upland habitats were identified on the Site during the LFR surveys (listed in order of acreage highest to lowest): Non-native Grassland, Central Coastal Scrub, Coast Live Oak Woodland, Central Maritime Chaparral, Central Dune Scrub, and Plantations and Windbreaks.

3.2.1 Non-native Grassland

Significant portions of the Site are dominated primarily by non-native grasses and other weedy annual species, especially north of Orcutt Creek. The presence of non-native grassland usually suggests prior clearing of native perennial vegetation, which then is largely replaced by invasive non-native grasses and forbs. The Site has supported cattle grzing for decades.

Among the non-native grasses are invasive annual Mediterranean grasses such as slender wild oats (*Avena barbata*), rip-gut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), red brome (*Bromus madritensis* subsp. *rubens*), foxtail barley (*Hordeum murinum*), and annual fescues (*Vulpia* species). Associated with these grasses are weedy mustards (*Brassica rapa, B. nigra,* and *Hirshfeldia incana*) and filaree (*Erodium cicutarium, E. botrys*) along with patches of Italian thistle, milk thistle, poison-hemlock, sheep sorrel (*Rumex acetocella)*, and others. The thistles are

most abundant in low-lying drainages and under coast live oak trees that have been cleared of understory vegetation.

North of Orcutt Creek, among the most abundant native species in the heavily grazed grassland areas are the coast tarplant (*Deinandra increscens* subsp. *increscens*) and doveweed.

In general, the grassland areas would be classified as Non-Native Grasslands in the CNDDB community classification system (Holland, 1986) and as California Annual Grassland Series within the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Non-native Grassland has a global rank of G4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat) and a state rank of S4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat), as listed in the CNDDB (2009).

3.2.2 Central (Lucian) Coastal Scrub

Central coastal scrub covers most of the slopes on the southern portion of the Site and, prior to modern agricultural and ranching activities, probably intergraded with riparian scrub along the north side of Orcutt Creek as it does to the south. Central coastal scrub is dominated by drought-tolerant, soft-leaved shrubs from three to six feet tall that are summer dormant and winter active, exhibiting a significant burst of growth in the winter and spring months. Many species are partially or completely summer deciduous. At the Site, coyote bush (*Baccharis pilularis* subsp. *consanguinea*) and California sagebrush (*Artemisia californica*) are the most abundant representatives of this plant community, along with California coffeeberry (*Rhamnus californica*), dune-heather (*Ericameria ericoides*), black sage (*Salvia mellifera*), and Lompoc monkeyflower (*Mimulus aurantiacus* subsp. *lompocensis*), a regional endemic. Poison-oak (*Toxicodendron diversilobum*) also predominates, especially adjacent to ravines and gullies. Occasional individuals of fuchsia-flowered gooseberry (*Ribes speciosum*) and coastal goldenbush (*Isocoma menziesii*) also occur at the Site.

In places, the central coastal scrub vegetation is very dense, with little to no openings between shrubs, especially on the steeper slopes and at higher elevations at the southern end of the Site where cattle do not appear to penetrate. Elsewhere on more gentle slopes, the scrub becomes more open and pockets of annuals and herbaceous perennials flourish between shrubs. Native subshrubs such as deerweed (*Lotus scoparius*), California croton (*Croton californicus*), and California-aster occur in exposed openings, along with herbaceous perennials such as green everlasting (*Gnaphalium californicum*), snakeroot (*Sanicula crassicaulis*), coast horkelia (*Horkelia cuneata* subsp. *cuneata*), and others.

Native annuals in central coastal scrub habitats include the sensitive California mucronea, as well as doveweed (*Croton* [*Eremocarpus*] *setigerus*), suncups (*Camissonia* species), holly-leaved navarretia (*Navarretia atractyloides*), and others.

Fairy mist (*Pterostegia drymarioides*) and California goosefoot (*Chenopodium californicum*.) are particularly conspicuous in the understory of the shrubs. Non-native weeds common in non-native grasslands are also found in these disturbed openings, especially black mustard (*Brassica nigra*), scarlet pimpernel (*Anagallis arvensis*), sheep sorrel (*Rumex acetocella)*, and a range of weedy grasses.

Two species, coyote bush and California sagebrush, are particularly tolerant of disturbance and both reinvade areas that have been previously cleared of scrub or grassland vegetation. Coyote bush, which can produced roots 10 to 15 feet long, is unusual in being tolerant of drought as well as a high water table. This species is particularly common in the heavily disturbed floodplain to the north of Orcutt Creek, accompanied by the more shallow-rooted California sagebrush and coastal goldenbush.

In a few places, especially adjacent to minor drainages and Orcutt Creek, coast live oak (*Quercus agrifolia*) becomes more abundant and is described more fully below in the section describing Coast Live Oak Woodland.

This community would be classified as the Central (Lucian) Coastal Scrub in the CNDDB community classification system (Holland, 1986). Areas where California sagebrush is dominant are best described by the California Sagebrush Series within the CNPS Manual of California Vegetation, and where coyote bush dominates as the Coyote Brush Series (Sawyer and Keeler-Wolf, 1995). Central Lucian Coastal Scrub has a global rank of G3 (10,000-50,000 acres) and a state rank of S3.3 (10,000-50,000 acres, no current threats known), as listed in the CNDDB (2009).

3.2.3 Coast Live Oak Woodland

Coast live oak woodland dominated by coast live oak trees (*Quercus agrifolia*) occurs on Site along Orcutt Creek, as well as in tributaries on the north-facing slope of the Solomon Hills on the southern portion of the Site. Coast live oaks vary in density from concentrated bands of oaks along the main corridor of this drainage to scattered trees in coastal scrub, chaparral or grassland habitats.

Coast live oak is an evergreen tree ranging from 20 to 75 feet in height, with a spreading crown, many massive branches, and a dense canopy of thick waxy leaves. Trees can easily live for 300 years or more. Although seemingly ubiquitous in the hills surrounding Orcutt and Santa Maria, coast live oaks (*Quercus agrifolia*) are restricted to a fifty-mile wide swath along the coast from Mendocino County south to northern Baja California. They are completely absent in the Sierra Nevada and other interior ranges; rather, they tend to occur in the maritime belt that receives fog during the summer months.

In dense coast live oak woodlands, the environment under the oak canopy is very shady. At the Site, shade-tolerant shrubs such as toyon (*Heteromeles arbutifolia*), climbing penstemon (*Keckiella cordifolia*) and poison-oak (*Toxicodendron diversilobum*) are found in oak woodland habitats, especially near the western border at

high elevations, which are the least disturbed oak woodlands at the Site. Herbaceous perennials such as hummingbird sage (*Salvia spathacea*), wood mint (*Stachys bullata*), wild cucumber (*Marah fabaceus*), and others also form a dense understory in undisturbed oak woodland.

Much of the oak woodland at the Site has a heavily disturbed understory (due to cattle), however, with occasional cover of native vegetation and a preponderance of invasive non-native weeds. These include Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum marianum*), poison-hemlock (*Conium maculatum*), ripgut brome (*Bromus diandrus*), and others. Along Orcutt Creek, the habitat can be characterized as Central Coast live oak riparian forest (see discussion of wetland communities below).

A few distinctive patches of Indian rush (*Juncus textilis*) occur in sandy soil under the canopy of the coast live oak near Orcutt Creek. Indian rush is classified as an obligate wetland indicator species by the US Fish and Wildlife Service (1988 list, wetlands.fws.gov/plants.htm). The juxtaposition of this wetland species in the understory of coast live oak creates an unusual association that has a limited distribution in Santa Barbara County, including a few occurrences at La Purisima Mission State Historic Park and in the nearby Burton Mesa Ecological Reserve near Vandenberg Village. This may be a reflection of a subsurface seep.

This community would be classified as the Coast Live Oak Woodland Community in the CNDDB community classification system (Holland, 1986), and as the Coast Live Oak Series within the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Coast Live Oak Woodland has a global rank of G4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat) and a state rank of S4 (apparently secure, but factors exist to cause some concern; i.e. there is some threat or somewhat narrow habitat), as listed in the CNDDB (2009).

Although not listed as a rare community by the California Department of Fish and Game, oak trees and oak woodlands are specifically addressed as sensitive habitat by Santa Barbara County through habitat-specific impact assessment guidelines (County of Santa Barbara, 1995) and oak woodlands are protected through the California Environmental Quality Act (CEQA). Coast live oak trees and oak woodlands of varying densities exist throughout the Site, particularly on ridgetops and north-facing slopes.

3.2.4 Central Maritime Chaparral

Central maritime chaparral, also called sandhill chaparral and in some areas Burton Mesa chaparral, is dominated by evergreen shrubs and scattered multi-trunked coast live oaks that grow together at varying densities from open stands to almost impenetrable thickets over vast expanses of the historic sand sheets of the Central Coast. The woody chaparral shrub vegetation ranges from one to four meters in height, although low-growing annuals and herbaceous perennials flourish in exposed openings.

Central maritime chaparral in Santa Barbara County is primarily found in the Santa Maria Valley and in the Santa Ynez River Valley on Aeolian sands of the Orcutt formation (Ferren et al. 1984); these sands are underlain at varying depths by bedrock from the Monterey and Paso Robles formations and can include cemented rock and clay lenses (Shipman 1972). Maritime chaparral is an unusual vegetation type found on mostly sandy substrates in a few coastal locations in Santa Barbara, San Luis Obispo, Monterey, and Santa Cruz Counties; often these maritime chaparral associations are dominated by local endemic species of ceanothus (*Ceanothus*) and manzanita (*Arctostaphylos*) mixed with other widespread and endemic species (Holland, 1986; Holland and Keil, 1995).

Central maritime chaparral often exhibits a pattern of greatest diversity at the highest elevations on the sand sheets, with manzanitas, ceanothus, chamise, coast live oak, and other species predominating. On the lower slopes, which are usually more xeric, the manzanitas and ceanothus gradually are replaced by chamise, and even lower the chamise is replaced by coastal scrub. This pattern was observed at the Site, although the Site lacks the high elevations that support the most diverse maritime chaparral associations.

At the southern border of the Site a maximum elevation of approximately 750 above sea level is reached. In this area, central coastal scrub gives way to chaparral dominated by dense stands of chamise (*Adenostoma fasciculatum*) mixed with clumps of multi-trunked coast live oaks. A few Lompoc ceanothus (*Ceanothus cuneatus* var. *fascicularis*) also occur here and are found in one area where the proposed connector road south of Orcutt Creek crosses a small ravine.

Mountain-mahogany (*Cercocarpus betuloides*) is also scattered in the chaparral, along with redberry (*Rhamnus crocea*), black sage, Lompoc monkeyflower, and poison-oak. In most chaparral habitats in California dominated by chamise, there are few to no plants growing under the shrub canopy. Other native grasses such as needlegrass (*Nassella pulchra* and *N. lepida*) and Coast Range melic (*Melica imperfecta*) are also scattered in the understory of the shrubs.

This community would be classified as the Central Maritime Chaparral in the CNDDB community classification system (Holland, 1986). It fits best into the Chamise Series within the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Central Maritime chaparral has a global rank of G2 (2,000-10,000 acres) and a state rank of S2.2 (2,000-10,000 acres, threatened), as listed in the CNDDB (2009).

3.2.5 Central Dune Scrub

Central dune scrub occurs in sandy soils near the ocean but also on older stabilized dune sheets such as those in the Orcutt area (Holland and Keil, 1995). Woody vegetation predominates, but open sand is easily observed between shrubs. This community is said to be edaphically controlled, occurring only on sandy substrates (Holland and Keil, 1995). Although similar to central coastal scrub, described below,

the dominants in this habitat include dune-heather (*Ericameria ericoides*) and dune bush lupine *(Lupinus chamissonis)*. Other common shrubs are California sagebrush (*Artemisia californica*) and black sage (*Salvia mellifera*). In addition, subshrubs and herbaceous perennials such as California croton (*Croton californicus*), deerweed (*Lotus scoparius*), and California-aster (*Corethrogyne filaginifolia*) are scattered in openings between shrubs, along with small-fruited seaside fiddleneck (*Amsinckia spectabilis* var. *microcarpa*) and California mucronea (*Mucronea californica*). The two latter species are all considered sensitive and small-fruited seaside fiddleneck and California mucronea were recognizable in August 2009 along the connector road realignment.

Central dune scrub at the Site would be classified as Central Dune Scrub in the CNDDB community classification system (Holland, 1986), and fits best into the Dune Lupine – Heather Goldenbush series within the CNPS Manual of California Vegetation classification (Sawyer and Keeler-Wolf, 1995).Central Dune Scrub has a global rank of G2 (2,000-10,000 acres) and a state rank of S2.2 (2,000-10,000 acres, threatened), as listed in the CNDDB (2009).

3.2.6 Plantations and Windbreaks

Introduced species have been planted at the Site, most especially blue gum eucalyptus (*Eucalyptus globulus*) by Orcutt Creek. One individual of ribbon gum (*E. viminalis*) occurs along the eastern edge of Orcutt Creek near Highway 101 along with several large Northern California walnuts (*Juglans hindsii*), a species widely planted along the Central Coast but not native to the area. This plant was incorrectly identified as Southern California Black Walnut (*Juglans californica* subsp. *californica*), a sensitive plant species, in Sykes 2003. In addition, three planted Monterey pines (*Pinus radiata*) occur along the eastern boundary of the site adjacent to Highway 101. A few Aleppo pines (*Pinus halepensis*) are also planted in the northwestern corner of the Site adjacent to homes.

Eucalyptus trees were introduced into California from Australia beginning in the 1850s. Blue gum (*Eucalyptus globulus*) was the most common species planted, and has now become naturalized throughout much of California. A grove can spread three to six meters in diameter a year, displacing native species as it colonizes areas (Keil and Holland, 1998). Blue gum eucalyptus is listed on List A-1 for the most invasive wildland pest plants by CalIPC. Naturalization of eucalyptus into several native plant communities, including maritime chaparral, vernal pools, riparian zones, and grasslands, has occurred at the nearby Vandenberg Air Force Base. Eucalyptus seedlings have been noted to outgrow and displace maritime chaparral (Keil and Holland, 1998).

The eucalyptus may be used by wintering monarch butterflies, although no roosts were observed during the wildlife surveys and the surveys were conducted during the appropriate time of year. A variety of migratory and resident songbirds, as well as raptors such as turkey vultures and a variety of hawks are known to use the eucalyptus. However, overall wildlife habitat value for this community is low because of the poorly

developed understory, which eliminates heavy use by amphibians, reptiles, and small mammals.

The tree plantings of eucalyptus can best be described by the Eucalyptus Series within the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995); there is no corresponding CNDDB classification. Although Monterey pines are native to California, they do not naturally occur on the Site. As part of non-native stands, these and other planted species are not treated in either the CNDDB or CNPS classification.

3.3 Wetland Communities

Areas with standing or flowing water or with seasonally or permanently saturated soils commonly support wetland communities. Freshwater wetlands are extremely complex and variable, and their species composition and overall structure are dependent on a number of factors. Water depth, seasonal fluctuations in water levels, rate of water movement, water and sediment chemistry (including salinity, pH, and quantity of organic matter), depth and texture of bottom sediments, amount of sunlight, and water and air temperatures are among the most important variables affecting overall wetland dynamics. Along rivers and streams, fine-grained alluvial soils settle in the bottom of the drainages, and annual inundation after rains provide a tremendous of nutrients, soil, and new germination sites.

Two wetland habitats are found at the Site, both associated with Orcutt Creek. A jurisdictional wetland delineation was not conducted as part of this supplemental study but was previously conducted by LFR in April 2009 addressing all potentially jurisdictional features on the Site including County, State, and Federal wetland criteria (Jurisdictional Waters Assessment, LFR Inc., 2009).

3.3.1 Central Coast Live Oak Riparian Forest

For most of the passage of Orcutt Creek through the Site, coast live oak predominates along the drainage, with only a few arroyo willows here and there. Although contiguous with coast live oak woodland on nearby slopes, this vegetation can be characterized as central coast live oak riparian forest due to the dense cover of oaks and riparian associates such as mulefat, mugwort (*Artemisia douglasiana*), California blackberry, poison-oak, Indian rush, and other native species, along with non-native weeds. As described above in the section on coast live oak woodland, a distinctive association of coast live oak with Indian rush occurs in a couple of places near Orcutt Creek.

The center of the creek corridor is sandy and mostly devoid of woody vegetation, although many annuals and herbaceous perennials were observed, along with occasional sand bars supporting coast live oaks and other shrubs and herbs.

In the CNDDB community classification system (Holland, 1986), the vegetation along Orcutt Creek is part of both the Central Coast Riparian Scrub Community and the Central Coast Live Oak Riparian Forest Community. The Central Coast Live Oak Riparian Forest Community would comprise the Coast Live Oak Series in the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Central Coast Live Oak Riparian Forest has a global rank of G3 (10,000-50,000 acres) and a state rank of S3.2 (10,000-50,000 acres, threatened), as listed in the CNDDB (2009).

3.3.2 Dry Wash

The ephemeral nature of Orcutt Creek and the significant surge of water associated with short period storm flow have created large sandy areas within the channel and extending up the banks that are devoid of perennial vegetation. This is particularly the case where the main channel of Orcutt Creek exits the Site to the west. This dynamic habitat shifts through seasons and years depending on the frequency, duration, volume, and velocity of creek flows.

This habitat type does not have a corresponding description in the CNDDB community classification system.

3.3.3 Central Coast Arroyo Willow Riparian Scrub

Central coast arroyo willow riparian scrub occurs in a few small areas on the Site. The creek enters the Site through a channel under Highway 101 in the southeastern corner of the Site. In this area a few large clumps of arroyo willow occur scattered along the creek banks, with the more abundant coast live oak and occasional Mexican elderberry (*Sambucus mexicana*). Coyote bush (*Baccharis pilularis*) and mulefat (*B. salicifolius*) are also present, along with locally common patches of native poison-oak, mugwort (*Artemisia douglasiana*), and other native species. One individual of sandbar willow (*Salix exigua*) was also observed.

Orcutt Creek leaves the Site at the western boundary below the rise leading to the upper mesa near Chancellor Drive, and crosses a small portion of the Site again to the northwest. This stretch of Orcutt Creek also supports small patches of Central coast riparian scrub where scattered arroyo willow, mulefat, Mexican elderberry, and coast live oak predominate.

In the CNDDB community classification system (Holland, 1986), the vegetation along Orcutt Creek is part of both the Central Coast Riparian Scrub Community and the Central Coast Live Oak Riparian Forest Community. The Central Coast Riparian Scrub Community comprises the Arroyo Willow Series in the CNPS Manual of California Vegetation (Sawyer and Keeler-Wolf, 1995). Central Coast Riparian Scrub has a global rank of G3 (10,000-50,000 acres) and a state rank of S3 (10,000-50,000 acres), as listed in the CNDDB (2005). Central Coast Arroyo Willow Riparian Forest has a global rank of G3 (10,000-50,000 acres) and a state rank of S3.2 (10,000-50,000 acres, threatened), as listed in the CNDDB (2009).

4.0 HABITAT DESCRIPTIONS OF SUPPLEMENTAL STUDY AREAS

4.1 Oakbrook Lane Connection

Oakbrook Lane intersects Stillwell Road south of Sunny Hills mobile home park and the paved portion currently terminates approximately 75 feet from the property line of the Site along the northwestern perimeter (Figure 2). The area between the existing paved road and the Site supports a ruderal non-native grassland community with scattered non-native landscaping species.

4.2 Chancellor Street Extension

Chancellor Street intersects Stillwell Road one block south of Oakbrook Lane and runs easterly and then southeasterly until the paved portion terminates approximately 350 feet from the Key Site 3 property line. A poorly developed existing dirt road extends from the paved road to the property line. The proposed Chancellor Street extension would link the proposed western estate lots with Stillwell Road (the eastern estate lots would take access from Clark through the main portion of the Site). The proposed Chancellor Street extension traverses non-native annual grassland dominated by wild oat, ripgut brome, soft chess, summer mustard and scattered native telegraph weed (*Heterotheca grandiflora*). To the east at the Site boundary, the grassland abruptly transitions to central coastal scrub vegetation at the fence-line, dominated by California coffeeberry, coyote bush, California sagebrush, and Lompoc bush monkeyflower.

4.3 Orcutt Creek Crossing

A new connector road will cross Orcutt Creek in the southwest corner of the northwestern portion of the Site connecting the upper mesa with Chancellor Drive (Figure 2). From the mesa, the road proceeds southwest down the slope across non-native annual grassland dominated by ripgut brome and foxtail barley, with a few scattered native species such as coyote bush, coastal goldenbush, and coast tarplant.

Where the alignment reaches Orcutt Creek, a vehicle bridge will be constructed. Project utilities including sewer will also be routed through this corridor. The utilities will either be hung from the bridge or directionally drilled under the creek to avoid the need to trench through the Orcutt Creek channel. The creek bottom supports mulefat in this area, with arroyo willow to the immediate west. The alignment has been developed to avoid the existing coast live oak trees along the creek banks. The alignment was not staked in the field at the time of the LFR surveys however it appears that it is possible to avoid removal of any coast live oak trees. Limbing or trimming of the canopies of two live oaks may be required. Depending on the width of the final bridge and the required disturbance envelope for installation, removal of two oaks is possible. Pre-construction field surveys of the final staked alignment and post construction confirmation of avoidance is recommended to verify that the bridge avoids impacts to

individual oak trees. If significant impacts or removal of the trees occurs, mitigation would be required as with other project impacts to coast live oak trees. South of the creek, the road extends across a small field of annual grassland before connecting with Chancellor Drive.

4.4 Estate Lots – Southern Connector Road

Between the two development envelopes for the estate lots on the southern slopes of the site, a new connector road would pass through central maritime chaparral, oak woodland, and central coastal scrub vegetation. The road would be closed to routine traffic and only available for Emergency Vehicle Access. Central coastal scrub is traversed at the western and eastern ends of the connector road, and supports populations of California mucronea and small-flowered seaside fiddleneck between native shrubs such as dune-heather, California coffeeberry, coyote bush, California sagebrush, and others. Coast live oak woodland and central maritime chaparral occurs through the middle of the road alignment. The oaks occupy the base of the minor depressions/drainages, as well as upland margins, where they interface with the surrounding coastal scrub and maritime chaparral vegetation. The central maritime chaparral vegetation is dominated by chamise, California coffeeberry, mountain-mahogany, toyon, Lompoc monkeyflower, and Lompoc ceanothus.

Sensitive species observed along the connector road route include California mucronea, small-flowered seaside fiddleneck, Lompoc ceanothus, and Lompoc monkeyflower. Approximately 37 established coast live oak trees occur along the connector road alignment, including several large trees supporting four to seven trunks.

At least 37 coast live oak trees would be impacted, along with individuals of the sensitive California mucronea, small-flowered seaside fiddleneck, and Lompoc ceanothus.

4.6 Revised Access to Clark Avenue Across Key Site 2

Impacts associated with access from the Site to Clark Avenue to the north across Key Site 2 were previously studied and described in the Sensitive Species and Habitat Assessment (LFR 2006, Updated May 2009). The types of impacts have not changed, however the road was slightly realigned recently to utilize more of the existing road and a revised impact table is included as part of Table 3.

4.7 Highway 101 Realignment at Clark Avenue – Alternative A & B

Two alternatives for modifications to the northbound on-ramp and off-ramp at the Highway 101/Clark Avenue interchange have been surveyed. These modifications would align the on-ramp and off-ramp where they meet Clark Avenue. Currently they are offset with the off-ramp meeting Clark Avenue approximately 75 feet east of where the northbound on-ramp join Clark Avenue.

4.7.1 Alternative A – North-bound On-ramp Modifications

A narrow strip of non-native grassland borders the area between an agricultural field to the east and the current northbound onramp to the west. Dominant plants in this area include veldt grass, wild oat, and telegraph weed.

The area south of the current onramp consists of a west-facing slope that supports dense patches of veldt grass along the eastern and northern tip, scattered non-native annual grasses and native California croton towards the southern portion, and scattered a few scattered native shrubs (dune-heather and silver dune lupine) on the north-facing slope immediately below and to the north of Clark Avenue.

The impacts associated with Alternative A of the Highway 101 ramp realignments are provided on Table 3.

4.7.2 Alternative B – North-bound Off-ramp Modifications

The area west of the current off-ramp where work would occur consists of a steep west-facing slope that is dominated by non-native grassland, including veldt grass, wild oat, stork-billed filaree, summer mustard, and other non-native species. A few native shrubs are present in low numbers, especially dune-heather, California sagebrush, and silver bush-lupine. Native herbaceous species include California plantain (*Plantago californica*), California croton, slender buckwheat (*Eriogonum gracile* subsp. *gracile*), clustered tarplant (*Deinandra increscens* subsp. *increscens*), and telegraph weed. At the bottom of the slope near the northbound eastern lane of Highway 101 is a culvert that drains the agricultural field to the north. Non-native iceplant borders the culvert along with non-native grasses; a large individual of Peruvian pepper (*Schinus molle*) occurs in this area as well.

The impacts associated with Alternative B of the Highway 101 ramp realignments are provided on Table 3.

4.8 Solomon Hills Trail

As required in the Orcutt Community Plan, an undeveloped (non-paved) “nature” trail is required to extend to the southern property line to connect with potential future trails through the Solomon Hills. It is anticipated that the trail will be four to six feet in width and will follow the existing cattle and deer trails to the maximum extent feasible. The trail would pass through central maritime chaparral, oak woodland, and central coastal scrub vegetation. No oak trees will be impacted for the trail. In some areas, vegetation removal or pruning may be required to garner access through chaparral or central coastal scrub habitat.

The final alignment of the trail should be staked in the field by a qualified biologist at the time of construction to avoid and minimize impacts to the maximum extent feasible. The general alignment is shown on Figure 2.

5.0 FINDINGS

The Sections below describe the findings of the surveys. Please note that no previously undescribed impacts to wildlife resources are anticipated as part of the supplemental work elements. Full assessment of occurring and potentially occurring wildlife species, anticipated and potentially occurring impacts, as well as impact avoidance, minimization, and mitigation measures are described in the Sensitive Species and Habitat Assessment (LFR 2006, updated May 2009).

5.1 Sensitive Habitats

The following plant communities have a California state ranking of S3.2 or higher, which are considered to be "threat" ranks by the California Department of Fish and Game Natural Diversity Database (CDFG, 2009). The state ranking system for S3 and above includes the estimated number of existing acres for the sensitive habitat, as well as a threat ranking from .1 (very threatened) to .3 (no current threats known). Sensitive habitats for this report are defined as S3.2 and above for habitats with an identified threat.

- Central Maritime Chaparral (S2.2 - 2,000-10,000 acres, threatened)

Habitats of Local Concern in Santa Barbara County
Coast live oak woodland
Riparian drainage
Central maritime chaparral

5.2 Sensitive Plants

No state or federally listed threatened or endangered botanical species were observed on the Site by LFR. A total of four sensitive plants were observed during the August surveys: California mucronea, Lompoc ceanothus, small-flowered seaside fiddleneck, and Lompoc monkeyflower. Three additional species were found in the general area of the connector road during 2005 LFR surveys: dune larkspur, San Luis Obispo wallflower, and few-flowered collinsia. Three of these species are listed by the California Native Plant Society and three are considered to be a plant of local concern in Santa Barbara County (Wiskowski, 1988). Of the three CNPS listed species, one is on List 1B for plants considered rare in California; the other two species are on List 4, a watch list as further described in the species accounts below. The discussion below addresses the sensitive species observed on the Site and also includes species that were not observed on the Site but are known from the general area.

Additional sensitive species may be identified during other surveys. The CNDDB and CNPS Electronic Inventory search, as well as a review of the 1995 Rindlaub survey, point to a larger list of plant species whose presence has been reported in the Orcutt and adjacent quadrangles, or that may potentially occur in the habitat present at the Site. All sensitive species observed at the Site or which have been reported from the area using the CNDDB and CNPS Electronic Inventory search are included in Table 2.

5.2.1 Observed Sensitive Botanical Species

The following plant species were observed in the August 2009 survey areas on Site. Additional sensitive species that are only recognizable in spring may be on Site in the survey areas.

Lompoc (Coast) Ceanothus (*Ceanothus cuneatus* var. *fascicularis*)

Lompoc ceanothus, also called coast ceanothus, is an endemic variety of the more wide-ranging buckbrush ceanothus (*Ceanothus cuneatus* var. *cuneatus*) that rarely exceeds two meters in height, though prostrate forms have been observed at Point Sal (Smith 1998). Lompoc ceanothus has narrow leaves in clusters along the stems and lilac-colored flowers, in contrast to the wider, less clustered leaves of the widespread white-flowered varieties.

Lompoc ceanothus is scattered to abundant in Burton Mesa chaparral on Burton Mesa north in the Purisima, Solomon, and Casmalia Hills to Pt. Sal, Nipomo Mesa, and Morro Bay, where it occurs with the Morro manzanita (*A. morroensis*) as well as sand almond *(Prunus fasciculata var. punctata*). It occurs south to the hills behind Lompoc and northeast of Buellton.

The Lompoc ceanothus is listed on CNPS List 4.2, which is a watch list for species with a limited distribution that are fairly endangered in California.

Presence on the Site: Lompoc ceanothus is found in the central maritime chaparral on the Site south of Orcutt Creek. Seven individuals were observed along the proposed southern Emergency Vehicle Access road between the southern development areas.

California spineflower (*Mucronea californica*)

California spineflower is a distinctive reddish annual. It branches low to the ground and rarely exceeds 30 cm in height. Large triangular awn-tipped reddish bracts arise from the slender stems and support the smaller white to pink flowers. California spineflower begins blooming in spring but is readily visible long into autumn.

This annual herb is known from sandy soils from Santa Barbara, Buellton to Lompoc, Point Sal, Los Alamos, Santa Maria, and the Nipomo Mesa. It is on CNPS List 4.2,

which is a watch list for species with a limited distribution that are fairly endangered in California.

Presence on the Site: California spineflower is found in many sandy openings in central dune scrub, central coastal scrub, and maritime chaparral south of Orcutt Creek. Hundreds of individuals were found in numerous locations along the proposed southern Emergency Vehicle Access road between the southern development areas.

Small-seeded fiddleneck (*Amsinckia spectabilis* var. *microcarpa*)

The small-seeded fiddleneck is an annual member of the borage family that produces yellow-orange flowers in spring. It had been considered for inclusion in the fifth edition of the CNPS Inventory, but was rejected because it is too common (California Native Plant Society, 1994). However, it is still considered to be a species of local concern within Santa Barbara County (Wiskowski, 1988). It is commonly scattered as an endemic to the sandy hills and brushy mesas of stabilized dunes from the Buellton area to Lompoc, Purisima Hills, Surf, Burton Mesa, San Antonio Creek Area, Point Sal, and the Nipomo Mesa and Santa Maria area (Smith, 1998).

Presence on the Site: Small-seeded fiddleneck is found scattered in central dune scrub and coastal scrub habitats on Site, especially in moister areas. Although the plants die in late spring, numerous dried individuals were observed along the proposed southern Emergency Vehicle Access road between the southern development areas.

Lompoc monkeyflower (*Mimulus aurantiacus* subsp. *lompocensis*)

The Lompoc monkeyflower is recognized by some taxonomists as a distinctive subspecies of the more widespread *Mimulus aurantiacus* and is regarded as a local species of concern by the County of Santa Barbara (Rindlaub, et al., 1995; Wiskowski, 1988). It is endemic to coastal scrub, chaparral and woodlands from Gaviota Pass and Pojoaque Falls into southern San Luis Obispo County.

Presence on the Site: Lompoc monkeyflower is common in central dune scrub, central coastal scrub, and maritime chaparral at the Site. Scattered individuals were found in numerous locations along the proposed southern Emergency Vehicle Access road between the southern development areas.

Among the sensitive species that have been previously mapped by LFR in the survey areas are: dune larkspur (Delphinium parryi subsp. blochmaniae), San Luis Obispo wallflower (Erysimum capitatum var. lompocense), and few-flowered collinsia (Collinsia sparsiflora var. collina).

6.0 IMPACTS

The following sections discuss general impacts anticipated from the proposed activities studied in this supplemental assessment. Both potential impacts and potential impact avoidance and minimization measures are broadly discussed below. Table 3 provides quantitative impact calculations for each habitat including all project elements (not just the new elements studied on this supplemental report).

6.1 Direct Loss of Vegetation, Wildlife Habitat, and Sensitive Species

No direct impacts to state or federally-listed threatened or endangered species are anticipated. Expected direct impacts associated with the project involve the loss of native plants and portions of plant communities, as well as loss of open foraging ground for wildlife and loss of fossorial wildlife species present on the Site during clearing. Nesting and foraging habitat for birds favoring grassland, coastal scrub, and oak woodland communities would be lost through project implementation. Fragmentation of native habitat could occur, resulting in barriers to wildlife movement and conversion of sustainable plant populations into non-reproductive remnants.

6.2 Indirect Loss of Vegetation and Wildlife Habitat

Indirect losses to vegetation are anticipated to occur as a result of construction or in association with ultimate build-out and occupancy of the development project. An increase in noise, artificial light, human activity, vehicle traffic, domestic pets, and weed invasion are anticipated to result from this project. These changes diminish the ability of existing natural habitat to support wildlife and typically lead to a reduction in the carrying capacity of the habitats resulting in the decline or potential extirpation of local populations of certain native plant and wildlife species.

7.0 POTENTIAL IMPACT AVOIDANCE, MINIMIZATION, AND MITIGATION MEASURES

Any development plans would benefit from offering a variety of measures to effectively avoid, minimize, and mitigate potential impacts associated with the project. Several of these are described below for consideration during the development of subsequent environmental review documents.

7.1 Avoidance & Minimization Measures

Avoidance of impacts is the preferred approach to decision-making during the development design review. Two measures not previously described have been added to the list below from the initial Sensitive Species and Habitat Assessment.

- Pre-construction surveys, construction monitoring, and post-construction surveys to quantify oak impacts – The actual number of oaks impacted or removed by project activities should be quantified for mitigation. Pre-construction surveys of staked grading areas and/or the limits of disturbance can be used to identify impacted oaks. Construction monitoring and/or post-construction surveys may also be necessary to ensure that the number of impacted oak trees is accurately quantified for mitigation.

- Final trail alignment – The final alignment of the required southern trail that extends from the western estate lot area to the southern property line should be staked by a qualified biologist at the time of construction to avoid and minimize impacts to native resources to the maximum extent feasible. It is anticipated that no oak trees will be impacted to facilitate development of the trail. Wherever possible, the trail should follow existing trails through the general area.

- Limit disturbance of upland habitat – The portion of the Site designated for development in the Orcutt Community Plan is limited to the upper mesa. Protection of the southern portion of the Site, particularly the slopes south of Orcutt Creek would substantially reduce project impacts (compared to complete clearing of the Site). All of the sensitive resources mapped on the Site occur south of Orcutt Creek with the exception of the short section of Orcutt Creek crossing the northwest portion of the Site near the cattle corral. Disturbed native habitat occurs north of Orcutt Creek on the lower floodplain, and disturbed non-native grassland covers the upper mesa.

- A designation of natural open space should consist of large contiguous areas particularly with connectivity to adjacent open space areas off-site to the south and west.

- Limit disturbance of riparian habitat – Development should be kept as far back from the banks of Orcutt Creek and the associated drainages as possible. The hydrologic regimen of these areas of the Site should be protected to avoid changes in the volume or duration of flooding, and to maintain or improve habitat and water quality conditions in if feasible.

- Maintain connectivity across the Site – Orcutt Creek and the adjacent upland areas on the Site provide connectivity with the parcels adjacent to the Site (south and west) and to different areas within the Site. Road crossings should be designed to avoid impacts to wildlife movement through these corridors (particularly small mammals and amphibians).

- Avoid impacts to nesting birds - The initial disturbance should avoid the bird breeding season (March 1 to August 15). If initial construction activities are proposed during this period, pre-construction nesting bird surveys of the Site should be conducted two weeks prior to the start of ground clearing or grading activity. Construction activities that involve disturbances within 500-feet of an

active nest should be avoided. Construction personnel should be aware of the importance of staying out of Orcutt Creek and associated tributaries as they represent an important habitat type commonly used for nesting purposes by many bird species.

- Pre-construction wildlife surveys are recommended prior to initial ground clearing activities in order to identify any active American badger dens occurring on the Site. Detection of active burrows well in advance (at least two weeks) of scheduled construction work is necessary in order to adequately exclude badger from the Site prior to the start of clearing activities.

- LFR recommends that construction activities near Orcutt Creek cease during rainy weather when amphibian species such as CRLF, CTS, and spadefoot toads are more likely to be found above ground and dispersing to aquatic habitats. Silt fencing is recommended along the edge of riparian vegetation adjacent to all drainages through the Site. The fencing can help prevent amphibians such as western spadefoot toads from entering the work area, delineate the work area for construction personnel, and help prevent erosion into the creek.

7.2 Mitigation Measures

Mitigation measures to reduce and avoid impacts are described above and in the original Sensitive Species and Habitat Assessment (LFR 2006, updated May 2009). The anticipated impacts associated with the project could include the loss of upland and riparian habitat resources as well as the potential loss of individual botanical and wildlife resources. In addition to the measures previously described, LFR recommends that, during the current environmental review for the project, consideration of permanent protection of natural open space through easement or fee dedication is considered. This could include permanent protection of particular resources (e.g., central maritime chaparral or oak trees) for mitigation of specific losses, or more generalized consideration of protected habitat to offset loss of other less specific habitat resources (e.g., common wildlife species and foraging habitat). The dedication should include a management plan describing allowable and prohibited use of the open space areas as well as any required activities (e.g., maintenance or monitoring) if not specifically addressed in the development plan for the project. If active measures are required to replace habitat losses, the Site supports large areas of degraded habitat suitable for habitat restoration where native conditions could be effectively enhanced through maintenance (e.g., weed abatement) or habitat replacement. If habitat restoration and replacement are proposed, they should include a formal restoration implementation plan including quantifiable performance criteria and long-term maintenance and monitoring requirements.

8.0 CONCLUSIONS

The findings of the LFR Supplemental Ecological Assessment for Key Site 3 indicate that six sensitive communities and several sensitive species occur on the Site. No state or federally listed threatened or endangered species were observed at the Site during the surveys. Central dune scrub and central maritime chaparral occur on the north-facing slopes of the Solomon Hills south of Orcutt Creek, with the maritime chaparral replacing coastal scrub at higher elevations. Central coast arroyo willow riparian scrub occurs in a few patches along Orcutt Creek. Central coast live oak riparian forest predominates along Orcutt Creek. Coast live oak woodland is found on the north-facing slopes on the southern portion of the Site, especially adjacent to ravines and slopes leading to Orcutt Creek. Coast live oaks are considered a sensitive species in Santa Barbara County.

Eight other sensitive plant species were observed at the Site; these include shagbark manzanita, dune larkspur, Lompoc ceanothus, California spineflower, San Luis Obispo wallflower, small-seeded seaside bird's beak, small-flowered collinsia, and Lompoc monkeyflower. Several other sensitive species may be present, however, that may be more recognizable later because they bloom later in the summer or in early fall.

The limits of disturbance should be clearly delineated and fenced prior to any Site clearing or grading activities.

Conditions existing on the Site provide potentially suitable habitat for sensitive wildlife species such as the California horned lizard, western spadefoot toad, loggerhead shrike, Cooper's hawk, white-tailed kite, and American badger; all of which have been observed on or near the Site (see LFR 2006 for additional detail regarding wildlife). Several raptor species are known to utilize the Site either on a year round basis, intermittently, or seasonally and may nest on the Site. Development of the Site will significantly change the existing Site conditions and will impact wildlife resources.

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TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3 DURING SPECIAL AUGUST 2009 SURVEYS

(Compiled from LFR August 2009 field surveys; not year-round surveys)

Scientific Name	Common Name	Oak Brook Lane	Creek crossings	Chancelor Road extension	Proposed freeway ramp realignments	Connector Road south of Orcutt Creek
TREES						
Eucalyptus globulus	blue gum eucalyptus	x	x	x	x	
Pinus radiata	Monterey pine	x			x	
Quercus agrifolia	**coast live oak**	**x**			**x**	**x**
Salix lasiolepis	**arroyo willow**	**x**				
Schinus molle	Peruvian pepper				x	
SHRUBS						
Adenostoma fasciculatum	**chamise**					**x**
Artemisia californica	**California sagebrush**		**x**	**x**	**x**	**x**
Baccharis pilularis subsp. consanguinea	**coyote bush**	**x**	**x**	**x**	**x**	**x**
Baccharis salicifolius	**mule fat**	**x**	**x**			
Ceanothus cuneatus subsp. fascicularis	**Lompoc ceanothus**					**x**
Cercocarpus betuloides var. betuloides	**mountain-mahogany**					**x**
Ericameria ericoides	**dune-heather**				**x**	**x**
Eriophyllum confertiflorum	**golden yarrow**					**x**
Heteromeles arbutifolia	**toyon**					**x**
Isocoma menziesii	**Coastal goldenbush**	**x**			**x**	**x**
Keckiella cordifolia	**climbing penstemon**					**x**
Lotus scoparius	**deerweed**					**x**
Lupinus chamissonis	**silver bush lupine**				**x**	**x**
Mimulus aurantiacus subsp. lompocensis	**Lompoc sticky monkeyflower**			**x**		**x**
Rhamnus californica	**coffee berry**			**x**		**x**
Rhamnus crocea	**redberry**					**x**
Rubus ursinus	**California blackberry**					**x**
Salvia mellifera	**black sage**					**x**
Sambucus nigra subsp. canadensis	**blue elderberry**	**x**		**x**		**x**
Solanum douglasii	**Douglas' nightshade**					**x**
Toxicodendron diversilobum	**poison-oak**					**x**

TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3 DURING SPECIAL AUGUST 2009 SURVEYS

(Compiled from LFR August 2009 field surveys; not year-round surveys)

Scientific Name	Common Name	Oak Brook Lane	Creek crossings	Chancelor Road extension	Proposed freeway ramp realignments	Connector Road south of Orcutt Creek
HERBS (annuals, biennials, and herbaceous perennials)						
Acourtia microcephala	**sacapellote**					**x**
Agrostis pallens	**thin grass**					**x**
Aira caryophyllea	silver hair grass					x
Amaranthus species	amaranth					x
Ambrosia psilostachya	**western ragweed**	**x**	**x**			**x**
Amsinckia spectabilis var. microcarpa	**small-fruited seaside fiddleneck**			**x**		**x**
Anagallis arvensis	scarlet pimpernel	x	x	x	x	x
Artemisia douglasiana	**mugwort**					**x**
Asclepias fascicularis	**narrow-leaved milkweed**					
Avena barbata	slender wild oat	x	x	x	x	x
Brassica nigra	black mustard	x			x	
Bromus carinatus	**California brome**					**x**
Bromus diandrus	ripgut brome	x	x	x	x	x
Bromus hordeaceus	soft chess brome	x	x	x	x	x
Calystegia macrostegia subsp. cyclostegia	**chaparral morning glory**					**x**
Camissonia micrantha	**small sun-cup**					**x**
Carduus pycnocephalus	Italian thistle				x	
Carpobrotus edulis	ice plant				x	
Chamaesyce serpyllifolia	**thyme-leaved spurge**				**x**	
Chenopodium californicum	**California goosefoot**					**x**
Clarkia purpurea subsp. quadrivulnera	**farewell-to-spring**					**x**
Claytonia perfoliata	**miner's lettuce**					**x**
Conium maculatum	poison-hemlock				x	
Conyza bonariensis	flax-leaved fleabane				x	
Conyza canadensis	**horseweed**	**x**	**x**	**x**	**x**	**x**
Corethrogyne filaginifolia	**California aster**					**x**
Croton [Eremocarpus] setigerus	**dove weed**			**x**	**x**	
Croton californicus	**California croton**			**x**	**x**	
Cryptantha **species (not blooming)**	**Cleveland's cryptantha**					**x**
Cynodon dactylon	Bermuda grass	x				x

TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3 DURING SPECIAL AUGUST 2009 SURVEYS

(Compiled from LFR August 2009 field surveys; not year-round surveys)

Scientific Name	Common Name	Oak Brook Lane	Creek crossings	Chancelor Road extension	Proposed freeway ramp realignments	Connector Road south of Orcutt Creek
Deinandra [Hemizonia] increscens subsp. increscens	**coast tarweed**	**x**		**x**	**x**	
Ehrharta calycina	veldt grass				x	
Epilobium brachylobum	**panicled willow-herb**				**x**	
Eriogonum gracile subsp. gracile	**slender buckwheat**				**x**	**x**
Erodium botrys	storkbill filaree	x	x	x	x	x
Erodium cicutarium	redstem filaree	x				
Gnaphalium luteo-album	cudweed everlasting				x	
Helianthemum scoparium	**rush-rose**					**x**
Heterotheca grandiflora	**telegraph weed**	**x**	**x**	**x**	**x**	**x**
Hirschfeldia incana	Mediterranean mustard, summer mustard	x	x	x	x	x
Hordeum murinum	Mediterranean barley					x
Horkelia cuneata subsp. cuneata	**coast horkelia**					**x**
Iva axillaris subsp. robustior	**poverty weed**	**x**		**x**		
Juncus textilis	**Indian rush**					**x**
Lessingia glandulifera var. glandulifera	**sticky lessingia**					**x**
Leymus condensatus	**giant rye**					**x**
Leymus triticoides	**creeping ryegrass, alkali rye**	**x**				**x**
Linaria canadensis var. texana	**blue toad-flax**					
Lotus wrangelianus	**Chilean lotus**				**x**	
Madia sativa	**coast tarweed**				**x**	
Marah fabaceus	**wild cucumber**					**x**
Marrubium vulgare	horehound			x		
Medicago polymorpha	burclover	x	x	x	x	x
Micropus californica	**slender cottonplant**					
Mucronea californica	**California spineflower**					**x**
Nassella pulchra	**purple needlegrass**	**x**				
Navarretia atractyloides	**holly-leaved navarretia**					**x**
Plantago erecta	**California plantain**				**x**	**x**

TABLE 1
OBSERVED VASCULAR PLANT SPECIES AT KEY SITE 3 DURING SPECIAL AUGUST 2009 SURVEYS

(Compiled from LFR August 2009 field surveys; not year-round surveys)

Scientific Name	Common Name	Oak Brook Lane	Creek crossings	Chancelor Road extension	Proposed freeway ramp realignments	Connector Road south of Orcutt Creek
Plantago lanceolata	English plantain				x	
Polycarpon tetraphyllum	four-leaved all seed				x	
Polygonum aviculare	common knotweed			x	x	
Pseudognaphalium ramosissimum	**pink everlasting**					**x**
Pseudognaphalium stramineum	**cotton-batting everlasting**				**x**	**x**
Salsola tragus	Russian-thistle				x	
Salvia spathacea	**hummingbird sage**					**x**
Sanicula crassicaulis	**Pacific sanicle**					**x**
Stachys bullata	**wood mint, hedge-nettle**					**x**
Verbena lasiostachys	**western verbena**					**x**
Vicia sativa subsp. *sativa*	common vetch				x	
Vulpia myuros	rattail fescue			x	x	x

Note: native species are in **bold** print

TABLE 2
PRESENT OR CNDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY
FOR THE KEYSITE 3 PROPERTY AND SURROUNDING AREA

Based on CNPS Inventory of Rare and Endangered Plants (online edition, 2009) and CNDDB (2009) search results for the Orcutt, Casmalia, Sisquoc, Santa Maria, and Lompoc quadrangles; and LFR 2005, 2006, and 2009 field surveys.

Name	Common Name	Status	Occurrence of Element on Project Site
Natural Communities		**CDFG**	
	Central Coast Arroyo Willow Riparian Forest	**Threatened**	**Present**
	Central Coast Live Oak Riparian Forest	**Threatened**	**Present**
	Central Maritime Chaparral	**Threatened**	**Present**
	Central Foredunes	Very Threatened	Not present
	Central Dune Scrub	**Threatened**	**Present**
	Native Grassland	Very Threatened	Not present
	Coastal and Valley Freshwater Marsh	Very Threatened	Not present
	Southern California Steelhead Stream	Status not defined	Not present
	Southern California Threespine Stickleback Stream	Status not defined	Not present
	Southern Vernal Pool	Status not defined	Not present
Amphibians		**USFWS / CDFG**	
Ambystoma californiense	California tiger salamander	FE / CSC	Not observed; potentially suitable upland habitat present. Site isolated from known breeding locations
Rana aurora draytonii	California red-legged frog	FT / CSC	Not observed; no suitable habitat present
Scaphiopus hammondii	Western spadefoot toad	FSC / CSC	Not observed; potentially suitable upland habitat present
Birds		**USFWS / CDFG**	
Accipiter cooperii	**Cooper's hawk**	**- / CSC**	**Observed; may nest on the Site**
Agelaius tricolor (nesting colony)	Tricolored blackbird	FSC / CSC	Not observed; no suitable habitat present
Aquila chrysaetos (wintering and nesting)	Golden eagle	- / CSC	Not observed; suitable foraging habitat present
Athene cunicularia (burrow sites)	Western burrowing owl	FSC, MNBMC / CSC	Not observed; suitable habitat present
Buteo regalis (wintering)	Ferruginous hawk	FSC / CSC	Not observed; suitable foraging habitat present
Dendroica petechia brewsteri (nesting)	Yellow warbler	- / CSC	Not observed; no suitable riparian habitat present
Empidonax traillii extimus (nesting)	Southwestern willow flycatcher	FE / -	Not observed; no suitable riparian habitat present
Elanus leucurus (nesting)	White-tailed kite	MNBMC / CSC, nesting (fully protected)	Not observed; suitable foraging and nesting habitat present
Eremophila alpestris	California horned lark	- / CSC	Not observed; limited suitable habitat present
***Falco columbarius* (wintering)**	**Merlin**	**- / CSC**	**Observed; suitable foraging habitat present**
Falco mexicanus (nesting)	Prairie falcon	- / CSC	Not observed; suitable foraging habitat present
Lanius ludovicianus	**Loggerhead shrike**	**- / CSC**	**Observed; suitable nesting and foraging habitat present**
Vireo bellii pusillus (nesting)	Least Bell's vireo	FE / SE	Not observed; no suitable riparian habitat present

TABLE 2
PRESENT OR CNDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY
FOR THE KEYSITE 3 PROPERTY AND SURROUNDING AREA

Based on CNPS Inventory of Rare and Endangered Plants (online edition, 2009) and CNDDB (2009) search results for the Orcutt, Casmalia, Sisquoc, Santa Maria, and Lompoc quadrangles; and LFR 2005, 2006, and 2009 field surveys.

Name	Common Name	Status	Occurrence of Element on Project Site
Fish			
Gasterosteus aculeatus williamsoni	Unarmored threespine stickleback	FE / SE	Not observed; no suitable habitat present
Oncorhynchus mykiss irideus	southern steelhead trout	FE / CSC	Not observed; no suitable habitat present
Invertebrates			
Danaus plexippus	**Monarch butterfly**	**- / -**	**Observed; marginal roosting habitat present**
Mammals			
Taxidea taxus	American badger	- / -	Not observed; suitable habitat present
Reptiles			
Anniella pulchra pulchra	Silvery legless lizard	FSC / CSC	Not observed; marginal habitat present
Clemmys marmorata pallida	Southwestern Pond Turtle	FSC / CSC	Not observed; no suitable aquatic habitat present
Phrynosoma coronatum ssp. frontale	Coast horned lizard	FSC / CSC	Not observed; suitable habitat present
Thamnophis hammondii	Two-striped garter snake	- / CSC	Not observed; no suitable aquatic habitat present
Plants		**USFWS / CDFG / CNPS**	
Agrostis hooveri	Hoover's bent grass	- / - / 1B.2	Not observed; potential suitable grassland habitat present, although the hardpan soils with which it is associated were largely absent.
Amsinckia spectabilis* var. *microcarpa	**Small-seeded fiddleneck**	**Local Concern**	**Present in central dune scrub, central coastal scrub, and maritime chaparral south of Orcutt Creek.**
Aphanisma blitoides	Aphanisma	SOC / - / 1B.2	Not observed; unlikely to occur in coastal scrub as far inland as project site.
Arctostaphylos purissima	La Purisima manzanita	- / - / 1B.1	Not observed; occurs nearby in maritime chaparral.
A. rudis	shagbark manzanita	- / - / 1B.2	Present in maritime chaparral in one location above the connector road; not present in supplemental survey area.
A. tomentosa ssp. e*astwoodiana*	Eastwood's manzanita	- / - / 1B.1	Not observed; suitable soils (diatomaceous) not observed.
Astragalus didymocarpus var. *milesianus*	Mile's milk-vetch	- / - / 1B.2	Not observed; suitable coastal scrub habitat with clay soils not present.
Atriplex serenana var. *davidsonii*	Davidson's saltscale	- / - / 1B.2	Not observed; possible habitat in alkaline soils of coastal scrub.
Calandrinia breweri	Brewer's calandrinia	- / - / 4.2	Not observed; unlikely to occur in disturbed coastal scrub on site; outside known range.
Calycadenia villosa	dwarf calycadenia	- / - / 1B.1	Not observed; known from chaparral, cismontane woodlands, meadows and seeps, and rocky valley and foothill grasslands; suitable grassland habitat present.
Ceanothus cuneatus var. fascicularis	**Lompoc ceanothus**	**- / - / 4.2**	**Present in maritime chaparral.**
Ceanothus impressus var. *impressus*	Santa Barbara/Coast ceanothus	Local Concern	Not observed; suitable maritime chaparral habitat present (but not recently burned).
Chorizanthe angustifolia var. *eastwoodiae*	Eastwood's spineflower	Local Concern	Not present; suitable sandy soils of coastal scrub present.

TABLE 2
PRESENT OR CNDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY
FOR THE KEYSITE 3 PROPERTY AND SURROUNDING AREA

Based on CNPS Inventory of Rare and Endangered Plants (online edition, 2009) and CNDDB (2009) search results for the Orcutt, Casmalia, Sisquoc, Santa Maria, and Lompoc quadrangles; and LFR 2005, 2006, and 2009 field surveys.

Name	Common Name	Status	Occurrence of Element on Project Site
Chorizanthe blakleyi	Blakely's spineflower	- / - / 1B.3	Not observed; suitable habitat not present, found further inland.
Chorizanthe palmeri	Palmer's spineflower	- / - / 4.2	Not observed; unlikely on project site; suitable serpentine or serpentine derived soils absent.
Chorizanthe rectispina	Straight-awned spineflower	SOC / - / 1B.3	Not observed; unlikely on project site; suitable rocky, heavy clay or serpentine derived soils absent.
Circium loncholepis	La Graciosa thistle	FE / CT / 1B.1	Not observed; suitable brackish marsh habitat absent.
Cirsium rhothophilum	Surf thistle	SOC / CT(2/90) / 1B.2	Not observed; unlikely on project site; suitable coastal dune and coastal bluff scrub habitat absent
Collinsia sparsiflora var. collina	**few-flowered collinsia**	**Local Concern**	**Present in the connector road vicinity during 2005 LFR surveys; only known location in Santa Barbara County. Known from further north. One specimen from Santa Barbara County collected in 1928 by Ralph Hoffmann.**
Cordylanthus rigidus ssp. *littoralis*	seaside bird's-beak	- / CE / 1B.1	Not observed; appropriate sandy (often disturbed) coastal scrub, coastal dunes, oak woodland, maritime chaparral, present
Deinandra increscens ssp. *villosa*	Gaviota tarplant	FE (3/20/00) / CE (1/90) / 1B.1	Not observed; possible in coastal scrub and grassland habitat on site.
Delphinium parryi* subsp. *blochmaniae	**dune larkspur**	**- / - / 1B.2**	**Present in central dune scrub and central coastal scrub in the connector road vicinity during 2005 LFR surveys.**
Dichondra occidentalis	Western dichondra	- / - / 4.2	Not observed; possible in oak woodlands, coastal scrub or grasslands on site, but not known from Orcutt area.
Dithyrea maritima	Beach spectaclepod	SOC / CT (2/90) / 1B.1	Not observed; unlikely on project site; occurs closer to coast.
Dudleya blochmaniae ssp. *blochmaniae*	Blochman's dudleya	SOC / - / 1B.1	Not observed; unlikely on project site; suitable rocky soils present but heavy clay or serpentine derived soils absent.
Erigeron blochmaniae	Blochman's leafy daisy	- / - / 1B.2	Not observed; unlikely on project site; suitable coastal dune scrub habitat absent.
Erigeron sanctarum	Saint's daisy	- / - / 4.2	Not observed; suitable coastal scrub and oak woodland habitat present. May appear following fire or disturbance.
Eriodictyon capitatum	Lompoc yerba santa	FE / CR / 1B.2	Not observed; suitable sandy maritime chaparral present.
Erysimum capitatum* subsp. *lompocense	**San Luis Obispo wallflower**	**- / - / 4.2**	**Present in the connector road vicinity during 2005 LFR surveys in central dune scrub and central coastal scrub.**
Erysimum insulare ssp. *suffrutescens*	Suffrutescent wallflower	- / - / 4.2	Not observed; possible in coastal scrub habitat, but typically observed closer to coast.
Galium cliftonsmithii	Santa Barbara bedstraw	- / - / 4.3	Not observed; suitable oak woodland habitat present.
Hordeum intercedens	Vernal barley	- / - / 3.2	Not observed; unlikely on project site.
Horkelia cuneata ssp. *sericea*	Kellogg's horkelia	- / - / 1B.1	Not observed, but suitable potential habitat in sandy or gravelly soil of coastal scrub or oak woodlands with well developed understory. Very uncommon south of San Luis Obispo County.
Horkelia cuneata ssp. *puberula*	mesa horkelia	- / - / 1B.1	Not observed; suitable sandy or gravelly coastal scrub, cismontane woodland, chaparral habitats present.
Lasthenia glabrata ssp. *coulteri*	Coulter's goldfields	SOC / - / 1B.1	Not observed; wet valley grassland, vernal wetlands and vernal pool habitat absent.
Lepidium virginicum var. *robinsonii*	Robinson's pepper-grass	- / - / 1B.2	Not observed; possible habitat in coastal scrub.

TABLE 2
PRESENT OR CNDDB RECORDED SENSITIVE ELEMENTS OF BIOLOGICAL DIVERSITY
FOR THE KEYSITE 3 PROPERTY AND SURROUNDING AREA

Based on CNPS Inventory of Rare and Endangered Plants (online edition, 2009) and CNDDB (2009) search results for the Orcutt, Casmalia, Sisquoc, Santa Maria, and Lompoc quadrangles; and LFR 2005, 2006, and 2009 field surveys.

Name	Common Name	Status	Occurrence of Element on Project Site
Leptodactylon californicum ssp. *tomentosum*	Fuzzy prickly phlox	- / - / 4.2	Not observed; coastal dunes and coastal strand habitat absent.
Lupinus ludovicianus	San Luis Obispo County lupine	SOC / - / 1B.2	Not observed; unlikely on project site; outside of known range.
Mimulus aurantiacus* var. *lompocensis	**Lompoc monkeyflower**	**Local Concern**	**Present in central dune scrub, central coastal scrub, and maritime chaparral habitat.**
Monardella crispa	Crisp monardella	SOC / - / 1B.2	Not observed; unlikely on coastal dunes as far inland as project site; suitable open back dune habitat not present.
Monardella frutescens	San Luis Obispo monardella	SOC / - / 1B.2	Not observed; unlikely on coastal dunes as far inland as project site.
Monardella undulata	Curly-leaved monardella	- / - / 4.2	Not observed; suitable coastal scrub habitat present.
Mucronea californica	**California spineflower**	**- / - / 4.2**	**Present in sandy soils in coastal scrub.**
Prunus fasciculata var. *punctata*	Sand almond	- / - / 4.3	Not observed, suitable sandy soils in coastal scrub present.
Quercus parvula var. *parvula*	Santa Cruz Island oak	- / - / 4.2	Not observed, marginally suitable habitat present.
Rorippa gambelii	Gambel's water cress	FE / - / 1B.1	Not observed, suitable freshwater marsh habitat absent.
Sanicula hoffmannii	Hoffmann's sanicle	- / - / 4.3	Not observed; unlikely on sandy soils of project site; usually in clay or serpentine soils.
Scrophularia atrata	black-flowered figwort	SOC / - / 1B.2	Not observed; suitable coastal scrub, oak woodland, and riparian scrub habitat present.
Senecio aphanactis	Rayless ragwort	- / - / 2.2	Not observed; possible habitat in oak woodland or coastal scrub on alkaline soils.
Senecio blochmaniae	Blochman's groundsel	- / - / 4.2	Not observed; suitable coastal dune scrub habitat present.

Status Codes

United States Fish and Wildlife Service (USFWS)
FE Federal Endangered
FT Federal Threatened
SOC Species of Concern as listed by Sacramento Office (USFWS, 2004)
MNBMC Migratory nongame bird of management concern
FSC Federal special concern species
BCC Birds of Conservation Concern

California Department of Fish and Game (CDFG)
CE California Endangered
CT California Threatened
CR California Rare
CSC California Species of Concern

California Native Plant Society (CNPS)
Lists
List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere
List 2: Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3: Plants About Which We Need More Information - A Review List

Extensions to List Categories
.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

TABLE 3
APPROXIMATE ACREAGE OF HABITATS AND DIRECT IMPACTS (Cumulative Total for Project)

KeySite 3 Property (includes connections to Chancellor Drive and Oakbrook Lane)	DIRECT IMPACT AREA (acres)	IMPACTED AREA (%)	OPEN SPACE AREA (acres)	OPEN SPACE AREA (%)	TOTAL EXISTING (acres)
Sensitive Habitats					
Coast Live Oak Woodland	0.6	5	10.4	95	**11.0**
Central Maritime Chaparral	0.5	6	8.2	94	**8.7**
Central Coast Live Oak Riparian Forest	0.1	2	7.4	98	**7.5**
Central Dune Scrub	0.00	0	4.7	100	**4.7**
Dry Wash	0.01	1	1.5	99	**1.5**
Central Coast Arroyo Willow Riparian Scrub	<0.01	<1	0.04	100	**0.04**
Non-Sensitive Habitats					
Non-native Grassland	37.6	68	18.0	32	**55.6**
Disturbed Coastal Scrub	19.7	69	8.7	31	**28.4**
Central (Lucian) Coastal Scrub	9.5	49	10.0	51	**19.4**
Planted Trees	0.01	3	0.35	97	**0.4**
SENSITIVE HABITAT TOTALS	**1.22**	**4**	**32.2**	**96**	**33.5**
NON-SENSITIVE HABITAT TOTALS	**66.8**	**64**	**37.0**	**36**	**103.8**
TOTAL ACRES	**68.0**	**50**	**69.2**	**50**	**137.3**

Note 1: Impact assessment assumes that native resources on private property outside development envelopes south of Orcutt Creek will be protected in perpetuity

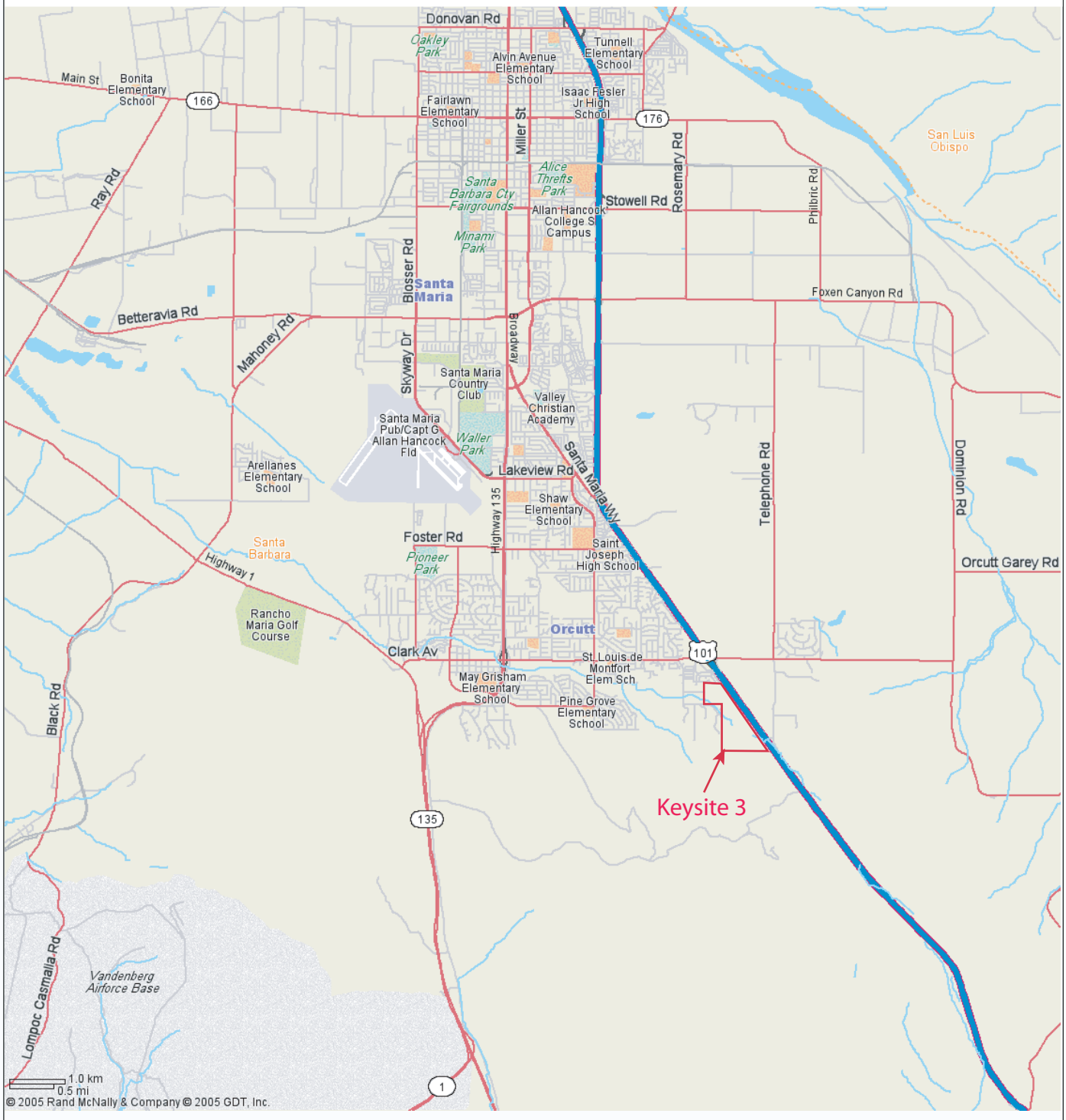
Note 2: Impacts calculated based on 2009 Development Design and *exclude* Clark Road Access across Keysite 2 and modifications of the Highway 101 onramp or offramp (see following tables).

TABLE 3
APPROXIMATE ACREAGE OF HABITATS AND DIRECT IMPACTS (Cumulative Total for Project)

Access Road to Clark Avenue (Across KS-2)	DIRECT IMPACT AREA (acres)
Sensitive Habitats	
Central Coast Arroyo Willow Riparian Scrub Forest	0.01
Non-Sensitive Habitats	
Central (Lucian) Coastal Scrub	0.13
Non-native Grassland	2.34
Planted Trees	0.01
SENSITIVE HABITAT TOTALS	**0.01**
NON-SENSITIVE HABITAT TOTALS	**2.48**
TOTAL ACRES	**2.49**

Highway 101/Clark Avenue Offramp (Alternative A - North-bound On-ramp)	DIRECT IMPACT AREA (acres)
Non-Sensitive Habitats	
Non-native Grassland	0.74
HABITAT IMPACT TOTALS	**0.74**
TOTAL ACRES	**0.74**

Highway 101/Clark Avenue Offramp (Alternative B - North-bound Off-ramp)	DIRECT IMPACT AREA (acres)
Non-Sensitive Habitats	
Non-native Grassland	0.61
Planted Trees	0.33
HABITAT IMPACT TOTAL	**0.94**
TOTAL ACRES	**0.94**



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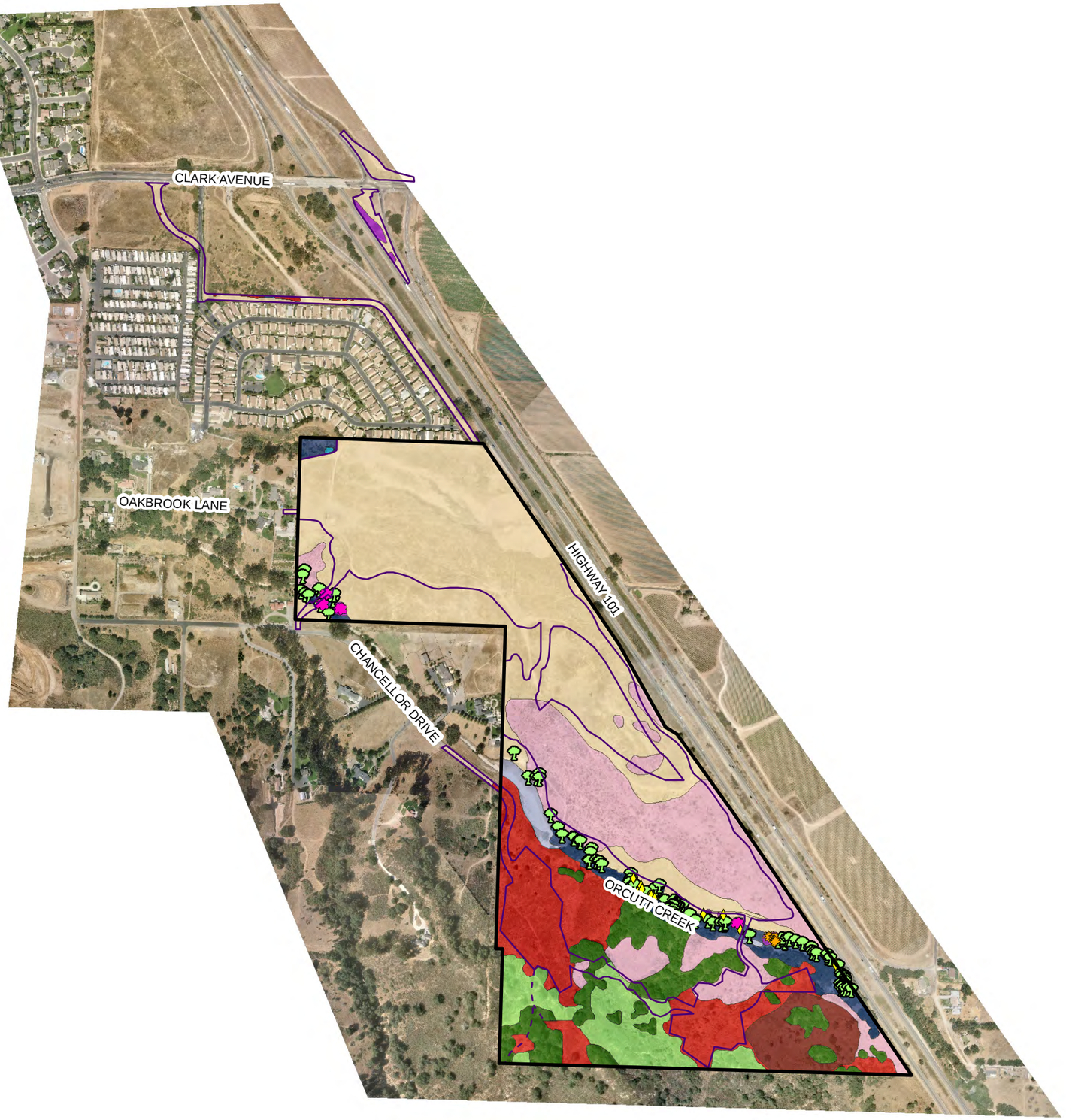
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Site Location Map

SB Clark / Key Site 3

LFR

Figure 1



LEGEND

- Site Boundary
- Limits of Disturbance

EXISTING HABITATS

- Central Maritime Chaparral
- Central (Lucian) Coastal Scrub
- Central Dune Scrub
- Central Coast Arroyo Willow Riparian Scrub
- Central Coast Live Oak Riparian Forest
- Coast Live Oak Woodland
- Disturbed Coastal Scrub
- Non-native Grassland
- Dry Wash

EXISTING TREES

- Planted Trees
- Coast Live Oak
- Eucalyptus
- Walnut
- Elderberry

NOTES

· Only oaks north of Orcutt Creek are individually mapped.
· Non-paved trail - Final alignment will be staked in the field and approved by a qualified biologist at the time of construction to avoid removal of oak trees, minimize impacts to native vegetation, and follow existing trail(s) to the maximum extent feasible.

0 350 700 Feet

Scale: 1" = 700'

Existing Habitats

SB Clark
Key Site 3, Santa Maria, California

Figure 2

LFR an ARCADIS company

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LEGEND

- Site Boundary
- Limits of Disturbance

SENSITIVE HABITATS

- Central Maritime Chaparral
- Central Dune Scrub
- Central Coast Arroyo Willow Riparian Scrub
- Central Coast Live Oak Riparian Forest
- Coast Live Oak Woodland
- Dry Wash

SENSITIVE PLANTS

- Coast live oak (*Quercus agrifolia*)
- Shagbark manzanita (*Arctostaphylos rudis*)
- Lompoc ceanothus (*Ceanothus cuneatus* subsp. *fascicularis*)
- Few-flowered collinsia (*Collinsia sparsiflora* var. *collinsia*)
- Blochman's larkspur (*Delphinium parryii* subsp. *blochmaniae*)
- San Luis Obispo wallflower (*Erysimum capitatum* subsp. *lompocense*)
- California spineflower (*Mucronea californica*) (individual)
- California spineflower (*Mucronea californica*)
- Indian rush (*Juncus textilis*)

NOTES

· Only oaks north of Orcutt Creek are individually mapped.
· Two species of local concern, Lompoc sticky monkeyflower (*Mimulus aurantiacus* subsp. *lompocensis*) and small-fruited seaside fiddleneck (*Amsinckia spectabilis* var. *microcarpa*), are widespread south of Orcutt Creek and not included on this map.

N

0 350 700 Feet

Scale: 1" = 700'

Sensitive Habitat and Sensitive Species Locations

SB Clark
Key Site 3, Santa Maria, California

Figure 3

LFR an ARCADIS company

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The Chancellor Street extension passes through non-native annual grassland. A few native herbs and shrubs are present in this area, but none are sensitive species.

Looking east

8/19/2009

Photo # 8190088

LFR Inc.



The proposed Chancellor access road will extend from the fence post in the foreground diagonally across this field towards Orcutt Creek in the vicinity of the Eucalyptus tree on the south bank and the two oak trees on the north bank.

Looking northeast

9/3/2009

Photo # 9030067

LFR Inc.



The proposed Chancellor access road will cross Orcutt Creek roughly where the arrow is shown in this photograph.

Looking northwest

9/3/2009

Photo # 9030063

LFR Inc.



These two oak trees are in the vicinity of the proposed Chancellor access road creek crossing on the north side of Orcutt Creek.

9/3/2009

Photo # 9030068

LFR Inc.



The proposed southern EVA road between the development envelopes south of Orcutt Creek passes through coastal scrub vegetation and between these two large clusters of oaks (blue arrows). Several oaks are in the path of the proposed road (red arrow).

Looking east

9/3/2009

Photo # 9030034



Coastal scrub vegetation (foreground) and oak woodland along proposed EVA road route.

Looking west

9/3/2009

Photo # 9030052

LFR Inc.



Several small weathered oak trees occur in the scrub vegetation along the proposed EVA road route.

Looking east

9/3/2009

Photo # 9030046

LFR Inc.



Non-native grassland vegetation predominates in much of the area surrounding a culvert in the area immediately adjacent to Highway 101 and the current Highway 101 northbound offramp.

Looking north

8/19/2009

Photo # 8190178

LFR Inc.



Non-native grassland vegetation with scattered native and non-native annuals is visible in the foreground. Planted Peruvian pepper and iceplant are seen below next to Highway 101.

Looking southwest

8/19/2009

Photo # 8190173

LFR Inc.



Central coastal scrub dominants such as coyote bush, dune-heather, and silver bush lupine occur adjacent to Clark Avenue in the Highway 101 northbound onramp area.

Looking south

8/19/2009

Photo # 8190200

LFR Inc.



Non-native grassland predominates in most of the right-of-way for in the Highway 101 northbound onramp area.

Looking northwest

8/19/2009

Photo # 8190197

LFR Inc.

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MEMO

To:
John Franklin
SB Clark, LLC
300 Esplanade Dr., Suite 430
Oxnard, CA 93036

From:
Greg McGowan

Date:
March 2, 2010

ARCADIS Project No.:
SM010246.0000, Task 0003

Subject:
Key Site 3 Ecological Assessment Update

This memo is in response to comments from Rob Mullane (Rincon Consultants) provided to John Zorovich (Santa Barbara County) via a February 9, 2010 email entitled "Comments/Needs for latest Key Site 3 ecological assessment." The requested changes have been made, and are incorporated into revised Figures 2 and 3 and revised Table 3 attached. The items that have been changed are described below:

1. The Limits of Disturbance have been updated to reflect the most current Grading Disturbance Area (dated January 15, 2010). All portions of the project site that are within the Limits of Disturbance are represented by cross-hatching so the reader can more easily see impacted areas.

2. The MR-O area has been added to the figures, shaded in a gray color. A note has been added that indicates the MR-O is not part of the project site and has been excluded from habitat mapping and calculations.

3. Both figures now show the Temporarily Flooded Swale, the shape of which is based on the dominance of Bermuda grass visible during an August 2008 survey and previously submitted as a Jurisdictional Waters Investigation for Key Site 3 (LFR, April 2009). A portion of this area falls within the MR-O area.

4. An area in the northwest corner of the project site, previously mapped as Central Coast Live Oak Riparian with a small portion of Central Coast Arroyo Willow Scrub, has been remapped as Central (Lucian) Coastal Scrub per Rincon's recommendation.

5. All individual tree symbols have been removed from the figures, with a note to that effect on both figures. Areas mapped as “Planted Trees” that constitute a portion of the total site acreage remain on the figures and on Table 3.

The exclusion of the MR-O area from total project acreage, addition of the Temporarily Flooded Swale and re-characterization of other habitats (#4 listed above), and the new grading limit boundaries have resulted in changes to project acreage and impact acreage (see Table 3). The changes are summarized below:

1. The total site acreage has been reduced from 137.3 to 129.4 due to removal of the MR-O as part of the site.

2. The direct impacts associated with the latest disturbance footprint are slightly lower than previously reported (67.1 acres now compared to 68.2 acres previously). However, increases in the area of impact outside the prior limits of disturbance (e.g., stormwater infrastructure) offset the reduction in impact area associated with removal of the MR-O. As such, the percentage of impacted area has increased from 50% to 52% because the total site acreage has been reduced.

3. The total open space acreage has been correspondingly reduced slightly (from 69.1 to 62.3 acres), with a corresponding percentage drop from 50% to 48% of the total site acreage.

4. The total amount of sensitive habitat has increased from 33.5 acres to 35.7 acres with the new re-characterization of a portion of the non-native grassland as Temporarily Flooded Swale. Impacts to sensitive habitat have increased from 1.2 acres to 4.8 acres, primarily due to the Temporarily Flooded Swale. In addition, there are now small impacts (0.06 acre) associated with Central Dune Scrub in the southeast corner that had not previously been expected.

Please don’t hesitate to contact me if you have any questions regarding the data described herein and shown on the attached table and figures or if I may be of any further service.

Sincerely,



Greg McGowan
Principal Ecologist

TABLE 3
APPROXIMATE ACREAGE OF HABITATS AND DIRECT IMPACTS (Cumulative Total for Project; March 2010 Revision)

KeySite 3 Property (includes connections to Chancellor Drive and Oakbrook Lane)	DIRECT IMPACT AREA (acres)	IMPACTED AREA (%)	OPEN SPACE AREA (acres)	OPEN SPACE AREA (%)	TOTAL EXISTING (acres)
Sensitive Habitats					
Coast Live Oak Woodland	1.02	9	9.93	91	**10.95**
Central Maritime Chaparral	0.82	9	7.88	91	**8.70**
Central Coast Live Oak Riparian Forest	0.23	3	6.77	97	**7.00**
Central Dune Scrub	0.06	1	4.68	99	**4.74**
Dry Wash	0.03	2	1.49	98	**1.52**
Temporarily Flooded Swale	2.78	100	0.00	0	**2.78**
Non-Sensitive Habitats					
Non-native Grassland	30.74	68	14.29	32	**45.03**
Disturbed Coastal Scrub	20.59	72	7.84	28	**28.44**
Central (Lucian) Coastal Scrub	10.81	54	9.10	46	**19.91**
Planted Trees	0.05	13	0.31	87	**0.36**
SENSITIVE HABITAT TOTALS	**4.93**	**14**	**30.75**	**86**	**35.68**
NON-SENSITIVE HABITAT TOTALS	**62.19**	**66**	**31.55**	**34**	**93.74**
TOTAL ACRES	**67.12**	**52**	**62.30**	**48**	**129.42**

Note 1: Impact assessment assumes that native resources on private property outside development envelopes south of Orcutt Creek will be protected in perpetuity

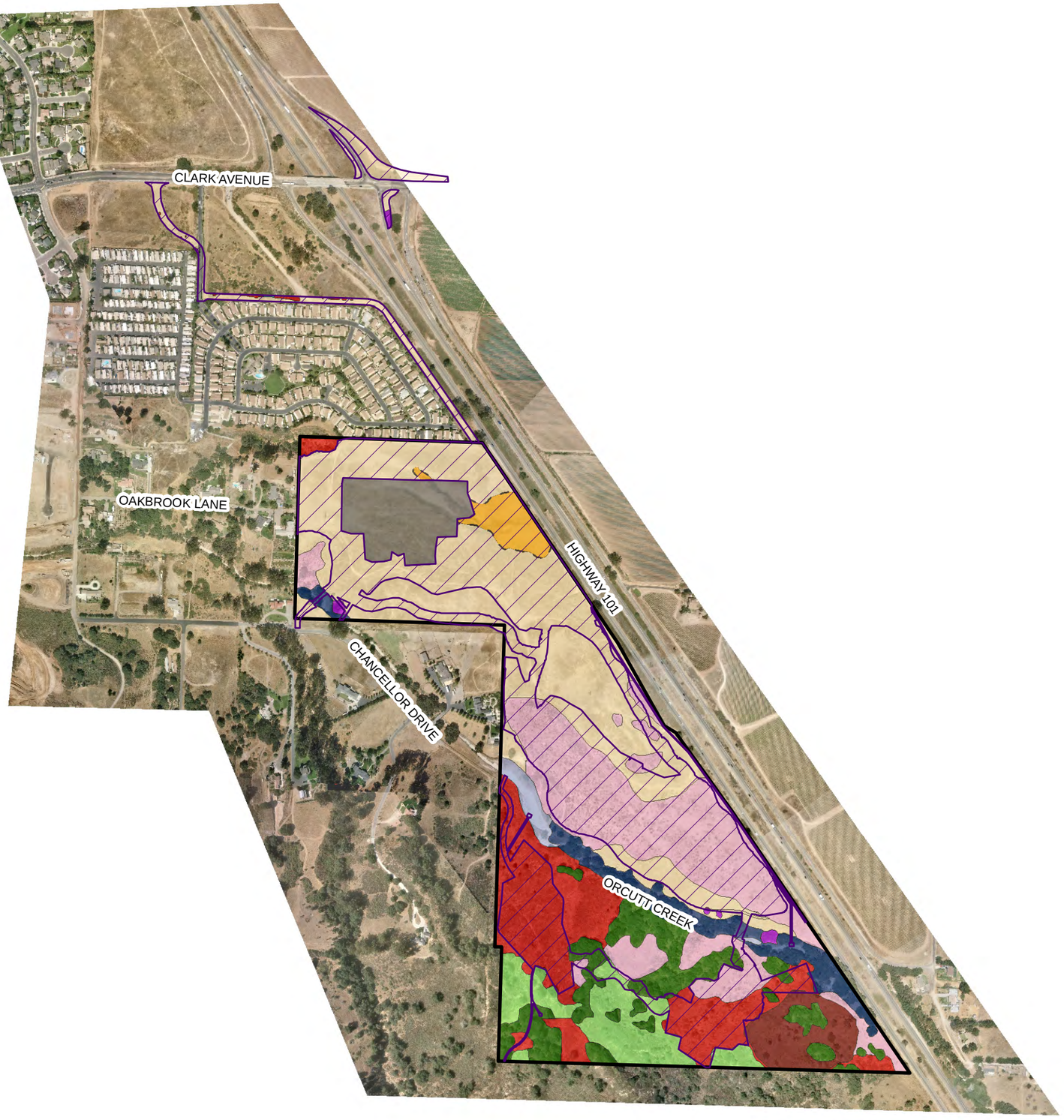
Note 2: Impacts calculated based on 2010 Development Design and *exclude* Clark Road Access across Keysite 2 and modifications of the Highway 101 onramp or offramp (see following tables). These areas are excluded above to allow the percentages of open space to developed area to be accurately quantified.

Note 3: The MR-O area is excluded from all calculations.

TABLE 3
APPROXIMATE ACREAGE OF HABITATS AND DIRECT IMPACTS (Cumulative Total for Project; March 2010 Revision)

Access Road to Clark Avenue (Across KS-2)	DIRECT IMPACT AREA (acres)
Sensitive Habitats	
Central Coast Arroyo Willow Riparian Scrub	0.01
Non-Sensitive Habitats	
Central (Lucian) Coastal Scrub	0.13
Non-native Grassland	2.34
Planted Trees	0.01
SENSITIVE HABITAT TOTALS	**0.01**
NON-SENSITIVE HABITAT TOTALS	**2.48**
TOTAL ACRES	**2.49**

Highway 101/Clark Avenue Northbound (on-ramp and off-ramp)	DIRECT IMPACT AREA (acres)
Non-Sensitive Habitats	
Non-native Grassland	1.63
Planted Trees	0.08
HABITAT IMPACT TOTAL	**1.71**
TOTAL ACRES	**1.71**



LEGEND

- Site Boundary
- Limits of Disturbance
- MR-O Area
- Planted Trees

EXISTING HABITATS

- Central Maritime Chaparral
- Central (Lucian) Coastal Scrub
- Central Dune Scrub
- Central Coast Arroyo Willow Riparian Scrub
- Central Coast Live Oak Riparian Forest
- Coast Live Oak Woodland
- Disturbed Coastal Scrub
- Non-native Grassland
- Dry Wash
- Temporarily Flooded Swale (dominated by Bermuda grass, August 2008)

NOTES

- Individual existing trees (planted or native) are not displayed on this map.
- Non-paved trail - Final alignment will be staked in the field and approved by a qualified biologist at the time of construction to avoid removal of oak trees, minimize impacts to native vegetation, and follow existing trail(s) to the maximum extent feasible.
- MR-O Area is not part of this project. It is not included as part of habitat mapping or calculations.

Feet
0 350 700
Scale: 1" = 700'

Existing Habitats

SB Clark
Key Site 3, Santa Maria, California

Figure 2

ARCADIS

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LEGEND

- Site Boundary
- Limits of Disturbance
- MR-O Area

SENSITIVE HABITATS

- Central Maritime Chaparral
- Central Dune Scrub
- Central Coast Arroyo Willow Riparian Scrub
- Central Coast Live Oak Riparian Forest
- Coast Live Oak Woodland
- Dry Wash
- Temporarily Flooded Swale (dominated by Bermuda grass, August 2008)

SENSITIVE PLANTS

- Shagbark manzanita (*Arctostaphylos rudis*)
- Lompoc ceanothus (*Ceanothus cuneatus* subsp. *fascicularis*)
- Few-flowered collinsia (*Collinsia sparsiflora* var. *collinsia*)
- Blochman's larkspur (*Delphinium parryii* subsp. *blochmaniae*)
- San Luis Obispo wallflower (*Erysimum capitatum* subsp. *lompocense*)
- California spineflower (*Mucronea californica*) (individual)
- California spineflower (*Mucronea californica*)
- Indian rush (*Juncus textilis*)

NOTES

- Coast live oak *(Quercus agrifola)* individuals are present but are not included on this map.
- Two species of local concern, Lompoc sticky monkeyflower (*Mimulus aurantiacus* subsp. *lompocensis*) and small-fruited seaside fiddleneck (*Amsinckia spectabilis* var. *microcarpa*), are widespread south of Orcutt Creek and not included on this map.
- MR-O Area is not part of this project. It is not included as part of habitat mapping or calculations.

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Scale: 1" = 700'

Sensitive Habitat and Sensitive Species Locations

SB Clark
Key Site 3, Santa Maria, California

Figure 3

ARCADIS

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ARCADIS
Infrastructure, environment, buildings

SB Clark LLC
c/o: Mr. John Franklin
Franklin Real Estate Development LLC
3159 Eaglewood Avenue
Thousand Oaks, California 91362

Subject:
Key Site 3 Impacts Revisions

ENVIRONMENTAL

Dear John:

The memorandum addresses the revised April 2013 development design plan for Key Site 3 in Orcutt, California. From an ecological perspective, the impacts of the revised project design (eliminating residential development south of Orcutt Creek) are substantially reduced compared to the prior design plan studied by staff and the Planning Commission, particularly in terms of impacts to sensitive plant communities and native habitat.

Compared with the original design plan studied through the CEQA process, the April 2013 design plan reduces overall habitat impacts by 33.82 acres. Impacts to sensitive habitats are reduced by 7.06 acres, primarily south of Orcutt Creek. There is a decrease in impacts to non-sensitive habitats of 26.76 acres including a decrease of 21.67 acres of impacted Central (Lucian) Coastal Scrub/Disturbed Coastal Scrub. Table 1 (attached) separately presents the impacts associated with the new April 2013 design plan, the previously studied design plan reviewed by the Planning Commission, and a comparison of the two design plans identifying the differences.

Included in the numbers above and shown in Table 1, are increases in impacts associated with the proposed Chancellor Street/Stillwell Road improvements (0.41 acres) and improved access to Clark Avenue across Key Site 2 (0.52 acres). The impacts to sensitive habitats will be mitigated with a proposed 3.75 acres of habitat restoration (employing the mitigation ratios shown on Table 1).

Please do not hesitate to contact me if I can provide additional information or be of further service.

Sincerely,



Greg T. McGowan
Principal Ecologist

Date:
May 21, 2013

Contact:
Greg McGowan

Phone:
805.349.7180

Email:
Greg.mcgowan@arcadis-us.com

Our ref:
SM010246.0000

TABLE 1 - Impact Comparisons Between the April 24, 2013 Design Plan and the Previously Studied Design Plan
Key Site 3

Table 4-4.6(a) Habitat Impacts on the Project Site - APRIL 24 2013 REVISED Design Plan

Habitat Type	Approximate Acreage of Impacted Habitat	Rec Repl. Ratio	Req. Rest. Acreage
Central Maritime Chaparral	0.04	3:1	0.12
Central (Lucian) Coastal Scrub	4.89	None	
Central Dune Scrub	0.11	2:1	
Central Coast Live Oak Riparian Forest	0.34	2:1	0.68
Central Coast Arroyo Willow Riparian Scrub Forest	0.02	2:1	0.04
Coast Live Oak Woodland	0.07	2:1	0.13
Non-native Grassland	29.65	None	
Dry Wash	0.02	None	
Planted Trees	0.15	None	
Temporarily Flooded Swale	2.78	1:1	2.78
PROJECT SITE TOTAL	**38.06**	varies	**3.75**

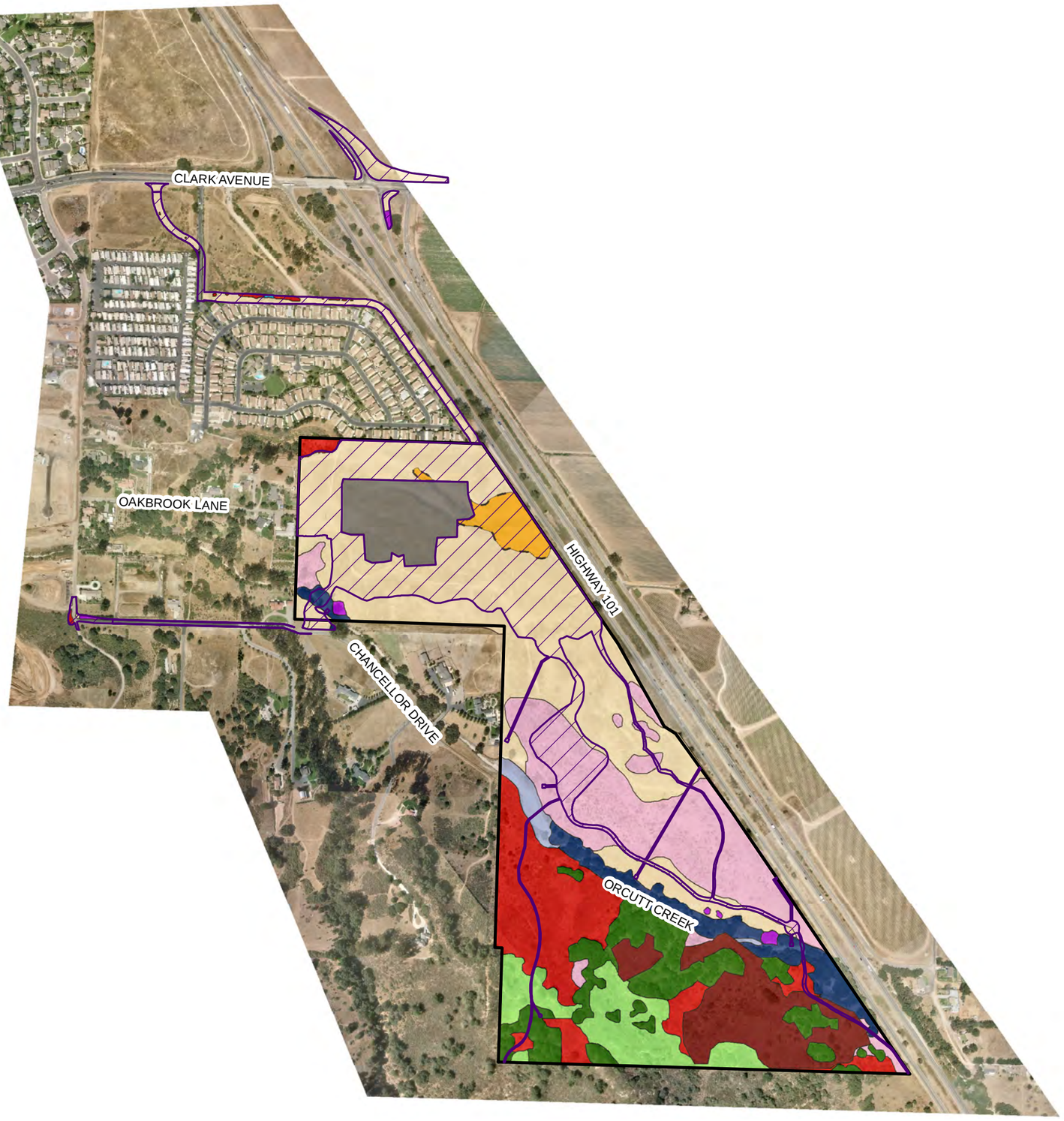
Table 4-4.6(b) Habitat Impacts on the Project Site - Previously studied design plan

Habitat Type	Approximate Acreage of Impacted Habitat	Rec Repl. Ratio	Req. Rest. Acreage
Central Maritime Chaparral	0.99	3:1	2.97
Central (Lucian) Coastal Scrub	26.56	None	
Central Dune Scrub	4.56	2:1	9.12
Central Coast Live Oak Riparian Forest	0.91	2:1	1.82
Central Coast Arroyo Willow Riparian Scrub Forest	0.01	2:1	0.02
Coast Live Oak Woodland	1.17	2:1	2.04
Non-native Grassland	34.71	None	
Dry Wash	0.06	None	
Planted Trees	0.14	None	
Temporarily Flooded Swale	2.78	1:1	2.78
PROJECT SITE TOTAL	**71.89**	varies	**18.75**

Table 4-4.6(c) Habitat Impacts on the Project Site - CHANGES BETWEEN Previously studied design plan and April 2013 design

Habitat Type	Change in Approximate Acreage of Impacted Habitat	Rec Repl. Ratio	Change in Rest. Acreage
Central Maritime Chaparral	-0.95	3:1	-2.85
Central (Lucian) Coastal Scrub	-21.67	None	0.00
Central Dune Scrub	-4.45	2:1	-9.12
Central Coast Live Oak Riparian Forest	-0.57	2:1	-1.14
Central Coast Arroyo Willow Riparian Scrub Forest	0.01	2:1	0.02
Coast Live Oak Woodland	-1.10	2:1	-1.91
Non-native Grassland	-5.06	None	0.00
Dry Wash	-0.04	None	0.00
Planted Trees	0.01	None	0.00
Temporarily Flooded Swale	0.00	1:1	0.00
PROJECT SITE TOTAL	**-33.82**	varies	**-15.00**

Sensitive Habitat Change	-7.06	Reduction in Impacts
Non-Sensitive Habitat Change	-26.76	Reduction in Impacts



LEGEND

- Site Boundary
- Limits of Disturbance
- MR-O Area
- Planted Trees

EXISTING HABITATS

- Central Maritime Chaparral
- Central (Lucian) Coastal Scrub
- Central Dune Scrub
- Central Coast Arroyo Willow Riparian Scrub
- Central Coast Live Oak Riparian Forest
- Coast Live Oak Woodland
- Disturbed Coastal Scrub
- Non-native Grassland
- Dry Wash
- Temporarily Flooded Swale (dominated by Bermuda grass, August 2008)

NOTES

· Individual existing trees (planted or native) are not displayed on this map.
· Non-paved trail - Final alignment will be staked in the field and approved by a qualified biologist at the time of construction to avoid removal of oak trees, minimize impacts to native vegetation, and follow existing trail(s) to the maximum extent feasible.
· MR-O Area is not part of this project. It is not included as part of habitat mapping or calculations.
· Limits of disturbance from Penfield and Smith, 24 Apr. 2013.

Feet
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Scale: 1" = 700'

SB CLARK
KEY SITE 3
SANTA MARIA, CALIFORNIA

EXISTING HABITATS

ARCADIS

FIGURE
2

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Coordinate System: NAD 1983 StatePlane California V FIPS 0405



LEGEND

- Site Boundary
- Limits of Disturbance
- MR-O Area

SENSITIVE HABITATS

- Central Maritime Chaparral
- Central Dune Scrub
- Central Coast Arroyo Willow Riparian Scrub
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NOTES

· Coast live oak *(Quercus agrifola)* individuals are present but are not included on this map.
· Two species of local concern, Lompoc sticky monkeyflower (*Mimulus aurantiacus* subsp. *lompocensis*) and small-fruited seaside fiddleneck (*Amsinckia spectabilis* var. *microcarpa*), are widespread south of Orcutt Creek and not included on this map.
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· Limits of disturbance from Penfield and Smith, 24 Apr. 2013.

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Scale: 1" = 700'

SB CLARK
KEY SITE 3
SANTA MARIA, CALIFORNIA

SENSITIVE HABITAT AND SENSITIVE SPECIES LOCATIONS

ARCADIS

FIGURE 3

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Coordinate System: NAD 1983 StatePlane California V FIPS 0405



LEGEND

- Site Boundary
- Limits of Disturbance July 5, 2011
- MR-O Area
- Planted Trees
- Disturbance (in KS3) April 7, 2011
- Limits of Disturbance November 2, 2011
- Limits of Disturbance April 24, 2013

EXISTING HABITATS

- Central Maritime Chaparral
- Central (Lucian) Coastal Scrub
- Central Dune Scrub
- Central Coast Arroyo Willow Riparian Scrub
- Central Coast Live Oak Riparian Forest
- Coast Live Oak Woodland
- Disturbed Coastal Scrub
- Non-native Grassland
- Dry Wash
- Temporarily Flooded Swale (dominated by Bermuda grass, August 2008)

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- Non-paved trail - Final alignment will be staked in the field and approved by a qualified biologist at the time of construction to avoid removal of oak trees, minimize impacts to native vegetation, and follow existing trail(s) to the maximum extent feasible.
- MR-O Area is not part of this project. It is not included as part of habitat mapping or calculations.
- April 2011 plan also included a slightly narrower access road to Clark Avenue (across Key Site 2) and 101 freeway ramp impacts but did not include the impacts along Chancellor and Stillwell Road.

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SB CLARK
KEY SITE 3
SANTA MARIA, CALIFORNIA

EXISTING HABITATS AND IMPACT AREA CHANGES 2011-2013

ARCADIS

FIGURE
X

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Coordinate System: NAD 1983 StatePlane California V FIPS 0405

ARCADIS U.S., Inc.
735 Tank Farm Road
Suite 150
San Luis Obispo
California 94301
Tel 805-706-2805
Fax 805-782-9273
www arcadis-us.com

Mr. John Franklin
Franklin Real Estate Development, LLC
3159 Eaglewood Avenue
Thousand Oaks, CA 91362

Subject:
Key Site 3 Field Survey of Revised Plan, April 2014

Date:
May 5, 2014

Contact:
Greg McGowan

Phone:
805-878-4288

Email:
Greg.mcgowan@arcadis-us.com

Our ref:
Key Site 3

Dear Mr. Franklin:

ARCADIS has re-surveyed the vegetation, plant species, and sensitive species and habitats for a portion of Key Site 3 in Orcutt, Santa Barbara County, California. This additional survey was conducted to satisfy inquiries regarding any observed changes at the Site since previous investigations (e.g., LRF 2006/2009; ARCADIS 2013) and for potential impacts resulting from revisions to the limits-of-disturbance related to the proposed residential development (see attachment).

Methods

ARCADIS Project Ecologist, Wayne Ferren, conducted a one-day survey of KeySite 3 on April 25, 2014, generally focusing on areas northeast of Orcutt Creek, in particular the top and upper slopes of the mesa portion of the property. Mild, still, and partly cloudy weather conditions during the site visit were preceded by early morning showers. Two maps were available for the assessment including *O.C.P. Key Site 3, Vesting Tentative Tract Map 14,801 Proposed Site Improvements* (Penfield & Smith, 2013, sheet 4 of 8) and *Preliminary Key Site 3 100' Offset of Bluff Property Line, Santa Barbara, California* (Penfield & Smith April 2014, attached). Each map provided guidance related to the revised development plan. Relevant figures and text contained in LFR (2006/2009), County of Santa Barbara (2011), and ARCADIS (2013) also were reviewed as part of the assessment. Existing conditions were compared to previously reported conditions to determine potential impacts to sensitive species and habitats. Vegetation types and plant species were documented and presence or absence of sensitive species and habitats was determined. Photographs documenting the existing conditions also were taken. Detailed descriptions of the vegetation and sensitive species and habitats are provided elsewhere (LFR 2006/2009).

The Surveyed Area

Key Site 3 is bordered on the east by U.S. Highway 101 and is approximately 0.25 miles (0.4) kilometers [km]) south of Clark Avenue in the southeastern portion of Orcutt, in unincorporated Santa Barbara County, California. The entire Key Site 3 property covers approximately 137 acres (55.4 hectares [ha]), approximately 40 acres (16.2 ha) of which are proposed for development. The relatively flat mesa, which is situated adjacent to and southwest of U.S. Highway 101 and is the focus of this assessment (the Site), drops 30 to 50 feet (9 to 15 meters [m]) to the floodplain and lowlands surrounding Orcutt Creek. The revised development plan, which places all residential development on the mesa portion of Key Site 3, also includes a 100 foot wide limit-of-disturbance zone evaluated as part of this 2014 survey (see attached map). The northern portion of the mesa is fenced and actively grazed by cattle and horses. During the ARCADIS survey, four head of cattle and eight horses grazed, rested, and moved about the contained area. In addition to the mesa and adjacent upper slopes, ARCADIS also surveyed the proposed western road from the development site, across Orcutt Creek to Chancellor Road, and the proposed stormwater facility on the west side of Orcutt Creek adjacent to Chancellor Road (see attached map).

Findings of the Survey

ARCADIS found the site conditions similar to and consistent with those reported previously including in the *Key Site 3 Orcutt, California Sensitive Species and Habitat Survey* (LFR 2006/2009) and the subsequent environmental review documents prepared by the County of Santa Barbara. The majority of the mesa and adjacent slopes are characterized by non-native grassland, which is dominated by non-native, generally annual plant species. Storkbill filaree (*Erodium botrys*) is the dominant plant in most of the non-native grassland and gives the site a characteristic red color in late spring. Summer mustard (*Hirschfeldia incana*) and Bermudagrass *(Cynodon dactylon*) are two common non-native perennial species observed onsite. Areas with slightly lower topography were dominated by burclover (*Medicago polymorpha*), another non-native species. Several common native plant species also were observed growing in the non-native grassland vegetation, including California goosefoot (*Chenopodium californicum*), western verbena (*Verbena lasiostachys*), and coast tarweed (*Deinandra increscens* subsp*. increscens*), reported previously for the Site. Non-native grassland is listed among the non-sensitive habitats in previous surveys of the Site (LFR 2006/2009).

Disturbed coast scrub, dominated by coyote brush (*Baccharis pilularis* subsp. *consanguinea*) occurs as a few small patches within the fenced and actively grazed portion of the mesa and in somewhat larger patches outside the fenced area. Disturbed coastal scrub also is listed among the non-sensitive habitats in previous surveys of the Site (LFR 2006/2009), where it is mapped for lowlands along Orcutt Creek.

The proposed northern access road across Orcutt Creek is positioned through Disturbed coastal scrub from the northwest corner of the Site (see attachment). This proposal location does not impact native trees or wetlands. No changes to vegetation or sensitive habitats were noted during the survey on April 25, 2014. The location of the stormwater facility on the terrace adjacent to the proposed road at the intersection with Chancellor Road is characterized by non-native grassland, as noted in previous surveys (e.g., LFR 2006/2009). Povertyweed (*Iva axillaris* subsp. *robustior*), a herbaceous perennial native to the area and listed in previous reports, is common within the non-native grassland at this location. Povertyweed has a Facultative Wetland Status, occurring equally common in upland and wetland habitats. The proposed terrace location of the stormwater facility is characterized by upland habitat features.

No sensitive plant or wildlife species were observed within the revised limits-of-disturbance during the survey on April 25, 2014.

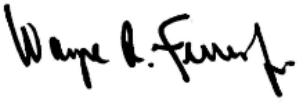
Conclusions of the Survey

ARCADIS concludes the existing conditions observed within the revised limits-of-disturbance, as illustrated on the attached map (Penfield & Smith 2014), represent only minor changes since the previous sensitive species and habitats survey (LFR 2006/2009; ARCADIS 2013). Such changes in the distribution of non-native grassland and disturbed coastal scrub are anticipated in an area with continual and ongoing disturbances associated with the existing agricultural (grazing) land use practices.

Thank you for the opportunity to conduct this additional survey. Please contact us if you have any questions.

Sincerely,

ARCADIS U.S., Inc.



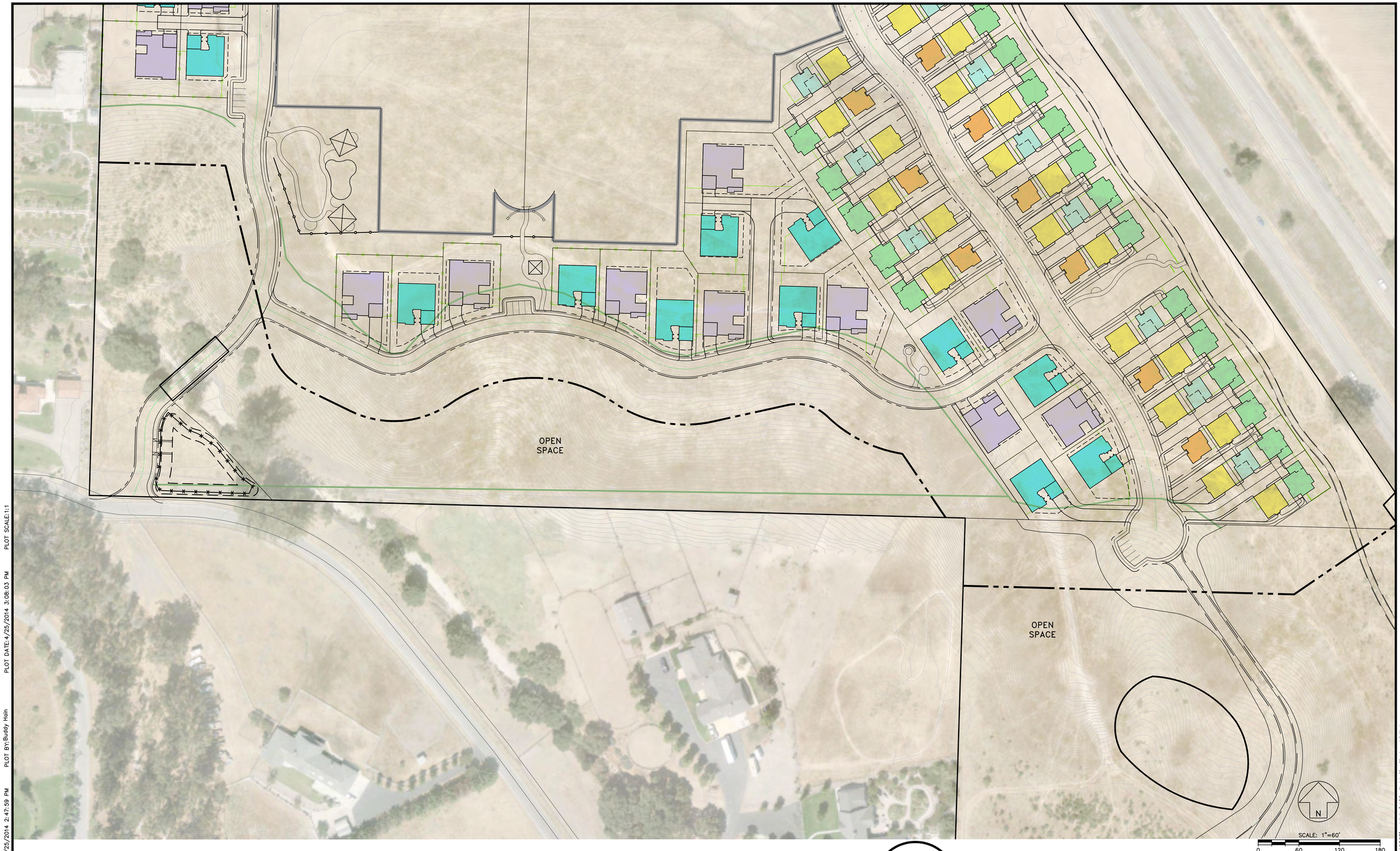
Wayne R. Ferren Jr.
Project Ecologist

References

ARCADIS US. 2013. *SB Clark LLC Key Site 3 Habitat Restoration Plan, Orcutt, Santa Barbara County, California*. Prepared for SB Clark LLC. Prepared by ARCADIS U.S., Inc., 735 Tank Farm Road, Suite 150, San Luis Obispo, CA 93401.

County of Santa Barbara. 2011. *Orcutt Key Site 3 Project Final Subsequent Environmental Impact Report.* Prepared by County of Santa Barbara Planning & Development Department, Santa Maria, CA, with the Assistance of Rincon Consultants, Inc., San Luis Obispo, CA. March 2011. State Clearing House No, 2007091023.

LFR, Inc. 2006. *Key Site 3, Orcutt, California Sensitive Habitat and Species Survey 021-1016300 June, 2006 (updated May, 2009).* Prepared for SB Clark LLC, 300 Esplanade, Suite 430, Oxnard, CA 93036. Prepared by LFR, Inc. Santa Maria, CA 93454.



NO.	DATE	REVISIONS	APPD.

Penfield & Smith
Engineering • Surveying • Planning
• Construction Management •
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801

DESIGN _____ CHECKED _____

BRIANNA M. DANIELS DATE: _____
PROJECT ENGINEER
R.C.E. (EXP. – –)

REVIEWED BY:

_____ _____
SIGNATURE DATE

PRELIMINARY

KEY SITE 3
100' OFFSET OF BLUFF PROPERTY LINE
SANTA BARBARA COUNTY, CALIFORNIA

P&S PROJECT NO. 16527.12
SHEET 1 OF 1
PLAN DATE APRIL 2014

PLOT SCALE:1:1
PLOT DATE:4/25/2014 3:08:03 PM
PLOT BY:Buddy Hoin
36-ENG SAVE DATE: 4/25/2014 2:47:59 PM
DRAWING:s:\ecod\work\16527\exhibits\100-ft bluff offset exhibit.dwg

Key Site 3
Orcutt, California
California Tiger Salamander Survey Report

021-10246-00
April, 2009

Prepared for

LFR

Key Site 3
Orcutt, California
California Tiger Salamander Survey Report

021-10246-00
April, 2009

Prepared for

SB Clark LLC
300 Esplanade ~ Suite 430
Oxnard, California 93036

Prepared by

LFR Inc.
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S.B. COUNTY (NORTH)
PLANNING & DEVELOPMENT

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1.0 INTRODUCTION

This report presents the results of the two year upland drift fence study for California tiger salamanders (CTS) on Key Site 3 (the Site, APN 129-151-26), located in Orcutt, California. This Site comprises approximately 146.5 acres supporting grassland, oak woodland and coastal scrub habitat. As is detailed below, no CTS were captured or observed during the two-year study.

The Site is bordered on the east by Highway 101 and is approximately 1/4 mile south of Clark Avenue in the southeastern portion of the community of Orcutt in unincorporated Santa Barbara County, California (Figure 1). The Site contains approximately 40 acres on a relatively flat mesa at the north end of the property, which drops 30 to 50 feet to the floodplain and lowlands surrounding Orcutt Creek. Orcutt Creek, which originates in Solomon Canyon southeast of the Site, crosses the property, entering from an outfall under Highway 101 and exiting in a northwesterly direction along the western perimeter of the Site. The property extends up the north-facing slopes of the Solomon Hills to a maximum elevation of approximately 750 feet.

The Site is bordered on the north by a mobile home park and on the west by low density residential housing. The southern property boundary borders open space supporting oak woodland and coastal scrub. Agricultural fields occupy the land across Highway 101 to the east of the Site. Land use on the Site is currently limited to cattle grazing.

1.1 Background

In 2005, wildlife biologist Steve Sykes (Fish and Wildlife Service permit number TE-025732-1) was hired by a development firm to conduct a CTS habitat assessment for Keysite 3 (see report in Appendix A). At that time Key Site 3 was not known to be within dispersal range (1.2 miles) from any known CTS breeding ponds. In his report Mr. Sykes concluded that no impacts to CTS resulting from development of the Site were likely to occur.

In 2006 LFR Inc. under direction of a new land owner conducted an additional sensitive species and habitat survey resulting in similar conclusions regarding impacts to CTS. However, in March of 2007, a potential CTS breeding pond (ORCU-3) located on property south of the Site was surveyed by a 10(a)(1)(A) permitted biologist and breeding by CTS was confirmed. Approximately one half of the Key Site 3 property occurs within 1.2 miles (2 km) of ORCU-3. The discovery of CTS at ORCU-3 prompted further review by LFR regarding potential for the species to occur on Key Site 3 property.

Following additional study of the Site and discussion with other local 10(a)(1)(A) permitted biologists, LFR Inc. concluded that although suitable upland habitat exists at the Site, the dense and often steep terrain between ORCU-3 and the Site likely prevented CTS from occurring on the Site. In September of 2007 LFR submitted a letter to United States Fish and Wildlife Service (the Service) asking for their concurrence with LFR's

findings (Appendix B). The Service was unable to concur and recommended that a presence / absence survey for CTS be conducted at the Site. In October of 2007 LFR submitted a CTS upland drift fence study design to the Service. Approval was granted by the Service with minor changes to the design and the study began in November of 2007.

The purpose of the two year upland drift fence study was to make a finding of presence or absence of CTS on the Site. The study design and implementation was based on the USFWS survey protocols detailed in their October 2003 document titled "Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander." Approval of the CTS study design was received from the Service prior to installation and monitoring of the system during the 2007/08 and 2008/09 study periods.

The two year upland drift fence study was organized and monitored by VJS Consulting wildlife biologist Vince Semonsen (CA Tiger Salamander Federal Fish and Wildlife Permit Number TE-030384-2) and LFR Inc. wildlife biologist Mitch Siemens (CA Tiger Salamander Federal Fish and Wildlife Permit Number TE-190302-0). The permitted biologists oversaw all aspects of the study including installation, monitoring, maintenance and removal of the system.

1.2 Environmental Setting

The Key Site 3 property is within the historic CTS range as per the Service Map dated July, 2001, with approximately half of the property within the salamander's dispersal range from ORCU-3; a recently confirmed (2007) CTS breeding pond. ORCU-3 is shown as a potential CTS breeding pond on the Santa Barbara County CTS Habitat Map dated August 31, 2001.

Although the Site itself does not have aquatic habitat capable of supporting breeding by CTS, it does have good upland habitat that supports a large California ground squirrel population. Burrows of California ground squirrels, pocket gophers and other small mammals are common on the Site and provide potential refuge for CTS.

2.0 METHODS

Installation of the drift fence system was completed prior to October 15th during both study periods. The drift fence was installed in 45-48 foot segments with gaps of 5 – 8 feet between each segment to allow for animal passage. The fence itself was a type of silt fencing made of woven black plastic approximately three feet high (two foot silt fence was used during the 2008/09 survey). A small trenching machine was used to excavate a six-inch deep trench with the fencing staked in the trench and buried. Four bucket-type pit fall traps were installed along each segment of drift fence, two on each side. Fencing segments were placed in various Service approved locations on the property and a total of 472 traps were installed for the survey. For the 2008/09 study period, the fencing array

was changed in two locations on the Site to avoid flooding and maintenance issues experienced during the previous winters survey.

The pit fall traps (two gallon plastic buckets with lids) were installed as much as possible to avoid rodent burrows, ant nests, and areas likely to flood. Several improvements to the system were implemented for the second year of the survey and these in combination with less severe weather reduced the maintenance requirements. First, two-foot silt fence with a higher UV rating was used, second; storm events were less severe than in 2007/08 and third, fencing and buckets were installed so as to avoid flood areas observed during the 2007/08 survey. However, examples of common maintenance issues experienced during both survey periods included soil settling, flooded traps, and broken and torn silt fence. Damage to the trapping system due to cattle was an issue early on in the 2008/09 survey period but the issues was resolved when the leasing rancher built a temporary corral to contain the cows on the Site.

The drift fence array was installed solely on Key Site 3 property and was designed to capture CTS moving between the Site and ORCU-3 or other neighboring parcels (see Figure 2). The Service requested that some pit fall traps be installed along Highway 101 and adjacent to the mobile home park in the northern portion of the Site. In addition, fence segments were installed atop the mesa where ground squirrel burrows are concentrated and provide potentially suitable refuge for CTS. Fencing was also installed in the lowlands along Orcutt Creek and in the coastal scrub dominated foothills south of Orcutt Creek in the southern corner of the Site nearest ORCU-3.

3.0 RESULTS

No CTS were captured or observed on the Site during the two year surveys and the species is considered absent in accordance with the survey protocols. The winter of 2007/08 brought substantial rain events and 21 CTS trap nights were run between October 29, 2007 and February 24, 2008. The winter of 2008/09 had less total rainfall with 23 trap nights being run between November 1st, 2008 and February 16, 2009. Rainfall totals for the Santa Maria valley were 13.68 inches for the winter of 2007/08 and 8.90 inches for the winter of 2008/09. This information comes from Santa Barbara County Flood Control Districts Santa Maria rain gauge beginning in September 2007.

The 2007/08 and 2008/09 trapping seasons produced rain events of sufficient intensity and duration to induce dispersal activity by CTS in the Santa Maria Valley. During this time, CTS were captured during drift fence studies being conducted at other locations in northern Santa Barbara County using identical methods as those used for the Key Site 3 study (Vince Semonsen and Dr. Larry Hunt personal communication). However, **no CTS were captured at Key Site 3.**

CTS are adapted to drought cycles and may not leave the burrow systems without the proper environmental conditions. Given the amount of rain and the status of aquatic features in the Santa Maria Valley, the winter of 2007/08 provided adequate environmental conditions required for CTS dispersal and breeding. The winter of 2008/09

provided suitable conditions for dispersal activity by CTS but not necessarily adequate breeding conditions.

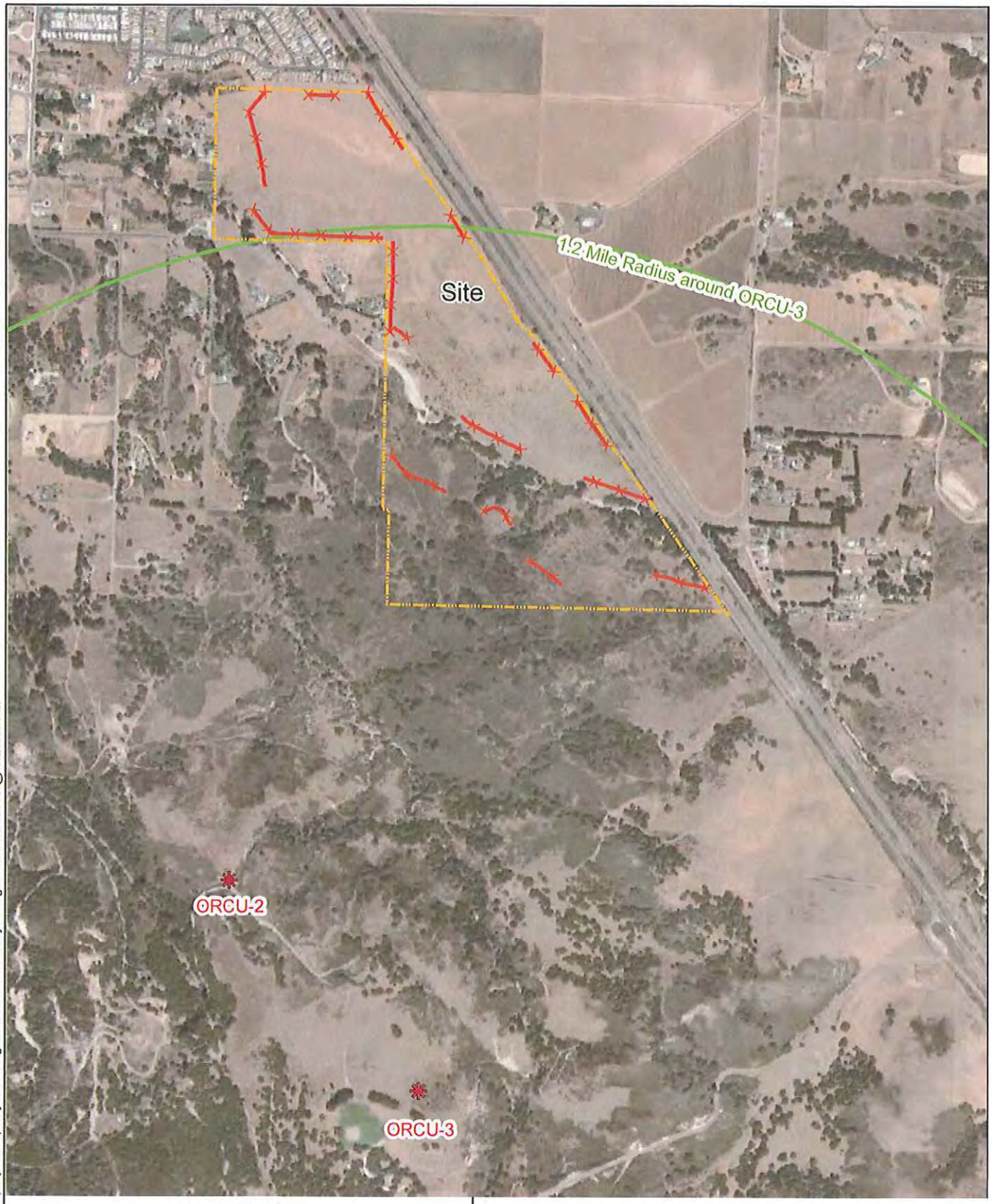
A variety of other species were captured in the pit fall traps including; Western fence lizards (*Sceloporus occidentalis*), one slender salamander (*Batrachoseps attenuatus*), Pacific treefrogs (*Hyla regilla*), numerous Western toads (*Bufo boreas*), more than a dozen Monterey ensatina salamanders (*Ensatina eschscholtzii*), one juvenile coast horned lizard (*Phrynosoma coronatum*), a number of Botta's pocket gophers (*Thomomys bottae*), California voles (*Microtis californicus*), Ornate shrews (*Sorex ornatus*), deer mice (*Peromyscus maniculatus*), a yellow-rumped warbler (*Dendroica coronata*) and one adult California ground squirrel (*Spermophilus beecheyi*) in addition to many hundreds of invertebrate species; most commonly Jerusalem crickets (*Stenopelmatus* sp.), various beetles (Order *Coleoptera*), and millipedes (Subclass *Helminthomorpha*).

4.0 CONCLUSION

The winters of 2007/08 and 2008/09 produced sufficient rain events triggering dispersal by CTS in northern Santa Barbara County. CTS were found in similar upland studies being conducted in northern Santa Barbara County at the same time as the Key Site 3 study. **No CTS were found during the Key Site 3 study.** The Key Site 3 study verified activity by other amphibian species on the Site. For example, in one trap night on November 2, 2008; 61 western toads were captured in the buckets. Other amphibians captured included Pacific tree frogs, one slender salamander and several ensatina salamanders. These findings suggest that conditions on the site during the two year survey were conducive to movement by amphibian species and would likely have induced movement by CTS if the species were present on the Site.

The fact that conditions during each of the two survey periods were favorable to induce movement by amphibian species and yet no CTS were discovered at the Site supports previous opinion that CTS are unlikely to occur on Key Site 3. Based on the negative finding of this two year study, LFR believes it is reasonable to assume that CTS are not reaching the Site from ORCU-3 or any other location and that the terrain between ORCU-3 and the Site may act as a barrier between the two locations.

FIGURES



Silt Fence (as installed)

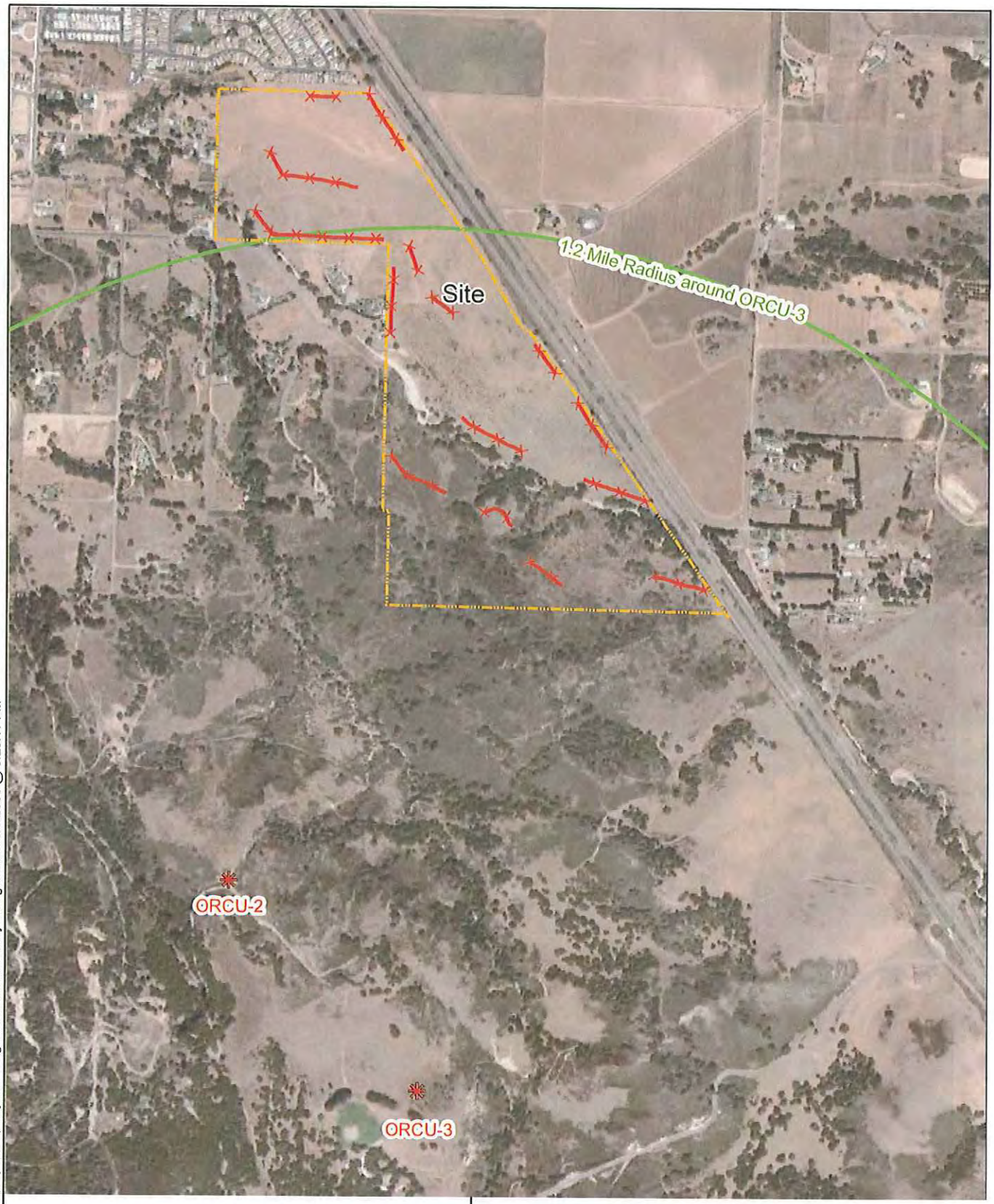
0 500 1,000 2,000 Feet

CTS Study Design
2007/2008

SB Clark / Key Site 3

LFR

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Silt Fence (as installed)

N

0 500 1,000 2,000 Feet

CTS Study Design

2008/2009

SB Clark / Key Site 3

LFR

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APPENDICES

APPENDIX A

CENTEX HOMES

CENTRAL COAST DIVISION
735 TANK FARM ROAD, #100
SAN LUIS OBISPO, CA 93401
805-548-0333
FAX: 805-548-0444

FACSIMILE TRANSMITTAL SHEET

TO: GREG MCGOWAN	FAX: 805- 349-7176
COMPANY: LFR	DATE 11/04/05
FROM: URBAN G. MCLELLAN	
RE: ORCUTT KS-3	TOTAL PAGES INCLUDING COVER: 20

☐ URGENT ☐ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

Greg,
Attached is the full report from Sykes re CTS and KS-3 FYI.
Urban

CONFIDENTIAL

Biological Assessment of Impacts for Proposed Construction Project on SDC-CT, LLC Property in Orcutt, California



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14 March 2005

About the Author

Stephen A. Sykes is a graduate student at the University of California, Santa Barbara, conducting research under the direction of Dr. Samuel Sweet. His research is aimed at gathering an understanding of the terrestrial ecology of the California tiger salamander. His field sites are at the Santa Maria Airport, where he is using methods such as drift fence trapping, radio tracking, and burrow searches with a 3 meter long video scope to capture and track California tiger salamanders into the upland habitat.

In addition to his academic research, he has been involved with several biological consulting projects with the California tiger salamander. He was hired to prepare a biological assessment for a proposed construction project at the Clos Pepe Vineyards in Lompoc. He was also the principal biological consultant for a California tiger salamander drift fence study conducted on Bradley Land Company property in Santa Maria during the 2002-2003 rainy season.

Stephen Sykes' research at the Santa Maria Airport and biological consulting activities are conducted under US Fish and Wildlife Permit TE-025732-1.

1.0 EXECUTIVE SUMMARY

SDC-CT, LLC has proposed the construction of a residential development on their property in Orcutt, California. Approximately 25 acres of the 146.49 acre parcel is proposed for development, with the remaining 121 acres to be deeded to Santa Barbara County or an approved land management organization to be maintained as open space. The 25 acres proposed for development consist of relatively flat grassland habitat, while the southern portion of the property consists of coastal scrub habitat, riparian areas along Orcutt Creek, and oak woodland/sandhill chaparral.

No breeding sites for California tiger salamanders are present on the subject property. Four potential California tiger salamander breeding ponds are present within 5 km (3.1 miles) to the south of the subject property, however the closest of these ponds is 4,750 feet from the development area. This distance, along with dense chaparral and steep topography found in the southern portion of the property likely prevent any California tiger salamanders that may be using these potential ponds from entering the development area. Therefore, no California tiger salamanders should be impacted by this proposed development.

The southern portion of 121 acres may provide important breeding, foraging, or roosting sites for animals listed as California Species of Special Concern. These include western spadefoot toad (*Scaphiopus hammondii*), coast horned lizard (*Phrynosoma coronatum*), silvery legless lizard (*Anniella pulchra pulchra*), burrowing owl (*Speotyto cunicularia*), Cooper's hawk (*Accipiter cooperi*), white-tailed kite (*Elanus leucurus*), and golden eagle (*Aquila chrysaetos*). Preservation of the southern portion of the property will likely benefit these listed species and other "common" species that utilize this property.

Horned lizards are known from the vicinity of this property and are highly likely on the subject property, including the area to be developed. Pre-construction surveys should be conducted to capture and relocate any wildlife encountered (including horned lizards) to the southern portion of the property. Additionally, a biologist should be present during the initial grading of the site to capture and remove horned lizards from the construction footprint.

2.0 INTRODUCTION

This report summarizes the results of a site assessment of the SDC-CT, LLC property (Parcel # 129-151-26) in Orcutt, California as potential habitat for the California tiger salamander (*Ambystoma californiense*). This parcel is located in the southeastern region of Orcutt, immediately west of U.S. Highway 101 (Figure 1). Residential development has been proposed for the northern portion of this property at a density of approximately 4-5 units per acre. The proposed development area would occupy approximately 25 acres of this 146.49 acre parcel, with the remaining southern portion to be deeded as open space. This property has been designated Key Site #3 in the Orcutt Community Plan (Austin, personal communication).

This site is within the designated range of the California tiger salamander (USFWS, July 2001), therefore a site assessment is necessary to evaluate potential impacts to this species. The California tiger salamander is a federally listed endangered species that occurs in northern Santa Barbara County. This species was listed in early 2000 as a result of rapid development of its habitat to intensive agriculture and residential development (USFWS, 2000).

3.0 METHODS

I surveyed the entire property on foot between 0900 and 1600 on 26 February 2003. The weather was partly to mostly cloudy at times, with a 10-15 mph wind. The maximum ambient air temperature during the survey was 60 degrees F. Almost ½ inch of rain had fallen over the two days preceding my visit.

Only a portion of the basin (see Photo 2) in the northwest corner of the site is included in the SDC-CT, LLC property, and extremely steep sides (40 feet) and landowner access restrictions only allowed a visual survey from the southeastern edge of this basin. Binoculars were used to survey this area as best as possible and identify plant species observed.

Methodology for conducting site assessments for the California tiger salamander was taken from the *Standard Protocol for Site Assessment and Field Surveys for Determining Presence or Absence of the California Tiger Salamander* (USFWS and CDFG, 2002). The suitability of the subject property as habitat for California tiger salamanders was determined by evaluating and comparing existing habitat components with that of confirmed California tiger salamander habitat elsewhere in Santa Barbara County. Vegetative types and communities, hydrological conditions, topography, soil characteristics, proximity to known and potential California tiger salamander breeding pools, and terrestrial habitat components were used to evaluate the property as potential California tiger salamander habitat. Plant species were identified using dichotomous keys including (Hickman, 1993).

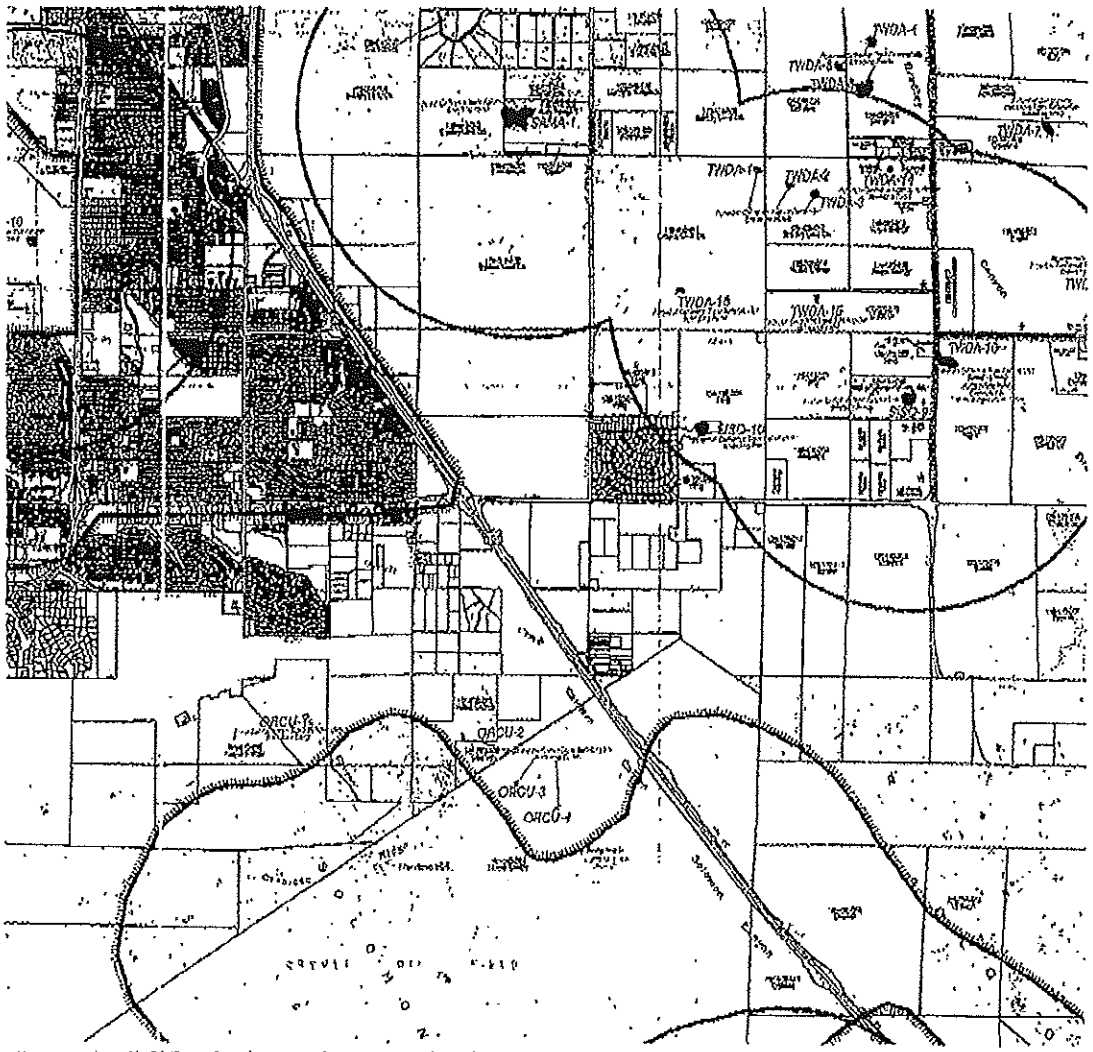


Figure 1. California tiger salamander habitat map showing the SDC-CT, LLC property in yellow. Potential and known California tiger salamander breeding ponds are shown in blue. The red line depicts a 1.2 mile buffer around known California tiger salamander breeding ponds. The green line depicts California tiger salamander range. Source: Santa Barbara County Planning and Development, August 31, 2001.

4.0 HABITAT DESCRIPTION

This 146.49 acre property can be divided into a northern and southern region by continuing the southern boundary of the northern region west to US Highway 101 (Figure 2 and Figure 3). The northern parcel ("Mesa Area") of 25 acres has been proposed for residential development, while the southern parcel has been proposed to remain as open space. This region of the property will be deeded to either Santa Barbara County or another land management entity approved by the county (Austin, personal communication).

4.1 Northern Portion (Mesa Area)

The Mesa Area in the northern portion of the property has relatively flat topography and is dominated by grasses and forbs including thistles, lupine (*Lupinus* spp.), burclover (*Medicago* spp.), and filaree (*Erodium spp.*) (Photo #1 and cover photo). The topography slopes downward in the southern region of this portion to Orcutt Creek (Figure 3). This area is currently grazed by cows. Numerous California ground squirrels (*Spermophilus beecheyi*) were observed in the Mesa Area and other grassland areas north of Orcutt Creek.

A small area of coastal scrub is present in the southwestern portion of the property, dominated by coyote bush (*Baccharis pilularis*), California sage brush (*Artemisia californica*), blue elderberry (*Sambucus mexicana*), and coffeberry (*Rhamnus californica*).

A basin is present in the northwest corner of the Mesa Area, and this was evaluated as a potential California tiger salamander breeding site (Figure 3). This basin is characterized by highly eroded, steep sides (30-40 feet) (Photo #2). Runoff from the Mesa Area flows into this basin through large drains. However, no standing water was observed in this basin during my site visit. Vegetation observed in and around this basin includes the following:

Common Name	Scientific Name
California sage brush	*Artemisia californica*
Coyote Bush	*Baccharis pilularis*
Mustard	Brassicaceae
Iceplant	*Carpobrotus edulis*
Blue Gum	*Eucalyptus globulus*
Tree Tobacco	*Nicotiana glauca*
Coffeberry	*Rhamnus californica*
Willow	*Salix* spp.
Western Poison Oak	*Toxicodendron diversilobum*

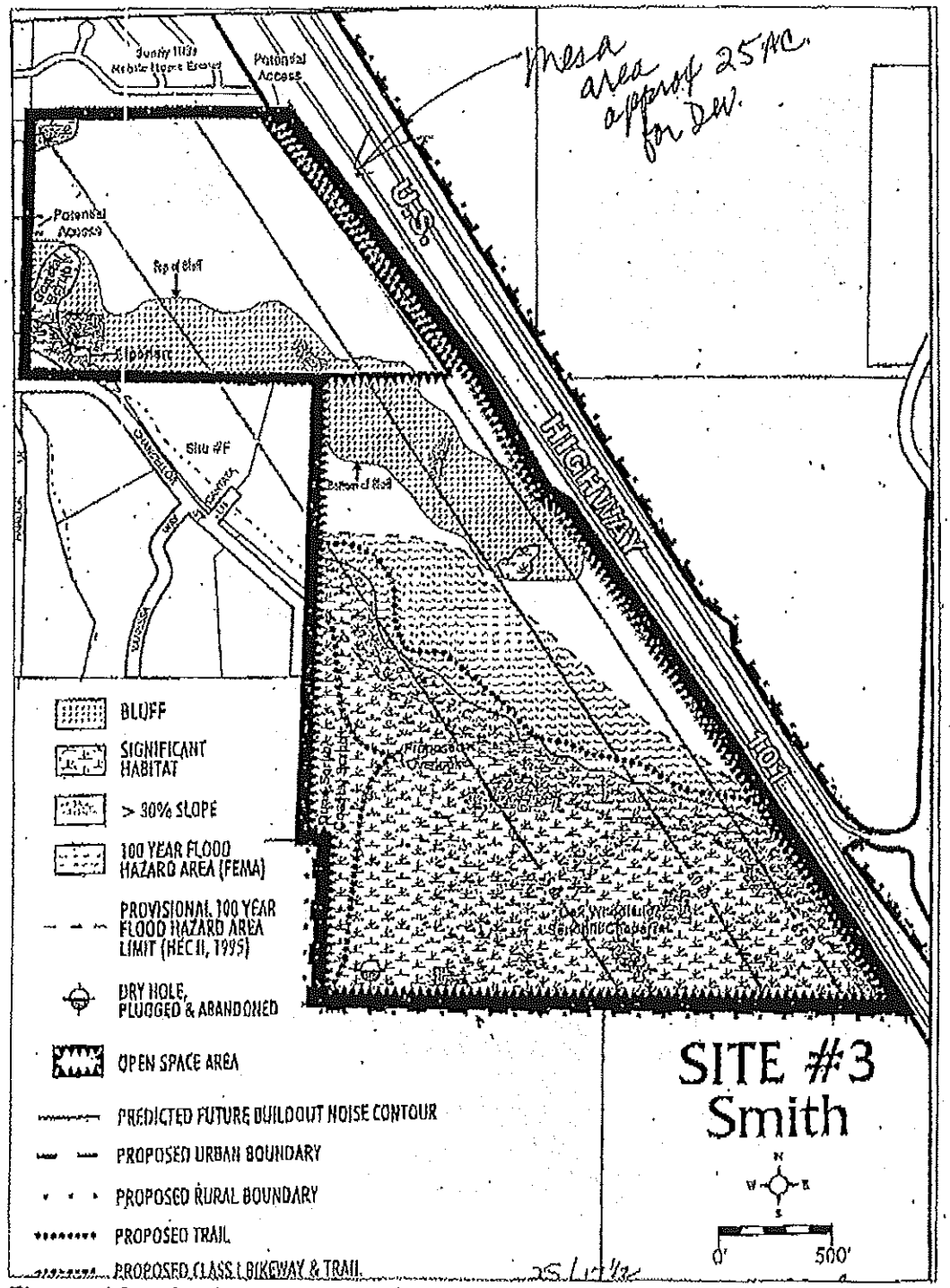


Figure 2. Map of subject property showing planned development area and habitat types present.

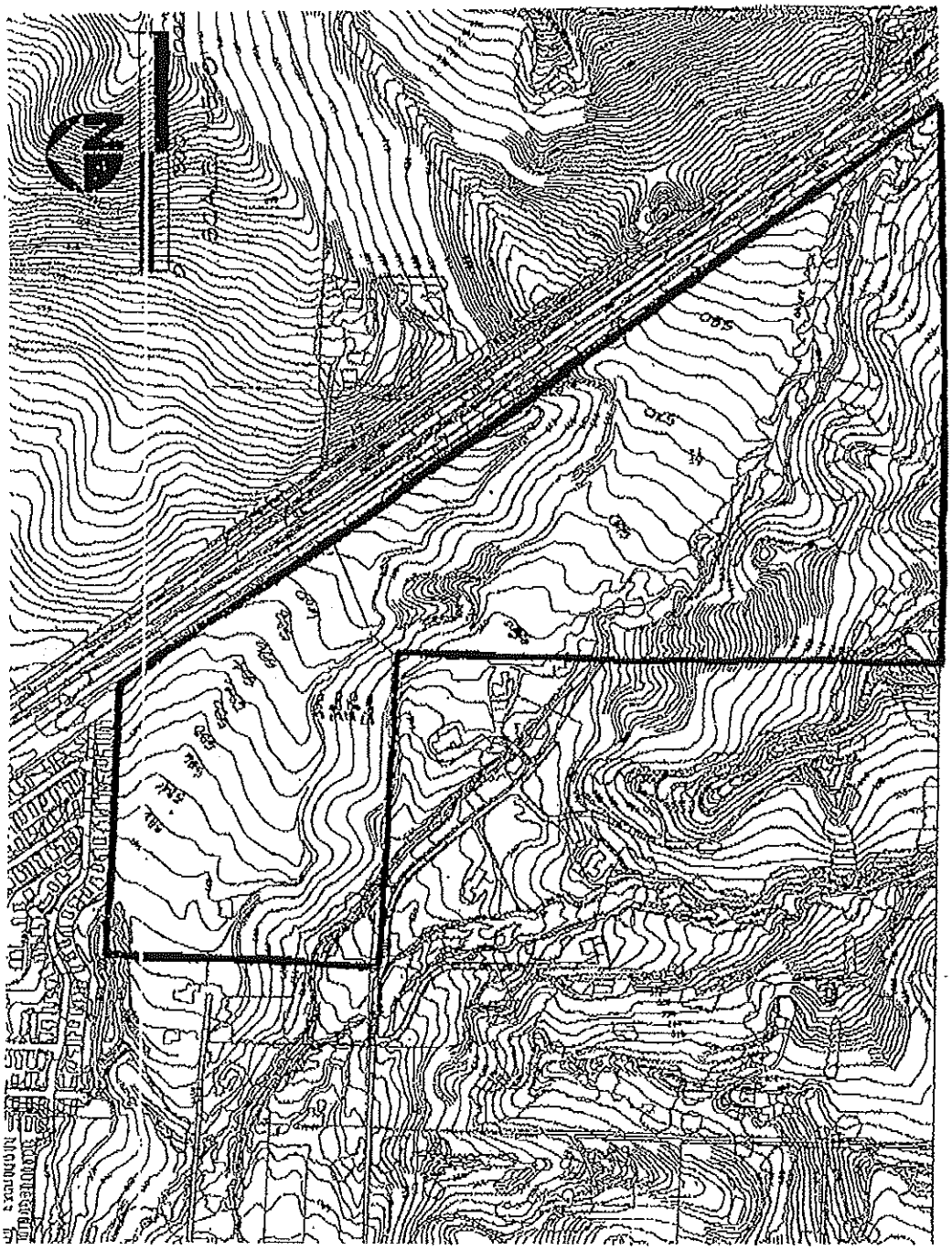


Figure 3. Topographical map of subject property.

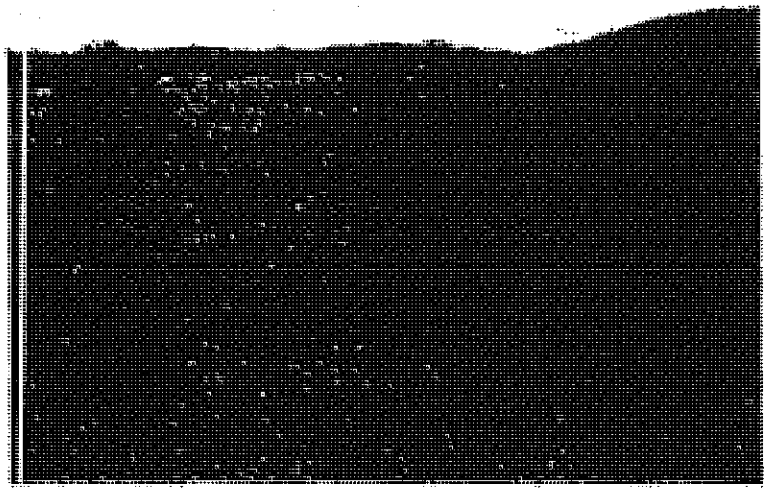


Photo 1. Northern portion (Mesa Area) of SDC-CT, LLC property, looking southeast. Note three cars driving on U.S. Highway 101 on the left.

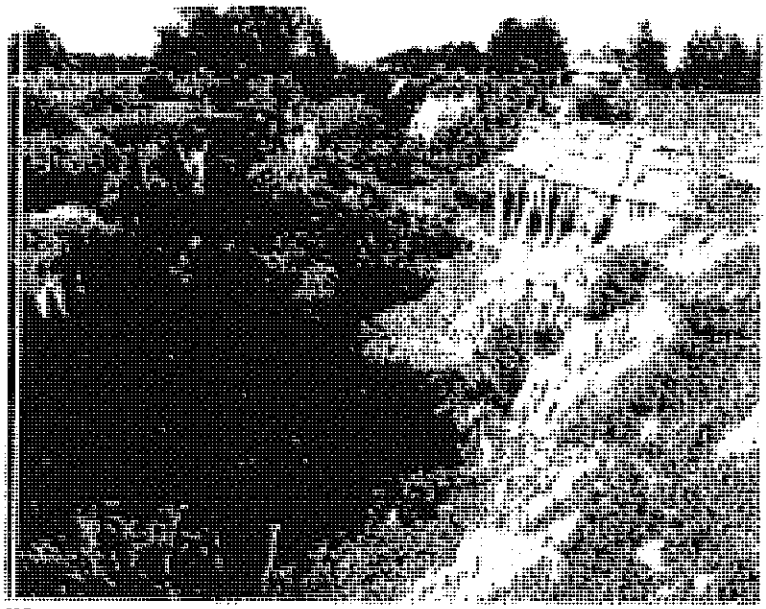


Photo 2. Steep sided basin in northwest corner of SDC-LLC property, looking northwest.

4.2 Southern Portion

Orcutt Creek runs through the southwestern portion of the northern parcel and through the southern region, crossing under US Highway 101 to the east (Figure 3). The creek was dry during my site visit, but it was apparent it can experience heavy water flow during heavy rains (Photo 3). No pools of standing water were present in or along the creek corridor that could serve as potential breeding sites for amphibians. Numerous mature coast live oaks (*Quercus agrifolia*) were observed along the stream corridor. Other plant species observed along the stream corridor include the following:

Common Name	Scientific Name
Mule Fat	*Baccharis salicifolia*
Miner's Lettuce	*Claytonia* spp.
Blue Gum	*Eucalyptus globulus*
Southern California Black Walnut	*Juglans californica californica*
Bermuda Buttercup	*Oxalis pes-caprae*
Willow	*Salix* spp.
Blue Elderberry	*Sambucus mexicana*
Nightshade	*Solanum douglasii*
Western Poison Oak	*Toxicodendron diversilobum*



Photo 3. Orcutt Creek in southwest corner of Mesa Area, looking southeast.

The relatively flat habitat on the northern side of Orcutt Creek is coastal scrub with shrubs such as coyote bush (*Baccharis pilularis*), California sage brush (*Artemisia californica*) scattered among grasses and various forbs. The topography becomes much steeper south of Orcutt Creek (Figure 3). This habitat consists of oak woodland/sandhill chaparral (Photo 4). Vegetation observed here includes the following:

Common Name	Scientific Name
Chamise	*Adenostoma fasciculatum*
Fiddleneck	*Amsinckia* spp.
Mountain Mahogany	*Cercocarpus betuloides*
Croton	*Croton californicus*
Coast Live Oak	*Quercus agrifolia*
Bush Lupine	*Lupinus* spp.
Tree Tobacco	*Nicotiana glauca*
Peony	*Paeonia californica*
Coffeberry	*Rhamnus californica*
Spiny Redberry	*Rhamnus crocea*
Black Sage	*Salvia mellifera*
Western Poison Oak	*Toxicodendron diversilobum*



Photo 4. Northern view of entire property from chaparral in southern portion. Note U.S. Highway 101 on the right and Sunny Hills Mobile Home Estates just below the horizon in the center of the photo.

5.0 BIOLOGICAL ASSESSMENT OF IMPACTS

5.1 Amphibian Breeding Habitat

No vernal pools were observed on the subject property that could serve as potential breeding habitat for amphibian species. Although rainfall totals for January and February were well below average, heavy rains in November and December of 2002 have filled most ponds in Santa Barbara County with enough water to allow California tiger salamanders and other vernal pool breeding amphibians opportunity to breed.

No water was observed in the basin in northwest corner of the property, however steep sides and landowner access restrictions only allowed a visual survey with binoculars. No water was observed from my vantage point during my site visit, but this basin may hold water for a period after heavy rains. The steep sides of this basin (30-40 feet) would likely prevent any amphibians that were able to breed in this basin from dispersing southeast onto the subject property. The topography is less steep to the west of this basin, and this could be a possible migration corridor for any dispersing amphibians that could be breeding in this basin.

5.2 California Tiger Salamander

5.2.1 Known and Potential Aquatic Breeding Sites Within 5 km (3.1 miles)

The subject property is within the range of the California tiger salamander as designated by US Fish and Wildlife Service (SB County Planning and Development, 2001).

Listed in the tables below are the known and potential California tiger salamander breeding ponds within 5 kilometers (3.1 miles) of the subject property. US Highway 101 is likely a barrier to salamander movement, so I have split this table into ponds on the east and west sides of Highway 101. The subject property is on the west side of Highway 101, and it is highly unlikely salamanders could move to the subject property from the east side of Hwy. 101.

I have further broken this down into northern and southern regions of the property because only the northern portion has been proposed for development. Distances listed are from the pond edge to the closest boundary of the subject property.

Known and potential California tiger salamander breeding ponds within 5 km (west side of US Highway 101) (Figure 1).

Pond Number	Status	Distance to Northern Portion	Distance to Southern Portion
ORCU-2	Potential	4,750 feet (0.90 mile)	2,125 feet (.40 mile)
ORCU-3	Potential	6,000 feet (1.14 miles)	3,375 feet (.64 mile)
ORCU-4	Potential	7,000 feet (1.33 miles)	4,250 feet (.80 mile)
ORCU-1	Potential	8,250 feet (1.56 miles)	8,500 feet (1.61 miles)
SAMA-10	Known	16,250 feet (3.08 miles)	18,250 (3.46 miles)

Source: Santa Barbara County Planning and Development, California tiger salamander habitat map, August 31, 2001

Known and potential California tiger salamander breeding ponds within 5 km (east side of US Highway 101) (Figure 1).

Pond Number	Status	Distance to Northern Portion	Distance to Southern Portion
SISQ-10	Potential	7,250 feet	7,250 feet
TWDA-16	Potential	9,750 feet	10,250 feet
TWDA-15	Known	12,500 feet	13,500 feet
SISQ-9	Known	12,750 feet	13,250 feet
SAMA-1	Known	13,000 feet	14,250 feet
TWDA-1	Potential	14,250 feet	14,750 feet
TWDA-2	Potential	14,500 feet	14,750 feet
TWDA-10	Potential	14,750 feet	14,750 feet
TWDA-3	Potential	14,750 feet	15,000 feet

Source: Santa Barbara County Planning and Development, California tiger salamander habitat map, August 31, 2001

5.2.2 Potential California Tiger Salamander Habitat Within 2 km (1.24 miles)

5.2.2.1 Aquatic Breeding Habitat

Since the portion of the property proposed for development (northern portion) is bordered by US Highway 101 on the west and residential development to the north and west, any potential salamander dispersal to the property could only come from the south. Only two potential California tiger salamander breeding ponds lie within 2 km (1.24 miles) of the northern portion of the property, both located to the south. These ponds are ORCU-2 and ORCU-3. ORCU-2 is a very small pond on the border between the Nuevo Energy and Bonney Properties. ORCU-3 is a larger pond further south on the Nuevo Energy property. ORCU-2 and ORCU-3 are 4,750 and 6,000 feet south of the portion of the property proposed for development, respectively. Both of these ponds are well outside the 2,200 foot buffer to development that has been proposed for confirmed breeding ponds by the California tiger salamander recovery team (Fahey, personal communication). Even if ORCU-2 and ORCU-3 are confirmed as California tiger salamander breeding ponds in the future, this proposed development project would lie more than twice the recommended buffer from those ponds.

Potential breeding ponds ORCU-2 and ORCU-3 lie 2,125 feet and 3,375 feet from the southern portion the property, respectively. Although this is within the possible dispersal distance for California tiger salamanders, the proposed development plan for this property includes a provision to preserve the southern portion of the property (approximately 121 acres) as open space. However, the steep topography coupled with dense chaparral habitat and few mammal burrows south of Orcutt

Creek may not provide preferable upland habitat for California tiger salamanders. California tiger salamanders typically reside in ground squirrel and gopher burrows during the dry portion of the year (Loredo and Van Vuren, 1996). Trenham (2001) indicates open grassland areas are used preferentially to continuous woody areas (i.e. chaparral). I have made similar observations of radio tracked animals at the Santa Maria Airport this year (Sykes, unpublished data).

5.2.2.2 Upland Habitat

Numerous ground squirrel burrows were observed on the northern portion of the subject property that could provide suitable upland habitat for California tiger salamanders. However, at this site, distance coupled with steep topography present in the southern portion and habitat fragmentation from Highway 101 would likely prevent any tiger salamanders in potential ponds south of the property (if they are present) from dispersing onto the subject property. Additionally, few small mammal burrows were observed in the oak woodland/sand hill chaparral habitat in the southern portion of the southern parcel that could provide upland habitat for California tiger salamanders during the dry portion of the year.

5.3 Other Species

Several animal species listed as California Species of Special Concern may occur on the subject property. These species include the western spadefoot toad (*Scaphiopus hammondii*), coast horned lizard (*Phrynosoma coronatum*), silvery legless lizard (*Anniella pulchra pulchra*), burrowing owl (*Speotyto cunicularia*), Cooper's hawk (*Accipiter cooperi*), white-tailed kite (*Elanus leucurus*), golden eagle (*Aquila chrysaetos*), or American badger (*Taxidea taxus*), although none of these species were observed on the subject property during my surveys.

Western Spadefoot Toad

Western spadefoot toads are unlikely from the northern portion of the property, but possible in the southern portion. This amphibian requires aquatic habitat for breeding, and the closest possible breeding habitat appears to be south of the southern portion, at the ponds discussed previously as potential California tiger salamander breeding pools, although the closest of these ponds is over 2,000 feet away.

Coast Horned Lizard

Although horned lizards were hibernating during my site visit, there is a high potential for their occurrence on the property. These lizards have been observed near the subject property, south of Orcutt Creek on the east side of U.S. Highway 101 (Hunt, personal communication). Horned lizards are typically found in open shrubby habitats including coastal sage scrub and chaparral, but have been known to use grazed grasslands as well (Hunt, personal communication). The chaparral habitat south of Orcutt Creek appears to be highly potential habitat for this species, and the grazed habitat present in the Mesa Area could also support this reptile.

To mitigate any potential effects of the development on horned lizards, a pre-construction survey should be conducted to capture and remove any horned lizards in the development footprint to the suitable habitat south of Orcutt Creek. Additionally, a construction monitor should be present onsite during the initial grading to move any horned lizards out of the construction path. Monitoring activities should be conducted during April and October when these animals are active.

Silvery Legless Lizard

Legless lizards are typically associated with scrub or chaparral habitats. Although suitable habitat is present in the southern portion of the property, the Mesa Area consists of grassland and therefore has low potential as legless lizard habitat.

Burrowing Owl

Burrowing owls are typically associated with grassland areas, where they use and enlarge abandoned California ground squirrels. Numerous ground squirrel burrows are present in the Mesa Area, however no enlarged burrows were observed. Additionally, the relatively small parcel of grassland present on the property and disturbance from U.S. Highway 101 and surrounding residential developments have likely degraded the onsite habitat for this species. However, this habitat may be used occasionally as foraging habitat of transient or wintering birds.

Cooper's Hawk, White-tailed Kite, and Golden Eagle

Although these species were not observed on the property, grassland areas in the Mesa Area and riparian areas along Orcutt Creek may provide foraging habitat for these birds. Numerous mature oaks and eucalyptus trees are present in the southern portion of the property that may provide nesting habitat. All mature oak and eucalyptus trees on the property will be protected on the southern portion of the property, and this will preserve any potential nesting sites for these species.

American Badger

Badgers typically use grassland and scrub habitat for foraging and den construction. Badger have been observed near the subject property (Hunt, personal communication), however, no badger or their sign was observed on the property. The grassland habitat present in the Mesa Area is likely foraging habitat for this mammal.

6.0 CONCLUSIONS

It is likely no California tiger salamanders would be impacted by development of approximately 25 acres in the northern portion of the property. Aquatic breeding habitat is not present on the subject property. The proposed development area is 4,750 feet from the closest potential California tiger salamander breeding pond (ORCU-2). Numerous ground squirrel burrows were observed in the proposed development area, however distance, dense chaparral, and steep topography likely prevent any salamanders that may use the potential ponds south of the property from using the upland habitat in the development area.

Approximately 121 acres of coastal sage scrub, riparian, and oak woodland/sandhill chaparral habitat will be deeded as open space as mitigation for this proposed development. These habitats in the southern portion of the property are important habitat for many non-listed plants and animals, but may also provide valuable breeding, foraging, or roosting habitat for several California Species of Special Concern. Coast horned lizards are likely present on the property, and may utilize the open grazed land in the Mesa Area for foraging habitat. Pre-construction surveys should be conducted to capture and relocate horned lizards in the construction path, as well as surveys during the initial grading of the site to remove animals that are disturbed by heavy machinery. Non-listed species should also be salvaged and moved from the construction path during these construction monitoring activities.

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APPENDIX B

LFR ENVIRONMENTAL MANAGEMENT & CONSULTING ENGINEERING

September 24, 2007

Diane K. Noda
Field Supervisor, Ventura Fish and Wildlife Office
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura, California 93003

RE: Request for Concurrence – California tiger salamander; Proposed Residential Development (Keysite-3) in Orcutt, Santa Barbara County, California

Dear Ms. Noda:

Centex Homes has proposed to build a residential housing development on Keysite-3 (the Site; APN# 129-151-26). The Site is an approximately 137-acre parcel located adjacent to (west of) Highway 101 approximately one-quarter mile south of Clark Avenue in the southeastern portion of the community of Orcutt in unincorporated Santa Barbara County (Figure 1). Prior to starting this project, Centex Homes is requesting concurrence from the United States Fish and Wildlife Service (Service) that the project is not likely to result in the take of the California tiger salamander (CTS; *Ambystoma californiense*).

The proposed Keysite-3 project involves building single family homes, townhomes and apartment buildings on approximately 65-acres of the Site leaving the remaining 72-acres as open space. Centex Homes is interested in breaking ground on this project by the summer of 2008. A CTS habitat assessment of the Site was conducted by Dr. Steve Sykes in 2003 and again by LFR Inc. in 2006 (reports enclosed). Dr. Sykes holds a valid 10(A)(1)(a) permit for CTS work. Both CTS habitat assessments concluded that the project was unlikely to impact CTS based on the absence of suitable breeding habitat in the area and the level of surrounding development (including Highway 101). However, in March of 2007 a pond previously labeled as a "potential" CTS breeding pond (ORCU-3) was surveyed by a 10(A)(1)(a) permitted biologist and found to contain CTS larvae. This finding resulted in the establishment of the 1.2-mile CTS dispersal radius of influence around a "known" CTS breeding pond covering a portion of Keysite-3 (see Figure 2).

In consideration of the recent finding of CTS larvae in ORCU-3, LFR recommended to Centex that additional analysis be conducted to address the potential that CTS would disperse from ORCU-3 to the project site. LFR Wildlife Biologist Mitch Siemens (resume attached) and Mr. Vince Semonsen conducted additional field studies and conducted discussions with other CTS experts to evaluate the situation. Mr. Semonsen holds a valid 10(A)(1)(a) permit for CTS work. Mr. Semonsen and Mr. Siemens visited Keysite-3 on September 4th, 2007 to assess the areas of the Site that are within the 1.2 mile dispersal buffer and visited adjacent parcels to assess the area between ORCU-3 and the Site boundary. Photographs of all areas are included with this letter.

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The shortest straight line distance between ORCU-3 and Keysite-3 is approximately 0.67 miles. The nearest disturbance is beyond that distance as shown by the blue dotted lines on the figure. The remaining area outside the blue dotted lines would be deed restricted as natural open space. As is evident in the attached photographs and figures; the habitat between the Site and ORCU-3 consists of a mosaic of chaparral, coastal scrub, dense oak woodland, and non-native grassland plant communities (see figures and photographs). The topography is generally hilly and occasionally steep. Along the "straight-line" route, a large drainage and some rock outcrops occur between the pond and the Site (see Figures 2). In addition, the upland habitat immediately surrounding ORCU-3 appears suitable for CTS though LFR did not visit the actual pond location and relied on aerial photographs for this determination. Presumably the Service has the report documenting CTS larvae in ORCU-3 and can review the site setting discussion in that report. High quality upland habitat surrounding the pond has been identified as a factor that would reduce the likelihood of CTS associated with ORCU-3 dispersing over a considerable distance and through difficult terrain to reach Keysite-3 when suitable and easily accessed habitat is available surrounding the pond.

Due to the conditions described above and in consultation with 10(A)(1)(a) permitted biologist, Vince Semonsen, LFR believes it is reasonable to assume that CTS associated with ORCU-3 are unlikely to occur on Keysite-3.

In planning the Keysite-3 residential development project, Centex Homes fully understands the implications associated with take of a federally listed species, in this case the California tiger salamander. The project will not impact habitat known to support CTS and is not expected to affect the normal behavior patterns of CTS associated with the ORCU-3 breeding pond. As an added measure of caution, the measures described below will be followed prior to and during the project.

- A Worker Environmental Awareness Training Program for construction personnel will be conducted by a USFWS approved biologist before the commencement of construction. The program will provide workers with information on their responsibilities with regard to the salamander, an overview of the life-history of the species, information on the protections afforded to this animal under the Endangered Species Act. Workers shall be informed that they are not to handle CTS, and that they should cease work and notify the biological monitor immediately if a CTS is encountered in the project area.

- A USFWS approved biologist shall be present at the project site during all earth excavation or disturbing activities, including times such as during trenching, cut and fill, and excavation of holes for gate posts, or other similar activities required for the project within the 1.2 mile dispersal buffer.

- The biologist shall have the authority to halt construction activities at the site to prevent death, injury or harassment of an individual CTS.

- Construction work will not occur immediately prior to, during and for twelve hours following significant rain events when CTS are most likely moving above ground.

LFR

- A qualified biologist will search the work area for CTS following significant rain events and prior to start of construction activities. The search would include looking under construction materials and other objects on the job site that might provide temporary shelter for CTS.

- Centex Homes shall eliminate attractions to predators of the salamander, such as raccoons, crows, and ravens, by ensuring all food-related trash items such as wrappers, cans, bottles, and food scraps are disposed of in closed containers and removed at least once a week from the proposed project site during the construction period of the proposed project. The site shall be inspected daily to make sure that all trash items are being disposed of properly.

If you have any questions or comments concerning these matters, please feel free to contact me at (805) 349-7180. We would appreciate the opportunity to discuss this with you at your soonest convenience. Due to the time sensitivity for this project, an electronic copy of this letter was also provided directly to Ms. Katherine Drexhage via e-mail.

Sincerely,



Greg McGowan
LFR Director of Ecological Services

APPENDIX C

April 11, 2008

Key Site 3 Project
Orcutt, California

CALIFORNIA TIGER SALAMANDER
Upland Drift Fence Study
(Summary of First Season Trapping Event)

For: Mr. Urban McLellan, Centex Homes

From: Vince Semonsen, Wildlife Biologist
CA Tiger Salamander Federal Fish and Wildlife Permit Number TE030384-2
Mitch Siemens, LFR Inc. Wildlife Biologist

Re: Project Update, Results of the First Year of the Upland Drift Fence Study for CTS

The drift fence study for CA tiger salamanders (CTS) began on the approximately 140-acre Key Site 3 property (the Site, APN 129-151-26) located in Orcutt, California on October 23, 2008. Over a six day period a total of 6,500 feet of drift fencing and 516 pit fall traps were installed according to a study plan designed by project wildlife biologists Vince Semonsen and Mitch Siemens and approved by the United States Fish and Wildlife Service (the Service) with minor adjustments. The first official trapping event occurred on October 29, 2008 and the last trapping event occurred on February 24, 2008.

The winter of 2007/08 brought substantial rain events resulting in a total of 21 trap nights being run between October 29, 2007 and February 24, 2008. **No CTS were captured during this time**. A variety of other species were captured in the pit fall traps including; several Western fence lizards (*Sceloporus occidentalis*), one slender salamander (*Batrachoseps attenuatus*), Pacific treefrogs (*Hyla regilla*), numerous Western toads (*Bufo boreas*), more than a dozen Monterey ensatina salamanders (*Ensatina eschscholtzii*), a number of Botta's pocket gophers (*Thomomys bottae*), California voles (*Microtis californicus*), Ornate shrews (*Sorex ornatus*), deer mice (*Peromyscus maniculatus*), a yellow-rumped warbler (*Dendroica coronata*) and one adult California ground squirrel (*Spermophilus beecheyi*) in addition to many hundreds of invertebrate species; most commonly Jerusalem crickets (*Stenopelmatus* sp.), various beetles (Order *Coleoptera*), and millipedes (Subclass *Helminthomorpha*).

There were several intense storm events during the fall and winter of 2007/08. The wind generated during these storm events resulted in unanticipated wear on the silt fence used for the CTS upland drift fence study. A significant amount of time was needed to maintain the drift fence so that it could be operational during subsequent storm events. The intensity of the storms also resulted in repeated repair and reinstallation of inundated pit fall buckets that had been "floated out" by sheet

flow caused by heavy rain. Although time consuming, the repair work was absolutely necessary to enable the study to continue and was largely unavoidable due to the intensity of the storms and the exposure of some of the fencing to high winds. At least two and possibly more of the fence line locations used in the trapping system will be re-evaluated and likely installed elsewhere on the Site to reduce exposure to sheet flow and high winds thereby lowering maintenance costs during the second half of the study if it is conducted in 2008/09.

The property continues to support excellent upland habitat for CTS with a large and active ground squirrel colony noted within the northern portion of the property.

LFR understands that Centex Homes has recently decided to discontinue further pursuit of the proposed Key Site 3 development project. However, if there is potential for development of the Site to occur in the future, it would be necessary to conduct a second year upland drift fence study in 2008/09 for CTS in order to facilitate regulatory concurrence from the Service that the project is not likely to impact this species. If LFR Inc. is involved in a second season study, a final report will be generated at the end of the 2008/09 field season documenting all aspects of the entire two year CTS drift fence study for the Key Site 3 property.



This photograph shows a recently installed section of the silt fence used in the CTS upland drift fence study at Key Site 3. Note the closed pitfall bucket installed at the base of the fence in the lower left corner of the photograph.

View looking southeast

Photo # 1010001

October , 2007

LFR Inc.



This photograph shows a recently installed section of the silt fence used in the CTS upland drift fence study at Key Site 3. This particular section of fencing was damaged by sheet flow running off the hillside to the right requiring numerous repairs.

View looking west

Photo # 1010003

October , 2007



Some of the fencing included in the CTS study was installed in the coastal scrub habitat on the southern hillsides of the Site as is shown here. All of the Monterey salamanders or "Ensatina" (*Ensatina eschscholtzii*) caught during the survey were caught in this coastal scrub habitat.

View looking west

Photo # 1010007

October 29, 2007

LFR Inc.



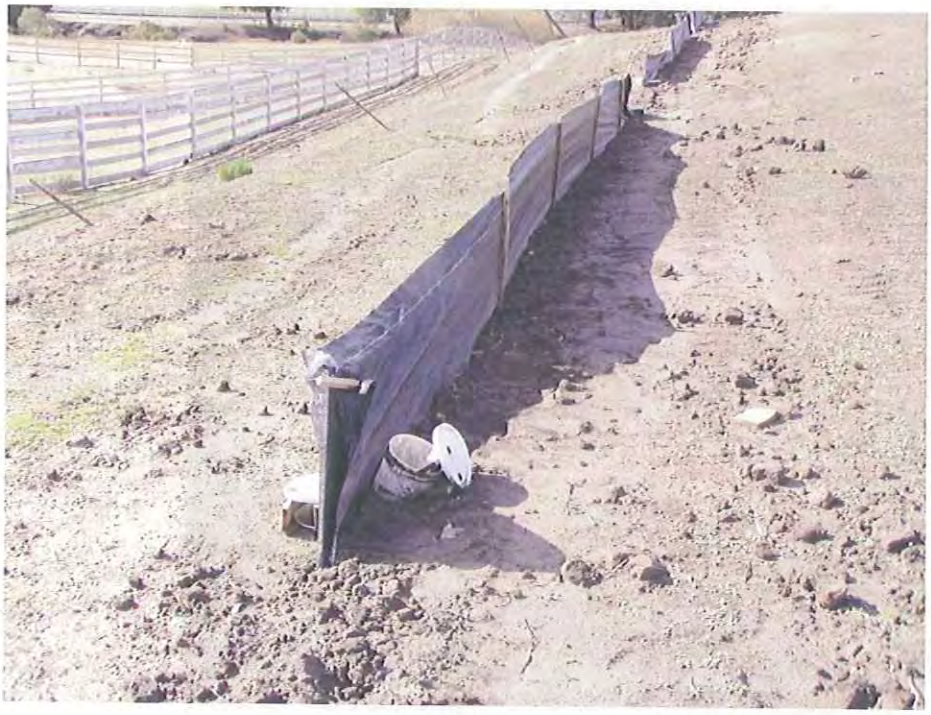
This photograph shows another of the hillside fence lines with installed pitfall traps located in the coastal scrub habitat. The grassland area in the background supported many California ground squirrels and presented the most suitable habitat for CTS on the Site though it is outside the 2km buffer from a known breeding pond.

View looking north

Photo # 1010008

October 29, 2007

LFR Inc.



This photograph shows a "floated" pitfall bucket that occurred as a result of sheet flow from the previous night storm event. All "floated" buckets following heavy rains were reinstalled.

View looking west

Photograph # 1010001

January 7, 2008

LFR Inc.



Portions of the CTS trap system were almost completely destroyed due to intense storm conditions including high winds and sheet flow following significant storms. Hours of maintenance were required to bail and in some cases re-insert pitfall buckets and erect the fence in order to be operational before the next storm system.

View looking west

Photograph # 1010010

January 28, 2008

LFR Inc.



More than a dozen Monterey salamanders or Ensatina (*Ensatina eschscholtzii*) were found in pitfall traps within the hillside coastal scrub habitat on the Site.

January 28, 2008

Photograph # 1010001

LFR Inc.



Amphibians caught during the first season trapping event included Western toads (*Bufo boreas*) shown here, slender salamanders (*Batrachoceps attenuatus*), Monterey salamanders (*Ensatina eschscholtzii*) shown above, and Pacific treefrogs (*Hyla regilla*).

No California tiger salamanders (*Ambystoma californiense)* were found.

APPENDIX D



Drift fence with pitfall traps installed next to the mobile home park that borders the north corner of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed next to Highway 101 in the northeast corner of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed next to Highway 101 on the northeast side of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed near the center of the site atop the mesa.

LFR Inc.

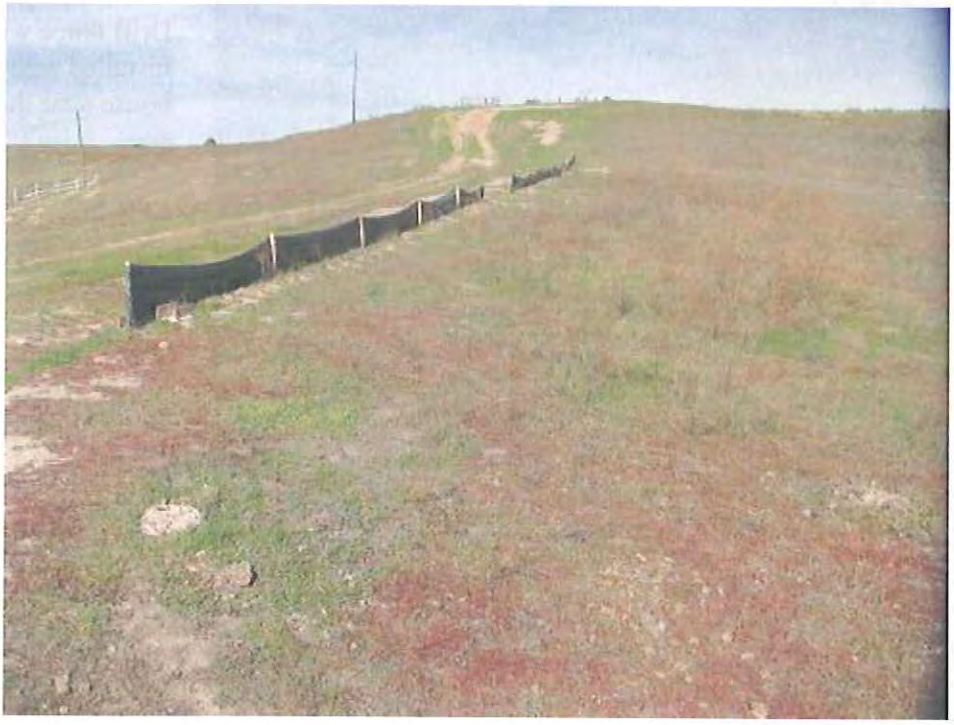
1/6/2009



Drift fence with pitfall traps installed adjacent to private property on the west side of the site.

LFR Inc.

1/6/2009



A section of drift fence with pitfall traps installed on the downhill side of the mesa.

LFR Inc.

1/6/2009

LFR Inc.



A section of drift fence with pitfall traps installed at the base of the mesa on the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed next to the ranch house near the center of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed adjacent to Orcutt Creek on the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed along Orcutt Creek on the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed adjacent to Highway 101 near the southeastern corner of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed adjacent to Highway 101 near the southeastern corner of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed in oak woodland / coastal scrub habitat near the southeastern corner of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed on the foothills in the southern portion of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed in coastal scrub dominated foothills on the southwest border of the site.

LFR Inc.

1/6/2009



Drift fence with pitfall traps installed on a hillside near the southwest border of the site west of Orcutt Creek.

LFR Inc.

1/6/2009



One of approximately a dozen ensatina salamanders (*Ensatina eschscholtzii*) caught during the two year drift fence study.

11-25-08



Western toads (*Bufo boreas*) like the one shown in this photograph were the most commonly encountered amphibian species during the two year drift fence study.

1/28/2008



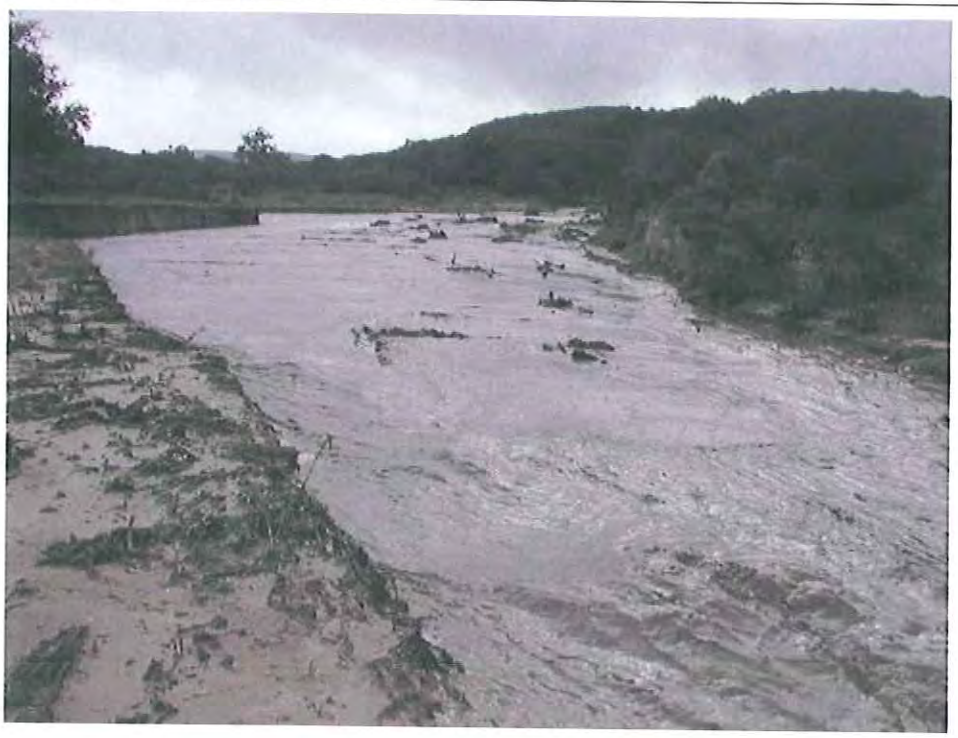
The most surprising capture during the 2008/09 trapping season was this juvenile coast horned lizard (*Phrynosoma coronatum*) recovered from a pit-fall bucket on January 24th following a night of intermittent showers. It was found and released in coastal scrub habitat on the hillsides south of Orcutt Creek.

1/24/2009



This portion of the drift fence on the mesa in the northwest portion of the site was flooded in January of the 2007/08 study. The section of fence was relocated for the 2008/09 study period.

1/28/2008



Orcutt Creek had periodic flowing surface water during the storms that occurred in the 2007/08 and 2008/09 study period.

1/28/2008

LFR

LFR an ARCADIS company

May 12, 2009

Melissa Mooney
Santa Barbara County Planning and Development
624 W. Foster Road
Santa Maria, CA 93455-3623

RE: Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) Supplemental Habitat Assessment
Key Site-3 - Santa Barbara County, California

Dear Ms. Mooney:

LFR is pleased to provide this vernal pool fairy shrimp (*Branchinecta lynchi*) habitat suitability assessment for Key Site-3 (the Site; APN 129-151-26; Figure 1). This assessment was prepared to address questions from the County of Santa Barbara (the County) regarding the potential for the Site to support this federally threatened species. The information provided herein is intended to assist the County in understanding conditions at the Site as they relate to the potential occurrence of vernal pool fairy shrimp.

The Site comprises approximately 137 acres crossed by Orcutt Creek. Based on our prior experience at the Site conducting sensitive species and habitat survey work and on an understanding of the species habitats and preferences, LFR concluded that the site does not support suitable habitat for the vernal pool fairy shrimp. The findings presented herein provide the requested documentation on areas within the project site that support potential wetland vegetation: specifically, the swale area on the upper mesa in the northwest corner of the Site. As indicated in the information provided below, the existing grassland habitat atop the mesa is unsuitable for the vernal pool fairy shrimp. There are no locations on the Site including the swale area on the mesa that provide adequate hydrology for this species and neither the species or suitable temporary aquatic habitat have been observed on the Site. Accordingly, we conclude that the project is unlikely to affect or impact the vernal pool fairy shrimp.

Project Description

SB Clark LLC is proposing residential development on the Site. The most recent development design proposes housing to be concentrated on the mesa in the northwest corner of the Site and in the lowlands east of Orcutt Creek and west of the 101 freeway. The Site is bordered on the east by Highway 101 and is approximately 1/4 mile south of Clark Avenue in the southeastern portion of the community of Orcutt in unincorporated Santa Barbara County, California. The Site contains more than 40 acres on a relatively flat mesa at the north end of the property, which drops 30 to 50 feet to the floodplain and lowlands surrounding Orcutt Creek. Orcutt Creek, which originates in Solomon Canyon to the southeast of the Site, crosses the property, entering from an outfall under Highway 101 and exiting in a northwesterly direction along the western perimeter of the Site. The creek re-enters and crosses a corner on the property for a short distance along the northwest edge. South of the main creek crossing, the property extends up the north-facing slopes of the Solomon Hills to a maximum elevation of approximately 750 feet. These slopes exceed 30% in places and include erosional features such as gullies.

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Vernal Pool Fairy Shrimp

The vernal pool fairy shrimp is a member of the aquatic crustacean order Anostraca. It is a federally listed Threatened species found in pools associated with lowland and foothill oak woodlands and grasslands. It is widely distributed in California and southern Oregon ranging from Oregon's Agate Desert south through much of California's Central Valley, and ultimately via several disjunct populations to the Santa Rosa Plateau in Riverside County in the South Coast Mountains Region of California. The vernal pool fairy shrimp is distinguished from other fairy shrimp by the female's tapered, pear-shaped brooding pouch, its relatively large size (0.75 – 1 inch), and antenna size and shape. *B. lynchi* inhabits small vernal pools and other static seasonal wetland habitats with cool water (10°C) of moderate alkalinity and conductivity that are typically less than one meter deep.

The vernal pool fairy shrimp has evolved to survive the ephemeral nature of vernal pool and seasonal wetland habitats. Vernal pools and static seasonal wetlands are temporary wetlands that form in depressions of unplowed grasslands, situated over a hardpan clay layer, bedrock, or other impervious soil condition such as heavy clay soils. Pools fill with winter rains and evaporate over time, lasting anywhere from a few weeks to a few months. As a result, *B. lynchi* can complete its life cycle in a matter of weeks. Fairy shrimp eggs, called cysts, are encapsulated in a hard shell. Cysts can withstand desiccation and extreme temperatures when pools disappear; they also survive when ingested by animals. Short and long-distance dispersal occurs when cysts "hitch rides" on migrating birds or when consumed by traveling animals. Cysts will only hatch when the right conditions - cool water - appear again (Cornell University, n.d.).

The discovery of *B. lynchi* at the Chevron/Unocal Tank Farm in San Luis Obispo City/County in 2003 and at Vandenberg AFB in 2004 prompted a fairy shrimp survey at the Santa Maria Public Airport as a part of environmental review for a proposed Business Park. David Wolff under recovery permit conducted surveys at the Santa Maria Public Airport during the 2006 wet season and discovered *B. lynchi* at modified seasonal wetlands and natural sandstone bedrock vernal pools in the southwest portion of the airport. This recent and nearby discovery of *B. lynchi* prompted the County to inquire as to the potential presence of the species on the KeySite 3 project Site located approximately 4.0 miles east of the airport. One location on the KeySite 3 property supports plant species such as six-weeks fescue (*Vulpia bromoidess*) and annual bluegrass (*Poa annua*) that can be associated with vernal pool and seasonal wetland habitats potentially supporting suitable conditions for vernal pool fairy shrimp. The following is an examination of the location on the Site considered to have the greatest likelihood of providing potentially suitable habitat for *B. lynchi*.

Temporarily Flooded Swale Area

Topography in the vicinity of the mesa consists of a mostly flat but slightly concave open field having an approximately 2% or less westerly slope. The dominant plant community consists of non-native grassland. During substantial rain events, storm water runoff flows from a culvert under Highway 101 and sheet flows across the field in a westerly direction before entering a large natural drainage. The distance from the culvert where the water enters the field atop the mesa to the drainage is approximately 400 meters. Sheet flow of storm water across the open field has been witnessed by LFR during and immediately following substantial rain events. Drainage patterns observed on aerial photographs also

confirm this westerly movement of water across the field in this location. LFR's field observations and historic aerial photographs indicate surface water does not pond on the Site but flows over the area for brief periods of time. LFR's observations over the last three winters is that surface water is present for less than 24 hours following substantial rain events.

The mesa area supports mostly non-native grasses and ruderal weed species. No obligate wetland plant species were identified during a recent wetland investigation of the mesa conducted in April of 2009 by LFR. However three facultative wetland (FACW) species; annual bluegrass (*Poa annua*), curly dock (*Rumex crispus*) and six-weeks fescue (*Vulpia bromoides*) were found in the potential wetland area. A wetland indicator status of FACW means that a species occurs in wetlands 67-99% of the time. A plus or a minus following the FAC designation indicates the species is typically found in the upper (wetter end of the spectrum) or lower (drier end of the spectrum) respectively for that species. Both annual bluegrass and curly dock are considered FACW- species and six-weeks fescue is a FACW species with no plus or minus in the designation indicating it typically occurs somewhere in the middle of the spectrum. Photographs of the mesa and swale area are provided as Photographs 1 and 2.

The mesa area is mapped in the Department of Agriculture Soil Conservation Service Northern Santa Barbara Area General Soil Map as occurring within the Garey and Marina soil series which it describes as occurring on nearly level to moderately steep, well drained and excessively well drained sandy loams and sandy soils on terraces. Within the association on the Site, the swale area is mapped as existing on Gary sandy loam (GaC2), 2 to 9 percent slopes,eroded and Marina sand , 9 to 30 percent slopes, severely eroded. According to the Soil Survey, these soil types indicate permeability is slow to moderate and surface runoff is very slow to medium.

The swale area described above is the only potentially suitable habitat for *B. lynchi* if the species were to occur on the Site. However, the area is not known to have surface water persist for more than 24 hours following extensive rain events. The lack of prolonged surface water (lasting for at least 18 days - the minimal time under optimum conditions required for vernal pool fairy shrimp to complete their life cycle) greatly limits the overall suitability of the location to support vernal pool fairy shrimp. There are no other potentially suitable aquatic habitats for vernal pool fairy shrimp on the Site.

Summary and Conclusions

The review of available background information and field surveys of the Key Site 3 project site revealed one area of interest because it supports three different species of plants sometimes associated with wetland conditions. The swale on the mesa, while supporting potential wetland plants has not shown any evidence of ponding for the duration required to support *B. lynci*. No *B. lynchi* have been observed in the swale area or at any other location on the Site. It is LFR's opinion that the swale area on the mesa assoticated with the culvert under Highway 101 is not suitable for *B. lynchi*. It is also the opinion of LFR that the KeySite 3 project is not likely to affect the vernal pool fairy shrimp (*B. lynchi*).

If you have any questions or comments concerning these matters, please feel free to contact me at (805) 349-7180.

LFR an ARCADIS company

Sincerely,

Mitch Siemens
Project Wildlife Biologist
LFR Inc.

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A view of the field on top of the mesa at the KeySite-3 property in the location of the seasonal swale.

View looking southwest

4/22/2009

Photo # 504

LFR Inc.



A view of the field on top of the mesa at the KeySite-3 property in the location of the seasonal swale.

View looking southeast

4/22/2009

Photo # 484

LFR Inc.

SB Clark

Key Site-3 Vernal Pool Fairy Shrimp

LFR Inc.



This photograph shows the swale area following significant rain. No surface water is present after more than two and a half inches of precipitation were recorded during the five days prior to the date of this photograph.

View looking southwest

2-10-09

LFR Inc.



The mesa in the northwest portion of the site was flooded in January 2008, though surface water did not persist for more than 48 hours.

1/28/2008

Jurisdictional Waters Investigation
Key Site 3
Orcutt, California

021-10246-00
April, 2009

Prepared for:

LFR

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1.0 INTRODUCTION

This report describes the field evaluation of Orcutt Creek and a temporarily flooded swale area by LFR Inc. (LFR) at the Key Site 3 property in Orcutt, California ("the Site") and discusses the findings as they relate to federal, state, and local regulatory jurisdiction of habitat resources under the Federal Clean Water Act (Section 401 and Section 404), the California Fish and Game Code (Section 1602) and under the County of Santa Barbara Environmental Thresholds and Guidelines Manual respectively. The primary focus of this report is to provide an evaluation of the Site conditions and associated physical data typically used to make a jurisdictional determination by the United States Army Corps of Engineers (the Corps), California Department of Fish and Game (the Department or CDFG), and the County of Santa Barbara (the County), under their respective federal, state, and local regulations.

LFR has been involved in the ecological assessment and characterization of Key Site 3 since 2004 and LFR biologists, botanists and ecologists have visited the Site on numerous occasions during that time. Most recently, the Site was visited by LFR Biologist Mitch Siemens, LFR Senior Ecologist Mary Carroll, LFR Plan Ecologist Susi Bernstein, and LFR Principal Biologist Greg McGowan on numerous occasions during February, March, and April reassessing the seasonal swale previously mapped on the Site. LFR staff met at different times with biologists from Rincon Consultants and representatives of the County of Santa Barbara to review conditions and to discuss changed conditions since the initial delineation by LFR. Changed conditions include the removal of grazing cattle from the area potentially altering the botanical resources present. Formal wetland delineation employing transects across the previously mapped areas was conducted on April 22, 2009, however, it is important to note that LFR has conducted winter surveys of the Site as well and is familiar with the conditions during rain events.

2.0 METHODS

Plant surveys of the seasonal swale were conducted on August 26, 2008 and again on March 30 and April 22, 2009. All plant species found to be in a recognizable condition during the surveys were recorded and are listed in Table 1. Nomenclature follows the Jepson Online Interchange (Baldwin et al., 2009), which lists updates based on The Jepson Manual (Hickman, 1993). It is important to note that the list of vascular plant species on the Site presented in this report may not be comprehensive, however, surveys were conducted in summer and spring. Plants that bloom earlier or later may not have been in recognizable condition.

In April of 2009 additional soil observations were made in the previously mapped seasonal wetland area to confirm the Soil Survey data and to describe the existing soil characteristics in greater detail. A total of 16 soil observation pits were excavated along

north – south aligning transects that crossed the potential wetland area (Figure 2). These were in addition to three soil observation pits excavated in August of 2008. The pits were advanced to a depth of approximately 20 inches (51 centimeters). A Munsell soil color chart (1994) was used to compare soil colors observed at the Site with those described in the Soil Survey. Additionally, observations of the texture of the soil and the sides of the soil pits were examined and compared with hydric soils indicators and positive hydrology indicators described and pictured in the Arid West Regional Supplement.

All plant species within a five foot radius of the soil pit were recorded, along with their absolute cover. The Arid West Regional Supplement dominance test (as described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0) employing the "50/20 rule" was utilized for analysis of data from each of the 16 plots in order to determine the dominant plant species. Plots dominated by a majority of wetland plants (51% or more FAC, FACW, or OBL plants), based on percentage of wetland dominants to total number of dominants per plot, were classified as wetland plots, and plots dominated by a majority of upland plants were classified as non-wetland plots (see explanation of symbols in Section 4.1).

3.0 EXISTING CONDITIONS

Key Site 3 comprises approximately 146.5 acres crossed by Orcutt Creek. The Site is bordered on the east by Highway 101 and is approximately $^1/_4$ mile south of Clark Avenue in the southeastern portion of the community of Orcutt in unincorporated Santa Barbara County, California (Figure 1). The Site contains more than 40 acres on a relatively flat mesa at the north end of the property, which drops 30 to 50 feet to the floodplain and lowlands surrounding Orcutt Creek. South of Orcutt Creek, the property extends up the north-facing slopes of the Solomon Hills to a maximum elevation of approximately 750 feet. These slopes exceed 30% in places, and include relatively minor erosional features such as gullies and rills.

It should be noted that cattle have historically grazed the Site and cattle were present at least periodically on the Site through January of 2009 . Grazing has likely affected the botanical characteristics of the Site, especially the seasonal composition and abundance of herbaceous species.

3.1 Orcutt Creek

Orcutt Creek shows up as a blue-line drainage on the United States Geological Survey (USGS) 7.5-minute Orcutt topographic quadrangle map. Orcutt Creek originates in Solomon Canyon to the southeast of the Site, crosses the property, entering from an outfall under Highway 101 and exiting in a northwesterly direction along the western perimeter of the Site. The creek re-enters and crosses a corner on the property for a short distance along the northwest edge (Figure 2). Orcutt Creek through the Site is bordered

by Central Coast live oak riparian forest and, in places, Central Coast arroyo willow riparian scrub. The height of the bank of Orcutt Creek varies widely but typically ranges between two and six feet (0.6 to 1.8 meters). The width of the creek bottom is also variable but is generally between 10 and 16 feet (3 to 5 meters). The substrate is composed predominantly of fine sand and silt. Orcutt Creek is an ephemeral creek that conveys surface water following heavy rain events but is typically dry for most of the year. The creek does not support intermittent pools of surface water for more than a few hours after cessation of rain induced surface water flow.

3.2 Temporarily Flooded Swale Area

A review of the USGS 7.5-minute Orcutt topographic quadrangle map does not indicate a blue-line drainage or water feature on the mesa in the northeast corner of the Site. However, a portion of the mesa at the northeast corner of Key Site 3 receives periodic runoff from a culvert that drains west from under Highway 101. Water discharged from the culvert quickly percolates into the sandy soil or, during heavier rain or flood events, sheet flows across the mesa toward the northwest corner of the Site where it discharges through sheet flow or underground conveyance to a deep and steep-banked tributary to Orcutt Creek. No obvious surface flow connection is present at the edge of the mesa at the top of the tributary as the area has been bermed.

Although the surface soil is sandy in the runoff area on Key Site 3, finer sediments are present at varying depths below the soil surface, including thin clay or fine grain bands, as evidenced in soil pits excavated by LFR. A corresponding shift in plant composition is readily observable along most portions of the swale area as compared with nearby vegetation (see photographs in Appendix A).

Outside of the runoff area, the mesa is dominated by annual grassland characterized by rip-gut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), foxtail barley (*Hordeum murinum*), and annual fescues (*Vulpia* species). Associated with these grasses are weedy mustards (especially *Hirshfeldia incana*) and filaree (*Erodium cicutarium, E. botrys, E.. moschatum*), along with patches of bur-clover (*Medicago polymorpha*), and many other weedy species. Native species include coast tarplant (*Deinandra increscens* subsp. *increscens*), which is most conspicuous during summer months, along with dove weed (*Croton setigerus*); in spring sky lupine (*Lupinus nanus*) and peppergrass (*Lepidium strictum*) are found occasionally in patches, along with a few other native annuals. Scattered coyote bush (*Baccharis pilularis* subsp. *consanguinea*) is also present.

The swale area receives temporary runoff and was reported by LFR as dominated by the non-native perennial Bermuda grass (*Cynodon dactylon)* in September 2008, although this species exhibited low cover during the winter months. By April 2009, however, some areas were showing rapid emergence and growth by Bermuda grass, which is winter-dormant and summer-active and exhibits the C4 photosynthetic pathway (see photographs in Appendix A).

Species characteristic of the swale area during winter and spring 2009, during which cattle were removed from the area, include six-weeks fescue (*Vulpia bromoides*), annual bluegrass (*Poa annua*), Italian ryegrass (*Lolium multiflorum*), smooth barley (*Hordeum murinum* subsp. *glaucum*), filaree (*Erodium botrys, E. moschatum*), Australian brass buttons (*Cotula australis*), bur-clover, red maids (*Calandrinia ciliata*), curly dock (*Rumex crispus*), and occasional sour dock (*R. acetosella*), along with several other species. Other species observed in this area in limited numbers include two individuals of rabbitsfoot grass (*Polypogon monspeliensis*) near the culvert along with occasional tree tobacco (*Nicotiana glauca*) and spiny clotbur (*Xanthium spinosum*) in the same area. Some of these species are wetland indicators, and will be discussed further in Section 4.1,

4.0 WETLAND HABITAT AND FEDERAL JURISDICTION

LFR followed procedures described in the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0); ("Arid West Regional Supplement") to determine if all or a portion of the swale area could be considered a jurisdictional wetland pursuant to the following federal definition:

> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

According to the federal definition, in order for an area to be considered a wetland, predominantly hydrophytic vegetation, evidence indicating anaerobic soil conditions, and positive hydrologic indicators must be present. LFR examined conditions existing on the mesa in terms of these three criteria in order to determine if jurisdictional wetland habitat is present.

4.1 Hydrophytic Vegetation

The existing plant community found on the mesa is generally classified by LFR as annual grassland due to the preponderance of annual grasses and associated forbs, although detailed habitat characterization using species associations would reveal a more patchy mosaic of species composition, based on site micro-topography and variations in seasonal water retention. LFR assigned a wetland indicator status to the dominant species occurring on the mesa within the annual grassland using the United States Fish and Wildlife Service National Wetland Inventory, as managed by the USDA Natural Resources Conservation Service (USDA, NRCS) for Region 0 (California) (USDA, NRCS 2009, plants.usda.gov/wetland.html). The National List of Vascular Plant Species that Occur in Wetlands (USFWS 1996) was also reviewed.

The percentage of time a particular plant species is likely to be found within a wetland is defined in this list and given an indicator status. The wetland indicator status categories range from Obligate wetland (OBL) species, those species found in wetland habitat greater than 99% of the time, to Upland (UPL) species, those species found in a wetland habitat less than 1% of the time. Additional categories include facultative wetland plants (FACW), which occur in wetlands 67-99% of the time; facultative (FAC), which occur in wetlands and uplands equally (34-66%) of the time; and facultative upland (FACU), which occur in wetlands 1-33% of the time. Plus (+) and minus (-) values are given to represent species near the wetter and drier ends of the spectrum respectively. In general, wetland indicators are plants that are classified as FAC, FACW, and OBL.

The following plant species found in the transect plots in April 2009 have a wetland indicator status of FAC, FACW, or OBL (USDA, NRCS, 2009): six-weeks fescue (FACW), annual bluegrass (FACW-), curly dock (FACW-), Bermuda grass (FAC), sour dock (FAC-), red spurrey (FAC-). Additional plants reported from the swale with wetland indicator status include spiny clotbur (FAC+), rabbitsfoot grass (FACW+), and tree tobacco (FAC).

4.1.1 August 2008 Site Visit Vegetation Analysis

During the August 2008 Site visit, the single dominant plant observed within the swale area was Bermuda grass. Bermuda grass has a wetland indicator status of FAC, meaning that it is equally likely to occur in wetland and non-wetland habitat. The Corps considers plant communities dominated by species with a wetland indicator status of FAC or higher to be indicative of a wetland. Therefore, in August of 2008 the swale area satisfied the vegetation parameter for a wetland according to the Corps criteria. Note that the dominance of Bermuda grass decreases as it gets farther from the culvert and does not cross the entire mesa (see Figure 2 and Figure 3).

Non-native annual grasses were also observed in the swale, especially smooth barley, but most of these had been removed by cattle grazing at the time of the August 2008 survey; cattle were observed pulling these dried annual grasses out by the roots during the August 2008 visit. Curly dock, an associate (non-dominant) species in the area, was also observed among the Bermuda grass and dried annual grasses; it is classified as a facultative wetland plant (FACW-). Two individuals of rabbitsfoot grass (FACW+) were found in the swale area near the outlet of the culvert. Two other species that occur infrequently in the swale, tree tobacco and spiny clotbur, are classified as facultative plants that occur in wetlands and uplands equally (FAC 33%-66%), with spiny clotbur designated as FAC+.

4.1.2 April 2009 Site Visit Vegetation Analysis

A summary of the vegetation sampling in April 2009 is provided in Table 1. The predominant species in most plots were non-native grasses. Some plots also had a high

cover of filaree. Close to the culvert, Bermuda grass exhibited 60% cover in plot D3, and also had 30 – 35% cover in plots E1 and E2; Bermuda grass had lower cover or was absent in most other plots, although thick new Bermuda grass growth was observed in some nearby areas outside the plots. Soft chess brome, smooth barley, and Italian ryegrass showed fairly even distributions in the swale plots, although cover varied. Soft chess brome was found in 81% of the plots and provided up to 50% cover at highest densities, with an average of 10% cover for all plots. Smooth barley occurred in 88% of the plots, with cover reaching 80% in two plots and an average of 15% cover for all plots. Italian ryegrass, which also occurred in 88% of the plots, had a mean cover of only 3%, reaching 30% cover in one plot.

Of the additional non-native grasses that are wetland indicators in these plots, annual bluegrass was present in one plot at 20% cover, and six-weeks fescue was present in five plots with cover ranging from 3% to 50% in two plots.

Other wetland indicators in plots include sour dock, curly dock, and red spurrey. In all plots they exhibited cover values of 1% or less, suggesting a sporadic presence in areas sampled.

Forbs that had the highest cover in these samples include storkbill filaree (12% average cover) and bur-clover (10% average cover). Neither of these species are considered wetland indicators.

Vegetation analysis of the 16 plot locations conducted during the April investigation identified one plot (D3) as containing a predominance of hydrophytic vegetation (Bermuda grass{FAC} was the only dominant and had 60% cover in the plot). Three other plots (D4, E1, & E2) had a dominance of 50% hydrophytic plant species. The Arid West Regional Supplement indicates that there must be "greater than" 50% presence of hydrophytic plant species present for the vegetation to qualify as a positive wetland indicator, therefore, these three plots were not considered positive for the wetland vegetation parameter.

4.2 Hydric Soils

LFR conducted a review of maps contained in the Soil Survey of Northern Santa Barbara Area, California (U.S. Department of Agriculture Soil Conservation Service, 1972; "Soil Survey") to determine whether or not the soil mapped for the Site was included on the list of hydric soils for Santa Barbara County. The Soil Survey Map identified the Site as having Garey Series and Marina Series soils in the vicinity of the mesa (please refer to Appendix B for a detailed description of these soil types). Garey Series and Marina Series soils are described as "well drained" and "excessively drained" soil types respectively and are not included on the list of hydric soils for Santa Barbara County.

Observations in the field generally confirmed the description of the soil series given in the Soil Survey for Northern Santa Barbara County. None of the 22 hydric soil indicators described in the Arid West Regional Supplement were observed in any of the 19 observation pits (field data forms are included in Appendix C). LFR also reviewed the Natural Resources Conservation Service (NRCS) manual (*Field Indicators of Hydric Soils in the United States* Guide for Identifying and Delineating Hydric Soils, Version 5.01, 2003) and found no hydric soil indicators that matched soil characteristics observed during excavation of the soil observation pits. LFR determined that soils on the mesa are not indicative of a wetland for the soil parameter according to the Regional Supplement to the Army Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0).

4.3 Hydrology

Hydrologic indicators for wetlands include but are not limited to rafted debris, silt deposits, water marks, water stained leaves, observation of soil saturation, and drainage patterns. The soil observation pits excavated by LFR did not have free standing water or evidence of recent saturation within the root zone or 18-inches of the soil surface. Four soil observation pits (B2, D3, E1 and E2) showed evidence of redoximorphic features in the form of fine to medium sized faint mottles with an abundance of approximately two to three percent in the soil matrix. Pit E1 was found to have a thin vaguely discernable lens approximately two inches thick consisting of organic matter and containing signs of oxidation of very fine root pores and linings. It was not possible to discern if the roots were dead or alive at the time of the observation and it didn't appear as though oxidized rhizospheres occupied 2 or more percent of the volume of the layer as is required in the Arid West Supplement; for this reason, confirmation of this primary hydrology indicator was not indicated on the data sheet for this observation pit. Redoximorphic features (faint mottles) observed in the three other pits (B2, D3 and E2) did not appear to be extensive enough to satisfy the requirement for positive hydrology as described in the Supplement for the Arid West although they could indicate that the soil may be saturated for short periods of time.

One positive secondary indicator of local hydrology (drainage patterns) is associated with the outflow of the culvert under Highway 101. Aerial photographs of the Site show the feature and deposits of sediment on the mesa where water exits the culvert and spreads out across the mesa in a westerly direction (Figure 3). LFR has also observed the flow of water discharged from the culvert under Highway 101 during winter surveys in 2006/2007. However, the Arid West Regional Supplement requires two secondary hydrology indicators to be present in order for an area to qualify as positive for wetland hydrology. Drainage patterns were the only secondary hydrology indicator found by LFR. There were no primary hydrology indicators observed. Therefore, in the absence of a positive primary hydrology indicator or two secondary hydrology indicators, the location of the swale area was not considered to be positive for the hydrologic parameter.

4.4 Aerial Photographs

A review of aerial photographs from 1938 to the present (1938, 1943, 1954, 1956, 1967, 2005 and 2006; Figure 4) reveals historic disturbances on much of the Site to support agricultural operations. The historic agricultural operations resulted in disturbance of native communities in various locations across the Site at different times. The vegetation on the hillside south of Orcutt Creek appears to have been subject to the least amount of disturbance and unlike other portions of the Site there is no evidence that this area has been completely cleared during the past seven decades.

North of Orcutt Creek, clearing of vegetation for farming is visible in several photographs. In 1938, the floodplain north of Orcutt Creek appears to have been cleared for agricultural purposes, along with the flat mesa at the north end of the Site. The slopes that separate the mesa to the north from the floodplain by Orcutt Creek appear to support coastal scrub vegetation in this photograph.

Also visible in 1938 are two small tributaries to Orcutt Creek that join the creek from the north. Each tributary originates east of the highway and traverses the Site in a westerly direction. The northern tributary (the swale discussed above) drains a small slope to the east of Highway 101 that had also been cleared in 1938. As this tributary reaches the northwestern corner of the Site, it drops abruptly from the edge of the mesa into a steep-walled chasm. This steep drainage at the corner of the Site remains today and the tributary continues to be fed by water coming through the culvert under Highway 101 though no channel exists today across the mesa. Aerial photographs from 1954 and 1956 appear to indicate a defined drainage course through the mesa where the swale is located today. A second tributary skirts the slope that drops down from the mesa towards Orcutt Creek. This tributary is barely visible today on the Site, though the culvert remains under Highway 101.

In 1943 and 1954 all flat areas north of Orcutt Creek appear to have been cleared. The slopes between the mesa and the floodplain by Orcutt Creek appear to support coastal scrub vegetation. Vegetation also appears cleared in 1956 and 1967, although the poor resolution of these images makes it difficult to interpret the land use patterns adjacent to Orcutt Creek. The slopes between the mesa and lower floodplain appear more heavily disturbed in 1967.

Aerial photographs show that the mesa area once had defined channel from water draining the hills on the east side of Highway 101 and crossing the mesa before entering the steep-walled tributary west of the Site. By 1956, the drainage had become poorly defined and by 1967, conditions appear to be similar to current conditions with no defined channel. In the most recent aerial image, sediment deposits are apparent where water sheet flows across the Site, but as is discussed herein, no defined channel exists.

4.5 Wetland Inventory Records

The United States Fish and Wildlife Service's National Wetlands Inventory maps (U.S. Fish and Wildlife Service, 1995) were reviewed by LFR to determine if a wetland had previously been mapped at the Site. No wetlands have been previously mapped on the Site.

4.6 Determination of Federal Jurisdiction

The following sections describe LFR's conclusions regarding potentially jurisdictional Waters of the United States and wetlands on the Site. It is important to note that only the Army Corps of Engineers has the authority to determine federal jurisdiction. The discussions and conclusions in the following sections represent LFR's professional judgment based on application of the Corps wetland delineation protocols and applicable regulatory guidance documents.

4.6.1 Swale Area (Federal Jurisdiction)

The swale area on the mesa does not meet the conditions of a jurisdictional wetland as defined by the Corps. Although temporary inundation of the swale does occur during and immediately following rain events, water apparently does not remain long enough to create hydric soil conditions. No obligate wetland plants were found in the swale area. Two FACW species were observed in plots with other dominants in the UPL and FACU category, resulting in a non-wetland indicator status for the vegetation parameter when applying the "50/20 rule." The FACW species were annual bluegrass (a dominant species in one of the observation plots at 20% coverage) and six-weeks fescue (a dominant species in two of the observation plots at 50% coverage). The other dominant plant with a FAC or wetter wetland indicator status is Bermuda grass, which has a facultative wetland category designation of FAC, meaning the species is as likely to be found in upland habitat as it is in wetland habitat. This species exhibits rapid growth in warm weather and is winter dormant; it may have greater cover in some plots during the summer months.

One secondary positive hydrology indicator (drainage patterns) was confirmed in the swale area through direct observation during the winter months and because of the silt layer that can be seen in aerial photographs spreading out on the mesa from the culvert under Highway 101. However, during the investigation there were no other signs of positive surface or sub-surface hydrology in the swale area. A jurisdictional wetland as defined by the Corps requires that all three parameters (hydric soils, positive hydrology, and a dominance of hydrophytic vegetation) be present for a habitat to qualify as a wetland. The swale area does not meet all three criteria. Furthermore, the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency joint guidance document for Clean Water Act jurisdictional determinations issued in response to U.S. Supreme Court findings (Clean Water Act Jurisdiction, June 5, 2007, U.S. EPA and the Corps)

states that the agencies generally will not assert jurisdiction over swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow). The guidance document supports LFR's opinion that the temporarily flooded swale area on the mesa is not federally jurisdictional.

4.6.2 Orcutt Creek (Federal Jurisdiction)

Orcutt Creek through the Site is considered to be a non-navigable tributary that is not permanent (maintains flow for less than three months of the year) as defined in the current Corps and U.S. EPA joint guidance document for Clean Water Act jurisdictional determinations. With this designation, a finding of jurisdiction would require that the Corps determine whether the creek has a significant nexus with a traditional navigable water (in this case the Pacific Ocean). If found to be federally jurisdictional, the area of the creek occurring between the ordinary high water mark (OHWM) on opposing banks would be under federal authority. The OHWM is defined in the Corps 1987 Wetlands Delineation Manual as the following: "***That line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural lines impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.***" Impacts to jurisdictional Waters of the U.S. are regulated under Section 404 of the Clean Water Act and are generally subject to mitigation requirements imposed by the Corps.

The regulatory standing of Orcutt Creek has been disputed in terms of jurisdiction under the Clean Water Act. Orcutt Creek does not naturally flow into another jurisdictional water but instead ends in the "Betteravia Lakes" area. This area currently supports agricultural operations but historically supported a significant wetland complex. Based on a lack of natural connectivity to a jurisdictional water body (in this case the Santa Maria River as a connection to the Pacific Ocean), arguments have been made that Orcutt Creek is not a jurisdictional water body. However, agricultural practices in the area move water mechanically throughout the area using pumps, canals, and surface storage features, and in some cases these actions facilitate artificial hydrologic connectivity to the Santa Maria River. In legal action (United States of America vs. Adam Brothers Farming), the court supported a determination that Orcutt Creek is a jurisdictional Water of the United States. This case was settled so the determination was not formalized, but it is assumed for purposes of this analysis that the Corps does consider Orcutt Creek a jurisdictional water. As such, impacts to Orcutt Creek below the OHWM are regulated by the Corps under Section 404 of the Clean Water Act, and by the California Regional Water Quality Control Board under Section 401 of the Clean Water Act.

It is important to note that only the Army Corps of Engineers has the authority to determine whether or not an aquatic feature falls under federal Clean Water Act jurisdiction. The discussions and conclusions above represent LFR's professional

judgment based on application of the Corps wetland delineation protocols and applicable regulatory guidance documents.

5.0 WETLAND HABITAT AND STATE JURISDICTION

The following sections describe LFR's conclusions regarding potentially jurisdictional Waters of the State. It is important to note that only the Department of Fish and Game has the authority to determine state jurisdiction.

5.1 Swale Area (State Jurisdiction)

The California Department of Fish and Game (the Department) has not officially adopted regulations pertaining to wetlands. However, Section 1602 of the CA Fish and Game Code (Lake and Streambed Alteration Program) charges CDFG with executing Streambed Alteration Agreements. Pursuant to Section 1602 of the California Fish and Game Code "an entity may not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake..." The Department specifies that Fish and Game Code Section 1602 applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the state. The regulatory definition of a stream is a body of water that flows at least periodically or intermittently through a bed or channel that has banks and supports fish or other aquatic life. This includes watercourses with a surface or sub-surface flow that supports or has supported riparian vegetation.

LFR does not consider the swale area on the mesa to constitute a stream or lake as defined for application of the Lake and Streambed Alteration program in Section 1602 of the Fish and Game Code. There is currently no stream bed with defined banks on the mesa and the conditions are not suitable to support fish or other aquatic life.

5.2 Orcutt Creek (State Jurisdiction)

Orcutt Creek has a clearly defined bed and banks and does meet the CDFG definition of a stream and as such any project-related impacts to the creek will require a streambed alteration agreement from the Department. The area of the creek under state jurisdiction includes the bed and banks of the drainage and or the outer limit of riparian vegetation, whichever is greater.

6.0 WETLAND HABITAT AND COUNTY JURISDICTION

According to the County of Santa Barbara Environmental Thresholds and Guidelines Manual (1995), in order for a habitat area to be defined as a wetland it must exhibit at least one of the attributes described below.

- ***At least periodically, the land supports predominantly hydrophytes; that is, plants adapted to moist areas.***
- ***The substrate is predominantly undrained hydric soil.***
- ***The substrate is non soil and is saturated with water or covered by shallow water at some time during the growing season of each year (Cowardin 1979).***

The County describes the importance of wetlands in the Thresholds Manual in terms of the high number of functional values in a generally dry, arid region, and because of their rare occurrence. The County lists a number of important biological attributes including diverse assemblages of plants and animals including invertebrate larvae, large mammals, and plants that may only survive in wetland areas. The County also notes the function of wetlands in providing food, cover for protection against predators, and habitat for breeding of some species. Public benefits noted by the County include protection of the shore, water quality/hydrology supporting groundwater recharge, surface water availability, and water purification/filtration, food chain support, nutrient cycling, and socio-economic benefits (aesthetics, ethno-botany, recreation, research, education, economic benefit, etc.

6.1 Swale Area (County Jurisdiction)

As discussed in Section 3.2, the mesa is characterized by an annual grassland community. Within the swale area, six plant species were identified that had a wetland indicator status of FAC or FACW (no obligate species were found). Two FACW species; annual bluegrass and six-weeks fescue, were found to be dominant species within three of the observation plots where they were found, but they did not by themselves or together with other dominants make up a greater than 50 percent occurrence of species within the plots that are OBL, FACW, or FAC and thus did not satisfy the predominance of wetland vegetation parameter. At one soil investigation area (D3), a single dominant FAC or wetter plant (Bermuda grass) satisfied the predominance of wetland vegetation parameter. Bermuda grass has a federal wetland indicator status of FAC meaning that it is equally likely to occur in wetland and non-wetland habitat. The distribution of Bermuda grass on the site varies seasonally as the species is winter dormant and summer active. The distribution in August 2008 is shown in Figure 5, but in April 2009, the distribution was quite limited.

The County of Santa Barbara defines hydrophytes as "plants adapted to moist areas." The federal standard considers plant communities dominated by species with a wetland indicator status of FAC or higher to be indicative of a wetland, but also requires that the feature meet the other two standards for hydric soils and positive wetland hydrology. The County criteria are not defined other than as shown above.

The swale area does not have predominantly undrained hydric soil and the area does not meet the hydric soil criteria as described in the Arid West Regional Supplement. The existing soils do not show hydric soil characteristics in the field and are described in the Soil Survey as being well drained to excessively drained.

LFR characterized the substrate within the swale as sand or silt loam, both of which are soil types in the USDA classification system. As such, the feature does not meet the third criteria above as a non soil. Furthermore, the swale area experiences relatively brief periods of sheet flow following heavy and prolonged rain events where water originating on the east side of Highway 101 exits through a culvert onto the Site and spreads west across the mesa before entering a deep drainage that connects to Orcutt Creek. The connection is either through sheet flow or subsurface flow as no bed, bank, or channel occurs on the mesa. Depending upon the frequency and intensity of rain, it has been LFR's experience that surface water typically does not cover the swale area for more than a few hours at a time. In reviewing the feature pursuant to the Cowardin Wetland Classification System, the hydrologic regime most closely matches the definition of a Temporarily Flooded feature as opposed to a Seasonally Flooded feature. The Cowardin definition of Temporarily Flooded is as follows:

> **Temporarily Flooded**. Surface water is present for brief periods during the growing season, but the water table usually lies well below the soil surface for most of the season. Plants that grow both in uplands and wetlands are characteristic of the temporarily flooded regime (Cowardin 1979).

Surface water does not occur frequently enough or for a prolonged enough period to meet the definition of a Seasonally Flooded hydrologic regime (seasonally flooded areas are defined as having surface water present for extended periods especially early in the growing season, but absent by the end of the season in most years. When surface water is absent, the water table is often near the land surface).

6.1.1 Swale Area Findings (County Jurisdiction)

The swale area at the Site does not meet the hydric soils or the non-soils hydrology criteria for a County jurisdictional wetland. In some of the soil pits, redoxomorphic indications were observed but they were not significant. If the County considers a dominance of Bermuda grass to meet the standard of 'supporting predominantly hydrophytes' then the swale would meet the County's standard on that single parameter. Because the presence of Bermuda grass varies through the year, mapping the area is

difficult. Figure 5 shows the area dominated by Bermuda grass in August 2008. In April 2009, only a single soil pit observation area had a dominance of hydrophitic vegetation and a discreet polygon could not be mapped other than the quadrat itself.

As is discussed above, the criteria for meeting the federal standard for hydrophytic vegetation, is a dominance of species with a Facultative or higher rating. However, the federal delineation technique uses plants as the first tier of review and then requires that both positive hydrology and hydric soil indicators are present to delineate a jurisdictional wetland. As such, it is appropriate to use an inclusive standard for hydrophytes, that includes species equally likely to occur in both wetland and upland conditions, as the other two indicators serve to refine the characterization. With the one parameter approach employed by the County, it would seem reasonable to rely on plants that provide a higher level of certainty that the feature is wetland (e.g., Obligate [OBL], Facultative Wetland [FACW], etc., for plants that occur in wetland habitat most or all of the time). Bermuda grass has a designation of Facultative, meaning that it occurs in wetland and upland communities with equal frequency. Based on the discussion above, LFR does not consider the feature to be a County jurisdictional wetland, nowithstanding that the presence of Bermuda grass would allow a finding that the feature meets the County's one-parameter wetland definition. Only the County of Santa Barbara has the authority for a final determination.

In addition to the regulatory parameters discussed above, LFR also considered the functional role of this feature. While wetland types are extremely diverse in the arid west, the Environmental Thresholds Manual specifies a number of important functions and values provided by wetlands. The Manual notes that the presence of wetland conditions facilitates a diverse assemblage of plants and animals, cover for protection against predators, and special foraging and breeding habitat. Except for during short periods of temporary inundation, the swale at the Site does not provide significantly different function and value than the surrounding upland habitat. The floristic composition is distinct; however, the wildlife services are the same as the surrounding uplands as the swale does not provide additional cover or different foraging or breeding habitat than the adjacent areas.

6.2 Orcutt Creek (County Jurisdiction)

The County recognizes riparian zones as sensitive habitat. The County describes riparian habitat as "***the terrestrial or upland area adjacent to freshwater bodies, such as the banks of creeks and streams, the shores of lakes and ponds, and aquifers which emerge at the surface such as springs and seeps*** (Bowland and Ferren 1992)."

Orcutt Creek through the Site is considered a riparian zone by the County and guidelines are listed in the Environmental Thresholds and Guidelines Manual that are intended to reduce project-related impacts considered as significant.

7.0 CONCLUSIONS

The swale area on the mesa does not fulfill all three criteria established by the Corps to qualify as a three-parameter wetland and therefore the area should not fall under federal jurisdiction. Additionally, the swale area does not exhibit features such as a defined bed and banks that would include it under state jurisdiction through Division 2, Chapter 6, Section 1602 of the California Fish and Game Code.

A habitat area must fulfill at least one of three criteria established by the County of Santa Barbara to qualify as a wetland. The swale area on the mesa of Key Site 3 may meet the first criteria (at least periodically some areas support predominantly hydrophytes) if the County considers Bermuda grass to be a hydrophyte (see Section 6.1.1).

In the Environmental Thresholds Manual, the County stipulates that potential wetlands which have only one of the defining three characteristics, require careful review to ensure that highly disturbed areas with artificially compacted soils which do not have true wetland characteristics are not mistakenly identified as wetlands (Santa Barbara County 1995). In this particular case, it is LFR's opinion that while the feature is not an artifact of Site disturbance, the designation of the feature as a County wetland based on the presence of Bermuda grass is inappropriate and the feature should be given careful review before a determination of "wetland" is applied by the County. The swale does not provide differentiated functional value for wildlife due to the short duration of surface water and does not provide conditions for obligate or other plant species that require wetland conditions for survival.

Orcutt Creek through the Site falls under jurisdiction of the California Department of Fish and Game as a stream course with a recognizable bed and banks and as such is subject to permitting under Section 1602 of the CA Fish and Game Code. Orcutt Creek also represents a riparian corridor through the Site. The County of Santa Barbara recognizes riparian corridors as a sensitive habitat type, and accordingly, the creek is subject to set-backs and other protection measures established in the County of Santa Barbara Environmental Thresholds and Guidelines Manual.

Because of recent findings summarized in the U.S. Army Corps of Engineers and U.S. Environmental Protection Agency joint guidance document for Clean Water Act jurisdictional determinations (Clean Water Act Jurisdiction, June 5, 2007, U.S. EPA and the Corps), it is LFR's opinion that Orcutt Creek through the Site can be described as a "Non-navigable tributary that is not relatively permanent" and as such, is subject to federal jurisdiction based on a fact-specific analysis by the Corps to determine whether it has a significant nexus with a traditional navigable water (in this case the Pacific Ocean). Historically, the Corps has considered Orcutt Creek to be jurisdictional and this has been upheld through litigation review. While a significant nexus analysis may reveal that Orcutt Creek is no longer federally jurisdictional based on more recent court action, it is

assumed to be jurisdictional based on prior Corps determinations until the Corps has determined otherwise.

8.0 REFERENCES

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Tables

HYDROPHYTIC VEGETATION DOMINANCE TEST DATA
KEY SITE 3
WETLAND DELINEATION

Herb stratum only

FAC, FACW, OBL Categories
Dominant Species are those that alone or collectively exceed 50% of the absolute cover or that alone equal or exceed 20% of the absolute cover

Scientific Name	Common Name	A1	A2	B1	B2	B3	C1	C2	C3	C4	D1	D2	D3	D4	E1	E2	E3	WETLAND INDICATOR STATUS NRCS Region 0 2009	USFWS 1996	native	non-native
Amsinckia menziesii subsp. menziesii	**common fiddleneck**										0.001%							UPL	UPL	x	
Anthemis cotula	mayweed																	FACU	FACU		x
Avena barbara	slender wild oat				0.001%													UPL	UPL		x
Avena sativa	cultivated oat	0.001%				0.001%		0.001%	0.001%				0.001%					UPL	UPL		x
Baccharis pilularis	**coyote bush**										0.001%							**UPL**	**UPL**	**x**	
Bromus diandrus	ripgut brome	1%							1%				0.001%	0.001%				UPL	UPL		x
Bromus hordeaceus	soft chess brome	25%	5%		1%	25%		0.001%	0.001%	1%	15%	10%	1%		3%	20%	50%	FACU-	FACU-		x
Calandrinia ciliata	**red maids**																	FACU*	FACU*	x	
Convolvulus arvensis	bindweed				0.001%									1%			0.001%	UPL	UPL		x
Cotula australis	Australian brass buttons	0.001%																UPL	FAC*		x
Cynodon dactylon	Bermuda grass	5%			0.001%							15%	60%		30%	35%		FAC	FACU		x
Deiandra increscens subsp. increscens	**coast tarweed**			0.001%	0.001%	0.001%	0.001%				1%					0.001%	0.001%	UPL	UPL	x	
Erodium botrys	storkebill filaree	1%		70%		25%	15%	0.001%		15%			10%	40%	1%	1%	20%	UPL	UPL		x
Erodium moschatum	whitestem filaree	3%	10%		5%			2%	21%		40%				10%			UPL	UPL		x
Hirschfeldia incana	summer mustard	0.001%			0.001%		0.001%									0.001%	0.001%	UPL	UPL		x
Hordeum murinum subsp. *glaucum*	smooth barley	2%	80%	0.001%	80%	1%		1%	45%		1%	15%	0.001%	0.001%	1%	5%	5%	UPL	UPL		x
Hypochaeris glabra	smooth cat's ears			0.001%														UPL	UPL		x
Lepidium strictum	**peppergrass**	**16%**										**1%**						**UPL**	**UPL**	**x**	
Lolium multiflorum	Italian ryegrass	3%	5%	3%	0.001%		0.001%	5%	30%	0.001%	0.001%		3%		2%	3%	1%	UPL	UPL		x
Lupinus nanus	**sky lupine**														0.001%			UPL	UPL	x	
Malva nicaeensis	bull mallow				0.001%										0.001%			UPL	UPL		x
Matricaria discoidea [Chamomilla suaveolens]	pineapple weed	0.001%																FACU	FACU		x
Medicago polymorpha	burclover	1%		10%		1%		90%				50%	2%		0.001%	1%	1%	UPL	FACU-		x
Poa annua	annual bluegrass	20%																FACW-	FAC		x
Rumex acetosella	sour dock											1%						FAC-	FAC-		x
Rumex crispus	curly dock	0.001%		1%			0.001%					0.001%					0.001%	FACW-	FACW-		x
Spergularia rubra	red spurrey	1%									0.001%				0.001%			FAC-	FAC-		x
Trifolium hirtum	rose clover			0.001%														UPL	UPL		x
Triticum aestivum	cultivated wheat								0.001%									UPL	UPL		x
Vulpia bromoides	six-weeks fescue			3%		50%						5%		50%			6%	FACW	FACU*		x
Vulpia myuros	rattail fescue				0.001%		75%			84%	40%							FACU*	FACU*		
																		28		6	24

Absolute cover	**78%**	**100%**	**87%**	**86%**	**102%**	**90%**	**98%**	**97%**	**100%**	**97%**	**97%**	**76%**	**91%**	**47%**	**65%**	**83%**
50% of absolute cover	39%	50%	44%	43%	51%	45%	49%	49%	50%	49%	49%	38%	46%	24%	33%	42%
20 % of absolute cover	16%	20%	17%	17%	20%	18%	20%	19%	20%	19%	19%	15%	18%	9%	13%	17%
# of Dominant species that are OBL, FACW, or FAC	1/3	0/1	0/1	0/1	1/3	0/1	0/1	0/3	0/1	0/2	0/1	1/1	1/2	1/2	1/2	0/2
% of dominant species that are OBL, FACW, or FAC	33%	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	100%	50%	50%	50%	0%
Positive hydrophytic vegetation indicator (>50% cover)	not present	not present	not present	not present	not present	not present	not present	not present	not present	not present	not present	**YES**	not present	not present	not present	not present

30 Total Species

Figures



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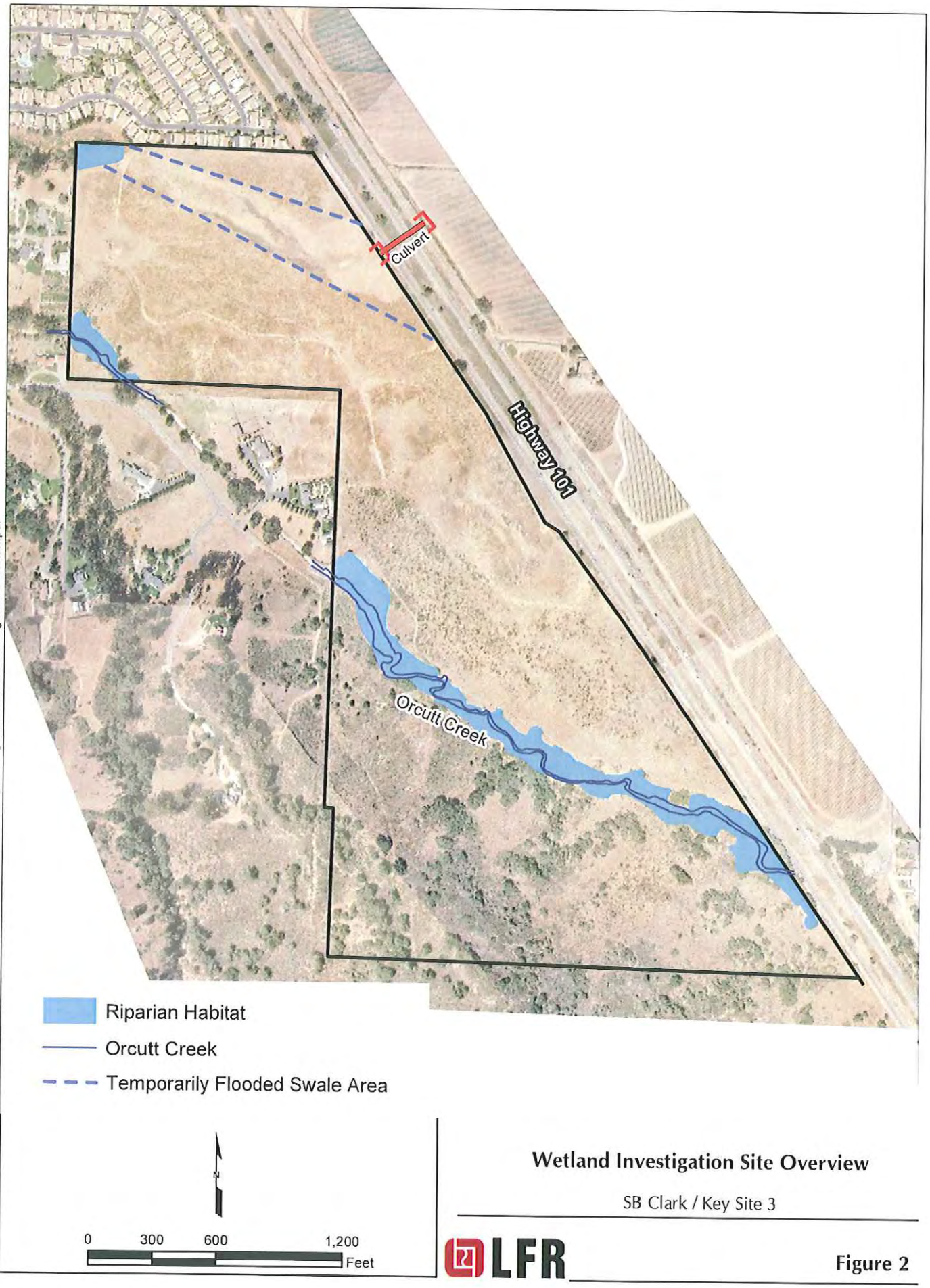
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Site Location Map

SB Clark / Key Site 3

LFR

Figure 1



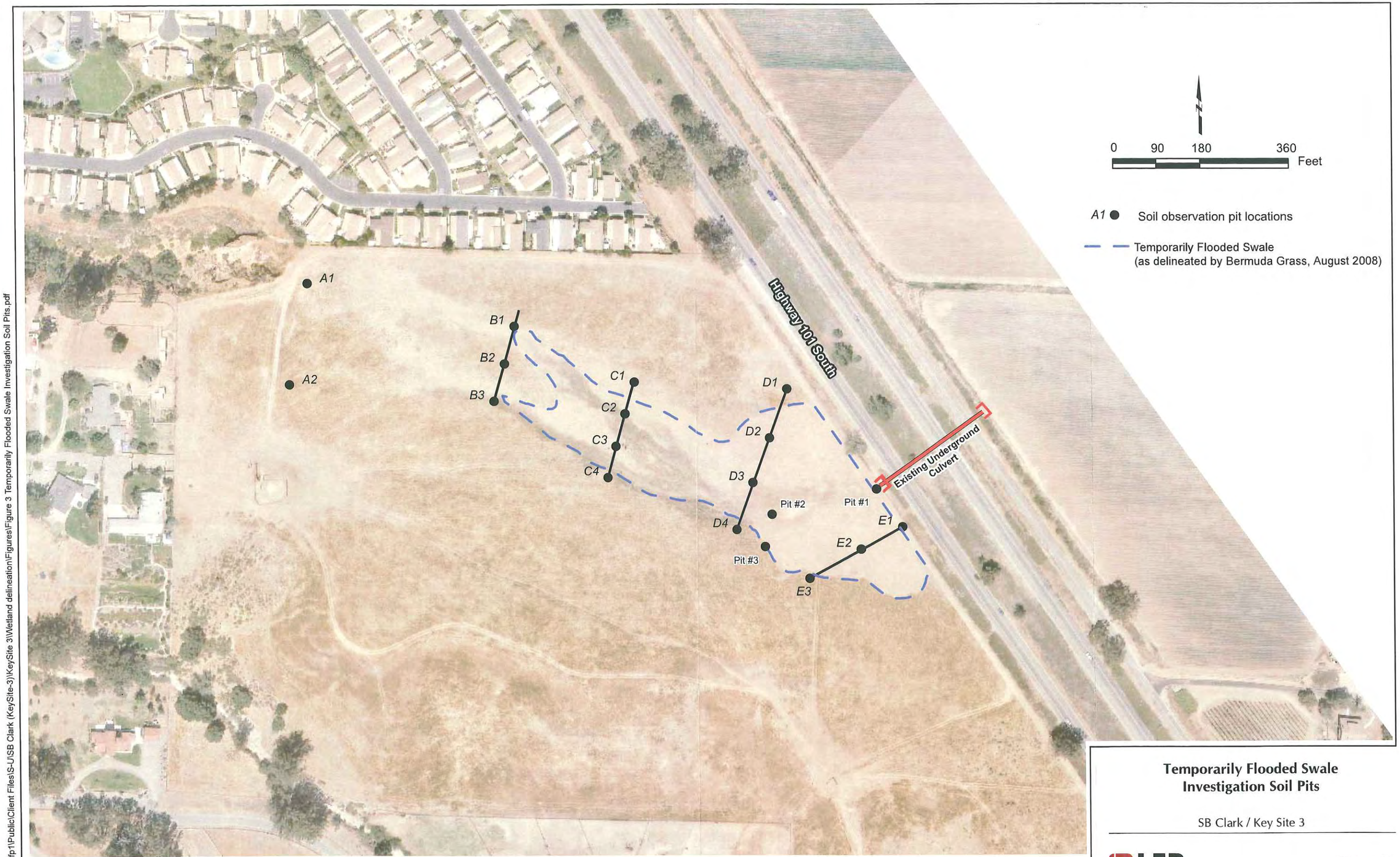
\\Ca22fp1\Public\Client Files\S-U\SB Clark (KeySite-3)\KeySite 3\Wetland delineation\Figures\Figure 2 Wetland Investigation Overview.pdf

Wetland Investigation Site Overview

SB Clark / Key Site 3

LFR

Figure 2



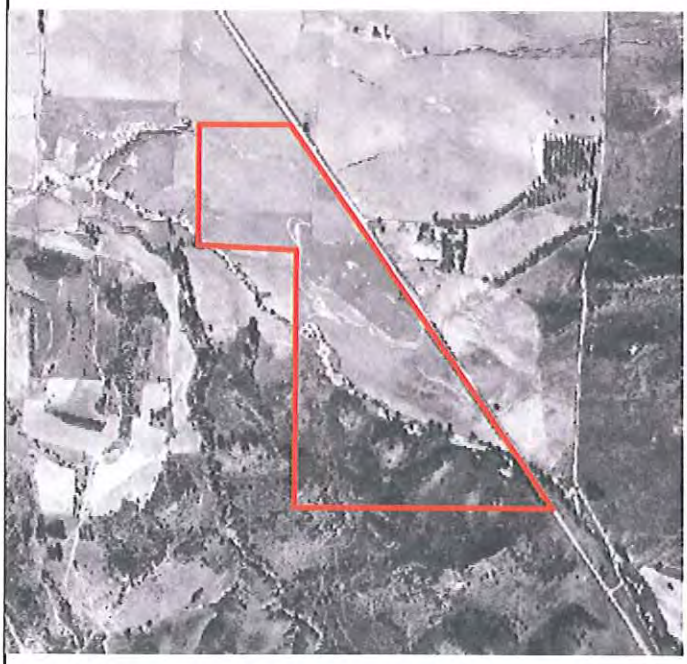
\\Ca2fp1\Public\Client Files\S-U\SB Clark (KeySite-3)\KeySite 3\Wetland delineation\Figures\Figure 3 Temporarily Flooded Swale Investigation Soil Pits.pdf

Temporarily Flooded Swale Investigation Soil Pits

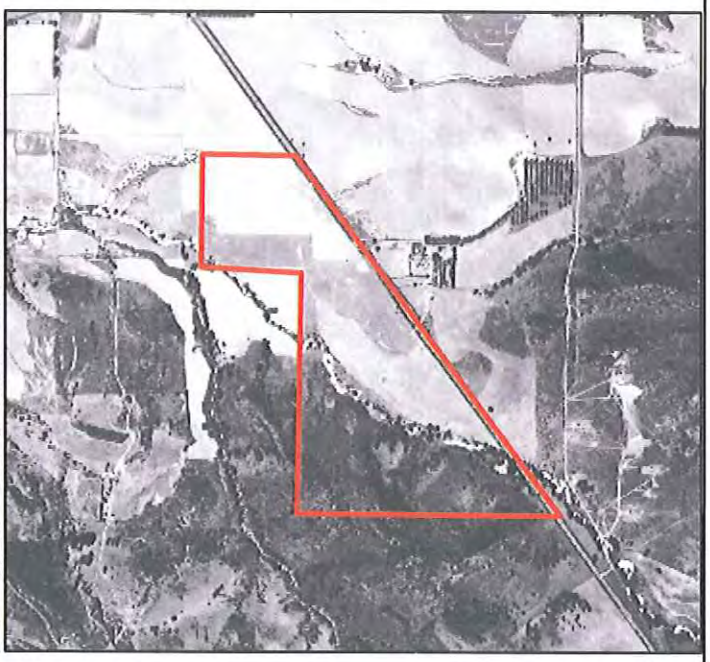
SB Clark / Key Site 3

LFR

Figure 3



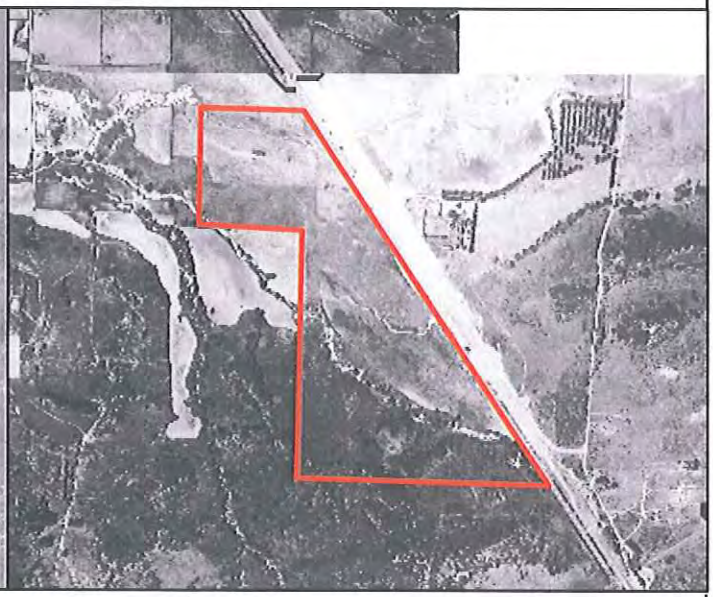
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1943



1954



1956

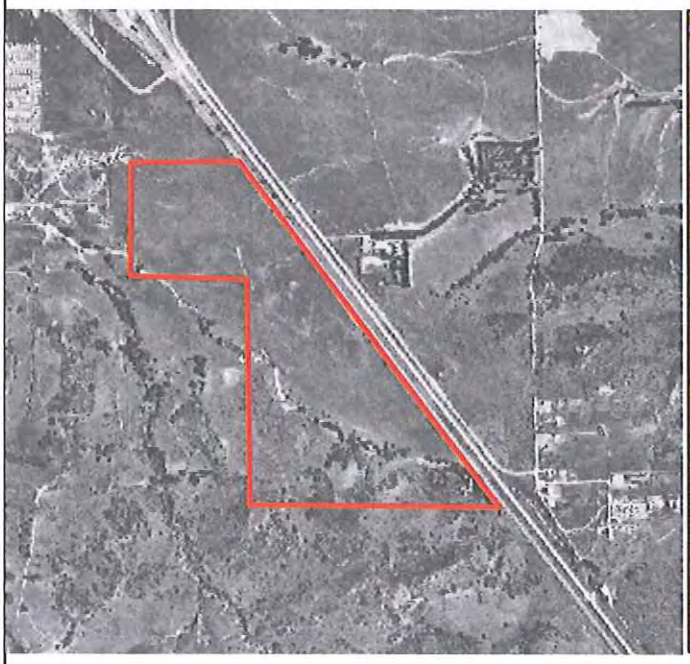
Historic Aerial Photographs

SB Clark / Key Site 3

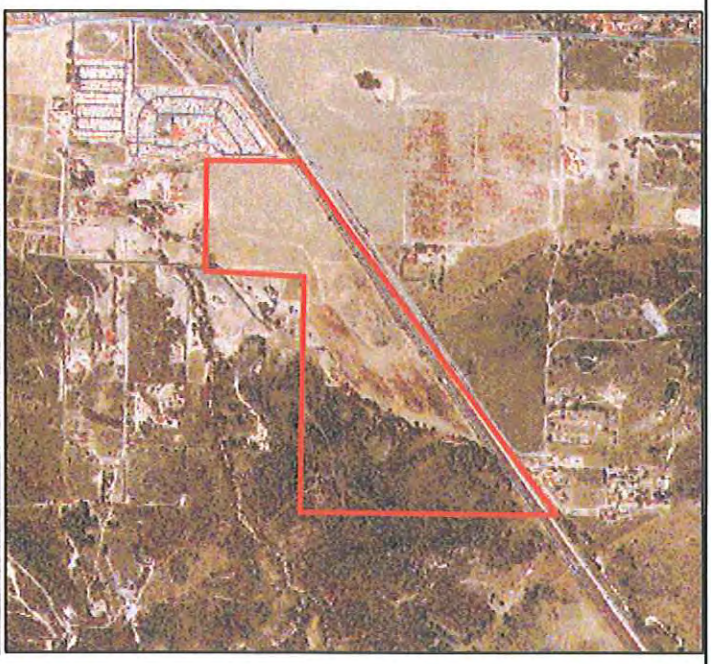
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Figure 4

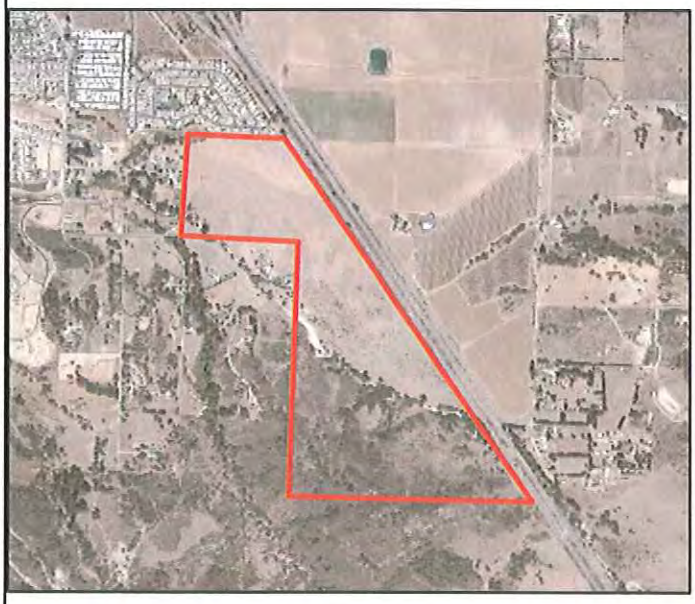
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1967



1989



2006

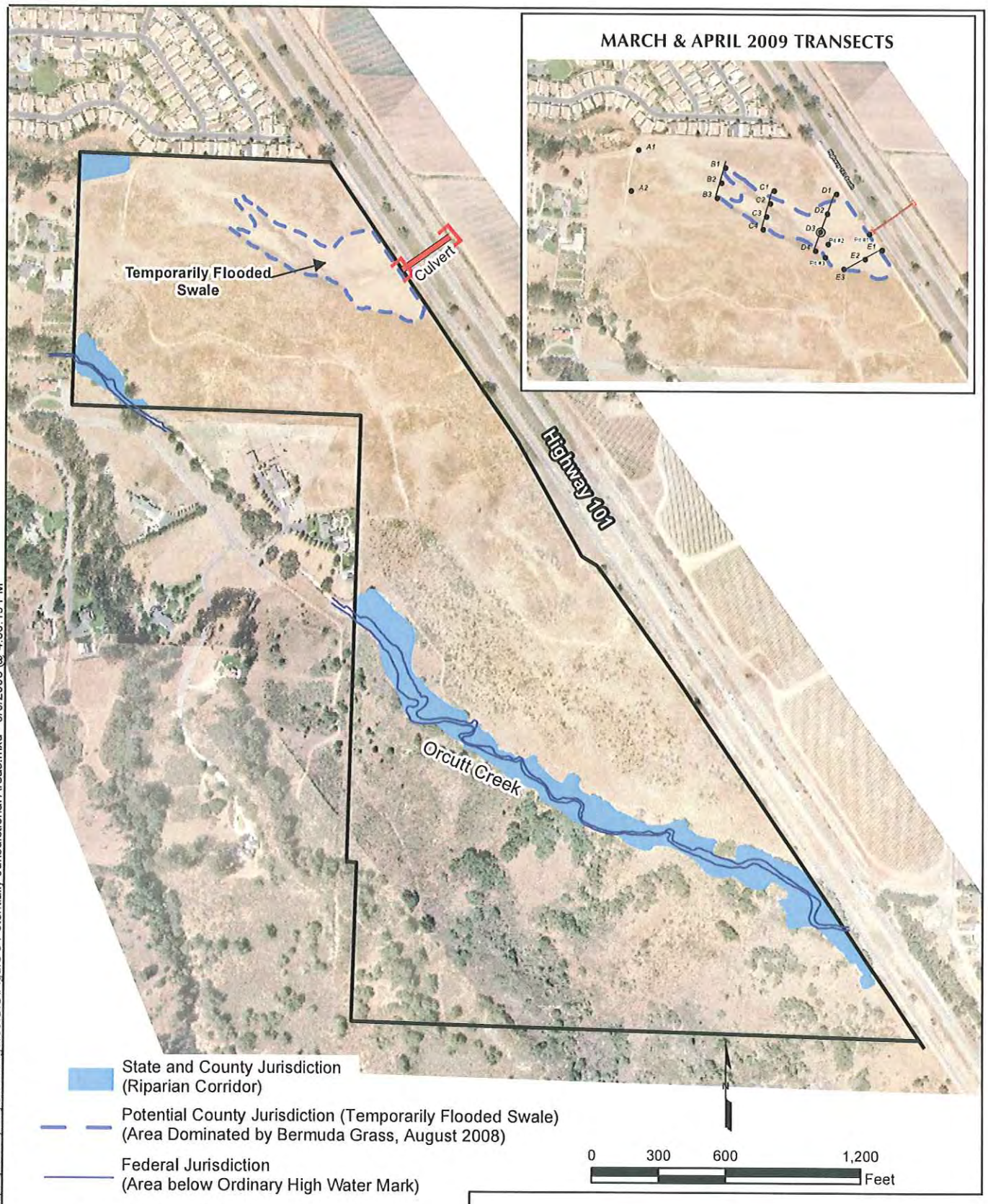
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Historic Aerial Photographs

SB Clark / Key Site 3

LFR

Figure 4



H:\Client Files\S-U\SB Clark (KeySite-3)\KeySite 3\Figures\GIS\Figure 5 Potentially Jurisdictional Areas.mxd - 9/9/2008 @ 4:30:19 PM

Potentially Jurisdictional Areas

SB Clark / Key Site 3

LFR

Figure 5

Appendices

Appendix A



A view of the field on top of the mesa at the Key Site-3 property in the location of the seasonal swale.

View looking southwest

4/22/2009

Photo # 504

LFR Inc.



A view of the field on top of the mesa at the Key Site-3 property in the location of the seasonal swale.

View looking southeast

4/22/2009

Photo # 484

LFR Inc.



Soil observation pit #B2. Note the lack of layers in the soil profile. The ground was extremely hard and an iron bar was needed to excavate the soil pits. The top of the sharp-shooter shovel blade shown in this photograph is 16-inches from the bottom of the pit.

4/22/2009

Photo # 594

LFR Inc.



Soil observation pit #D1 showing the lack of distinctive layers in the soil profile. Soil texture and color was very similar at all 16 of the observation pits.

4/22/2009

Photo # 596

LFR Inc.



A close up of the soil profile in the upper 10-inches at pit #D3. Redoximorphic concentrations (faint mottles of oxidized iron) indicated possible soil saturation at this soil pit location.

4/22/2009

Photo # 600

LFR Inc.



The soil observation pit at the E1 location. Some evidence of soil saturation was found at this pit location. Note the lack of obvious layers in the soil profile.

4/22/2009

Photo # 608

LFR Inc.



This section of soil from observation pit #E1 contained a vague lens or layer of organic matter and very small faint mottles indicating potential soil saturation at some time.

4/22/2009

Photo # 611

LFR Inc.



A closer look at the same section of soil from pit #E1. The lens of organic material can be seen in the lower half of the section and some faint mottling in the upper half can also be found. The features were not distinct enough to qualify as a primary hydric soils indicator in accordance with the Corps Regional Supplement for the Arid West Region.

4/22/2009

Photo # 609

LFR Inc.



This photograph shows the meter square with grid used to estimate total percent cover of vegetation within the plots. Vegetation coverage estimates were taken within a 5-foot radius around the soil pit location.

4/22/2009

Photo # 504

LFR Inc.



Bermuda grass, a C4 plant with most active growth in warm weather, is visible emerging between the dried annual grasses.

4/22/2009

Photo # 532

LFR Inc.

Appendix B

water capacity is 6.0 to 7.5 inches in the 60 inches of rooting depth.

This Elder soil is used mainly for range. A few small areas are used for dryland hay, grain, and beans. Capability unit IIIe-1(15); Loamy range site.

Elder sandy loam, 9 to 15 percent slopes, eroded (EdD2).--This soil occupies narrow valleys and alluvial fans and is subject to overflow by runoff from surrounding hills during heavy rains. This soil has a profile similar to the one described as representative for the series except that it is stratified with layers of loamy fine sand and coarse sandy loam.

Botella, Corralitos, and shaly Elder soils are included in mapping.

Permeability is moderately rapid. Surface runoff is medium, and the erosion hazard is moderate. Fertility is low. The available water capacity is 6.0 to 7.5 inches in the 60 inches of rooting depth.

This soil is used for range and for dryland grain. Capability unit IVe-1(15); Loamy range site.

Elder loam, 0 to 2 percent slopes (EmA).--This nearly level soil occurs on flood plains that are not subject to overflow. It has a profile similar to the one described as representative for the series except that this soil is loam throughout the profile.

Included in mapping are small areas of Botella and Corralitos soils. Some eroded areas and areas of Elder shaly loam are also included.

Permeability is moderate. Surface runoff is very slow, and the erosion hazard is none to slight. Fertility is high. The available water capacity is 9 to 11 inches in the 60 inches of rooting depth.

This soil is used for both irrigated and dryland crops. Capability unit I-1(14).

Elder loam, 2 to 9 percent slopes (EmC).-- This soil occurs on alluvial fans. It is subject to slight runoff from adjacent hills. The profile is similar to the one described as representative for the series except that this soil is loam throughout the profile.

Included in mapping are small areas of Botella and Corralitos soils. Areas of Elder shaly loam and of eroded Elder soils are also included.

Permeability is moderate. Surface runoff is slow to medium, and the erosion hazard is slight to moderate. Fertility is high. The available water capacity is 9.0 to 11.0 inches in the 60 inches of rooting depth.

This soil is used for irrigated and dryland crops and for range. Capability unit IIe-1(14) and IIe-1 (15); Loamy range site.

Elder shaly loam, 0 to 2 percent slopes, eroded (EnA2).--This soil is nearly level and is subject to overflow from higher surrounding areas. It has a profile similar to the one described as representative for the series except that it is loam throughout and 15 to 35 percent of the profile is shale fragments. Shallow, meandering gullies are common. During flooding, fresh deposits of alluvium are laid down and removed. This deposition and erosion damages crops.

Included in mapping are Botella and Corralitos soils. Also included are small areas of nonshaly Elder soils and of Elder soils in which 35 to 50 percent of the entire profile is shale fragments.

Permeability is moderate. Surface runoff is very slow. Fertility is moderate. The available water capacity is 7.0 to 9.0 inches in the 60 inches of rooting depth.

This soil is used for irrigated and dryland crops and for range. Capability units IIe-1(14) and IIe-1 (15); Loamy range site.

Elder shaly loam, 2 to 9 percent slopes, eroded (EnC2).--This soil occurs on long narrow valleys and flood plains that are subject to overflow by runoff from higher areas. The profile is similar to the one described as representative for the series except that this soil is loam throughout and 15 to 35 percent of the entire profile is shale fragments. Most areas have long, deep gullies.

Included in mapping are areas of Botella soils and areas in which 35 to 50 percent of the soil profile is shale fragments.

This soil is moderately permeable. Surface runoff is slow to medium, and the erosion hazard is slight to moderate. Fertility is moderate. The available water capacity is 7.0 to 9.0 inches in the 60 inches of rooting depth.

This Elder soil is used for range and for dryland beans, hay, and grain. Capability unit IIe-1(15); Loamy range site.

Elder shaly loam, 9 to 15 percent slopes, eroded (EnD2).--This soil occurs in small, irregularly shaped areas along minor drainage channels. The profile is similar to the one described as representative for the series except that this soil is stratified loam and sandy loam throughout and is 20 to 40 percent shale fragments. Deep gullies or deeply entrenched drainageways are common.

Included in mapping are small areas of Botella soils. Also included are areas of Elder soils in which 40 to 60 percent of the entire soil profile is shale fragments.

Permeability is moderate. Surface runoff is medium, and the erosion hazard is moderate. Fertility is moderate. The available water capacity is 6.5 to 8.5 inches in the 60 inches of rooting depth.

This soil is used mainly for range. Small areas are used for dryland grain or sudangrass. Capability unit IIIe-1(15); Loamy range site.

KS-3

Garey Series

The Garey series consists of well-drained sandy loams that developed on wind-modified terraces that have been dissected by deep drainageways. These soils are south of the Santa Maria Valley. Slopes

are 0 to 30 percent. The vegetation consists of annual grasses, forbs, and scattered California sagebrush. Elevations range from 300 to 1,000 feet. The average annual rainfall is 12 to 18 inches, the average annual air temperature is about 57° F., and the frost-free season is 250 to 300 days. Garey soils are associated with Marina and Oceano soils.

In a representative profile, the Garey soils have brown and light-brown sandy loam surface and subsurface layers about 27 inches thick. The subsoil is light-brown and pinkish-gray sandy loam and loamy sand and has weakly brittle bands about 1/2 inch thick. At a depth of about 70 inches is very pale brown sand (pl. III, top).

Garey soils are used for shallow-rooted irrigated and dryland crops and for range.

Representative profile of the Garey series (approximately 3.8 miles east of Orcutt, 1 1/4 miles east of Clark Avenue and Telephone Road intersection, 820 feet north on ranch road, then 20 feet west in field; SW1/4 SW1/4 sec. 9, T. 9 N., R. 33 W.):

Ap1--0 to 4 inches, brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) when moist; weak, fine, subangular blocky and weak, medium, granular structure; slightly hard, very friable, nonsticky and slightly plastic; many very fine roots; many very fine interstitial pores; medium acid (pH 5.9); clear, smooth boundary.

Ap2--4 to 8 inches, brown (10YR 5/3) sandy loam, dark brown (7.5YR 4/3) when moist; slightly finer than Ap1 horizon; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots and many very fine roots in joints; many very fine interstitial pores, very few fine and medium tubular pores; strongly acid (pH 5.5); clear, wavy boundary.

A1--8 to 16 inches, brown (10YR 5/3) sandy loam, dark brown (7.5YR 3/3) when moist; weak, fine, and medium, subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; very few very fine roots and common very fine roots in joints; very few medium and coarse woody roots; many very fine interstitial pores and common fine and very few medium tubular pores; medium acid (pH 5.6); gradual, smooth boundary.

A3--16 to 27 inches, light-brown (7.5YR 6/3) sandy loam, dark brown (7.5YR 3/3) when moist; slightly more clay than in Ap1, Ap2, and A1 horizons; massive; hard, friable, slightly sticky and slightly plastic; very few very fine roots, mostly in joints; many very fine interstitial pores and common fine and very few medium tubular pores; few thin clay films as bridges and in pores; slightly acid (pH 6.2); gradual, wavy boundary.

B21--27 to 36 inches, light-brown (7.5YR 6/3) heavy sandy loam, dark brown (7.5YR 3/3) when moist; massive; hard to very hard, firm, slightly sticky and slightly plastic; very few very fine roots; many very fine interstitial pores, common fine and very fine pores, and very few medium tubular pores; common thin clay films as bridges and in pores; few weakly cemented nodules; indistinct bands, 1/2 inch thick, that are dark reddish brown (5YR 3/3m) and slightly brittle; slightly acid (pH 6.5); gradual, smooth boundary.

B22--36 to 47 inches, light-brown (7.5YR 6/4) sandy loam, reddish brown (5YR 4/4) when moist; massive; hard to very hard, soil mass friable, bands firm, slightly sticky and slightly plastic; very few very fine roots; many very fine interstitial pores and common very fine and very few medium tubular pores; common thin clay films as bridges and in pores; several indistinct, discontinuous, firm, dark reddish-brown (5YR 3/2, 3/3m) bands that are weakly brittle; neutral (pH 6.8); clear, wavy boundary.

B31--47 to 58 inches, pinkish-gray (7.5YR 7/2) loamy sand, dark brown (7.5YR 4/3) when moist; massive; slightly hard, very friable, nonsticky and nonplastic, bands are very hard, dry, and firm when moist; very few very fine roots; many very fine interstitial pores, very few very fine tubular pores in bands only; distinct continuous bands about 1/2 inch thick, reddish brown (5YR 5/3d) and dark reddish brown (5YR 3/3) when moist; slightly acid (pH 6.3); clear, wavy boundary.

B32--58 to 70 inches, pinkish-gray (7.5YR 7/3) loamy sand, brown (7.5YR 5/4) when moist; massive; slightly hard, very friable, nonsticky and nonplastic; no roots; many very fine interstitial pores; no clay films except thin, weak bridges in bands; bands are 1/4 to 1/2 inch thick, continuous and wavy, thinner at bottom, similar to those in B31 horizon; neutral (pH 7.0); clear, wavy boundary.

C--70 to 83 inches, very pale brown (10YR 7/3) sand, brown (7.5YR 5/4) when moist; massive; soft, very friable, nonsticky and nonplastic; no roots; many very fine interstitial pores; weak bands 1/4 to 1/2 inch thick, 5 to 7 inches apart, continuous and wavy, reddish brown (5YR 4/3d); a few pendants of bands 1 to 1 1/2 inches long; neutral (pH 7.3), bands have same reaction.

The texture of the A horizon ranges from sandy loam to loam, and the depth to the B21 horizon ranges from 8 to 30 inches. Color of the A horizon ranges from light yellowish brown to brown. The B horizons are harder at the edge of the mesalike areas but the hardness is variable within mapping delineations. Most of the long swales are cut by shallow gullies.

Garey sandy loam, 0 to 2 percent slopes, eroded (GaA2).--This soil is nearly level and occurs on terraces that are partly dissected by deep drainageways. Shallow gullies are common in draws, and deep gullies are common near the edge of terraces. Depth to the indistinct bands is 26 to 30 inches.

Permeability is slow. Surface runoff is medium to rapid, and the erosion hazard is moderate to high. Fertility is moderate. The available water capacity is 4.0 to 5.0 inches in the 24 to 30 inches of rooting depth.

This Los Osos soil is used for range and, in some areas, for dryland hay. Capability unit IVe-3(15); Clayey range site.

Los Osos clay loam, 30 to 75 percent slopes (LoG).--This soil occurs in the hills and mountains. Depth to rock ranges from 20 to 40 inches.

Included in mapping are areas of Arnold, Tangair, and San Benito soils. Landslides and small eroded areas are also included.

Permeability is slow. Surface runoff is rapid to very rapid, and the erosion hazard is high to very high. Fertility is moderate. The available water capacity is 3 to 7 inches in the 20- to 40-inch root zone.

This soil is used for range, wildlife habitat, and watershed. Capability unit VIIe-1(15); Clayey range site.

Los Osos-San Benito clay loams, 15 to 30 percent slopes (LsE).--The moderately steep soils that make up this complex occur in the hills. Nearly 70 percent of the mapping unit is Los Osos clay loam, and nearly 30 percent is San Benito clay loam. These soils are in such intricate patterns that mapping them separately was impractical. Included in mapping are small areas of Diablo, Lodo, and Gaviota soils.

Each of the major soils has a profile similar to the one described as representative for its series. Both soils have medium to rapid runoff and are moderately to highly susceptible to erosion. Their fertility is moderate.

The Los Osos soil is slowly permeable. Its available water capacity is 3 to 7 inches in the 20 to 40 inches of rooting depth.

In the San Benito soil, permeability is moderately slow. The available water capacity is 6 to 8 inches in the 36 to 48 inches of rooting depth.

These soils are used chiefly for range. Small areas are used for dryfarmed grain and hay. Capability unit IVe-3(15); Clayey range site.

Los Osos-San Benito clay loams, 30 to 45 percent slopes (LsF).--These steep soils are in the hills. Nearly 70 percent of the mapping unit is Los Osos clay loam, and nearly 30 percent is San Benito clay loam. Small areas of Landslides and of Diablo and Gaviota soils are included in mapping.

Each of the major soils has a profile similar to the one described as representative for its series. On both soils, surface runoff is rapid, and the hazard of erosion is high. Their fertility is moderate.

Permeability in the Los Osos soil is slow. The available water capacity is 3 to 6 inches in the 20 to 36 inches of rooting depth.

In the San Benito soil, permeability is moderately slow. The available water capacity is 5 to 7 inches in the 34 to 40 inches of rooting depth.

The soils of this complex are used for range, for wildlife, and as watershed. Capability unit VIe-3(15); Clayey range site.

Los Osos-San Benito clay loams, 30 to 75 percent slopes, severely eroded (LsG3).--These soils are steep to very steep. Los Osos clay loam makes up nearly 70 percent of the mapping unit, and San Benito clay loam, nearly 30 percent. In most places the soils are covered with brush and scattered patches of grass. Included in mapping are small areas of deeper, less eroded soils and of Landslides.

Severe erosion is evident, but in other respects each of the major soils has a profile similar to the one described as representative for its series. Surface runoff on both soils is very rapid, and the erosion hazard is very high. Fertility is moderate.

Los Osos clay loam has slow permeability. The available water capacity is 3 to 4 inches in the 20 to 25 inches of rooting depth.

San Benito clay loam has moderately slow permeability. The available water capacity is 4 to 5 inches in the 20 to 25 inches of rooting depth.

These soils are used for range, for wildlife habitat, and as watershed. Capability unit VIIe-1 (15); Clayey range site.

Marina Series

The Marina series consists of somewhat excessively drained sandy soils that are underlain by wind-deposited sand. These soils are on mesalike areas within 20 miles of the coast. In some places the mesalike areas are broken by deeply entrenched drainageways. Slopes are 0 to 30 percent. The vegetation is sparse annual grasses, forbs, brush, and scrubby live oak. Elevations range from 100 to 600 feet. The average annual rainfall is 14 to 22 inches, the average annual air temperature is about 57° F., and the frost-free season is 300 to 320 days. Marina soils are associated with Oceano soils.

In a representative profile, the surface layer is grayish-brown and brown sand and light loamy sand about 27 inches thick. The subsoil, about 23 inches thick, is light-brown loamy sand and contains thin clay bands. The substratum is light-brown and pink sand extending to a depth of 60 inches and deeper.

Marina soils are used for a variety of irrigated crops, such as strawberries and alfalfa, and for range.

Representative profile of the Marina series (about 7 miles southeast of Santa Maria, NW1/4 of SW1/4 sec. 7, T. 9 N., R. 33 W.):

Ap1--0 to 7 inches, grayish-brown (10YR 5/2) sand, dark brown (10YR 4/3) when moist; weak, fine and medium, granular structure; soft, very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine interstitial pores and few fine tubular pores; slightly acid (pH 6.5) (low acidity may be

Appendix C

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site Keysite 3, Orcutt CA.	Date 8-27-08
Applicant / Owner SB- Clark	County Santa Barbara
Investigator Mitch Siemens	State CA
Do Normal Circumstances exist on the site? (YES) NO	Community ID Annual Grassland
Is the site significantly disturbed (Atypical Situation)? YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES (NO)	Plot ID pit #1

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Cynodon dactylon	H	FAC	9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100 %

Remarks Polypogon monspeliensis (rabbit foot grass; FACW+) and Rumex crispus (curly dock; FACW-) also present within 10-feet of test pit but not dominant.

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

FIELD OBSERVATIONS		
Depth of Surface Water	none	(in)
Depth to Free Water in Pit	none	(in)
Depth to Saturated Soil	none	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits seen on aerial
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- none ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Gasey Sandy Loam 2-9% | Drainage Class: Well drained

Taxonomy (Subgroup) Typic Xerochrept | Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
5"	A	10YR 6/3	—	—	Fine Sand
12"	E	10YR 3/4	—	—	Sandy Loam
16"	B	7.5YR 3/3	—	—	Sand

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor — none
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

Very thin clay-like layers observed at ≈ 12".
Field observations generally confirm mapped soil type.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site	Keysite 3, Orcutt CA	Date	8-27-08
Applicant / Owner	SB - Clark	County	Santa Barbara
Investigator	Mitch Siemens	State	CA
Do Normal Circumstances exist on the site?	(YES) NO	Community ID	Annual Grassland
Is the site significantly disturbed (Atypical Situation)?	YES NO	Transect ID	
Is the area a potential Problem Area? (If needed, explain on reverse)	YES NO	Plot ID	Pit #2

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Cynodon dactylon	H	FAC	9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 100%

Remarks: Cynodon dactylon is the only dominant species in the vicinity of Pit #2.

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

FIELD OBSERVATIONS		
Depth of Surface Water	none	(in)
Depth to Free Water in Pit	none	(in)
Depth to Saturated Soil	none	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☒ Sediment Deposits Seen on aerial
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Garey Sandy Loam 2-9% | Drainage Class: Well drained

Taxonomy (Subgroup) Typic Xerochrept | Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-18"	A	7.5 YR 3/2	—	—	Silt Loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

0-4" made up of Cyn dactylon root masses
Soil appears to be homogeneous to bottom of test pit (18-inches).
Field observations generally confirm mapped soil type.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(YES) NO	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	(YES) NO	
Hydric Soils Present?	YES (NO)	

Remarks

DATA FORM

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site Keysite 3, Orcutt CA.	Date 8-27-08
Applicant / Owner SB - Clark	County Santa Barbara
Investigator Mitch Siemens	State CA
Do Normal Circumstances exist on the site? (YES) NO	Community ID Annual Grassland
Is the site significantly disturbed (Atypical Situation)? YES (NO)	Transect ID
Is the area a potential Problem Area? (If needed, explain on reverse) YES (NO)	Plot ID Pit #3

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1 Deinandra increscens	H	UPL	9		
2			10		
3			11		
4			12		
5			13		
6			14		
7			15		
8			16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-) 0%

Remarks: Deinandra increscens and dead annual weedy species are ALL that occur within 10-foot radius around Pit.

HYDROLOGY

☐ Recorded Data (Describe in Remarks)
- ☐ Stream, Lake, or Tide Gauge
- ☒ Aerial Photographs
- ☐ Other

☐ No Recorded Data Available

FIELD OBSERVATIONS		
Depth of Surface Water	none	(in)
Depth to Free Water in Pit	none	(in)
Depth to Saturated Soil	none	(in)

WETLAND HYDROLOGY INDICATORS

Primary Indicators:
- ☐ Inundated none
- ☐ Saturated in Upper 12 Inches
- ☐ Water Marks
- ☐ Drift Lines
- ☐ Sediment Deposits
- ☐ Drainage Patterns in Wetlands

Secondary Indicators (2 or more Required):
- ☐ Oxidized Root Channels in Upper 12 Inches
- ☐ Water-Stained Leaves
- ☐ Local Soil Survey Data
- ☐ FAC-Neutral Test none
- ☐ Other (Explain in Remarks)

SOILS

Map Unit Name (Series and Phase): Ganey Sandy Loam 2-9% | Drainage Class: Well drained

Taxonomy (Subgroup) Typic Xerochrept | Field Observations Confirm Mapped Type? (YES) NO

PROFILE DESCRIPTION

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-18"	A	7.5YR 3/3	—	—	silt loam

HYDRIC SOIL INDICATORS:

- ☐ Histosol
- ☐ Histic Epipedon
- ☐ Sulfidic Odor
- ☐ Aquic Moisture Regime
- ☐ Reducing Conditions
- ☐ Gleyed or Low-Chroma Colors
- ☐ Concretions
- ☐ High Organic Content in Surface Layer in Sandy Soils
- ☐ Organic Streaking in Sandy Soils
- ☐ Listed on Local Hydric Soils List
- ☐ Listed on National Hydric Soils List
- ☐ Other (Explain in Remarks)

Remarks:

Soil appears homogeneous to bottom of test pit (18") as was observed at Pit #2. Field observations generally confirm mapped soil type.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES (NO)	Is this Sampling Point Within a Wetland? YES (NO)
Wetland Hydrology Present?	YES (NO)	
Hydric Soils Present?	YES (NO)	

Remarks

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: A1
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Bromus hordeaceus	25%	Yes	FACU
2. Poa annua	20%	Yes	FACW
3. Lepidium strictum	16%	Yes	UPL
4. Cynodon dactylon	5%	no	FAC
5.			
6.			
7.			
8.			
	78% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: A1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
20"	10YR 3/3	100					Silt Loam	No visible Layers

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Extremely hard ground / Iron bar used to excavate soil observation pit.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site-3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB-Clark State: CA Sampling Point: A2
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Hordeum murinum subsp. glaucum	80%	Yes	UPL
2. Erodium moschatum	10%	No	UPL
3. Bromus hordeaceus	5%	No	FACU
4. Lolium multiflorum	5%	No	UPL
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: A2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
20"	10YR 3/3	100					silt loam	No visible layers

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ___ No X

Remarks: Extremely hard ground / Iron bar used to excavate soil observation pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: B1
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Erodium botrys	70%	Yes	UPL
2. Medicago polymorpha	10%	No	UPL
3. Lolium multiflorum	3%	No	UPL
4. Vulpia bromoides	3%	No	FACW
5. Rumex crispus	1%	No	FACW
6.			
7.			
8.			
	86% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: B1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
20"	10YR 3/3	100					silt loam	No visible layers

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Extremely hard ground / Iron bar used to excavate soil observation pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: B2
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Hordeum murinum subsp. glaucum	80%	Yes	UPL
2. Bromus hordeaceus	1%	No	FACU
3. Erodium moschatum	5%	No	UPL
4.			
5.			
6.			
7.			
8.			
	86% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: B2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16"	10YR 3/3	100	5YR 5/8	3	C	M	silt loam	≈3% very fine mottles at ≈ 6" depth
								-No obvious layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: Hard ground / Iron bar used to excavate soil observation pit / Soil observations suggest saturation at some point but maybe not of sufficient duration to develop classic hydric soil indicators listed above.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: B3
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34° 51' 44" N Long: 120° 23' 40" W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10' x 10')			
1. Vulpia myuros	50%	Yes	FACW
2. Bromus hordeaceus	35%	Yes	FACU
3. Erodium botrys	25%	Yes	UPL
4. Hordeum murinum subsp. glaucum	1%	No	UPL
5. Medicago polymorpha	1%	No	UPL
6.			
7.			
8.			
	102% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: B3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
16"	10YR 3/3	100					silt loam	No obvious layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: Very hard ground / Iron bar used to excavate soil observation pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: C1
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10' x 10')			
1. Vulpia myuros	75%	Yes	FACU
2. Erodium botrys	15%	No	UPL
3.			
4.			
5.			
6.			
7.			
8.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: C1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
20	10YR 3/3	100					silt loam	No obvious Layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: Very hard ground / difficult to excavate

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: C2
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Medicago polymorpha	90%	Yes	UPL
2. Lolium multiflorum	5%	No	UPL
3. Erodium moschatum	2%	No	UPL
4. Hordeum murinum subsp. glaucum	1%	No	UPL
5.			
6.			
7.			
8.			
	98% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: C2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
20	10YR 3/3	100					silt Loam	No Layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: observed 2-3% coverage of faint redox concentrations at 10" Level. Firm ground, difficult to excavate.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Possible indication of oxidation of Fe along root channels / Living roots?

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: C3
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34° 51' 44" N Long: 120° 23' 40" W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10' X 10')			
1. Hordeum murinum subsp. glaucum	45%	Yes	UPL
2. Lolium multiflorum	30%	Yes	UPL
3. Erodium moschatum	21%	Yes	UPL
4. Bromus diandrus	1%	No	UPL
5.			
6.			
7.			
8.			
	97% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: C3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
20	10YR 3/3	100					silt Loam	No obvious layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: Slightly easier to excavate in top 5" but very hard to excavate below that level. Uniform soil coloration throughout.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- NO ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ___ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: A few oxidized root channels appearing but not as prominent as at C2

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: C4
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Vulpia myuros	84%	Yes	FACU
2. Erodium botrys	15%	No	UPL
3. Bromus hordeaceus	1%	No	FACU
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: C4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
20	10YR 3/3	100					silt loam	No Layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Entire profile compact and very difficult to excavate

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: D1
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Erodium moschatum	40%	Yes	UPL
2. Vulpia myuros	40%	Yes	FACU
3. Bromus hordeaceus	15%	No	FACU
4. Delandra increscens subsp. increscens	1%	No	UPL
5. Hordeum murinum subsp. glaucum	1%	No	UPL
6.			
7.			
8.			
	97% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: D1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
18	10YR 3/3	100					silt loam	No visible layers

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Very hard ground / Iron bar necessary to excavate pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: D2
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'X10')			
1. Medicago polymorpha	50%	Yes	UPL
2. Cynodon dactylon	15%	No	FAC
3. Hordeum murinum subsp. glaucum	15%	No	UPL
4. Bromus hordeaceus	10%	No	FACU
5. Lepidium strictum	1%	No	UPL
6. Rumex acetosella	1%	No	FAC
7. Vulpia bromoides	5%	No	FACW
8.			
	97% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: D2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
18	10YR 3/3	100					silt loam	No visible layers

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: Very hard ground / Iron bar used to excavate soil pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: D3
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No	Is the Sampled Area within a Wetland? Yes No X
Hydric Soil Present?	Yes No X	
Wetland Hydrology Present?	Yes No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10' X 10')			
1. Cynodon dactylon	60%	Yes	FAC
2. Erodium botrys	10%	No	UPL
3. Lolium multiflorum	3%	No	UPL
4. Medicago polymorpha	2%	No	UPL
5. Bromus hordeaceus	1%	No	FACU
6.			
7.			
8.			
	76% = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: D3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
18	10 YR 3/3	100	5 YR 6/8	3	C	M	Sandy Loam	Very fine faint mottles at ≈10". No obvious Layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: More sand content in matrix at this Location / Soil observations suggest saturation at some point but may be not of sufficient duration to develop classic hydric soil indicators Listed above.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site-3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB-Clark State: CA Sampling Point: D4
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ~~X~~	No X	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Vulpia bromoides	50%	Yes	FACW
2. Erodium botrys	40%	Yes	UPL
3. Convolvulus arvensis	1%	No	UPL
4.			
5.			
6.			
7.			
8.			
	91% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ~~X~~ No X

Remarks:

SOIL

Sampling Point: D4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
18	10YR 3/3	100					silt loam	No Layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: Very hard ground / Iron bar used to excavate soil observation pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: E1
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____
Hydric Soil Present?	Yes ____	No X
Wetland Hydrology Present?	Yes ____	No X
Is the Sampled Area within a Wetland?	Yes ____	No X

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10' x 10')			
1. Cynodon dactylon	30%	Yes	FAC
2. Erodium moschatum	10%	Yes	UPL
3. Bromus hordeaceus	3%	No	FACU
4. Lolium multiflorum	2%	No	UPL
5. Hordeum murinum subsp. glaucum	1%	No	UPL
6. Erodium botrys	1%	No	UPL
7.			
8.			
	47% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species	x 1 =	
FACW species	x 2 =	
FAC species	x 3 =	
FACU species	x 4 =	
UPL species	x 5 =	
Column Totals: (A)		(B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: E1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
18	10 YR 3/3	100	5 YR 5/8	3	C	M/PL	Silt Loam	≈ 3% Faint redox concen, - No obvious Layer but a thin 1"-2" Lens of organic material present containing diffuse rust colored areas

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Very small, faint redox concentrations surrounding root channels. Vague lens of organic material in matrix. Indicators suggest soil saturation at some point but maybe not of sufficient time to develop classic hydric soil indicators listed above

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ? Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Oxidation observed along root channels / difficult to determine if roots alive or dead / very small and hard to see / hand lens utilized / Not likely to occupy a minimum of 2% of the volume of the Layer where it is found

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: E2
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA. Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: observations suggest soil saturation at some point but maybe not of sufficient duration to develop classic hydric soil indicators listed above.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Cynodon dactylon	35%	Yes	FAC
2. Bromus hordeaceus	20%	Yes	FACU
3. Hordeum murinum subsp. glaucum	5%	No	UPL
4. Lolium multiflorum	3%	No	UPL
5. Medicago polymorpha	1%	No	UPL
6. Erodium botrys	1%	No	UPL
7.			
8.			
	65% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: E2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
20	10YR 3/3	100	5YR 6/8	2	C	M	Silt Loam	≈2% very fine faint mottles in upper 10" - No obvious Layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks: Very hard ground / Iron bar used to excavate soil observation pit / Soil observation suggest saturation to some degree but maybe not of sufficient duration to develop classic hydric soil indicators listed above.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Key Site - 3 City/County: Orcutt / Santa Barbara Sampling Date: 4.22.09
Applicant/Owner: SB - Clark State: CA Sampling Point: E3
Investigator(s): M. Siemens Section, Township, Range: 18, 9N, 33W
Landform (hillslope, terrace, etc.): terrace / mesa Local relief (concave, convex, none): concave Slope (%): 2
Subregion (LRR): Mediterranean CA Lat: 34°51'44"N Long: 120°23'40"W Datum: NAD 83
Soil Map Unit Name: Garey Sandy Loam 2-9% NWI classification:
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? no Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? no (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____ No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____ No X	
Wetland Hydrology Present?	Yes ____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: ____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	____ = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 10'x10')			
1. Bromus hordeaceus	50%	Yes	FACU
2. Vulpia bromoides	6%	No	FACW
3. Hordeum murinum subsp. glaucum	5%	No	UPL
4. Lolium multiflorum	1%	No	UPL
5. Medicago polymorpha	1%	No	UPL
6. Erodium botrys	20%	~~No~~ Yes	UPL
7.			
8.			
	83% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum ____ % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:
___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: E3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
18	10 YR 3/3	100					silt loam	No Layers observed

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks: Very hard ground / Iron bar used to excavate soil observation pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix D

Water Distribution Study



Key Site 3
Orcutt, CA

Water Distribution Study

SB Clark, LLC

W.O. 16527.12

PREPARED BY:

Project Manager: Brianna Daniels, P.E.
Project Engineer: Jonathan Zukowski, E.I.T.

May 2013

Penfield & Smith

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EXECUTIVE SUMMARY

SB Clark, LLC has proposed to construct a residential development on Key Site 3 of the Orcutt Community Plan. The proposed development will consist of 125 detached single family homes, and 160 multi-family townhomes on approximately 139 acres. The subject property will obtain potable water through a connection to existing Golden State Water Company infrastructure.

A computer based hydraulic model was used to evaluate and design the proposed domestic water distribution system for the development. The proposed water system was designed to meet applicable standards, including system criteria set forth in California Code of Regulations Title 22 and Santa Barbara County Standards.

Domestic water lines will be PVC or HDPE throughout, with selected pipe sizes adequate in meeting applicable standards. The proposed water system consists of an 8-inch diameter piping system for residential service. Three connections are proposed to existing off-site infrastructure. All water lines will be located under the public right-of-way, residential streets, or contained within public utility easements traversing the property.

Domestic flows were studied under average day, maximum day, and peak hour conditions. Adequate water flow was available for both domestic and fire use while maintaining required system residual pressures. Fire flows in the hydraulic model were based on applicable buildings equipped with approved fire sprinkler systems.

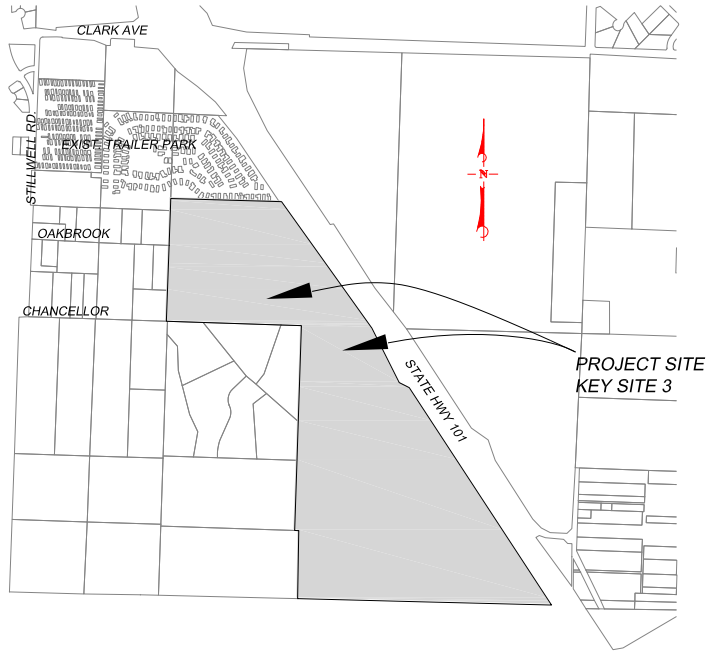
PURPOSE

This report documents the proposed water distribution system for the Key Site 3 property. The proposed water system was analyzed with a computer based hydraulic model. This model was used as a tool in designing the on-site distribution system to meet required standards. More specifically, required pipe sizes and available fire flows were determined using data extracted from the model.

BACKGROUND

Key Site 3 Project Description

Key Site 3 consists of approximately 139 acres, located in the southeastern section of the Orcutt Community Planning Area. The Key Site 3 property is bound by Highway 101 on the northeast, the Sunny Hills mobile home park on the north, ranchettes to the west, and the undeveloped Solomon Hills to the South. The following vicinity map details the project location.



Existing site topography consists of approximately 40 acres on a level northern area where elevations vary between 570 to 605-ft, approximately 42 acres in a central low lying area where elevations vary from 548 to 590-ft, and approximately 57 acres located south of the low lying area where elevations vary from 590 to 720-ft. The proposed

development will consist of 125 detached single family homes and 160 multi-family townhomes on the northern (upper) area.

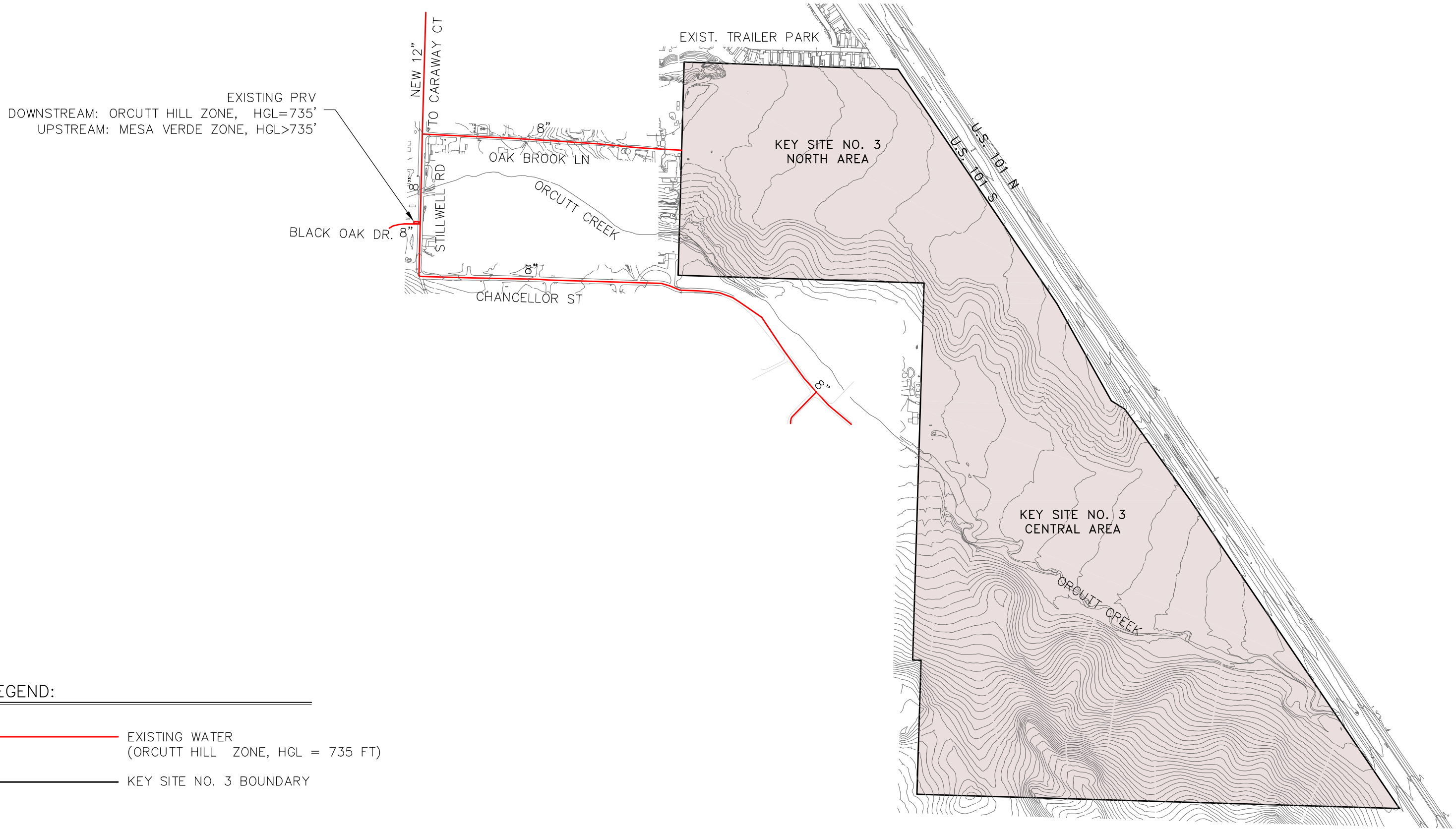
Existing Orcutt Water Facilities

Golden State Water Company (GSWC), a subsidiary of American States Water Company, provides water service in the Community of Orcutt. The water company's District Engineer was contacted to obtain information on the existing system including water atlas information, system operations, future improvements, and fire hydrant flow test data.

The Santa Maria Ground Water Basin is the current source of water supply for the Community of Orcutt. GSWC owns 16 wells, 14 of which are operational. There are eight existing pressure zones with hydraulic gradients ranging from 393-ft (Country Club Zone) to 735-ft (Orcutt Hill Zone). Wells pump directly into four of the pressure zones (Evergreen, Patterson, Orcutt, and Orcutt Hill Zones), with the remaining pressure zones created by pressure reducing stations. The 1.5 million-gallon Orcutt Hill Reservoir, located just south of Bradley Road, sets the HGL for the Orcutt Hill Zone.

A booster pump station pumps water from the Orcutt Hill Zone Reservoir into the Mesa Verde development, maintaining a system pressure for the Mesa Verde Zone of 82 psi. A pressure reducing valve connects the Mesa Verde Zone (HGL > 735') to the existing Orcutt Hill Zone (HGL = 735') near Stillwell Road and Chancellor Street. According to GSWC, the pressure relief valve is set to a pressure of 122 psi. This pressure relief valve has been included as part of the analysis of Key Site 3. The analysis confirms that the pressure relief valve does not impact operating pressures within the vicinity of Key Site 3, and serves to provide additional reliability during a fire flow event.

The GSWC water atlas indicates no existing water facilities on Key Site 3. Existing nearby facilities include an 8-inch PVC pipe along Oakbrook Lane and an 8-inch AC pipe along Chancellor Street due west of the Key Site. North of Key Site 3 a 12-inch PVC pipe runs along Stillwell Road from Caraway Court to Oakbrook Lane. Existing water facilities are shown in Figure 1 on page 4.



LEGEND:

EXISTING WATER
(ORCUTT HILL ZONE, HGL = 735 FT)

KEY SITE NO. 3 BOUNDARY

S:\ACAD\Work\16527\WATER STUDY FIGURES\Figure1_WaterStudy_KS3_ExistCond.dwg

Figure 1

Existing Conditions

Orcutt Key Site No. 3 — SB Clark, LLC

N

0 250 500

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· Construction Management ·

Proposed Key Site 3 Water Distribution System

All proposed water lines for the Key Site 3 property will be located under the public right-of-way or residential streets, or contained within public utility easements traversing the property. Proposed piping was selected based on applicable standards and the computer based hydraulic analysis.

The proposed water distribution facilities will connect to the existing system in the Orcutt Hill Pressure Zone at two locations. The first proposed connection will be near the northwest property corner and will connect to the existing 8-inch line that runs along Oakbrook Lane. The second connection will be just south of the first and will connect to the existing 8-inch line that runs along Chancellor Street. See Figure 2, page 6, for the proposed site and water distribution layout.

LEGEND

NEW 8" WATER (ONSITE)

W EXISTING WATER
(ORCUTT HILL ZONE, HGL = 735–FT)

MATCHLINE
SEE BOTTOM LEFT

EX. 12"

EX. 8"

STILLWELL RD

EX. 8"
OAK BROOK LN

CONNECT TO EXISTING
SYSTEM, LOCATION TWO

BLACK OAK DR.

CONNECT TO EXISTING
SYSTEM, LOCATION
THREE

EXIST. PRV
MESA VERDA/ORCUTT HILL ZONE

EX. 8"
CHANCELLOR ST

KS3 SMALL
SINGLE FAMILY

KS3 LARGE
SINGLE FAMILY

KS3
TOWNHOMES

PROPOSED
8", TYP.

U.S. 101 N

U.S. 101 S

KS3 SMALL
SINGLE FAMILY

PROPOSED
8", TYP.

EX. 8"

ORCUTT CREEK

CONNECT TO EXISTING
SYSTEM, LOCATION ONE

12" (OFFSITE
IMPROVEMENT PER
KS2 WATER STUDY)

CLARK AVE.

556.7

562.3

ASHBROOK

5628

JENSEN RANCH

CARAWAY

EX. 6"

EX. 12"

STILLWELL RD

5748

MATCHLINE
SEE TOP RIGHT

ONSITE IMPROVEMENT QUANTITIES:

APPROX. 11,072 LF OF 8" PVC

S:\ACAD\Work\18527\WATER STUDY FIGURES\Figure2_WaterStudy_KS3.dwg

Figure 2

Proposed Water System: On-site & Off-site Improvements

N

0 250 500

PROJECT DATA

The Key Site 3 tentative map was used to determine site-specific information, such as water user locations and elevations. Applicable standards for the proposed water distribution system were referenced. System requirements are based on California Code of Regulations Title 22, the Golden State Water Company Technical Pipeline Specifications, the Uniform Plumbing and Fire Codes, and Santa Barbara County Standards. Projected water usage for the development was determined from the Santa Barbara County Environmental Thresholds and Guidelines Manual. Pertinent information was taken from GSWC fire hydrant flow test records for modeling connections to the existing system.

System Physical Requirements

The proposed waterlines for Key Site 3 shall be constructed of polyvinyl chloride (PVC) pipe, and will conform to American Water Works Association (AWWA) C905 standards in accordance with the GSWC Technical Pipeline Specifications. Water pipe shall withstand working pressures up to 150 psi (CL235), and will be no smaller than 8-inch diameter. Hydraulic requirements are summarized in Table 1. These requirements do not apply to fire flow conditions.

Table 1
ORCUTT KEY SITE 3
DISTRIBUTION SYSTEM
PHYSICAL REQUIREMENTS (NORMAL OPERATION)

Maximum Friction Head Loss:	10 feet per 1000 lineal feet
Maximum Velocity:	5 feet per second

Although not included in the model, all necessary appurtenances such as blow off assemblies and air release and vacuum relief valves shall be incorporated in the proposed water distribution system per the Design Engineer. These types of appurtenances are only included in a hydraulic model when performing transient surge analyses of water transmission and distribution systems.

System Fire Flow Requirements

Orcutt fire flow requirements are based on Santa Barbara County Fire Department (SBCFD) Standards. SBCFD standards refer to the Uniform Fire Code fire flow requirements for other than one and two family dwellings. Uniform Fire Code fire flow requirements are based on building size, type of construction per California Building Code, and fire flow duration. A two-hour fire flow duration is required by California Code of Regulations Title 22.

Per the Uniform Fire Code Appendix B, Section B105, multi-family fire flows may be reduced by 75%, to a minimum of 1,500 GPM, when a building is equipped with an approved automatic sprinkler system. Per the National Fire Protection Agency minimum fire sprinkler discharge shall be 0.05 GPM per square foot of structure. Sprinkler systems must meet the requirements of the Uniform Building Code, Chapter 9.

Fire flow requirements per the Santa Barbara County Fire Department Standards and Uniform Fire Code are summarized in Table 2.

Table 2
ORCUTT KEY SITE 3
FIRE FLOW REQUIREMENTS

Unit Type	Fire Hydrant Flow Requirement
Single-family	1,000 GPM[1]
Multi-Family (Townhomes)	2,250 GPM[2]
Multi-Family (Townhomes) with sprinklers	1,500 GPM[3]

Notes:

1. As indicated on SBCFD Development Standard #2, the hydrant fire flow rate of 1,000 gpm is valid only for one and two-family dwellings with fire areas less than 3,600 square feet. Fire flows for all other structures shall be determined per Appendix III-A of the Uniform Fire Code.
2. As indicated on Table B105.1 of the UFC, the hydrant fire flow rate of 2,250 gpm is valid for all structures with fire areas less than 7,700 square feet (for all types of construction including Type V-B). The approximate footprint for the proposed multi-family 8-plex structure is 7,575 square feet.
3. Per Appendix B of the UFC; 1500 gpm min. with approved automatic sprinkler system.

System Pressure Requirements

Water distribution systems are most often designed to meet fire flow system pressure requirements; however, system wide requirements also exist for normal operating conditions. Key Site 3 water system pressure requirements are summarized in Table 3.

Table 3
Key Site 3 WATER SYSTEM
PRESSURE REQUIREMENTS

Maximum	80 psi[1]
Minimum Peak Hour	45 psi
Target Peak Hour	50 psi
Minimum Fire Flow	20 psi

Notes:
[1] System pressures exceeding this value will require that pressure regulators be installed ahead of building plumbing to limit pressures to not more than 80-psi, as required by the Uniform Plumbing Code.

The proposed distribution system was evaluated for user maximum day demand plus design fire flow. This means that the system must meet maximum day water demand along with required fire flows while maintaining a minimum system-wide residual pressure of 20 psi.

To provide ideal service under peak hour conditions, operating pressure should drop no lower than 50 psi at any service connection. The value of 50 psi will be a conservative goal to work towards when evaluating and designing the system.

Water Demands

For this study, projected water demands are consistent with those as put forth in the Santa Barbara County Environmental Thresholds and Guidelines Manual (SBCETG). Gross water demand per year was used to compute a daily water demand, which was assumed to be the average day water demand (ADD). Distribution of water demand in the hydraulic model was based on water service type, service location, and service elevation.

The SBCETG list values for gross water demand in acre feet per year (AFY) per unit (SBCETG Table 7). The gross demand in AFY/Unit was multiplied by 43,560 ft^2/acre, resulting in gross demand in cubic feet per year per unit. Next, the demand was multiplied by 7.48 gallons/cubic feet, resulting in gallons per year per unit. The value was then divided by 525,600 min/year, resulting in a demand in gallons per minute (GPM) per unit. Additionally, the SBCETG also lists approximate water demands in AFY/acre for landscape uses including lawns, gardens, and other vegetation (SBCETG Table 8b). These values were used to calculate additional landscape demands for the project site using the same calculation methodology as for the household unit demands. See Appendix D for detailed calculations. Calculated demands used in the model are summarized in Table 4.

Table 4
ORCUTT KEY SITE 3
CALCULATED AVERAGE DAY WATER DEMANDS

Residential Demands

Demand Type	Number of Units	Gross Unit Demand (AFY per Unit)	Demand per Unit (GPM)
Small Single Family Residential	97	0.25	0.15
Large Single Family Residential	28	0.94	0.58
Multi-Family Residential (Townhomes)	160	0.164	0.10

Landscape Demands

Demand Type	Number of Acres	Gross Unit Demand (AFY per Acre)	Gross Unit Demand (GPM per Acre)
Park Landscaping	2	2.0	1.24
Miscellaneous Landscaping	13	1.0	0.62

Demand Peaking Factors

Peaking factors used for maximum day and peak hour demand allocation are as follows[1]:

Maximum Day Demand (MDD) = **2.25** x ADD

Peak Hour Demand (PHD) = **1.5** x MDD.

[1] Per California code of Regulations Title 22 Division 4 Chapter 16 Article 2 regarding MDD and PHD multipliers for annual water consumption values.

Fire Hydrant Flow Data

Fire hydrant flow test data was used to simulate connection to the existing Orcutt Hill Pressure Zone. Hydraulic data was collected from two existing hydrants, one for the flow test and one for the pressure test. The flow test hydrant is located at the corner of Ashbrook and Brittany Streets, just west of Key Site 2 and Stillwell Road. The hydrant tested for static and residual pressure measurements is located approximately 300-ft north of the flow test hydrant. Fire hydrant flow test data is summarized below in Table 5. See Appendix A for the complete GSWC fire hydrant flow test data sheet.

Table 5
GOLDEN STATE WATER COMPANY
FIRE HYDRANT FLOW TEST DATA[1]

Fire Hydrant	Static Pressure	Residual Pressure	Measured Flowrate
Flow Test Hydrant: Ashbrook and Brittany Streets (Orcutt Hill Zone, HGL = 735-FT)	----	----	1190 gpm
Pressure Test Hydrant: 300-ft north of Ashbrook and Brittany Streets (Orcutt Hill Zone, HGL = 735-FT)	82 psi	58 psi	----

Notes:
1. GSWC fire hydrant test data per fax received on June 02, 2006. Test performed on June 01, 2006, at 4:00 pm.

HYDRAULIC MODEL CONFIGURATION

The proposed potable water distribution network was modeled using the Bentley Systems computer program WaterCAD V8i. Hydraulic model configuration is comprised of three primary components:

1. Physical system representation. The waterline alignment is in accordance with the current site plan.
2. Demand allocation. Unit demands were quantified and allocated to representative nodes in the model.
3. Existing System Hydraulics. Connection to the existing system was simulated using data from fire hydrant flow tests and knowledge of system zone hydraulic grade lines.

Physical System Representation

The proposed waterlines for Key Site 3 were located in the hydraulic model based on the current site plan layout. Existing pipelines along Stillwell Road were included to accurately model existing system conditions. Proposed and existing ground elevations over the pipe were used to set model elevations. This simplification is standard practice when modeling municipal water distribution systems. The complete hydraulic model layout is shown in Figure 3 on page 14.

Demand Allocation

Allocation of water use demands is a key component in water distribution network modeling. Within the hydraulic model, junction nodes were used to represent water demands. Nodes are model entities where system pressure is calculated, as well as points where water can leave or enter the system. Nodes were placed at strategic locations throughout the site, based upon the intersection of pipes or the accurate representation of physical demand locations.

Demands for each node were calculated using the values listed in Table 4 of the PROJECT DATA section on page 10. The total flowrate for a node is equal to the flow rate needed per household multiplied by the number of households the node represents. Similarly, for nodes representing landscaping demands, flowrate per acre was multiplied by the number of acres represented by the node. For maximum day and peak hour demands the average day demand was multiplied by the appropriate peaking factor. See Appendix B for the WaterCAD junction reports listing individual demands assigned to each node.

Existing System Hydraulics

The proposed water system for Key Site 3 will connect to the existing system at two locations. All connections will be to the Orcutt Hill Pressure Zone; one near the northwest property corner connecting to the existing 8-inch line that runs along Oakbrook Lane and one just south of the first connecting to the existing 8-inch line that runs along Chancellor Street. Hydraulic characteristics of the existing system were simulated at two model boundaries: the Stillwell Road and Clark Avenue intersection and the pressure reducing valve near the Stillwell Road and Chancellor Street intersection.

Water Model Boundary No. 1: Stillwell Road and Clark Avenue. Hydraulic characteristics at Stillwell Road and Clark Avenue were simulated using fire hydrant flow test data provided by GSWC. A three-point pump curve was generated from the hydrant flow data, representing flowrates and corresponding system pressures available at this location. A reservoir placed in the hydraulic model at this intersection simulates a water supply. The modeled pump then limits water supply into the modeled system to the

actual supply as determined by the hydrant flow tests. The pump curve used for the hydraulic simulation is summarized in Table 6 below.

Table 6
PUMP CURVE
CONNECTION TO EXISTING ORCUTT HILL ZONE
(HGL = 735-FT)

Flow Rate (gpm)	Pressure (psi)
0	82
1,190	58
2,380	0[1]

Notes:
1. This is typically outside the operating range of actual pumps. This value was used as a model approximation only.

The calculated pump curve resulted in operating pressures at this intersection ranging from 76 psi to 79 psi. According to GSWC fire hydrant test records, system static pressure near the vicinity of Stillwell Road and Clark Avenue ranges from 80 to 82 psi.

Water Model Boundary No. 2: PRV at Stillwell Road and Chancellor Street. The PRV connection from the Mesa Verde Boosted Zone to the Orcutt Hill Zone at Stillwell Road and Chancellor Street was approximated and included in the hydraulic model. The PRV pressure setting was obtained from GSWC at 122 psi, with system pressures in the Mesa Verde Boosted Zone at 82 psi.

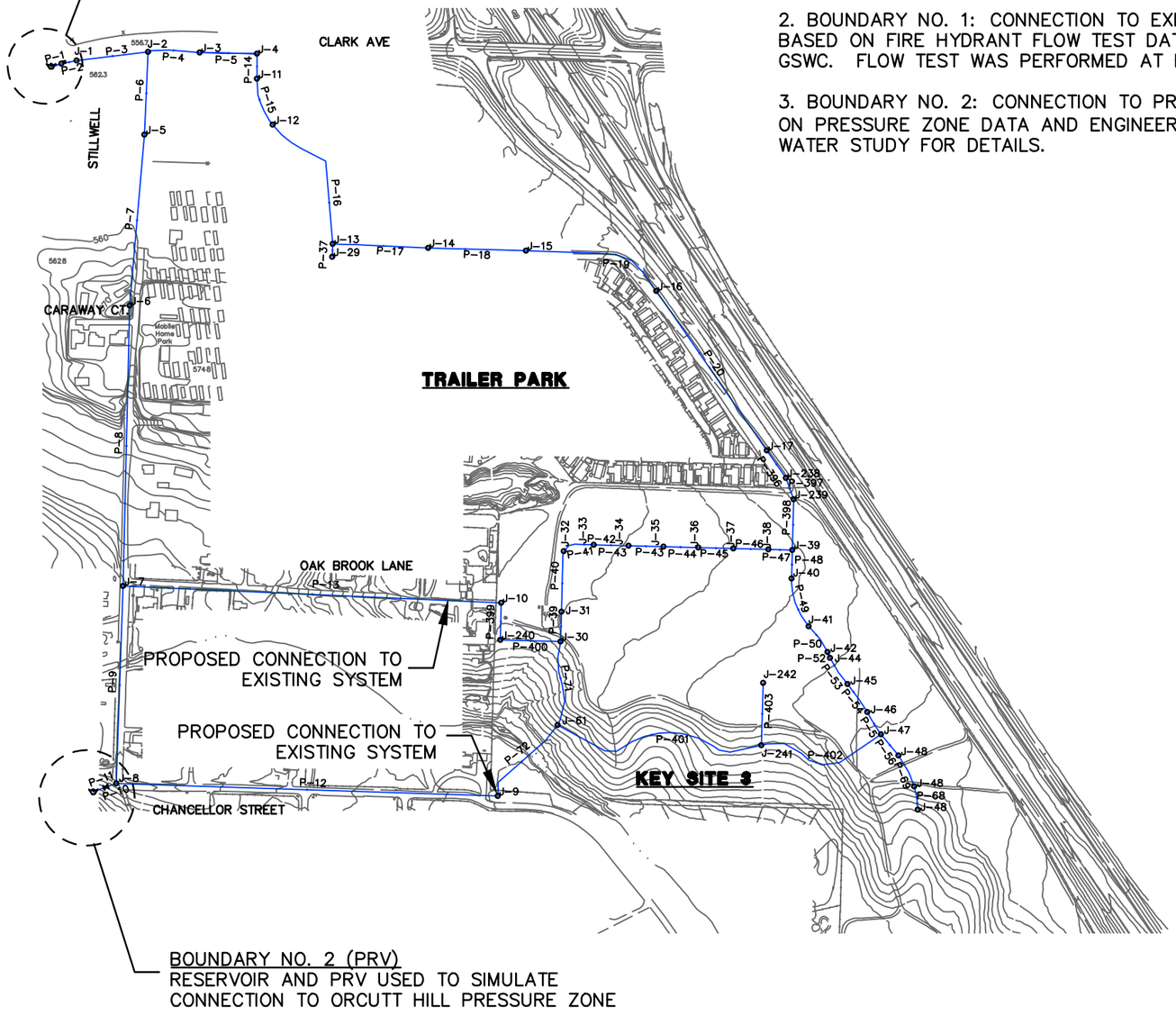
Model Computation

Pipe friction loss is calculated in the model using the Hazen-Williams formula:

$$h_L = [4.73 * L * Q^{1.852}] \div [C^{1.852} * D^{4.87}]$$

where:
- h_L = head loss due to friction (ft)
- L = pipe length (ft)
- C = Hazen-Williams C–factor
- D = pipe diameter (ft)
- Q = pipeline flow rate (CFS)

For calculation purposes, the specified pipe diameter is nominal inside diameter. Pipe lengths are rounded to the nearest whole foot. The Hazen-Williams C-factor is user specified and was set to 150 for all new PVC.



ENGINEER'S NOTES:

1. NODE ELEVATIONS FOR KEY SITE 3 BASED ON TENTATIVE MAP GRADING PLANS. NODE ELEVATIONS FOR KEY SITE 2 BASED ON EXISTING TOPOGRAPHY. NODE ELEVATIONS FOR TRAILER PARK BASED ON SBCFCD TOPO MAPS (1992–1993, SHEET 013).

2. BOUNDARY NO. 1: CONNECTION TO EXIST. PIPE. MODELING BASED ON FIRE HYDRANT FLOW TEST DATA PROVIDED BY GSWC. FLOW TEST WAS PERFORMED AT BRITTANY & ASHBROOK.

3. BOUNDARY NO. 2: CONNECTION TO PRV. MODELING BASED ON PRESSURE ZONE DATA AND ENGINEER'S CALCULATIONS. SEE WATER STUDY FOR DETAILS.

LEGEND:

P–72	WATER MODEL PIPE P–72 INDICATES PIPE LABEL
	WATER MODEL PUMP
	WATER MODEL RESERVOIR
	WATER MODEL TANK
J–4	WATER MODEL JUNCTION NODE J–4 INDICATES NODE LABEL
	WATER MODEL PRESSURE REDUCING VALVE
	WATER MODEL CHECK VALVE

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Figure 3

Hydraulic Water Model Layout

Orcutt Key Site No. 3 — SB Clark, LLC

0 250 500

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RESULTS

System Physical Requirements

System physical requirements were met within the hydraulic model using all 8-inch pipe, as shown in Figures 2 and 3. Velocity and head loss gradients calculated in the hydraulic model are summarized in Table 7. This table shows only the highest values for velocity and head loss, representing the worst case scenario. Refer to Appendix B for the complete WaterCAD pipe reports.

Table 7
PIPE REPORT: WORST CASE
VELOCITY & HEAD LOSS

	Head Loss [ft per 1000 ft]		Velocity [ft/sec]	
Condition	**Actual**	**Allowed**	**Actual**	**Allowed**
Peak Hour	0.17 (Pipe 7[1])	10	0.71 (Pipes 398, 397, 396)	5

Notes:
[1] Modeled existing AC line in Stillwell.

System Fire Flow Requirements

Fire flow requirements of 1,000 GPM for detached single-family units and 1,500 GPM for multi-family units were met within the hydraulic model using the proposed piping selection. Available system fire flows calculated using the hydraulic model are summarized in Table 8 on the following page. Actual available fire flows may be restricted by type and size of fire hydrants installed, as well as existing system limitations not addressed in the hydraulic model. Refer to Appendix C for the complete WaterCAD Fire Flow Reports.

For the fire flow analysis, it was assumed Key Site 3 multi-family townhomes would be equipped with an approved automatic sprinkler system. The fire flow analysis was performed in the hydraulic model by simulating the required fire flow at each water demand point throughout the model. This insures that fire flows can be met across the site.

Table 8
KEY SITE 3 - AVAILABLE FIRE FLOW RESULTS

Housing Type / Location	Minimum Available Fire Flow [gpm]	Calculated Residual Pressure [psi]	Minimum System Pressure [psi]
Small Single Family (North Area)	1,350	22-39	24
Multi-Family Townhomes (North Area)	1,500	39-42	34
Large Single Family (North Area)	1,250	28-47	32
Connection to Exist. System at Oak Brook Lane	2,000	45	38
The following are calculated fire flows for the existing trailer park			
Trailer Park Entrance	2,000	52	37

System Pressure Requirements

Key Site 3 water system pressure requirements were met throughout the hydraulic model using the proposed piping selection. It is understood that pressure regulators may be required upstream of building plumbing within Key Site 3 in conformance with the Uniform Plumbing Code. See Appendix B for complete WaterCAD reports detailing calculated pressures throughout the site.

CONCLUSIONS AND RECOMMENDATIONS

Results of the Hydraulic Model Analysis lead to the following conclusions:

1. System physical requirements were met:
   a) Pipe friction head loss and velocity based on proposed pipe sizes are within acceptable limits, as summarized in Table 7.

2. System fire flow requirements were met:
   a) Fire flow requirements were met using the proposed pipeline layout and sizes as indicated in Table 8. See Figure 2 for proposed pipeline layout and sizes.

3. System pressure requirements were met:
   a) Minimum Peak Hour operating pressure of 40 psi was attained at all demand nodes.
   b) The maximum pressure criterion of 80 psi was not exceeded by any residential demand nodes within Key Site 3 at Average Day Demand.

4. To provide adequate potable water service to the proposed development, the following facilities must be provided by the developer:
   a) On-site water mains as shown on Figure 2.
   b) Off-site water mains and upgrades as shown on Figure 2.
   c) New fire hydrants as required by SBCFD review.

APPENDIX A

GSWC FIRE HYDRANT FLOW TEST DATA SHEET

GOLDEN STATE WATER COMPANY

FAX

Date: 6/2/6

Number of pages including cover sheet: 2

To:
CAESAR

Phone:

Fax:

From:
Louis Rivas
Golden State Water Company
2330 A Street, Suite A
Santa Maria, CA 93455

Phone: (805) 349-7407

Fax: (805) 349-7617

REMARKS: ☐ Urgent ☐ For your review ☐ Reply ASAP ☐ Please comment

Fire Flow

Form #804.2R

FIRE HYDRANT FLOW TEST & DATA REQUEST

District: SANTA MARIA System: ORCUTT Date: 6/1/16

Requested By:

HYDRANT INFORMATION

Hydrant No. _____ Location: Ashbrook & BRITTANY

Hydrant Make: Clow Type: WET No. of Outlets: 1-4" 1-2½"

G.W.O. No. _____ Date in Service: _____ Fire Dist: S.B. FIRE

Main Size & Type: _____ Fire Hydrant Lead Size & Type: _____

Size of Tee: _____ Gate Valve Size: _____ Valve Location: _____ (Ft. & Dir. From F.H.)

Size of Tap. Sl: _____ Tap. Valve Size: _____ Valve Location: _____ (Ft. & Dir. From F.H.)

Remarks: _____

TEST DATA

Person(s) Making Test: L. RIVAS S. MORA Test Date: 6/2/16 Test Time: 4:00 PM

Static 82 PSI Required Flow _____ GPM

Residual 58 PSI Observed Flow 1190 GPM

Pitot 50 PSI Flow @ 20 psi _____ GPM

Orifice Size: 2 ½" Butt End ___ Tube ___ (Check One)

Residual Location: 300' NORTH (Ft. & Dir. From F.H.)

Flowed Separately YES / NO Flowed with following Hydrants: No. _____

No. _____

Calculated combined Flow @ 20 PSI _____ GPM. No. _____

Plants Running: _____

MWD Connections Operating: _____

Remarks: _____

ENGINEERING DEPARTMENT RECORDS

Checked By: _____ Date: _____ Test File No. _____

APPENDIX B

WATERCAD PIPE AND JUNCTION REPORTS

FlexTable: Pipe Report (KS3 Water Model 2013_BFH.wtg)

Current Time: 0.000 hours

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)
P-2	56.00	12.0	PVC	150.0	173.99	0.00	0.076	0.49
P-5	210.00	12.0	PVC	150.0	118.41	0.01	0.037	0.34
P-5	96.00	8.0	PVC	150.0	19.93	0.00	0.010	0.13
P-49	191.00	8.0	PVC	150.0	-40.84	0.01	0.038	0.26
P-10	2.00	8.0	PVC	150.0	0.00	0.00	0.000	0.00
P-11	3.00	8.0	PVC	150.0	0.00	0.00	0.000	0.00
P-56	101.00	8.0	PVC	150.0	18.44	0.00	0.008	0.12
P-7	628.00	6.0	AC	150.0	-55.58	0.17	0.270	0.63
P-12	1,398.00	8.0	AC	140.0	25.41	0.02	0.018	0.16
P-9	724.00	8.0	PVC	150.0	25.41	0.01	0.016	0.16
P-13	1,387.00	8.0	AC	140.0	30.17	0.03	0.024	0.19
P-53	116.00	8.0	PVC	150.0	-29.11	0.00	0.021	0.19
P-3	264.00	12.0	PVC	150.0	173.99	0.02	0.076	0.49
P-52	23.00	8.0	PVC	150.0	-32.17	0.00	0.024	0.21
P-6	303.00	12.0	PVC	150.0	-55.58	0.00	0.009	0.16
P-4	192.00	12.0	PVC	150.0	-118.41	0.01	0.037	0.34
P-1	1.00	16.0	PVC	150.0	173.99	0.00	0.000	0.28
P-20	711.00	12.0	PVC	150.0	115.17	0.03	0.035	0.33
P-19	535.00	12.0	PVC	150.0	115.17	0.02	0.036	0.33
P-18	359.00	12.0	PVC	150.0	115.17	0.01	0.035	0.33
P-17	350.00	12.0	PVC	150.0	115.17	0.01	0.036	0.33
P-16	542.00	12.0	PVC	150.0	118.41	0.02	0.037	0.34
P-15	182.00	12.0	PVC	150.0	118.41	0.01	0.038	0.34
P-14	92.00	12.0	PVC	150.0	118.41	0.00	0.037	0.34
P-8	1,027.00	12.0	AC	140.0	55.58	0.01	0.010	0.16
P-48	104.00	8.0	PVC	150.0	69.37	0.01	0.100	0.44
P-402	493.00	8.0	PVC	150.0	6.35	0.00	0.001	0.04
P-401	803.00	8.0	PVC	150.0	23.99	0.01	0.014	0.15
P-400	220.00	8.0	PVC	150.0	30.17	0.00	0.021	0.19
P-399	136.00	8.0	PVC	150.0	30.17	0.00	0.022	0.19
P-398	186.00	8.0	PVC	150.0	111.93	0.05	0.243	0.71
P-397	83.00	8.0	PVC	150.0	111.93	0.02	0.243	0.71
P-396	122.00	8.0	PVC	150.0	111.93	0.03	0.243	0.71
P-69	128.00	8.0	PVC	150.0	-14.80	0.00	0.006	0.09
P-71	313.00	8.0	PVC	150.0	-4.45	0.00	0.001	0.03
P-72	354.00	8.0	PVC	150.0	25.41	0.01	0.016	0.16
P-54	125.00	8.0	PVC	150.0	-22.99	0.00	0.013	0.15
P-37	47.00	8.0	PVC	150.0	3.24	0.00	0.000	0.02
P-403	228.00	8.0	PVC	150.0	5.88	0.00	0.001	0.04
P-47	88.00	8.0	PVC	150.0	-37.28	0.00	0.031	0.24
P-46	128.00	8.0	PVC	150.0	-34.22	0.00	0.027	0.22
P-45	128.00	8.0	PVC	150.0	-31.16	0.00	0.023	0.20
P-44	128.00	8.0	PVC	150.0	-28.10	0.00	0.019	0.18
P-43	128.00	8.0	PVC	150.0	-25.04	0.00	0.015	0.16
P-42	128.00	8.0	PVC	150.0	-21.98	0.00	0.012	0.14
P-41	119.00	8.0	PVC	150.0	-18.92	0.00	0.009	0.12

FlexTable: Pipe Report (KS3 Water Model 2013_BFH.wtg)

Current Time: 0.000 hours

Label	Length (ft)	Diameter (in)	Material	Hazen-Williams C	Discharge (gpm)	Headloss (ft)	Headloss Gradient (ft/1000ft)	Velocity (ft/s)
P-40	222.00	8.0	PVC	150.0	1.68	0.00	0.000	0.01
P-39	109.00	8.0	PVC	150.0	25.72	0.00	0.016	0.16
P-50	117.00	8.0	PVC	150.0	-35.23	0.00	0.028	0.22
P-68	86.00	8.0	PVC	150.0	9.78	0.00	0.003	0.06

FlexTable: Junction Report (KS3 Water Model 2013_BFH.wtg)

Current Time: 0.000 hours

Label	Elevation (ft)	Zone	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)	Notes
J-5	553.00	ORCUTT HILL	0.00	737.54	79.84	
J-3	552.00	ORCUTT HILL	0.00	737.54	80.27	
J-30	568.20	ORCUTT HILL	0.00	737.32	73.17	small single family
J-39	585.00	ORCUTT HILL	5.27	737.33	65.91	Landscape Irrigation
J-9	525.00	ORCUTT HILL	0.00	737.33	91.86	
J-8	505.00	ORCUTT HILL	0.00	737.35	100.53	
J-10	570.00	ORCUTT HILL	0.00	737.33	72.40	
J-7	495.00	ORCUTT HILL	0.00	737.36	104.86	
J-6	568.00	ORCUTT HILL	0.00	737.37	73.28	
J-48	595.50	ORCUTT HILL	3.64	737.31	61.35	small single family
J-2	555.00	ORCUTT HILL	0.00	737.54	78.98	
J-59	597.00	ORCUTT HILL	9.78	737.31	60.70	Landscape Irrigation
J-17	596.00	ORCUTT HILL	3.24	737.43	61.19	
J-29	557.00	ORCUTT HILL	3.24	737.50	78.09	
J-16	586.00	ORCUTT HILL	0.00	737.46	65.53	
J-15	571.50	ORCUTT HILL	0.00	737.47	71.81	
J-14	560.50	ORCUTT HILL	0.00	737.49	76.57	
J-13	553.50	ORCUTT HILL	0.00	737.50	79.61	
J-12	549.00	ORCUTT HILL	0.00	737.52	81.56	
J-11	548.00	ORCUTT HILL	0.00	737.53	82.00	
J-4	548.00	ORCUTT HILL	0.00	737.53	82.00	
J-1	560.50	ORCUTT HILL	0.00	737.57	76.61	
J-41	591.00	ORCUTT HILL	5.61	737.32	63.30	small single family
J-241	584.00	ORCUTT HILL	11.76	737.31	66.33	
J-240	570.00	ORCUTT HILL	0.00	737.33	72.39	
J-239	595.00	ORCUTT HILL	0.00	737.38	61.60	
J-238	596.30	ORCUTT HILL	0.00	737.40	61.05	
J-61	537.60	ORCUTT HILL	5.88	737.32	86.41	
J-60	596.50	ORCUTT HILL	5.02	737.31	60.92	
J-46	594.00	ORCUTT HILL	3.06	737.31	62.00	small single family
J-45	593.00	ORCUTT HILL	6.12	737.31	62.44	small single family
J-47	593.00	ORCUTT HILL	7.84	737.31	62.44	small single family
J-42	593.00	ORCUTT HILL	3.06	737.31	62.44	small single family
J-242	588.00	ORCUTT HILL	5.88	737.31	64.60	
J-40	583.00	ORCUTT HILL	28.53	737.32	66.77	
J-38	591.00	ORCUTT HILL	3.06	737.33	63.31	small single family
J-37	589.00	ORCUTT HILL	3.06	737.33	64.17	small single family
J-36	587.00	ORCUTT HILL	3.06	737.33	65.04	small single family
J-35	585.00	ORCUTT HILL	3.06	737.32	65.90	small single family
J-34	583.00	ORCUTT HILL	3.06	737.32	66.77	small single family
J-33	581.00	ORCUTT HILL	3.06	737.32	67.63	small single family
J-32	580.00	ORCUTT HILL	20.60	737.32	68.06	small single family
J-31	579.00	ORCUTT HILL	24.04	737.32	68.50	small single family
J-44	592.00	ORCUTT HILL	3.06	737.31	62.87	small single family

APPENDIX C

WATERCAD FIREFLOW REPORTS

Junction FlexTable: Fire Flow (KS3 Water Model 2013_BFH.wtg)

Current Time: 0.000 hours

Label	Satisfies Fire Flow Constraints	Fire Flow (Available) (gpm)	Fire Flow (Needed) (gpm)	Flow (Total Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/Minimum Pressure (Zone)
J-3	True	2,000.00	1,500.00	1,500.00	2,000.00	56.28	37.84	J-17
J-4	True	2,000.00	1,500.00	1,500.00	2,000.00	57.83	37.66	J-17
J-11	True	2,000.00	1,500.00	1,500.00	2,000.00	57.75	37.58	J-17
J-12	True	2,000.00	1,500.00	1,500.00	2,000.00	57.17	37.43	J-17
J-13	True	2,000.00	1,500.00	1,500.00	2,000.00	54.81	36.97	J-17
J-14	True	2,000.00	1,500.00	1,500.00	2,000.00	51.53	36.67	J-17
J-15	True	2,000.00	1,500.00	1,500.00	2,000.00	46.55	36.37	J-17
J-16	True	2,000.00	1,500.00	1,500.00	2,000.00	39.97	35.91	J-17
J-29	True	2,000.00	1,500.00	1,503.24	2,003.24	52.26	36.97	J-17
J-17	True	2,000.00	1,500.00	1,503.24	2,003.24	35.29	35.56	J-238
J-5	True	2,000.00	1,500.00	1,500.00	2,000.00	55.62	38.16	J-17
J-2	True	2,000.00	1,500.00	1,500.00	2,000.00	55.16	38.00	J-17
J-1	True	2,000.00	1,500.00	1,500.00	2,000.00	52.72	38.07	J-17
J-6	True	2,000.00	1,500.00	1,500.00	2,000.00	48.13	40.63	J-59
J-7	True	2,000.00	1,500.00	1,500.00	2,000.00	81.22	40.81	J-59
J-10	True	2,000.00	1,500.00	1,500.00	2,000.00	44.80	37.55	J-59
J-8	True	2,000.00	1,500.00	1,500.00	2,000.00	80.92	42.77	J-59
J-9	True	2,000.00	1,500.00	1,500.00	2,000.00	64.87	37.62	J-59
J-39	True	2,000.00	1,500.00	1,505.27	2,005.27	39.34	34.99	J-59
J-30	True	2,000.00	1,500.00	1,500.00	2,000.00	47.15	36.55	J-59
J-47	True	2,000.00	1,500.00	1,507.84	2,007.84	31.30	29.56	J-59
J-48	True	2,000.00	1,500.00	1,503.64	2,003.64	27.96	27.32	J-59
J-59	True	2,000.00	1,500.00	1,509.78	2,009.78	22.58	24.69	J-60
J-31	True	2,000.00	1,500.00	1,524.04	2,024.04	41.54	36.38	J-59
J-32	True	2,000.00	1,500.00	1,520.60	2,020.60	39.92	36.17	J-59
J-33	True	2,000.00	1,500.00	1,503.06	2,003.06	39.19	36.08	J-59
J-34	True	2,000.00	1,500.00	1,503.06	2,003.06	38.20	35.94	J-59
J-35	True	2,000.00	1,500.00	1,503.06	2,003.06	37.40	35.78	J-59
J-36	True	2,000.00	1,500.00	1,503.06	2,003.06	36.78	35.60	J-59
J-37	True	2,000.00	1,500.00	1,503.06	2,003.06	36.35	35.40	J-59
J-38	True	2,000.00	1,500.00	1,503.06	2,003.06	36.14	35.17	J-59
J-40	True	2,000.00	1,500.00	1,528.53	2,028.53	39.12	34.14	J-59
J-41	True	2,000.00	1,500.00	1,505.61	2,005.61	34.17	32.75	J-59
J-42	True	2,000.00	1,500.00	1,503.06	2,003.06	32.61	31.96	J-59
J-44	True	2,000.00	1,500.00	1,503.06	2,003.06	32.92	31.80	J-59
J-45	True	2,000.00	1,500.00	1,506.12	2,006.12	31.96	31.03	J-59
J-46	True	2,000.00	1,500.00	1,503.06	2,003.06	31.10	30.20	J-59
J-60	True	2,000.00	1,500.00	1,505.02	2,005.02	24.69	24.48	J-59
J-61	True	2,000.00	1,500.00	1,505.88	2,005.88	60.40	36.17	J-59
J-238	True	2,000.00	1,500.00	1,500.00	2,000.00	34.84	35.71	J-239
J-239	True	2,000.00	1,500.00	1,500.00	2,000.00	35.23	35.36	J-238
J-240	True	2,000.00	1,500.00	1,500.00	2,000.00	45.28	37.20	J-59
J-241	True	2,000.00	1,500.00	1,511.76	2,011.76	35.23	32.01	J-59
J-242	True	2,000.00	1,500.00	1,505.88	2,005.88	28.48	32.01	J-59

APPENDIX D

KEY SITE 3 WATER DEMAND CALCULATIONS

Penfield & Smith

ENGINEERS, SURVEYORS, PLANNERS

BY: JTZ **DATE:** 5/16/2013 **SUBJECT** Water Demand Calculations **JOB NO:** 16527.12

CHKD. BY: **DATE:** Keysite No. 3

Directory: see footer

: indicates manually inputted data; all other values are calculated

RESIDENTIAL WATER DEMAND

Small Single Family Area Density (northern mesa)

Approximate parcel area =	356883	ft^2	From Key Site 3 map (03/2013)
	8.2	AC	
# of units =	97	units	
Area Density =	3679.21	ft^2/unit	
# of dwelling units/acre =	11.84		

Water Duty Factor

Go w/ land use designation =	9-12	DU/AC	From Table 7 of Thresholds Manual
Water duty factor =	0.25	AFY/Unit	From Table 7 of Thresholds Manual

Multi-Family Townhomes/flats Area Density (northern mesa)

Approximate parcel area =	348480	ft^2	
	8.0	AC	From Key Site 3 map (03/2013)
# of units =	160	units	
Area Density =	2178.00	ft^2/unit	
# of dwelling units/acre =	20.00	DU/AC	

Water Duty Factor

Go w/ land use designation =	13-22	DU/AC	From Table 7 of Thresholds Manual
Water duty factor =	0.164	AFY/Unit	From Table 7 of Thresholds Manual

Large Single Family Area Density

Approximate parcel area =	299013	ft^2	From Key Site 3 map (03/2013)
	6.9	AC	
# of units =	28	units	
Area Density =	10679.04	ft^2/unit	
# of dwelling units/acre =	4.08		

Water Duty Factor

Go w/ land use designation =	10-R-1		From Table 7 of Thresholds Manual
Water duty factor =	0.94	AFY/Unit	From Table 7 of Thresholds Manual

Penfield & Smith

ENGINEERS, SURVEYORS, PLANNERS

BY: JTZ **DATE:** 5/16/2013 **SUBJECT** Water Demand Calculations **JOB NO:** 16527.12

CHKD. BY: **DATE:** Keysite No. 3

Residential Water Demands Summary

Area	Area Density (DU/acre)	# Units	Duty Factor (AFY/unit)	Duty Factor (GPM/unit)	Average Day Demand (GPM)
Small Single Family	11.84	97	0.25	0.2	15.0
Multi-Family	20.00	160	0.164	0.1	16.3
Large Single Family	4.08	28	0.94	0.6	16.3
				Total	47.6

Area Density (DU/acre)	#Units	(AFY/unit)	Gross Demand (AFY)	Consumptive Use Factor	Net Consumptive Use (AFY)
11.84	97	0.25	24.3	0.7	17.0
20.00	160	0.164	26.2	0.7	18.4
4.08	28	0.94	26.3	0.7	18.4
		Total	76.8	Total	53.8

Area	(GPM/unit)	Demand[1]	Maximum Daily Demand (GPM)	Demand[2] (GPM/unit)	Peak Hour Demand (GPM)
Small Single Family	0.2	0.35	33.8	0.52	50.7
Multi-Family	0.1	0.23	36.6	0.34	54.9
Large Single Family	0.6	1.31	36.7	1.97	55.1
		Total	107.1	Total	160.7

[1] Per Title 22: Maximum Daily Demand = Average Daily Demand x 2.25

[2] Per Title 22: Peak Hour Demand = Maximum Daily Demand x 1.5

LANDSCAPE DEMANDS

Area	Number of ac.	Gross Demand (AFY/ac)	Gross Demand (GPM/ ac)	Average Day Demand (GPM)
Park Landscaping	2	2	1.24	0.62
Misc. Landscaping	13	1	0.62	0.05
			Total	0.67

Appendix E

Geology and Soils Engineering Reports

Earth Systems Pacific

4378 Old Santa Fe Road
San Luis Obispo, CA 93401-8116

(805) 544-3276 • FAX (805) 544-1786
E-mail: esp@earthsys.com

July 28, 2014

FILE NO.: SL-14813-GB

Mr. John Franklin
SB Clark, LLC
c/o Franklin Real Estate Development, LLC
3159 Eaglewood Avenue
Thousand Oaks California 91362

PROJECT: ORCUTT KEY SITE 3
SOUTH OF CLARK AVENUE, WEST OF HIGHWAY 101
ORCUTT AREA OF SANTA BARBARA COUNTY, CALIFORNIA

SUBJECT: Geologic Evaluation of the Lot 130 Gully Area

REF.:
1) Proposal for a Geologic Evaluation of the Lot 130 Gully Area, Orcutt Key Site 3, South of Clark Avenue, West of Highway 101, Orcutt Area of Santa Barbara County, California, by Earth Systems Pacific, Doc. No. 1407-036.PRP, dated July 2, 2014
2) Soils Engineering Report, Orcutt Key Site 3, South of Clark Avenue, East of Stillwell Road, Orcutt Area of Santa Barbara County, California, by Earth Systems Pacific, ESP Fie No. SL-14813-SA, Doc. No. 0602-036.SER, dated February 10, 2006

Dear Mr. Franklin:

In accordance with your authorization of the above referenced proposal, this report presents our geologic evaluation of the gully area on Lot 130 of the Orcutt Key Site 3 project. The gully is in the northwest corner of the project site as shown on the Vesting Tentative Tract Map 14,801 prepared by Penfield & Smith (copy attached). A modular residential development is present to the north; the areas to the east and south are undeveloped portions of the Orcutt Key Site 3 project. The area to west is developed with a rural residential property; the downstream portion of the gully also lies to the west.

The gully was formed as a result of natural erosional processes. At the time of our evaluation, the top of the gully was covered with a sparse growth of weeds and isolated areas of native brush and trees. Within the gully, the weed, brush, and tree growth was denser but sporadic; some areas were almost devoid of vegetation.

Topographically, the ground surface surrounding the top of the gully is relatively flat to gently sloping; however, the interior gully banks range from steeply sloping to near vertical. Information obtained from the Google Earth website (Europa Technologies 2013) indicates the top of the gully has an approximate elevation of 570 feet, and the bottom is approximately 540 feet. It also appears that an approximately 2-foot high earthen berm was previously constructed along the top of the easterly and southerly sides of the gully to reduce the potential for surface water runoff from entering the gully in an uncontrolled manner. The earthen berm channels surface water runoff into a drainage inlet and culvert on the southerly side of the gully, and into a concrete drainage swale constructed near the northeast corner of the gully.

Historical Erosion

On July 22, 2014, a site reconnaissance was performed by the undersigned to observe the existing site conditions. Additionally, the project soils engineering report (Reference 2), other technical documents, and historical aerial photographs were reviewed.

To estimate the average headward erosion rate for the gully, historical aerial photographs were reviewed and analyzed. These included stereoscopic vertical aerial photographs of the site developed by Caltrans SBd1-72 & 73 dated 1953; 05-4 1-28 & 29, dated 1972; and 05-5B-101 2B-99 & 100, dated 1996. A Google Earth website (Europa Technologies 2013) aerial photograph dated 2013 was also used in the analysis.

Stereographic interpretation of the 1953, 1972 and 1996 aerial photographs was performed using manual and digital/computer stereo-scope techniques to review the configurations of the gully banks over time, and specifically to identify the top edges of the gully bank. Once the edges of gully banks were determined and plotted on the 1953, 1972, and 1996 photographs, they were imported and geo-registered into the software program Global Mapper (ver. 15). The top of bank edge for the Google Earth 2013 air photograph (Europa Technologies 2013) was mapped in the field during the site reconnaissance. Please see the attached Air Photographs for comparison of the gully edges from 1953 to 1972, and from 1996 to 2013.

To estimate the average headward erosion of the gully, a common geologic feature within the gully was selected as a point of reference. This feature, described as "Drainage Swale 1" is shown on the attached Air Photographs. The top edge of the drainage swale was measured using the software program Global Mapper on each of the four air photographs, using Highway 101 as a second reference point. Results of the measurements indicated that from 1953 to 1972 the approximate headward erosion was 19 feet during this 19-year period, for an average erosion rate of 1 foot per year. From 1972 to 1996, approximately 16 feet of headward erosion occurred. Over this 24-year time span, the average erosion rate was 8 inches (0.67 feet) per year. From 1996 to 2013, the configuration of the gully did not change significantly, indicating that very little erosion has occurred over the last 17 years. The width of the gully, measured near the gully head, widened 15 feet from 1953 to 1972, and 5 feet from 1972 to 1996. No significant change in the gully width appears to have occurred from 1996 to 2013.

In our opinion, the reduction in the rate of erosion from 1996 to 2013 was due to improvements in surface drainage that were likely implemented in or around 1996, as they are visible in the 1996 air photograph but not in earlier photographs. These include an earthen berm, a concrete drainage swale along the northeast corner of the gully, and a drainage inlet and culvert on the south side of the gully. The drainage improvements prevent surface water runoff originating from the southeast from flowing in an uncontrolled manner over the top of the gully banks, thus reducing the erosive effects of the runoff.

Slope Stability

No evidence of gross slope instability was observed in the gully banks during the site reconnaissance, nor is there any indication of such instability in the air photographs. The gully exposes sediments of the Orcutt Sand Formation which consists of poorly cemented, indurated windblown sand deposits. These sand deposits have a low potential for gross slope instability, but do exhibit a moderate potential for shallow soil slumps when saturated. Minor sloughing of the sand in the gully bank can also occur under long-term drought conditions due to desiccation of the sand.

Conclusions

Based on our geologic evaluation of the gully, it is our opinion that the historic higher magnitude headward migration and increased width of the gully was predominately due to the erosion caused by uncontrolled surface water runoff flowing over the top of the gully banks. Since the construction of the current drainage features, no significant erosion has occurred.

There was no evidence of gross slope instability in the gully banks. There is, however, a potential for isolated, minor soil sloughing and slumps to occur due to seasonal wetting and desiccation cycles. These natural processes may lead to minor widening of some areas of the gully banks.

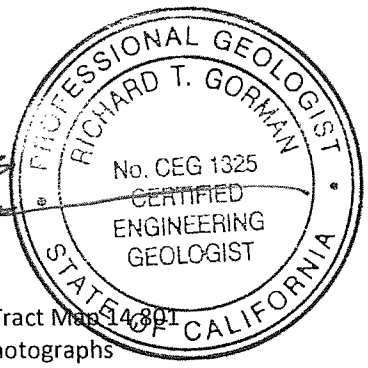
With the development of the property, the construction of additional drainage improvements will further control surface drainage; consequently, increased erosion of the gully banks is not expected to occur. The development of the site is not expected to have any significant impact upon the potential for localized minor soil sloughing and slumps.

Property line and building setbacks from the gully should be in accordance with the recommendations presented in the Santa Barbara County Grading Code (SBC), Chapter 14, Section 14-28, and the 2013 California Building Code (CBC).

If you have any questions regarding this report, or wish further discussion of any of the issues presented, please contact the undersigned at your convenience.

Sincerely,

Earth Systems Pacific



Richard T. Gorman, CEG

Attachments: Vesting Tentative Tract Map 14,801
1953 & 1972 Air Photographs
1996 & 2013 Air Photographs

Doc. No.: 1407-297.LTR/nf

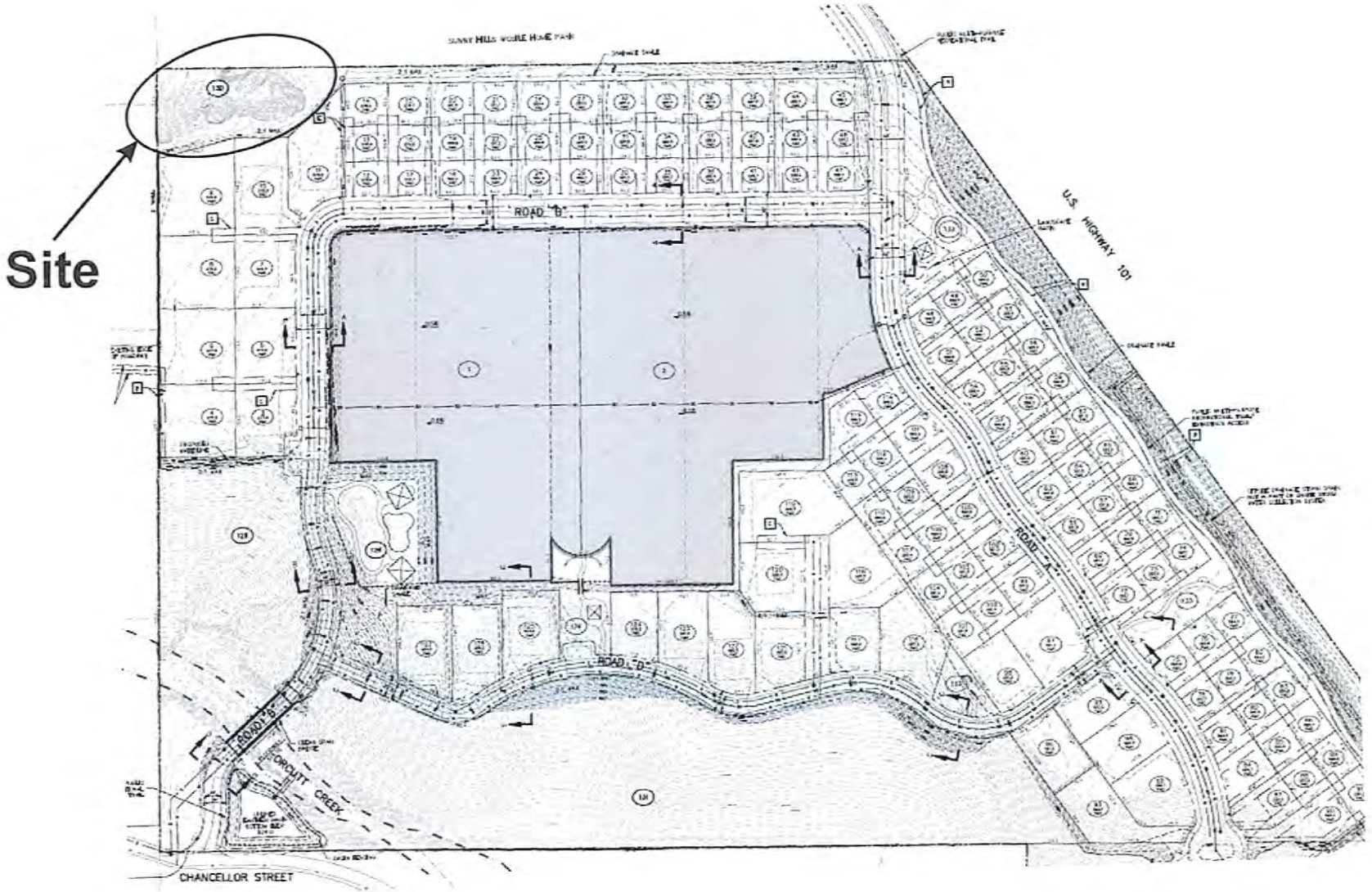
TECHNICAL REFERENCES

Europa Technologies. 2013. U.S. Department of State Geographer. *Google Earth Website.* Retrieved from: http://www.google.com/earth/index.html

SBC (Santa Barbara County Code of Ordinances). 2014 "*Chapter 14, Grading Code.*"

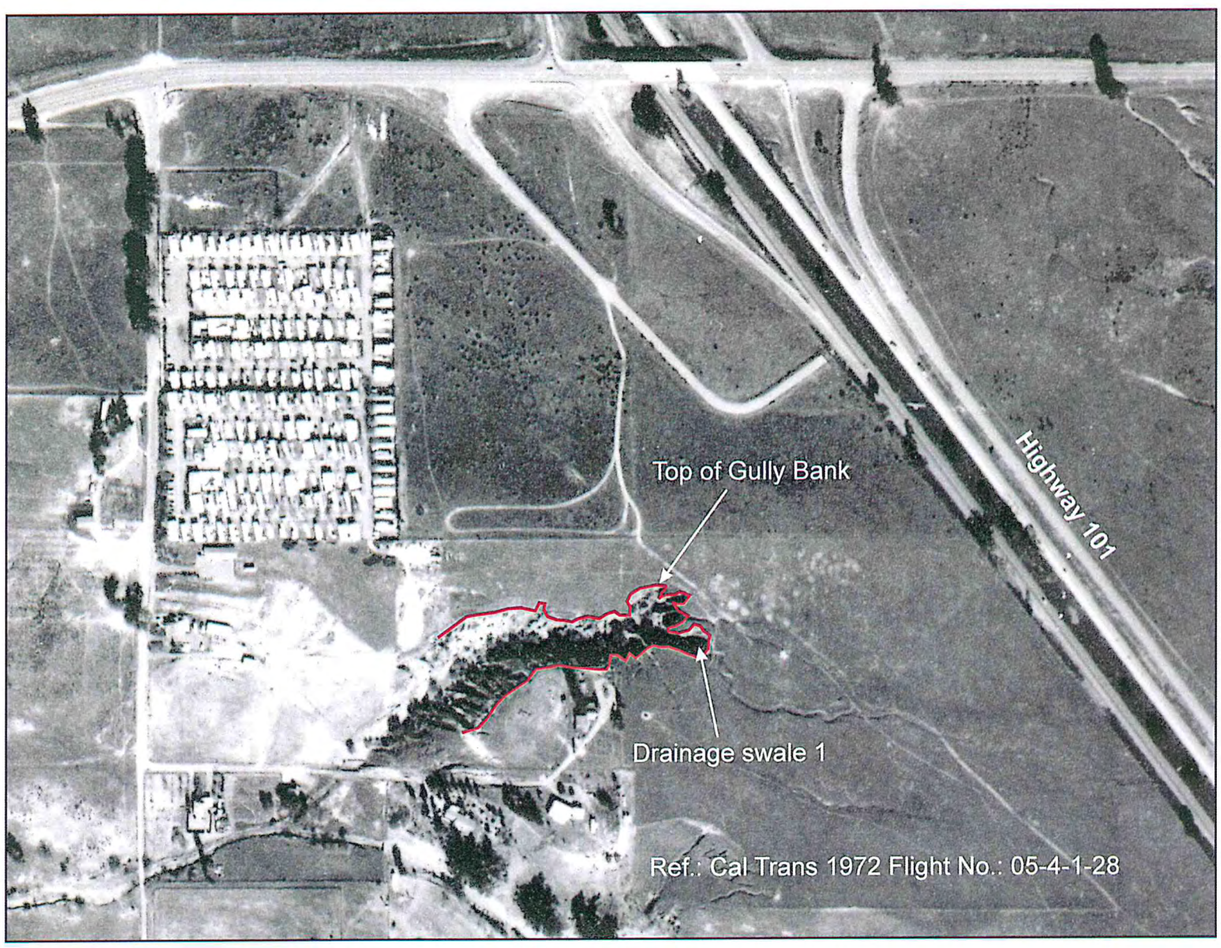
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ORCUTT KEY SITE 3
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, California



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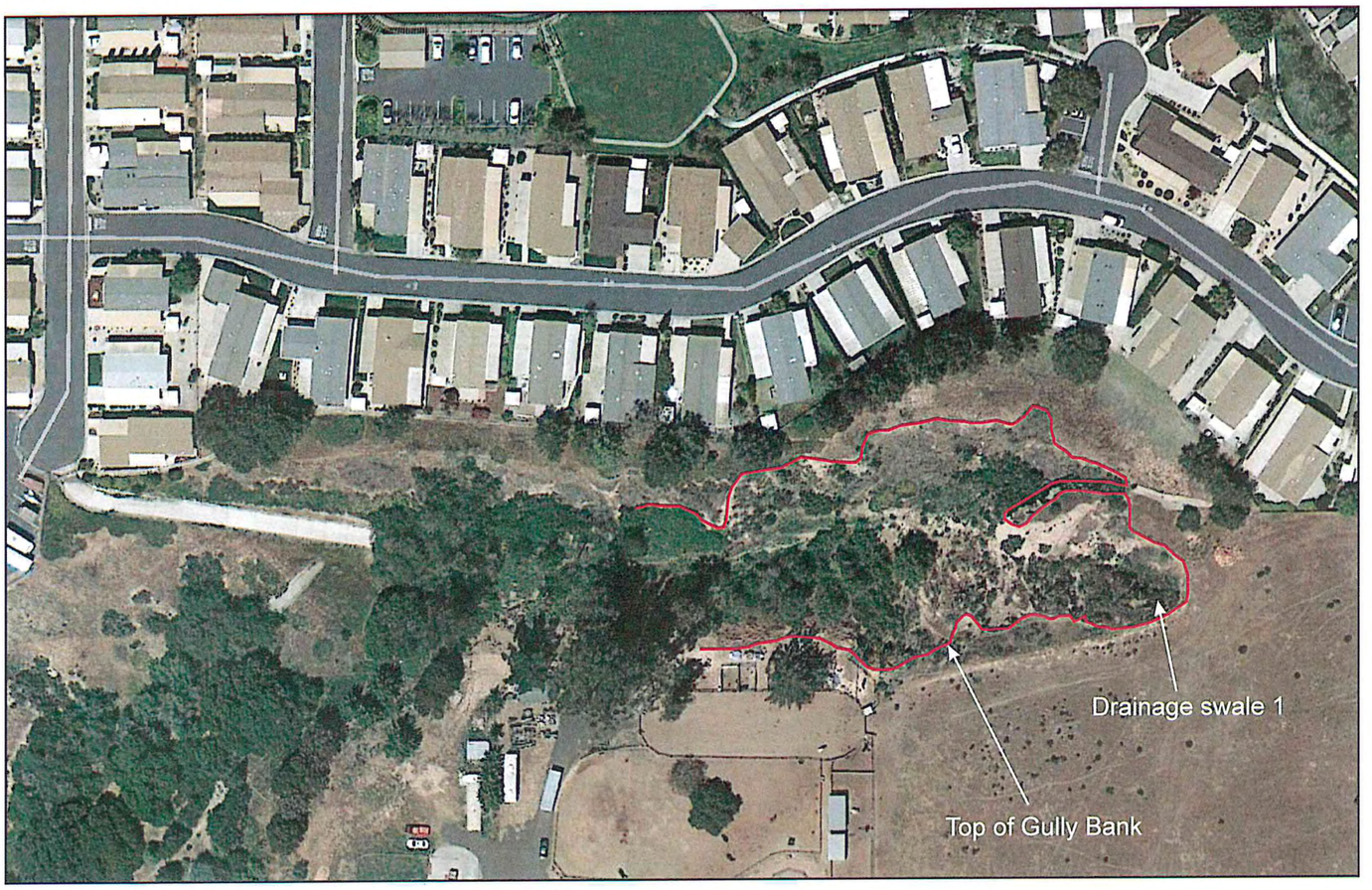




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1953 & 1972 Air Photographs
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Date
July 2014
Project No.
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Drafted by:
R.G.



Ref.: Google Earth 2013



Ref.: Cal Trans 1996 Flight No.: 05-SB-101

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1996 & 2003 Air Photographs

ORCUTT KEY SITE 3
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Orcutt Area of Santa Barbara County, California

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July 2014

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R.G.

GEOLOGIC HAZARDS REPORT
ORCUTT KEY SITE 3
SOUTH OF CLARK AVENUE, WEST OF HIGHWAY 101
ORCUTT AREA
SANTA BARBARA COUNTY, CALIFORNIA

March 16, 2006

Prepared for

Centex Homes, Central Coast Division

Prepared by

Earth Systems Pacific
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San Luis Obispo, CA 93401

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March 16, 2006 FILE NO.: SL-14813-GA

Mr. Urban McLellan
Centex Homes, Central Coast Division
735 Tank Farm Road, Suite 100
San Luis Obispo, California 93401

PROJECT: ORCUTT KEY SITE 3
SOUTH OF CLARK AVENUE, WEST OF HIGHWAY 101
ORCUTT AREA OF SANTA BARBARA COUNTY, CALIFORNIA

SUBJECT: Geologic Hazards Report

REF: Proposal for a Geologic Hazards Study, Orcutt Key Site 3, South of Clark Avenue, East of Stillwell Road, Orcutt Area of Santa Barbara County, California, by Earth Systems Pacific, Doc. No. 0602-018.PRP, dated February 6, 2006

Dear Mr. McLellan:

In accordance with your authorization of the above-referenced proposal, this geologic hazards report has been prepared for use in the development of plans and specifications for the Orcutt Key Site 3 project located south of Clark Avenue and west of Highway 101 in the Orcutt area of Santa Barbara County, California. This report is based upon the results of our review of geologic and geotechnical maps and literature, and a site reconnaissance. It describes the general geologic characteristics, identifies existing and potential geologic hazards at the site, and discusses impacts that the geology may have on the project. Four copies of the report are being furnished for your use.

We appreciate the opportunity to have provided geological services for this project and look forward to working with you again in the future. If there are any questions concerning this report, please do not hesitate to contact the undersigned.

Sincerely,

Earth Systems Pacific



Richard T. Gorman, C.E.G.
Date Signed: 3-16

Doc. No.: 0603-104.RPT/jc

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Site Vicinity Map
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1.0 INTRODUCTION

Planned Development

The Orcutt Key Site 3 project is south of Clark Avenue and west of Highway 101 in the Orcutt area of Santa Barbara County, California, and is shown on the Vicinity Map in the Appendix. At the writing of this report, development plans were not available for our review; however, we understand the project will generally consist of developing a residential subdivision on the northern portion of the property that is on the northerly side of Orcutt Creek (site). Although the property extends southerly of Orcutt Creek, residential development is planned only for the area northerly of Orcutt Creek. The residential development essentially divided into two areas by a northwest trending slope. These building areas are noted herein as; Area A is north of the slope, and Area B south of the slope (see Vicinity Map and Geologic Map in the Appendix). We have assumed the residences will be one to two-story, will be of wood and steel frame construction, will utilize concrete slabs-on-grade, and will be supported by shallow foundation systems.

Municipal sewer, water, storm drain, power, and communication utilities will service the project; no effluent disposal systems for sewage or drainage basins for runoff will be constructed. Grading plans were not available at the writing of this report; however, we have assumed that cuts and fills of 10 feet or more will be needed to develop the residential building and improvement areas.

Purpose and Scope of Work

This study has been conducted to evaluate and define the geologic/seismic conditions and potential geologic/seismic hazards associated with the proposed site. The report is intended to comply with the considerations of Sections 3309.4 and 3309.6 of the 2001 Edition of the California Building Code (CBC), California Division of Mines and Geology (CDMG) Note 44, and common engineering geology practice. The seismicity evaluation is intended to conform to the requirements of the CBC.

It is our intent that this report be used exclusively by the client to form the geologic/seismic basis of the design of the project as described herein, and in the

preparation of plans and specifications. Application beyond this intent is strictly at the user's risk. If future property owners wish to use this report, such use will be allowed to the extent that the report is applicable, provided the future user is bound by the same contractual conditions as the original client or by conditions that may be applicable at the time of the report's use.

This report does not address issues in the domain of contractors such as, but not limited to, site safety, loss of volume due to stripping of the site, shrinkage of soils during compaction, excavatability, dewatering, shoring, temporary slope angles, construction methods, etc. Analysis of the site for soils engineering parameters, radioisotopes, hydrocarbons, mold potential, or chemical properties are beyond the scope of this study. Evaluation of ancillary features such as access roads, fences, light and flag poles, signage, nonstructural fills, and suitability of the site for on-site effluent disposal are all not within our scope and are also not addressed.

In the event that there are any changes in the nature, design, or location of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing. The criteria presented in this report are considered preliminary until such time as any peer review or review by any jurisdiction has been completed, conditions are observed by the geologist in the field during construction, and the recommendations have been verified as appropriate, or modified in writing.

Site Setting

The site is generally comprised of two relatively level areas separated by a moderately sloping area. The level area on the north side (Area A) of the site is at a higher elevation than the level area to the south (Area B). Highway 101 forms the easterly boundary and Orcutt Creek forms the southerly boundary to the site. Developed residential areas are west and north of the site, as well as south of the western part of the northerly level portion of the site. The remaining area to the south of Orcutt Creek is undeveloped open

space. The site ranges from relatively flat to moderately sloping; however, there is a localized steeply sloping area in the northwest corner of area A. Drainage is by sheet flow, generally in a southeasterly direction into Orcutt Creek. The site is covered with a sparse to dense growth of weeds and brush. Mature trees grow along Orcutt Creek.

2.0 INVESTIGATION METHOLOGY

Site Reconnaissance

The site reconnaissance was performed to observe the geologic surface conditions on and adjacent to the site; geomorphic features were also observed to evaluate the stability of the site.

Surface Exploration

On December 7 and 8, 2005, a total of twelve borings were drilled to depths ranging from approximately 16.5 to 51.5 feet below the existing ground surface for the soils engineering investigation (Earth Systems Pacific, 2006). The borings were drilled with a CME 75 drill rig, equipped with an 8-inch diameter hollow stem auger and an automatic trip hammer for sampling. Logs of the borings were reviewed for the purposes of this study.

3.0 GEOLOGY

Geologic Site Conditions

The northern part of the site lies on a relatively flat older dune sand surface, (see Geologic Map in the Appendix). This surface was eroded by Orcutt Creek to the southwest which created a southwest facing slope that is approximately 25 feet high. The slope face exposes approximately 10 to 15 feet of older dune sand that is underlain by Orcutt sand. The central part of the site consists of a relatively flat, alluvial/floodplain area formed by Orcutt Creek. The alluvial/floodplain deposits were comprised generally of silty, clayey, and poorly graded sands. The thread of Orcutt Creek lies along the southwestern part of the alluvial/floodplain. The creek is bounded to the south by a northwest trending ridge that generally consists of Orcutt sand. This ridge also underlies the majority of the southern part of the site.

Faulting

The Los Osos, Los Alamos, Hosgri-San Simeon, and San Andreas faults are the most significant regional *active* faults within a 65-mile radius of the site which could affect the proposed residential subdivision during its anticipated lifespan (see the Historical Earthquake/Fault Map in the Appendix). The closest active to the site is the Los Alamos fault situated approximately 12 miles southeast. The closest mapped fault (regardless of activity) to the site is the Pleistocene age Orcutt Frontal fault (referred as the Casmalia fault by Jennings, 1994 and PG&E, 1988) which crosses the northern part of the site. A Pleistocene age unnamed fault lies just south-southwest of the site (see Geologic Map and Historical Earthquake/Fault Map in the Appendix). The Orcutt Community Plan (revised July 2002) referred to this unnamed fault as the Orcutt/Casmalia fault.

4.0 ANALYSIS AND CONCLUSIONS

Earthquake History

The historic seismicity in the site region was researched using EQSEARCH (Blake, 2000, updated 2003) and the Boore and others (1997) method of analysis for rock sites. EQSEARCH is a computer program that performs automated searches of a custom catalog of historical Central California earthquakes. As the program searches the catalog, it computes and prints the epicentral distance from the selected site to each of the earthquakes within the specified search area. The epicentral distances should be considered estimated distances, particularly for earthquake data information that dates prior to 1932, before instruments were used to record earthquake data. The parameters used for the search consisted of earthquake Richter magnitudes ranging from 5.0 to 9.0 that occurred in a 65-mile radius from the site from 1800 to 2003.

Results of the search indicated that within the search parameters, 34 earthquakes have occurred (see Historical Earthquake/Fault Map). The highest peak horizontal ground acceleration estimated to have occurred at the site from those historical earthquakes is 0.27g from different earthquake events. One earthquake had a 7.5 magnitude, occurred in 1927, and was located approximately 17 miles northwest of the site. This earthquake

probably occurred on the southern end of the Hosgri fault, and is known as the Lompoc earthquake. The other earthquake had a magnitude of 5.7, occurred in 1902, and was located approximately 3.5 miles south. The largest magnitude earthquake that the search revealed was a 7.9 magnitude earthquake. This earthquake was located approximately 45 miles east and was known as the 1857 earthquake on the San Andreas fault. It produced an estimated peak horizontal ground acceleration of 0.16g at the site. The closest earthquake to the site was a 5.3 magnitude earthquake that occurred in 1928 approximately 3 miles north (see Historical Earthquake/Fault Map).

Primary Seismic Hazards

Ground Shaking

The site is in a region of generally high seismicity. According to the CBC, Chapter 16, Figure 16 A-2, the site lies within Seismic Zone 4, the most active seismic zone rated. The site has the potential of experiencing strong ground shaking from earthquakes on regional and/or local causative faults. To characterize the seismicity at the site and to provide seismic design parameters for the architect/engineer, a probabilistic and deterministic seismic analysis was performed.

The Probabilistic Seismic Hazard Analysis (PSHA) was performed using the FRISKSP computer program (Blake, revised 2000, ver. 4.0) to obtain the Design Basis Earthquake (DBE). This earthquake is defined as having a 10 percent chance of exceedance in 50 years with a return period of approximately 475 years. To develop the DBE, significant mapped faults within a radius of 65 miles from the site were selected from the program database. The peak horizontal ground acceleration for a CBC soil type S_D, were estimated using the Boore et al (1997) method for stiff soil sites. The soil profile type was derived from the conditions encountered during the subsurface investigation.

The results of the analysis indicate that the DBE is estimated to have a peak horizontal ground acceleration of 0.33g.

A deterministic analysis was also performed to estimate the ground motions produced by the Orcutt Frontal fault if it ruptured under the site. Using Boore et al (1997) method for reverse-slip faults and soils with a shear wave velocity of 250 m/s, it was calculated that a peak horizontal ground acceleration of approximately 0.58g could occur at the site.

Surface Ground Rupture

The site is not in a State Earthquake Fault Zone, and there are no mapped active faults crossing or immediately adjacent to the site area. The closest mapped fault to the site, regardless of activity, is the Orcutt Frontal (Casmalia) fault that crosses the northern part of the site. This fault trace is shown on the Geologic Map as an inferred surface projection of the fault. The Orcutt Frontal (Casmalia) fault is a blind-thrust or low-angle reverse fault that dips to the south and buried by approximately 2,500 feet of sediment in the vicinity of the site (Clark, 1993). PG&E (1988) indicated that the 1980 Point Sal Earthquake occurred on the western end of the Orcutt frontal fault, suggesting that this section of the fault is active. However, if fault movement did occur under site it would not produce any ground surface rupture due to the buried depth and low angle of the fault. However, an earthquake on this fault would produce strong ground shaking at the site, as indicated by the above deterministic analysis.

Secondary Seismic Hazards

Liquefaction

Soil liquefaction is the loss of soil strength during a significant seismic event. It occurs primarily in saturated, loose, fine to medium-grained sands and in very soft to medium stiff, silts. There appears to be a potential for liquefaction in a discontinuous soil layer(s) between the depths of approximately 33 to 39 feet below the existing ground surface in a localized area near Boring 1, drilled next to Orcutt Creek. If liquefaction were to occur in this localized area of the site, the repercussions would likely be in the form of dynamic settlement. The maximum magnitude of total dynamic settlement is estimated to be less than 1 inch with differential settlement estimated to be less than 1/2 inch. In addition, based on the thickness of the potentially liquefiable soil layer (or layers) and the

thickness of the overlying non liquefiable soil, it is our opinion that surface manifestation of any of this dynamic settlement would be very remote (Earth Systems Pacific, 2006).

The remaining areas of the site have very low to nil potential for liquefaction to due the absence of groundwater or the presence of shallow bedrock.

Seismically Induced Settlement

Seismically induced settlement of sufficient magnitude to cause structural damage is normally associated with poorly consolidated, predominantly sandy soils or variable consolidation characteristics. Due to presence of shallow bedrock and the medium dense to dense conditions of the soils underlying the site, the potential for seismically induced settlement is considered to be low.

Slope Stability

The building areas (areas A and B) are essentially flat. The southwest facing slope that is approximately 25 feet high, separating Area A and Area B appears to be grossly stable. Minor soil slumps were observed on the face of the slope, which should be mitigated during site grading and construction.

5.0 RECOMMENDATIONS

Due to the close proximity the Orcutt Frontal fault is to the site and the potential for the fault to produce strong ground shaking at the, it is recommended that the deterministic ground acceleration of 0.58g be used in the design for the proposed buildings.

6.0 CLOSURE

This report is valid for conditions as they exist at this time for the type of project and associated risks described herein. Our intent was to perform this study in a manner consistent with the level of care and skill commonly exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is

intended for the exclusive use by the client as discussed in the "Purpose and Scope of Work" section. Application beyond the stated intent is strictly at the user's risk.

If changes with respect to project type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions used in the preparation of this report are not correct, this firm shall be notified for modifications to this report.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. Copies may be made only by Earth Systems Pacific, the client, and the client's authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.

Thank you for this opportunity to have been of service. If you have any questions, please feel free to contact this office at your convenience.

End of Text

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Blake, T. F., *EQSEARCH: A Computer Program for the Estimation of Peak Horizontal Acceleration from California Historical Earthquake Catalogs, User's Manual*, 2000, database updated 2003.

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APPENDIX

Site Vicinity Map
Geologic Map
Historical Earthquake/Fault Map

VICINITY MAP

ORCUTT KEY SITE 3

South of Clark Ave., West of Highway 101
Orcutt Area of Santa Barbara County, California

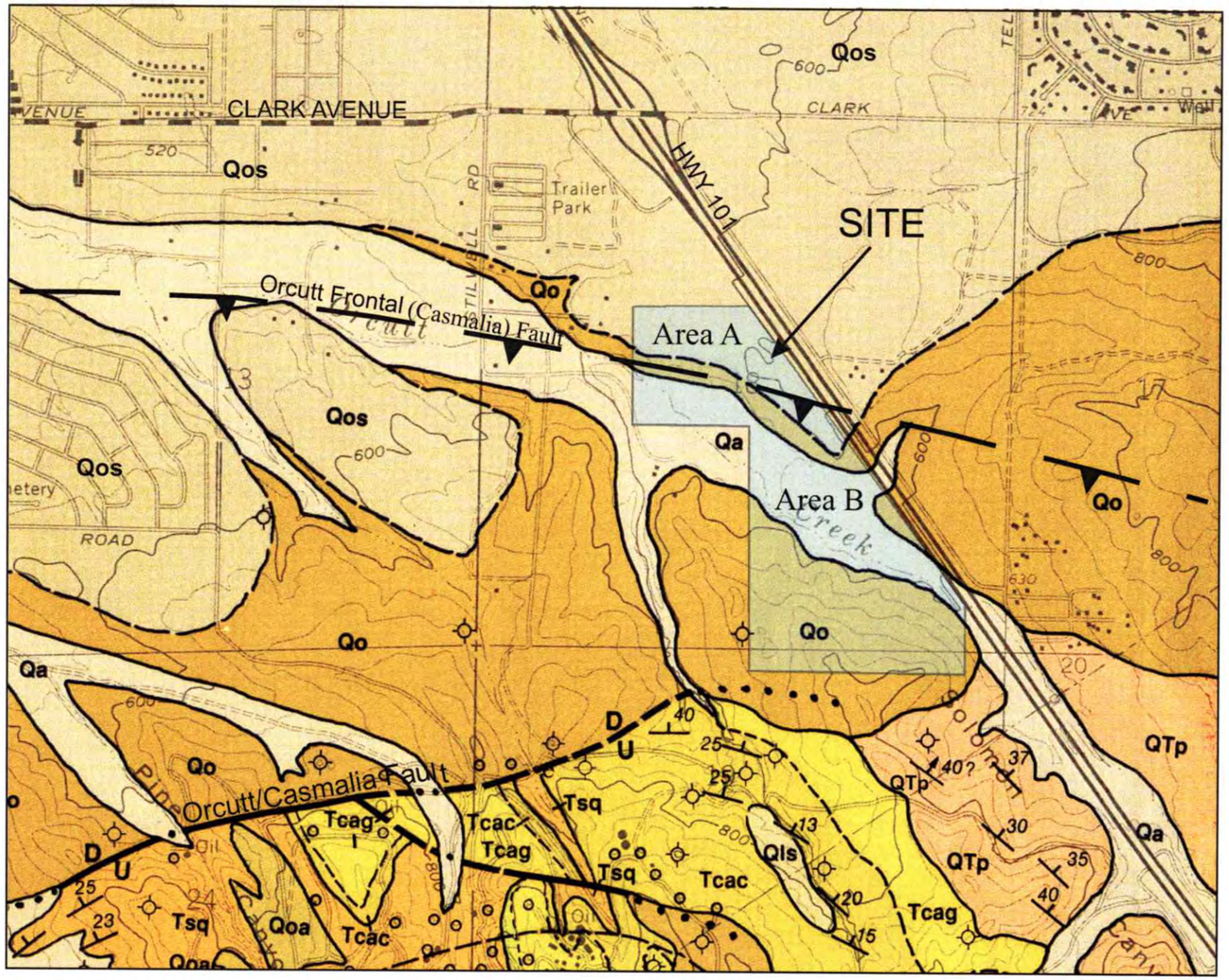


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GEOLOGIC MAP

ORCUTT KEY SITE 3

South of Clark Ave., West of Highway 101
Orcutt Area of Santa Barbara County, California



Extract from: Geologic Map of the Casmalia and Orcutt Quadrangles, T.W. Dibblee, Jr., 1989
Location of projected Orcutt Frontal Fault provided by D.G. Clark, 1993
Orcutt/Casmalia fault name was taken from the Orcutt Community Plan, revised July 2002

EXPLANATION

Geologic Units

Qa

Alluvium-valley and floodplain deposits

Qls

Landslide debris

Qoa

Older Alluvium-remnants of weakly consolidated stream terrace and alluvial fan deposits

Qos

Older Dune Sand-in places weakly consolidated

Qo

Orcutt Sand-tan to rusty brown, poorly consolidated to locally indurated, wind deposited sand

QTp

Paso Robles formation-light gray to reddish, weakly consolidated alluvial sediments and conglomerate

Tca (Tcag / Tcac)

Careaga Sand-Tca-Undivided, weakly indurated, massive, grayish yellow, locally pebbly sand, Tcag-Graciosa member, thick bedded, grayish yellow, weakly indurated sand, Tcac-Cebada member, massive, tan-yellow, fine-grained sand

Tsq

Sisquoc formation-light gray claystone, slightly diatomaceous or siliceous clay shale

Geologic Symbols

Contact
Dashed where approximately located or inferred

High-angle fault
Dashed where approximately located or inferred; dotted where concealed

Thrust or reverse fault
Dashed where approximately located or inferred; dotted where concealed. Saw-teeth on upper plate. Dip of fault plane between 30° and 80°

Anticline
Showing axis at surface. Dashed where approximately located; dotted where concealed

Syncline
Showing axis at surface. Dashed where approximately located; dotted where concealed

Horizontal 30 Inclined 90 Vertical
Strike and dip of beds

N

Approx. Scale: 1" = 1500'

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March 2006

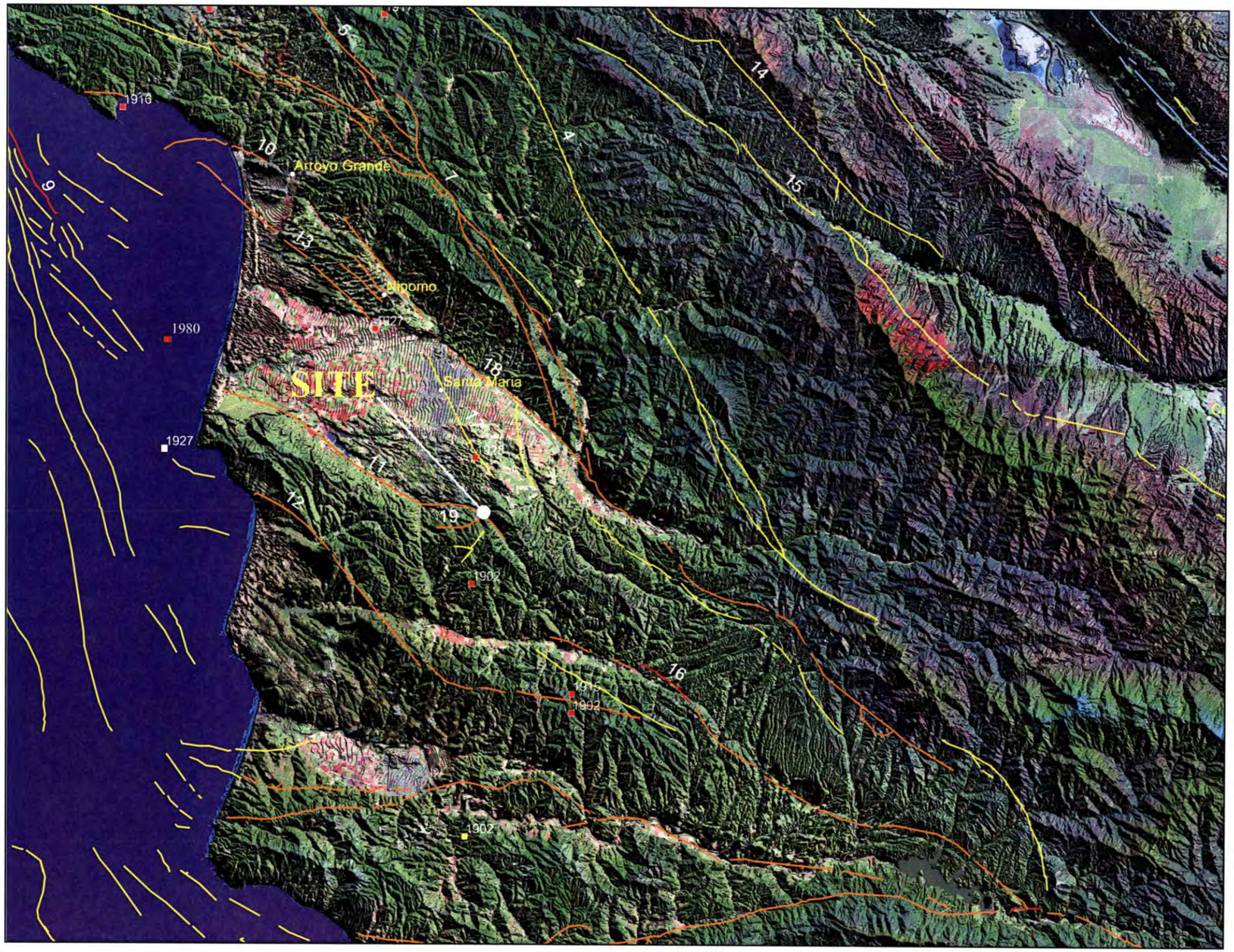
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HISTORICAL EARTHQUAKE/ FAULT MAP

ORCUTT KEY SITE 3

South of Clark Ave., West of Highway 101

Orcutt Area of Santa Barbara County, California



LEGEND

- Historic rupture (<200 years)
- Holocene fault (<10,000 years)
- Late Quaternary (<700,000 years)
- Quaternary fault (<1.6 million)

HISTORICAL EARTHQUAKE MAGNITUDE

5.0 to 5.9 | 6.0 to 6.9 | 7.0 to 7.9

FAULTS

1	San Andreas	11	Orcutt Frontal (Casmalia)
2	San Juan	12	Lions Head
3	Rinconada	13	Oceano
4	East Huasna	14	La Panza
5	Oceanic	15	South Cuyama
6	Cambria	16	Los Alamos
7	West Huasna	17	Santa Maria
8	Los Osos	18	Santa Maria River
9	Hosgri-San Simeon	19	Orcutt/Casmalia
10	San Luis Range		

Note: Not all faults are shown on map

REFERENCES

Blake, T.F., EQSEARCH, updated 2003

Jennings, C.W, 1994

N

(Approximate Scale: 1" = 6 miles)

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March 2006

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Earth Systems Pacific

SOILS ENGINEERING AND
ENGINEERING GEOLOGY REPORT
ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
)UTH OF CLARK AVENUE, WEST OF HIGHWAY 10
ORCUTT AREA
SANTA BARBARA COUNTY, CALIFORNIA

SOILS ENGINEERING AND ENGINEERING GEOLOGY REPORT ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS SOUTH OF CLARK AVENUE, WEST OF HIGHWAY 101 ORCUTT AREA SANTA BARBARA COUNTY, CALIFORNIA

October 12, 2007

Prepared for

Centex Homes, Central Coast Division

Prepared by

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October 12, 2007 FILE NO.: SL-14813-SB

Mr. Urban McLellan
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PROJECT: ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
SOUTH OF CLARK AVENUE, WEST OF HIGHWAY 101
ORCUTT AREA OF SANTA BARBARA COUNTY, CALIFORNIA

SUBJECT: Soils Engineering and Engineering Geology Report

REF: Proposal for a Soils Engineering and Engineering Geology Report, Orcutt Key Site 3, Southern Hills 11-Lot Subdivision, South of Clark Avenue, East of Stillwell Road, Orcutt Area of Santa Barbara County, California, by Earth Systems Pacific, dated September 6, 2007, Doc. No. 0709-013.PRP.

Dear Mr. McLellan:

In accordance with your authorization of the above-referenced proposal, this soils engineering and engineering geology report has been prepared for use in the development of plans and specifications for the interior street improvements planned at the Orcutt Key Site 3 Southern Hills project located south of Clark Avenue and west of Highway 101 in the Orcutt area of Santa Barbara County, California. Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, retaining walls, pavement sections, exterior flatwork, drainage around improvements, and construction observation and testing are presented herein. This report also describes the general geologic characteristics and identifies existing and potential geologic hazards at the site, and discusses impacts that the geologic conditions may have upon the project. Six copies of this report are being furnished for your use.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. If there are any questions concerning this report, please do not hesitate to contact me.

Sincerely,
Earth Systems Pacific

Doug Dunham

Doug Dunham, G.E.
Date Signed: 10-12-07

REGISTERED PROFESSIONAL ENGINEER
DOUGLAS A. DUNHAM
No. 2586
Exp. 12-31-07
GEOTECHNICAL
STATE OF CALIFORNIA

Richard T. Gorman, C.E.G.
Date Signed: 10-12-07

PROFESSIONAL GEOLOGIST
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STATE OF CALIFORNIA

Doc. No.0710-040.SER/msd

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APPENDIX E	Typical Detail A: Pipe Placed Parallel to Foundations

1.0 INTRODUCTION

The Orcutt Key Site 3 Southern Hills project (referred to herein as "the site") is south of Clark Avenue and west of Highway 101 in the Orcutt area of Santa Barbara County, California. The site is shown on the Vicinity and Trench Location Maps in Appendix A.

The purpose of this report is to address the development of the interior streets and associated improvements that will provide ingress, egress, and service utilities to this 11-lot residential subdivision. We understand the lots will not be developed at this time and will be sold to others for development. Future evaluation will be needed to address the geotechnical aspects of constructing residential structures and improvements on each of the individual lots when development plans become available. A general discussion of the feasibility and anticipated geotechnical issues to be encountered during lot development is presented in the text of this report.

We have assumed that interior streets for the site will be paved with asphalt concrete (AC) over aggregate base (AB) and that flatwork for pedestrian use will be constructed of Portland cement concrete (PCC). We understand that underground municipal sewer, water, storm drain, power, and communication utilities will provide services to the site; no effluent disposal systems for sewage or drainage basins for runoff are anticipated. Site work retaining walls may also be constructed. Retaining walls are anticipated to use continuous footings for support; a maximum line load of 1.5 kips per linear foot was assumed.

Due to the sloping nature of the site, we have assumed that cuts and fills of 5 feet or more will be needed to develop the building and surface improvement areas (defined in the "Preliminary Geotechnical Recommendations" section), to improve access, and to improve drainage.

2.0 SCOPE OF SERVICES

The scope of work for the soils engineering and engineering geology report included a general site reconnaissance, subsurface exploration, laboratory testing of selected soil samples, geotechnical evaluation of the data collected, and preparation of this report. The report and subsequent preliminary geotechnical recommendations were based on information provided by the client.

The report and recommendations are intended to comply with the considerations of Sections 1804.2 through 1804.5 and 3309.5 of the 2001 Edition of the California Building Code (CBC), and common geotechnical practice in this area at this time. The test procedures were accomplished in general conformance with the standards noted, as modified by common geotechnical practice in this area at this time.

Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, retaining walls, pavement sections, exterior flatwork, drainage around improvements, and construction observation and testing are presented to guide the development of project plans and specifications. It is our intent that this report be used exclusively by the client in the preparation of plans and specifications. Application beyond this intent is strictly at the user's risk. If future property owners wish to use this report, such use will be allowed to the extent the report is applicable, only if the user agrees to be bound by the same contractual conditions as the original client, or contractual conditions that may be applicable at the time of the report use.

This report does not address issues in the domain of contractors such as, but not limited to, site safety, subsidence of the site due to compaction, loss of volume due to stripping of the site, shrinkage of soils during compaction, shoring, temporary slope angles, construction means and methods, etc. Analyses of the soil for mold potential, radioisotopes, asbestos (either man-made or naturally occurring), hydrocarbons, or other chemical properties are

beyond the scope of this report. Ancillary structures such as temporary access roads, fences, flag and light poles, signage, and nonstructural fills are also not within our scope and are not addressed.

This firm should be retained to provide consultation as the design progresses, to review project plans as they near completion, to assist in verifying that pertinent geotechnical issues have been addressed, and to aid in conformance with the intent of this report. In the event that there are any changes in the nature, design, or location of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing. The criteria presented in this report are considered preliminary until such time as any peer review or review by any jurisdiction has been completed, conditions are observed by the soils engineer or geologist in the field during construction, and the recommendations have been verified as appropriate or modified in writing.

3.0 SITE SETTING

The site is generally comprised of two relatively gentle to moderately sloping areas within this hillside property. Orcutt Creek forms the northerly boundary and Highway 101 forms the easterly boundary of the site. Undeveloped open space is south and west of the site. The site drains by sheet flow, generally in a northerly direction into Orcutt Creek. The site is covered with areas of sparse to dense growths of weeds and brush, and sporatic areas of abundant trees.

4.0 FIELD INVESTIGATION AND LABORATORY ANALYSIS

On September 21 and 22, 2007, a total of twenty trenches were excavated at the site with a backhoe to depths ranging from 7 to 11 feet below the existing ground surface. The approximate locations of the trenches are shown on the Trench Location Map.

Soils encountered in the trenches were logged and categorized in general accordance with the Unified Soil Classification System and ASTM D 2488-06. Logs of trenches can also be found in Appendix A. Bulk soil samples were obtained from the trench spoils.

Two bulk samples were tested for maximum density and optimum moisture (ASTM D 1557-02). Direct shear tests (ASTM D 3080-04) were also conducted on these bulk samples after they were remolded to approximately 90 percent of maximum dry density. For use in the development of pavement design criteria, the R-value (ASTM D 2844-07) of two near-surface soils were tested. Four particle size tests (ASTM D 422-02 and D 1140-06) were performed on these bulk samples. Two bulk samples were also sent to Schiff Associates of Claremont, California for corrosivity testing for use by the architect/engineer in determining appropriate corrosion mitigation measures. Results of the laboratory data are presented in Appendix B.

5.0 GENERAL SOIL PROFILE

The general profile encountered in the all the trenches was sand soils in a dry to moist condition with a loose to medium dense consistency. Subsurface water was not encountered within the depths explored. Please refer to the trench logs for a more complete description of the subsurface conditions.

6.0 GEOLOGY

Geologic Site Conditions

The site is located within the Solomon Hills of Orcutt, California. It lies on the northeastern flank of a northwest trending ridgeline that generally consists of dune sand overlying Orcutt sand. The ridgeline is broad and well rounded with moderately incised drainages on the ridge flanks.

Based on our subsurface field exploration, and our site reconnaissance, the subsurface stratigraphy at the site consists of a thin deposit of dune sand overlying the Pleistocene-age Orcutt sand. Our findings generally agrees with Dibblee's geologic map (1989) except for the thin deposit of dune sand as shown on the Geologic Map in Appendix C.

Faulting

The Los Osos, Los Alamos, Hosgri-San Simeon, and San Andreas faults are the most significant regional *active* faults within a 65-mile radius of the site which could affect the proposed interior street improvements and the future residential structures during its anticipated lifespan (see the Historical Earthquake/Fault Map in Appendix C). The closest active fault to the site is the Los Alamos fault situated approximately 12 miles southeast. The closest mapped fault (regardless of activity) to the site is the Pleistocene-age Orcutt Frontal fault (referred as the Casmalia fault by Jennings, 1994 and PG&E, 1988) which is located north of the site. A Pleistocene age unnamed fault lies just south-southwest of the site (see Geologic Map and Historical Earthquake/Fault Map). The Orcutt Community Plan (revised July 2002) referred to this unnamed fault as the Orcutt/Casmalia fault.

Groundwater

Groundwater was not encountered within any of the trenches excavated on the site. A review of the boring logs from the soils engineering report for the northern portion of Orcutt Key

Site 3, (Earth Systems Pacific, 2006) indicated that groundwater was encountered in alluvium at an approximate depth of 33 feet below the existing ground surface. The alluvium was encountered to the maximum depth explored of 51.5 feet. This boring was drilled near the southeast property corner next to Orcutt Creek near Highway 101.

Slope Stability

The site lies on a gentle to moderately sloped hillside where no evidence of slope instability was observed or encountered during the site reconnaissance or field exploration.

7.0 SEISMICITY

Earthquake History

The historic seismicity in the site region was researched using EQSEARCH (Blake, 2000, updated 2007) and the Boore and others (1997) method of analysis for stiff soil sites. EQSEARCH is a computer program that performs automated searches of a custom catalog of historical Central California earthquakes. As the program searches the catalog, it computes and prints the epicentral distance from the selected site to each of the earthquakes within the specified search area. The epicentral distances should be considered estimated distances, particularly for earthquake data information that dates prior to 1932, before instruments were used to record earthquake data. The parameters used for the search consisted of earthquake Richter magnitudes ranging from 5.0 to 9.0 that occurred in a 65-mile radius from the site from 1800 to June 2007.

Results of the search indicated that within the search parameters, 34 earthquakes have occurred (see Historical Earthquake/Fault Map). The highest peak horizontal ground acceleration estimated to have occurred at the site from those historical earthquakes is 0.27g, which occurred twice during the last 207 years from different earthquake events. One

earthquake had a 7.5 magnitude, occurred in 1927, and was located approximately 17 miles northwest of the site. This earthquake probably occurred on the southern end of the Hosgri fault, and is known as the Lompoc earthquake. The other earthquake had a magnitude of 5.7, occurred in 1902, and was located approximately 3.5 miles south. The largest magnitude earthquake that the search revealed was a 7.9 magnitude earthquake. This earthquake was located approximately 45 miles east and was known as the 1857 earthquake on the San Andreas fault. It produced an estimated peak horizontal ground acceleration of 0.16g at the site. The closest earthquake to the site was a 5.3 magnitude earthquake that occurred in 1928 approximately 3 miles north.

Ground Shaking

The site is in a region of generally high seismicity. According to the CBC, Chapter 16, Figure 16 A-2, the site lies within Seismic Zone 4, the most active seismic zone rated. The site has the potential of experiencing strong ground shaking from earthquakes on regional and/or local causative faults. To characterize the seismicity at the site and to provide seismic design parameters for the architect/engineer, a probabilistic and deterministic seismic analysis was performed.

The Probabilistic Seismic Hazard Analysis (PSHA) was performed using the FRISKSP computer program (Blake, revised 2000, ver. 4.0) to obtain the Design Basis Earthquake (DBE). This earthquake is defined as having a 10 percent chance of exceedance in 50 years with a return period of approximately 475 years. To develop the DBE, significant mapped faults within a radius of 65 miles from the site were selected from the program database. The peak horizontal ground acceleration for a CBC soil type S_D, were estimated using the Boore et al (1997) method for stiff soil sites. The soil profile type was derived from the conditions encountered during the subsurface investigation.

The results of the analysis indicate that the DBE is estimated to have a peak spectral acceleration of 0.71g at 0.30 second, and a peak horizontal ground acceleration of 0.33g (see the Site Response Spectra in Appendix C).

A deterministic analysis was also performed to estimate the ground motions produced by the Orcutt Frontal fault if it ruptured under the site. Using Boore et al (1997) method for reverse-slip faults and soils with a shear wave velocity of 250 m/s, it was calculated that a peak horizontal ground acceleration of approximately 0.58g could occur at the site.

8.0 CONCLUSIONS

Geology

It is our opinion that there are no significant local geologic conditions that would preclude development at the site as described in the "Introduction" section of this report.

Site Geology

The site is underlain by dune sand deposits and soils of the Orcutt Sand.

Groundwater

Groundwater was not encountered within any of the trenches excavated on the project site. Groundwater was encountered at a depth of 33 feet in one boring drilled adjacent to Orcutt Creek (Earth Systems Pacific, 2006).

Slope Stability

The site is gently to moderately sloping; therefore, the potential for landsliding is very low.

Seismicity

The site is located within the seismically active southern California area, and moderate to severe ground shaking can be expected during the life of the proposed structures. The largest historical mean peak horizontal acceleration estimated to have occurred in the near vicinity of the site within the last 200 years was 0.27g. The site DBE is estimated to have a peak spectral acceleration of 0.71g at a 0.30 second natural site period and a peak horizontal ground acceleration of 0.33g.

Surface Ground Rupture

The site is not in a State Earthquake Fault Zone, and there are no mapped faults crossing the site. Therefore, the potential for surface ground rupture to occur within the site is considered to be very low.

Liquefaction

Soil liquefaction is the loss of soil strength during a significant seismic event. It occurs primarily in saturated, loose, fine to medium-grained sands, and in very soft to medium stiff silts. Common types of liquefaction related ground failure include dynamic settlement and lateral spreading. The depth to groundwater in the creek alluvial soils was previously found to be approximately 33 feet below the ground surface (Earth Systems Pacific, 2006). It was determined that there was potential for liquefaction in a discontinuous soil layer(s) between the depths of approximately 33 to 39 feet below the existing ground surface in a localized area near the creek. If liquefaction were to occur in this localized area, the repercussions would likely be in the form of dynamic settlement, lateral spreading is not anticipated. Considering the site is generally at least 20 feet higher in vertical elevation than the creek bed and is underlain by the Orcutt sand at depth, it is our opinion that the potential for liquefaction at the site is extremely low. Further, based on the thickness of the potentially liquefiable soil layer (or layers) and the thickness of the overlying non liquefiable soil, it is

our opinion that surface manifestation of any of this dynamic settlement would be very remote.

Seismically Induced Settlement

Seismically induced settlement of sufficient magnitude to cause structural damage is normally associated with poorly consolidated, predominantly sandy soils, or variable consolidation characteristics within the site. There is a high potential for the seismically induced settlement to occur in the loose dune sands, and a low potential in the Orcutt sand.

Soils Engineering

In our opinion, the site is suitable, from a soils engineering standpoint, for the proposed development of the interior street improvements as described in the "Introduction" section of this report, provided the recommendations contained herein are implemented in the design and construction.

The primary soils engineering concerns are the potential for differential settlement, the excavation characteristics of the site soils, the suitability of the soil for use as fill/backfill, the stability of soil during grading, the stability of slopes, the erodible nature of the site soils, and the pavement support characteristics of the site soils. The site soils were judged to be generally nonexpansive, therefore no special measures with respect to expansive soils are anticipated. Assuming the site is prepared in accordance with the recommendations of the "Preliminary Geotechnical Recommendations" section of this report, the soils should provide adequate support for the planned interior street improvements.

Differential settlement can occur when foundations and surface improvements span materials with significantly different compression characteristics, such as the soils at this site with variable moisture and densities. The portion supported by the softer material will settle more

than the portion supported by the harder material. These conditions can stress and possibly damage foundations and surface improvements, causing severe cracks and displacement. To reduce the potential for dissimilar settlement, it is necessary for foundations and surface improvements to bear in sufficiently uniform material. A program of overexcavation, scarification, moisture conditioning, and compaction of the soils in the building and surface improvement areas is recommended to provide more uniform soil moisture and density, and to provide appropriate pavement and foundation support.

The site soils are anticipated to be readily excavatable with conventional equipment. Excavations within these soils may exhibit ravelling and caving. Accordingly, temporary excavations and trenches should be shored and/or sloped in accordance with CALOSHA criteria for Type C soils.

We anticipate that the majority, if not all of the soils excavated will be acceptable for reuse as compacted fill or backfill. However, special requirements for utility trench bedding and shading per the specifications of Santa Barbara County should be anticipated.

The site soils maybe susceptible to temporary high soil moisture conditions, especially during or soon after the rainy season. Attempting to compact these materials in an overly moist condition may promote unstable conditions in the form of pumping, yielding, shearing and/or rutting. Therefore, the contractor and construction schedule should allow adequate time during grading for aerating and drying the soil to near optimum moisture content prior to compaction. Once the appropriate moisture content is achieved, the soil should then be compacted as recommended. If unstable conditions occur, this firm should be consulted to provide recommendations for correction of the condition.

Long term erosion and maintenance issues associated with the slopes at the site are a concern. Cut slopes and fill over cut slopes are generally considered grossly and surficially stable; however, our experience in the general area indicates that the cut portion of these slopes will be subject to long term remedial issues with erosion and increased maintenance requirements. We have concluded that cut slopes, and fill over cut slopes should be overexcavated and rebuilt as compacted fill slopes. Compacted fill slopes, constructed with the site soils, are considered grossly stable at a 2-horizontal to 1-vertical inclination up to a height of approximately 10 feet under normal conditions. Slopes above this height are feasible, but should be evaluated on a case by case basis. To improve surficial stability, reduce the potential for erosion, and minimize maintenance intervals, fill slopes should also be covered with synthetic vegetation matting. The slopes should be vegetated with ground cover, shrubs, and trees which possess deep, dense root structure and require a minimum of irrigation. Berms should be constructed at the top of slope areas to prevent all surface runoff from flowing over the slopes. The future owner of the slopes should be responsible for maintaining the planting scheme, applying the proper amounts of irrigation water, and maintaining the drainage gradients away from the top of slopes throughout the life of the slope. The owner should also implement and maintain a program for the elimination of burrowing animals in slope areas.

The surface soils are highly erodible on this site. Stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means *during* and *following* construction is essential to reduce the potential of erosion damage. Care should be taken to establish and maintain proper drainage around the structures and improvements.

The soils tested for R-value produced results of 42 and 60, which indicate a high resistance to the types of loads imposed by traffic. As the test results were different, pavement design for the two R-values is provided.

Feasibility of Individual Lot Development

The development of the individual lots with residential structures and improvements is feasible as we did not observe any geotechnical constraints that would preclude this future lot development; *however, each residential lot should be evaluated on an individual basis once development plans are available.* The primary soils engineering concerns listed above should be anticipated during development of the residential lots and their associated improvements. Assuming the residences will be one to two-stories, will be of wood-frame construction, and will utilize PCC slabs-on-grade or raised floors, we anticipate that the structures can be supported by shallow conventional continuous and spread (pad) footings. To provide appropriate support for foundations and improvements, and reduce the potential for seismically induced settlement of the dune sand, grading should be anticipated to develop the building and surface improvement areas, improve drainage, and improve access on the individual lots.

9.0 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

The following recommendations are applicable to interior street improvements as described in the "Introduction" section of this report and assume that retaining walls will not exceed a height of 8 feet. If other improvements, taller retaining walls, stacked retaining walls, or other such features are incorporated into site development, this firm should be contacted for individual assessment.

The building area for isolated structures is defined as the area within and extending a minimum of 5 feet beyond the foundation perimeter of the structure. The surface improvement area is defined as the area within and extending a minimum of 2 feet beyond the perimeter of the surface improvement.

Site Preparation

1. The existing ground surface in the building and surface improvement areas should be prepared for construction by removing existing structures, improvements, vegetation, tree stumps, large roots, debris, and other deleterious material. Any existing fill soils should be completely removed and replaced as compacted fill. Any existing utilities that will not be serving the site should be removed or properly abandoned. The appropriate method of utility abandonment will depend upon the type and depth of the utility. Recommendations for abandonment can be made as necessary.

2. Voids created by the removal of materials or utilities, and extending below the recommended overexcavation depth, should be immediately called to the attention of the soils engineer. No fill should be placed unless a representative of this firm has observed the underlying soil.

Grading

1. Following site preparation, soils in the building area should be removed to a level plane at a minimum depth of 2 foot below the design elevation of the bottom of the deepest footing elements or 3 feet below existing grade, *whichever is deeper*. Locally deeper removals may be needed, based on field conditions. The resulting soil surface should then be scarified to a minimum depth of 1 foot, moisture conditioned to near optimum moisture content, and compacted.

2. Following site preparation, the soils in surface improvement area should be removed to a level plane at a minimum depth of 1 foot below the proposed subgrade elevation or 2 feet below the existing ground surface, *whichever is deeper*. Locally deeper removals may be needed, based on field conditions. The resulting soil surface should then be scarified to a minimum depth of 1 foot, moisture conditioned to near optimum moisture content, and compacted.

3. Voids created by dislodging cobbles and/or debris during scarification should be backfilled and compacted, and the dislodged materials should be removed from the area of work.

4. Where fill will be placed on existing slopes that are steeper than 10 percent, the slope should be cut to level benches into competent material as approved by this firm. The benches should be a minimum of 10 feet wide and angled 2 to 3 percent back into the slope. Where fill is planned on existing slopes that are steeper than 20 percent, the toe of the fill should be keyed into competent material as approved by this firm. The keyway should be a minimum of 10 feet wide. The keyway should be angled 2 to 3 percent back into the slope, and should penetrate 2 feet into the competent material.

5. Backdrains should be provided in all keyways and on benches at approximately 10-foot vertical intervals, unless otherwise recommended by this firm at the time of construction. Typical bench and keyway, and backdrain details are included in Appendix D.

6. On-site material and approved import materials may be used as general fill. Fill should be placed in level lifts not exceeding 8 inches in loose thickness, moisture conditioned to near optimum content, and compacted. In general, fill should be compacted to a minimum of 90 percent of maximum dry density. The upper 1 foot of subgrade and all AB in areas to be paved with AC or PCC should be compacted to a minimum of 95 percent of the maximum dry density. Subgrade and AB should be firm and unyielding when proofrolled with heavy, rubber-tired grading equipment prior to continuing construction.

7. All imported soils should be nonexpansive. Nonexpansive soils are defined as being coarse grained (ASTM D 2488-06), and having an expansion index of 10 or less (ASTM D 4829-03). Proposed nonexpansive imported soils should be evaluated by a representative of this firm before being used, and on an intermittent basis during placement on the site.

8. All materials used as fill should be cleaned of any debris and rocks larger than 6 inches in diameter. No rocks larger than 3 inches in diameter should be used within the upper 3 feet of finish grade. When fill material includes rocks, the rocks should be placed in a sufficient soil matrix to ensure that voids caused by nesting of the rocks will not occur and that the fill can be properly compacted.

9. Slopes should not be constructed steeper than 2-horizontal to 1-vertical under normal conditions. We also recommend that cut slopes, and fill over cut slopes be overexcavated and constructed as fill slopes. Unless otherwise recommended by the landscape architect, completely constructed fill slopes should be covered with a synthetic vegetation matting (Miramat, Enkamat, Amerimat, or equivalent), and the slopes should be revegetated, in accordance with the installation recommendations of the manufacturer and as per CBC Section 3316.

Utility Trenches

1. Unless otherwise recommended, utility trenches adjacent to foundations should not be excavated within the zone of foundation influence, as shown on Typical Detail A in Appendix E.

2. Utilities that will pass beneath a foundation, should be placed with properly compacted utility trench backfill and the foundation should be designed to span the trench.

3. A select, noncorrosive, granular, easily compacted material should be used as bedding and shading immediately around utilities. Generally, the soil found at the site may be used for trench backfill above the select material.

4. In general, trench backfill should be compacted to a minimum of 90 percent of maximum dry density. A minimum of 95 percent of maximum dry density, however, should be obtained where trench backfill comprises the upper 1 foot of subgrade beneath AC or PCC pavement, and in all AB. Subgrade and AB should be firm and unyielding when proof rolled with heavy, rubber-tired grading equipment prior to continuing construction. A minimum of 85 percent of maximum dry density will generally be sufficient where trench backfill is located in landscaped or other unimproved areas, where settlement of trench backfill would not be detrimental.

5. Jetting of the trench backfill should not be allowed as a means of backfill densification. However, we do recommend that all import sand in multi-conduit trenches be jetted or saturated from the surface to aid in encasing the conduits with the import sand.

6. Where utility trenches will slope steeper than 10 percent, clay or sand/cement slurry plugs should be placed in the trenches at maximum 100-foot intervals. The plugs should be at least 2-feet thick and extend a minimum of 2 feet below the bottom of the trench and a minimum of 2 feet into the side of the trench. The top of the plug should be a minimum of 1 foot above the top of the utility conduit. A gravel pocket

drain should be constructed upgradient of each clay or slurry plug. Each drain should consist of a minimum of 1 cubic foot of free-draining gravel per foot of trench width. The drain gravel should be wrapped in a permeable synthetic filter fabric conforming to Caltrans Standard 88-1.03 for Underdrains. A rigid PVC discharge pipe should extend from the gravel drain at a minimum 1 percent slope to a convenient discharge point.

7. The recommendations of this section are minimum requirements and may be superseded by the governing jurisdiction.

Foundations

1. Structures may be supported by continuous and spread (pad) footings bearing in compacted fill soil. Footings should have minimum overall dimensions in accordance with CBC Table 18-I-C. Footing reinforcement should be in accordance with the requirements of the architect/engineer; minimum reinforcement should consist of two No. 4 rebar, one near the top and one near the bottom.

2. Footings bearing on compacted fill should be designed using a maximum allowable bearing capacity of 1,500 psf dead plus live loads. Using this criterion, total and differential settlement is expected to be on the order of 3/4-inch and 3/8-inch in 25 feet, respectively.

3. The allowable bearing capacity may be increased by one-third when transient loads such as wind or seismicity are included. The foundations should be designed using the following seismic parameters:

Seismic Source	Casmalia Fault
Distance to Seismic Source	< 2 km
Seismic Zone	4
Seismic Zone Factor (CBC Table 16-I)	0.40
Seismic Source Type (CBC Table 16-U)	B
Soil Profile Type (CBC Table 16-J)	S_D
Seismic Coefficient-C_A (CBC Table 16-Q)	0.57
Seismic Coefficient-C_V (CBC Table 16-R)	1.02
Near Source Factor-N_A (CBC Table 16-S)	1.3
Near Source Factor-N_V (CBC Table 16-T)	1.6

4. Lateral loads may be resisted by friction and by passive resistance of the soil acting on foundations. Lateral capacity is based on the assumption that backfill adjacent to foundations is properly compacted. Please refer to the "Retaining Walls" section of this report for values.

5. Foundation excavations should be observed by this firm during excavation, and prior to placement of reinforcing steel or formwork. The foundation excavations should be moistened to at least optimum moisture content and no desiccation cracks should be present prior to concrete placement.

Retaining Walls

1. Foundations for all sitework walls and retaining walls should have a minimum depth of 18 inches below lowest adjacent grade, not including the keyway. It is assumed that wall heights will not exceed 8 feet.

2. Design of retaining walls should be based on the following parameters:

Active equivalent fluid pressure (native soil or imported sand or gravel backfill)	35 pcf
At-rest equivalent fluid pressure (native soil or imported sand or gravel backfill)	50 pcf
Passive equivalent fluid pressure	300 pcf
Maximum toe pressure	1,500 psf
Coefficient of sliding friction	0.40

3. No surcharges are taken into consideration in the above values. The maximum toe pressure is an *allowable* value; all others are ultimate values that will require application of appropriate factors of safety by the architect/engineer.

4. The above pressures are applicable to a retained surface that is horizontal at the top of the wall. Walls having a retained surface that slopes upward from the top of the wall should be designed for an additional equivalent fluid pressure of 1 pcf for the active case and 1.5 pcf for the at-rest case, for every two degrees of slope inclination.

5. All retaining walls should be drained with perforated pipe encased in free draining gravel. The pipe should be placed perforations downward and should discharge in a nonerosive manner away from foundations and other improvements. The gravel zone should have a width of approximately 1 foot and should extend upward to 1 foot from the top of any wall that does not have a slab abutting the top of the wall. The upper 1-foot of backfill should consist of native soils to reduce the flow of surface drainage into the wall drain system. If a slab or pavement abuts the top of the wall, the gravel zone should extend to the sand cushion layer below the slab or the AB below the pavement. To reduce infiltration of soil into the gravel, a permeable

synthetic fabric (conforming to Caltrans Section 88-1.03 for edge drains) should be placed between the two. Manufactured synthetic drains such as Miradrain or Enkadrain are acceptable alternatives to the use of gravel provided they are installed in accordance with the manufacturer's recommendations. Where drainage can be properly controlled, the perforated pipe may be omitted in lieu of weep holes on maximum 4-foot centers placed at the lowest point in the wall that will still provide drainage. A filter fabric as described above should be placed between the weep holes and the drain gravel.

6. Walls facing habitable areas or areas where moisture transmission through the wall would be undesirable should be *thoroughly* waterproofed in accordance with the requirements of the architect/engineer.

7. Retaining walls by their nature are flexible structures, and surface treatments on walls often crack. Where walls are to be plastered or will otherwise have a finish surface applied, the flexibility should be considered in determining the suitability of the surfacing material, spacing of horizontal and vertical joints, etc. The flexibility should also be considered where a retaining wall will abut or be connected to a rigid structure, and where the geometry of the wall is such that its flexibility will vary along its length.

Pavement Sections

The following pavement sections are based on tested R-values of 42 and 60. We recommend that the soil exposed at street subgrade be tested for R-value to verify that the pavement sections are appropriate, otherwise revised pavement sections will be needed. Pavement design sections are provided for assumed Traffic Indices (TI) of 4.5, 5.0, 5.5, 6.0, 6.5, and 7.0. Determination of the appropriate TI for specific areas is left to others. The AC sections were calculated in accordance with the Caltrans Highway Design Manual. The calculated

AB and AC thickness are for compacted material. Normal Caltrans construction tolerances should apply.

R-value	TI	AC Thickness (inches)	Class 2 Base Thickness (inches)
42	4.5	2.50	4.0
42	5.0	2.75	4.0
42	5.5	3.00	5.0
42	6.0	3.25	6.0
42	6.5	3.75	6.0
42	7.0	4.00	6.5

R-value	TI	AC Thickness (inches)	Class 2 Base Thickness (inches)
60	4.5	2.50	4.0
60	5.0	2.75	4.0
60	5.5	3.00	4.0
60	6.0	3.25	6.0
60	6.5	3.75	6.0
60	7.0	4.00	6.0

1. The upper 12 inches of subgrade and all AB should be compacted to a minimum of 95 percent of maximum dry density.

2. Subgrade and AB should be firm and unyielding when proof-rolled by heavy rubber-tired equipment prior to paving.

3. To provide stability for curbs, they should be set back a minimum of 3 feet from the tops of slopes, or the curbs should be deepened to provide stability. A representative of this firm should review all conditions where curbs are deepened to provide stability.

4. Finished AC surfaces should slope toward drainage facilities such that rapid runoff will occur and no ponding is allowed on or adjacent to the AC.

5. To reduce migration of surface drainage into the subgrade, maintenance of pavement areas is critical. Any cracks that develop in the pavement should be promptly sealed.

Exterior Flatwork

1. Exterior flatwork (PCC slabs-on-grade) should have a minimum thickness of 4 full inches. Exterior flatwork should be reinforced, at a minimum, with No. 3 rebar at 24 inches on-center each way.

2. If any flatwork will support vehicular traffic, it should be cast in a minimum of 12 inches of Class 2 AB material. Design of vehicular flatwork should be based upon a subgrade modulus (K_{30}) of 300 (psi/in).

3. A measure that can be taken to reduce the risk of movement of flatwork due to variable bearing conditions is to provide thickened edges or grade beams around the perimeters of the flatwork. The thickened edges or grade beams could be up to 12 inches deep, with the deeper edges or grade beams providing better protection. At a minimum, the thickened edge or grade beam should be reinforced by two No. 4 rebar, one near the top and one near the bottom.

4. Flatwork should be constructed with frequent joints to allow articulation as flatwork moves in response to expansion and contraction of the soil or variable bearing conditions. The soil in the subgrade should be moistened to at least optimum moisture content and no desiccation cracks should be present prior to casting the flatwork.

5. To reduce shrinkage cracks in concrete, the concrete aggregates should be of appropriate size and proportion, the water/cement ratio should be low, the concrete should be properly placed and finished, contraction joints should be installed, and the concrete should be properly cured. Concrete materials, placement, and curing specifications should be at the direction of the architect/engineer; AC 302.1R-04 is suggested as a resource for the architect/engineer in preparing such specifications.

Drainage Around Improvements

1. Unpaved ground surfaces should be *graded during construction,* and *finish graded* to direct surface runoff away from foundations and other improvements at a minimum 2 percent grade for a minimum distance of 5 feet. If this is not feasible due to the terrain, property lines, or other factors, swales with improved surfaces, area drains, or other drainage facilities should be provided to divert drainage away from these areas. Paved surfaces should provide positive drainage away from foundations and other improvements.

2. Runoff should discharge to an appropriate outlet in a nonerosive manner away from foundations and other improvements in accordance with the requirements of the governing agencies.

4. The site soils are *highly* erodible; stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means *during and following construction* is essential to reduce erosion damage. Care should be taken to establish and maintain vegetation. The landscaping should be installed to maintain the surface drainage recommended above.

Construction Observation and Testing

1. It must be recognized that the recommendations contained in this report are based on a limited number of trenches and rely on continuity of the subsurface conditions encountered. It is assumed that this firm will be retained to provide consultation during the design phase, to review plans as they near completion, to interpret this report during construction, and to provide construction monitoring in the form of testing and observation.

2. Unless otherwise stated, the term "compacted" or "recompacted" refers to soils placed in level lifts not exceeding 8 inches in loose thickness and compacted to a minimum of 90 percent of maximum dry density. The standard test used to define maximum dry density and field density should be ASTM D 1557-02, ASTM D 2922-05, respectively, or other methods acceptable to the soils engineer and jurisdiction. Unless otherwise stated, "moisture conditioning" refers to the moistening of soils to near optimum moisture content, prior to application of compactive effort.

3. At a minimum, the following items should be reviewed, tested, or observed by this firm:
    - Final plans
    - Stripping and clearing of vegetation
    - Overexcavation to the recommended depths

- Scarification, moisture conditioning, and compaction of the soil
- Fill quality, placement, and compaction
- Utility trench backfill
- Retaining wall drains and backfill
- Foundation excavations
- Subgrade and AB compaction and proof rolling

4. It will be necessary to develop a program of quality control prior to beginning grading. It is the responsibility of the owner, contractor, or project manager to determine any additional inspection items required by the architect/engineer or the governing jurisdiction. A preconstruction conference between a representative of the owner, this firm, the architect/engineer and contractors is recommended to discuss planned construction procedures and quality control requirements. This firm should be notified at least 48 hours prior to beginning grading operations.

5. If Earth Systems Pacific is not retained to provide construction observation and testing services, it shall not be responsible for the interpretation of the information by others or any consequences arising therefrom.

10.0 CLOSURE

Our intent was to perform the investigation in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the "Scope of Services" section. Application beyond the stated intent is strictly at the user's risk.

This report is valid for conditions as they exist at this time for the type of project described herein. The conclusions and recommendations contained in this report could be rendered invalid, either in whole or in part, due to changes in building codes, regulations, standards of geotechnical or construction practice, changes in physical conditions, or the broadening of knowledge.

If changes with respect to development type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions used in the preparation of this report are not correct, this firm shall be notified for modifications to this report. Any items not specifically addressed in this report shall comply with the CBC and the requirements of the governing jurisdiction.
The preliminary recommendations of this soils report are based upon the geotechnical conditions encountered at the site, and may be augmented by additional requirements of the architect/engineer, or by additional recommendations provided by this firm based on conditions exposed at the time of construction.

This document, the data, conclusions, and recommendations contained herein are the property of Earth Systems Pacific. This report shall be used in its entirety, with no individual sections reproduced or used out of context. Copies may be made only by Earth Systems Pacific, the client, and the client's authorized agents for use exclusively on the subject project. Any other use is subject to federal copyright laws and the written approval of Earth Systems Pacific.

Thank you for this opportunity to have been of service. If you have any questions, please feel free to contact this office at your convenience.

End of Text

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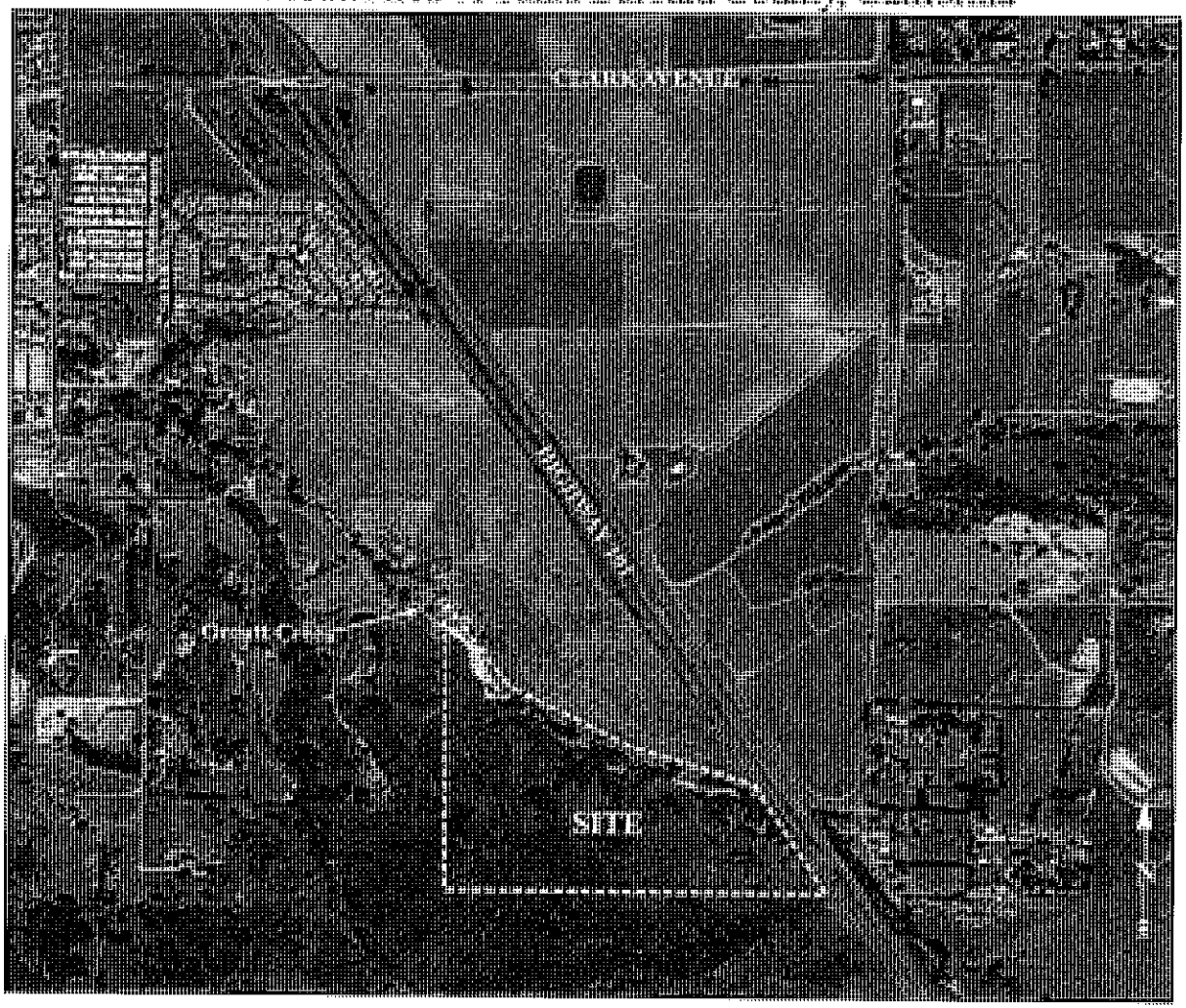
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APPENDIX A

Vicinity Map
Trench Location Map
Trench Logs

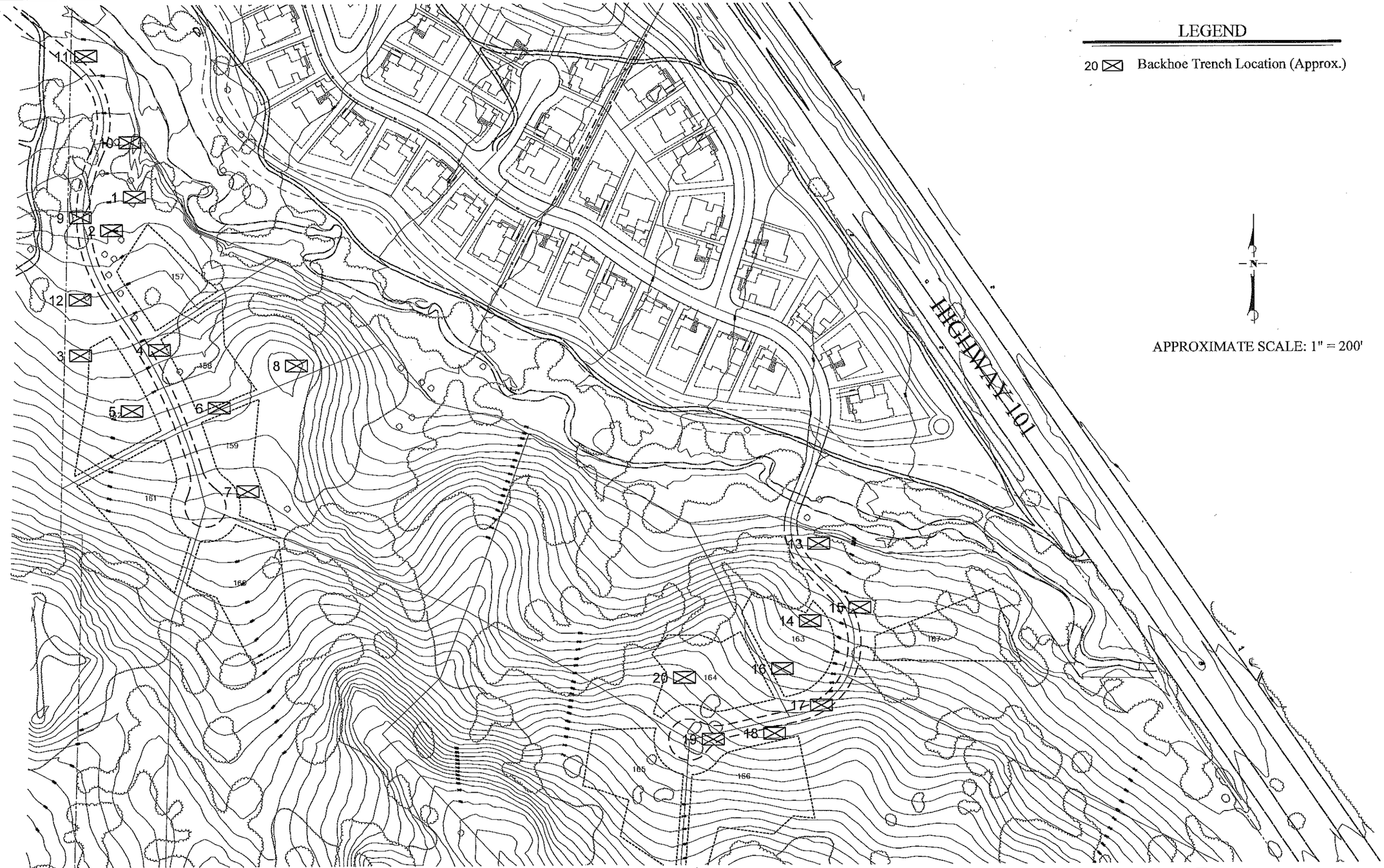
VICINITY MAP

ORCUTT KEY SITE 3
SOUTHERN HILLS
South of Clark Ave., West of Highway 101
Orcutt Area of Santa Barbara County, California



EARTH SYSTEMS PACIFIC
4378 Old Santa Fe Road, San Luis Obispo, CA 93401
October 2007

(805) 544-3276 - (805) 544-1786
www.earthsys.com - email: esc@earthsys.com
SL-14813-SB



TRENCH LOCATION MAP

ORCUTT KEY SITE 3 - SOUTHERN HILLS

South of Clark Avenue and West of Highway 101
Orcutt Area of Santa Barbara County, California

Earth Systems Pacific
4378 Santa Fe Road
San Luis Obispo, CA 93401-8116
(805) 544-3276 • FAX (805) 544-1786
E-mail: esc@earthsys.com

October 10, 2007 RLW SL-14813-SB

ORCUTT KEY SITE 3 SOUTHERN HILLS-101007-trenches.dwg

Earth Systems Pacific

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

Trench No. 1
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 21, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; light brown, loose, dry	0–5	○			
5	SM		ORCUTT SAND: SILTY SAND; dark yellow brown, medium dense, moist	5–8	○			
11			Bottom of trench @ 11.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

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LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

Trench No. 2
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 21, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 4	SP-SM		DUNE SAND: POORLY GRADED SAND WITH SILT; light brown, loose, dry					
4 - 8	SM		ORCUTT SAND: SILTY SAND; dark yellow brown, medium dense, moist					
8			Bottom of trench @ 8.0 feet No subsurface water encountered No coving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 4
PAGE 1 OF 1

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

JOB NO.: SL-14813-SB
September 21, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 5	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; light brown, loose, dry					
5 - 8			medium dense, moist					
8 - 8	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
8			Bottom of trench @ 8.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 3
PAGE 1 OF 1

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

JOB NO.: SL-14813-SB
September 21, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 3	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; light brown, loose, moist					
3 - 5			brown, medium dense					
5 - 8			gray brown	5–8	○			
8 - 10	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
10			Bottom of trench @ 10.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 5
PAGE 1 OF 1

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

JOB NO.: SL-14813-SB
September 21, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SAND; light brown, loose, dry					
4			medium dense, moist					
6	SM		ORCUTT SAND: SILTY SAND; dark yellow brown, medium dense, moist					
8			Bottom of trench @ 8.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 6
PAGE 1 OF 1

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

JOB NO.: SL-14813-SB
September 21, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 3	SP-SM		DUNE SAND: POORLY GRADED SAND WITH SILT; light brown, loose, dry					
3 - 6			light gray brown, medium dense, moist					
6 - 10	SP-SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
10			Bottom of trench @ 10.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 7
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 21, 2007

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
3			medium dense, moist					
6	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
8			Bottom of trench @ 8.0 feet No subsurfoce water encountered No coving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 8
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 21, 2007

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP-SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
3			dark yellow brown, medium dense, moist					
8			Bottom of trench @ 8.0 feet No subsurface water encountered No caving					

LEGEND: ▬ Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 9
PAGE 1 OF 1

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

JOB NO.: SL-14813-SB
September 21, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
3			medium dense, moist					
5	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark brown, medium dense, moist					
7			Bottom of trench @ 7.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 10
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 21, 2007

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 5	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
5 - 7	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
7			Bottom of trench @ 7.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 11
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP-SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry	0–3	○			
4			light brown, medium dense, moist					
7	SM		ORCUTT SAND: SILTY SAND; dark yellow brown, medium dense, moist					
9			Bottom of trench @ 8.5 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

Trench No. 12
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 3	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
4 - 7	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark brown, medium dense, moist					
7			Bottom of trench @ 7.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 13
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry	0–3	○			
5			medium dense, moist					
8	SM		ORCUTT SAND: SILTY SAND; dark yellow brown, medium dense, moist					
9			Bottom of trench @ 9.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 14
PAGE 1 OF 1

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

JOB NO.: SL-14813-SB
September 22, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
5			light brown, medium dense, moist					
8	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
9			Bottom of trench @ 9.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 15
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP-SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
5			medium dense, moist					
8			Bottom of trench @ 8.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

Trench No. 16
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 5	SP-SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
5 - 8	SM		ORCUTT SAND: SILTY SAND; dark yellow brown, medium dense, moist					
8			Bottom of trench @ 8.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

Trench No. 17
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry	0–3	○			
4			gray brown, moist					
5			yellow brown, medium dense					
9	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
10			Bottom of trench @ 10.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Trench No. 18
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SP–SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown, loose, dry					
5			yellow brown, medium dense, moist	5–8	○			
8	SP–SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
10			Bottom of trench @ 10.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

Trench No. 19
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 5	SP-SM		DUNE SAND: POORLY GRADED SAND WITH SILT; brown to red brown, loose, dry					
5 - 8			medium dense, moist					
8 - 11			light yellow brown					
11			Bottom of trench @ 11.0 feet No subsurface water encountered Severe caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: B. Fagundes
EQUIPMENT: Backhoe
AUGER TYPE: 24" Bucket

Trench No. 20
PAGE 1 OF 1
JOB NO.: SL-14813-SB
September 22, 2007

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS
South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0 - 4	SP-SM		DUNE SAND: POORLY GRADED SAND WITH SILT; light brown, loose, dry					
4 - 7			light yellow brown, medium dense, moist					
7 - 10	SP-SM		ORCUTT SAND: POORLY GRADED SAND WITH SILT; dark yellow brown, medium dense, moist					
10			Bottom of trench @ 10.0 feet No subsurface water encountered No caving					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

APPENDIX B

Laboratory Test Results

Orcutt Key Site 3, Southern Hills

SL-14813-SB

PARTICLE SIZE ANALYSIS

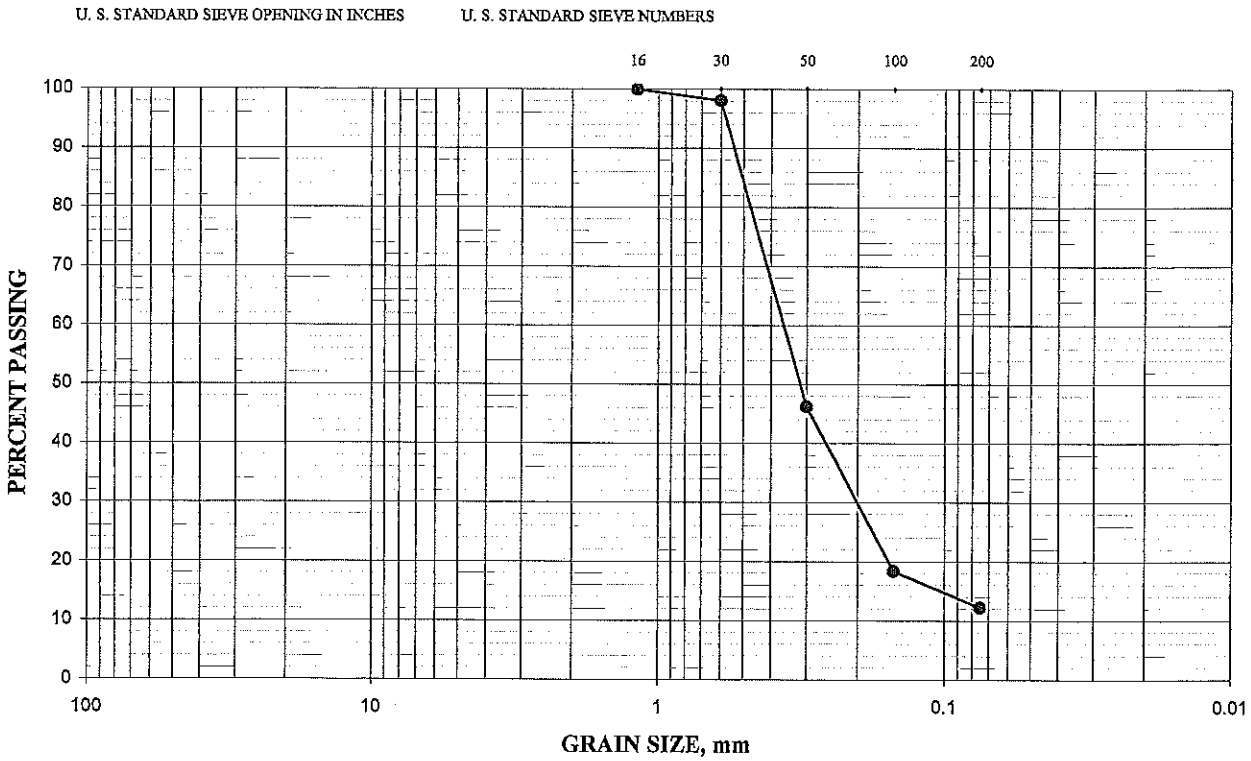
ASTM D 422-02; D 1140-06

Trench #1 @ 0.0 - 5.0'

October 15, 2007

Poorly Graded Sand with Silt (SP-SM)

Sieve size	% Retained	% Passing
#16 (1.18-mm)	0	100
#30 (600-µm)	2	98
#50 (300-µm)	54	46
#100 (150-µm)	82	18
#200 (75-µm)	88	12



Orcutt Key Site 3, Southern Hills

SL-14813-SB

MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-02

PROCEDURE USED: A

PREPARATION METHOD: Moist

RAMMER TYPE: Mechanical

SPECIFIC GRAVITY: 2.65 (assumed)

October 15, 2007

Trench #1 @ 0.0 - 5.0'

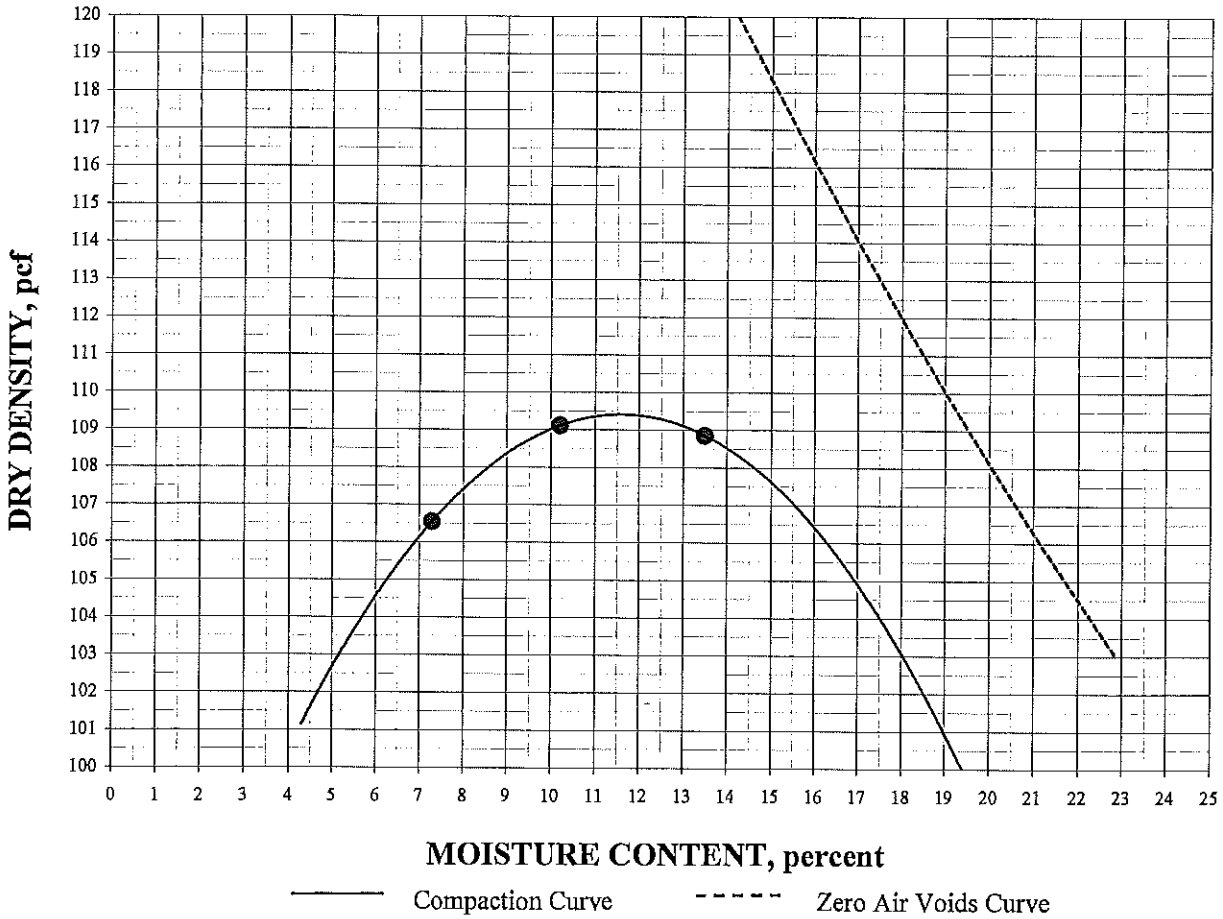
Poorly Graded Sand with Silt (SP-SM)

SIEVE DATA:

Sieve Size	% Retained
3/4"	0
3/8"	0
#4	0

MAXIMUM DRY DENSITY: 109.5 pcf

OPTIMUM MOISTURE: 11.5%



Orcutt Key Site 3, Southern Hills

SL-14813-SB

DIRECT SHEAR

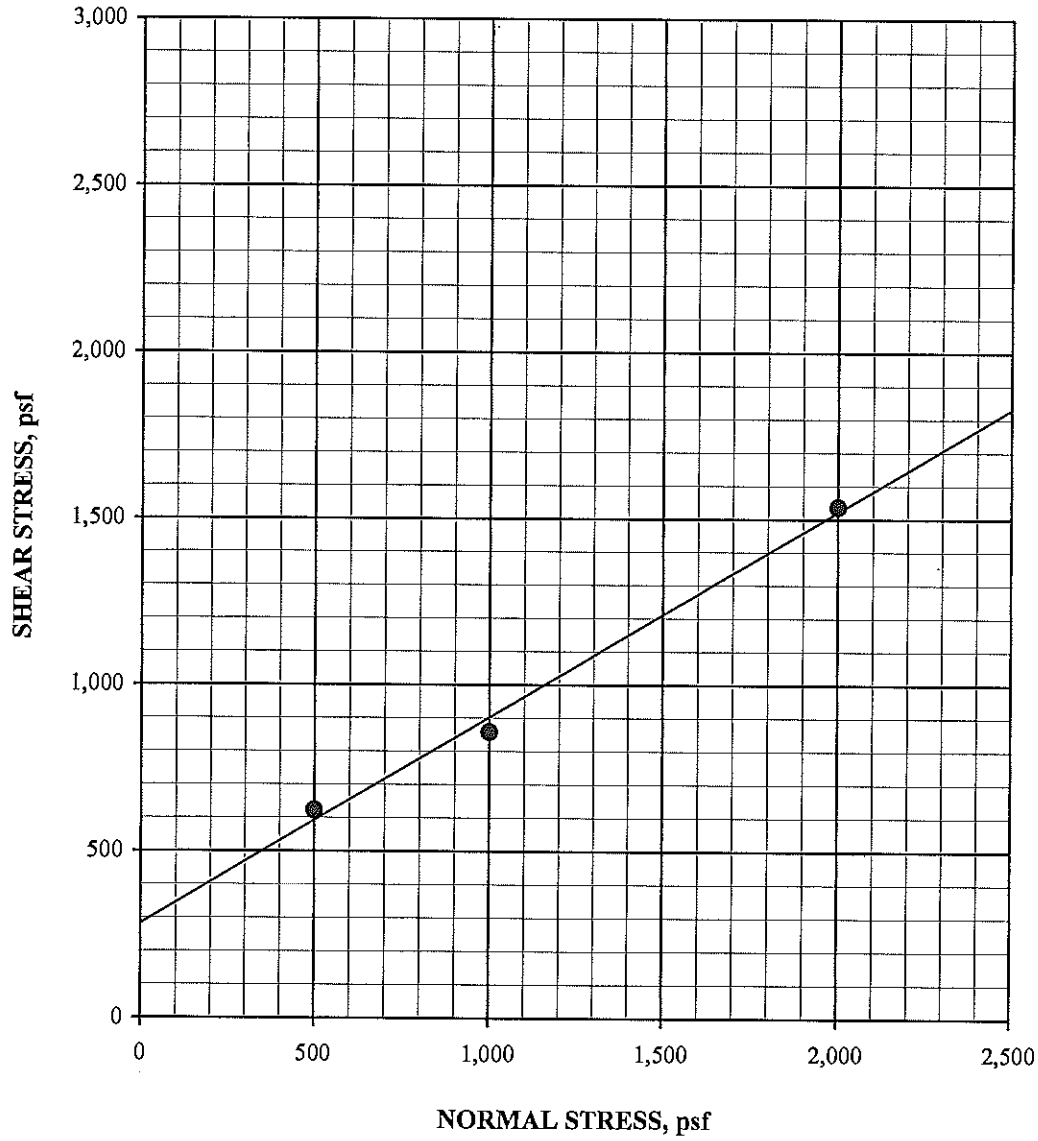
ASTM D 3080-04 (modified for consolidated, undrained conditions)

October 15, 2007

Trench #1 @ 0.0 - 5.0'
Poorly Graded Sand with Silt (SP-SM)
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 98.6 pcf
INITIAL MOISTURE CONTENT: 11.5 %
PEAK SHEAR ANGLE (Ø): 32°
COHESION (C): 284 psf

SHEAR vs. NORMAL STRESS



Orcutt Key Site 3, Southern Hills SL-14813-SB

DIRECT SHEAR continued

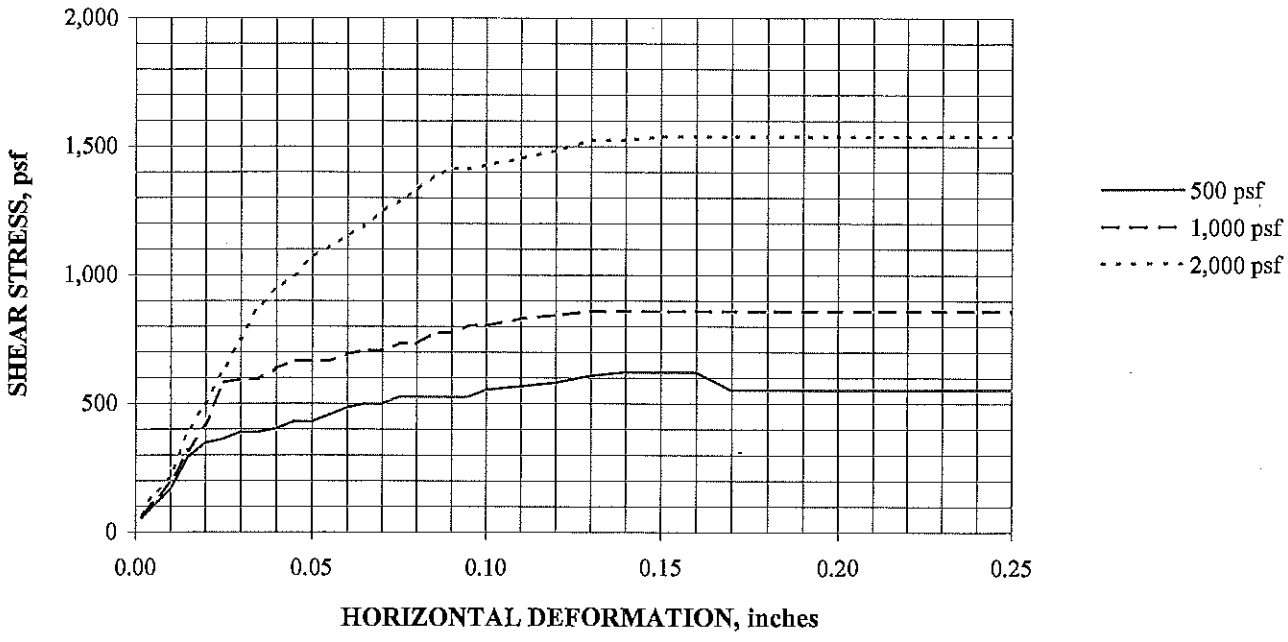
ASTM D 3080-04 (modified for consolidated, undrained conditions)

Trench #1 @ 0.0 - 5.0' October 15, 2007

Poorly Graded Sand with Silt (SP-SM)

Compacted to 90% RC, saturated SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	11.5	11.5	11.5	11.5
DRY DENSITY, pcf	98.6	98.6	98.6	98.6
SATURATION, %	45.0	45.0	45.0	45.0
VOID RATIO	0.678	0.678	0.678	0.678
DIAMETER, inches	2.375	2.375	2.375	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	23.3	22.5	22.2	
DRY DENSITY, pcf	102.2	103.7	104.5	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.618	0.594	0.582	
HEIGHT, inches	0.96	0.95	0.94	



Orcutt Key Site 3, Southern Hills

SL-14813-SB

PARTICLE SIZE ANALYSIS

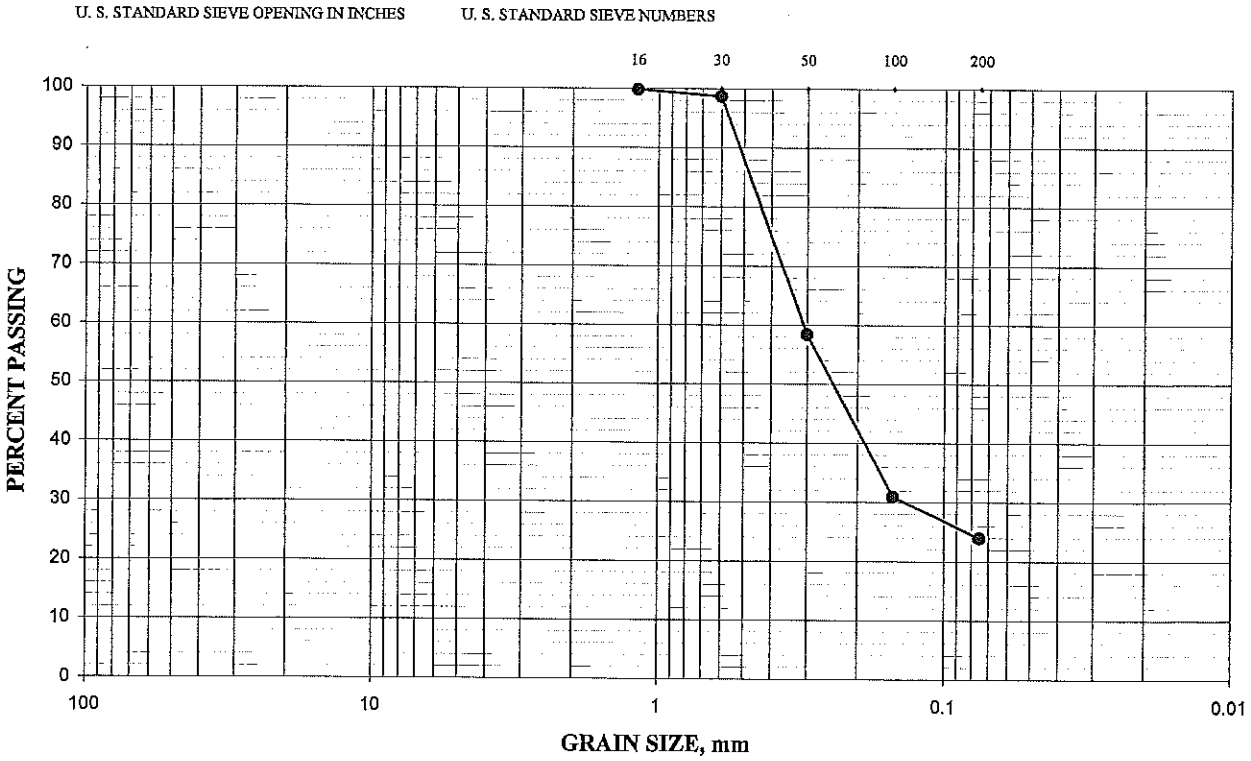
ASTM D 422-02; D 1140-06

Trench #1 @ 5.0 - 8.0'

October 15, 2007

Silty Sand (SM)

Sieve size	% Retained	% Passing
#16 (1.18-mm)	0	100
#30 (600-µm)	1	99
#50 (300-µm)	42	58
#100 (150-µm)	69	31
#200 (75-µm)	76	24



Orcutt Key Site 3, Southern Hills

SL-14813-SB

RESISTANCE '*R*' VALUE AND EXPANSION PRESSURE

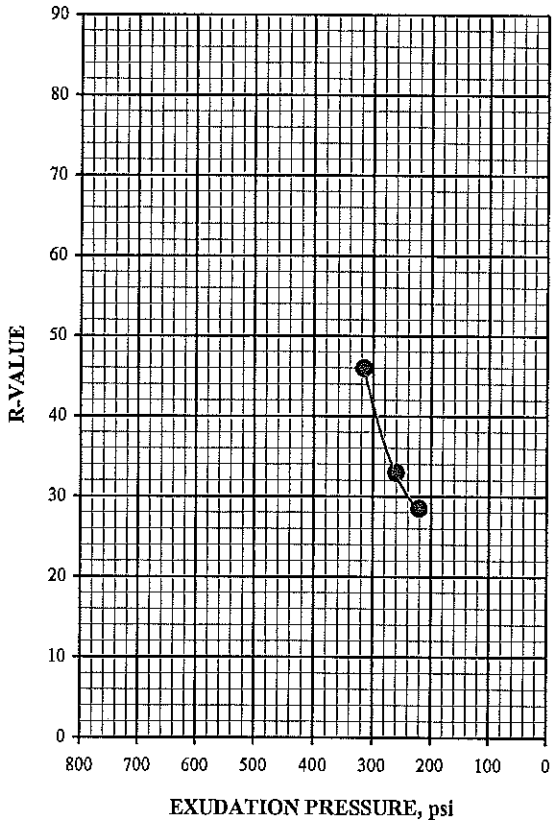
ASTM D 2844-07

October 15, 2007

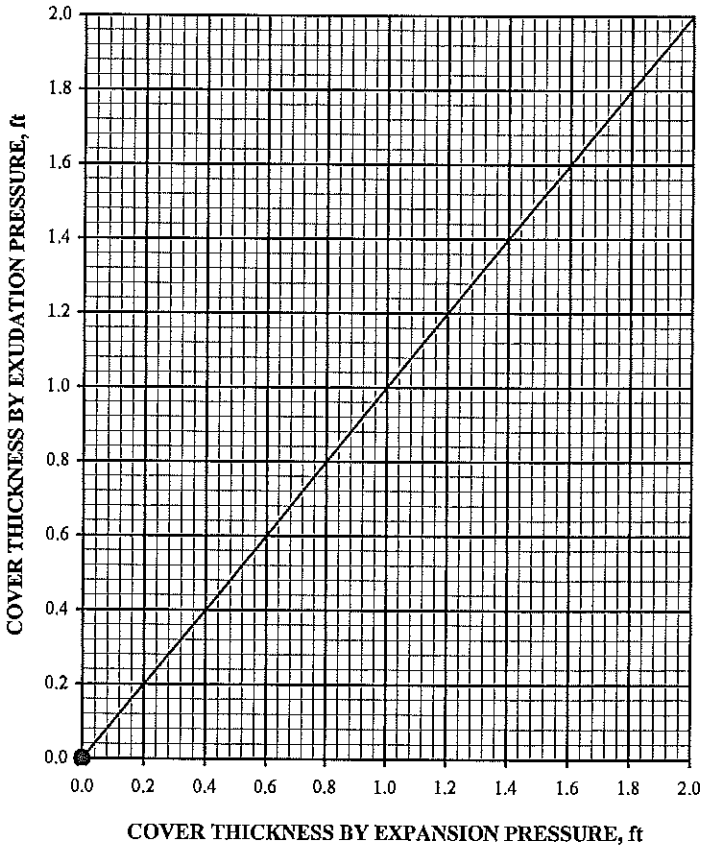
Trench #1 @ 5.0 - 8.0'
Silty Sand (SM)

Dry Density @ 300 psi Exudation Pressure: 120.3-pcf
%Moisture @ 300 psi Exudation Pressure: 11.4%
R-Value - Exudation Pressure: 42
R-Value - Expansion Pressure: N/A
R-Value @ Equilibrium: 42

EXUDATION PRESSURE CHART



EXPANSION PRESSURE CHART



Orcutt Key Site 3, Southern Hills

SL-14813-SB

PARTICLE SIZE ANALYSIS

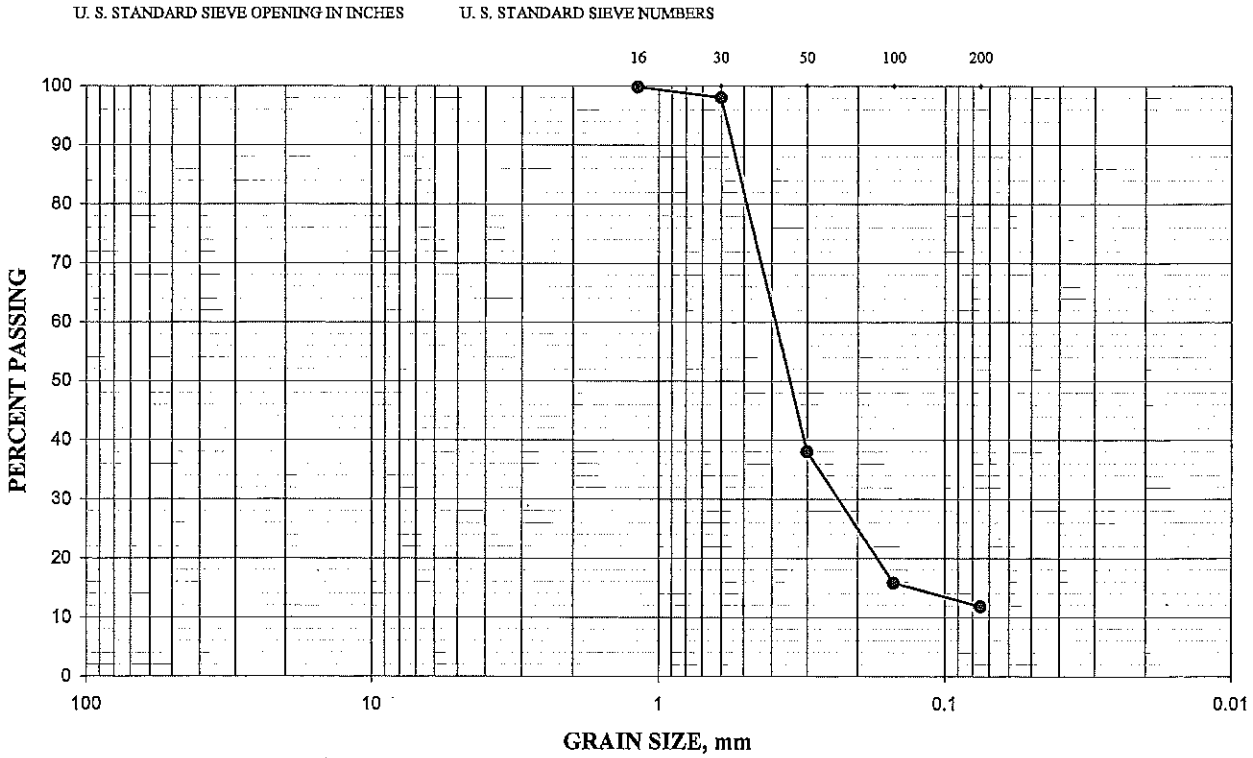
ASTM D 422-02; D 1140-06

Trench #13 @ 0.0 - 3.0'

October 15, 2007

Poorly Graded Sand with Silt (SP-SM)

Sieve size	% Retained	% Passing
#16 (1.18-mm)	0	100
#30 (600-µm)	2	98
#50 (300-µm)	62	38
#100 (150-µm)	84	16
#200 (75-µm)	88	12



Orcutt Key Site 3, Southern Hills

SL-14813-SB

RESISTANCE '*R*' VALUE AND EXPANSION PRESSURE

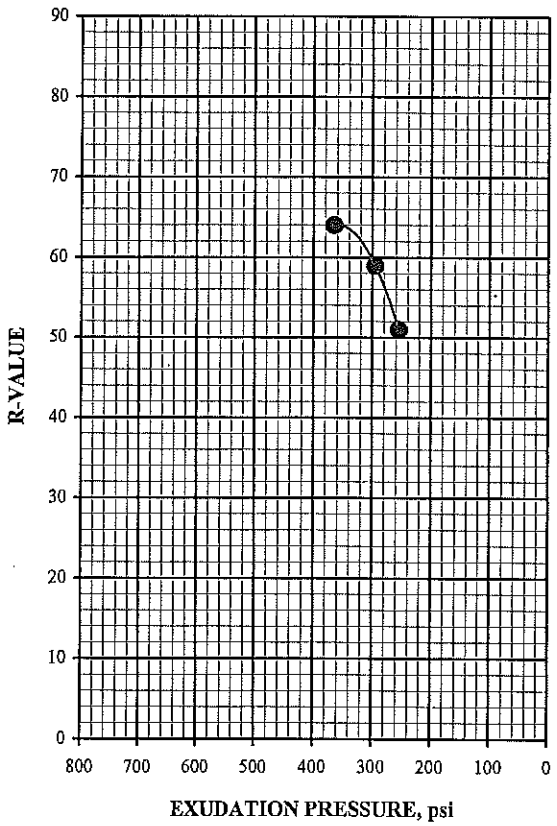
ASTM D 2844-07

October 15, 2007

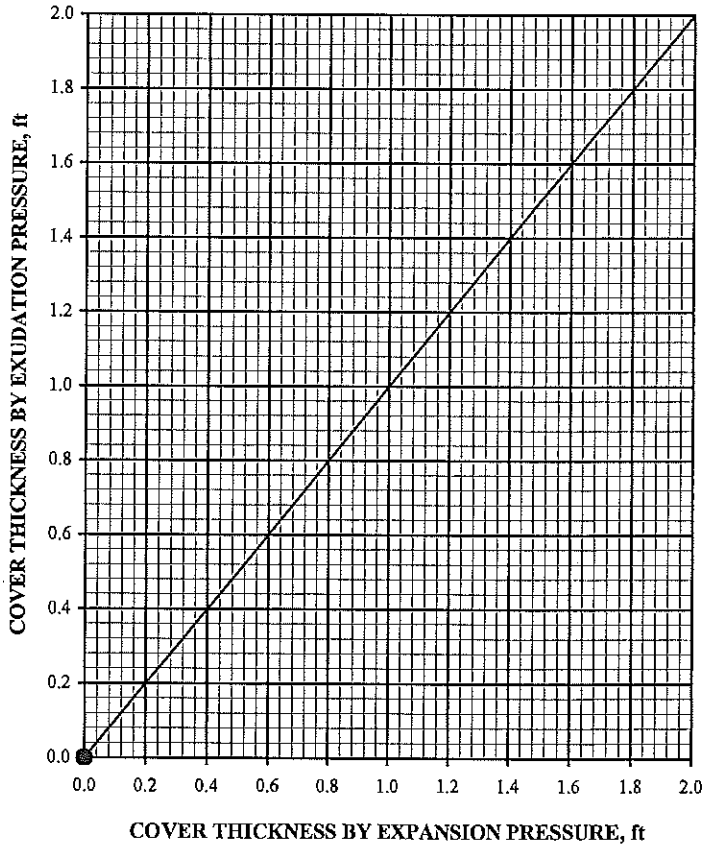
Trench #13 @ 0.0 - 3.0'
Poorly Graded Sand with Silt (SP-SM)

Dry Density @ 300 psi Exudation Pressure: 103.4-pcf
%Moisture @ 300 psi Exudation Pressure: 18.4%
R-Value - Exudation Pressure: 60
R-Value - Expansion Pressure: N/A
R-Value @ Equilibrium: 60

EXUDATION PRESSURE CHART



EXPANSION PRESSURE CHART



Orcutt Key Site 3, Southern Hills

SL-14813-SB

PARTICLE SIZE ANALYSIS

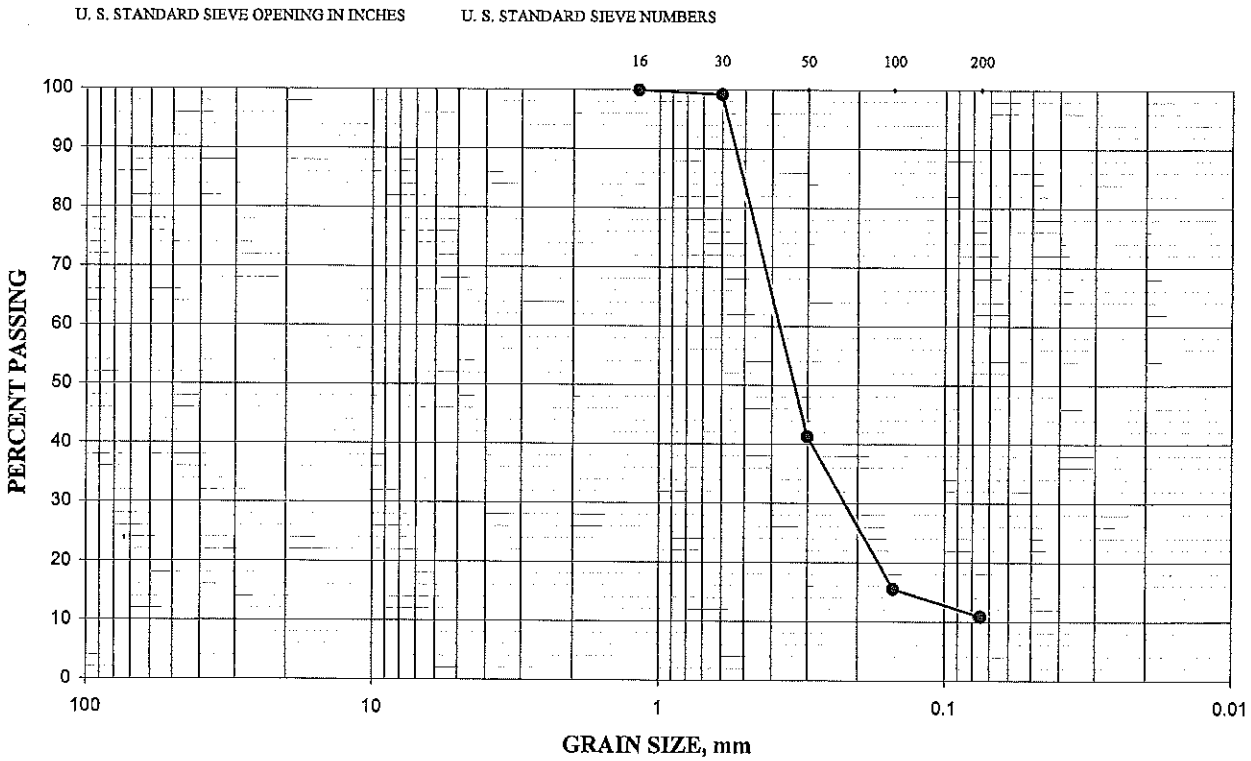
ASTM D 422-02; D 1140-06

Trench #18 @ 5.0 - 8.0'

October 15, 2007

Poorly Graded Sand with Silt (SP-SM)

Sieve size	% Retained	% Passing
#16 (1.18-mm)	0	100
#30 (600-µm)	1	99
#50 (300-µm)	59	41
#100 (150-µm)	84	16
#200 (75-µm)	89	11



Orcutt Key Site 3, Southern Hills

SL-14813-SB

MOISTURE-DENSITY COMPACTION TEST

ASTM D 1557-02

PROCEDURE USED: A

PREPARATION METHOD: Moist

RAMMER TYPE: Mechanical

SPECIFIC GRAVITY: 2.65 (assumed)

October 15, 2007

Trench #18 @ 5.0 - 8.0'

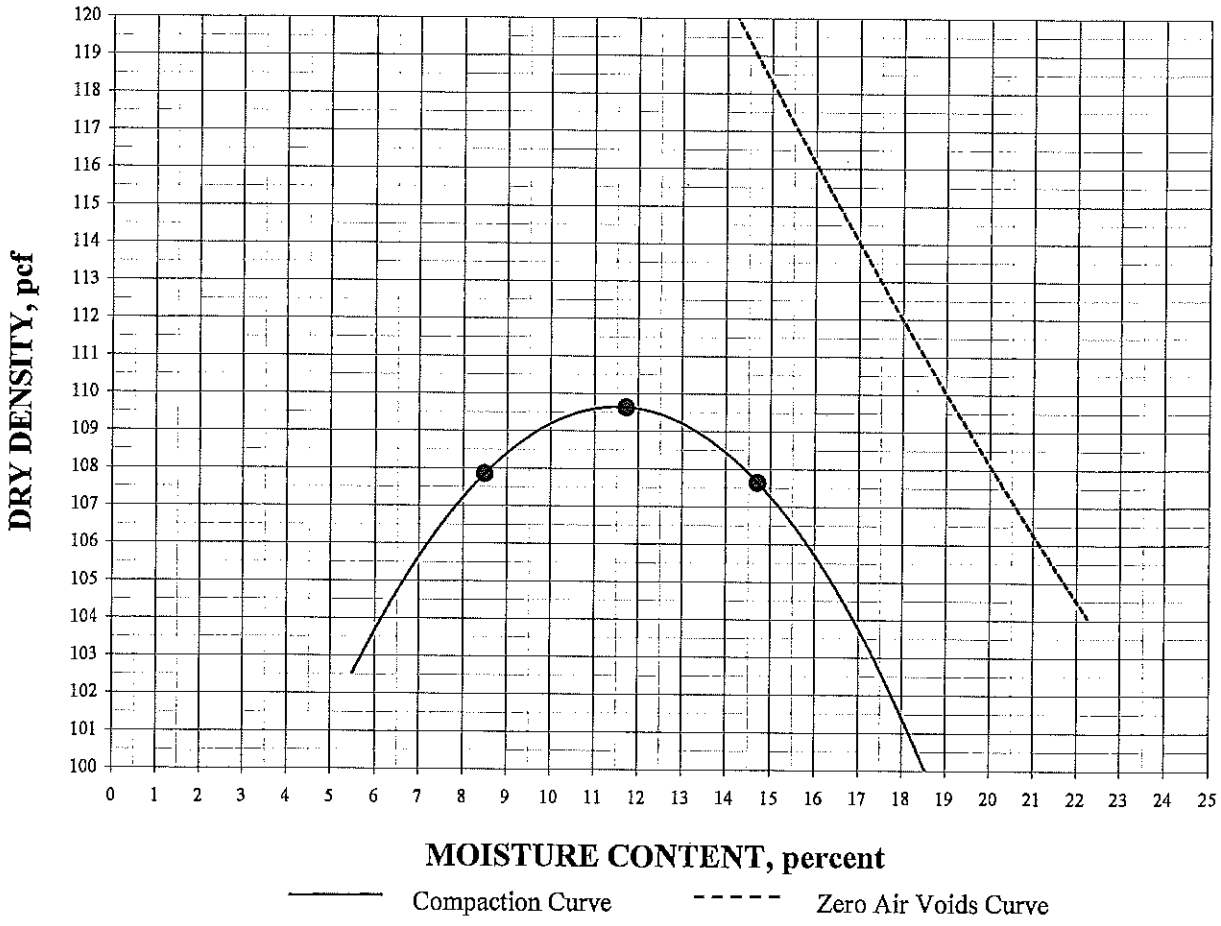
Poorly Graded Sand with Silt (SP-SM)

SIEVE DATA:

Sieve Size	% Retained
3/4"	0
3/8"	0
#4	0

MAXIMUM DRY DENSITY: 109.5 pcf

OPTIMUM MOISTURE: 11.5%



Orcutt Key Site 3, Southern Hills

SL-14813-SB

DIRECT SHEAR

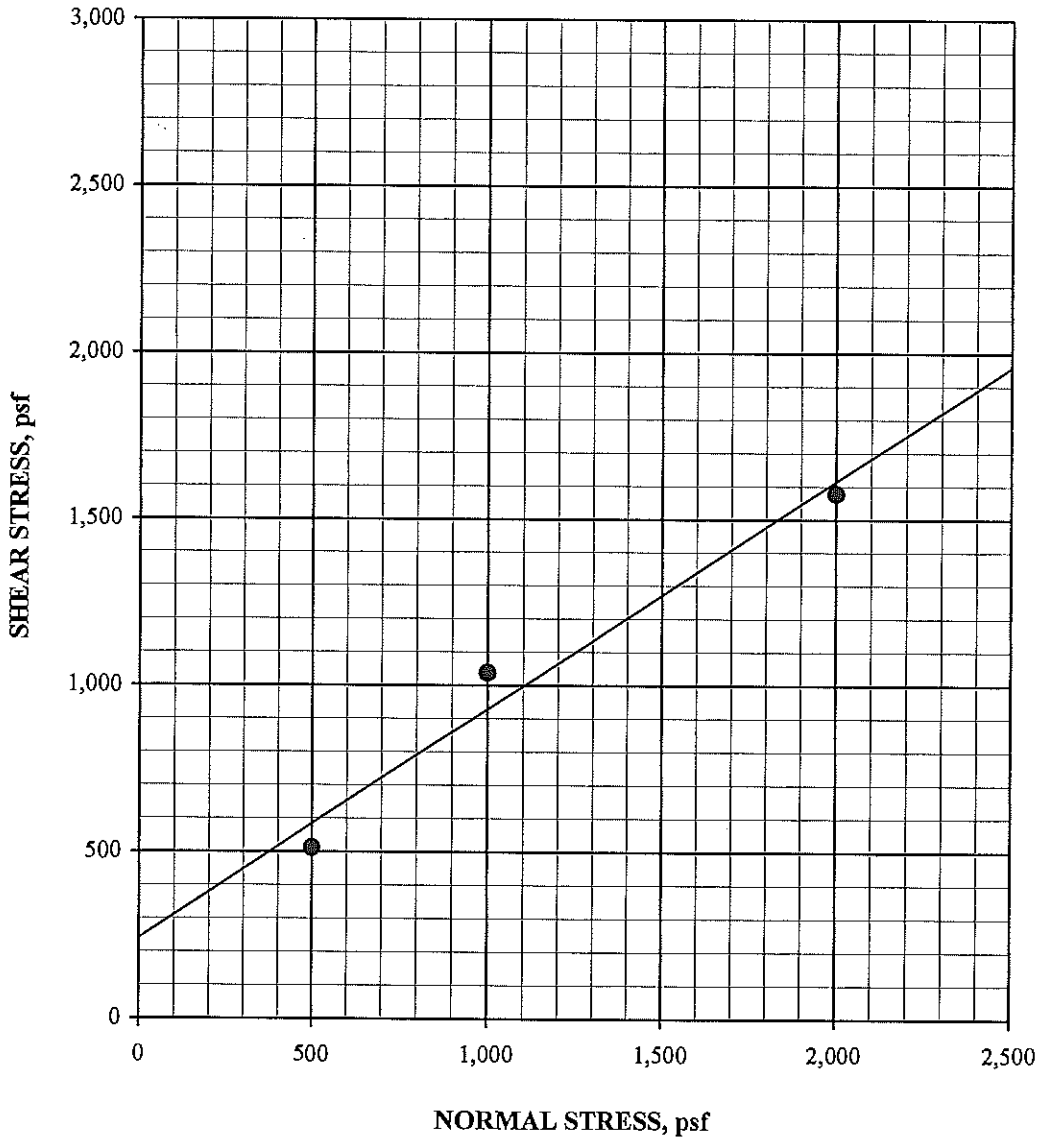
ASTM D 3080-04 (modified for consolidated, undrained conditions)

October 15, 2007

Trench #18 @ 5.0 - 8.0'
Poorly Graded Sand with Silt (SP-SM)
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 98.6 pcf
INITIAL MOISTURE CONTENT: 9.5 %
PEAK SHEAR ANGLE (Ø): 34°
COHESION (C): 242 psf

SHEAR vs. NORMAL STRESS



Orcutt Key Site 3, Southern Hills SL-14813-SB

DIRECT SHEAR continued

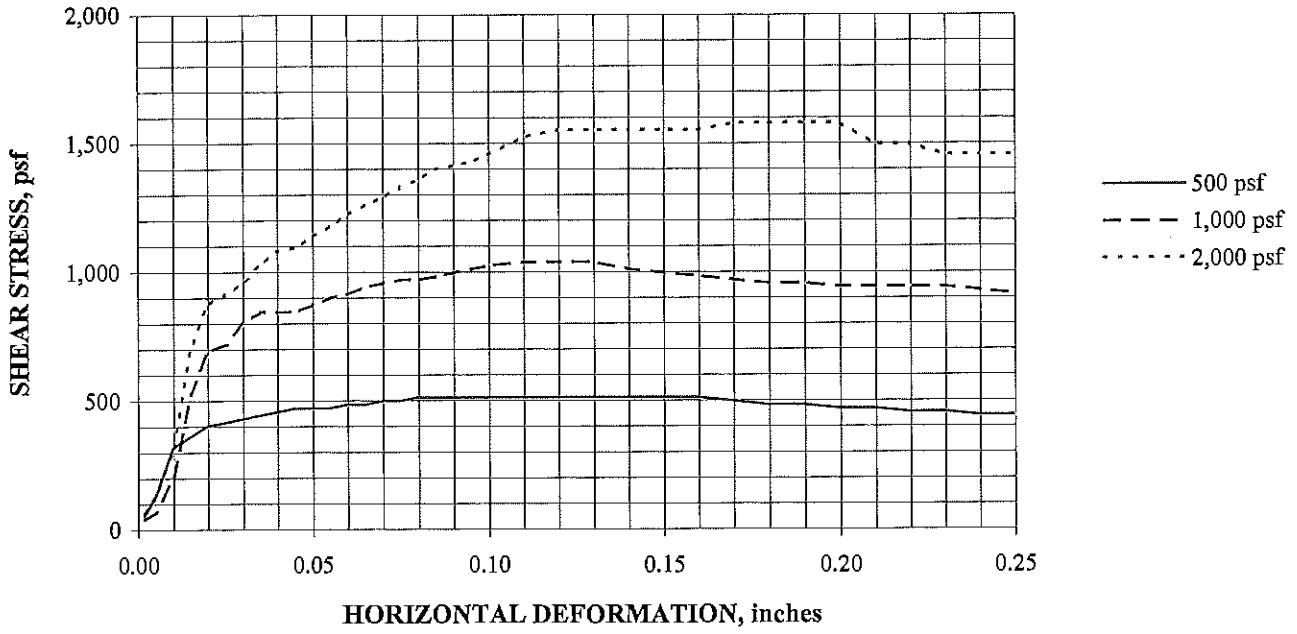
ASTM D 3080-04 (modified for consolidated, undrained conditions)

Trench #18 @ 5.0 - 8.0' October 15, 2007

Poorly Graded Sand with Silt (SP-SM)

Compacted to 90% RC, saturated SPECIFIC GRAVITY: 2.65 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	9.5	9.5	9.5	9.5
DRY DENSITY, pcf	98.6	98.6	98.6	98.6
SATURATION, %	37.1	37.1	37.1	37.1
VOID RATIO	0.678	0.678	0.678	0.678
DIAMETER, inches	2.375	2.375	2.375	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	24.1	23.1	22.6	
DRY DENSITY, pcf	101.1	102.7	103.5	
SATURATION, %	100.0	100.0	100.0	
VOID RATIO	0.636	0.611	0.597	
HEIGHT, inches	0.98	0.96	0.95	



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TRANSMITTAL LETTER

DATE: October 8, 2007

ATTENTION: **Doug Dunham**

TO: Earth Systems Pacific
2049 North Preisker Lane, Suite E
Santa Maria, CA 93454

SUBJECT: Laboratory Test Data
Orcutt Key Site 3 - Southern Hills
Your #SL-14813-SB, SA #07-1299LAB

COMMENTS: Enclosed are the results for the subject project.

James T. Keegan
Laboratory Manager

431 West Baseline Road · Claremont, CA 91711
Phone: 909.626.0967 · Fax: 909.626.3316

Table 1 - Laboratory Tests on Soil Samples

Earth Systems Pacific
Orcutt Key Site 3 - Southern Hills
Your #SL-14813-SB, SA #07-1299LAB
27-Sep-07

Sample ID			TP-1 @ 5-8' SP-SC	TP-18 @ 5-8' SP
Resistivity		**Units**		
as-received		ohm-cm	60,000	680,000
saturated		ohm-cm	13,600	52,000
pH			5.9	6.3
Electrical Conductivity		mS/cm	0.05	0.04
Chemical Analyses				
Cations				
calcium	Ca^{2+}	mg/kg	14	15
magnesium	Mg^{2+}	mg/kg	3.0	3.0
sodium	Na^{1+}	mg/kg	16	7.0
potassium	K^{1+}	mg/kg	10.0	6.0
Anions				
carbonate	CO_3^{2-}	mg/kg	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	55	52
flouride	F^{1-}	mg/kg	ND	ND
chloride	Cl^{1-}	mg/kg	2.0	1.0
sulfate	SO_4^{2-}	mg/kg	8.0	9.0
phosphate	PO_4^{3-}	mg/kg	ND	1.0
Other Tests				
ammonium	NH_4^{1+}	mg/kg	1.5	1.2
nitrate	NO_3^{1-}	mg/kg	ND	0.5
sulfide	S^{2-}	qual	na	na
Redox		mV	na	na

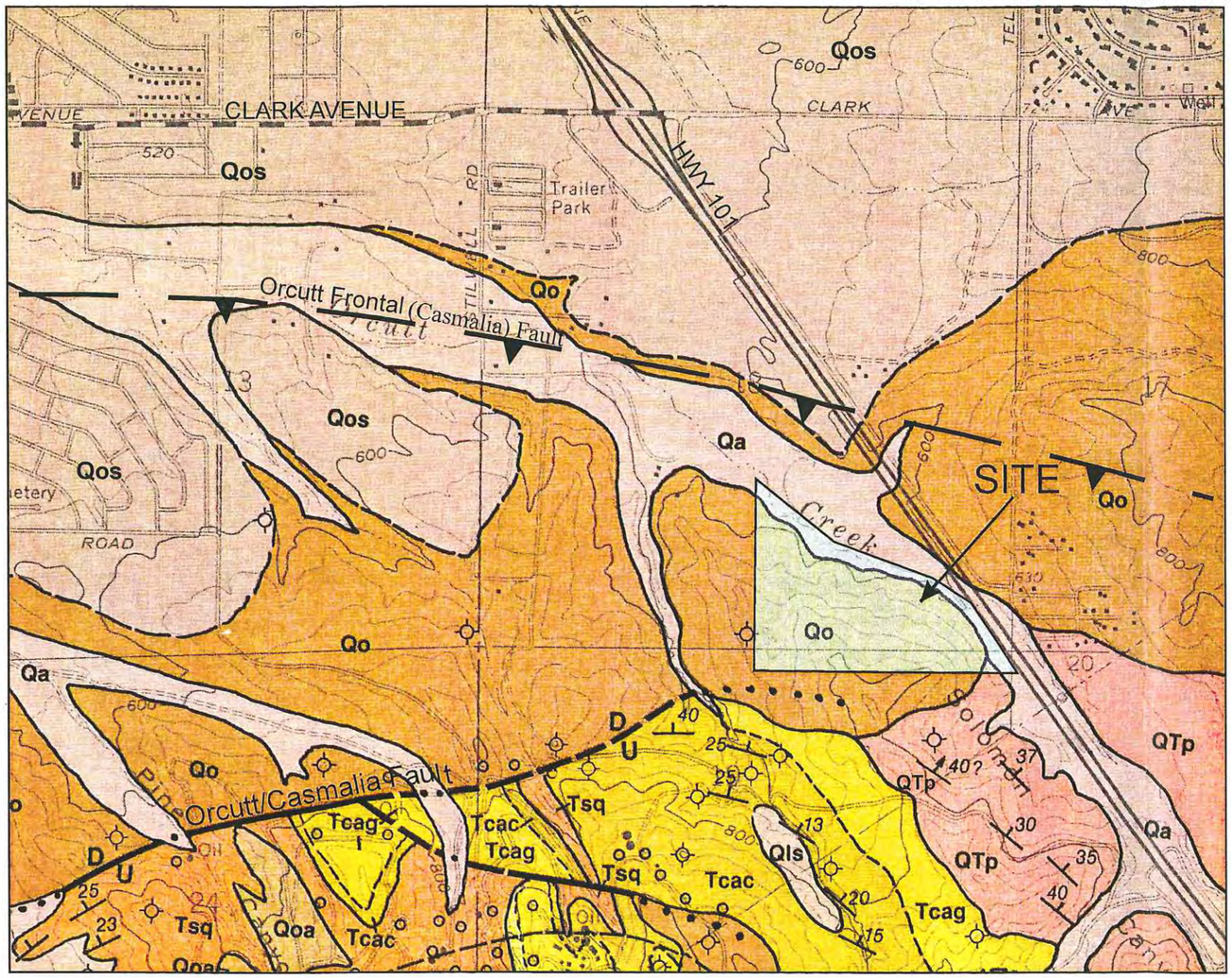
Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

APPENDIX C

Geologic Map
Historical Earthquake/Fault Map
Site Response Spectra

GEOLOGIC MAP

ORCUTT KEY SITE 3
SOUTHERN HILLS
South of Clark Ave., West of Highway 101
Orcutt Area of Santa Barbara County, California



Extract from: Geologic Map of the Casmalia and Orcutt Quadrangles, T.W. Dibblee, Jr., 1989
Location of projected Orcutt Frontal Fault provided by D.G. Clark, 1993
Orcutt/Casmalia fault name was taken from the Orcutt Community Plan, revised July 2002

EXPLANATION

Geologic Units

Qa

Alluvium-valley and floodplain deposits

Qls

Landslide debris

Qoa

Older Alluvium-remnants of weakly consolidated stream terrace and alluvial fan deposits

Qos

Older Dune Sand-in places weakly consolidated

Qo

Orcutt Sand-tan to rusty brown, poorly consolidated to locally indurated, wind deposited sand

QTp

Paso Robles formation-light gray to reddish, weakly consolidated alluvial sediments and conglomerate

Tca (Tcag / Tcac)

Careaga Sand-Tca-Undivided, weakly indurated, massive, grayish yellow, locally pebbly sand, Tcag-Graciosa member, thick bedded, grayish yellow, weakly indurated sand, Tcac-Cebada member, massive, tan-yellow, fine-grained sand

Tsq

Sisquoc formation-light gray claystone, slightly diatomaceous or siliceous clay shale

Geologic Symbols

Contact
Dashed where approximately located or inferred

High-angle fault
Dashed where approximately located or inferred; dotted where concealed

Thrust or reverse fault
Dashed where approximately located or inferred; dotted where concealed. Saw-teeth on upper plate. Dip of fault plane between 30° and 80°

Anticline
Showing axis at surface. Dashed where approximately located; dotted where concealed

Syncline
Showing axis at surface. Dashed where approximately located; dotted where concealed

Horizontal 30 Inclined 90 Vertical
Strike and dip of beds

N

Approx. Scale: 1" = 1500'

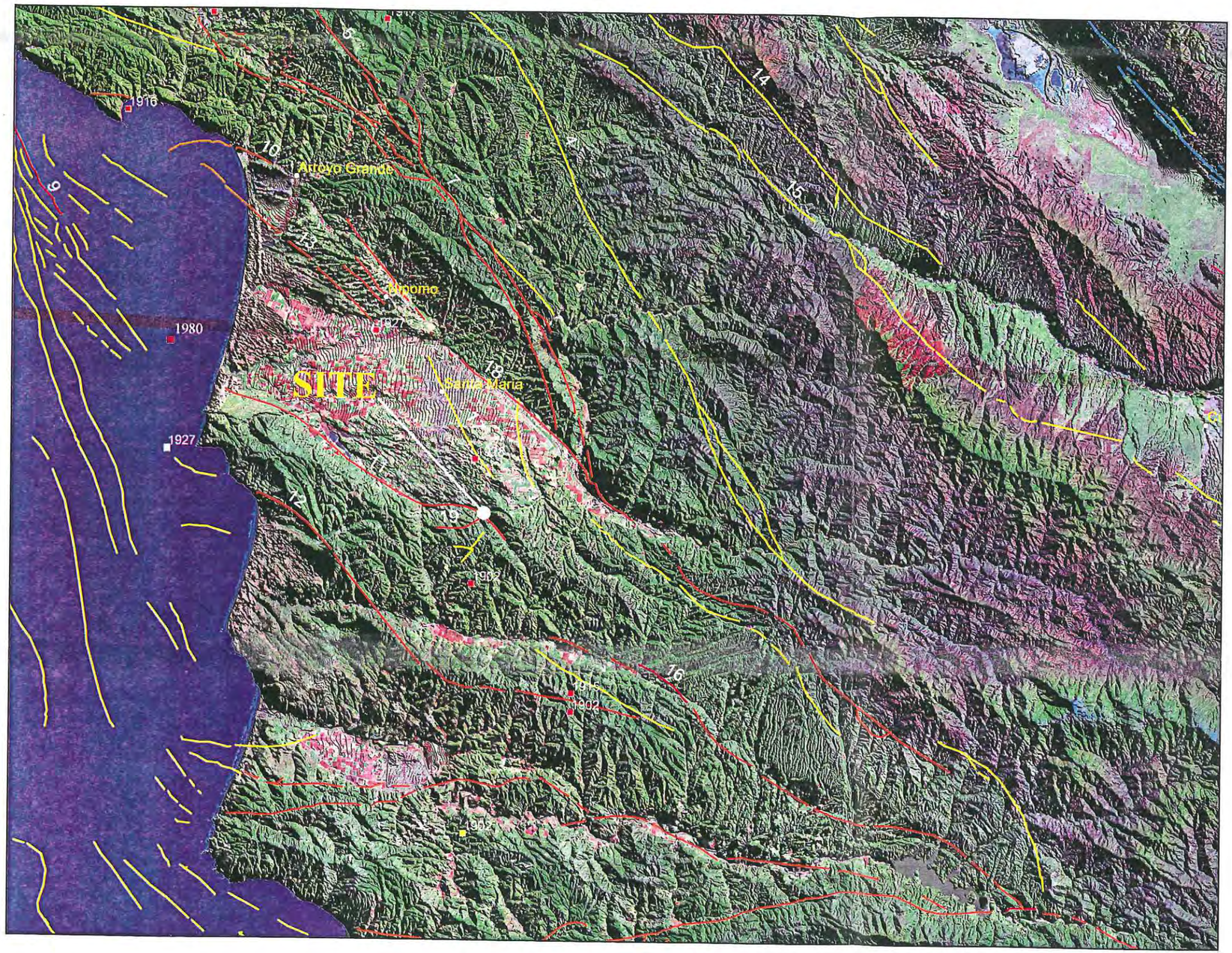
Earth Systems Pacific
4378 Old Santa Fe Road, San Luis Obispo, CA 93401
October 2007

(805) 544-3276 - (805) 544-1786 Fax
www.earthsys.com - e-mail: esc@earthsystems.com

SL-14813-SB
ORCUTT KEY SITE 3 SOUTHERN HILLS-100907geology map.cdr

HISTORICAL EARTHQUAKE/ FAULT MAP

ORCUTT KEY SITE 3
SOUTHERN HILLS
South of Clark Ave., West of Highway 101
Orcutt Area of Santa Barbara County, California



LEGEND

- Historic rupture (<200 years)
- Holocene fault (<10,000 years)
- Late Quaternary (<700,000 years)
- Quaternary fault (<1.6 million)

HISTORICAL EARTHQUAKE MAGNITUDE

5.0 to 5.9 | 6.0 to 6.9 | 7.0 to 7.9

FAULTS

1 San Andreas
2 San Juan
3 Rinconada
4 East Huasna
5 Oceanic
6 Cambria
7 West Huasna
8 Los Osos
9 Hosgri-San Simeon
10 San Luis Range
11 Orcutt Frontal (Casmalia)
12 Lions Head
13 Oceano
14 La Panza
15 South Cuyama
16 Los Alamos
17 Santa Maria
18 Santa Maria River
19 Orcutt/Casmalia

Note: Not all faults are shown on map

REFERENCES

Blake, T.F., EQSEARCH, updated 2007
Jennings, C.W, 1994

N

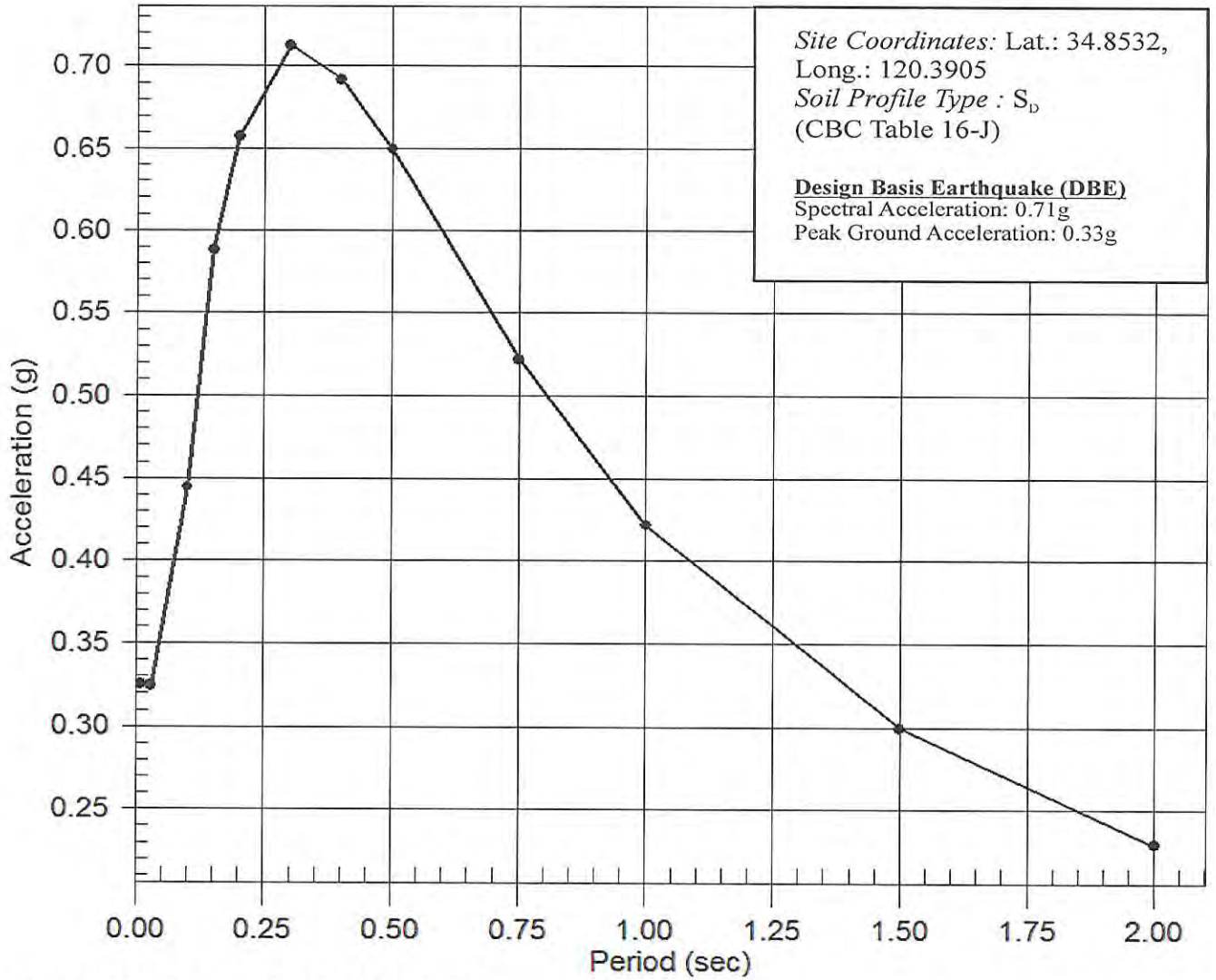
(Approximate Scale: 1" = 6 miles)

Earth Systems Pacific
4378 Old Santa Fe Road, San Luis Obispo, CA 93401
October 2007

(805) 544-3276 - (805) 544-1786 Fax
www.earthsys.com - e-mail: esc@earthsystems.com
SL - 14813 - SB

SITE RESPONSE SPECTRA

ORCUTT KEY SITE 3
SOUTHERN HILLS
South of Clark Avenue and West of Highway 101
Orcutt Area of Santa Barbara County, California



EARTH SYSTEMS PACIFIC

4378 Old Santa Fe Road, San Luis Obispo, CA 93401

(805) 544-3276 - (805) 544-1786

www.earthsys.com - email: esc@earthsys.com

October 2007

SL-14813-SB

ORCUTT KEY SITE 3 SOUTHERN HILLS-100907spectra.cdr

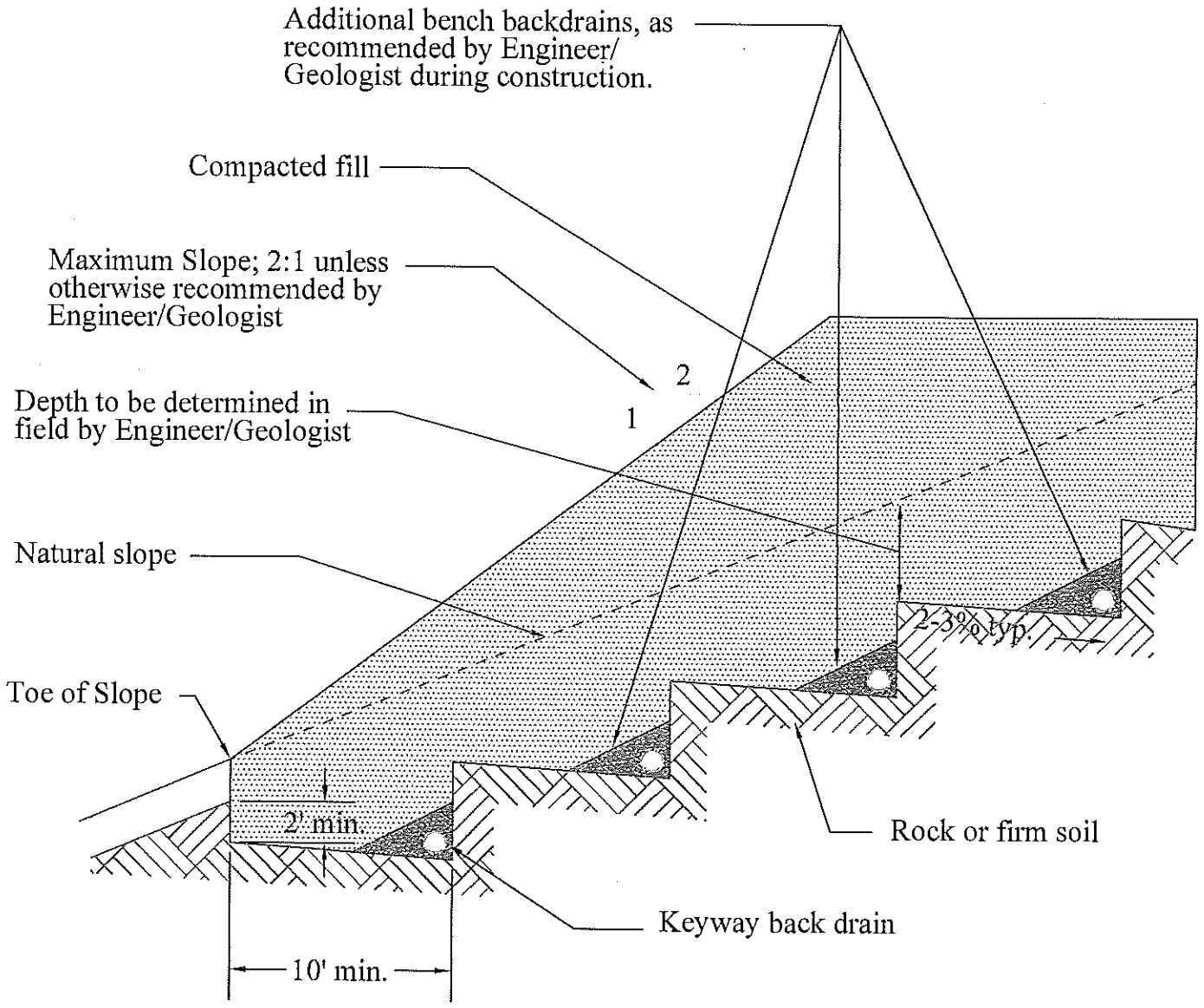
APPENDIX D

Typical Bench and Keyway, and Backdrain Details

BENCH and KEYWAY DETAIL (Typical)

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVEMENTS

South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, California



SCHEMATIC ONLY
NOT TO SCALE

Earth Systems Pacific

2049 North Preisker Lane, Suite E
Santa Maria, California 93454
(805) 928-2991 • FAX (805) 928-9253
E-mail: esc@earthsys.com

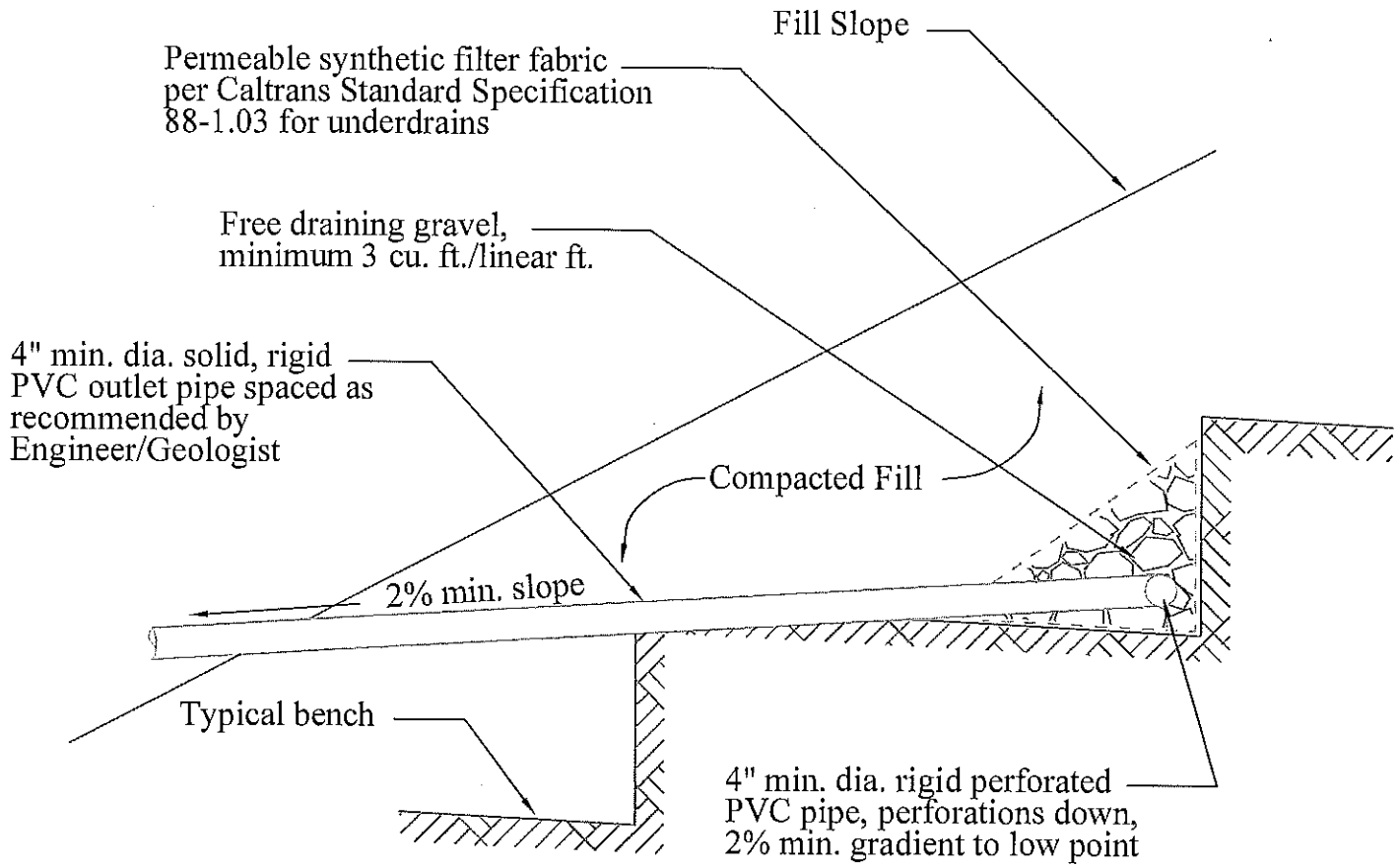
Ocotber 12, 2007 smk SL-14813-SB

BENCH-D01-V03.dwg

BACK DRAIN DETAIL (Typical)

ORCUTT KEY SITE 3, SOUTHERN HILLS
INTERIOR STREET IMPROVMENTS

South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, California



Note: A prefabricated panel drainage system (Advanedge, Miradrain, etc.) may be substituted for the gravel / pipe system, provided it is installed in accordance with the manufacturer's recommendations

SCHEMATIC ONLY
NOT TO SCALE

Earth Systems Pacific

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October 12, 2007 smk SL-14318-SB
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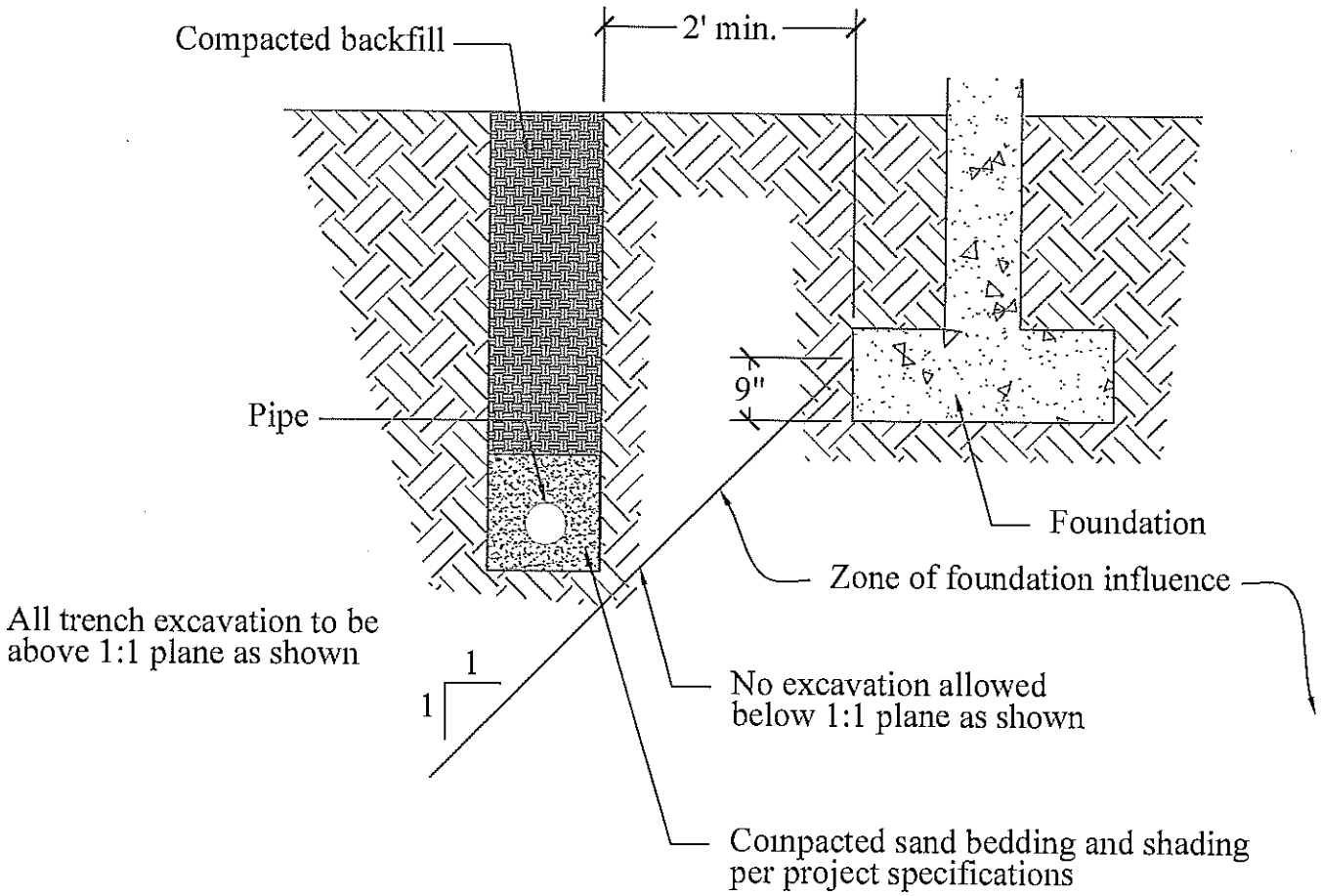
APPENDIX E

Typical Detail A: Pipe Placed Parallel to Foundations

TYPICAL DETAIL A:
PIPE PLACED PARALLEL TO FOUNDATIONS

ORCUTT KEY SITE 3, SOUTHERN HILLS INTERIOR STREET IMPROVEMENTS

South of Clark Avenue, West of Highway 101
Orcutt Area of Santa Barbara County, California



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SOILS ENGINEERING REPORT
ORCUTT KEY SITE 3
SOUTH OF CLARK AVENUE, WEST OF HIGHWAY 101
ORCUTT AREA
SANTA BARBARA COUNTY, CALIFORNIA

February 10, 2006

Prepared for

Centex Homes, Central Coast Division

Prepared by

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February 10, 2006

FILE NO.: SL-14813-SA

Mr. Urban McLellan
Centex Homes, Central Coast Division
735 Tank Farm Road, # 100
San Luis Obispo, California 93401

PROJECT: ORCUTT KEY SITE 3
SOUTH OF CLARK AVENUE, WEST OF HIGHWAY 101
ORCUTT AREA OF SANTA BARBARA COUNTY, CALIFORNIA

SUBJECT: Soils Engineering Report

REF: Proposal for a Soils Engineering Report, Orcutt Key Site 3, South of Clark Avenue, East of Stillwell Road, Orcutt Area of Santa Barbara County, California, by Earth Systems Pacific, dated October 18, 2005, Doc. No. 0510-040.PRP.

Dear Mr. McLellan:

In accordance with your authorization of the above-referenced proposal, this soils engineering report has been prepared for use in the development of plans and specifications for the Orcutt Key Site 3 project located south of Clark Avenue and west of Highway 101 in the Orcutt area of Santa Barbara County, California. Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, slabs-on-grade and exterior flatwork, retaining walls, pavement sections, drainage around improvements, and construction observation and testing are presented herein. Six copies of this report are being furnished for your use.

We appreciate the opportunity to have provided services for this project and look forward to working with you again in the future. If there are any questions concerning this report, please do not hesitate to contact me.

Sincerely,

Earth Systems Pacific

Doug Dunham

Doug Dunham, G.E.
Date Signed: 2-10-06

REGISTERED PROFESSIONAL ENGINEER
DOUGLAS A. DUNHAM
No. 2586
Exp. 12-31-07
GEOTECHNICAL
STATE OF CALIFORNIA

Doc. No.0602-036.SER/msd

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1.0 INTRODUCTION

The Orcutt Key Site 3 project is south of Clark Avenue and west of Highway 101 in the Orcutt area of Santa Barbara County, California, and is shown on the Boring Location Map in Appendix A. At the writing of this report, development plans were not available for our review; however, we understand the project will generally consist of developing a residential subdivision on the portion of the property that is on the northerly side of Orcutt Creek (site). Although the property extends southerly of Orcutt Creek, this report only covers the area northerly of Orcutt Creek. We have assumed the residences will be one to two-story, will be of wood and steel frame construction, will utilize concrete slabs-on-grade, and will be supported by shallow foundation systems. Masonry retaining walls, up to a height of 8 feet, for sitework or connected to or forming part of the residences may also be constructed. Retaining walls are anticipated to use continuous footings for support. Maximum line loads of 1.5 kips per lineal foot, and maximum point loads of 10 kips were assumed.

Surface and subsurface improvements are also planned. We have assumed that access roads will be paved with asphalt concrete (AC) over aggregate base (AB) and that flatwork for pedestrian use will consist of Portland cement concrete (PCC). Municipal sewer, water, storm drain, power, and communication utilities will service the project; no effluent disposal systems for sewage or drainage basins for runoff will be constructed.

Grading plans were not available at the writing of this report; however, we have assumed that cuts and fills of 10 feet or more will be needed to develop the residential building and improvement areas.

2.0 SCOPE OF SERVICES

The scope of work for the soils engineering report included a general site reconnaissance, subsurface exploration, laboratory testing of selected soil samples, geotechnical evaluation of

the data collected, and preparation of this report. The report and subsequent preliminary geotechnical recommendations were based on information provided by the client.

The report and recommendations are intended to comply with the considerations of Sections 1804.2 through 1804.5 and 3309.5 of the 2001 Edition of the California Building Code (CBC), and common geotechnical engineering practice in this area. The test procedures were accomplished in general conformance with the standards noted, as modified by common geotechnical practice in this area.

Preliminary geotechnical recommendations for site preparation, grading, utility trenches, foundations, slabs-on-grade and exterior flatwork, retaining walls, pavement sections, drainage around improvements, and construction observation and testing are presented to guide the development of project plans and specifications. It is our intent that this report be used exclusively by the client in the preparation of plans and specifications. Application beyond this intent is strictly at the user's risk. If future property owners wish to use this report, such use will be allowed to the extent the report is applicable, only if the user agrees to be bound by the same contractual conditions as the original client, or contractual conditions that may be applicable at the time of the report use.

This report does not address issues in the domain of contractors such as, but not limited to, site safety, subsidence of the site due to compaction, loss of volume due to stripping of the site, shrinkage of soils during compaction, excavatability, shoring, temporary slope angles, construction methods, etc. Analyses of the areal and/or site geology, and of the soil for mold potential, radioisotopes, asbestos (either man-made or naturally occurring), hydrocarbons, or other chemical properties are beyond the scope of this report. Ancillary structures such as temporary access roads, fences, flag and light poles, signage, and nonstructural fills are also not within our scope and are not addressed.

This firm should be retained to provide consultation as the design progresses, to review project plans as they near completion, to assist in verifying that pertinent geotechnical issues have been addressed, and to aid in conformance with the intent of this report. In the event that there are any changes in the nature, design, or location of improvements, or if any assumptions used in the preparation of this report prove to be incorrect, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and the conclusions of this report modified or verified in writing. The criteria presented in this report are considered preliminary until such time as any peer review or review by any jurisdiction has been completed, conditions are observed by the soils engineer in the field during construction, and the recommendations have been verified as appropriate or modified in writing.

3.0 SITE SETTING

The site is generally comprised of two relatively level areas separated by a moderately sloping area. The level area to the north (See Area A on the Boring Location Map) is at a higher elevation than the level area to the south (See Area B on the Boring Location Map). Highway 101 forms the easterly boundary and Orcutt Creek forms the southerly boundary to the site. Developed residential areas are west and north of the site, as well as south of the western part of the northerly level portion of the site. The remaining area to the south of Orcutt Creek is undeveloped open space. The site ranges from relatively flat to moderately sloping; however, there is a localized steeply sloping area in the northwest corner. Drainage is by sheet flow, generally in a southeasterly direction into Orcutt Creek. The site is covered with a sparse to dense growth of weeds and brush. Mature trees grow along the Orcutt Creek.

4.0 FIELD INVESTIGATION AND LABORATORY ANALYSIS

On December 7 and 8, 2005, a total of twelve borings were drilled to depths ranging from approximately 16.5 to 51.5 feet below the existing ground surface. The borings were drilled with a CME 75 drill rig, equipped with an 8-inch diameter hollow stem auger and an automatic trip hammer for sampling. The approximate locations of the borings are shown on the Boring Location Map.

Soils encountered in the borings were logged and categorized in general accordance with the Unified Soil Classification System and ASTM D 2488-00. Logs of borings can also be found in Appendix A. Soil samples were taken using a ring-lined barrel sampler (ASTM D 3550-01, with shoe similar to D 2937-04). Standard penetration tests were also conducted at selected depths in the borings (ASTM D 1586-99). Bulk soil samples were obtained from the auger cuttings.

Ring samples were tested for unit weight and moisture (ASTM D 2937-04, as modified for ring liners). Two bulk samples were tested for maximum density and optimum moisture (ASTM D 1557-02). The expansion index (ASTM D 4829-03), an indicator of the potential for the soil to swell when moistened, was determined for the two bulk samples. Direct shear tests (ASTM D 3080-04) were also conducted on the bulk samples after they were remolded to approximately 90 percent of maximum dry density. Four consolidation tests (ASTM D 2435-04) was performed on ring samples. Six particle size tests (ASTM D 422-02 and D 1140-02) were performed on bulk samples. Four bulk samples were also sent to Schiff Associates of Claremont, California for corrosivity testing for use by the architect/engineer in determining appropriate corrosion mitigation measures. Results of the laboratory data are presented in Appendix B.

5.0 GENERAL SOIL PROFILE

The general soil profile encountered in the borings was typical of the alluvial soils in the area and consisted predominately of layered sand soils, although some layers of silts and clays were also observed. The sand soils were in a moist to saturated condition with a loose to very dense consistency. The silts and clays were moist and medium stiff to hard. Subsurface water was only encountered in Boring 1 at an approximate depth of 33 feet below the existing ground surface. Please refer to the boring logs for a more complete description of the subsurface conditions.

6.0 CONCLUSIONS

In our opinion, the site is suitable, from a soils engineering standpoint, for the proposed residential development as described in the Introduction section of this report, provided the recommendations contained herein are implemented in the design and construction. The primary soils engineering concerns are the potential for differential settlement, settlement from fill placement, the excavation characteristics of the site soils, the suitability of the soil for use as fill/backfill, the erodible nature of the site soils, the stability of soil during grading, the stability of slopes, and the potential for liquefaction. The site soils were tested and found to be generally nonexpansive, therefore no special measures with respect to expansive soils are anticipated. Assuming the site is prepared in accordance with the recommendations of the Preliminary Geotechnical Recommendations section of this report, shallow foundation systems may be used to support the planned residential structures.

Differential settlement can occur when foundations and surface improvements span materials with significantly different compression characteristics, such as soils with variable moisture and densities. The portion supported by the softer material will settle more than the portion supported by the harder material. Differential settlement can also occur between areas of cut and fill (cut/fill transitions) or if a lot has a significant variable fill depth across the lot.

These conditions can stress and possibly damage foundations and surface improvements, causing severe cracks and displacement. To reduce the potential for dissimilar settlement, it is necessary for the foundations of individual structures and surface improvements to bear in sufficiently uniform material. A program of overexcavation, scarification, moisture conditioning, and compaction of the soils in the building and surface improvement areas is recommended to provide more uniform soil moisture and density, and to provide appropriate foundation support.

Settlement can occur when fill soils are placed on loose alluvial soils as may be the case where embankment fills are placed in the southern portion of the site designated as Area B. To reduce the potential for settlement, deeper overexcavation of the loose native soils are recommended for Area B. Depending on the depth of fills in this area and consideration that complete removal of all loose alluval soils are beyond a practicable grading program, a post construction surface settlement monitoring program may also be recommended in Area B prior to building structures and improvements. Revised recommendations for deeper overexcavation and recommendations for settlement monitoring may be forthcoming, once development plans are available for our review.

The site soils are anticipated to be readily excavatable with conventional equipment. Excavations within these soils may exhibit ravelling and caving. Accordingly, temporary excavations and trenches should be shored and/or sloped in accordance with CALOSHA criteria.

We anticipate that the majority, if not all of the soils excavated will be acceptable for reuse as compacted fill or backfill. However, special requirements for utility trench bedding and shading per the specifications of Santa Barbara County should be anticipated.

The surface soils are highly erodible on this site. Stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means *during* and *following* construction is essential to reduce the potential of erosion damage. Care should be taken to establish and maintain proper drainage around the structures and improvements.

Long term erosion and maintenance issues associated with the slopes at the site are a concern. Cut slopes and fill over cut slopes are generally considered grossly and surficially stable; however, our experience in the general area indicates that the cut portion of these slopes will be subject to long term remedial issues with erosion and increased maintenance requirements. We have concluded that cut slopes and fill over cut slopes should be overexcavated and rebuilt as compacted fill slopes. Compacted fill slopes, constructed with the site soils, are considered grossly stable at a 2-horizontal to 1-vertical inclination up to a height of approximately 20 feet under normal conditions. To improve surficial stability, reduce the potential for erosion, and minimize maintenance intervals, fill slopes should also be covered with synthetic vegetation matting. The slopes should also be vegetated with ground cover, shrubs, and trees which possess deep, dense root structure and require a minimum of irrigation. Berms should be constructed at the top of slope areas to prevent all surface runoff from flowing over the slopes. The future owner of the slopes should be responsible for maintaining the planting scheme, applying the proper amounts of irrigation water, and maintaining the drainage gradients away from the top of slopes throughout the life of the residence. The owner should also implement and maintain a program for the elimination of burrowing animals in slope areas.

Soil liquefaction is the loss of soil strength during a significant seismic event. It occurs primarily in saturated, loose, fine to medium-grained sands and in very soft to medium stiff, silts. There appears to be a potential for liquefaction in a discontinuous soil layer(s) between the depths of approximately 33 to 39 feet below the existing ground surface in a localized

area near Boring 1. If liquefaction were to occur in this localized area of the site, the repercussions would likely be in the form of dynamic settlement. The maximum magnitude of total dynamic settlement is estimated to be less than 1 inch with differential settlement estimated to be less than 1/2 inch. In addition, based on the thickness of the potentially liquefiable soil layer (or layers) and the thickness of the overlying non liquefiable soil, it is our opinion that surface manifestation of any of this dynamic settlement would be very remote. However, we do recommend the following to reduce the potential effects of liquefaction. If conventional foundations are used to support the residences, the perimeter footings should be reinforced and isolated spread footings should be connected with grade beams. Post-tensioned foundations can also be used in lieu of conventional foundations.

7.0 PRELIMINARY GEOTECHNICAL RECOMMENDATIONS

The following recommendations are applicable to maximum two story residences with all floors above grade, and masonry retaining walls that do not exceed a height of 8 feet. If additional stories, basements or cellars, sunken rooms, taller retaining walls, stacked retaining walls, or other such features are incorporated into site development, this firm should be contacted for individual assessment.

The building area is defined as the entire residential lot area or any area where isolated structures may be planned. The building area for isolated structures outside of the lot areas is further defined as the area within and extending a minimum of 5 feet beyond the foundation perimeter of the structure.

The surface improvement area is generally defined as the area within and extending a minimum of 1 foot beyond the perimeter of the surface improvement.

Site Preparation

1. The existing ground surface in the building and surface improvement areas should be prepared for construction by removing existing structures, improvements, vegetation, tree stumps, large roots, debris, and other deleterious material. Any existing fill soils should be completely removed and replaced as compacted fill. Any existing utilities that will not be serving this residential development should be removed or properly abandoned. The appropriate method of utility abandonment will depend upon the type and depth of the utility. Recommendations for abandonment can be made as necessary.

2. Voids created by the removal of materials or utilities, and extending below the recommended overexcavation depth, should be immediately called to the attention of the soils engineer. No fill should be placed unless a representative of this firm has observed the underlying soil.

Grading

1. Following site preparation, soils in the building areas of Area A should be removed to a level plane at a minimum depth of 2 foot below the design elevation of the bottom of the deepest footing(s) or 3 feet below existing grade, *whichever is deeper*. Soils in the building areas of Area B should be removed to a level plane at a minimum depth of 4 foot below the design elevation of the bottom of the deepest footing(s) or 5 feet below existing grade, *whichever is deeper*. Locally deeper removals may be needed, based on field conditions. The resulting soil surface should then be scarified to a minimum depth of 1 foot, moisture conditioned and compacted.

2. In addition to the recommendations of Paragraph 1 of this section, we recommend that all cut or cut/fill transition areas be overexcavated such that a minimum of 3 feet and 5 feet of compacted fill is provided in the building areas of Area A and Area B,

respectively. Also, the minimum depth of the fill below the building area grades should not be less than half of the maximum depth of fill below the building area grades. For example, if the maximum depth of fill below the building area grades is 10 feet, the minimum depth of fill below the building area grades should be no less than 5 feet. In no case should the depth of fill be less than 3 feet and 5 feet on the building areas of Area A and Area B, respectively.

3. The soils in surface improvement areas should be removed to a level plane at a minimum depth of 1 foot below the proposed subgrade elevation or 1 foot below the existing ground surface, *whichever is deeper*. Locally deeper removals may be needed, based on field conditions. The resulting soil surface should then be scarified to a minimum depth of 1 foot, moisture conditioned to a minimum of optimum moisture content, and compacted.

4. Voids created by dislodging cobbles and/or debris during scarification should be backfilled and compacted, and the dislodged materials should be removed from the area of work.

5. On-site material and approved import materials may be used as general fill. Fill should be placed in level lifts not exceeding 8 inches in loose thickness, moisture conditioned, and compacted. In general, fill should be compacted to a minimum of 90 percent of maximum dry density. The upper 1 foot of subgrade and all AB in areas to be paved with AC or PCC should be compacted to a minimum of 95 percent of the maximum dry density. Subgrade and AB should be firm and unyielding when proofrolled with heavy, rubber-tired grading equipment prior to continuing construction.

6. All imported soils should be nonexpansive. Nonexpansive soils are defined as being coarse grained (ASTM D 2488-00), and having an expansion index of 10 or less (ASTM D 4829-03). Proposed nonexpansive imported soils should be evaluated by a representative of this firm before being used, and on an intermittent basis during placement on the site.

7. All materials used as fill should be cleaned of any debris and rocks larger than 6 inches in diameter. No rocks larger than 3 inches in diameter should be used within the upper 3 feet of finish grade. When fill material includes rocks, the rocks should be placed in a sufficient soil matrix to ensure that voids caused by nesting of the rocks will not occur and that the fill can be properly compacted.

8. Slopes should not be constructed steeper than 2-horizontal to 1-vertical under normal conditions. Slopes subject to inundation should be constructed at inclinations of 3-horizontal to 1-vertical or flatter. We also recommend that cut slopes and fill over cut slopes be overexcavated and constructed as fill slopes.

Fill Slope Construction

Fill slopes should be keyed and benched into competent soil as shown on Typical Bench and Keyway Detail in Appendix B, and as approved by the project soils engineer, geologist, or their representative. Keyways should be at least 15 feet wide or 1/2 of the slope height, *whichever is greater*. Back drains may be recommended at the heel of the keyway and the back of the benches. The need for these drains will be based on field conditions. Fill slopes shall be overfilled to an extent determined by the contractor, but not less than 3 feet measured perpendicular to the slope face, so that when trimmed back to the compacted core, the required compaction is achieved. Compaction of each fill lift should extend out to the temporary slope face. Backrolling the temporary slope face with a sheepsfoot compactor during mass filling

at intervals not exceeding 4 feet in height is recommended, unless more extensive overfilling is undertaken.

As an alternative to overfilling, fill slopes may be built to the finish slope surface provided compaction of each fill lift extends to the face of the slopes, and the slope face is backrolled with a sheepsfoot compactor at intervals not exceeding 4 vertical feet. Backrolling at more frequent intervals may be required. Care shall be taken to avoid spillage of loose materials down the faces of the slopes during grading. At the completion of mass filling, the slope surfaces shall be watered, shaped, and compacted first with a sheepsfoot roller, then with a grid roller operated from a side boom Cat, or equivalent, such that compaction to project standards is achieved to the slope face. In lieu of a grid roller, the slope may be track walked with a D-8 bulldozer or equivalent. To obtain the required compaction and appearance of the slope face, soil moisture should be maintained at optimum moisture, or slightly above, from the time of mass filling to final compaction of the slope face.

9. Unless otherwise recommended by the landscape architect, completely constructed fill slopes should be covered with a synthetic vegetation matting (Miramat, Enkamat, Amerimat, or equivalent), and the slopes should be revegetated, in accordance with the installation recommendations of the manufacturer and as per CBC Section 3316.

Utility Trenches

1. Unless otherwise recommended, utility trenches adjacent to foundations should not be excavated within the zone of foundation influence, as shown on Typical Detail A in Appendix D.

2. Utilities that will pass beneath a foundation, should be placed with properly compacted utility trench backfill and the foundation should be designed to span the trench.

3. A select, noncorrosive, granular, easily compacted material should be used as bedding and shading immediately around utilities. Generally, the soil found at the site may be used for trench backfill above the select material.

4. In general, trench backfill should be compacted to a minimum of 90 percent of maximum dry density. A minimum of 95 percent of maximum dry density, however, should be obtained where trench backfill comprises the upper 1 foot of subgrade beneath AC or PCC pavement, and in all AB. Subgrade and AB should be firm and unyielding when proof rolled with heavy, rubber-tired grading equipment prior to continuing construction. A minimum of 85 percent of maximum dry density will generally be sufficient where trench backfill is located in landscaped or other unimproved areas, where settlement of trench backfill would not be detrimental.

5. Jetting of trench backfill should generally not be allowed as a means of backfill densification. However, we do recommend that all import sand in multi-conduit trenches be jetted or saturated from the surface so that the sand will completely encase the conduits.

6. Where utility trenches will slope steeper than 10 percent, clay or sand/cement slurry plugs should be placed in the trenches at maximum 100-foot intervals. The plugs should be at least 2-feet thick and extend a minimum of 2 feet below the bottom of the trench and a minimum of 2 feet into the side of the trench. The top of the plug should be a minimum of 1 foot above the top of the utility conduit. A gravel pocket drain should be constructed upgradient of each clay or slurry plug. Each drain should

consist of a minimum of 1 cubic foot of free-draining gravel per foot of trench width. The drain gravel should be wrapped in a permeable synthetic filter fabric conforming to Caltrans Standard 88-1.03 for Underdrains. A rigid PVC discharge pipe should extend from the gravel drain at a minimum 1 percent slope to a convenient discharge point.

7. The recommendations of this section are minimum requirements and may be superseded by the governing jurisdiction.

Foundations, General

1. Conventional, post-tensioned, and retaining wall foundations should be designed using maximum allowable bearing capacities of 1,000 psf dead load and 1,500 psf dead plus live loads. Using these criteria, maximum total and differential settlement are expected to be on the order of 3/4-inch and 3/8-inch in 25 feet, respectively.

2. Allowable bearing capacities may be increased by one-third when transient loads such as wind or seismicity are included. The foundations should be designed using the following seismic parameters:

Seismic Source	Casmalia Fault
Distance to Seismic Source	< 2 km
Seismic Zone	4
Seismic Zone Factor (CBC Table 16-I)	0.40
Seismic Source Type (CBC Table 16-U)	B
Soil Profile Type (CBC Table 16-J)	S_D
Seismic Coefficient-C_A (CBC Table 16-Q)	0.57
Seismic Coefficient-C_V (CBC Table 16-R)	1.02
Near Source Factor-N_A (CBC Table 16-S)	1.3

Near Source Factor-N_V (CBC Table 16-T) 1.6

3. Lateral loads may be resisted by friction and by passive resistance of the soil acting on foundations. Lateral capacity is based on the assumption that backfill adjacent to foundations is properly compacted. Please refer to the Retaining Walls section of the report for values.

4. Foundation excavations should be observed by a representative of this firm during excavation, and prior to placement of reinforcing steel or formwork. The foundation excavations should be moistened to at least optimum moisture content and no desiccation cracks should be present prior to concrete placement.

Foundations, Conventional

1. Conventional continuous and spread footings connected by grade beams bearing entirely in fill compacted per the grading section of this report may be used to support the residences. Grade beams should also be placed across all vehicular entrances. All minimum footing dimensions should conform to the requirements of Table 18-I-C of the CBC for the appropriate number of supported floors. Spread footings should be a minimum of 2 feet square.

2. Continuous footings and grade beams should be reinforced as required by the architect/engineer; minimum continuous reinforcement should consist of two No. 4 rebar; one near the top and one near bottom. Reinforcement for spread footings should be as required by the architect/engineer.

Foundations, Post-tensioned

The following post-tensioned foundation design and construction parameters are presented for very low to low expansive soil conditions.

POST-TENSIONED FOUNDATION DESIGN CRITERIA

	CENTER LIFT		EDGE LIFT							
	All Perimeter Beam Conditions		12 Inch Deep Perimeter Beam		18 Inch Deep Perimeter Beam		24 Inch Deep Perimeter Beam		30 Inch Deep Perimeter Beam	
EXPANSION POTENTIAL	Em (ft.)	Ym (in.)	Em (ft.)	Ym (in.)	Em (ft.)	Ym (in.)	Em (ft.)	Ym (in.)	Em (ft.)	Ym (in.)
Very Low to Low	6.0	3.2	3.50	0.48	3.50	0.43	3.50	0.38	3.50	0.33

Footing/Slab Dimensions

The footing width, depth and the structural slab-on-grade thickness should be as specified by the architect/engineer based upon the soil parameters provided by ESP and the requirements of the most current edition of the CBC.

Slab Subgrade Moisture Recommendations

Very Low to Low Expansion Potential	Minimum of optimum moisture immediately prior to placing concrete.

Slabs-on-Grade and Exterior Flatwork

1. Interior slabs-on-grade should have a minimum thickness of 4 full inches. Reinforcement size, placement, and dowels should be as directed by the architect/engineer; minimum slab reinforcement should consist of No. 3 rebar placed at 24 inches on-center each way. At a minimum, the slab should be doweled to footings and grade beams with No. 3 dowels lapped to the slab rebar at 24-inch spacing.

2. Due to the current use of impermeable floor coverings, water-soluble flooring adhesives, and the speed at which buildings are now constructed, moisture vapor

transmission through slabs is a much more common problem than in past years. Where moisture vapor transmitted from the underlying soil would be undesirable, the slab should be protected from subsurface moisture vapor. A number of options for vapor protection are discussed below; however, the means of vapor protection, including the type and thickness of the vapor barrier, if specified, are left to the discretion of the architect/engineer.

3. The most effective means of reducing the potential for infiltration of subsurface moisture vapor through the interior slab would be to cast the slab directly atop a durable, puncture and tear-resistant vapor barrier (e.g., polyolefin or HDPE conforming to ASTM E 1745-04, Class A or B). However, this option requires a special concrete mix with a very low water-cement ratio, as well as special finishing and curing procedures.

4. Probably the next most effective option would be vapor-inhibiting admixtures and/or surface sealers. This would also require special concrete mixes and placement procedures, depending upon the recommendations of the admixture or sealer manufacturer.

5. Another option that may be a reasonable compromise between effectiveness and cost considerations is the use of a subslab vapor barrier protected by a sand layer. If a durable, puncture and tear-resistant vapor barrier is specified (e.g., polyolefin or HDPE conforming to ASTM E 1745-04, Class A or B), the barrier can be placed directly on the native soil. The barrier should be covered with a minimum 2 inches of *clean* sand. If a less durable vapor barrier is specified (i.e. ASTM E 1745-04, Class C), a minimum of 4 inches of clean sand should be provided on top of the native soil, and the barrier should be placed in the center of the clean sand layer. Clean sand is

defined as a well or poorly graded sand (ASTM D 2488-00) of which less than 3 percent passes the No. 200 sieve.

6. Where utilized, the vapor barrier should be placed a minimum of 1 inch above the flow line of the drainage path surrounding the structure, or 1 inch above the area drain grates if area drains are used to collect runoff around the structure. Care should be taken to properly lap and seal the barrier, particularly around utilities, and to protect it from damage during construction.

7. The native soil material beneath the slab should be moistened only as necessary to promote concrete curing; saturation of any sand that lies above the vapor barrier should be avoided, as the excess moisture atop the vapor barrier could result in vapor transmission through the slab for a period of months or years.

8. Exterior flatwork should be reinforced, at a minimum, with No. 3 rebar at 24 inches on-center each way. If any exterior flatwork will support vehicular traffic, it should be cast in a minimum of 12 inches of Class 2 AB material. Design of vehicular flatwork should be based upon a subgrade modulus (K_{30}) of 300 (psi/in).

9. Another measure that can be taken to reduce the risk of movement of flatwork due to expansive soils or variable bearing conditions is to provide thickened edges or grade beams around the perimeters of the flatwork. The thickened edges or grade beams could be up to 12 inches deep, with the deeper edges or grade beams providing better protection. At a minimum, the thickened edge or grade beam should be reinforced by two No. 4 rebar, one at the top and one at the bottom.

10. Flatwork should be constructed with frequent joints to allow articulation as flatwork moves in response to expansion and contraction of the soil or variable bearing

conditions. The soil in the subgrade should be moistened to at least optimum moisture content and no desiccation cracks should be present prior to casting the flatwork.

11. Where maintaining the elevation of the flatwork at doorways and other areas is desired, the flatwork should be doweled to the perimeter foundation, at a minimum, by No. 3 dowels lapped to the flatwork rebar at 24-inch spacing. In other areas, the flatwork may be doweled to the foundation or the flatwork may be allowed to "float free," at the discretion of the architect/engineer. Flatwork that is intended to float free should be separated from foundations by a felt joint or other means.

12. To reduce shrinkage cracks in concrete, the concrete aggregates should be of appropriate size and proportion, the water/cement ratio should be low, the concrete should be properly placed and finished, contraction joints should be installed, and the concrete should be properly cured. Concrete materials, placement, and curing specifications should be at the direction of the architect/engineer; AC 302.1R-04 is suggested as a resource for the architect/engineer in preparing such specifications.

Retaining Walls

1. All sitework walls and retaining walls should be founded in material recompacted in a manner similar to the residences. Foundations for all sitework walls and retaining walls should have a minimum depth of 18 inches below lowest adjacent grade, not including the keyway. It is assumed that wall heights will not exceed 8 feet.

2. Design of retaining walls should be based on the following parameters:

Active equivalent fluid pressure
(native soil or imported sand or gravel backfill)..... 35 pcf

At-rest equivalent fluid pressure
(native soil or imported sand or gravel backfill)..... 50 pcf
Passive equivalent fluid pressure ..... 300 pcf
Coefficient of sliding friction.....0.40

3. No surcharges are taken into consideration in the above values. The maximum toe pressure is an *allowable* value; all others are ultimate values that will require application of appropriate factors of safety by the architect/engineer.

4. The above pressures are applicable to a retained surface that is horizontal at the top of the wall. Walls having a retained surface that slopes upward from the top of the wall should be designed for an additional equivalent fluid pressure of 1 pcf for the active case and 1.5 pcf for the at-rest case, for every two degrees of slope inclination.

5. All retaining walls should be drained with perforated pipe encased in free draining gravel. The pipe should be placed perforations downward and should discharge in a nonerosive manner away from foundations and other improvements. The gravel zone should have a width of approximately 1 foot and should extend upward to 1 foot from the top of any wall that does not have a slab abutting the top of the wall. The upper 1-foot of backfill should consist of native soils to reduce the flow of surface drainage into the wall drain system. If a slab or pavement abuts the top of the wall, the gravel zone should extend to the sand cushion layer below the slab or the AB below the pavement. To reduce infiltration of soil into the gravel, a permeable synthetic fabric (conforming to Caltrans Section 88-1.03 for edge drains) should be placed between the two. Manufactured synthetic drains such as Miradrain or Enkadrain are acceptable alternatives to the use of gravel provided they are installed in accordance with the manufacturer's recommendations. Where drainage can be properly controlled, the perforated pipe may be omitted in lieu of weep holes on

maximum 4-foot centers placed at the lowest point in the wall that will still provide drainage. A filter fabric as described above should be placed between the weep holes and the drain gravel.

6. Walls facing habitable areas or areas where moisture transmission through the wall would be undesirable should be *thoroughly* waterproofed in accordance with the requirements of the architect/engineer.

7. Retaining walls by their nature are flexible structures, and surface treatments on walls often crack. Where walls are to be plastered or will otherwise have a finish surface applied, the flexibility should be considered in determining the suitability of the surfacing material, spacing of horizontal and vertical joints, etc. The flexibility should also be considered where a retaining wall will abut or be connected to a rigid structure, and where the geometry of the wall is such that its flexibility will vary along its length.

Pavement Sections

The following pavement sections are based on an assumed R-value of 40. We recommend that the soil exposed at street subgrade be tested for R-value to verify that the assumed pavement sections are appropriate, otherwise revised pavement sections will be needed. Pavement design sections are provided for assumed Traffic Indices (TI) of 4.5, 5.0, 5.5, 6.0, 6.5, and 7.0. Determination of the appropriate TI for specific areas is left to others. The AC sections were calculated in accordance with the Caltrans Highway Design Manual. The calculated aggregate base and AC thickness are for compacted material. Normal Caltrans construction tolerances should apply.

R-value	TI	AC Thickness (inches)	Class 2 Base Thickness (inches)
40	4.5	2.50	4.0
40	5.0	2.75	4.5
40	5.5	3.00	5.5
40	6.0	3.25	6.0
40	6.5	3.75	6.5
40	7.0	4.00	7.0

1. The upper 12 inches of subgrade and all AB should be compacted to a minimum of 95 percent of maximum dry density.

2. Subgrade and AB should be firm and unyielding when proof-rolled by heavy rubber-tired equipment prior to paving.

3. To provide stability for curbs, they should be set back a minimum of 3 feet from the tops of slopes, or the curbs should be deepened to provide stability. A representative of this firm should review all conditions where curbs are deepened to provide stability.

4. Finished AC surfaces should slope toward drainage facilities such that rapid runoff will occur and no ponding is allowed on or adjacent to the AC.

5. To reduce migration of surface drainage into the subgrade, maintenance of pavement areas is critical. Any cracks that develop in the pavement should be promptly sealed.

Drainage Around Improvements

1. Unpaved ground surfaces should be *graded during construction,* and *finish graded* to direct surface runoff away from foundations and other improvements at a minimum 2

percent grade for a minimum distance of 5 feet. If this is not feasible due to the terrain, property lines, or other factors, swales with improved surfaces, area drains, or other drainage facilities should be provided to divert drainage away from these areas. Paved surfaces should provide positive drainage away from foundations and other improvements.

2. To reduce the potential for planter drainage to gain access to subslab areas, raised planter boxes should be installed with drains and sealed sides and bottoms. Drains should also be provided for areas adjacent to the residence that would not otherwise freely drain.

3. All eaves on the residences should be provided with roof gutters. Runoff from roof gutters, downspouts, area drains, weep holes, etc., should discharge to an appropriate outlet in a nonerosive manner away from foundations and other improvements in accordance with the requirements of the governing agencies.

4. The site soils are *highly* erodible; stabilization of surface soils, particularly those disturbed during construction, by vegetation or other means *during and following construction* is essential to reduce erosion damage. Care should be taken to establish and maintain vegetation. The landscaping should be installed to maintain the surface drainage recommended above.

Construction Observation and Testing

1. It must be recognized that the recommendations contained in this report are based on a limited number of borings and rely on continuity of the subsurface conditions encountered. It is assumed that this firm will be retained to provide consultation during the design phase, to review plans as they near completion, to interpret this report during construction, and to provide construction monitoring in the form of testing and observation.

2. Unless otherwise stated, the term "compacted" or "recompacted" refers to soils placed in level lifts not exceeding 8 inches in loose thickness and compacted to a minimum of 90 percent of maximum dry density. The standard test used to define maximum dry density and field density should be ASTM D 1557-02, ASTM D 2922-04, respectively, or other methods acceptable to the soils engineer and jurisdiction. Unless otherwise stated, "moisture conditioning" refers to the moistening of soils to near optimum moisture content, prior to application of compactive effort.

3. At a minimum, the following items should be reviewed, tested, or observed by this firm:

- Final plans
- Stripping and clearing of vegetation,
- Overexcavation to the recommended depths,
- Scarification, moisture conditioning, and compaction of the soil,
- Fill quality, placement, and compaction,
- Utility trench backfill,
- Retaining wall drains and backfill,
- Foundation excavations, and
- Subgrade and AB compaction and proof rolling.

4. It will be necessary to develop a program of quality control prior to beginning grading. It is the responsibility of the owner, contractor, or project manager to determine any additional inspection items required by the architect/engineer or the governing jurisdiction. A preconstruction conference between a representative of the owner, this firm, the architect/engineer and contractors is recommended to discuss planned construction procedures and quality control requirements. This firm should be notified at least 48 hours prior to beginning grading operations.

5. If Earth Systems Pacific is not retained to provide construction observation and testing services, it shall not be responsible for the interpretation of the information by others or any consequences arising therefrom.

9.0 CLOSURE

Our intent was to perform the investigation in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the locality of this project under similar conditions. No representation, warranty, or guarantee is either expressed or implied. This report is intended for the exclusive use by the client as discussed in the Scope of Services section. Application beyond the stated intent is strictly at the user's risk.

This report is valid for conditions as they exist at this time for the type of project described herein. The conclusions and recommendations contained in this report could be rendered invalid, either in whole or in part, due to changes in building codes, regulations, standards of geotechnical or construction practice, changes in physical conditions, or the broadening of knowledge.

If changes with respect to development type or location become necessary, if items not addressed in this report are incorporated into plans, or if any of the assumptions used in the preparation of this report are not correct, this firm shall be notified for modifications to this report. Any items not specifically addressed in this report shall comply with the CBC and the requirements of the governing jurisdiction.

The preliminary recommendations of this soils report are based upon the geotechnical conditions encountered at the site, and may be augmented by additional requirements of the architect/engineer, or by additional recommendations provided by this firm based on conditions exposed at the time of construction.

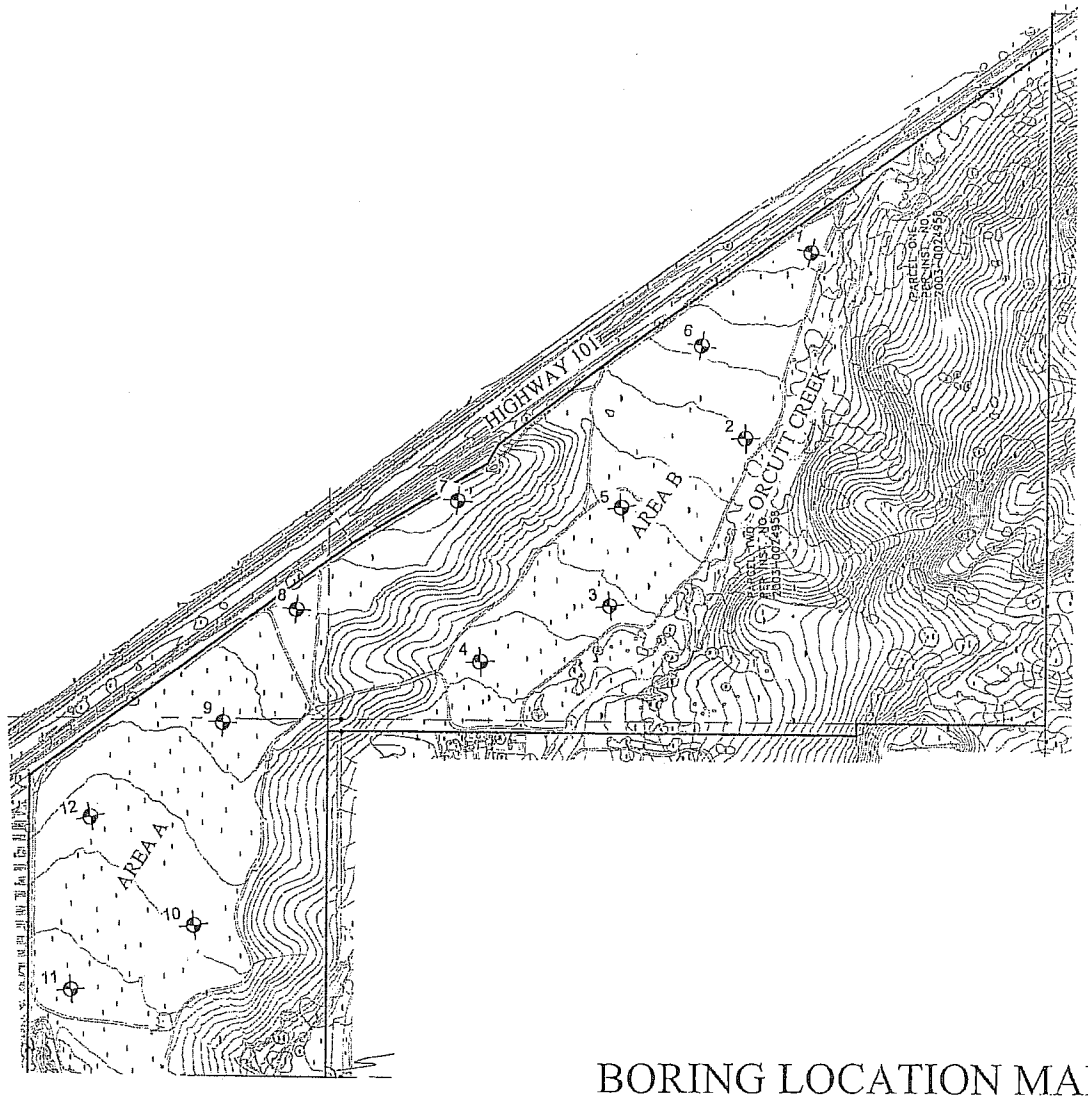
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Thank you for this opportunity to have been of service. If you have any questions, please feel free to contact this office at your convenience.

End of Text

APPENDIX A

Boring Location Map
Boring Logs



LEGEND

12 Boring Location (Approx.)

NOT TO SCALE

BORING LOCATION MAP

ORCUTT KEY SITE 3

S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, California

Earth Systems Pacific
308 North First Street
Lompoc, California 93436
(805) 737-9755 • FAX (805) 735-3456
E-mail: esc@earthsys.com

February 10, 2006 SMK SL-14813-SA

ORCUTT KEY SITE 3 – BLM Border–021005.dwg

Earth Systems Pacific

Boring No. 1
PAGE 1 OF 2
JOB NO.: SL-14813-SA
DATE: December 7, 2005

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: dark brown, loose, moist, some organics	0.0–3.0	○			
5				5.0–6.5	▬	103.7	8.5	2, 4, 5
10	SC		CLAYEY SAND: dark brown slightly mottled with light grayish brown, medium dense, moist, slightly porous	10.0–11.5	▬	106.8	6.5	5, 11, 16
15			light brown, trace grovel	15.0–16.5	▬	119.0	9.4	6, 11, 19
20	SP-SM		POORLY GRADED SAND WITH SILT: yellowish brown, medium dense, moist, fine to medium grained, trace gravel	20.0–21.5	●			5, 6, 8
25				25.0–26.5	●			5, 7, 6

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 1
PAGE 2 OF 2
JOB NO.: SL-14813-SA
DATE: December 7, 2005

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
27	SP-SM		POORLY GRADED SAND WITH SILT: as above					
28								
29								
30								
31								
32								
33			saturated					
34								
35				35.0–36.5	●			3 4 11
36								
37								
38								
39			light reddish brown, dense, wet					
40				40.0–41.5	●			12 17 22
41								
42								
43								
44								17
45				45.0–46.5	●			16 19
46								
47								
48								
49								16
50				50.0–51.5	●			23 24
51								
52			End of Boring at 51.5 feet Subsurface water encountered near 33.0 feet					
53								

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 2
PAGE 1 OF 2

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

JOB NO.: SL-14813-SA
DATE: December 7, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: dark brown, loose, moist					
				0.0–5.0	○			2 2 2
				5.0–6.5	▬	102.8	13.6	
8	SC		CLAYEY SAND: dark brown, loose, moist					
				10.0–11.5	▬	112.0	12.0	2 2 4
15	SP		POORLY GRADED SAND: light brown, medium dense, moist, fine grained	15.0–16.5	▬	117.6	9.2	8 15 20
				20.0–21.5	●			3 3 5
20			loose					

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 2
PAGE 2 OF 2

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

JOB NO.: SL-14813-SA
DATE: December 7, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
27–28	SP		POORLY GRADED SAND: as above					
29–30				30.0–31.5	●			6 11 14
31–32			yellowish brown, medium dense, moist, medium to fine grained					
33–34								
35				35.0–36.5	●			5 7 9
36–38								
39–40				40.0–41.5	●			8 9 10
41–44								
45	ML		SILT: light grayish brown mottled with reddish brown, very stiff, moist	45.0–46.5	●			9 10 15
46–47	SP		POORLY GRADED SAND: light brown and light grayish brown, medium dense, moist, fine to medium grained					
48–49								
50				50.0–51.5	●			11 18 19
51			light reddish brown, dense					
52			End of Boring at 51.5 feet No Subsurface water encountered					
53								

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 3
PAGE 1 OF 2

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

JOB NO.: SL-14813-SA
DATE: December 7, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	ML		SANDY SILT: light brown, medium stiff, moist	0.0–5.0	○			
5				5.0–6.5	▬	97.3	6.8	3 4 7
8			brown					
10				10.0–11.5	▬	113.2	4.2	3 4 8
15	SP		POORLY GRADED SAND: yellowish brown, medium dense, moist	15.0–16.5	▬	107.5	7.0	7 11 16
19			trace gravel					
20	SC		CLAYEY SAND: brown, loose, moist, trace gravel	20.0–21.5	●			3 5 4
25								

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

Boring No. 3
PAGE 2 OF 2
JOB NO.: SL-14813-SA
DATE: December 7, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
27	SC		CLAYEY SAND: as above					
28								
29								5
30	SP		POORLY GRADED SAND: light grayish brown and light brownish gray, dense, moist, medium grained, trace gravel	30.0–31.5	●			14 18
31								
32								
33								
34								
35								
36								
37								
38								
39								4
40	SC		CLAYEY SAND: grayish brown mottled with reddish brown, loose, wet, trace gravel	40.0–41.5	●			4 2
41								
42								
43								
44								10
45	SM		SILTY SAND: reddish brown, medium dense, moist	45.0–46.5	●			14 14
46	ML		SILT: light brownish gray mottled with reddish brown, very stiff, moist					
47								
48								16
49	SP		POORLY GRADED SAND: light reddish brown, dense, moist					19 23
50				50.0–51.5	●			
51								
52			End of Boring at 51.5 feet No Subsurface water encountered					
53								

LEGEND: ▬ Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 4
PAGE 1 OF 1

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

JOB NO.: SL-14813-SA
DATE: December 7, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: brown, dense, moist	0.0–4.0	○			
5				5.0–6.5	▬	118.6	5.7	14 41 50/4"
			light grayish brown mottled with brown, very dense, moist, trace sandstone fragments					
10	SP		POORLY GRADED SAND: light reddish brown, very dense, moist, trace sondstone fragments	10.0–11.5	▬	117.3	6.2	17 38 50/5"
14			dense	15.0–16.5	●			10 18 26
17			End of boring at 16.5' No subsurface water encountered					

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 5
PAGE 1 OF 2
JOB NO.: SL-14813-SA
DATE: December 8, 2005

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: light brown, loose, moist					
5				5.0–6.5	Ring	100.0	9.7	4 8 8
10			dark brown, slightly porous	10.0–11.5	Ring	101.7	12.2	2 3 4
15			brown, medium dense, trace gravel	15.0–16.5	Ring	118.5	11.2	5 8 12
20	ML		SANDY SILT: reddish brown, stiff, moist	20.0–21.5	SPT			4 5 7
25	SM		SILTY SAND: brown, loose, moist	25.0–26.5	SPT			5 4 2

LEGEND: Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 5
PAGE 2 OF 2

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

JOB NO.: SL-14813-SA
DATE: December 8, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
27	SM		SILTY SAND: as above					
28								
29								4
30				30.0–31.5	●			6
31	SP		POORLY GRADED SAND: brown, loose, moist					4
32			End of Boring at 31.5 feet No Subsurface water encountered					
33								
34								
35								
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46								
47								
48								
49								
50								
51								
52								
53								

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 6
PAGE 1 OF 1

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

JOB NO.: SL-14813-SA
DATE: December 8, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

SOIL DESCRIPTION

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: dark brown, loose, moist					
5				5.0–6.5	Ring	109.9	11.8	1, 2, 3
10				10.0–11.5	Ring	112.5	13.3	3, 4, 5
15	SP		POORLY GRADED SAND: brown, loose, moist	15.0–16.5	SPT			2, 3, 5
17			End of boring at 16.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 7
PAGE 1 OF 1

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

JOB NO.: SL-14813-SA
DATE: December 8, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: reddish brown, medium dense, moist, trace gravel					
5				5.0–6.5	■	119.2	7.1	8 12 18
10			decreased silt content	10.0–11.5	■	116.3	9.8	12 17 22
15	SP		POORLY GRADED SAND WITH GRAVEL: brown mottled with light brown, dense, moist	15.0–16.5	■	120.5	6.6	11 20 31
20								
25	SC		CLAYEY SAND: brown mottled with light gray brown, medium stiff to stiff, moist	25.0–26.5	●			15 17 10
26			End of boring at 26.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 8
PAGE 1 OF 1

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

JOB NO.: SL-14813-SA
DATE: December 8, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	ML		SANDY SILT: brown mottled with reddish brown and grayish brown, hard, moist, trace gravel	5.0–6.5	Ring	119.9	9.7	18 39 37
6	SC		CLAYEY SAND: brown mottled with dark brown, dense, moist, trace gravel	10.0–11.5	Ring	110.5	13.7	11 20 27
10	SP		POORLY GRADED SAND: light yellowish brown, medium dense, moist, fine grained	15.0–16.5	SPT			5 10 17
15			light grayish brown, dense, trace gravel					
17			End of boring at 16.5' No subsurface water encountered					

LEGEND: ■ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

Boring No. 9
PAGE 1 OF 1
JOB NO.: SL-14813-SA
DATE: December 8, 2005

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: brown mottled with yellowish brown, grayish brown and light brown, very dense, moist	0.0–4.0	○			
5				5.0–6.5	▬	109.8	9.0	27 50/5"
6	SC		CLAYEY SAND: dark brown, dense, moist					
10				10.0–11.5	▬	119.2	13.4	17 32 49
14	ML		SANDY SILT: dark brown, very stiff, moist					
15				15.0–16.5	▬	112.7	14.0	10 16 19
24								
25	SP		POORLY GRADED SAND: brown, medium dense, moist	25.0–26.5	●			9 9 9
26			End of boring at 26.5' No subsurface water encountered					

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 10
PAGE 1 OF 1
JOB NO.: SL-14813-SA
DATE: December 8, 2005

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	CL		SANDY LEAN CLAY: brown mottled with grayish brown and yellowish brown, hard, moist, trace sandstone fragments	5.0–6.5	Ring	118.3	12.9	13, 29, 33
10			very stiff, moist, trace gravel	10.0–11.5	Ring	111.8	16.8	8, 16, 24
15				15.0–16.5	SPT			6, 9, 11
16			End of boring at 16.5' No subsurface water encountered					

LEGEND: Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 11
PAGE 1 OF 1
JOB NO.: SL-14813-SA
DATE: December 8, 2005

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	ML		SANDY SILT: brown mottled with yellowish brown, hard, moist	0.0–4.0	○			
5				5.0–6.5	▬	Sample	Disturbed	50/1"
10				10.0–11.5	▬	108.9	17.3	18 40 49
15	SC		CLAYEY SAND: brown, medium dense, moist	15.0–16.5	▬	113.1	15.1	6 11 16
25	SP		POORLY GRADED SAND: light reddish brown, medium dense, moist	250.–26.5	●			7 9 10
26			End of boring at 26.5' No subsurface water encountered					

LEGEND: ▬ Ring Sample ○ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

Earth Systems Pacific

Boring No. 12
PAGE 1 OF 1
JOB NO.: SL-14813-SA
DATE: December 8, 2005

LOGGED BY: B. Fagundes
DRILL RIG: CME-75
AUGER TYPE: 8" Hollow Stem

ORCUTT KEY SITE 3
S. of Clark Avenue & W. of Highway 101
Orcutt Area of Santa Barbara County, CA.

DEPTH (feet)	USCS CLASS	SYMBOL	SOIL DESCRIPTION	SAMPLE DATA: INTERVAL (feet)	SAMPLE TYPE	DRY DENSITY (pcf)	MOISTURE (%)	BLOWS PER 6 IN.
0	SM		SILTY SAND: brown mottled with reddish brown, medium dense, moist	5.0–6.5	Ring	122.4	6.6	14 19 17
10	SP		POORLY GRADED SAND: light reddish brown, dense, moist	10.0–11.5	Ring	114.8	5.0	10 23 28
				15.0–16.5	SPT			11 22 23
17			End of boring at 16.5' No subsurface water encountered					

LEGEND: Ring Sample ◯ Grab Sample ▭ Shelby Tube Sample ● SPT

NOTE: This log of subsurface conditions is a simplification of actual conditions encountered. It applies at the location and time of drilling. Subsurface conditions may differ at other locations and times.

APPENDIX B

Laboratory Test Results

Orcutt Keysite 3 SL-14813-SA

BULK DENSITY TEST RESULTS

ASTM D 2937-04 (modified for ring liners)

January 25, 2006

BORING NO.	DEPTH feet	MOISTURE CONTENT, %	WET DENSITY, pcf	DRY DENSITY, pcf
1	6.0-6.5	8.5	112.6	103.7
1	10.0-10.5	6.5	113.7	106.8
1	16.0-16.5	9.4	130.2	119.0
2	6.0-6.5	13.6	116.8	102.8
2	11.0-11.5	12.0	125.4	112.0
2	16.0-16.5	9.2	128.4	117.6
3	6.0-6.5	6.8	103.9	97.3
3	11.0-11.5	4.2	117.9	113.2
3	16.0-16.5	7.0	115.0	107.5
4	6.0-6.5	5.7	125.4	118.6
4	11.0-11.5	6.2	124.6	117.3
5	6.0-6.5	9.7	109.7	100.0
5	11.0-11.5	12.2	114.1	101.7
5	16.0-16.5	11.2	131.8	118.5
6	6.0-6.5	11.8	122.9	109.9
6	11.0-11.5	13.3	127.4	112.5
7	6.0-6.5	7.1	127.7	119.2
7	11.0-11.5	9.8	127.6	116.3
7	16.0-16.5	6.6	128.5	120.5
8	6.0-6.5	9.7	131.6	119.9
8	11.0-11.5	13.7	125.7	110.5
9	6.0-6.5	9.0	119.6	109.8
9	11.0-11.5	13.4	135.1	119.2
9	16.0-16.5	14.0	128.4	112.7
10	6.0-6.5	12.9	133.6	118.3
10	11.0-11.5	16.8	130.6	111.8
11	11.0-11.5	17.3	127.7	108.9
11	16.0-16.5	15.1	130.2	113.1
12	6.0-6.5	6.6	130.4	122.4
12	11.0-11.5	5.0	120.6	114.8

Orcutt Keysite 3

SL-14813-SA

EXPANSION INDEX TEST RESULTS

ASTM D 4829-03

January 25, 2006

BORING NO.	DEPTH feet	EXPANSION INDEX
3	0.0-5.0	5
11	0.0-4.0	2

Orcutt Keysite 3

SL-14813-SA

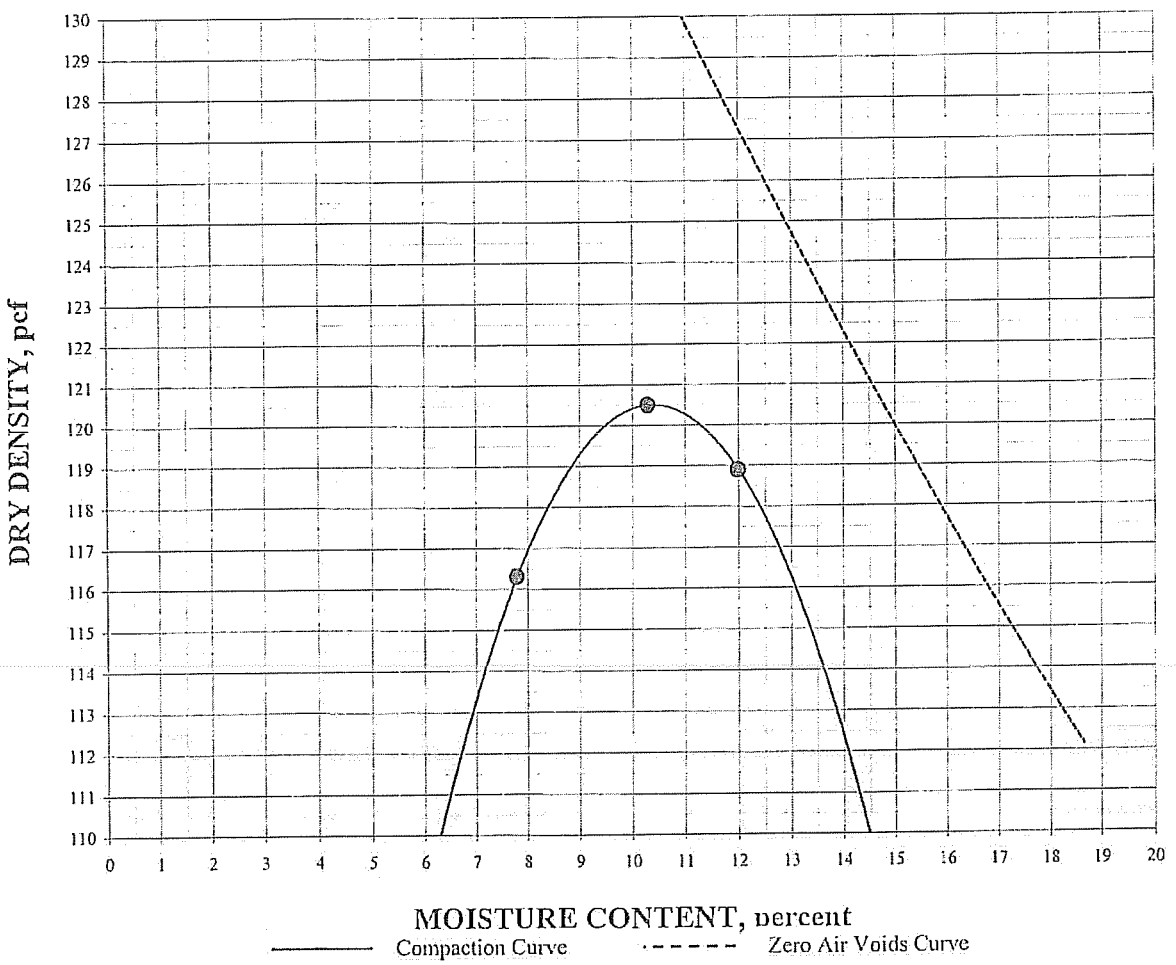
MAXIMUM DENSITY / OPTIMUM MOISTURE

ASTM D 1557-02 (Modified)

PROCEDURE USED: A
PREPARATION METHOD: Dry
RAMMER TYPE: Mechanical
SPECIFIC GRAVITY: 2.70 (assumed)

January 25, 2006
Boring #3 @ 0.0 - 5.0'
Sandy Silt (ML)

MAXIMUM DENSITY: 120.5 pcf
OPTIMUM MOISTURE: 10.5%



Orcutt Keysite 3

SL-14813-SA

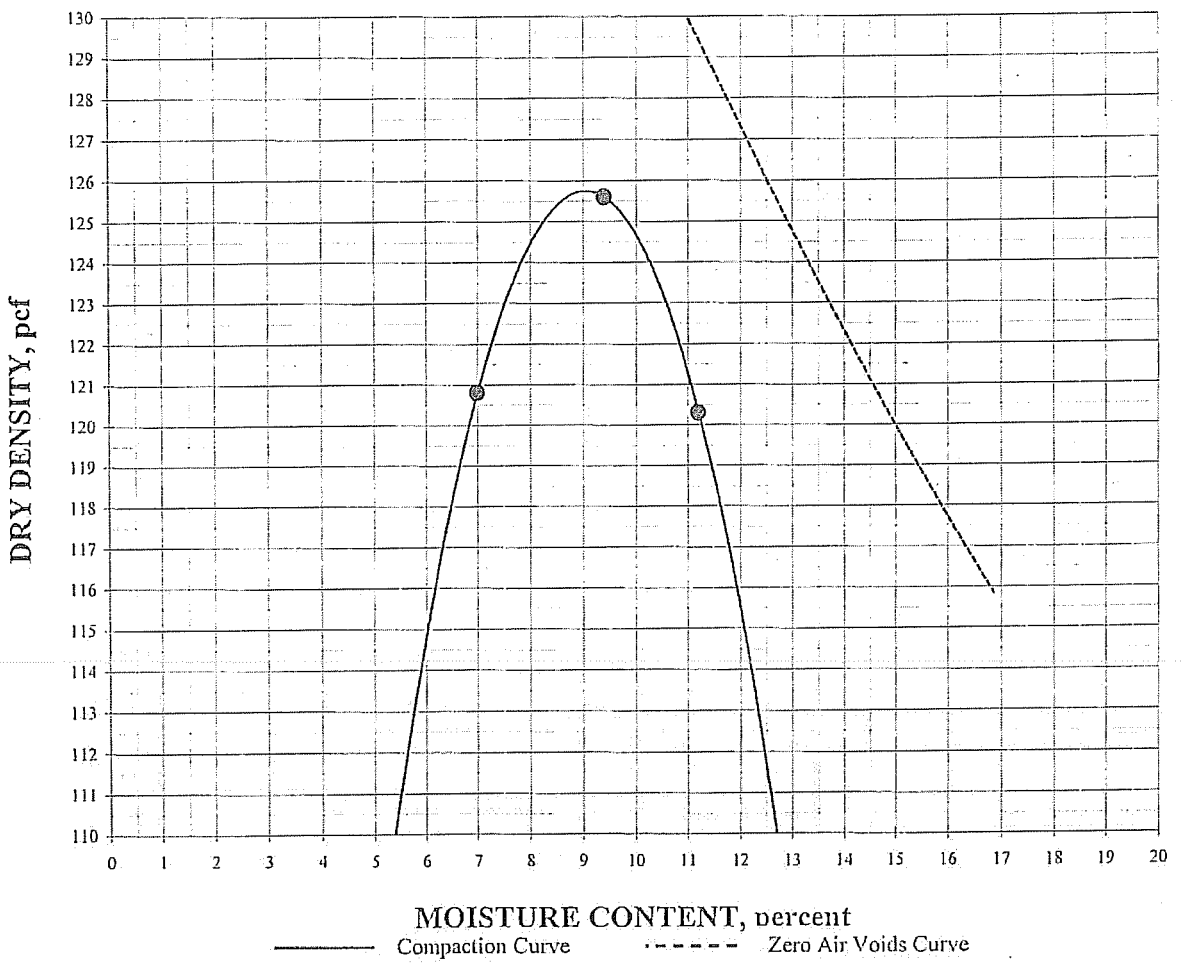
MAXIMUM DENSITY / OPTIMUM MOISTURE

ASTM D 1557-02 (Modified)

PROCEDURE USED: A
PREPARATION METHOD: Dry
RAMMER TYPE: Mechanical
SPECIFIC GRAVITY: 2.70 (assumed)

January 25, 2006
Boring #11 @ 0.0 - 4.0'
Sandy Silt (ML)

MAXIMUM DENSITY: 126.0 pcf
OPTIMUM MOISTURE: 9.0%



Orcutt Keysite 3

SL-14813-SA

DIRECT SHEAR

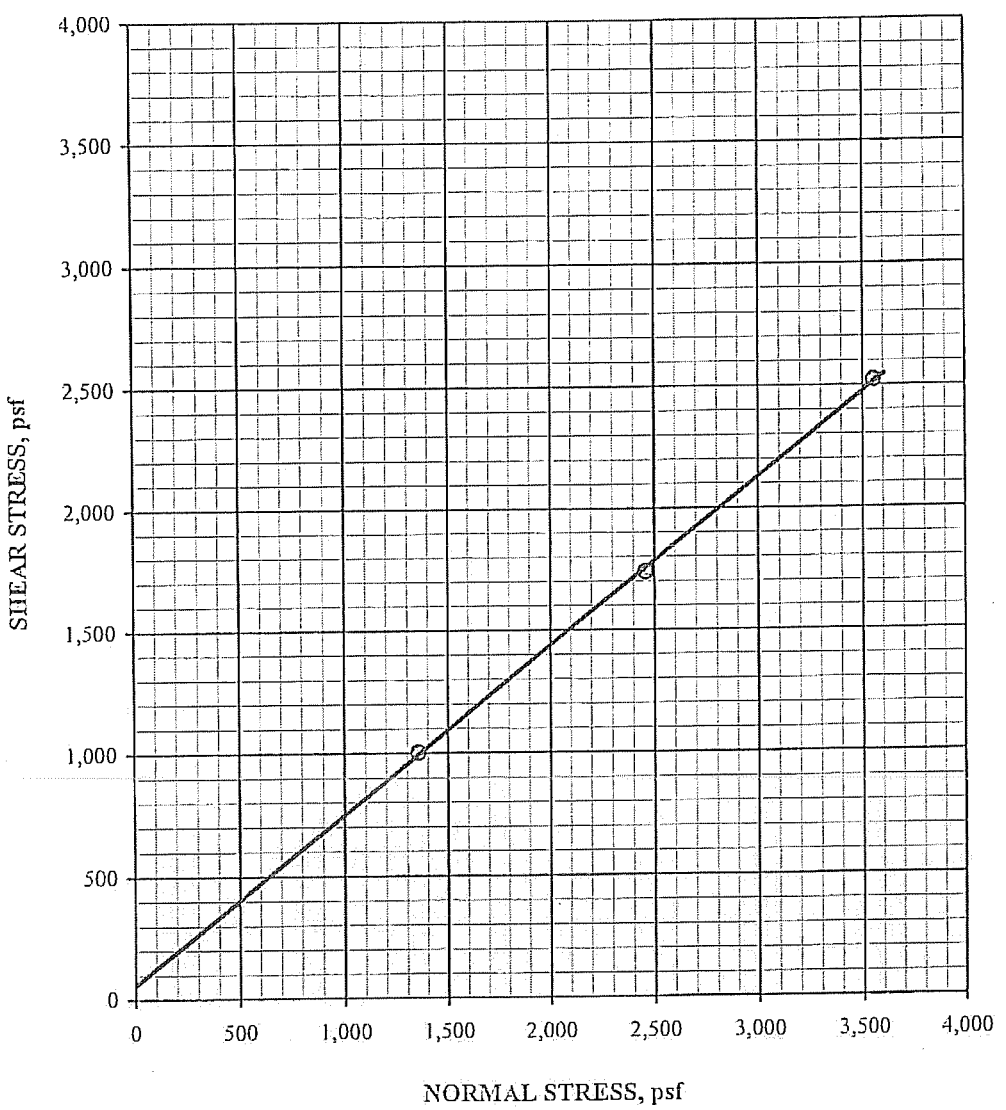
ASTM D 3080-04 (modified for consolidated, undrained conditions)

January 25, 2006

Boring #3 @ 0.0 - 5.0'
Sandy Silt (ML)
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 107.4 pcf
INITIAL MOISTURE CONTENT: 11.2 %
PEAK SHEAR ANGLE (Ø): 35°
COHESION (C): 56 psf

SHEAR vs. NORMAL STRESS



Orcutt Keysite 3 SL-14813-SA

DIRECT SHEAR continued

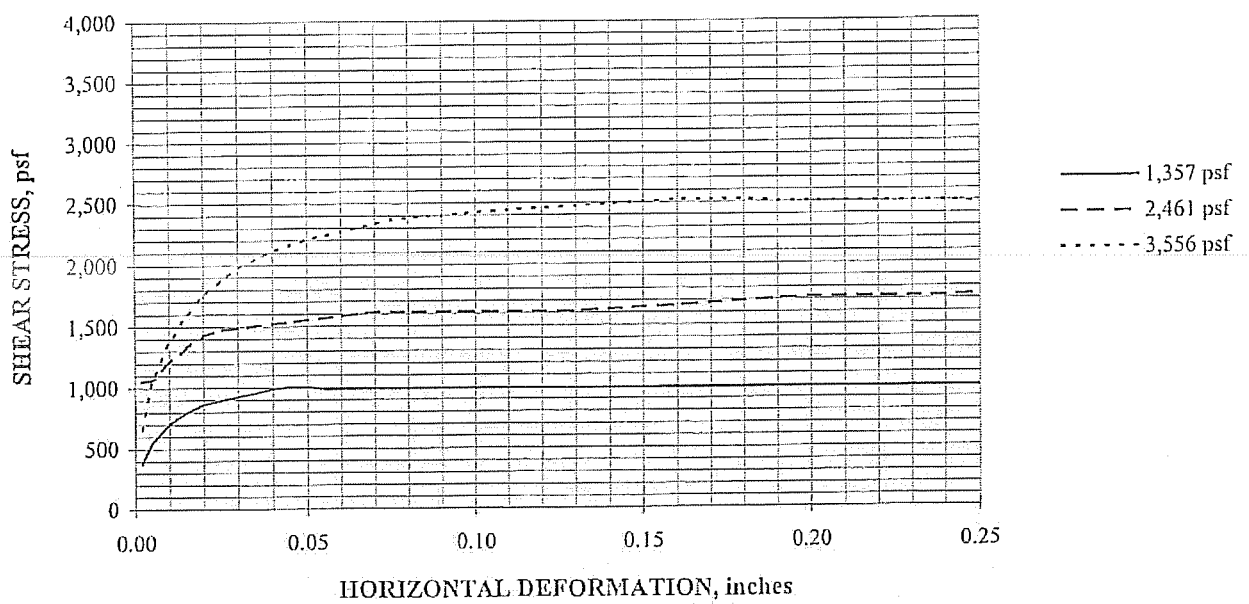
ASTM D 3080-04 (modified for consolidated, undrained conditions)

Boring #3 @ 0.0 - 5.0' January 25, 2006

Sandy Silt (ML)

Compacted to 90% RC, saturated SPECIFIC GRAVITY: 2.70 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	11.2	11.2	11.2	11.2
DRY DENSITY, pcf	107.5	107.5	107.3	107.4
SATURATION, %	53.3	53.3	53.0	53.2
VOID RATIO	0.568	0.568	0.571	0.569
DIAMETER, inches	2.420	2.420	2.420	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	16.1	16.8	17.6	
DRY DENSITY, pcf	105.7	104.5	102.7	
SATURATION, %	73.3	74.3	74.3	
VOID RATIO	0.594	0.611	0.640	
HEIGHT, inches	0.98	0.97	0.96	



Orcutt Keysite 3

SL-14813-SA

DIRECT SHEAR

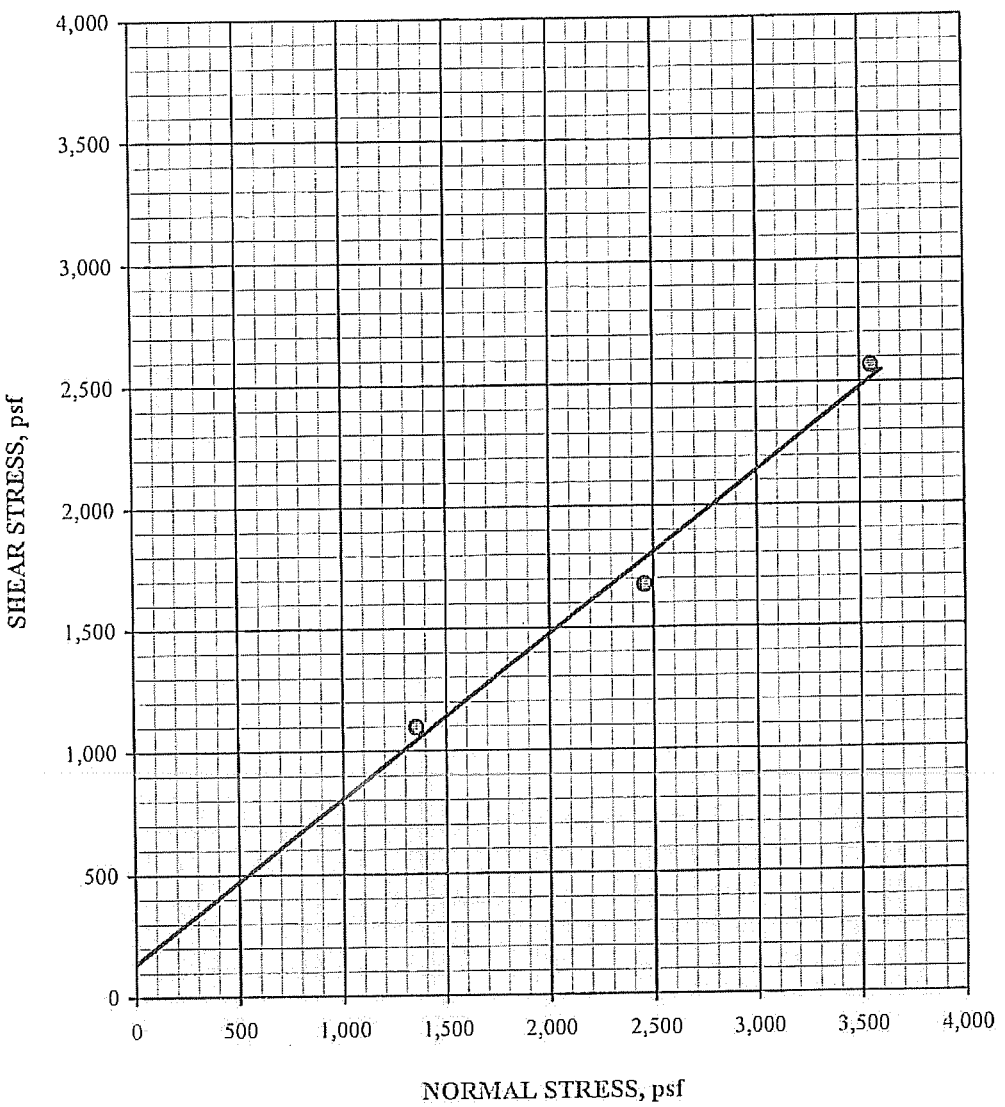
ASTM D 3080-04 (modified for consolidated, undrained conditions)

January 25, 2006

Boring #11 @ 0.0 - 4.0'
Sandy Silt (ML)
Compacted to 90% RC, saturated

INITIAL DRY DENSITY: 113.2 pcf
INITIAL MOISTURE CONTENT: 9.2 %
PEAK SHEAR ANGLE (Ø): 34°
COHESION (C): 135 psf

SHEAR vs. NORMAL STRESS



Orcutt Keysite 3

SL-14813-SA

DIRECT SHEAR continued

ASTM D 3080-04 (modified for consolidated, undrained conditions)

January 25, 2006

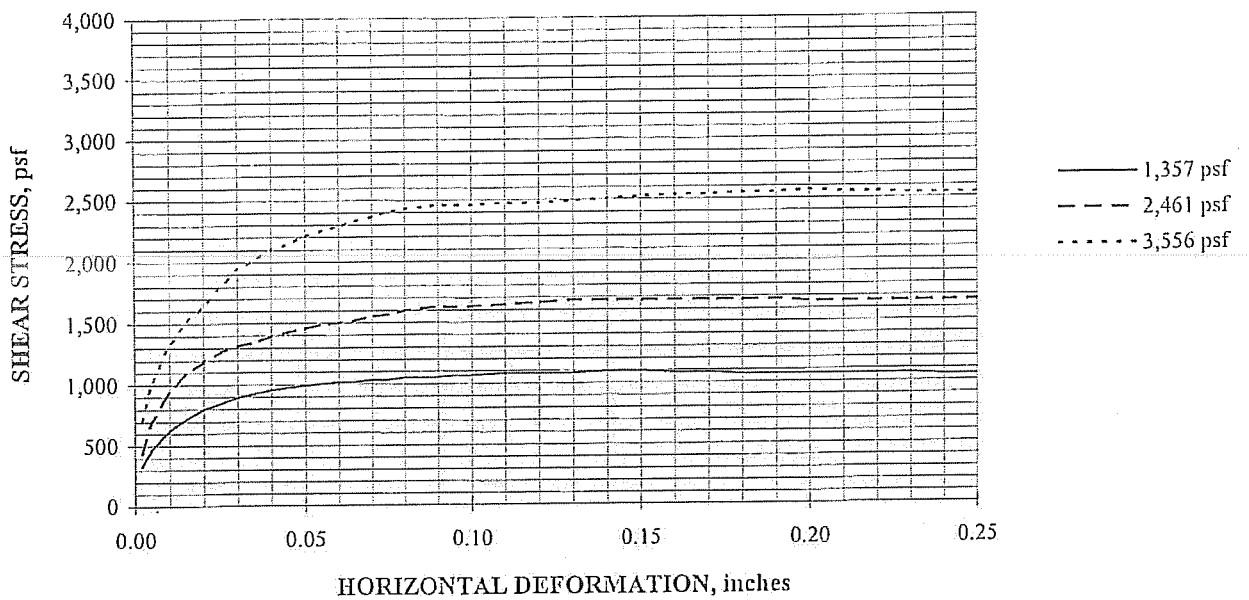
Boring #11 @ 0.0 - 4.0'

Sandy Silt (ML)

Compacted to 90% RC, saturated

SPECIFIC GRAVITY: 2.70 (assumed)

SAMPLE NO.:	1	2	3	AVERAGE
INITIAL				
WATER CONTENT, %	9.2	9.2	9.2	9.2
DRY DENSITY, pcf	113.0	113.4	113.2	113.2
SATURATION, %	50.6	51.1	50.8	50.8
VOID RATIO	0.491	0.486	0.489	0.489
DIAMETER, inches	2.420	2.420	2.420	
HEIGHT, inches	1.00	1.00	1.00	
AT TEST				
WATER CONTENT, %	14.0	14.3	14.3	
DRY DENSITY, pcf	109.9	109.0	107.5	
SATURATION, %	71.2	70.9	67.8	
VOID RATIO	0.533	0.545	0.568	
HEIGHT, inches	0.97	0.96	0.95	



Orcutt Keysite 3

SL-14813-SA

CONSOLIDATION TEST

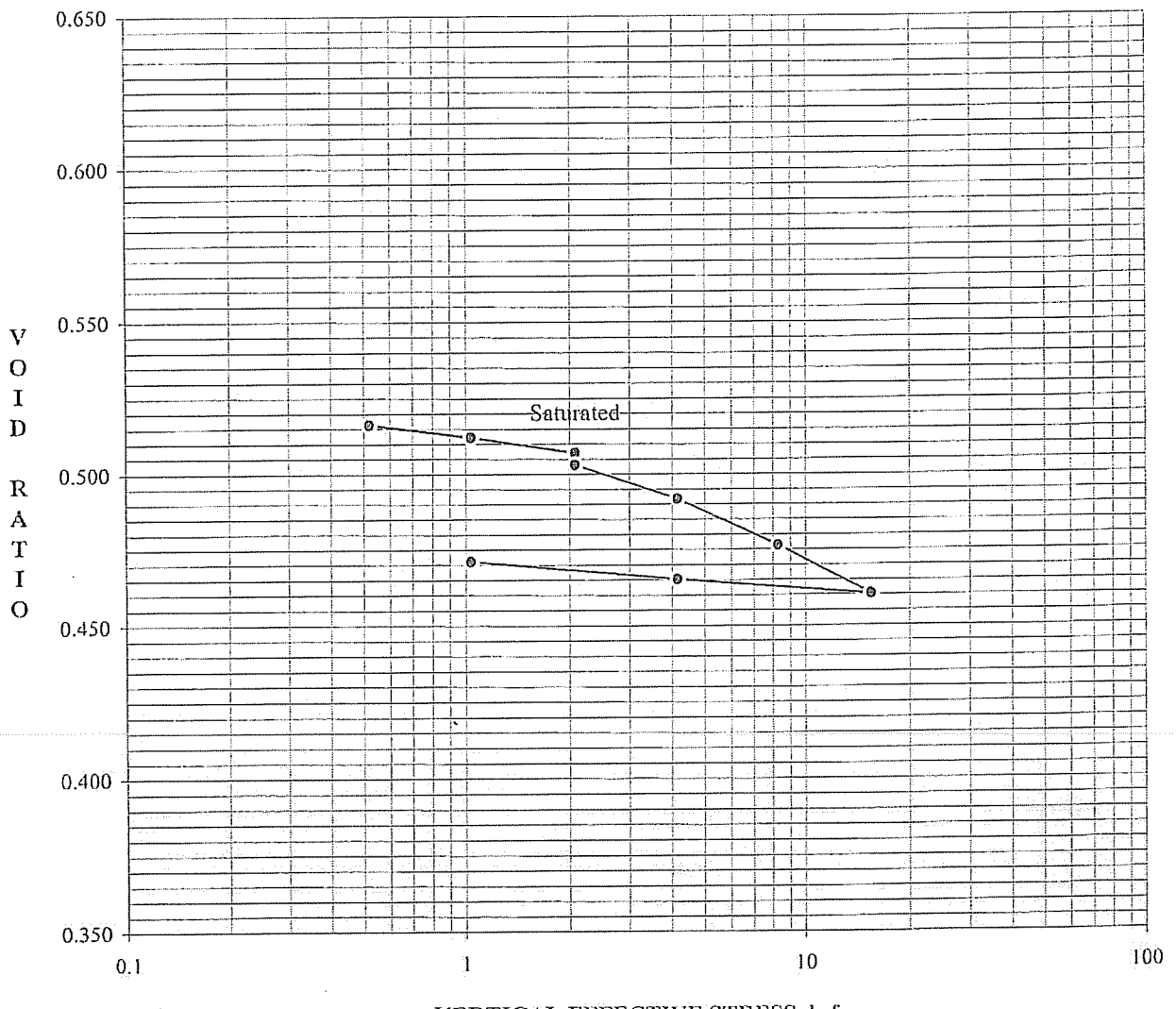
ASTM D 2435-04

January 25, 2006

Boring #2 @ 6.0 - 6.5'
Silty Sand (SM)
Ring Sample

DRY DENSITY: 99.9 pcf
MOISTURE CONTENT: 13.6%
SPECIFIC GRAVITY: 2.70 (assumed)
INITIAL VOID RATIO: 0.687

VOID RATIO vs. NORMAL PRESSURE DIAGRAM



Orcutt Keysite 3

SL-14813-SA

CONSOLIDATION TEST

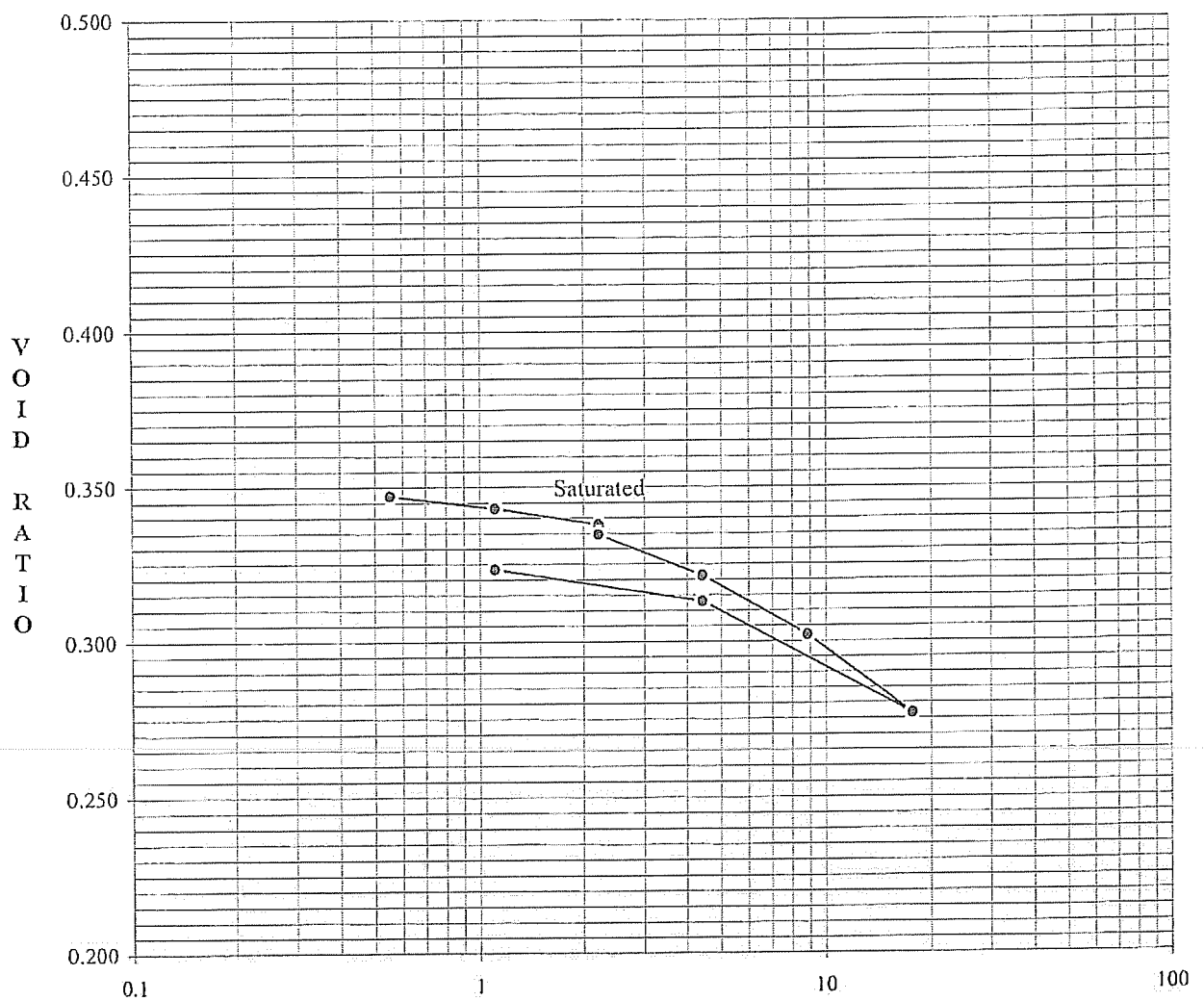
ASTM D 2435-04

January 25, 2006

Boring #2 @ 11.0 - 11.5'
Clayey Sand (SC)
Ring Sample

DRY DENSITY: 112.1 pcf
MOISTURE CONTENT: 12.0%
SPECIFIC GRAVITY: 2.70 (assumed)
INITIAL VOID RATIO: 0.504

VOID RATIO vs. NORMAL PRESSURE DIAGRAM



Orcutt Keysite 3

SL-14813-SA

CONSOLIDATION TEST

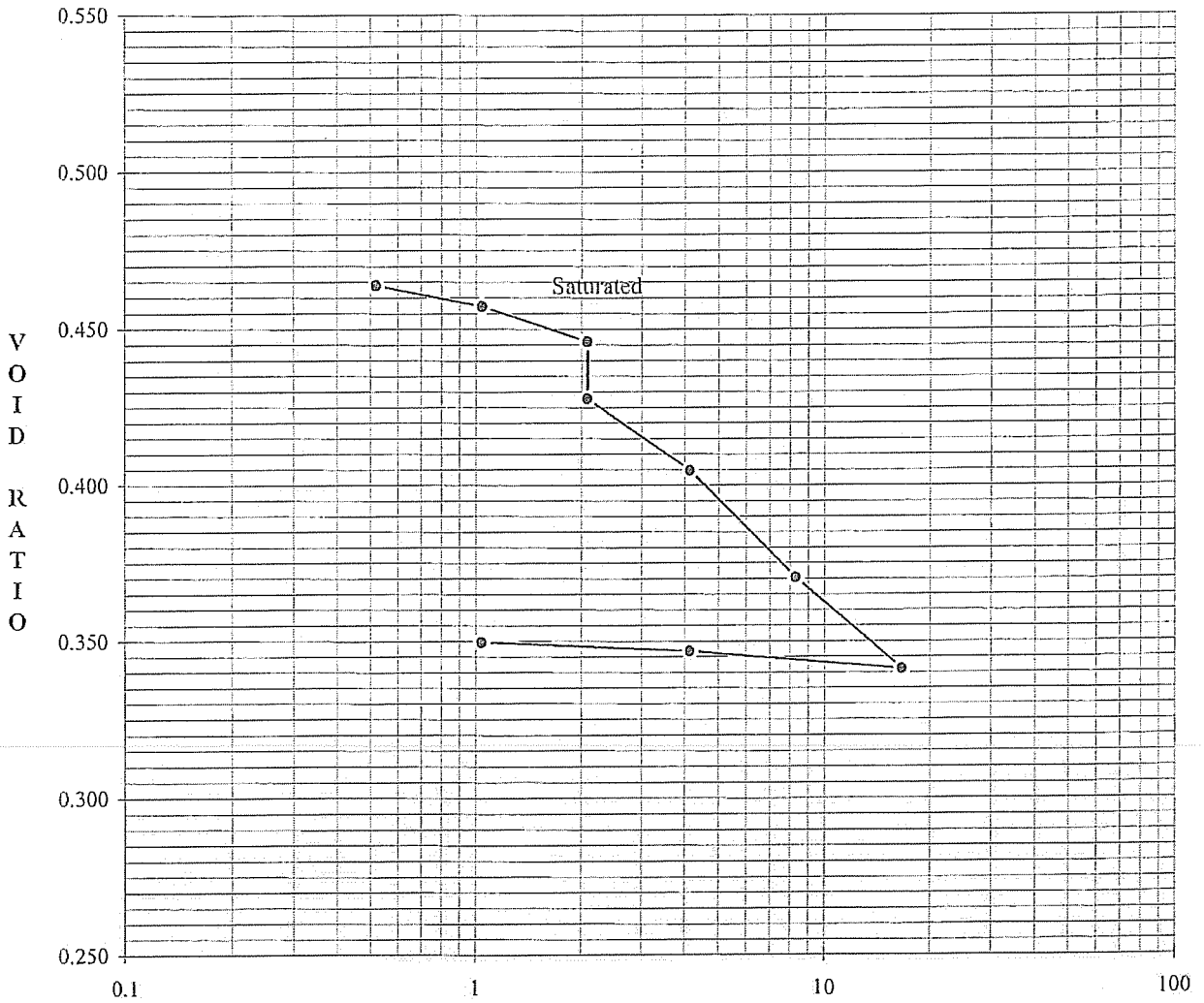
ASTM D 2435-04

January 25, 2006

Boring #5 @ 11.0 - 11.5'
Silty Sand (SM)
Ring Sample

DRY DENSITY: 103.3 pcf
MOISTURE CONTENT: 12.2%
SPECIFIC GRAVITY: 2.70 (assumed)
INITIAL VOID RATIO: 0.632

VOID RATIO vs. NORMAL PRESSURE DIAGRAM



Orcutt Keysite 3

SL-14813-SA

CONSOLIDATION TEST

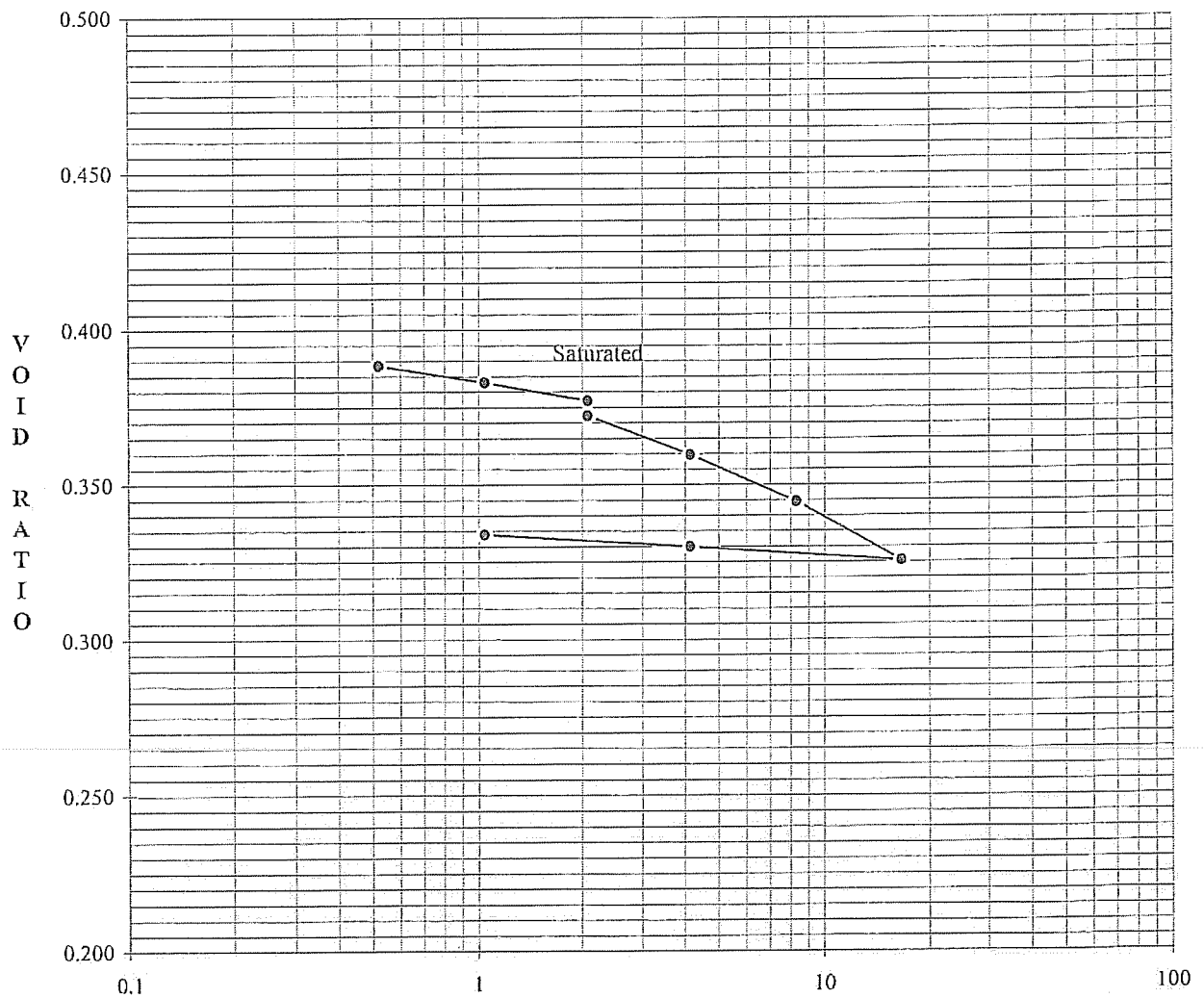
ASTM D 2435-04

January 25, 2006

Boring #6 @ 6.0 - 6.5'
Silty Sand (SM)
Ring Sample

DRY DENSITY: 109.1 pcf
MOISTURE CONTENT: 11.8%
SPECIFIC GRAVITY: 2.70 (assumed)
INITIAL VOID RATIO: 0.546

VOID RATIO vs. NORMAL PRESSURE DIAGRAM



Orcutt Keysite 3 SL-14813-SA

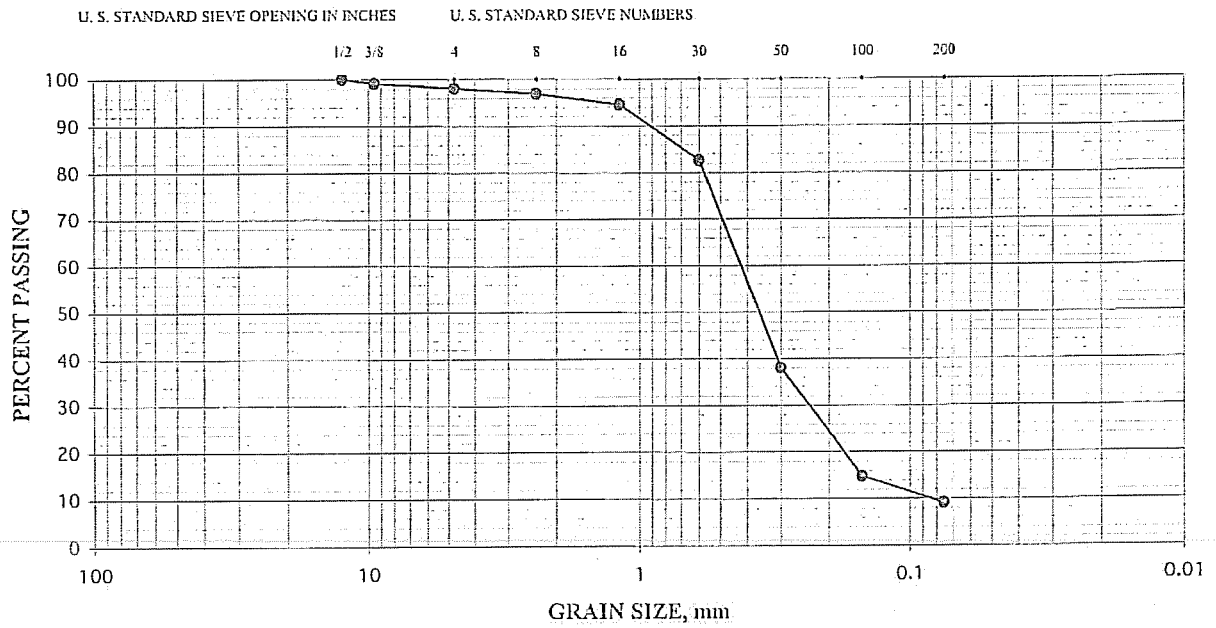
PARTICLE SIZE ANALYSIS

ASTM D 422-02; D 1140-02

Boring #1 @ 35.0 - 36.5' January 25, 2006

Poorly Graded Sand With Silt (SP-SM)

Sieve size	% Retained	% Passing
1/2" (12.5-mm)	0	100
3/8" (9.5-mm)	1	99
#4 (4.75-mm)	2	98
#8 (2.36-mm)	3	97
#16 (1.18-mm)	5	95
#30 (600-µm)	17	83
#50 (300-µm)	62	38
#100 (150-µm)	85	15
#200 (75-µm)	91	9



Orcutt Keysite 3 SL-14813-SA

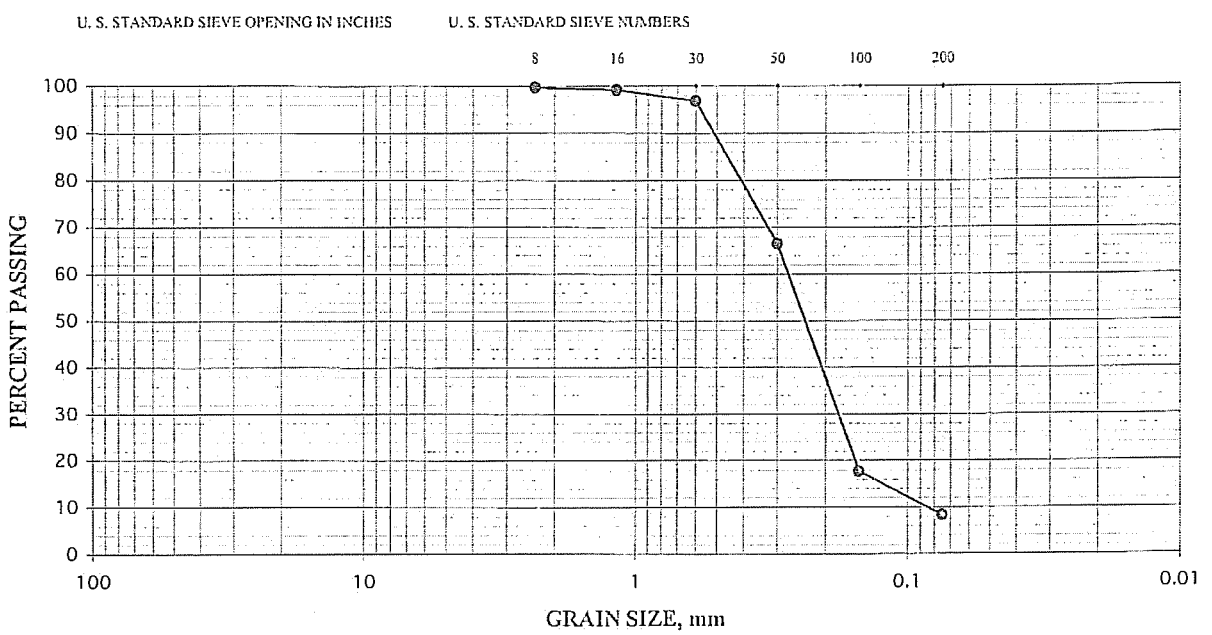
PARTICLE SIZE ANALYSIS

ASTM D 422-02; D 1140-02

Boring #2 @ 45.0 - 46.5' January 25, 2006

Poorly Graded Sand With Silt (SP-SM)

Sieve size	% Retained	% Passing
#8 (2.36-mm)	0	100
#16 (1.18-mm)	1	99
#30 (600-µm)	3	97
#50 (300-µm)	33	67
#100 (150-µm)	82	18
#200 (75-µm)	92	8



Orcutt Keysite 3 SL-14813-SA

PARTICLE SIZE ANALYSIS

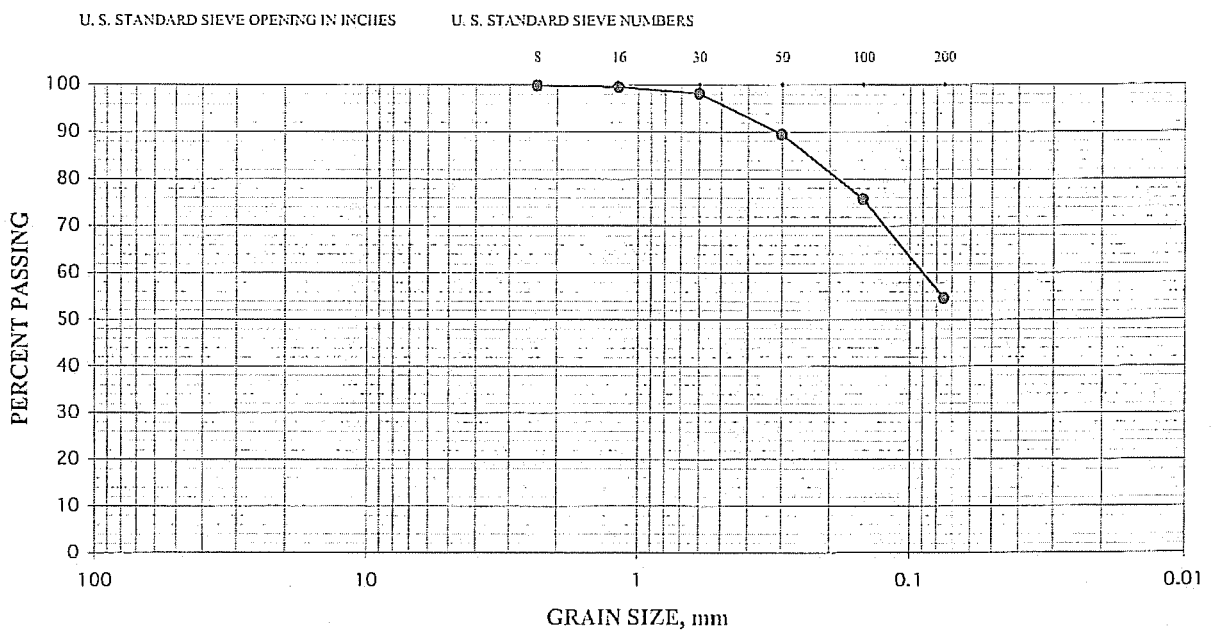
ASTM D 422-02; D 1140-02

Boring #3 @ 0.0 - 5.0'

January 25, 2006

Sandy Silt (ML)

Sieve size	% Retained	% Passing
#8 (2.36-mm)	0	100
#16 (1.18-mm)	1	99
#30 (600-µm)	2	98
#50 (300-µm)	11	89
#100 (150-µm)	24	76
#200 (75-µm)	45	55



Orcutt Keysite 3 SL-14813-SA

PARTICLE SIZE ANALYSIS

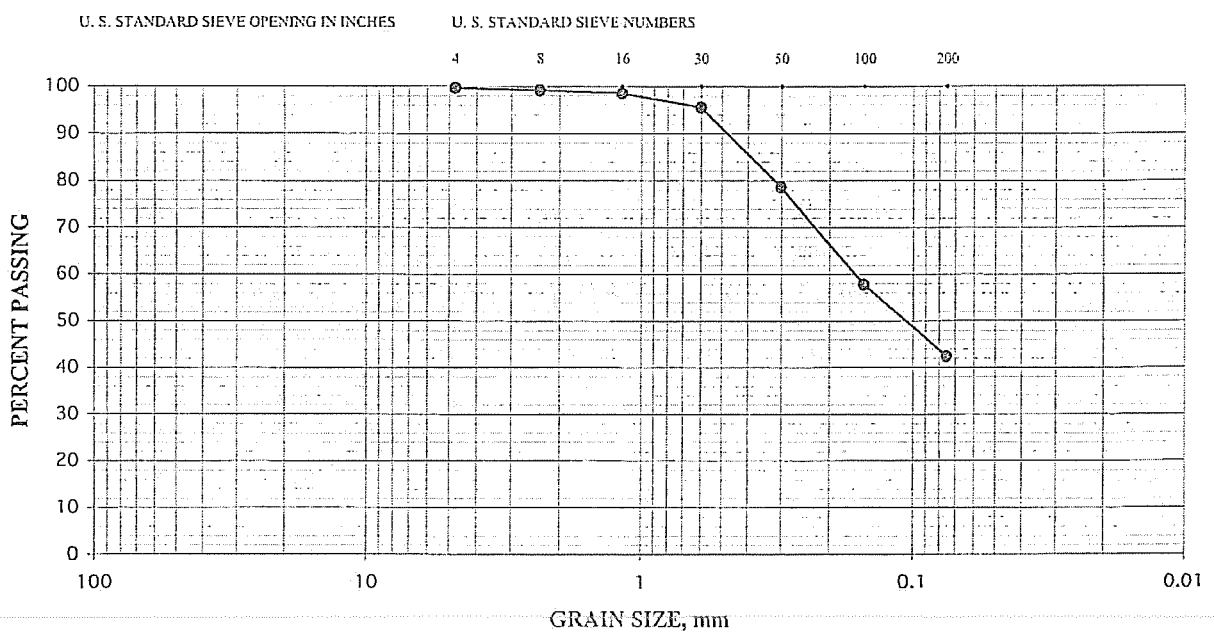
ASTM D 422-02; D 1140-02

Boring #7 @ 10.0 - 11.5'

January 25, 2006

Silty Sand (SM)

Sieve size	% Retained	% Passing
#4 (4.75-mm)	0	100
#8 (2.36-mm)	1	99
#16 (1.18-mm)	2	98
#30 (600-µm)	4	96
#50 (300-µm)	21	79
#100 (150-µm)	42	58
#200 (75-µm)	58	42



Orcutt Keysite 3 SL-14813-SA

PARTICLE SIZE ANALYSIS

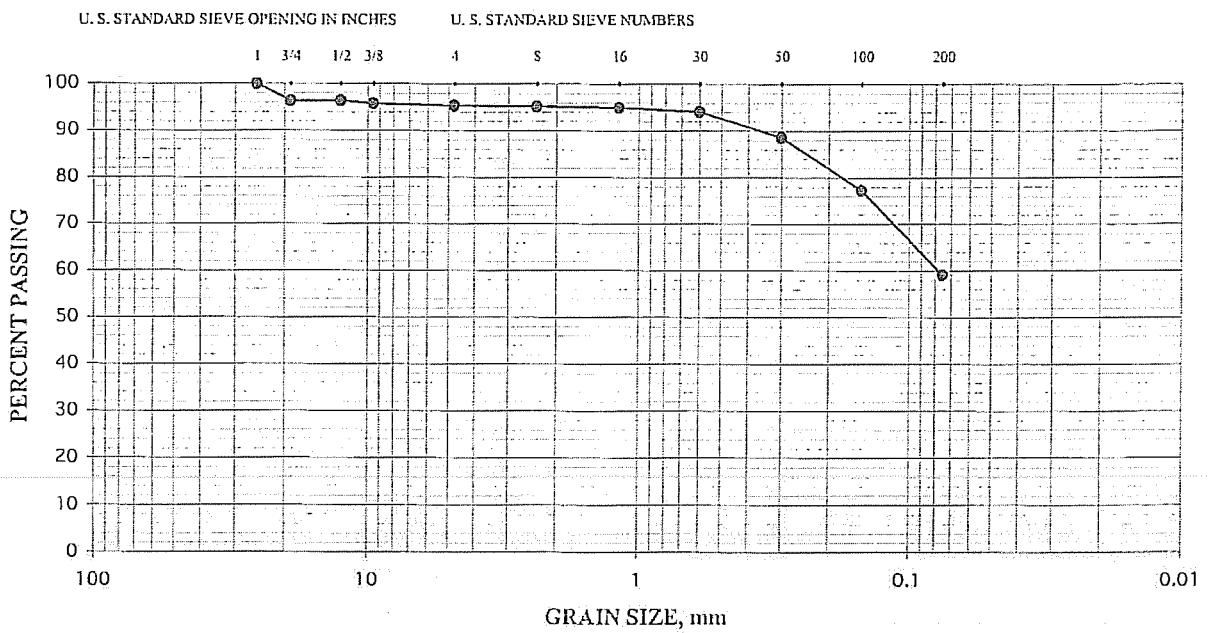
ASTM D 422-02; D 1140-02

Boring #10 @ 10.0 - 11.5'

January 25, 2006

Sandy Lean Clay (CL)

Sieve size	% Retained	% Passing
1" (25-mm)	0	100
3/4" (19-mm)	4	96
1/2" (12.5-mm)	4	96
3/8" (9.5-mm)	4	96
#4 (4.75-mm)	5	95
#8 (2.36-mm)	5	95
#16 (1.18-mm)	5	95
#30 (600-µm)	6	94
#50 (300-µm)	11	89
#100 (150-µm)	23	77
#200 (75-µm)	41	59



Orcutt Keysite 3 SL-14813-SA

PARTICLE SIZE ANALYSIS

ASTM D 422-02; D 1140-02

Boring #11 @ 0.0 - 4.0' January 25, 2006

Sandy Silt (ML)

Sieve size	% Retained	% Passing
#16 (1.18-mm)	0	100
#30 (600-µm)	2	98
#50 (300-µm)	12	88
#100 (150-µm)	23	77
#200 (75-µm)	30	70

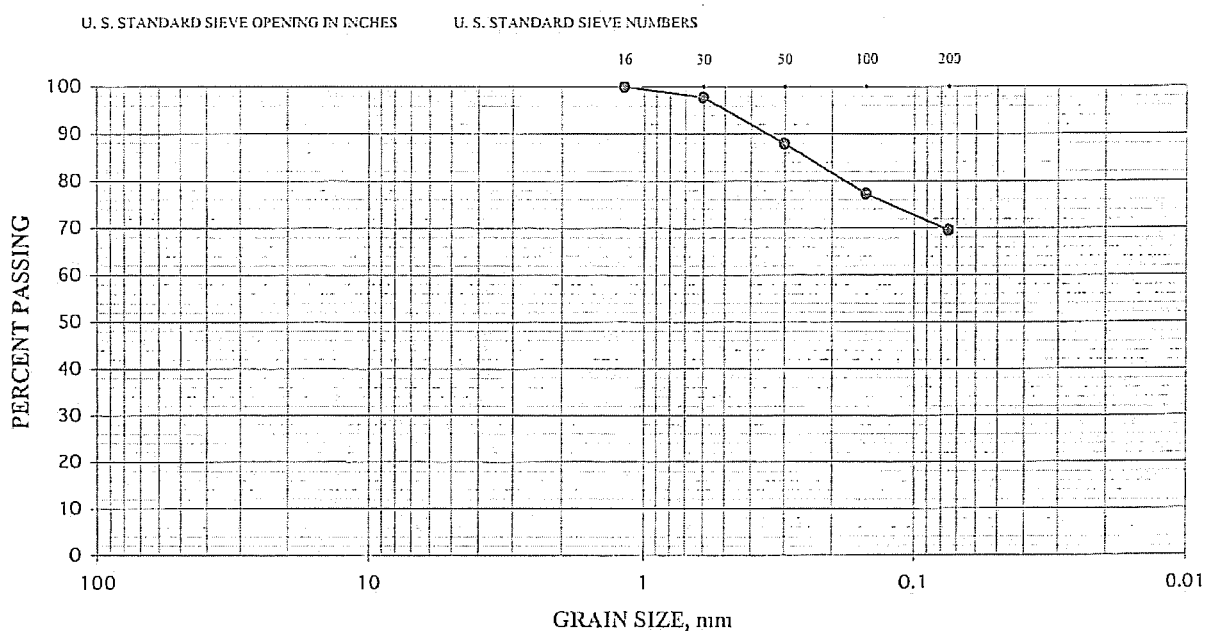


Table 1 - Laboratory Tests on Soil Samples

Earth Systems So.Ca.
Orcutt Key Site 3
Your #SL-14813-SA, MJS&A #05-1830LAB
16-Dec-05

Sample ID			B-2 @ 0-5' SM	B-4 @ 0-4' SM	B-9 @ 0-4' SM	B-11 @ 0-4' ML
Resistivity		**Units**				
as-received		ohm-cm	45,000	94,000	110,000	91,000
saturated		ohm-cm	6,300	3,400	3,000	2,700
pH			6.0	5.5	6.8	6.5
Electrical						
Conductivity		mS/cm	0.09	0.16	0.13	0.18
Chemical Analyses						
Cations						
calcium	Ca^{2+}	mg/kg	92	92	12	24
magnesium	Mg^{2+}	mg/kg	29	56	12	29
sodium	Na^{1+}	mg/kg	ND	ND	32	17
Anions						
carbonate	CO_3^{2-}	mg/kg	ND	ND	ND	ND
bicarbonate	HCO_3^{1-}	mg/kg	101	192	110	168
chloride	Cl^{1-}	mg/kg	ND	ND	ND	ND
sulfate	SO_4^{2-}	mg/kg	ND	54	58	77
Other Tests						
ammonium	NH_4^{1+}	mg/kg	10.4	56.2	5.1	9.6
nitrate	NO_3^{1-}	mg/kg	ND	ND	ND	ND
sulfide	S^{2-}	qual	na	na	na	na
Redox		mV	na	na	na	na

Electrical conductivity in millisiemens/cm and chemical analysis were made on a 1:5 soil-to-water extract.
mg/kg = milligrams per kilogram (parts per million) of dry soil.
Redox = oxidation-reduction potential in millivolts
ND = not detected
na = not analyzed

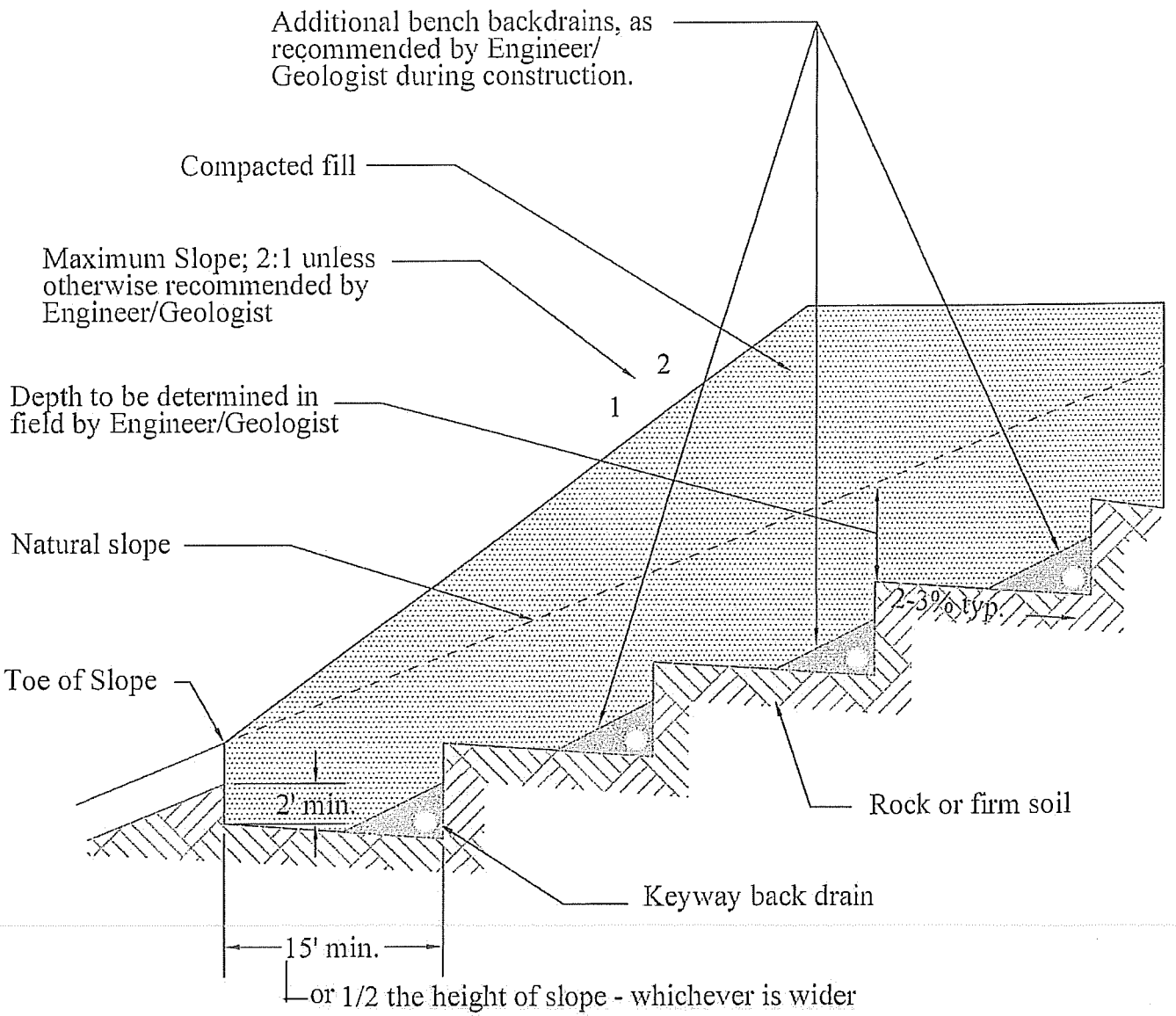
APPENDIX C

Typical Bench and Keyway, and Backdrain Details

BENCH and KEYWAY DETAIL (Typical)

ORCUTT KEY SITE 3

South of Clark Avenue & West of Highway 101
Orcutt Area of Santa Barbara County, California



SCHEMATIC ONLY
NOT TO SCALE

Earth Systems Pacific
308 North First Street
Lompoc, CA 93436
(805) 737-9755 • FAX (805) 735-3456
E-mail: esc@earthsys.com

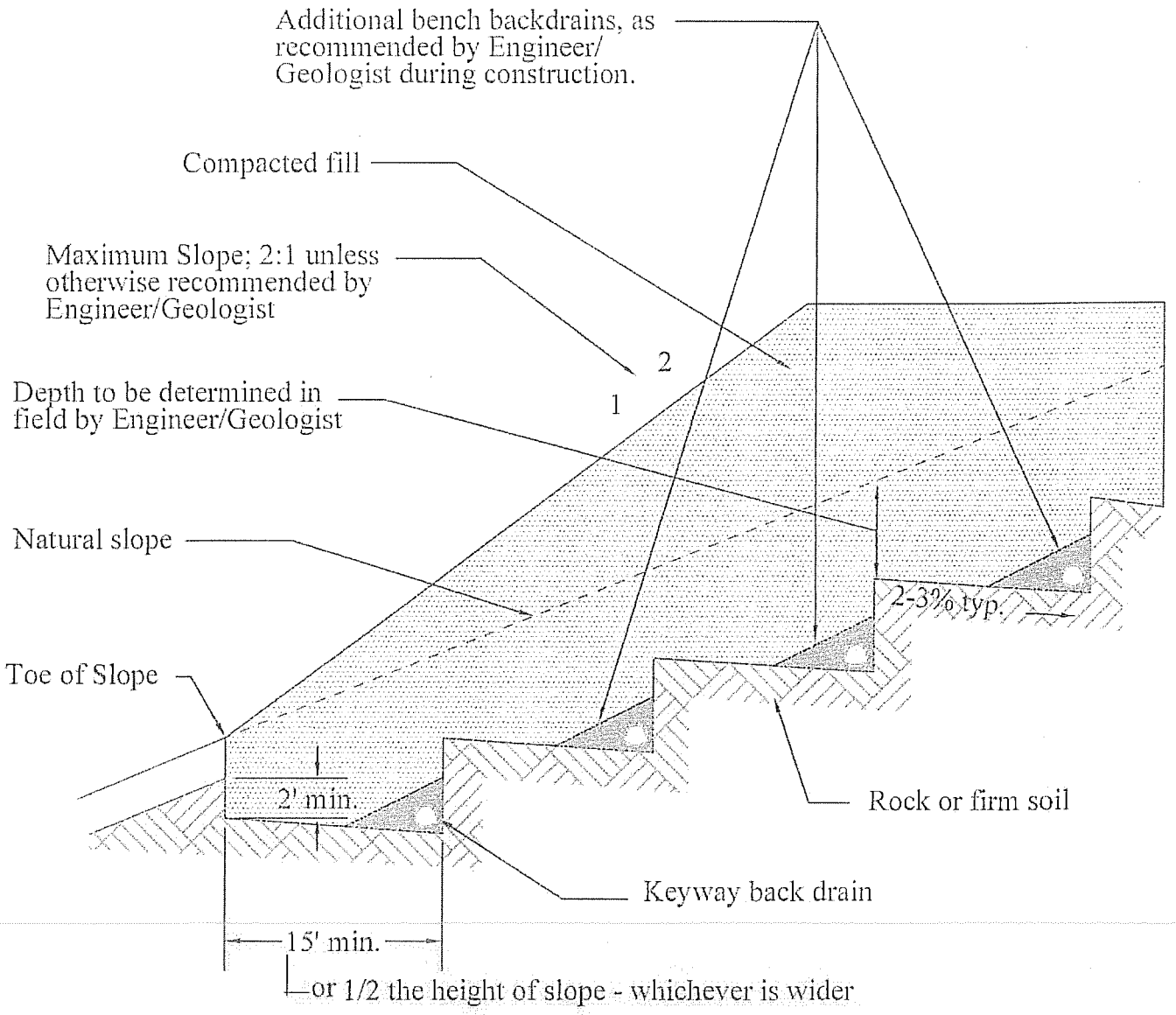
February 10, 2006 SMK SL-14813-SA

BENCH-D01-V03.dwg

BENCH and KEYWAY DETAIL (Typical)

ORCUTT KEY SITE 3

South of Clark Avenue & West of Highway 101
Orcutt Area of Santa Barbara County, California



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Earth Systems Pacific

308 North First Street
Lompoc, CA 93436

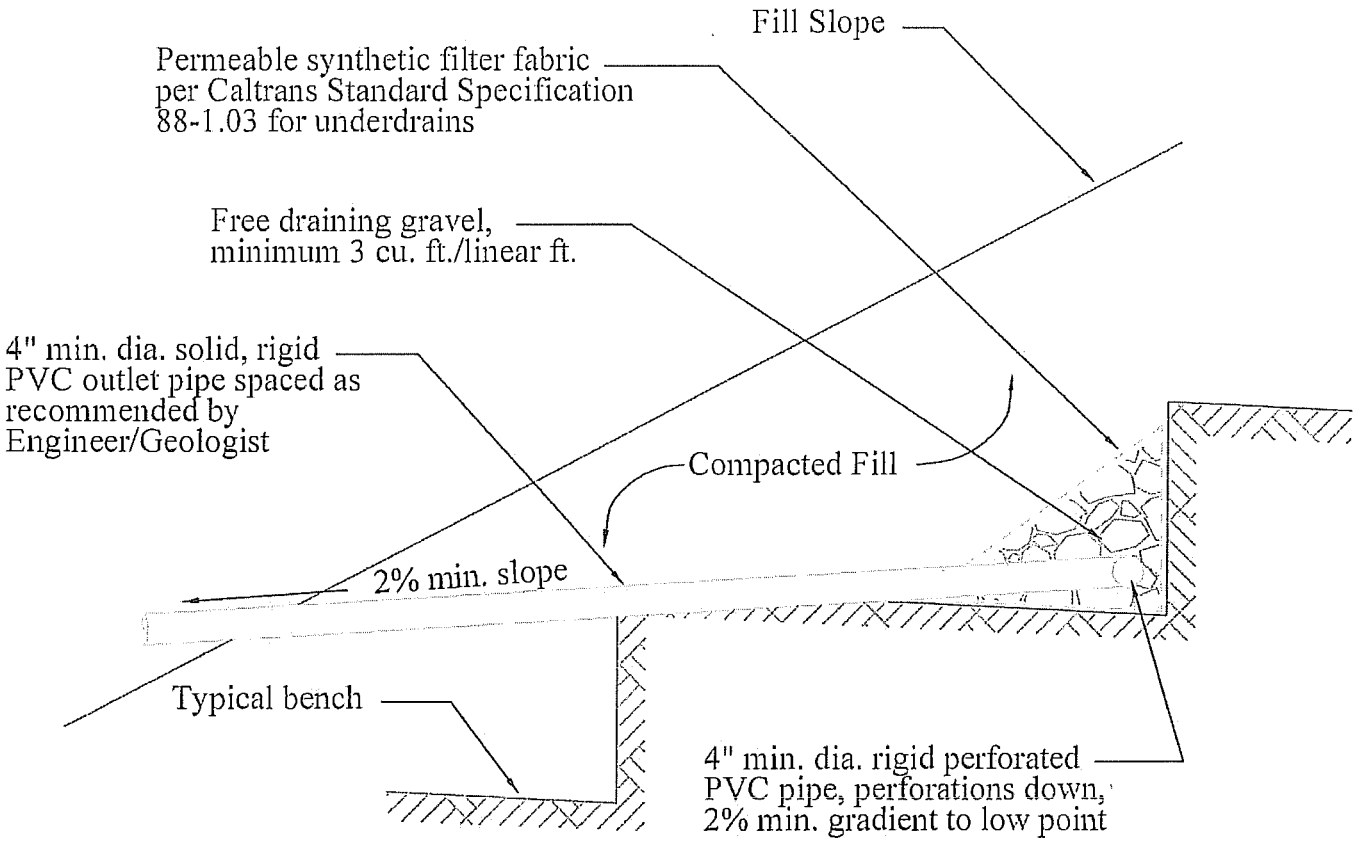
(805) 737-9755 • FAX (805) 735-3456
E-mail: esc@earthsys.com

February 10, 2006 SMK SL-14813-SA
BENCH-D01-V03.dwg

BACK DRAIN DETAIL (Typical)

ORCUTT KEY SITE 3

South of Clark Avenue & West of Highway 101
Orcutt Area of Santa Barbara County, California



Note: A prefabricated panel drainage system (Advanedge, Miradrain, etc.) may be substituted for the gravel / pipe system, provided it is installed in accordance with the manufacturer's recommendations

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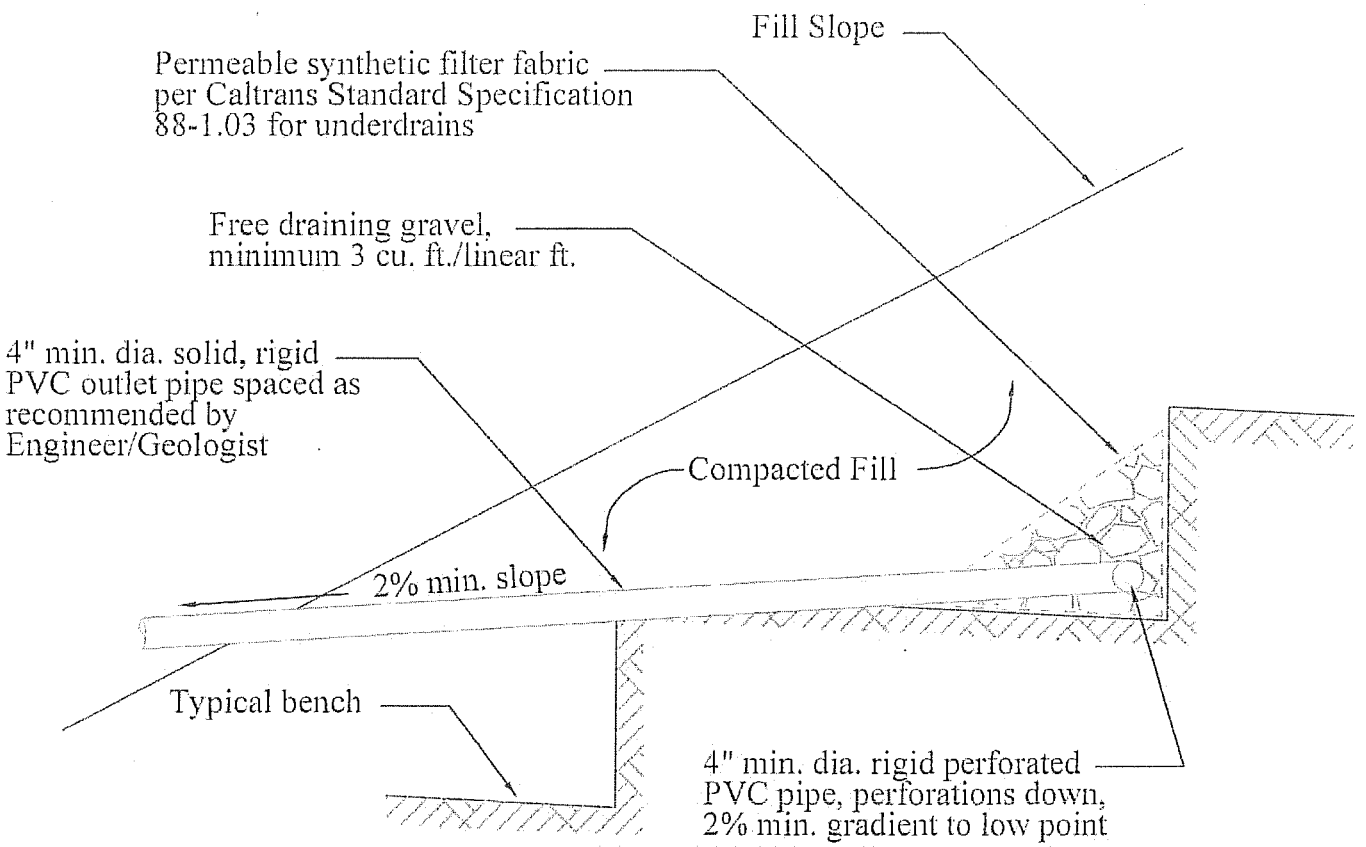
February 10, 2006 SMK SL-14813-SA

DRAIN-D01-V06.dwg

BACK DRAIN DETAIL (Typical)

ORCUTT KEY SITE 3

South of Clark Avenue & West of Highway 101
Orcutt Area of Santa Barbara County, California



Note: A prefabricated panel drainage system (Advanedge, Miradrain, etc.) may be substituted for the gravel / pipe system, provided it is installed in accordance with the manufacturer's recommendations

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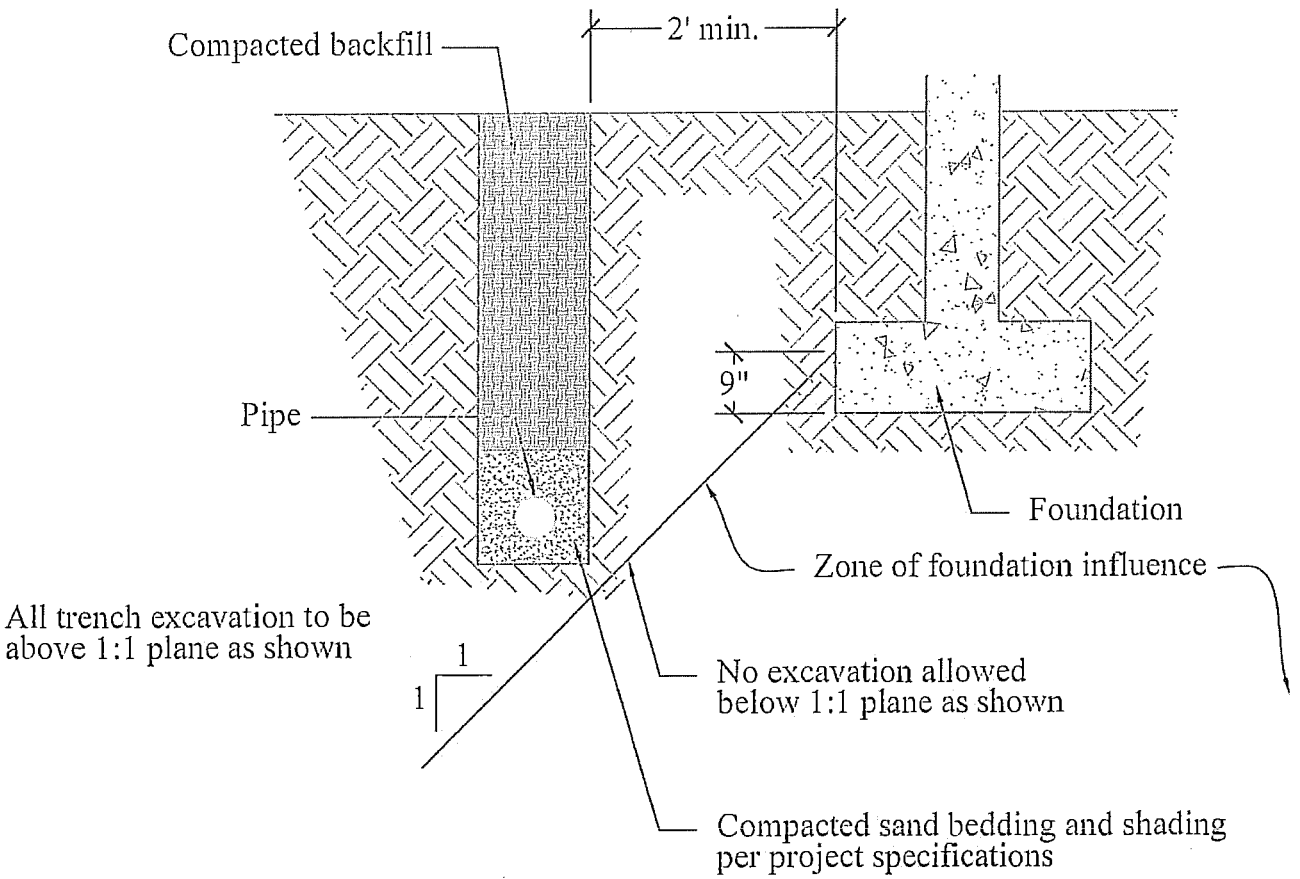
APPENDIX D

Typical Detail A: Pipe Placed Parallel to Foundations

TYPICAL DETAIL A:
PIPE PLACED PARALLEL TO FOUNDATIONS

ORCUTT KEY SITE 3

South of Clark Avenue & West of Highway 101
Orcutt Area of Santa Barbara County, California



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Appendix F

Policy Consistency Analysis



POLICY CONSISTENCY

This section provides a preliminary analysis of the project's consistency with applicable County goals, policies, actions and programs. Although such policy consistency matters do not have the potential to have direct impacts on the physical environment that would not be identified and addressed in other sections of this analysis, the consistency discussion is provided for informational purposes.

With respect to each of the identified goals, policies, actions and programs, the project is described as "consistent" (the project could directly implement the policy), "potentially consistent" (the project would not hinder implementation of the policy), or "potentially inconsistent" (the project may hinder implementation of the policy). A final determination of consistency will be made by County decision-makers. Refer also to Section 4.2, *Air Quality,* for an analysis of the project's consistency with the adopted Clean Air Plan, and Section 4.7, *Greenhouse Gas Emissions*, for a discussion of the proposed project's consistency with applicable State greenhouse gas emission reduction strategies.

Santa Barbara County Comprehensive Plan. The County's Comprehensive Plan is a long-range plan that serves as a guide for the physical development of Santa Barbara County. The Comprehensive Plan is comprised of several topical parts or elements, such as the Land Use Element, Noise Element, Circulation Element, Housing Element, etc. The Comprehensive Plan also includes the various Community Plans, including the Orcutt Community Plan, which applies to the project site. The Comprehensive Plan includes goals, policies, and implementation measures that provide a general framework for County-wide development. The following table shows the proposed project's consistency or inconsistency with the Comprehensive Plan goals, policies, actions, and development standards.

Table 1. Santa Barbara County Comprehensive Plan Policy Consistency

Goals, Policies, Actions, and Development Standards	Consistency Discussion
Land Use Element – Land Use Development Policies	
Policy 2. The densities specified in the Land Use Plan are maximums and may be reduced if it is determined that such reduction is warranted by conditions specifically applicable to a site, such as topography, geologic or flood hazards, habitat areas, or steep slopes. However, density may be increased under programs of the Housing Element.	**Potentially Consistent.** As discussed in Section 4.8, *Land Use*, buildout of Key Site 3 would result in 285 dwelling units, including the proposed 125 units and the 160 units approved as part of the Focused Rezone Housing Program. The Orcutt Community Plan (OCP) only anticipated 212 units on Key Site 3 but that was prior to the County's 2009 adoption of the Focused Rezone Program, which added the MR-O density of 160 units to the site as a way to partially satisfy affordable housing mandates, as also anticipated by the OCP (another MR-O site was added to Key Site 30 to fully satisfy housing mandates). The total density anticipated for Key Site 3, after adoption of the Focused Rezone Program, is therefore 372 (212 + 160). The proposed project is within this allowable density. The northerly portion of the site that is proposed for development does not appear to have conditions specifically applicable to the site as identified noise, air quality and visual impacts can be mitigated to less than significant levels. The project is therefore potentially consistent with this policy.

Table 1. Santa Barbara County Comprehensive Plan Policy Consistency

Goals, Policies, Actions, and Development Standards	Consistency Discussion
Policy 3. No urban development shall be permitted beyond boundaries of land designated for urban uses except in neighborhoods in rural areas.	**Consistent.** The proposed project is located within a designated urban area. Therefore, the proposed project would be consistent with this policy.
Policy 4. Prior to issuance of a development permit, the County shall make the finding, based on information provided by environmental documents, staff analysis, and the applicant, that adequate public or private services and resources (i.e., water, sewer, roads, etc.) are available to serve the proposed development. The applicant shall assume full responsibility for costs incurred in service extensions or improvements that are required as a result of the proposed project. Lack of available public or private services or resources shall be grounds for denial of the project or reduction in the density otherwise indicated in the land use plan.	**Consistent.** As discussed in Section 4.5, *Fire Protection*, Section 4.10, *Public Services*, and Section 5.0, *Effects Found Not to be Significant*, adequate fire and police protection, public school capacity, and wastewater service would be available for the proposed project, and impacts related to these services would be less than significant. The applicant has provided an agreement with the School District to mitigate school impacts (and will pay school fees) and has provided a draft contract with the City of Santa Maria for the purchase of supplemental water. Furthermore, adequate landfill capacity is available to serve the project, although the project's cumulative contribution to the landfill reaching it capacity has been identified as significant. As discussed in Section 4.11, *Transportation and Circulation*, implementation of mitigation measures T-1 and T-2 would result in less than significant project-specific and cumulative impacts to area roadways and intersections. Therefore, the project would be consistent with this policy.
Policy 5. Within designated urban areas, new development other than that for agricultural purposes shall be serviced by the appropriate public sewer and water district or an existing mutual water company, if such service is available.	**Consistent.** As discussed in Section 4.10, *Public Services*, public wastewater (Laguna Sanitary District) and water (Golden State) districts would have adequate capacity to serve the proposed project. Therefore, the project would be consistent with this policy.
Land Use Element – Hillside and Watershed Protection Policies	
Policy 1. Plans for development shall minimize cut and fill operations. Plans requiring excessive cutting and filling may be denied if it is determined that the development could be carried out with less alteration of the natural terrain.	**Consistent.** The proposed project would require grading; however, the grading would not be excessive because the development area does not contain steep slopes, unstable areas, or flood zones, and the project would not result in a substantial alteration of the topography of the site. Nearly all areas within the project site that would be developed with either access roads or residences would require some level of grading. On a development-wide basis, grading operations would result in approximately 290,950 cubic yards (168,450 cubic yards of cut and 122,500 cubic yards of fill). The excess cut generated from the grading would be used as additional fill to offset the anticipated shrinkage and compaction of cut material. No offsite hauling of excess material is anticipated. Therefore, the project would be consistent with this policy.
Policy 2. All development shall be designed to fit the site topography, soils, geology, hydrology, and any other existing conditions and be oriented so that grading and other site preparation is kept to an absolute minimum. Natural features, landforms, and native vegetation, such as trees, shall be preserved to the maximum extent feasible. Areas of the site which are not suited to development because of known soil, geologic, flood, erosion or other hazards shall remain in open space.	**Consistent.** The proposed project would not exceed permitted residential density on the site, and the project development is confined to a relatively flat mesa. As such, grading would be kept to the minimum required in order establish the planned use. Overall topography of the site would not be substantially altered nor would significant amounts of native vegetation. The hillside south of Orcutt Creek is wooded but the multi-use trail would minimize tree removals. The project therefore would be consistent with this policy.

Table 1. Santa Barbara County Comprehensive Plan Policy Consistency

Goals, Policies, Actions, and Development Standards	Consistency Discussion
Policy 3. For necessary grading operations on hillsides, the smallest practical area of land shall be exposed at any one time during development, and the length of exposure shall be kept to the shortest practicable amount of time. The clearing of land should be avoided during the winter rainy season and all measures for removing sediments and stabilizing slopes should be in place before the beginning of the rainy season.	**Consistent.** The project would not involve hillside grading, but adherence to mitigation measures that require preparation of and adherence to a Storm Water Pollution Prevention Plan (SWPPP) would minimize exposed soils; avoid construction during the rainy season; stabilize slopes; and control erosion. Therefore, the proposed project would be consistent with this policy.
Policy 4. Sediment basins (including debris basins, desilting basins, or silt traps) shall be installed on the project site in conjunction with the initial grading operations and maintained through the development process to remove sediment from runoff waters. All sediment shall be retained on-site unless removed to an appropriate dumping location.	**Consistent.** Project development would require preparation of a SWPPP that would include the implementation of sediment basins and other sediment control methods in the initial stage of construction in order to control sediment runoff, and such a basin is shown on proposed plans. Therefore, the proposed project would be consistent with this policy.
Policy 5. Temporary vegetation, seeding, mulching, or other suitable stabilization methods shall be used to protect soils subject to erosion that have been disturbed during grading or development. All cut and fill slopes shall be stabilized as rapidly as possible with planting of native grasses and shrubs, appropriate non-native plants, or with acceptable landscaping practices.	**Consistent.** Project development would require preparation of a SWPPP that would include stabilization of exposed soils within one week of exposure. Therefore, the proposed project would be consistent with this policy.
Policy 6. Provisions shall be made to conduct surface water to storm drains or suitable watercourses to prevent erosion. Drainage devices shall be designed to accommodate increased runoff resulting from modified soil and surface conditions as a result of development. Water runoff shall be retained onsite whenever possible to facilitate groundwater recharge.	**Consistent.** The proposed project includes a detention basin system which would ensure that stormwater runoff does not exceed County standards and water quality impacts are minimized to a less than significant level. Therefore, the proposed project would be consistent with this policy.
Policy 7. Degradation of the water quality of groundwater basins, nearby streams, or wetlands shall not result from development of the site. Pollutants, such as chemicals, fuels, lubricants, raw sewage, and other harmful waste, shall not be discharged into or alongside coastal streams or wetlands either during or after construction.	**Consistent.** The proposed project would include a detention basin system, which would control stormwater runoff and minimize water quality impacts to a less than significant level. The proposed project would be required to prepare a SWPPP, which would control the discharge of pollutants, including sediment, into local surface water drainages. Therefore, the proposed project would be consistent with this policy.
Land Use Element – Historical and Archaeological Sites Policies	
Policy 1. All available measures, including purchase, tax relief, purchase of development rights, etc., shall be explored to avoid development on significant historic, prehistoric, archaeological, and other classes of cultural sites.	**Consistent.** As discussed in Section 4.4, *Cultural Resources*, adherence to mitigation measures CR-2(a) through CR-2(c) would reduce potential impacts to unknown cultural resources to a less than significant level. Therefore, the proposed project would be consistent with this policy.
Policy 2. When developments are proposed for parcels where archaeological or other cultural sites are located, project design shall be required which avoids impacts to such cultural sites if possible.	**Consistent.** As discussed in Section 4.4, *Cultural Resources*, the proposed project would have a less than significant impact on known archeological and historical resources. Mitigation measures CR-2(a) through CR-2(c) include provisions for avoidance of cultural sites and proper artifact collection and recordation in the event that sites cannot be avoided, such that the potential impacts to unknown cultural resources would be reduced to a less than significant level. Therefore, the proposed project would be consistent with this policy.

Table 1. Santa Barbara County Comprehensive Plan Policy Consistency

Goals, Policies, Actions, and Development Standards	Consistency Discussion
Policy 3. When sufficient planning flexibility does not permit avoiding construction on archaeological or other types of cultural sites, adequate mitigation shall be required. Mitigation shall be designed to accord with guidelines of the State Office of Historic Preservation and the State of California Native American Heritage Commission.	**Consistent.** As discussed in Section 4.4, *Cultural Resources*, mitigation measures CR-2(a) through CR-2(c) would reduce potential impacts to unknown cultural resources to a less than significant level. Therefore, the proposed project would be consistent with this policy.
Policy 4. Off-road vehicle use, unauthorized collection of artifacts, and other activities other than development which could destroy or damage archaeological or other cultural sites shall be prohibited.	**Consistent.** As discussed in Section 4.4, *Cultural Resources*, mitigation measure CR-1(d) would prohibit off-road vehicle use, unauthorized collecting of artifacts, and other activities other than development which could destroy or damage archaeological or cultural sites. Further, mitigation measure CR-1(d) requires that signs be posted on the property to discourage these types of activities and and requires that the HOA assume maintenance responsibility for these signs (OCP EIR Mitigation Measure ARCH-7).
Policy 5. Native Americans shall be consulted when development proposals are submitted which impact significant archaeological or cultural sites.	**Consistent.** Mitigation Measures CR-2(a) through CR-2(c) require monitoring of initial earth disturbance activities and consultation with a qualified Native American consultant in the event of a discovery. Therefore, the proposed project would be consistent with this policy.
Land Use Element – Parks/Recreation Policies	
Policy 1. Bikeways shall be provided where appropriate for recreational and commuting use.	**Consistent.** The proposed project would include public multi-use trails, which would connect to existing bicycling infrastructure in the Orcutt area by way of Clark Avenue and Chancellor Street. Therefore, the project is consistent with this policy.
Policy 3. Future development of parks should emphasize meeting the needs of local residents.	**Consistent.** As discussed in Section 5.0, *Effects Found Not to be Significant*, the proposed project would not result in significant parks and recreation impacts. The project would include recreational amenities, such as internal parks, open space, and multi-use trails. In addition, the applicant would be required to pay Quimby Act park fees. Therefore, the project is consistent with this policy.
Policy 4. Opportunities for hiking and equestrian trails should be preserved, improved and expanded wherever compatible with surrounding uses.	**Potentially Consistent.** The proposed project would include public multi-use trails, but it would not accommodate equestrian use. However, there is currently no public equestrian access to the site. Therefore, the project is potentially consistent with this policy.
Land Use Element – Visual Resource Policies	
Policy 1. All commercial, industrial and planned developments shall be required to submit a landscaping plan to the County for approval.	**Consistent**. The project is subject to OCP Gateway policies and requires the preparation of a landscaping plan for review and approval by the Board of Architectural Review. Mitigation Measure BIO-2(e) in Section 4.3, *Biological Resources,* requires the preparation of a landscaping plan. The landscaping plan would require the use of drought tolerant, locally native plant species; noxious, invasive, and/or non-native plant species would not be permitted. Therefore, the proposed project would be potentially consistent with this development standard. Therefore, the project is consistent with this policy.

Table 1. Santa Barbara County Comprehensive Plan Policy Consistency

Goals, Policies, Actions, and Development Standards	Consistency Discussion
Policy 5. Utilities, including television, shall be placed underground in new developments in accordance with the rules and regulations of the California Public Utilities Commission, except where cost of undergrounding would be so high as to deny service.	**Consistent**. The proposed project would install all utilities underground, in accordance with this policy. Therefore, the project is consistent with this policy.
Noise Element	
Policy 1. In the planning of land use, 65 dB Day-Night Average Sound Level should be regarded as the maximum exterior noise exposure compatible with noise-sensitive uses unless noise mitigation features are included in project designs.	**Consistent.** As described in Section 4.9, *Noise,* the proposed project would result in potentially significant impacts related to construction noise near sensitive receptors and exposure to roadway noise from U.S. 101. However, implementation of mitigation measures N-1 (a-c) and N-2(a) would reduce exterior noise levels below 65 dBA. Therefore, exterior noise impacts would be reduced to less than significant levels and the proposed project would be consistent with this policy.
Policy 5. Noise-sensitive uses proposed in areas where the Day-Night Average Sound Level is 65 dB or more should be designed so that interior noise levels attributable to exterior sources do not exceed 45 dB LDN when doors and windows are closed. An analysis of the noise insulation effectiveness of proposed construction should be required, showing that the building design and construction specifications are adequate to meet the prescribed interior noise standard.	**Consistent.** As described in Section 4.9, *Noise*, the proposed project would result in potentially significant impacts related to exposure of new residences to roadway noise from U.S. 101. Mitigation Measure N-2(a) requires that perimeter walls be installed along the eastern property lines of dwelling units that face U.S. 101to reduce exterior noise levels below 65 dBA. In addition, homes on these lots must incorporate solid-core doors and double-paned glass to ensure interior noise levels below 45 dBA, and roof vents must be oriented away from the Highway. Upon implementation of these measures, interior noise levels within the proposed project would not exceed 45 dB. Therefore, the proposed project would be consistent with this policy.
Policy 6. Residential uses proposed in areas where the Day-Night Average Sound Level is 65 dB or more should be designed so that noise levels in exterior living spaces will be less than 65 dB LDN. An analysis of proposed projects should be required, indicating the feasibility of noise barriers, site design, building orientation, etc., to meet the prescribed exterior noise standard.	**Consistent.** As described in Section 4.9, *Noise*, the proposed project would result in potentially significant impacts related to exposure of new residences to roadway noise from U.S. 101. Mitigation Measure N-2(a) requires that 8' sound walls be installed along the easterly boundary of the lots nearest to U.S. 101 to reduce exterior noise levels to below 65 dBA. In addition, homes on these lots must incorporate solid-core doors and double-paned glass to ensure interior noise levels below 45 dBA. In addition, roof vents must be oriented away from the Highway. Upon implementation of these measures, exterior noise levels within the proposed project would not exceed 65 dB. Therefore, the proposed project would be consistent with this policy.

Table 1. Santa Barbara County Comprehensive Plan Policy Consistency

Goals, Policies, Actions, and Development Standards	Consistency Discussion
Circulation Element	
Roadway Standards: a. A project that would contribute ADTs to a roadway where the Estimated Future Volume does not exceed the policy capacity would be considered consistent with this section of this Element. b. For roadways where the Estimated Future Volume exceeds the policy capacity but does not exceed the Acceptable Capacity, a project would be considered consistent with this section of this Element only if the number of ADTs contributed by the project to the roadway was less than or equal to 2 percent of the remaining capacity of that roadway or 40 ADT, whichever is greater. c. For roadways where the Estimated Future Volume exceeds the acceptable capacity but does not exceed Design Capacity, a project would be considered consistent with this section of this Element only if the number of ADTs contributed by the project to the roadway does not exceed 25 ADT. d. For roadways where the Estimated Future Volume exceeds the design capacity, a project would be consistent with this section of this Element only if the number of ADTs contributed by the project to the roadway does not exceed 10 ADT.	**Consistent.** As discussed in Section 4.11, *Transportation and Circulation*, implementation of the proposed project would result in project-specific and cumulative impacts to roadways and intersections that are less than significant with mitigation. Therefore, the project would be consistent with this policy.
Intersection Standards: 1. Projects contributing PHTs (peak hour trips) to intersections that operate at an Estimated Future Level of Service that is better than LOS C shall be found consistent with this section of this Element unless the project results in a change in V/C (volume/capacity) ratio greater than 0.20 for an intersection operating at LOS A or 0.15 for an intersection operating at LOS B. 2. For intersections operating at an Estimated Future Level of Service that is less than or equal to LOS "C", a project must meet the following criteria in order to be found consistent with this section of this Element. • For intersections operating at an Estimated Future Level of Service C, no project must result in a change of V/C ratio greater than 0.10. • For intersections operating at an estimated future Level of Service D, no project shall contribute 15 or more Peak Hour Trips. • For intersections operating at an Estimated Future level of Service E, no project shall contribute 10 or more Peak Hour Trips. • For intersections operating at an Estimated Future Level of Service F, no project shall contribute 5 or more Peak Hour Trips.	**Consistent.** As discussed in Section 4.11, *Transportation and Circulation*, implementation of mitigation measures T-1 and T-2 would result in less than significant project-specific and cumulative impacts to area intersections. Therefore, the project would be consistent with this policy.

Table 1. Santa Barbara County Comprehensive Plan Policy Consistency

Goals, Policies, Actions, and Development Standards	Consistency Discussion
3. Where a project's traffic contribution does not result in a measurable change in the V/C ratio at an intersection but does result in a finding of inconsistency with Intersection Standard 2 above, intersection improvements that are acceptable to the Public Works Department shall be required in order to make a finding of consistency with these intersection standards. A measurable change in V/C ratio shall be defined as a change greater than or equal to 0.01. *(amended by 93-GP-12)* 4. Where a project's traffic contribution does result in a measurable change in V/C ratio and also results in a finding of inconsistency with Intersection Standards 1 or 2, above, intersection improvements that are sufficient to fully offset the change in V/C ratio associated with the project shall be required in order to make a finding of consistency with these intersection standards. *(amended by 93-GP-12)* 5. The above intersection standards shall also apply to all projects which generate Peak Hour Trips to intersections within incorporated cities that are operating at levels of service worse than those permitted by the City's Circulation Element.	
A) The roadway classifications, intersection levels of service, and capacity levels adopted in this Element shall apply to all roadways and intersections within the unincorporated area of the County, with the exception of those roadways and intersections located within an area included in an adopted community or area plan. Roadway classifications, intersection levels of service, and capacity levels adopted as part of any community or area plan subsequent to the adoption of this Element shall supersede any standards included as part of this Element.	**Potentially Consistent.** The proposed project is located within the Orcutt Community Plan (OCP) area. As discussed below in Table 2, the proposed project would be potentially consistent with OCP circulation policies.
C) The County shall continue to develop programs that encourage the use of alternative modes of transportation, including, but not limited to, an updated bicycle route plan, park and ride facilities, and transportation demand management ordinances.	**Potentially Consistent**. Development of the proposed project would not adversely affect any offsite bike routes or park and ride facilities. Moreover, the proposed project includes public walking and biking trails, which would connect to existing bicycling infrastructure in the Orcutt area by way of Clark Avenue and Chancellor Street. Therefore, the proposed project would be potentially consistent with this policy.
E) A determination of project consistency with the standards and policies of this Element shall constitute a determination of project consistency with the Land Use Element's Land Use Development Policy #4 with regard to roadway and intersection capacity.	**Potentially Consistent.** As described in the consistency analysis of Land Use Element Development Policy 4 above, and as discussed in Section 4.11, *Transportation and Circulation*, implementation of the project would result in less than significant project-specific and cumulative impacts to area roadways and intersections, with mitigation. Therefore, the project would be potentially consistent with this policy.

Table 1. Santa Barbara County Comprehensive Plan Policy Consistency

Goals, Policies, Actions, and Development Standards	Consistency Discussion
Housing Element	
Policy 1.1. Promote new housing opportunities adjacent to employment centers, and the revitalization of existing housing to meet the needs of all economic segments of the community, including extremely low income households, while bolstering the County's rural heritage and supporting each unincorporated community's unique character.	**Potentially Consistent.** The proposed project would result in the development of 125 new single family homes. In addition, 160 multi-family residences would be developed on the property as part of the previously approved MR-O project. The project site is within an urban area as designated in the Orcutt Community Plan and is therefore in relatively close proximity to employment centers, shopping opportunities, and local and regional transit facilities. Therefore, the proposed project would potentially be consistent with this policy.
Policy 2.1. Encourage housing that meets the requirements of special needs households, as identified per State law, and promotes housing diversity (i.e., size, type, tenure, location, and affordability levels).	**Potentially Consistent.** The proposed project would result in the development of 125 new single family homes. These residences would be required to ADA requirements relative to access and would fully comply with County Affordable Housing Zoning requirements through the payment of In-Lieu Fees. Therefore, the project would potentially be consistent with this policy.
Policy 3.1. Promote equal housing opportunities for all persons in all housing types (ownership and rental, market-rate and assisted).	**Consistent.** The proposed project would result in the development of 125 new single family homes and fully comply with County Affordable Housing Zoning requirements through the payment of In-Lieu Fees. Therefore, the proposed project would be consistent with this policy.

Orcutt Community Plan. The Orcutt Community Plan applies to the unincorporated area of Orcutt. The Orcutt Community Plan identifies growth projections and provides for orderly development to meet the full spectrum of housing, commercial and industrial space, roads, public facilities, and amenities for the community. The following table shows the proposed project's consistency with the following Orcutt Community Plan policy areas: Land Use Development, Fire Protection, Parks, Recreation Trails and Open Space, Police Protection, Schools, Sewer/Wastewater, Transportation, Water, and Visual Resources.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Orcutt Community Plan – Land Use	
Policy LU-O-3. The County shall require that adequate resources and service capacity are available to accommodate the growth identified within this Plan.	**Consistent.** As stated above in the analysis for Land Use Policy #4, adequate resources and service capacity is available for the proposed project. Therefore, the project would be consistent with this policy.
Policy LU-O-5. To improve fiscal balance in both the development, operations, and maintenance of public infrastructure, the County shall pursue establishment of appropriate funding mechanisms to ensure that development pays its "fair share" of public infrastructure costs.	**Consistent.** The applicant would be required to pay the project's fair share of fees for parks, fire, and police protection services, flood control, roads, and water in accordance with the County's developer fee schedule. Therefore, the project would be consistent with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy LU-O-6. The Orcutt Urban/Rural Boundary shall separate principally urban land uses and those which are rural and/or agricultural in nature. This boundary shall represent the maximum extent of the Orcutt urban area and the Urban/Rural Boundary shall not be extended until existing inventories of vacant land within the urban area are nearing buildout. Boundary adjustments shall be approved only as part of a major Community Plan update.	**Consistent.** The proposed project is located within the urban limit line of the OCP. In addition, the proposed project site has been identified for urban development by the OCP. The project does not propose to augment the existing urban boundary. Therefore, the proposed project would be consistent with this policy.
Policy LU-O-8. In order to preserve the semi-rural character of Orcutt, protect natural resources, and avoid development in hazardous areas, the County shall provide for large useable areas of (public or private) open space within the community. Appropriate planning tools should be explored and adopted which provide for the clustering or relocation of development from hazardous, environmentally sensitive or visually prominent areas, or other sites which are deemed unsuitable for development, to areas appropriate for development.	**Consistent.** The OCP designates the southerly portion of the subject site, south of the mesa, as open space. The applicant proposes to dedicate the area south of the mesa as open space. The proposed project would therefore be consistent with this policy.
Orcutt Community Plan – Residential	
Policy LUR-O-1. Consistent with the Housing Element, the County shall encourage the provision of a mix of affordable units on parcels within the Orcutt Planning Area.	**Consistent.** Key Site 3 is one of the sites within the Orcutt Planning Area that has been identified to accommodate future development. A portion of the site (the MR-O zoned portion) was previously designated for multi-family development, and the development proposed in this project would be adjacent to the MR-O area and would include a mix of residential densities. Therefore, the proposed project would be consistent with this policy.
Policy LUR-O-2. Future growth and development shall occur in a manner which minimizes construction related impacts on the community.	**Consistent.** Implementation of standard dust and emissions control measures required by the SBCAPCD would ensure that construction-related air quality impacts are less than significant. Other construction-related impacts would be reduced to less than significant levels with implementation of Mitigation Measures BIO-2(a) through BIO-2(e) and BIO-5(a) and BIO-5(b) in Section 4.3, *Biological Resources;* WR-1 in Section 4.12, *Water Resources*; N-1(a) through N-1(c) in Section 4.9, *Noise;* and T-1 in Section 4.11, *Transportation and Circulation.* Implementation of these measures would ensure that the proposed project would be consistent with this policy.
Policy LUR-O-6. In order to provide community cohesiveness, new neighborhoods should be designed to provide circulation, pedestrian, bicycle and public transportation linkage to existing neighborhoods, schools, parks, and commercial areas.	**Consistent.** The proposed project includes private parks and open space, and includes public multi-use trails that connect to Chancellor Street. The development would connect with the area circulation network and would provide access to needed services such as schools, parks, and commercial areas. Therefore, the proposed project would be consistent with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy LUR-O-7. County planning and maintenance efforts shall support development of safe, clean residential areas.	**Potentially Consistent.** Covenants, Conditions, and Restrictions (CC&Rs) would be developed and would contain requirements for maintenance of private residential lots and common recreational and open space areas. It is noted that the larger of the two proposed detention basins is 15 feet deep with the potential for 14 feet of standing water. The proposed 4-foot wood and wire fence would be easily climbable and may pose a safety risk. However, County Flood Control must review and approve this design. Therefore, the proposed project would be potentially consistent with this policy.
Orcutt Community Plan – Agricultural and Rural	
Policy LUA-O-2. Development in Orcutt shall be compatible with adjacent or nearby agricultural lands.	**Consistent.** The Key Site 3 property is not located adjacent to any parcels zoned for agricultural use. As discussed in Section 5.0, *Effects Found Not to be Significant*, the proposed project would result in less than significant impacts to agricultural resources. Therefore, the proposed project would be consistent with this policy.
DevStd LUA-O-2.1. Fencing, berming and/or landscaping shall be installed along property lines or across ends of street stubs contiguous to agricultural and/or permitted oil operations unless a waiver to the satisfaction of Planning & Development is obtained from the adjacent agriculturist(s) and property owner(s), and/or operators. Fencing, berming and/or landscaping shall be designed, installed, and maintained to protect agricultural land and permitted oil operations from effects of residential development.	**Consistent.** The Key Site 3 property is not located adjacent to any parcels zoned for agricultural use or used for oil operations. As discussed in Section 5.0, *Effects Found Not to be Significant*, the proposed project would result in less than significant impacts to agricultural resources. Therefore, the proposed project would be consistent with this development standard.
DevStd LUA-O-2.2. Consistent with the County's adopted Right to Farm Ordinance, a buyer beware notification shall be recorded on a separate information sheet with the final tract and/or parcel maps of properties within 1,000 feet of agriculturally zoned land. The notification shall inform the buyer that: The adjacent property is zoned for agriculture and is located in an area that has been planned for agricultural uses, including permitted oil development, and that any inconvenience or discomfort from properly conducted agricultural operations, including permitted oil development, shall be allowed consistent with the intent of the Right to Farm Ordinance. For further information, contact Santa Barbara County Planning and Development.	**Consistent.** The Key Site 3 property is not located within 1,000 feet of any parcels zoned for agricultural use, except the agriculturally-zoned lands east of U.S. 101. The County applies as a standard condition of approval for new residences adjacent to agricultural land a requirement that such residents be informed of the County's Right To Farm Ordinance. As discussed in Section 5.0 *Effects Found Not to be Significant*, the proposed project would result in less than significant impacts to agricultural resources. Therefore, the proposed project would be consistent with this development standard.
Orcutt Community Plan – Fire Protection	
Policy FIRE-O-2. Fire hazards in Orcutt shall be minimized in order to reduce the cost of/need for increased fire protection services and to protect the natural resources in undeveloped open space areas**.**	**Consistent**. As discussed in Section 5.0, *Effects Found Not to be Significant,* the proposed project would place structures and people within a mostly developed area, limiting the exposure to fire hazard areas. Moreover, mitigation measures FP-1(a) requires a Fire/Vegetation Management Plan and mitigation measure FP-1(b) requires the use of Fire Prevention Construction Techniques. Therefore, future development at this site would not expose structures, residents, or occupants to high fire hazards.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd FIRE-2.1. Development within or adjacent to high fire hazard areas should include the use of fire prevention measures such as perimeter roads, trails, Class A or B roofs, adequate access to the urban/rural interface and inclusion of structural setbacks per DevStd BIO 1.7. Fencing within the structural setback shall be comprised of fire-resistant material to minimize fire hazards.	**Consistent.** The Key Site 3 property is located within a high fire hazard area, as shown by the Fire Hazard Severity Zones Map for Santa Barbara County adopted by CalFire on November 7, 2007. As discussed in Section 4.5, *Fire Protection*, mitigation measures FP-1(a) requires a Fire/Vegetation Management Plan and mitigation measure FP-1(b) requires the use of Fire Prevention Construction Techniques prior to development and specify that fire resistant construction techniques are subject to approval by the Fire Department, which will ensure compliance with these requirements. Therefore, the project would be consistent with this policy.
DevStd FIRE-2.2. The County shall require two routes of ingress and egress for development unless waived by the Fire Department.	**Consistent** Access for the proposed project would be available from Clark Avenue and from Chancellor Street. Therefore, the proposed project would be consistent with this development standard.
Orcutt Community Plan – Parks, Recreation, Trails, and Open Space	
Policy PRT-O-1. Diverse passive and active recreational activities shall be developed in Orcutt.	**Consistent.** The proposed project would include trails and passive and active open space for recreation, detention basins, and drainage. Multi-use trails would provide a pedestrian connection between the project and residential development to the east of the site. The project would develop diverse recreational facilities and would therefore be consistent with this policy.
DevStd PRT-O-1.1. To the maximum extent feasible and consistent with applicable law, development on sites with identified proposed public parks shall dedicate and, where appropriate, construct such facilities.	**Consistent.** This site is not identified in the OCP to provide a public park. However, the proposed project would include private parks and significant open space for public use and enjoyment. Therefore, the proposed project would be consistent with this development standard.
Policy PRT-O-2. Development of parks shall be consistent with the community's existing semi-rural character and landscaping.	**Consistent.** The project includes several small private neighborhood parks. The park design has been reviewed by the Community Services Department Parks Division staff. Additionally, the project is subject to OCP Gateway policies and the proposed landscaping plan would be reviewed and approved by the Board of Architectural Review. This would ensure consistency with this policy.
DevStd PRT-O-2.1. Except for active recreation areas and other essential lawn space, park landscaping should consist of drought tolerant species. Appropriate native plants shall be utilized along park boundaries adjacent to passive undeveloped open space areas.	**Consistent.** The proposed project includes 106 acres of open space, most of which would be dedicated to the public as natural open space natural open space. Mitigation Measure BIO-2(e) in Section 4.3, *Biological Resources,* requires the preparation of a landscaping plan. The landscaping plan requires the use of drought tolerant, locally native plant species; noxious, invasive, and/or non-native plant species would not be permitted. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy PRT-O-3. Regional retention basins shall serve a dual flood control/recreational use where feasible and appropriate given flood control constraints and appropriate levels of natural resource protection.	**Potentially Consistent.** The proposed project was not identified as a potential regional basin site. The project includes a large detention basin located in the area to be offered as open space but it would only serve the proposed development as a drainage facility. However, the majority of the private developed park area would be a joint use detention basin area and would include amenities such as playground equipment, picnic tables, and basketball courts. Therefore, the proposed project would be potentially consistent with this policy.
DevStd PRT-O-3.1. Within regional retention basins, recreational areas must have side slopes no steeper than 6:1 along access frontage side (one side only) and 5:1 on all others. Basins totaling 10-15 acres may be no more than 15' deep. The minimum slope of the recreation area within a basin should be 0.5% to prevent ponding and allow runoff. Fencing of retention basins shall be minimized to the greatest extent feasible.	**Consistent.** The proposed large detention basin would not be regional and would not be designed for dual use. However, graded areas in the northern mesa area serving as dual purpose basins and parks would be gently sloped and fencing would be minimal so as to facilitate usage. Therefore the project would be potentially consistent with this development standard.
Policy PRT-O-4. The County Park Department and other agencies or groups pursuing implementation of the trail system shall use the Orcutt Multiple Use Trails Plan and its Trail Siting and Design Guidelines to guide future trail development and implementation.	**Potentially Consistent.** As noted, the applicant proposes to dedicate most of the subject property to the County as open space. As part of the proposed project, multi-use trails would provide a pedestrian loop through the subject property and a connection between the proposed residential development and the existing residential development to the east. Therefore, the proposed project would be potentially consistent with this policy.
DevStd PRT-O-4.1. Planning & Development and the County Park Department shall implement the Orcutt Multiple Use Trails Plan, including the Trail Siting Guidelines, by requiring, to the maximum extent feasible, development projects to dedicate, and where appropriate, construct designated trails. The County shall also pursue other methods to acquire and construct the trail system, including the use of grants and community volunteers.	**Consistent.** The applicant proposes to dedicate approximately 91 acres of designated open space to the County and construct the trails identified within the open space, consistent with the requirements of the Orcutt Community Plan. Trails shall also adhere to the Trails Plan and Siting Guidelines, ensuring consistency with this development standard.
DevStd PRT-O-4.2. Development shall comply with the Trail Siting Guidelines as set forth in the Orcutt Multiple Use Trails Plan.	**Consistent.** As shown in Figure 2-4 in Section 2.0, *Project Description,* multi-purpose trails would provide a pedestrian connection between Clark Avenue and the residential development to the west of the project site by way of Chancellor Street. The Orcutt Multiple Use Trails Plan includes a proposed trail crossing the Key Site 3 property along Orcutt Creek, and it also shows a proposed trail in the hills to the south of Orcutt Creek with a lookout point. This trail connection is included in the proposed project, as reflected in Figure 2-4 in Section 2.0, *Project Description*. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd PRT-O-4.3. Development on sites with identified trail corridors (Figure 14 in the OCP) shall include, where appropriate, the construction and assurance of the fitness of designated trails for two years, at which time the County Park Department would assume maintenance responsibility. Where immediate construction is not required, a construction bond shall be required.	**Consistent.** Figure 14 in the OCP depicts two trails crossing Key Site 3: W-1, which generally parallels U.S. 101; and OC-1, which parallels Orcutt Creek. In addition, an overlook is shown on the hillside south of Orcutt Creek. All of these facilities are shown in Figure 2-4 in Section 2.0, *Project Description*. These trails would be constructed by the applicant and dedicated to the public. Therefore, the project would be consistent with this development standard.
DevStd PRT-O-4.4. Trails should cross primary, and where appropriate secondary, roadways at controlled intersections. Trails located within an urban area may be included within the sidewalk system where appropriate. Trails in natural undeveloped open space areas, except Class I bikeways and emergency access routes, shall be limited to 6 feet in width.	**Consistent.** As shown on Figure 2-4, the proposed on-site trail system would not cross primary or secondary roadways because there are no such roadways on site; however, the proposed on-site trail system would connect to regional trails, and develop future potential trail connections that may cross primary or secondary roadways at controlled intersections in accordance with this development standard. Therefore, the proposed project would be consistent with this development standard.
Policy OS-O-1. When considering approval of development projects within or adjacent to areas identified for potential public open space (see Table 21), the County shall review the appropriate mix of public and/or private open space, and to the maximum extent feasible require dedication of contiguous areas identified as a priority for public acquisition as public open space based on the following criteria: • Location within designated open space corridors and proximity of adjacent open space; • The criteria and intent of the PRD zone district; and • Demonstration of rough proportionality between the level of permitted development, its associated impact, and the open space dedication, consistent with applicable laws.	**Consistent.** Table 21 of the OCP identifies Key Site 3 as a high priority site for public open space, designating 98 acres of the site to "trails, picnic tables, lookout/oak & riparian woodland, dune scrub." The one parcel that is proposed to be dedicated as public open spaces is approximately 91 acres, but that is in additional several other improved and natural private open space areas within the project. The two natural private open space parcels that are proposed would total approximately seven (7) acres, which brings the total amount of natural open space proposed up to approximately 98 acres. As discussed in the consistency analysis for this development standard, the proposed project would include the natural open space envisioned by the OCP. Therefore, the proposed project would be consistent with this policy.
Policy OS-O-3. Private open space within designated open space corridors shall be sited, designed, and managed to protect the natural resources and/or recreation potential of these corridors, consistent with the Open Space, Park, Recreation, & Trails, and Biological Resources of the OCP.	**Potentially Consistent**. The proposed project includes private yards at each of the individual residential units and private parks that would be used in common with other residents. The latter have been designed to maximize active recreational use. In addition, the project includes private open space that would be left in a natural condition. These areas have been designed to maximize natural resource protection and passive recreational use. In addition, as shown in Figure 2-4 in Section 2.0, *Project Description,* multi-use trails would be provided through extensive public open space areas, connecting the residential areas to the west to Clark Avenue. Minor improvements are proposed within this public open space, including a bridge, two detention basins and multi-use trails, but most would remain in its natural state. Therefore, the proposed project is potentially consistent with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd OS-0-3-3.1. Where lands within open space corridors remaining private open space, at the time of discretionary development approval the County should consider acquiring open space easements or using other mechanisms to ensure management of the natural resources in these corridors consistent with the goals of the Open Space Plan.	**Potentially Consistent**. The proposed project includes internal open space that is proposed to remain in private ownership. The County could consider acquiring the open space as an easement, or ensuring its ongoing maintenance through the recordation of CC&Rs. As the proposed project does not directly conflict with this development standard, it would be potentially consistent.
Policy OS-O-4. Development adjacent to, or within designated open space areas, shall be sited and designed to protect and enhance the natural resources of these areas, and accommodate appropriate recreation opportunities as identified in the Parks, Recreation and Trails section of this Plan.	**Potentially Consistent**. The proposed project includes private yards at each of the individual residential units and private parks that would be used in common with other residents. The latter have been designed to maximize active recreational use. In addition, the project includes private open space that would be left in a natural condition. These areas have been designed to maximize natural resource protection and passive recreational use. Further, as shown in Figure 2-4 in Section 2.0, *Project Description,* multi-use trails would be provided through extensive public open space areas, connecting the residential areas to the west to Clark Avenue. Minor improvements are proposed within this public open space, including a bridge, two detention basins and multi-use trails, but most would remain in its natural state. Therefore, the proposed project is potentially consistent with this policy.
DevStd OS-O-4.1. Prior to approval for any development within or adjacent to an open space area, a determination must be made that the proposed development is consistent with all applicable open space policies of the OCP, the OCP Open Space Map, as well as the regulations of the base zone district.	**Potentially Consistent.** The OCP anticipates the need for detention basins and trails in the designated open space. Although the OCP also anticipates the need for secondary access, the OCP does not discuss the need for a bridge spanning Orcutt Creek. The proposed free-span bridge would be a required component of secondary access to the site, and impacts to Orcutt Creek associated with the proposed bridge would be reduced to a less-than-significant level through mitigation measures described in Section 4.3, *Biological Resources*, and 4.12, *Water Resources*. Therefore, the proposed project is potentially consistent with this development standard.
DevStd OS-O-4.2. Designated open space boundaries may be subject to minor adjustments inward or outward from the designated open space area on a case-by-case basis in order to allow for substantial improvements in project design, enhance fire safety buffers and fuel management zones, to protect visual qualities from and of adjacent open space areas, or to include biological historic or archaeological sites. The OCP, EIR and other available data shall be used in determining the location, width, and extent of the open space boundary adjustment. Decision makers shall make a determination that such a minor boundary adjustment would be consistent with the overall goals of the Open Space Plan and Biological/History/Archaeology policies, and would avoid disruption of significant natural resources and recreation opportunities located within designated open space areas.	**Consistent.** The project is consistent with the Orcutt Community Plan Open Space Map. The applicant is not requesting an adjustment to the open space boundaries. The proposed secondary access road, multi-purpose trails and detention basins are uses similar to what was envisioned in the OCP. Therefore, the proposed project is consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd OS-O-4.3. No structures shall be located within a designated open space area with the exception of: related structures necessary for the provision of active and passive recreation opportunities that would not adversely affect open space areas, and flood control projects where no other method for protecting existing structures in the floodplain is feasible and where such protection is necessary for public safety (including retention basins). Culverts, crossings, roads, pipelines, fences, and bridges may be permitted when no alternative route or location is feasible, or where other constraints or site design considerations (e.g. public safety) would require such structure.	**Consistent.** The proposed project would locate passive public multi-use recreation trails and two detention basins within the open space area. In addition, a free-span bridge is proposed to allow secondary access to Chancellor Street. This type of development would be allowable in open space areas pursuant to this development standard. The proposed project would be consistent with this development standard.
Policy OS-O-5. The County shall encourage public use of trails and recreation facilities within designated open space areas consistent with protection of natural resources. Such public trails and recreation facilities shall be sited and designed to reduce conflicts with adjacent private property through use of unobtrusive fencing, landscape screening, appropriate setbacks, signage, etc.	**Consistent.** The proposed project would locate passive public recreation trails within the open space area. The trails would be passive in nature and would not include paving or fencing. The trails would be designed to blend into the landscape, and would not warrant landscape screening. Therefore, the proposed project would be consistent with this policy.
Policy OS-O-6: The County should acquire the open space lands prioritized for public acquisition through dedication by working with property owners and interested groups, or through purchase. Where dedication is required, the County shall offset fees as required. If dedication is not required, the County may consider purchase, use of the TDC program or permitting the property to remain as private open space, consistent with the standards of this plan for natural resource protection and provision of passive and active recreation opportunities.	**Potentially Consistent**. Table 21 of the OCP identifies Key Site 3 as a high priority for public open space. The proposed project includes 106 acres of open space, most of which would be dedicated to the public as part of the proposed project. The County could consider acquiring the remaining private open space areas as an easement, but these are not located within the area designated by the OCP as open space that should be dedicated to the public. The proposed project is therefore potentially consistent with this policy.
DevStd OS-O-7.3. If a Mello Roos District is formed in the Orcutt Planning Area to find operations and maintenance of parks, recreation, open space and trails, prior to discretionary project approval of project which impact open space, all applicants in the Planning Area must agree to either participate in the Mello Roos District, or provide other mitigation of the project's impacts on these services and demonstrate that a Home Owners Association will be formed which will generate adequate revenues to provide long term operations and maintenance of any private services.	**Consistent.** As stated in Section 4.10, *Public Services,* the project would be annexed to the Orcutt Community Facilities District prior to map recordation. Annexation would ensure consistency with this development standard.
Orcutt Community Plan – Police Protection	
Action PP-O-1.6. P&D shall give the Sheriff Department the opportunity to review development projects with substantial open space to determine the adequacy of public safety measures.	**Consistent.** Consistent with standard County policy, the Sheriff's Department would have the opportunity to review the proposed development to ensure the adequacy of public safety measures. Therefore, the proposed project would be consistent with this action.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Orcutt Community Plan – Resource Recovery	
Action RR-O-1.1. The County, in conjunction with the local waste hauler, shall continue to encourage a residential, commercial, and industrial recycling program throughout the Orcutt Planning Area, including yard waste collection, composting and conservation programs.	**Consistent.** As described in Section 4.10, *Public Services,* the County ensures compliance with the goals set by AB 939 by requiring a reduction in solid waste generation for all new development projects in the County. The County estimates that implementation of a source reduction and recycling program reduces the total volume of waste generated by new development projects by approximately 50% (County Environmental Thresholds and Guidelines Manual). Therefore, the proposed project would be consistent with this action.
Policy RR-0-2. The County shall strive to ensure that adequate solid waste services are available to accommodate expected growth in Orcutt.	**Potentially Consistent.** As described in Section 4.10, *Public Services,* the proposed project would not exceed the County's threshold of 196 tons/year of solid waste generation but it would exceed the 40 tons/year threshold for cumulative solid waste generation. Therefore, the proposed project would be potentially inconsistent with this policy. However, it should be noted that the approved Santa Maria Integrated Waste Management Facility is anticipated to open in the next five to ten years, and would alleviate the existing need for additional solid waste disposal capacity in the region. Despite the significant cumulative impact, the project would not conflict with the policy to ensure adequate waste services are available. Therefore, the proposed project would be potentially consistent with this policy.
Orcutt Community Plan – Schools	
Policy SCH-O-1. The County shall strive to ensure that new development fully mitigates its impacts to school facilities and does not cause school overcrowding.	**Consistent.** As discussed in Section 4.10, *Public Services*, the proposed project would add students to the OUSD and the SMJUHSD schools. However, the collection of state-mandated fees (pursuant to Section 65995 (3) (h) of the California Government Code) is considered full and complete mitigation for impacts related to public schools. Therefore, the proposed project would be consistent with this policy.
Action SCH-O-1.1. The County shall require that all statutory school facilities fees established by School Districts in the Orcutt Planning Area pursuant to Govt. Code Section 65996 be paid in full prior to issuance of building permits or as agreed to by the applicant and the school district.	**Consistent.** As discussed in Section 4.10, *Public Services*, pursuant to Section 65995 (3)(h) of the California Government Code (Senate Bill 50, chaptered August 27, 1998), the project applicant would be required to pay State-mandated school impact fees. Since developers would be required to pay mandated school impact fees in accordance with state law, the proposed project would be consistent with this action.
Policy SCH-O-2. New recreational facilities should be located near or adjacent to school facilities as much as possible to allow for joint-use by schools and the community.	**Consistent.** The recreational facilities included in the proposed project are intended to serve residents of the development. No schools are located adjacent to the project site; and hence, provision of joint use facilities is not required. Therefore, the proposed project would be consistent with this policy.
Orcutt Community Plan – Wastewater	
Policy WW-O-2. Prior to discretionary approval of a new development, the County shall make a finding that there will be adequate capacity and availability for LCSD to serve the new development.	**Consistent.** As discussed in Section 4.10, *Public Services,* LCSD has indicated to Planning and Development staff that there is adequate capacity within their collection system and treatment facilities to accommodate the new development. Therefore, the

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
	proposed project would be consistent with this policy.
DevStd WW-O-2.1: Prior to the discretionary approval of new development, the developer shall identify all additional facilities required to adequately collect, convey, treat and dispose of the sewage effluent from the development.	**Consistent.** The facilities required to convey project wastewater to LCSD infrastructure would be provided by the project applicant. Therefore, the project is consistent with this development standard.
DevStd WW-O-2.3: A "Can and Will Serve Letter" from LCSD will be found adequate for recording of maps or issuance of land use permits (including permits for development of preexisting lots) only if the letter demonstrates: • LCSD's effluent, including the effluent from the proposed project, will not exceed the discharge standards established by the Regional Water Quality Control Board; • Adequate disposal capabilities exist at the plant or through agreement with the City of Santa Maria (providing that treatment and disposal by the City does not further degrade the underlying groundwater quality) to serve the project(s); and • Existing or planned and funded transmission lines have available capacity to serve the project(s).	**Potentially Consistent.** As discussed in Section 4.10, *Public Services,* LCSD has indicated to Planning and Development staff that there is adequate capacity within their collection system and treatment facilities to accommodate the new development. The project applicant would be required to obtain a "Can and Will Serve Letter" from the LCSD prior to map recordation. Therefore, the proposed project would be potentially consistent with this development standard.
DevStd WW-O-2.4. At the time of discretionary approval, the County shall condition the recordation of the final map or issuance of LUP's on provision of an adequate "Can and Will Serve" letter from LCSD.	**Potentially Consistent.** The project applicant would be required to obtain a "Can and Will Serve Letter" from the LCSD prior to map recordation. Therefore, the proposed project would be potentially consistent with this development standard.
DevStd WW-O-3.3. At the time of discretionary project approval, the County shall make a finding that the project's effluent will meet RWQCB discharge standards.	**Consistent.** As required by this development standard, the proposed project would not exceed the RWQCB discharge standards. Therefore, the proposed project would be consistent with this development standard.
Orcutt Community Plan – Transportation	
Policy CIRC-O-1. The County shall adopt and implement an Orcutt Transportation Improvement Plan (OTIP) which includes long-term improvements to roadways and alternative transportation facilities targeted to provide for acceptable levels of service on roadways and intersections within the planning area. The OTIP shall be an integrated Plan for capital improvements of roads and intersections as well as alternative transportation facilities. The OTIP shall contain a list of transportation projects to be undertaken and include projected costs for each funded and unfunded improvement. The County shall also revise the Transportation Impact Fee based upon the projected cost of transportation system improvements identified in the OTIP.	**Consistent.** Mitigation Measures T-1and T-2 in Section 4.11, *Transportation and Circulation*, would require the applicant to construct needed improvements and/or pay transportation fees to mitigate impacts on traffic circulation. These improvements or fees would contribute to long-term improvements to maintain acceptable levels of service. Therefore, the proposed project would be consistent with this policy.
Policy CIRC-O-2. The County shall strive to provide an efficient and safe circulation system to accommodate future growth in Orcutt. The County will use its best efforts to coordinate the timing of roadway, intersection and other transportation improvements with the completion of the development projects that the improvements are intended to serve.	**Consistent.** As discussed in Section 4.11, *Transportation and Circulation*, implementation of the proposed project would result in potentially significant but mitigable traffic and circulation impacts under both project specific and cumulative conditions. The project applicant would be required to pay transportation impact fees in accordance with the OTIP. These improvements or fees would contribute to long-term improvements to maintain acceptable levels of service. Therefore, the project is consistent with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy CIRC-O-3. The County shall maintain a minimum Level of Service (LOS) C or better on roadways and intersections within the Orcutt Planning Area, except that minimum Level of Service for the Foster Road/Hwy 135 and Lakeview/Skyway Dr. intersections and Stillwell and Lakeview Roads shall be LOS D.	**Consistent.** As discussed in Section 4.11, *Transportation and Circulation*, with the implementation of mitigation measures T-1 and T-2, the proposed project would result in less than significant project-specific and cumulative impacts to area roadways and intersections. Traffic impacts would be less than significant, and service levels would be adequately maintained in conformance with this policy.
Policy CIRC-O-4. A determination of project consistency with the standards and policies of the Orcutt Community Plan Circulation Section shall constitute a determination of consistency with LUDP#4 with regard to roadway and intersection capacity.	**Consistent.** As discussed in Section 4.11, *Transportation and Circulation*, implementation of mitigation measures T-1 and T-2 would result in less than significant project-specific and cumulative impacts to area roadways and intersections. Traffic impacts would be less than significant, and service levels would be adequately maintained in conformance with this policy.
Policy CIRC-O-6. The County shall encourage development of all feasible forms of alternative transportation in the Orcutt/Santa Maria area.	**Consistent**. Development of the proposed project would not adversely affect any off-site bike routes or park and ride facilities. The proposed project would include public multi-use trails, and would connect to existing bicycling infrastructure in the Orcutt area by way of Clark Avenue and Chancellor Street. In addition, the project would provide access to the future multi-use trail along Orcutt Creek. Therefore, the proposed project would be consistent with this policy.
Policy CIRC-O-8. The County shall ensure that the circulation system maintains the quality of life within residential neighborhoods in the Orcutt Planning Area to the greatest extent feasible.	**Consistent.** As discussed in Section 4.11, *Transportation and Circulation*, implementation of mitigation measures T-1 and T-2 would result in less than significant project-specific and cumulative impacts to area roadways and intersections. Traffic impacts would be less than significant. In addition, the proposed trails would connect to existing and future bicycling infrastructure in the Orcutt area by way of Clark Avenue, Chancellor Street and Orcutt Creek. Therefore, the proposed project would be consistent with this policy.
Policy CIRC-O-9. Development shall be sited and designated to provide maximum access to non-motor vehicle forms of transportation, including well designed walkways, paths and trails between residential development and adjacent and nearby commercial uses and employment centers, where feasible.	**Consistent.** The project includes multi-use trails and sidewalks through the site. Provision for increased use of transit and other alternative transportation options is also provided through the implementation of OCP EIR Mitigation Measures AQ-3, AQ-4, and AQ-5, as discussed in Section 4.2, *Air Quality.* Therefore, the proposed project is consistent with this policy.
Policy CIRC-O-10: If it is determined that a project may cause significant traffic impacts which generate the need for offsite traffic improvements that are not identified in the then current OTIP, the County shall condition any approval of the project to ensure that those improvements are funded and completed before issuance of final inspection.	**Consistent.** As discussed in Section 4.11, *Transportation and Circulation*, development of the project would result in a need for off-site traffic improvements that have not been identified in the OTIP. These improvements, included under mitigation measure T-1, would be funded and installed by the applicant. In addition, the project would be required to pay fair share impact fees toward cumulative OTIP improvements, as described under mitigation measure T-2. Therefore, the proposed project would be consistent with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy CIRC-O-11: Developers should be encouraged to pursue innovative measures to fully mitigate transportation impacts associated with their projects.	**Consistent**. As discussed in Section 4.11, *Transportation and Circulation*, implementation of the proposed project with mitigation would result in less than significant project-specific and cumulative impacts to area roadways and intersections, thereby ensuring consistency with this policy.
Orcutt Community Plan – Groundwater Policies, Actions and Development Standards	
Policy WAT-O-2. In order to be found consistent with Land Use Development Policy No. 4 (LUDP#4), the water demand of new discretionary development must be offset by long-term* supplemental** water supplies that do not result in further overdraft of the local groundwater basin and that are adequate to meet the project's net water demand as determined by the County considering appropriate reliability factors as determined by County Water Agency. ** "long-term" means permanent source of water for development.* *** "supplemental" water means a source of water other than groundwater, unless: 1. the groundwater basin has been determined to be no longer in overdraft, or 2. The use of groundwater is consistent with the final water rights judgment entered in the Santa Maria Groundwater Basin adjudication (Santa Maria Valley Water Conservation District v. City of Santa Maria, et al., Santa Clara County Superior Court Case No. CV 770214). Amended by Res. 01-225, 7/10/01*	**Consistent.** As discussed in Section 4.10, *Public Services,* the project applicant has entered into a long-term Supplemental Water Purchase Agreement with the City of Santa Maria. The agreement stipulates that the City will provide 200 AFY for the purposes of consumptive use for the proposed project. This amount would be adequate to serve the water demands of the project. Therefore, the proposed project would be consistent with this policy.
DevStd WAT-O-2.1. Prior to discretionary action by any County decision-maker on new development, the applicant shall provide one of the following: 1. A "Can and Will Serve" letter from California Cities Water Company dated before July 1997; 2. An "Intent to Serve" letter from California Cities Water Company or other water purveyor(s) including draft contract(s), if any, demonstrating to the County's satisfaction that the development's net water demand will be offset by a long-term supplemental water supply and that the development will have a continuing right to obtain water equal to that of the water purveyor's other customers. Contract(s), if any, must include terms consistent with the requirements of DevStd WAT-O-2.2.	**Consistent.** As discussed in Section 4.10, *Public Services,* the project applicant has entered into a long - term Supplemental Water Purchase Agreement with the City of Santa Maria. The Agreement stipulates that the City will provide supplemental water that would be used to serve the proposed development. In addition, the applicant would be responsible for the installation of necessary water infrastructure to convey water to the project site. Therefore, the proposed project would be consistent with this development standard.
DevStd Wat-0-2.2. Prior to discretionary action on new development, the applicant must demonstrate adequacy of the water supply proposed to serve the project, unless the applicant has satisfied DevStd WAT-O-2.1 #1 above. This demonstration shall be based on the following information, which must be provided prior to application completeness: Resources • Provide information on project's projected gross and net demand for water. The supplemental water supply must offset the project's net water demand. • Documentation of the reliability of the proposed water supply as projected by the Department of Water Resources (for State Water) and confirmed by the County Water Agency.	**Consistent.** As discussed in Section 4.10, *Public Services,* the project applicant has entered into a long - term Supplemental Water Purchase Agreement with the City of Santa Maria. The Agreement stipulates that the City will provide supplemental water that would be used to serve the proposed development. In addition, the applicant would be responsible for the installation of necessary water infrastructure to convey water to the project site. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
• A description of how the project will be served during drought periods. If conjunctive use of the Santa Maria Groundwater Basin is planned, demonstration that use of the basin will not contribute to long-term groundwater overdraft considering drought periods. The factual determination of overdraft contribution shall be made by the Planning & Development Department and County Water Agency. • Provide a factual demonstration that the water purveyor has available, firm, long-term reliable water supplies which equal or exceed present demand from existing customers, projects approved for new service, and the proposed project under County review. The demonstration should also show that the project use would not contribute to overdraft of the basin. The factual determination of no additional overdraft shall be made by Planning & Development and County Water Agency. • Provide draft contract(s) with water purveyor(s), which demonstrate(s) to the satisfaction of the County that the development will be served by a long-term supplemental water source and will have a continuing right to obtain water equal to that of the water purveyor's other customers. • Provide information on the water purveyor's existing and projected range of potential State Water and/or other supplemental water delivery amounts needed for full buildout under the water purveyor's management plan, status of conservation programs, drought buffers, and groundwater pumpage consistent with applicable state government code requirements on water reporting. Provide information on the most recent annual water deliveries from various sources in the purveyor's service area, as available from existing reports. Facilities • Documentation of the facilities necessary to deliver water and demonstration of permanent access to the facilities such that uninterrupted service would be provided. The documentation must include a list and description of facilities, site plans, capacity and capital costs necessary to distribute water to the project. • Demonstration that capital costs associated with providing service to the new development will not impact existing Orcutt development. • Demonstration that the water supply project is designed, approved, funded and scheduled for implementation prior to tract map recordation or land use clearance. • Describe approvals and entitlements necessary for the proposed water supply and delivery system.	
DevStd Wat-0-2.3. Prior to map recordation or land use clearance, the developer must provide a Can and Will Serve letter and necessary final contract(s) consistent with the conditions of the discretionary permits and terms of the draft contract(s).	**Consistent.** As discussed in Section 4.10, *Public Services,* the project applicant has entered into a long - term Supplemental Water Purchase Agreement to obtain supplemental water from the City of Santa Maria that would be used to serve the proposed development. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy WAT-O-3. Development in Orcutt shall incorporate water efficient design and technology.	**Consistent.** As discussed in Section 4.10, *Public Services,* the project applicant has entered into a long - term Supplemental Water Purchase Agreement to obtain supplemental water from the City of Santa Maria that would be used to serve the proposed development. Therefore, the proposed project would not impact groundwater supplies. However, the Project Description requires a landscape plan that includes the use of drought-tolerant shrubs and ground covers. Therefore, the proposed project would be potentially consistent with this policy. The project also includes two landscaped detention basins, which are considered low impact development (LID) measures that would provide water efficient design and technology. Therefore, the proposed project would be consistent with this policy.
Policy WAT-O-5. To reduce overall TDS levels in the wastewater in Orcutt, and thereby reduce the level of potential groundwater contamination from disposal of this wastewater, water used to serve new development in Orcutt must have a TDS level of no greater than 425 mg/L. This may either be provided through direct deliveries of 425mg/L or less water to new development or through the delivery of offsetting 425mg/L or less water to the water system serving Orcutt. An exception to this standard is allowed only when the TDS level of State Water delivered to Santa Maria exceeds 425mg/L; in that case, the TDS level of water serving Orcutt may not exceed the TDS level of State Water. However, in "drought years" (as determined by the County Water Agency) water demand may be satisfied by groundwater pumpage in compliance with the adopted groundwater management agreement between the City of Santa Maria and the SMV Water Conservation District.	**Potentially Consistent.** Determining TDS levels is not possible at this time because no wastewater is being generated. However, the project does not contain components that would be anticipated to generate unusual levels of TDS, and the applicant of the proposed project would be required to comply with Policy WAT-O-5. Therefore, the proposed project would be potentially consistent with this policy.
Orcutt Community Plan – Air Quality	
Policy AQ-O-1. The County shall encourage land use planning and development design which reduces air pollution through development of transportation infrastructure supportive of alternative modes of transportation and pedestrian oriented developments.	**Consistent**. Development of the proposed project would not adversely affect any offsite bike routes or park and ride facilities. The proposed project would include public multi-use trails, and would connect to existing and future bicycling infrastructure in the Orcutt area by way of Clark Avenue, Chancellor Street and Orcutt Creek. Therefore, the proposed project would be consistent with this policy.
Policy AQ-O-2. Significant fugitive dust and PM_{10} emissions shall be reduced through implementation of appropriate construction restrictions and control measures, consistent with standards adopted by the Board.	**Consistent.** As discussed in Section 4.2, *Air Quality*, the proposed project would implement standard dust and emissions control measures required by the SBCAPCD, which would ensure that construction-related air quality impacts are less than significant. Therefore, the proposed project would be consistent with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy AQ-O-3. The County should promote the use of alternative fuels, solar energy systems, and the use of construction techniques which are designed to conserve energy and minimize pollution in Orcutt, consistent with, but not limited to the provisions of the CA Building Code.	**Consistent.** OCP Mitigation Measure AQ-11, as discussed in Section 4.2, *Air Quality*, requires implementation of energy conservation measures, including but not limited to; use of colored roofing, energy-efficient built-in appliances, lighting and temperature controls and window treatments, low NO_x or solar water and pool heaters, landscape with drought-tolerant plants, building design orientation to maximize natural lighting and passive solar heating and cooling and low-emission building materials such as water-based paints, and bricks, stone or concrete (instead of asphalt) for parking lots. In addition, mitigation measure GHG-1 requires several measures that would reduce air pollution. Therefore, the proposed project would be consistent with this policy.
Orcutt Community Plan – Biological Resources	
Policy BIO-O-1. Important natural resources in Orcutt, including sandhill chaparral, central dune scrub, wetlands, oak trees and woodland, Bishop pine forest, specimen trees, and central sage scrub shall be protected, consistent with the Open Space Plan and the standards below, unless this would prevent reasonable development of a property.	**Consistent.** As discussed in Section 4.3, *Biological Resources,* construction of the project would eliminate approximately; 5.17 acres of Central (Lucian) Coastal Scrub; 0.02 acres of Central Dune Scrub; 0.12 acres of Central Coast Live Oak Riparian Forest; and 27.16 acres of Non-native Grassland. However, no native tree removals are required and Mitigation Measures BIO-2(a-e) require that central dune scrub and central coast live oak riparian forest habitat be replaced at a 2:1 ratio. With implementation of these measures, impacts to natural habitat would be minimized and would be less than significant. Therefore, the proposed project would be consistent with this policy.
DevStd BIO-O-1.1. Development shall be sited and designed to avoid disruption and fragmentation of significant natural resources within and adjacent to designated undeveloped natural open space areas, minimize removal of significant native vegetation and trees, preserve wildlife corridors and provide reasonable levels of habitat restoration. Where possible, significant natural resources, such as specimen trees, adjacent to designated, natural undeveloped open space corridors should be preserved.	**Consistent.** The proposed project would limit development to the mesa, except for circulation connections to Chancellor Street and public trails and open space. The project would minimize impacts to natural resource by design and with adherence to mitigation measures BIO-2(a-e), which require that habitat lost be replaced at a 2:1 ratio. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd BIO-O-1.2. Development within or adjacent to designated natural open space areas shall be reviewed for, and required to implement, habitat restoration where site- specific impacts require restoration. If restoration on or near the site is not feasible, acquisition and preservation of additional habitat acreage should be considered, as a last resort if no other like-kind habitat mitigation options are available, payment into a mitigation bank program within the OPA that is acceptable to the County as provided for by new DevStd BIO-O-1.8. Mitigation and restoration plans should identify acreage impacted, replacement ratios, success criteria, remedial measures, and funding and responsibility for long-term maintenance and monitoring. All such restoration projects shall utilize native plants derived from local (Orcutt) seed and cutting stock, or as deemed biologically acceptable by a County qualified biologist. Wildlife relocation should be avoided. However, any wildlife relocation should be coordinated with Fish and Game and be consistent with applicable State standards.	**Consistent.** A portion of the proposed development abuts designated natural open space. As discussed in Section 4.3, *Biological Resources,* Mitigation Measures would require avoidance of this habitat where feasible, and where infeasible, restoration of the impacted habitat at a minimum ratio of 2:1 on-site. With implementation of these measures, impacts to this habitat type would be minimized and would be less than significant. In addition, Mitigation Measure BIO-2(e) requires preparation of a landscaping plan, including the use of drought tolerant, locally native plant species; Mitigation Measure BIO-4(b) requires an open space management plan; and Mitigation Measures BIO-4(c) and BI-4(d) include measures to avoid impacts to wildlife. Therefore, the proposed project would be consistent with this development standard.
DevStd BIO-O-1.3. Landscaping for development on the edge of designated natural undeveloped open space areas shall include native trees and shrubs, with habitat restoration efforts focused on buffers. Planting of highly invasive weedy plants (e.g., iceplant. pampas grass, veldt grass, monterey pine, eucalyptus, spiny clotbur, and Australian fireweed) shall be prohibited within 500 feet of natural undeveloped open space areas as designated on the Open Space map (Figure 20).	**Consistent.** Mitigation Measure BIO-2(e) in Section 4.3, *Biological Resources,* requires the preparation of a landscape plan. The landscape plan would require the use of drought tolerant, locally native plant species; noxious, invasive, and/or non-native plant species would not be permitted. Therefore, the proposed project would be consistent with this development standard.
DevStd BIO-O-1.5. The edges of designated undeveloped natural open space areas shall be clearly delineated and fenced where necessary to protect resources both during construction and, when appropriate, over the life of the project. Long term fencing shall be designed to accommodate wildlife passage where appropriate.	**Consistent.** Mitigation Measures require protection of all natural resources on the site during construction. Mitigation Measure BIO-4(d) requires that all permanent fencing be designed to minimize impacts to wildlife and allow wildlife movement. Therefore, the proposed project would be consistent with this development standard.
DevStd BIO-O-1.8. Where new development eliminates important onsite habitat (e.g. coastal sage scrub, grasslands, riparian habitat and wetlands), County shall require development to restore or enhance like-kind habitat either onsite or offsite. If restoration sites are limited or unavailable, County shall require payment of adequate fees into a mitigation bank program acceptable to County to permanently protect a comparable or greater amount of created or restored habitat elsewhere within the OPA.	**Consistent.** As discussed above and in Section 4.3, *Biological Resources,* construction of the project would eliminate some on-site habitat. However, implementation of Mitigation Measures would require avoidance of this habitat where feasible, and where infeasible, restoration of the impacted habitat at a minimum ratio of 2:1 on-site. With implementation of these measures, impacts to this habitat type would be minimized and would be less than significant with mitigation. Therefore, implementation of this mitigation measure would ensure consistency with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy BIO-O-2. Consistent with necessary flood control practices, natural stream channels and riparian vegetation in Orcutt shall be maintained in an undisturbed state in order to protect banks from erosion, enhance wildlife passageways, and provide natural greenbelts, unless this would prevent reasonable development of a property.	**Consistent.** The proposed project includes detention basins that would capture runoff from developed areas and prevent sediments from entering Orcutt Creek. The basins would also act as energy dissipaters to control the rate and amount of runoff into creek. As discussed in Section 4.12, *Water Resources*, all construction activities would be subject to the General Permit for Storm Water Discharge Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ) , which require preparation of a SWPPP to control the discharge of pollutants, including sediment, into local surface water drainages. The SWPPP is designed to minimize water quality degradation through storm water monitoring, establish BMPs, implement erosion control measures, and implement spill prevention and containment measures. In addition, implementation of mitigation measures Bio3(a-d) would avoid or mitigate impacts to Orcutt Creek. Therefore, the project would be consistent with this policy.
Policy BIO-O-3. Established native trees in designated open space areas shall be protected. Established native trees in developable areas shall be incorporated into the site landscaping plan to the greatest degree feasible except where it would interfere with reasonable development of a property. Native trees shall be considered established if they are six feet in height.	**Consistent.** As discussed in Section 4.3, Biological Resources, the project would not require the removal of any native trees; therefore, the project would be consistent with this policy.
Policy BIO-O-4. Non-native trees (e.g., eucalyptus groves and windrows) that provide known raptor nesting or key roosting sites shall be protected; non-native specimen trees shall be protected to the greatest degree feasible except where it would interfere with reasonable development of a property. Non-native trees of less than 25 inches in diameter at breast height do not qualify as specimens for this Policy.	**Consistent.** As discussed in Section 4.3, Biological Resources, the project would not require the removal of any native trees, or specimen trees, or non-native trees that provide nesting or roosting sites; therefore, the project would be consistent with this policy.
DevStd BIO-O-4.1. Where non-native specimen trees are removed for development the County should consider replacement with native trees.	**Consistent.** As discussed in Section 4.3, Biological Resources, the proposed project would not require the removal of any native or non-native trees. Therefore, the project would be consistent with this development standard.
Policy BIO-O-5. New facilities in Orcutt, including roads, bikepaths/trails, sewer lines and retention basins, shall to the maximum extent feasible be sited and designed to avoid disruption of significant natural resources within designated natural undeveloped open space areas, minimize removal of significant native vegetation and trees and provide for reasonable levels of habitat restoration for significant habitats disrupted by construction.	**Consistent**. The proposed project would include trails and detention basins in the open space area, as anticipated by the OCP. Habitat lost during construction of the basins and trails would be restored on-site at a 2:1 ratio. Therefore, the proposed project would be consistent with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd BIO-O-5.1. Road construction shall minimize filling within creeks, stream corridors and wetlands and avoid or minimize removal of riparian vegetation. To the maximum extent feasible, bridges (rather than culverts) shall be required over all major creeks and wildlife corridors. Such bridges shall be designed to facilitate wildlife passage by providing at least 6 feet of vertical clearance and locate support structures outside of creekbanks, if feasible. Crossings of tributaries and drainages should use bridges if a bridge would avoid or substantially reduce impacts to sensitive habitat and sediment buildup. Road projects should also preserve the hydrologic connectivity between wetlands, and between wetlands and upland areas.	**Consistent.** The proposed secondary access road would connect to Chancellor Street over a proposed new bridge across Orcutt Creek. The proposed project has located most of the project's components, including the roads, bridges over Orcutt Creek, and detention basin system to minimize impacts to significant natural habitat and resources, which ensures consistency DevStd BIO-O-5.1. The proposed project would therefore be consistent with this development standard.
DevStd BIO-O-5.2. In designated open space areas, roadway segments (e.g., Union Valley Parkway and E Street) shall be designed in consultation with P&D, the Park Department, and appropriate federal and state agencies to allow wildlife passage through provision of appropriately placed bridges and/or culverts, and shall prohibit all night lighting in designated open space corridors except as necessary for public safety (e.g.. intersections, trailheads or crossings). Light "spill over" should be minimized by directing lighting away from the open space area, the use of hoods, and landscape screening (with native species) along the road.	**Consistent.** The proposed bridge over Orcutt Creek would require interagency review. Mitigation Measures BIO-3(a-d) require that impacts to Orcutt Creek are minimized and that there is interagency cooperation relative to development in proximity to Orcutt creek. Furthermore, Mitigation Measure BIO-1(a) requires a lighting plan for entire site that minimizes light "pollution" into natural habitat areas. With implementation of these measures, impacts would be reduced to a less than significant levels and the proposed project would be consistent with this development standard.
DevStd BIO-O-5.3. Multi-use trail construction should avoid removal of riparian vegetation to the maximum extent feasible. The Orcutt Creek multi-use trail shall be set back a minimum of 50 feet from the outside edge of riparian vegetation or the top-of-bank (whichever is further), unless this would make the multi-use trail link infeasible. Trail construction shall include riparian restoration between the edge of existing native vegetation and the bicycle path. Trail lighting should be directed away from the creek.	**Consistent.** Mitigation Measure BIO-1(a) requires the applicant to develop a lighting plan for the development that reduces light pollution in open space habitat areas and requires that: (a) exterior lighting features within 100 feet of open space include installation of hoods to prevent "spill-over" into adjacent habitat, (b) night lighting of public areas be kept at the minimum necessary for safety purposes; (c) excessive night lighting shall not be permitted within 100 feet of open space areas; and (d) that no lighting shall be permitted along the multi-use trail along Orcutt Creek. With the application of this mitigation measure, the proposed project would be consistent with this development standard.
DevStd BIO-O-5.4. Trails should follow existing dirt road and trail alignments and utilize existing bridges where feasible. Where this is not possible, prior to final trail alignment proposed trail routes should be surveyed and rerouted where necessary to avoid sensitive species, subject to final approval by P&D) and the Park Department. All trails shall be sited and designed to avoid or minimize impacts to sensitive resources, areas of steep slopes and/or highly erosive/sandy soils, where feasible. Developers shall fund sign installation along certain trails (as identified in the Multi Use Trail Guidelines) providing educational and interpretive information and advising dog owners to keep their dogs out of sensitive habitats.	**Consistent**. There are no existing trails on the site but proposed trails would be designed to minimize impacts. With implementation of required mitigation measures, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd BIO-O-5.6. Excavated fill for retention basin construction shall not be placed within important natural resource areas. Areas adjacent to or within habitats which are disturbed during construction shall be revegetated with appropriate native species. All sensitive habitat areas adjacent to proposed detention basins shall be fenced before grading begins to prevent disturbance and stockpiling in these areas.	**Consistent.** The project proposes to use material left over from the construction of the detention basins as fill for residential development on the mesa. No import or export is anticipated. In addition, Mitigation Measure BIO-2(a) would require restoration of impacted habitat at a minimum ratio of 2:1 on-site, and mitigation measures BIOL-2(b) and BIO-2(c) require Oak tree avoidance and Central Dune Scrub and Central Coast Live Oak Riparian Forest Avoidance, respectively. Mitigation Measure BIOL-5(a) requires construction fencing to be installed 5 feet outside active grading areas, and Mitigation Measure BIOL-7(a) requires sensitive resources training as part of on-site worker pre-construction training. With implementation of these measures, impacts to sensitive habitat would be minimized and would be less than significant. Therefore, the proposed project would be consistent with this development standard.
Orcutt Community Plan – Flooding and Drainage	
Policy FLD-O-1. Flood risks in the Orcutt planning area shall be minimized through appropriate design and land use controls.	**Consistent.** As discussed in Section 4.12, *Water Resources*, the proposed residential development is located outside of the FEMA designated 100-year and 500-year flood zones. Flood risks would therefore be minimal, and the project would be consistent with this policy.
DevStd FLD-O-1.2. No structures or other development (except for bridges, culverts and flood control requirements) shall be allowed within creek channels.	**Consistent**. The proposed project does not include development (other than bridges and flood control structures) within the creek channel. Therefore, the proposed project would be consistent with this development standard.
DevStd FLD-O-1.3. No development shall be permitted within the floodplain of Orcutt, Pine Canyon or Graciosa Creeks unless such development would either be necessary to: 1. Permit reasonable development of the site and would not lead to disturbance or removal of significant riparian/wetland vegetation; or 2. Accomplish a major public policy goal of the Orcutt Community Plan.	**Consistent.** As discussed in Section 4.12, *Water Resources*, the proposed project does not include development within the floodplain, except for a detention basin. The OCP anticipates and specifically allows the detention basins to be located in the floodplain. Therefore, the project would be consistent with this development standard.
Policy FLD-O-2. Off-site runoff associated with development should be minimized.	**Consistent**. As discussed in Section 4.12, *Water Resources*, the proposed project includes two detention basins designed to capture runoff from developed areas. In addition, the project includes LID measures that would help control stormwater runoff where it is generated to reduce downstream impacts. Therefore, the proposed project would be consistent with this policy.
DevStd FLD-O-2.1. Pervious construction materials, such as turf block, non-grouted brick, and gravel, shall be used where feasible.	**Potentially Consistent**. Upon review of the proposed project, the County Flood Control District would determine whether materials such as turf block, non-grouted brick and gravel are appropriate for use. The applicant would be required to comply with the recommendations of the County Flood Control District. Therefore, the proposed project would be potentially consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy FLD-O-3: Short-term and long-term erosion associated with development shall be minimized.	**Potentially Consistent**. The proposed project would be required to prepare a Stormwater Pollution Prevention Plan (SWPPP) to reduce short-term construction related water quality impacts. In addition, and as noted above, Mitigation Measure requires that the project include LID measures. Therefore, the proposed project is potentially consistent with this policy.
DevStd FLD-O-3.1. Development projects shall incorporate sedimentation traps to minimize the erosion of soils into natural and manmade flood control drainages, where feasible. All development adjacent to stream channels shall be required to install check dams as deemed appropriate by Flood Control and Planning & Development to minimize channel down-cutting and erosion. To the maximum extent feasible, all such structures shall be designed to avoid impacts to creek vegetation.	**Consistent**. The proposed project includes detention basins that would act as sedimentation basins and control the release of runoff into Orcutt Creek, thereby minimizing erosion. Therefore, the proposed project would be consistent with this development standard.
DevStd FLD-O-3.2. Silt fencing, straw bales, sand bags, and sediment basins shall be used in conjunction with other methods to prevent erosion on slopes and siltation of the stream channel.	**Consistent**. The proposed project would be required to prepare a SWPPP, which would reduce construction related erosion and water quality impacts. The SWPPP is required to implement soil stabilization techniques such as geo-textile materials, gravel bags and sediment basins. Therefore, the proposed project would be consistent with this development standard.
Orcutt Community Plan – Geology, Topography and Soils	
Policy GEO-O-1. Development shall be sited to avoid geologically hazardous areas.	**Consistent.** As discussed in Section 4.6, *Geological Resources*, the site is subject to seismic shaking and soil stability hazards. Mitigation Measure G-4, which requires incorporation of recommendations from Earth Systems Pacific dated February 10, 2006, would reduce soil stability hazards and ensure that potential soil hazards are reduced to a less than significant level. Therefore, the proposed project would be consistent with this policy.
Policy GEO-O-2. In areas of high erosion potential, development shall be sited and designed to minimize increased erosion.	**Consistent.** The location of proposed development has been sited to avoid steep slopes. The gully in the northwest corner of the site would remain in open space. As discussed in Section 4.8 *Hydrology and Water Quality*, mitigation measures HWQ-1 and HWQ-2(d) would reduce potential impacts associated with erosion to a less than significant level. Therefore, the proposed project would be consistent with this policy.
DevStd GEO-O-2.1. Consistent with Hillside and Watershed Policy #1, excessive grading for creation or enhancement of views shall not be permitted. Where new roads and driveways would require substantial grading, development shall be sited close to existing access roads.	**Consistent.** The proposed project would not grade to enhance or create views. Proposed development would occur on the mesa which is essentially flat. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd GEO-O-2.2. Development shall be prohibited on slopes greater than 30% unless this would prevent reasonable development of a property. In areas of unstable soils, highly erosive soils or on slopes between 20% and 30% development shall not be allowed, unless an evaluation by a qualified professional (e.g., soils engineer, geologist, etc.) establishes that the proposed project will not result in unstable slopes or severe erosion or this would prevent reasonable development of a property.	**Consistent.** The project site does not contain slopes greater than 30%. The geotechnical evaluation for the project site determined that slope stability risks are less than significant. Therefore, the proposed project would be consistent with this development standard.
DevStd GEO-O-2.3. To aid in erosion control, existing hillside topography, large stands of trees, and natural flood channels shall be preserved, unless this would prevent reasonable development of a property.	**Consistent.** Large stands of trees would not be removed as a result of the project, but numerous trees and other ground stabilizing vegetation would be planted. Orcutt Creek and the hillside to the south of Orcutt Creek would be preserved, as would the gully in the northwest corner of the site. Therefore, the proposed project would be consistent with this development standard.
DevStd GEO-O-2.4. All surface water runoff shall be culverted and diverted to avoid erosion of exposed slopes and shall be directed to the nearest natural drainage channel. Where such measures are feasible and would not substantially increase erosion, vegetated earthen channels should be substituted for culverts. Cribwalls or other methods should only be used where necessary to retain slopes.	**Consistent**. As discussed in Section 4.12 *Water Resources*, the proposed project would not result in runoff in excess of County standards (0.07 cfs/acre). The proposed detention basin system was determined to adequately control runoff, and thereby minimize erosion. The basin system would maintain post-project runoff equal to or less than pre-project (existing) conditions. Therefore, the proposed project would be consistent with this development standard.
DevStd GEO-O-2.6. All landscape plans shall be reviewed by P&D to ensure revegetation of graded areas in areas of sandy soils. Landscape securities shall be required unless expressly waived by P&D.	**Consistent.** As discussed in Section 4.3 *Biological Resources*, mitigation measure BIOL-3(b) requires the preparation of a landscape plan, which is subject to the review of P&D. In addition, Mitigation Measure G-4, which require vegetation of cut and fill areas, would be subject to the review of P&D. Therefore, the proposed project would be consistent with this development standard.
Policy GEO-O-3. No grading in excess of 50 cubic yards (combined cut and fill) shall be permitted within areas designated open space in the Orcutt Community Plan without an approved Grading Permit. This requirement applies to all grading activity (including activities otherwise exempted under County Grading Ordinance 3937, Sections 14 6 and 14 8). This requirement shall not apply to the emergency activities of a public agency, including but not limited to wildfire and/or flood control.	**Consistent.** The project proposes the construction of two detention basins in the identified open space area. A Grading Permit would be required for the detention basins. The OCP anticipates the need for basins within the Key Site 3 open space. In addition, some grading would be required for the access road connection to Chancellor Street, but that grading would also be performed pursuant to an approved grading permit. Therefore, grading within the open space area would be consistent with this policy.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Orcutt Community Plan – History and Archaeology	
Policy HA-O-1. Archaeological and historic resources in the Orcutt Planning Area shall be protected and preserved to the maximum extent possible.	**Consistent.** As discussed in Section 4.4, *Cultural Resources*, an archeological survey was performed on the project site which identified the presence of archeological and historical resource sites. With the implementation of Mitigation Measures CR-1(a-d), CR-2(a), and CR-2(b), potential impacts to archeological and historical resources would be reduced to a less than significant level. These measures would avoid impacts to unknown cultural resources on the project site. Therefore, the proposed project would be consistent with this policy.
DevStd HA-O-1.1. Development on Key Sites that has not been surveyed by a County-qualified archaeologist should be surveyed and mitigated in accordance with State and County archaeological and historic guidelines.	**Consistent.** As discussed in Section 4.4 *Cultural Resources*, an archeological survey was performed on the project site which did identify the presence of archeological and historical resource sites and mitigation measures have been identified (CR-1[a-d], CR-2(a), and CR-2(b) to reduce impacts to a less than significant level. Therefore, the proposed project would be consistent with this development standard.
Orcutt Community Plan – Noise	
Policy NSE-O-1. Development of new noise sensitive uses (as defined in the Noise Element) in Orcutt should provide attenuation of ambient noise levels for indoor living areas and, where practical, for outdoor living areas.	**Consistent.** As described in Section 4.9, *Noise*, the proposed project would result in potentially significant impacts related to exposure of new residences to roadway noise from U.S. 101. County standards limit noise exposure in residential use areas. Exterior noise must not exceed 65 dBA and interior noise levels must not exceed 45 dBA. Mitigation Measure N-2(a) requires the construction of an 8' sound wall east of homes nearest to U.S. 101 and other noise minimizing construction techniques. Upon implementation of these measures, interior noise levels within the proposed project would not exceed 45 dB and exterior noise levels would exceed 65 dB. Therefore, the proposed project would be consistent with this policy.
DevStd NSE-O-1.1. Noise sensitive land uses should be located outside of the 65 dB(A) CNEL contours, unless this would prevent reasonable development of a property.	**Consistent.** As discussed above, Mitigation Measure N-2(a) requires the construction of an 8' sound wall east of homes nearest to U.S. 101. This would prevent any noise-sensitive land uses from being located within the 65 dB(A) CNEL contour. Therefore, the proposed project would be consistent with this development standard.
DevStd NSE-O-1.2. Noise sensitive uses proposed in areas exceeding 65 dB(A) CNEL shall be designed so that exterior living spaces do not exceed 65 dB(A) CNEL and interior noise levels attributable to exterior sources do not exceed 45 dB(A) CNEL when doors and windows are closed. Noise insulation construction techniques may include installation of air conditioning for all units and double-paned windows and wall insulation for all window and wall locations with lines of sight to the noise source. Building design and construction specifications shall meet the interior noise standard set forth in California Administrative Code, Title 25, as demonstrated through an acoustical analysis prior to project approval.	**Consistent.** As described in Section 4.9, *Noise*, Mitigation Measures N-2(a) and N-2(b) would ensure that exterior living spaces are not exposed to noise levels in excess of 65 dB(A) CNEL and that interior living spaces are not exposed to noise levels in excess of 45 dB(A) CNEL. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd NSE-O-1.3. Project design shall use a combination of vegetated berms, unit orientation or other methods to reduce noise affecting interior and exterior living spaces. The developer should retain a County-approved noise consultant to conduct a study determining the design and effectiveness of proposed noise reduction measures. Soundwalls shall only be used if alternative noise reduction measures are ineffective. If found necessary soundwalls shall be decorative masonry or wood walls planted with fast-growing vines and shrubs.	**Consistent.** As described in Section 4.9, *Noise*, the proposed project would result in potentially significant impacts related to exposure of new residences to roadway noise from U.S. 101. As currently designed, and as discussed above, the proposed project would require an 8-foot high sound wall to reduced exterior noise levels to below 65 dBA and noise-attenuation features in building designs to ensure that interior noise levels are below 45 dBA. As discussed in Section 4.1, *Aesthetics*, Mitigation Measure AES-1 would require architectural and landscape guidelines for the project and OCP Gateway policies would require review by the North County Board of Architectural Review. Upon implementation of these measures, the sound wall would be treated in a way that enhances its appearance. Therefore, the proposed project would be consistent with this development standard.
Policy NSE-O-2. Construction noise in Orcutt shall be minimized during non-standard work hours.	**Consistent.** Adherence to Mitigation Measure N-1(a), which limits construction operations to normal work hours (8 a.m. to 5 p.m.), would ensure consistency with this policy.
DevStd NSE-O-2.1. Standard construction working hours (i.e., 8 a.m. to 5 p.m., Monday-Friday) shall be required for development activities. Flexibility to allow extended hours on weekdays and/or occasional working hours on Saturdays should be determined on a case-by-case basis.	**Consistent.** Adherence to Mitigation Measure N-1(a), N-1(b) and N-1(c) would: limit construction operations to normal work hours (8 a.m. to 5 p.m.); provide all adjacent property owners with a construction activity schedule and construction routes at least one week in advance of construction activities; and shield stationary construction equipment that generates noise which exceeds 65 dBA at the project boundaries to prevent it from exceeding 65 dBA at the property boundary. With the implementation of these measures, the proposed project would be consistent with this development standard.
DevStd NSE-O-2.2. Noise attenuation barriers, muffling of grading equipment and additional mitigation where deemed appropriate should be required for development where construction equipment generates noise levels in excess of 95 dB(A).	**Consistent.** As discussed above and in Section 4.9, *Noise*, Mitigation Measure N-1(c) requires noise attenuation of construction equipment and activities. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Orcutt Community Plan – Risk of Upset/Hazardous Materials	
Policy RISK-O-1. The County shall minimize the risk to public safety associated with oil and gas activity.	**Consistent.** As discussed in Section 5.0, *Effects Found Not to be Significant*, an abandoned oil well is located on the south-westernmost portion of the site. The well was plugged and abandoned in 1904, before the establishment of the current DOGGR abandonment standards. No structural development is proposed within approximately 2,500 feet of the mapped location of the abandoned well, as depicted in the OCP Oil Activity Map (OCP EIR Figure 5.12-1). One of the public trails would be located closer to the mapped location of this well; however, no structures or substantial grading is associated with the trail at this location. Because of the approximately 2,500-foot separation between the well and the nearest building envelope of the nearest residential lot, no significant risk of upset hazards are anticipated. However, the Orcutt Community Plan stipulates that "in the event that past oil activity or potential hazardous substances are uncovered during grading or construction-related activity, such activity shall be suspended immediately until a Phase II Environmental Site Assessment and appropriate remedial action has been completed (DevStd RISK-O-1.2). Adherence to this existing policy would ensure that construction-related hazards are less than significant. Therefore, the proposed project would be consistent with this policy.
DevStd RISK-O-1.1. Parcels listed in Table 41 (of the OCP) shall be inspected by County Petroleum Office personnel to determine the existence of hazardous substances on the property or immediately abutting properties prior to County acceptance of an application for development.	**Consistent.** The proposed project is located on a parcel identified in Table 41 of the OCP, due to the location of an abandoned oil well in the far southwest corner of the site. As discussed in Section 5.0, *Effects Found Not to be Significant*, no structural development is proposed within approximately 2,500 feet of the mapped location of the abandoned well, as depicted in the OCP Oil Activity Map (OCP EIR Figure 5.12-1). One of the public trails would be located closer to the mapped location of this well; however, no structures or substantial grading is associated with the trail at this location. The abandoned well may still pose a hazard considering the likelihood that it was not abandoned to current DOGGR standards. However, the Orcutt Community Plan stipulates that "in the event that past oil activity or potential hazardous substances are uncovered during grading or construction-related activity, such activity shall be suspended immediately until a Phase II Environmental Site Assessment and appropriate remedial action has been completed (DevStd RISK-O-1.2). Adherence to this existing policy would ensure that construction-related hazards are less than significant. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd RISK-O-1.2. In the event that past oil activity or potential hazardous substances are uncovered during grading or construction-related activity, such activity should be suspended immediately until a Phase II Environmental Site Assessment and appropriate remedial action has been completed.	**Potentially Consistent.** As discussed in Section 5.0, *Effects Found Not to be Significant,* the project applicant would be required to adhere to existing regulations and policies. These include completion of a Phase II Environmental Site Assessment and appropriate remedial action. Therefore, the proposed project would be potentially consistent with this development standard.
DevStd RISK-O-1.3. Development should be sited and designed to include remedial and/or avoidance measures which may include actions such as setbacks and/or excavation as determined appropriate by a Phase II study. Any remediation plan shall include requirements that soil undergoing remediation must be tarped and not placed within the viewshed of the public or adjacent residents, where feasible.	**Consistent.** As discussed in Section 5.0, *Effects Found Not to be Significant,* the abandoned oil well is not located in an area that would be developed, but County staff would still be required to investigate to ensure that it has been properly abandoned pursuant to existing policy. This may or may not require Phase II testing and/or remediation, as determined by County staff. Therefore, the proposed project would be consistent with this development standard.
DevStd RISK-O-1.4. New habitable development shall be setback a minimum 25 feet from known oil and gas-related pipeline rights-of-way unless a project specific risk assessment indicates closer development is appropriate.	**Consistent.** No structure would be located within 2.500 feet of the abandoned well. Therefore, the proposed project would be consistent with this development standard.
Policy RISK-O-2. The County shall minimize the risk to public safety associated with airport operations.	**Consistent.** As discussed in Section 5.0, *Effects Found Not to be Significant,* the subject property is not located within the Airport Influence Area, as shown by maps contained within the Santa Maria Airport Land Use Plan. Therefore, the project would be consistent with this policy.
Policy RISK-O-3. The County shall minimize the risk to public safety associated with hazardous materials.	**Consistent.** As discussed in Section 5.0, *Effects Found Not to be Significant,* hazardous materials impacts from the proposed project would be less than significant. Therefore, the proposed project would be consistent with this policy.
DevStd RISK-O-3.2. The County should require development involving the transportation of hazardous materials to prepare a Comparative Route Assessment, determining the route with the least risk and designate that route as the preferred transportation corridor.	**Consistent.** The proposed project is a residential development and would not involve the transport of hazardous materials. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Orcutt Community Plan – Visual	
Policy VIS-O-1. Significant scenic and visual natural resources in Orcutt shall be protected in order to preserve the semi-rural character of the OPA.	**Consistent**. As discussed in Section 4.1, *Aesthetics/Visual Resources,* the proposed project would result in significant and unavoidable impacts to visual character. This is primarily due to the project's visibility from U.S. 101. However, when considered in combination with previously approved development on the MR-O portion of the site, views of the site from U.S. 101 will inevitably be altered and the current project may serve to mitigate or soften the effects of the MR-O development. Regardless, the two projects would both contribute to a change in character from undeveloped and semi-rural to suburban. Cumulative impacts are therefore considered significant and unavoidable from a CEQA standpoint. However, based on the design of the project (i.e., reduced height limits along the easterly and southerly portions of the project), OCP Gateway policies which require architectural review of buildings, landscaping and lighting and implementation of mitigation measure AES-1 discussed in Section 4.1, *Aesthetics/Visual Resources,* the proposed project would be consistent with this policy.
DevStd VIS-O-1.1. All development including buildings, understories, fences, water tanks and retaining walls adjacent to designated natural open space areas shall be sited and designed to protect the visual character of these areas and blend in with natural landforms through the use of such methods as setbacks, building orientation, materials and colors (earth tones and non-reflective paints), landscape buffers, shielded exterior lighting, screening of parking areas and inclusion of perimeter roads to allow maintenance of open space corridors.	**Consistent**. As discussed in Section 4.1, *Aesthetics/Visual Resources,* the proposed project would result in a significant and unavoidable cumulative impact to visual character. When considered in combination with previously approved development on the MR-O portion of the site, views of the site from U.S. 101 would be altered, thus contributing to a change in character from undeveloped and semi-rural to suburban. However, the project includes methods described in this development standard to protect visual character and would be therefore consistent, especially with incorporation of Mitigation Measure AES-1 as discussed in Section 4.1, *Aesthetics/Visual Resources*.
Policy VIS-O-2. Prominent public view corridors (U.S. 101, State Routes 1 & 135, Clark Ave., Santa Maria Way, and Union Valley Parkway) and public viewsheds (Orcutt/Solomon Hills, Casmalia Hills, and Orcutt Creek) shall be protected.	**Consistent.** As discussed above and in Section 4.1, *Aesthetics/Visual Resources*, the project's visual impact from prominent view corridors can be mitigated to a less than significant level through project design, compliance with gateway policies and mitigation measure AES-1, which requires architectural and landscape guidelines for the project. Therefore, the proposed project would be consistent with this policy.
DevStd VIS-O-2.1. Development shall be sited and designed to minimize the disruption of important public view corridors and viewsheds through building orientation, minimization of grading on slopes, landscaping, and minimization of sound walls.	**Consistent.** As discussed above and in Section 4.1, *Aesthetics/Visual Resources*, the project's visual impact from prominent view corridors would be reduced to a less than significant level through project design, compliance with gateway policies and mitigation measure AES-1, which requires architectural and landscape guidelines for the project. The project includes a sound wall, as required for noise reduction, but the architectural treatment of the required wall and intervening landscaping would minimize its visual effect. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Policy VIS-4. Public and private stormwater systems (recharge, retention, and retardation basins, culverts, channels, etc.) shall be designed and maintained to be visually attractive.	**Consistent.** The proposed project would include the construction of two on-site detention basins. The detention basins would not be located in steep areas and would be bermed and landscaped to minimize visual impacts. The basins would be fenced for safety but the wooden rail fencing would maintain a rural character. Therefore, the proposed project would be consistent with this policy.
Dev Std VIS-O-4.1. Basins shall be engineered so that perimeter fencing is minimized. Where required, perimeter fencing shall be unobtrusive (while minimizing interference with wildlife movement on rural parcels). Perimeter landscaping of basins shall consist of low maintenance trees, shrubs, turf, etc., and on public basins should be designed to accommodate recreational uses where appropriate. Landscaping and fencing within the basins should be maintained through a Landscape-Open Space Maintenance District.	**Consistent.** The proposed project would include the construction of two on-site detention basins. The detention basins would be fenced for safety but they would be surrounded by open space and therefore they would not impede wildlife movement. Therefore, the proposed project would be consistent with this development standard.
Policy VIS-O-6. Outdoor lighting in Orcutt shall be designed and placed so as to minimize impacts on neighboring properties and the community in general.	**Consistent.** As discussed in Section 4.1 *Aesthetics/ Visual Resources*, OCP Development Standards for Key Site 3 (KS-19 and KS-21) specifically address exterior lighting and ensure that it is minimized by design. Review of final landscaping, lighting, and architectural design by the North County Architectural Review Board (NBAR) would also ensure compliance with these standards and consistency with Policy VIS-O-6.
DevStd VIS-O-6.1. Low pressure sodium (LPS) lighting or other alternative methods used for street lighting, parking lot lighting and security lighting should be investigated by the Public Works Department to reduce off-site impacts from night lighting.	**Consistent.** As discussed in Section 4.1 *Aesthetics/ Visual Resources*, adherence to low outdoor lighting requirements would be ensured by development of and adherence to proposed architectural and landscaping guidelines intended to reduce visual impacts. Review of final landscaping, lighting, and architectural design by the NBAR would also ensure compliance with these standards and consistency with this development standard.
DevStd VIS-O-6.3. Night lighting fixtures adjacent to residential areas shall be of the minimum height and intensity required for security/safety.	**Consistent.** As discussed in Section 4.1 *Aesthetics/ Visual Resources*, adherence to low outdoor lighting requirements would be ensured by development of and adherence to proposed architectural and landscaping guidelines intended to reduce visual impacts. Review of final landscaping, lighting, and architectural design by the NBAR would also ensure compliance with these standards and consistency with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
Orcutt Community Plan – Key Site 3	
DevStd KS3-1. Key Site 3 (APN 129-151-26) is designated Res Ranch and zoned RR 10. Any proposed development on Key Site 3 shall comply with the following development standards. **Policy KS3-2:** The County shall consider redesignating/rezoning Key Site 3 to PD/PRD 125 units only if: A. The areas identified as "Open Space" on Figure KS3-1 have been dedicated to the County or other County-approved group or agency, and B. The property owner has demonstrated compliance with Action SCH-0-1.3.	**Potentially Consistent (pending approval of applicant-requested OCP amendment).** The applicant has requested an amendment to the OCP, which would modify this development standard to redesignate and rezone the site to PD/PRD 125, as follows: ***DevStd KS3-1:*** *Key Site 3 (APN 129-151-26) is designated ~~Res Ranch and~~ PD, Residential 20.0, and Open Space and zoned ~~RR 10 and~~ PRD-125, MR-O. Any proposed development on Key Site 3 shall comply with the following development standards.* In accordance with the proposed amendment to this development standard, the applicant proposes to dedicate the open space shown on Figure KS3-1 to the County as permanent open space and has demonstrated compliance with Action SCH-O-1.3 by entering into an agreement with the Orcutt Unified School District that will mitigate any impacts of the project on the area schools. Should the requested amendment be adopted, this development would not conflict with this Key Site 3-specific OCP development standard. Therefore, the project would be potentially consistent with this development standard, and with Policy KS3-2.
DevStd KS3-1: Development of the site shall be limited to the northern mesa as designated on Figure KS3-1 (north of the "neck" created by the NE comer of the lots on Chancellor Street).	**Consistent.** The proposed development is limited to the mesa, except for the trails, drainage structures and bridge to Chancellor Street. Drainage structures and trails in the open space, and secondary access, are anticipated by the OCP. Therefore, the proposed project would be consistent with this development standard.
DevStd KS3-2. In order to provide compatibility with existing adjacent development, density shall transition from “lower” at the southern and western perimeters of the mesa to "higher" for the internal development. The area extending from the top of the bluff to the southern site boundary, and a 75 foot strip along the entire eastern site boundary shall remain in natural, undeveloped open space. No development except bike paths, hiking trails, rural landscaping, the proposed rest area and other passive recreational areas (e.g ., seating areas) shall be permitted within this area.	**Consistent**. The proposed project complies with the requirement by providing single-story buildings and lower densities around the perimeter of the project with higher densities within the project interior. No development is proposed within the 75 foot strip along U.S. 101 or within other designated open space areas, except for the two on-site detention basins as anticipated in the OCP (see KS3-3 below). Therefore, the proposed project would be consistent with this development standard.
DevStd KS3-3. If it is determined that a weir or retention basin is needed onsite to control runoff, such a facility shall be sited within the proposed open space area (shown on Figure KS3-1) in coordination with SBCFCD and P&D, and designed to minimize impacts to riparian and/or oak woodlands.	**Consistent.** The proposed project includes a detention basin within the open space area to control runoff, as anticipated by this OCP standard. The 15 foot basin depth allows for a reduced footprint, and therefore reduced habitat loss. The proposed basins would not be located in riparian or oak woodland habitat. Therefore, the project would be consistent with this development standard.
DevStd KS3-4. Drought tolerant landscape screening such as oaks and other trees and shrubs shall be planted on the southwest facing slope leading down to Chancellor Street and on the southern slope between development and the proposed open space area.	**Consistent.** The proposed landscaping plan includes several oaks and other trees on this southern slope. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd KS3-5. The bikepath, hiking trails, rest area, and secondary access roads shall be located to minimize loss of significant vegetation.	**Consistent.** The proposed project includes a single multi-purpose trail rather than separate trails, which would minimize impacts. The trials would not involve the removal of a significant amount of vegetation, especially compared to the amount of open space that would remain natural. Therefore, the proposed project would be consistent with this development standard.
DevStd KS3-6. No development other than a secondary access road from Oakbrook Lane shall occur within 100 feet of the dripline of the vegetation in the southwest comer of the northern mesa, or within a 25-foot buffer from the top of bluff of the canyon in the northeast corner of the site.	**Potentially Consistent (pending approval of applicant-requested OCP amendment).** The applicant has requested an amendment to the OCP, which would modify this development standard to describe secondary access from Chancellor Street (rather than Oakbrook Lane) and clarify that the canyon is located in the northwest corner of the mesa (rather than the southwest corner), as follows: ***DevStd KS3-6:*** *No development, other than a secondary access road ~~from Oakbrook Lane~~ to Chancellor Street, shall occur within 100 feet of the dripline of the vegetation in the southwest corner of the northern mesa, or within a 25 foot-buffer from the top of bluff of the canyon in the north~~east~~west corner of the site.* The secondary access road is proposed within 100 feet of the dripline of the vegetation in the southwest corner of the northern mesa. No development would occur within 25 feet of the top of bluff adjacent to the canyon in the northwest corner of the site. Should the requested amendment be adopted, this development would not conflict with this Key Site 3-specific OCP development standard. Therefore, the project would be potentially consistent with this development standard.
DevStd KS3-7. Primary access to the site shall be from the frontage road along US Hwy 101. The existing easement over Site 2 shall be renegotiated to accommodate development of Site 2 and to align with the "preferred access point" intersection. The developer shall coordinate with P&D, Public Works Transportation Division and the Fire Department to ensure appropriate secondary access from Oakbrook Lane.	**Potentially Consistent (pending approval of applicant-requested OCP amendment).** The applicant has requested an amendment to the OCP, which would modify this development standard to describe secondary emergency access from Chancellor Street (rather than Oakbrook Lane), as follows: ***DevStd KS3-7:*** *Primary access to the site shall be from the frontage road along US Hwy 101. The existing easement over Site 2 shall be renegotiated to accommodate development of Site 2 and to align with the "preferred access point" intersection. The developer shall coordinate with P&D, Public Works Transportation Division, and the Fire Department to ensure appropriate secondary access from ~~Oakbrook Lane.~~ Chancellor Street using developer's existing Chancellor Street easement.*

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
	With respect to primary access, the applicant proposes to coordinate with the realignment of the access road through Key Site 2 to align with the preferred access point along Clark Avenue. The applicant does not have an access easement across Oakbrook Lane. As a result, secondary access to the project site is proposed from Chancellor Street where the applicant does have an access easement. Should the requested amendment be adopted, this development would not conflict with this Key Site 3-specific OCP development standard. Therefore, the project would be potentially consistent with this development standard.
DevStd KS3-8. The developer shall construct access road improvements along the eastern boundary of Sunny Hills Mobi1e Home Park in coordination with development on Site2. Improvements shall include standard County Roadway frontage improvements, landscape screening from US Hwy 101, and a separated, public off-road trail. Through the Infrastructure Financing Program, the County shall establish a reimbursement mechanism to allow road improvement costs to be shared on a pro-rata basis with the developer of Site 2, In addition, once the access road to Site 3 enters the developable area, it should be located away from US 101.	**Consistent.** The proposed project includes access through Key Site 2. At the project entrance, the access road shifts further way from U.S. Highway 101. A separated public trail continues south along the highway to the designated open space parcel along the creek. The project would therefore be consistent with this development standard.
DevStd KS3-9. Development setbacks shall be applied to identified archeological resources (see EIR, Vol. III). The areas within the identified setbacks shall be incorporated into the project design and designated on construction drawings as "Undevelopable Open Space." These areas shall be seeded with shallow-rooted vegetation.	**Potentially Consistent.** As discussed in Section 4.4, *Cultural Resources,* the subject site contains four (4) potentially significant historic sites and the proposed development would occur within 25 feet of two (2) of those sites. Mitigation measures C-1(a) and C-2(b) require avoidance measures and a 25-foot buffer from the two sites that can be avoided. Mitigation measure CR-2(a) requires monitoring during construction. If artifacts are encountered they would be collected and recorded and mitigation of impact excavations would reduce impacts to less than significant. Therefore the project would be potentially consistent with this development standard.
DevStd KS3-10. The developer shall dedicate an easement for, and construct, a flood control/emergency access route along Orcutt Creek which can also be used as a Class I bikepath as well as hiking trails through Key Site 3, with appropriate links to new onsite development**.**	**Consistent.** The proposed project includes a dedicated multi-purpose trail that encircles and follows the creek for most of its length through the site. Flood Control District staff has stated that, although there is no proposed development in the southern portion of the site, the multi-purpose trail is sufficient in width to provide access for small maintenance vehicles. Therefore, the project is consistent with this development standard.
DevStd KS3-11. Homes located on the northern, western and southern mesa boundaries adjacent to existing residential development shall be limited to one story in height to reduce visual impacts on these existing residences. In addition, on the northern site boundary, the developer shall install a 25-foot wide rural landscape buffer.	**Consistent.** The proposed project limits homes along the northerly, westerly and southerly boundaries of the development to single story, and a 25-foot landscaped buffer is proposed along the northerly property line. Therefore, the proposed project would be consistent with this development standard.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd KS3-12. Development on the site shall be consistent with the" gateway policies" in the Visual Resources section (IV.H).	**Consistent.** As discussed in Section 4.1, *Aesthetics,* the project would be required to comply with gateway policies, including review and approval by the North County Board of Architectural Review (NBAR). Therefore, the proposed project would be consistent with this development standard.
DevStd KS3-15: All front, side, and rear elevations for all structures visible from public viewpoints shall incorporate design features that avoid long, unarticulated facades. **DevStd KS3-17:** Signs shall be constructed of high-quality materials and are encouraged to have borders, trim, and be recessed into their frames. Lettering style and colors shall be consistent with the rural character of Orcutt.	**Consistent.** As discussed in Section 4.1, *Aesthetics/Visual Resources*, mitigation measure AES-1(a) requires compliance with Visual Development Standards as established by the OCP. The Planning and Development Department and NBAR would verify compliance. Therefore, the proposed project would be consistent with this policy.
DevStd KS3-16: Project entrance monuments that may be provided shall be visually compatible with surrounding development, shall be consistent with the natural character of the area, and shall only be illuminated with hooded and downward-directed lighting of the lowest intensity that provide adequate lighting. Excessive lighting intensity shall not be permitted. **DevStd KS3-19:** New lighting shall be oriented away from sensitive uses, and shall be hooded, shielded, and located to direct light pools downward and prevent glare. The following standards shall also be implemented: • All exterior lighting shall be designed as part of the overall architectural concept, • Fixtures, standards and all exposed accessories shall be harmonious with the building design, the lighting design and hardware of the public spaces, and the overall visual environment of the County, • Lighting shall be used for safety and security to illuminate building entrances, parking, and loading areas, and pedestrian walkways, • Light fixtures with exposed light bulbs shall generally be avoided, • All light fixtures with exposed light bulbs shall be of a type fitted with lenses to confine the cone of light to the extent feasible, • Lighting sources shall not cast stray light beyond the property line on which they are installed. **DevStd KS3-20:** Finish materials, including glazing shall be of a low reflectivity to minimize glare. Development shall include low reflectivity glass, subdued colors for building materials in high visibility areas, and the use of plant material along the perimeter of the structures to soften views.	**Potentially Consistent.** As discussed in Section 4.1 *Aesthetics/ Visual Resources*, adherence to these low outdoor lighting and aesthetics requirements would be ensured by development of and adherence to architectural and landscaping guidelines, as required by mitigation measure AES-1(a). Review of final landscaping, lighting, and architectural design by P&D and the NBAR would ensure compliance with these standards and consistency with Policy VIS-O-6.

Table 2. Orcutt Community Plan Policy Consistency

Policies, Actions, and Development Standards	Consistency Discussion
DevStd KS3-21: Streetlights located with the development shall be pedestrian in scale and range in height from 12 to 15 feet, and shall be architecturally compatible with surrounding development. Streetlights, where they are included, shall be primarily for pedestrian safety (at roadway intersections only), and shall not provide widespread illumination. High mast street lighting shall be shielded and decorative to be compatible with the rural character of Orcutt.	

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Appendix G

Sound Level Assessments and Roadway Noise Modeling

Sound Level Assessment for

Detached Homes
Orcutt Key Site 3
County of Santa Barbara, CA

requested by
SB Clark, LLC
300 Esplanade Dr. Suite 1550
Oxnard Ca. 93036

September 4, 2013

45dB.com
David Lord, PH.D.
Acoustics Consulting

P.O. Box 1406
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Sound Level Assessment for

Detached Homes
Orcutt Key Site 3
County of Santa Barbara, CA

1.0 Description and Criteria

The purpose of this report is to assess existing and future background sound levels due to the dominant transportation noise source to the east of the parcel with potential impact on identified detached homes on lots 45, 46, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77, 80, 83, 86, 89 and 91. See the location of the site in relation to the transportation noise source in "Figure 1. Site Plan" on page 4. This sound level assessment is evaluated against community noise criteria contained in the County of Santa Barbara General Plan Noise Element Land Use Compatibility Guidelines, and the County of Santa Barbara Environmental Thresholds and Guidelines Manual. This report will describe the existing, baseline sound levels on and around the site, and future sound levels in outdoor activity areas of possible future residential development.

With regard to land use, potential noise conflict and noise mitigation measures, the noise level standards contained in the Noise Element of the General Plan of the County of Santa Barbara (rev. 1986) are used. The Noise Element sets a limit of LDN = 65 dBA for residential outdoor activity areas (pages 58-59) and a limit of LDN = 45 dBA for interior noise sensitive uses.

2.0 Existing Sound Levels

A site visit, observations and sound level measurements are described in a previous report from this office, dated November 2, 2009. Daily sound level predictions for the present study are based on the original sound level measurements as well as the published Average Daily Traffic values provided by Caltrans, in order to project accurate vehicle noise impacting primarily the east side of the parcel.

Heavy traffic on U.S. Highway 101, consisting of automobiles, semi tractor-trailers, agricultural trucks and motorcycles are clearly audible along the eastern portion of the site. The traffic flows at about 60 to 75 m.p.h., and consists of about 15 percent truck traffic, half of which are medium trucks (having two axles and six wheels). Because of their noise characteristics, buses and motorcycles are included in the medium truck category. The remaining half of the truck traffic is heavy trucks, having three or more axles and designed for the transportation of cargo with a gross weight greater than 25,000 lbs. Average Daily Traffic (ADT) count for this segment of U.S. Highway 101 which is listed by Caltrans as 38,000 vehicles per day. Sound levels with no noise mitigation are shown in two figures, "Figure 2. Units 45, 46, 47, Without Noise Mitigation" on page 5 and in "Figure 3. Units 50 through 91, Without Noise Mitigation" on page 6.

Figure 1. Site Plan

Site Plan showing location of dwelling units studied in relation to the dominant noise source to the east of the site.

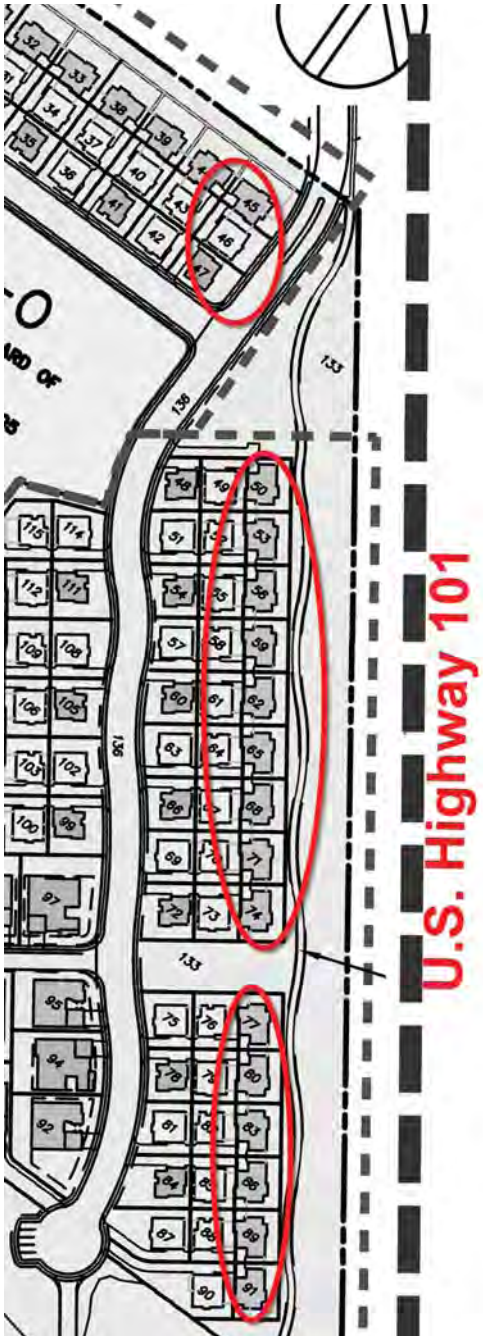


Figure 2. Units 45, 46, 47, Without Noise Mitigation

Site Plan showing Units 45, 46, 47. Sound level contours (LDN=dBA) are shown without noise mitigation in place.

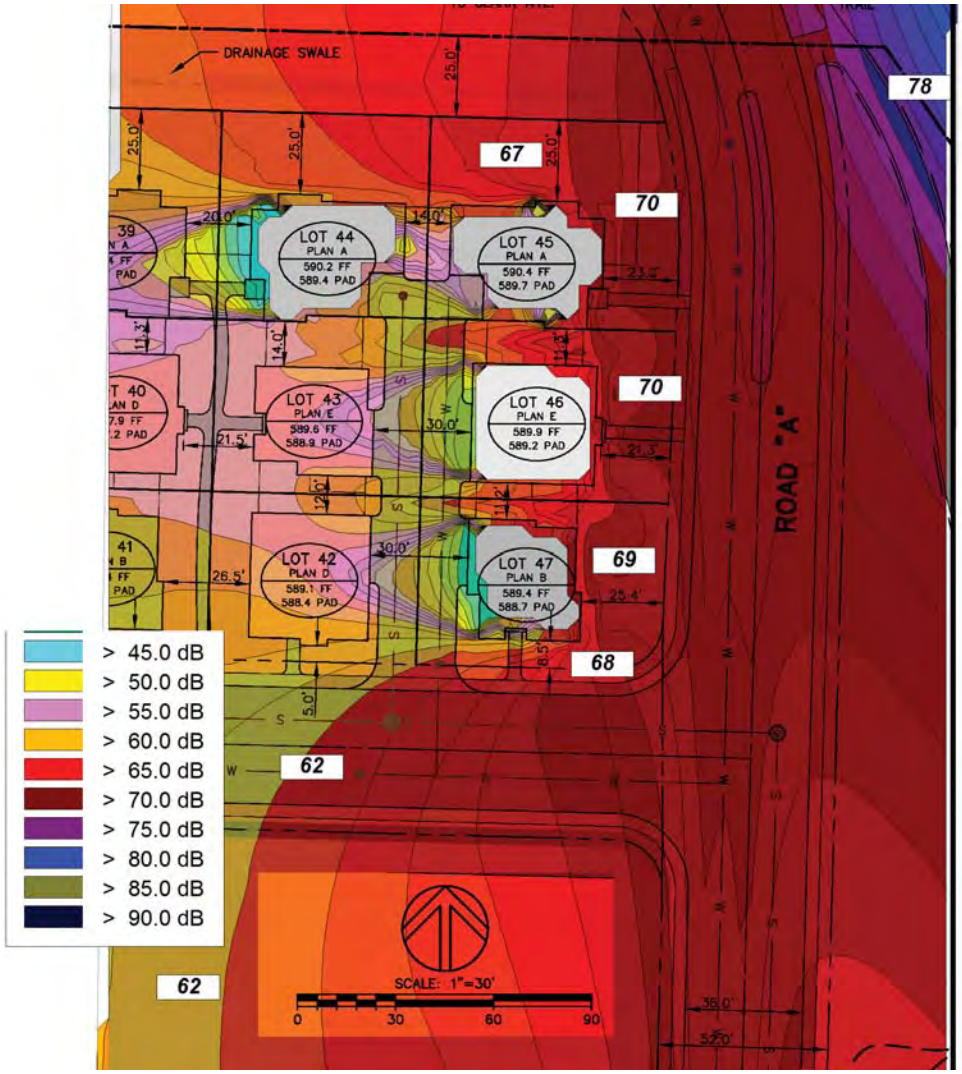


Figure 3. Units 50 through 91, Without Noise Mitigation

Site Plan showing units 50 through 91, sound level contours (LDN=dBA) are shown without noise mitigation in place.

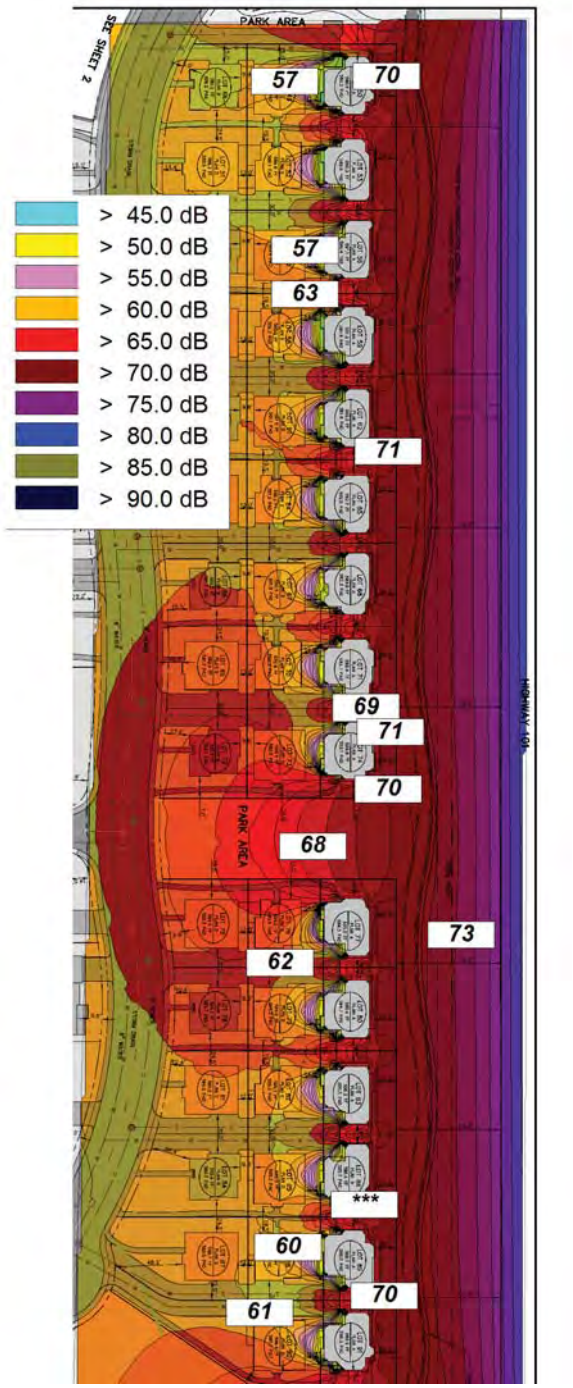


Figure 4. Units 45, 46, 47 with Noise Mitigation

Site Plan showing units 45, 46, 47 sound level contours (LDN=dBA) with specific site noise mitigation, shown at dwelling unit property line facing the noise source.

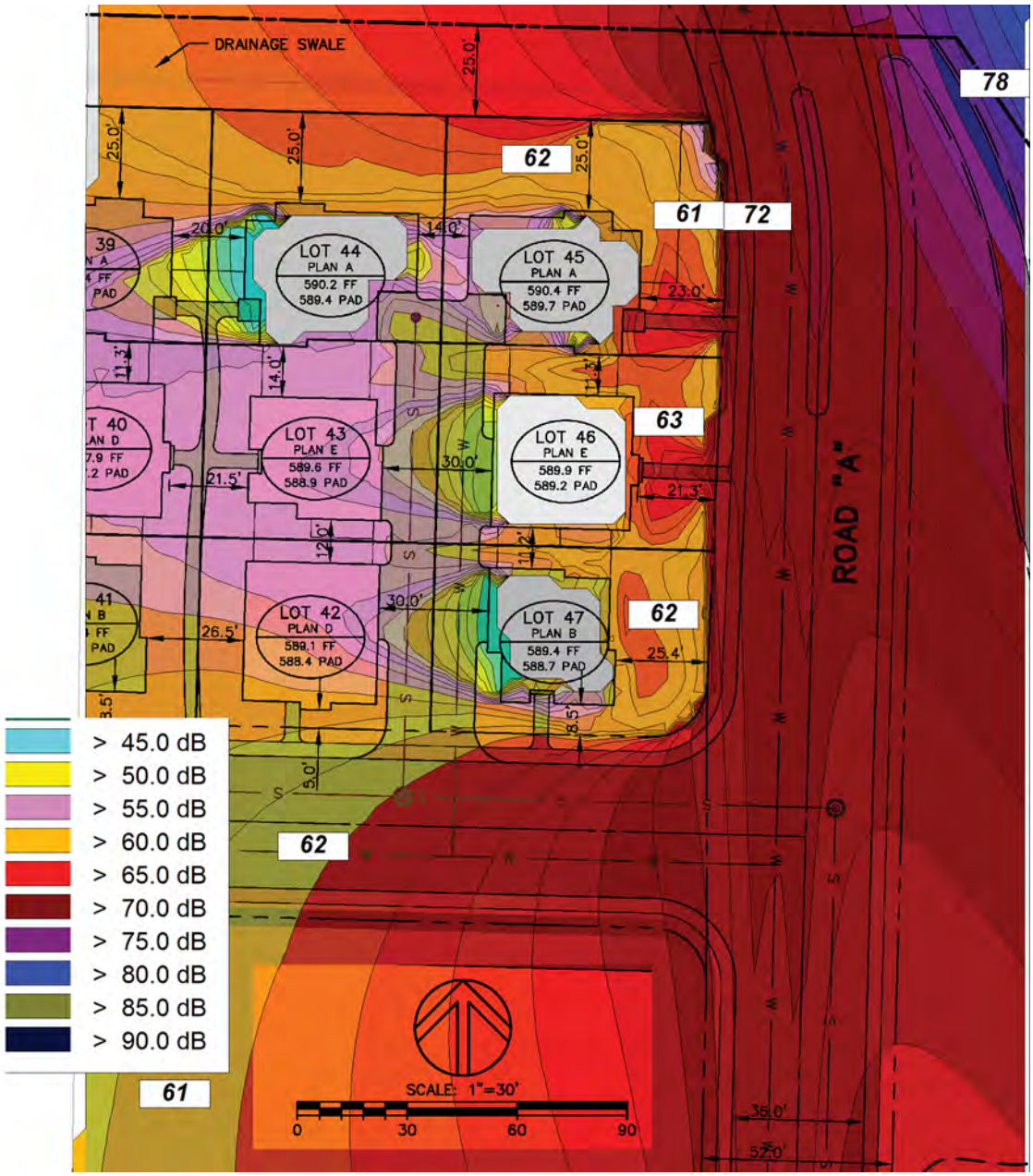
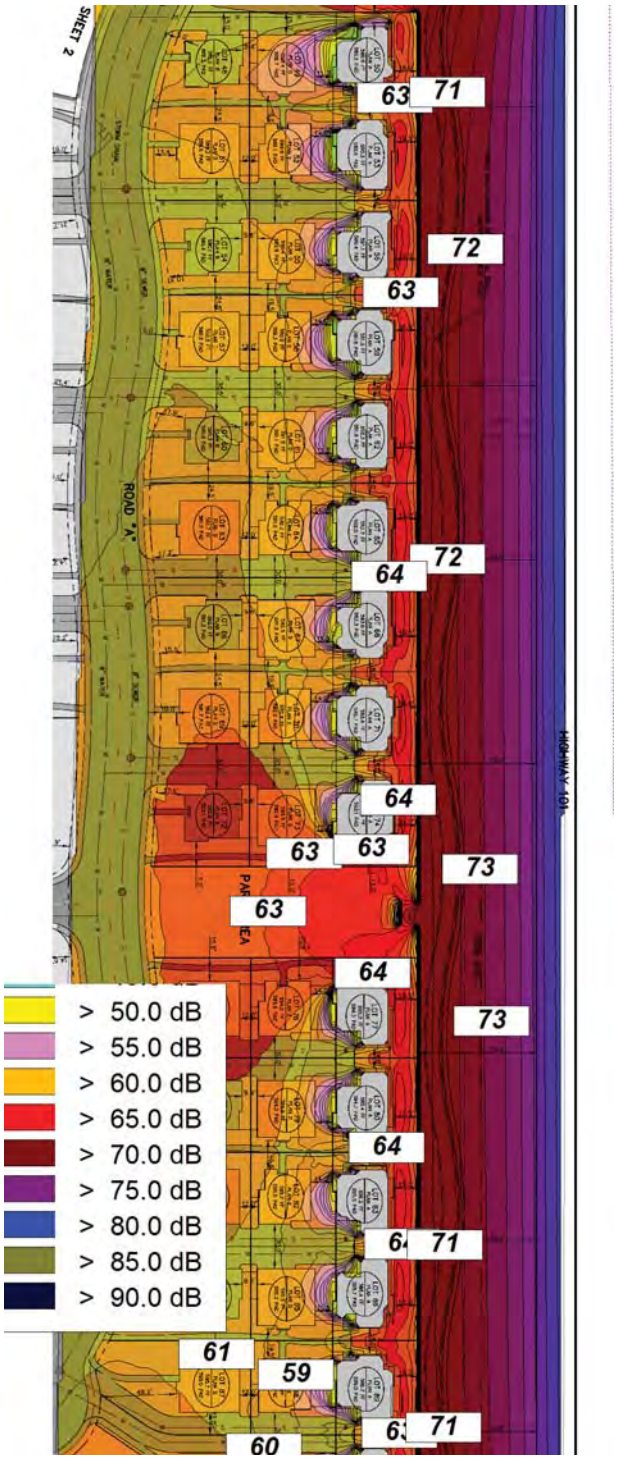


Figure 5. Units 50 through 91, with Noise Mitigation

Site Plan showing units 50 through 91 sound level contours (LDN=dBA) with specific site mitigation, shown at dwelling unit property lines facing the noise source. Noise barrier mitigation at park area boundary provides mitigation for units 72, 73, 75 and 76.



Adding eight foot high sound barrier walls as indicated in the figures, brings outdoor activity areas below the 65 dBA county sound level standard with an acoustical factor of safety. See “Figure 4. Units 45, 46, 47 with Noise Mitigation” on page 7 and also see “Figure 5. Units 50 through 91, with Noise Mitigation” on page 8. The location of the proposed feasible noise mitigation walls is shown at the individual unit property line, but other similar locations may also accomplish the same effect on noise attenuation.

3.0 Sound Level Contours

The sound level contours are generated from Caltrans data by the “Noise Contour Modeling” technique discussed on page 14 in APPENDIX II: Acoustical Modeling Methods. The location of the contours is affected by topography, the proposed future dwelling locations and heights, and by daily traffic volume on the transportation corridor, U.S. Highway 101.

4.0 Future Sound Levels

Future sound levels for this site will slowly increase as traffic volume increases. A projection of future growth was made by the Santa Barbara Association of Governments and published in its *The 2030 Travel Forecast for Santa Barbara County, published in 2004.* The resulting effect on future sound levels is shown in Table 1. Growth in Sound Levels, on page 9. The resulting increase to the year 2020 will be less than one LDN = dBA across the site. Therefore the increase is less than significant.

5.0 Recommended Noise Mitigation

The following noise mitigation measures are recommended in order to attenuate sound levels below the County of Santa Barbara maximum of LDN = 65 dBA for outdoor activity areas and LDN = 45 dBA for interior sound levels

Table 1. Growth in Sound Levels

Growth rate estimates from Santa Barbara Association of Governments, *2030 Travel Forecast for Santa Barbara County*

Growth of Noise from Average Daily Traffic Figures

David Lord, Acoustics Consulting 299 Albert Dr. San Luis Obispo, CA 93405

Orcutt, CA KS-3

1.6 % per year traffic growth rate to the year 2020

Calculation of added noise sources

			((10^-16)*10^(D9/10))
present noise level (LDN)	64.0	dBA	intensity= **2.51E-10** W/cm^2
present traffic flow	38000	ADT	(average daily traffic)
future traffic flow	46000	ADT	**0.8** dBA additional
future noise level (LDN)	**64.8**	dBA	10*LOG10(D13/D12)

5.1 Solid Noise Barriers

Solid noise barriers are recommended in the approximate positions indicated in Figures 4 and 5. Solid noise barriers shall be eight feet in height with reference to finish floor level of nearby dwelling unit. The noise barriers will also provide noise protection for side-yard outdoor areas. Acceptable materials for solid barriers are masonry, or stucco, or minimum 3/4 inch exterior plywood, or laminated glazing or any combination. However, all construction joints of the solid noise barrier shall be sealed with a resilient acoustical caulking in order to make the overall noise barrier assembly completely airtight. Gates shall be overlapping design to seal any cracks facing the noise source. Any open drainage holes, cracks or seams in the construction will seriously degrade the performance of the noise barrier.

5.2 Recommended Noise Resistant Construction

Ordinary dwelling unit construction facing the noise source is not likely to result in sufficiently quiet interior spaces, and therefore enhanced construction methods and materials are detailed below. The objective of noise resistant construction is to reduce exterior noise levels to less than LDN = 45 dBA in interior habitable spaces. This may be achieved by a performance specification which requires testing the interior habitable spaces after construction is complete to verify that interior sound levels are less than LDN = 45 dBA. An alternative to testing is for construction materials and methods to adhere to the following prescriptive specification:

The following prescriptive construction specification is recommended for east-facing elevations of the dwelling units in this study, nearest the transportation noise source, U.S. Highway 101. The following construction specification will result in an acoustical performance which gives less than LDN = 45 dBA interior noise level for habitable spaces located along the east elevation, where construction assemblies face the transportation noise source.

Noise mitigation may fail to perform if each and every one of the following recommendations is not followed. A small crack or air leak in the construction may completely compromise all other sound-proofing.

Vents and roof penetrations: Soffit vents, eave vents, dormer vents and other wall and roof penetrations shall be located on the walls and roofs facing away from the noise source (located on the north, west and south elevation) wherever possible. If kitchens or bathrooms are located on the east side, remote venting to other elevations is required. If vents are required to be located facing the noise source, a 90 degree bend shall be incorporated in the design of the ductwork or vent opening. Use of patented foam insulationsolutions, such as Icynene spray foam insulation or equivalent, in walls, floors, and ceiling cavity / roof construction will allow elimination of soffit vents and gable end vents, thereby eliminating a significant path for noise penetration.

Walls: Only the east-facing exterior walls closest to the transportation noise sources require noise mitigation. Any wall enclosing habitable spaces nearest the noise source shall be constructed with an S.T.C. (Sound Transmission Class) rating of 30 or greater. For instance, stucco exterior or fiber-cement panel siding, with 30 pound felt on 5/8”

sheathing, on 2” x 6” stud walls with R-21 fiber glass batt insulation and a layer of 5/8” Type X Gypsum Board will provide an S.T.C. rating of 30 or greater. Metal studs are preferable to wood studs for noise resistance.

Construction of the east-facing walls must include the liberal use of non-hardening acoustical sealant at all construction joints, including the header and footer construction and the edges and corners of gypsum board intersecting ceiling, walls and floor, especially behind papered joints. Apply resilient acoustical sealant (Johns Manville or equivalent) to gaps at intersecting walls, ceiling and floor before taping and spackling Gypsum Board in conventional manner. Seal all peripheries and apertures and joints around windows.

Acoustic Leaks: Common acoustic leaks, such as electrical outlets, pipes, vents, ducts, flues and other breaks in the integrity of the wall, ceiling or roof insulation and construction on the east sides of the dwelling units nearest transportation noise source shall receive special attention during construction. All construction openings and joints through the gypsum board on east-facing walls shall be insulated, sealed and caulked with putty pads and a resilient, non-hardening caulking material, as appropriate. All such openings and joints shall be airtight to maintain sound isolation.

Windows: To meet the interior LDN 45 DBA requirements, windows for habitable spaces on all floors of affected elevation facing the noise source shall be of double-glazed construction and installed in accordance with the recommendations of the manufacturer. The windows shall be fully gasketed, with an S.T.C. rating of 30 or better, as determined in testing by an accredited acoustical laboratory. An example that meets this requirement is Milgard Quiet Line windows.

Doors: More than 90% of all exterior noise comes in through windows and doors. To meet the interior LDN 45 DBA requirements, doors directly facing the noise source shall be solid core with sound dampening and fully gasketed, sealed jambs and grouted frames, with an overall S.T.C. rating of 30 or better, as determined in testing by an accredited acoustical laboratory. An alternative is the addition of a laminated glazed second door at least three inches from the primary door.

6.0 Discussion and Conclusion.

Mitigated sound levels for outdoor activity areas at the dwelling units of the proposed development do not exceed the County of Santa Barbara maximum level of LDN = 65 dBA, and will not result in interior levels greater than LDN = 45 dBA if the recommended noise barriers and recommended construction methods and materials are used on the elevations facing the noise source.



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7.0 REFERENCES

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2. American Society for Testing and Materials. 2004. *ASTM E 1014 - 84 (Reapproved 2000) Standard Guide for Measurement of Outdoor A-Weighted Sound Levels.*

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4. Bolt, Beranek and Newman. 1973. *Fundamentals and Abatement of Highway Traffic Noise*, Report No. PB-222-703. Prepared for Federal Highway Administration.

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6. California Department of Transportation (Caltrans). 1982. *Caltrans Transportation Laboratory Manual.*

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10. County of Santa Barbara. *City of Santa Barbara General Plan, Noise Element.*

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12. Federal Highway Administration. 2006. *FHWA Roadway Construction Noise Model User's Guide Final Report.* FHWA-HEP-05-054 DOT-VNTSC-FHWA-05-01.

13. Harris, Cyril.M., editor. 1979 *Handbook of Noise Control*.

8.0 APPENDIX I: Notes, Definitions

TERM	DEFINITION
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the LEQ level.
Background Noise Level	The underlying, ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the L90 percentile noise level.
Sound Level, dB	Sound Level. Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals, SLOW time response, in accordance with ANSI S1.4-1971 (R1976) Unit: decibels(dB).
dBA or dB(A):	A-weighted sound level. The ear does not respond equally to all frequencies, but is less sensitive at low and high frequencies than it is at medium or speech range frequencies. Thus, to obtain a single number representing the sound level of a noise containing a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are dBA. The A-weighted sound level is also called the noise level.
Equivalent Sound Level LEQ	Because sound levels can vary markedly in intensity over a short period of time, some method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, one describes ambient sounds in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called LEQ. In this report, both a 15 minute and an hourly period is used.
Percentile Sound Level (Ln)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., L90)
Subjective Loudness Changes.	In addition to precision measurement of sound level changes, there is a subjective characteristic which describes how most people respond to sound: •A change in sound level of 3 dBA is *barely perceptible* by most listeners. •A change in level of 6 dBA is *clearly perceptible*. •A change of 10 dBA is perceived by most people as being *twice* (or *half*) as loud.
Time weighting	Different, internationally recognized, meter damping characteristics are available on sound level measuring instruments: Slow (S), Fast (F) and Impulse (I). In this community sound level measurement, the Fast (F) response time is used.

9.0 APPENDIX II: Acoustical Modeling Methods

Roadway Traffic Noise Analysis

The traffic noise data was used to calibrate the noise modeling program using the algorithms of the Federal Highway Administration Highway Traffic Noise Model (TNM 2.5). The TNM 2.5 model is the analytical method currently favored for traffic noise prediction by most state and local agencies. It is applied to federal and state roadway projects by the California Department of Transportation (Caltrans). The model is based upon the CALVENO noise emission factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the project site. In addition, sound level measurements were performed over 24-hour periods at two locations to describe ambient sound levels in the project area, and to derive suitable LDN day/ night traffic noise distribution factors for traffic noise modeling.

Noise Contour Modeling

Noise contours incorporating the measured sound level values were generated using CADNA/A, an acoustical modeling program that incorporates the TNM 2.5 algorithms, and which was developed to predict hourly Leq values for free-flowing traffic conditions. This computer modeling tool, made by Datakustik GmbH, is an internationally accepted acoustical modeling software program, used by many acoustics and noise control professional offices in the U.S. and abroad. The software has been validated by comparison with actual values in many different settings. The program has a high level of reliability and follows methods specified by the International Standards Organization in their ISO 9613-2 standard, “Acoustics – Attenuation of sound during propagation outdoors, Part 2: General Method of Calculation.” The standard states that, “this part of ISO 9613 specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level under meteorological conditions favorable to propagation from sources of known sound emissions. These conditions are for downwind propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night.”

The computer modeling software takes into account source sound power levels, surface reflection and absorption, atmospheric absorption, geometric divergence, meteorological conditions, walls, barriers, berms, and terrain variations. The CADNA/A software uses a grid of receivers covering the project site.

10.0 Qualifications of Preparer

David Lord, Ph.D., Principal Consultant

For more than 20 years, David Lord has worked with architects, engineers, building contractors and public agencies to assess and solve problems in acoustics, noise and vibration. Dr. Lord is recognized as an acoustical consultant by several municipal and county planning departments and has provided acoustical consulting services for projects located in the following counties in California: San Luis Obispo, Santa Barbara, Orange, San Bernardino, Ventura and Los Angeles. David Lord is approved by the Department of Defense as an acoustical consultant at Vandenberg Air Force Base and at the Naval Facilities Engineering Command, Port Hueneme.

Community Noise Assessment

Projects have ranged in scale and complexity from residential to commercial and institutional developments. All noise assessments rigorously follow Caltrans and ASTM standard procedures, while adhering to local planning standards and noise ordinances and the Uniform Building Code. Recent projects include: Environmental Impact Report noise chapter for a Metrolink station in Orange County; noise assessment for an automobile service center, a retail food market, a community theater, a water treatment plant, various wineries, a boutique hotel, a remote, 600 acre religious retreat site, an annual rodeo and tractor pull event, a metal salvage yard, etc. Residential neighbor-noise assessments range from animal noise to motorcycle noise, to stationary mechanical noise issues.

Room Acoustics

Consulting projects undertaken in room acoustics range in scale from 50- to 400-seat spaces, such as church sanctuaries and restaurants. Consultation begins preferably with the architect early in design and continues through construction and occupancy. Music sources are evaluated and matched to the shape, the volume and the absorptivity of the space, using energy/time/frequency analysis tools. Recent projects include the Katsuya Restaurant at Hollywood and Vine; the Vina Robles Winery Refectory, and the United Methodist Church, San Luis Obispo.

Instrumentation

Sound and vibration measurements are made with multiple, state-of-the-art, data-logging, integrating, Type I instruments and a real time analyzer. Long-term total sound monitoring is conducted with high-resolution digital sound recorders. Sound transmission and reverberation studies are made with a real-time analyzer following ASTM procedures. Each instrument is factory calibrated annually to meet U.S. National Institute of Standards and Technology requirements and has a current Certificate of Calibration and Conformance.

Recent Projects in California. Partial list; References provided on request.

1. Bradley Square, Santa Maria, California; Housing Development 120 units. Transportation noise assessment, mitigation recommendations, noise-resistant construction design.

2. Por La Mar Nursery commercial horticulture development, worker housing, Santa Barbara / Goleta, California. Transportation noise assessment, noise resistant housing design.

3. Fess Parker Wine Center, Lompoc California, with Pults & Associates, Architects. CEQA Environmental Impact Assessment for Noise, City of Lompoc.

4. San Ysidro Ranch, Montecito, with Mechanical Engineering Consultants, Santa Barbara. Total sound level monitoring, recording, assessment and mitigation design.

5. Santa Maria Country Club, Santa Maria, California; room acoustics solutions for conference, dining and meeting rooms.

6. State Street, City of Santa Barbara, consultant to several entertainment establishments for entertainment noise mitigation and conflict resolution.

7. Expert testimony for Allen Hutkin, Attorney at Law, San Luis Obispo, noise nuisance cases.

8. Environmental Impact Report, Noise Impact Assessment for Enos Ranchos and Mahoney Ranch General Plan Amendment/Zone Change/Specific Plan Amendment/Annexation, Santa Maria, CA, with Science Applications International Corporation (SAIC)

9. Environmental Impact Report, Noise Impact Assessment, including rail noise issues, for Westgate Metrolink Station, Placentia, CA, with Crawford, Multari and Clark Associates.

10. Expert testimony for William S. Walter, Attorney, eminent domain compensation case, San Luis Obispo, CA.

11. QAD Inc., Summerland, CA. Chiller installation noise assessment and mitigation design evaluation to meet County of Santa Barbara noise standards.

Academic Qualifications

David Lord is a Professor Emeritus of Architecture at California Polytechnic State University, San Luis Obispo, where he developed the curriculum and taught courses in community noise and acoustical engineering.

David Lord holds the Master of Architecture degree from the University of California, Berkeley, with a specialization in architectural acoustics. David Lord earned the Ph.D. degree from the University of London, Bartlett School of Architecture.

Memberships

David Lord is a member of the American Society of Heating, Refrigerating and Air Conditioning Engineers, the Acoustical Society of America, the American Institute of Physics, the Institute of Noise Control Engineering, and the Audio Engineering Society.

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David Lord, Ph.D.
Principal Consultant

June 29, 2006

Sound Level Survey and Assessment

RE: Key Site 3
Highway 101 south of Clark Avenue
Orcutt, CA

Requested by: Centex Homes
735 Tank Farm Rd., #100
San Luis Obispo, CA 93401

Description and Criteria:

The site is located to the south of the intersection of Clark Avenue and U.S. Highway 101 in Orcutt, CA. A topographic and boundary site survey was provided by Penfield and Smith, dated May 15, 2006.

With regard to land use, potential noise conflict and noise mitigation measures, noise level standards and impact assessments contained in the Noise Element (1979) of the General Plan of the County of Santa Barbara, The Orcutt Community Plan EIR (Dec. 1995) and in the Orcutt Community Plan (1997) are used.

The Noise Element sets a limit of LDN = 65 dBA for outdoor activity areas (pages 58-59) and a limit of LDN = 45 dBA for interior habitable spaces. Volume II of the Orcutt Community Plan refers to the County's Environmental Thresholds and Guidelines Manual (1995), which establishes 65 dB as the maximum exterior noise exposure compatible with noise-sensitive uses. The Orcutt Community Plan Existing Noise Levels map shows generalized, computer-generated noise contours that may differ from what is actually found on the site, due to topographic variation and real-world transportation noise variability.

Existing Sound Levels at Key Site 3

Continuous, 24-hour sound level measurements were made at five fixed locations on the site, shown in the Existing Noise Contour map on page four. These fixed-location, long-duration measurements allow an accurate determination of Day / Night Level (LDN), which is the 24-hour standard descriptor. In addition, a series of average sound levels (LEQ), were taken at other locations on the site and correlated with the fixed measurements. The measured LEQ and LDN sound levels are an accurate depiction of existing noise conditions found in the field, as influenced by topographical variations, local built environment noise obstructions and reflective surfaces, as well as the variability in traffic flow on different days of the week. The terminology, sound level instruments, measurement technique, and standards used are more fully described in the Appendices to this report. From the grid of measurements, existing noise contours for the site were established. The duration of the sound level measurements included sound levels generated by traffic on a busy typical weekday and a Saturday, when traffic flow and sound levels are higher, in order to document "worst case" conditions as well as average conditions.

Existing transportation sound levels

The primary transportation noise source is U.S. Highway 101 to the east of the site. Heavy traffic, consisting of long-haul semi tractor-trailer vehicles, agricultural trucks, motorcycles and automobiles are clearly audible along the northernmost portion of the site. The traffic flows at about 55 to 75 m.p.h. and consists of about 15 percent truck traffic, half of which are medium trucks (having two axles and six wheels). Because of their noise characteristics, buses and motorcycles are included in the medium truck category. The remaining half of the truck traffic is heavy trucks, having three or more axles and designed for the transportation of cargo with a gross weight greater than 25,000 lbs.

The northbound lane, furthest from the site, is elevated above the southbound lane, and both lanes are elevated above the site. According to CalTrans, Average Daily Traffic flow for U.S. Highway 101 at this point is approximately 38,000 vehicles.

Future Sound Levels

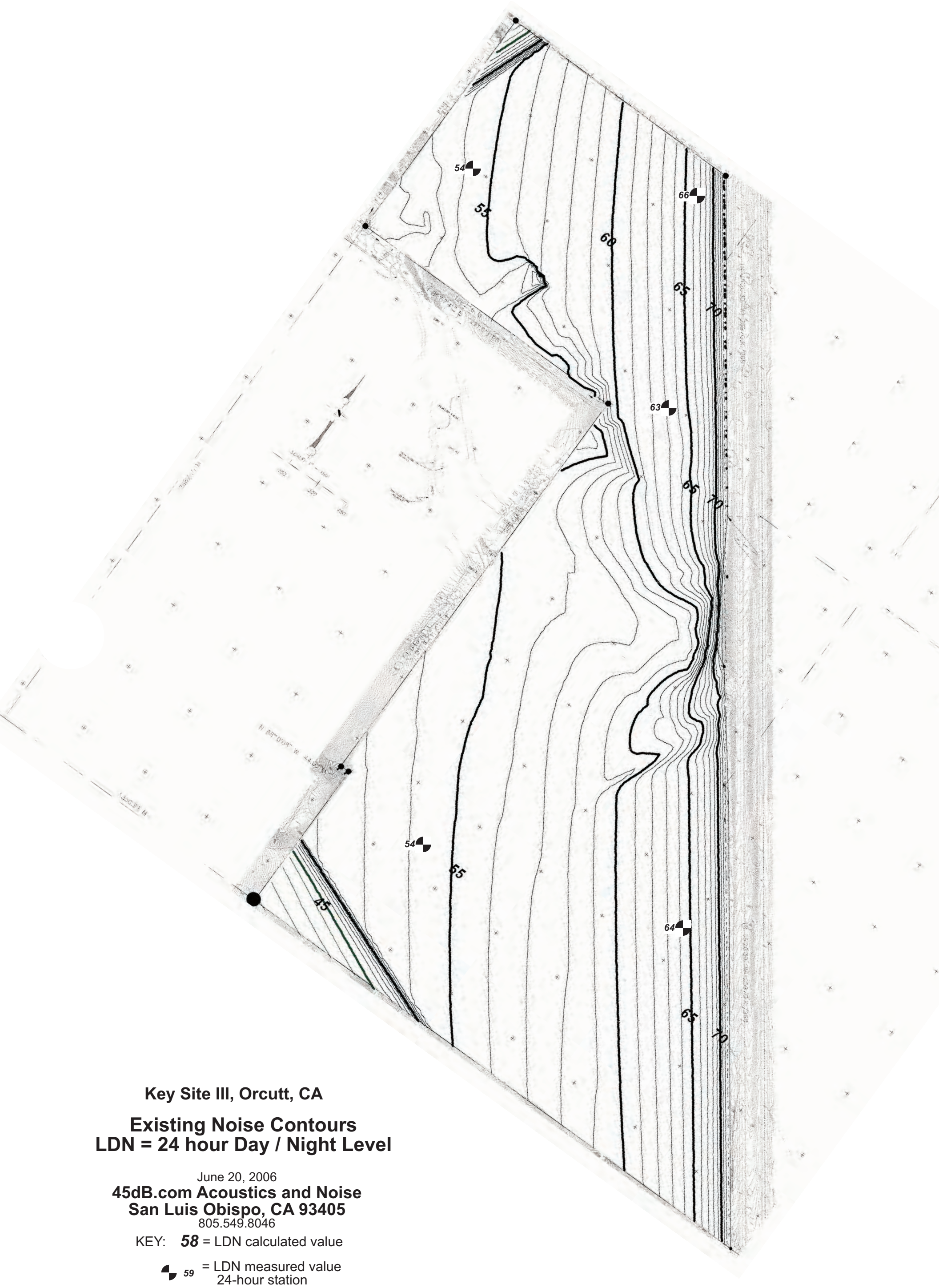
The configuration of the proposed development on Key Site 3 will result in a change to the topography and will insert built dwelling units at the perimeter of the site that will affect sound levels located further into the site away from the noise source. In most cases, the proposed development at the eastern perimeter of the site will become an effective noise barrier for the interior of the site. The noise contours will be dramatically reduced to the west of the first row of dwelling units on the east side of the site. Setback of dwelling units by 75 feet from the property line, the orientation of dwelling units and the orientation and placement of outdoor activity areas away from the noise source, protected by dwelling unit construction, will result in noise levels below the allowable 65 dBA in most instances. Larger common outdoor areas are sheltered by rows of dwelling units, which will result in relatively quiet conditions at the interior of the site.

Conclusion and Discussion

Existing noise levels which might affect potential residential outdoor activity areas, such as porches, balconies and patios, are lower than the Noise Element maximum value of LDN = 65 dBA over most of the buildable area of the site, and therefore noise mitigation would not be required for most residential units within the setback distance from the site boundary.

At the east side of the site, the sound levels at the elevations of the easternmost proposed dwelling units facing the highway may exceed 65 dBA, and may require acoustical design of the elevation facing the noise source in order to give interior sound levels less than the 45 dBA limit. All other elevations will perform satisfactorily with standard construction.

On the next page, Existing Noise Contours are shown, followed by the presentation of typical sound level measurement recordings and data, along with calculation of LDN from measured sound levels. At the end of this report, the appendices cover the definitions, instrumentation, methodology and qualifications represented in this sound level assessment.



Key Site III, Orcutt, CA

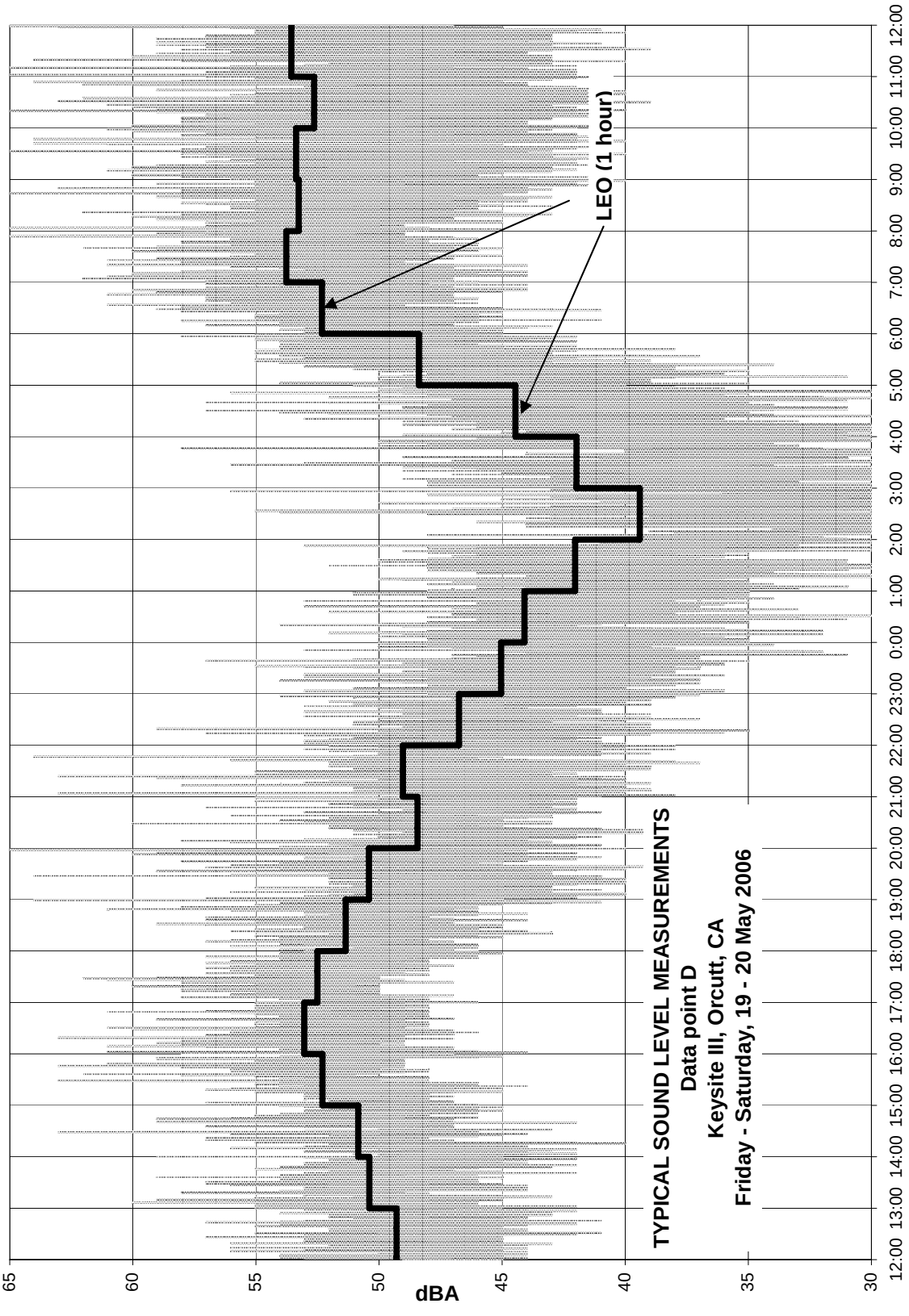
Existing Noise Contours
LDN = 24 hour Day / Night Level

June 20, 2006

45dB.com Acoustics and Noise
San Luis Obispo, CA 93405
805.549.8046

KEY: ***58*** = LDN calculated value

59 = LDN measured value 24-hour station


LEO (1 hour)
TYPICAL SOUND LEVEL MEASUREMENTS
Data point D
Keysite III, Orcutt, CA
Friday - Saturday, 19 - 20 May 2006
dBA
65
60
55
50
45
40
35
30
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00

45dB.com

David Lord, Principal Consultant

Keysite III Typical Calculation of LDN values

Orcutt, CA

5 feet above existing grade

5/19 - 5/20, 2006

LEQ (hour) calculated from 10 second continuous measurements

	dBA	hour
Calculated DAY LEQ:	**53.8**	**0700**
Calculated DAY LEQ:	**53.3**	**0800**
Calculated DAY LEQ:	**53.4**	**0900**
Calculated DAY LEQ:	**52.6**	**1000**
Calculated DAY LEQ:	**53.6**	**1100**
Calculated DAY LEQ:	**49.3**	**1200**
Calculated DAY LEQ:	**50.4**	**1300**
Calculated DAY LEQ:	**50.8**	**1400**
Calculated DAY LEQ:	**52.3**	**1500**
Calculated DAY LEQ:	**53.0**	**1600**
Calculated DAY LEQ:	**52.5**	**1700**
Calculated DAY LEQ:	**51.4**	**1800**
Calculated DAY/EVE. LEQ:	**50.4**	**1900**
Calculated DAY/EVE. LEQ:	**48.4**	**2000**
Calculated DAY/EVE. LEQ:	**49.0**	**2100**
Calculated NIGHT LEQ:	**46.8**	**2200**
Calculated NIGHT LEQ:	**45.0**	**2300**
Calculated NIGHT LEQ:	**44.1**	**0000**
Calculated NIGHT LEQ:	**42.0**	**0100**
Calculated NIGHT LEQ:	**39.4**	**0200**
Calculated NIGHT LEQ:	**42.0**	**0300**
Calculated NIGHT LEQ:	**44.5**	**0400**
Calculated NIGHT LEQ:	**48.4**	**0500**
Calculated NIGHT LEQ:	**52.3**	**0600**

(penalty added for evening or night hours)

LDN: 54 dBA

C.N.E.L.: 55 dBA

APPENDICES
Sound Level Assessment
Key Site III, Orcutt, CA

Appendix I, Definitions

ADT: Average Daily Traffic, describing number of vehicles traveling both directions on a road, generally on an average non-holiday weekday.

Sound Level, dB: Sound level - Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals, FAST time response, in accordance with ANSI S1.4-1971 (R1976) Unit: decibels(dB).

dBA or dB(A): A-weighted sound level. The ear does not respond equally to all frequencies, but is less sensitive at low and high frequencies than it is at medium or speech range frequencies. Thus, to obtain a single number representing the sound level of a noise containing a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are dBA. The A-weighted sound level is also called the noise level.

CNEL / LDN: Since the sensitivity to noise increases during the evening and at night--because excessive noise interferes with the ability to sleep--a 24-hour descriptor has been developed that incorporates an artificial noise penalty added to quiet-time noise events. The Community Noise Equivalent Level, CNEL, is a measure of the cumulative noise exposure in a community, with a 5 dB penalty added to evening (7 - 10 p.m.) and a 10 dB addition to nocturnal (10 p.m. - 7 a.m.) noise levels. The Day-Night Average Sound Level, LDN, is essentially the same as CNEL, with the exception that the evening time period is dropped and all occurrences during this 3-hour period are grouped into the day-time period with no dB penalty.

Time weighting: Different, internationally recognized, meter damping characteristics are available on sound level measuring instruments: Slow (S), Fast (F) and Impulse (I). In this community sound level assessment, the Fast (F) response time is used.

LEQ Because sound levels can vary markedly in intensity over a short period of time, some method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, one describes ambient sounds in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called LEQ. The most common averaging period is hourly, but LEQ can describe any series of noise events of arbitrary duration.

L10 The sound pressure level that is exceeded for 10% of the time for which the given sound is measured, commonly 1 hour.

Subjective Loudness Changes. In addition to precision measurement of sound level changes, there is a subjective characteristic which describes how most people respond to sound:

A change in sound level of 3 dBA is *barely perceptible* by most listeners.

A change in level of 6 dBA is *clearly perceptible*.

A change of 10 dBA is perceived by most people as being *twice* (or *half*) as loud.

Appendix II, Instrument Specifications

Audio Recording
Monophonic Audio Recorder Specification:
Encoding: 44.1 KHz, 16Kbps to 320 Kbps, 20 - 20000 Hz
Signal-To-Noise Ratio 90 dB
Supported Bit Rate 16 – 320 Kbps
Sampling Frequency 44.1 KHz

A continuous audio recording was made during the measurement period in order to detect interference or disruption of sound level measurements, and to distinguish between sounds that are not intended to be a part of the measurement series, such as the overflight of a helicopter.

Wind Measurement

Wind speed and direction were noted throughout the measurement period and compared with data from Santa Maria Airport. A magnetic compass was used to estimate wind direction. A Davis Turbo Wind meter was used to measure wind speed. The Turbo Wind meter is a high performance wind speed indicator with exceptional accuracy.

Sound level measurements become unreliable when average wind speed is greater than 11 m.p.h. at the measurement site. Sound level data was not used if wind speed measured at specific microphone sites exceeded 11 m.p.h. Wind protection for all microphones was in place at all times.

Caltrans Traffic Noise Analysis Protocol and Technical Noise Supplement, October 1998 ("The Protocol") contains Caltrans noise policies which fulfill the highway noise analysis and abatement/mitigation requirements stemming from CEQA and NEPA. The Protocol recognizes the profound effect of meteorological conditions on traffic noise levels. Any before and after comparisons of noise data should therefore be matched as carefully as possible by meteorological conditions in order to be meaningful. Consideration is given in this study to the following variables described in The Protocol:

Measurement Times
Measurement Duration
Number of Measurement Repetitions
Noisiest Hour for Highway Traffic
Adjusting for other-than-noisiest Hour
Normalizing Measurements for Differences in Traffic Mixes and Volumes

Sound Level Meters

Precision of Sound Level Meters. The American National Standards Institute (ANSI) specifies several types of sound level meters according to their precision. Types 1,2, and 3 are referred to as "precision," "general-purpose," and "survey" meters, respectively. Most measurements carefully taken with a type 1 sound level meter will have an error not exceeding 1 dB. The corresponding error for a type 2 sound level meter is about 2 dB. The sound level meters used for

measurements shown in this report are Larson-Davis Laboratories Model 812 and Model 820. These meters meet all requirements of ANSI s1.4, IEC 651 for Type 1 accuracy and include the following features:

110 dB dynamic range for error free measurements.
Measures FAST, SLOW, Unweighted PEAK, Weighted PEAK, Impulse, L_{eq}, LDOD, LOSHA, Dose, Time Weighted Average, SEL, Lmax, Lmin, $\mathbf{L_{DN}}$.

Time history sampling periods from 32 samples per second up to one sample every 255 seconds.

Field calibration of the meter is accomplished before and after all field measurements with an external calibrator. Laboratory calibration of the all instruments is performed at least biannually and accuracy can be traced to the U.S. National Institute of Science and Technology standard.

Type 1 Sound Level Meters Used for this Study:

Larson Davis model 812 Sound Level Meter, Serial Number 433.
Factory calibrated, Certificate Number 2006-77140
Certificate of Calibration and Conformance issued 07 FEB 2006
Preamp 828, Serial Number 1482
Factory calibrated, Certificate Number 2006-77138
Certificate of Calibration and Conformance issued 07 FEB 2006
Microphone 2560, Serial Number 3153
Factory calibrated, Certificate Number 2006-76883
Certificate of Calibration and Conformance issued 09 FEB 2006.

Larson Davis model 812 Sound Level Meter, Serial Number 0292.
Factory calibrated, Certificate Number 2006-77169
Certificate of Calibration and Conformance issued 10 FEB 2006
Preamp 828, Serial Number 1479
Factory calibrated, Certificate Number 2006-77163
Certificate of Calibration and Conformance issued 10 FEB 2006
Microphone 2560, Serial Number 3199
Factory calibrated, Certificate Number 2006-76952
Certificate of Calibration and Conformance issued 13 FEB 2006

All above instruments meet factory specifications per ANSI S1.4 1983.

Calibrator used in this study

Larson Davis CA250 Acoustic Calibrator, Serial Number 1931. Certificate of Calibration and Conformance, Certificate Number 2006-66284. Factory Calibrated on 01-22-2006. The instrument meets factory specifications per Procedure D0001.8192. The instrument was found to be in calibration as received. Full calibration report available on request.

Appendix III, Sound Level Measurement Protocol:

The protocol for conducting sound level measurements is prescribed in detail by the American Society for Testing and Materials (ASTM) in their E 1014 publication. The procedures and standards in that document are met or exceeded for most sound level measurements shown in this report. The standards of E 1014 are exceeded by using Type 1 sound level meters for all measurements in this report instead of the less accurate Type 2 meters called for in the standard. Therefore, the precision of the measurements in this report is likely to be better than +/- 2 dB as stated in ASTM E1014

The ASTM E 1014 publication is not widely available and is excerpted with annotations in this Appendix for further information:

ASTM E 1014 - 84 (Reapproved 2000)

Standard Guide for Measurement of Outdoor A-Weighted Sound Levels

This standard is issued under the fixed designation E 1014; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval.

1. Scope

1.1 This guide covers the measurement of A-weighted sound levels outdoors at specified locations or along particular site boundaries, using a general purpose sound-level meter.

1.2 Three distinct types of measurement surveys are described:

1.2.1 Survey around a site boundary,

1.2.2 Survey at a specified location,

1.2.3 Survey to find the maximum sound level at a specified distance from a source.

1.3 Since outdoor sound levels almost always vary with time over a wide range, the data obtained using this guide may be presented in the form of a histogram of sound levels. The data obtained using this guide enables calculations of average or statistical sound levels for comparison with appropriate criteria.

2. Referenced Documents

C 634 Terminology Relating to Environmental Acoustics.

2.1 ASTM Standards

2.2 ANSI Standard S1.4 Specification for Sound Level Meters'

3. Terminology

3.1 Definitions—For definitions of terms used in this guide,

see Terminology C 634.4

3.2 Definitions of Terms Specific to This Standard:

3.2.1 barrier - any obstacle that blocks the line-of-sight between a source and a receiver or a measurement location.

3.2.2 impulse noise - a brief, intrusive sound, such as that associated with a tire blowout, operation of a power press, the discharge of a firearm, or a shout.

3.2.3 measurement set—the set of data obtained at a measurement location during a specific time period. For the types of measurements covered by this guide, evaluation of a site may require several measurement sets. The time period is flexible but should not extend beyond the time when the conditions influencing noise, or atmospheric conditions affecting noise propagation, are reasonably uniform. As an example, a significant change in traffic density or start-up of a machine indicates the beginning or end of a measurement set.

4. Significance and Use

4.1 There are numerous situations for which outdoor sound level data are required. These include, but are not limited to, the following:

4.1.1 Documentation of sound levels before the introduction of a new sound source (for example, assessment of the impact due to a proposed use).

4.1.2 Comparison of sound levels with and without a specific source (for example, assessment of the impact of an existing source).

4.1.3 Comparison of sound levels with criteria or regulatory limits (for example, indication of exceedance of criteria or non-compliance with laws).

4.2 This guide provides a means for selecting measurement locations, operating a sound level meter, documenting the conditions under which the measurements were performed, and recording the results.

4.3 This guide provides the user with information to (1) make and document the sound level measurements necessary to quantify relatively steady or slowly varying outdoor sound levels over a specific time period and at specific places and (2) make and document the physical observations necessary to qualify the measurements.

4.4 The user is cautioned that there are many non-acoustical factors that can strongly influence the measurement of outdoor sound levels and that this guide is not intended to supplant the experience and judgment of experts in the field of acoustics. The guide is not applicable when more sophisticated measurement methods or equipment are specified. This guide, depending as it does on simplified manual data acquisition, is necessarily more appropriate for the simpler types of environmental noise situations. As the number of sources and the range of sound levels increase, the more likely experienced specialists with sophisticated instruments are needed.

4.5 This guide can be used by individuals, regulatory agencies or others as a measurement method to collect acoustical data for many common situations. The data are obtained in the form

of a histogram, a graph, or a table indicating the number of occurrences of each sound level observed during the measurement. Criteria for evaluating or analyzing the data obtained are beyond the scope of this guide.

4.6 Note that this guide is only a measurement procedure and, as such, does not address the methods of comparison of the acquired data with the specific criteria. No procedures are provided for estimating or separating the influences of two or more simultaneously measured sounds. This guide can be useful in establishing compliance when the measured data are below a specified limit.

4.7 Paragraph 8 2.1 outlines a procedure that can be used for a survey of the site boundary; paragraph 8.2.2 for a survey of specified monitoring points; and paragraph 8.2.3 for determining the location and magnitude of maximum sound level.

5. Apparatus

5.1 Acoustical Measurements:

5 .1.1 Sound Level Meter (required), Type 2, as defined by ANSI S I.4-1971 preferably with an a-c output port to permit the use of headphones.

5.1.2 Microphone Windscreen (required), recommended by the sound level meter manufacturer.

5.1.3 Acoustical Calibrator (required), with adaptors necessary to fit the microphone.

5.1.4 Set of Headphones (desirable), compatible with and electrically connected to the a-c output of the sound level meter. Monitoring the output of the sound level meter with headphones may enable the operator to detect equipment malfunctions or anomalies in the data caused by wind, humidity, and electrical interference.

5.1.5 Tripod (desirable), to ensure a steady and repeatable microphone position.

5.2 Physical Measurements:

5.2.1 To assure an accuracy of 1 dB in values derived from these measurements, the accuracy of distance measurements must be within 5 %. Any instrument that provides this degree of accuracy is satisfactory.

5 2.2 Pocket compass, used for site layout work and for determination of wind direction.

5.2.3 Site Map (optional).

5.3 Meteorological Measurements: the many available general-accuracy meteorological instruments may be used in order to enable the measurement of:

53.1 Wind speed (5-km/h or 2.5-mph increments),

5.3.2 Wind direction (in octants),

5.3.3 Relative humidity (in 10 %. increments).

5.3.4 Dry bulb temperature (in 2° C or 5°F increments).

6. Calibration

6.1 The calibration of the sound level meter shall be checked using an acoustical calibrator immediately before and after each measurement set in a manner prescribed by the manufacturer. Adjustments, if required shall be made at this time. Calibration shall also be verified if the sound level meter is abused (dropped, etc.). If the change in the calibration reading, as shown on the sound level meter, is 1 dB or greater, the data gathered since the preceding calibration arc considered invalid and should be discarded.

6.2 The sound level meter and the acoustical calibrator shall have been thoroughly calibrated with equipment traceable to the National Institute of Standards and Technology within 1 year before the survey. Included in this calibration shall be checks of frequency response, amplifier sensitivity, internal noise, and verification of correct operation of meter circuits and microphone.

7. Interference

7.1 Wind may influence sound level measurements even with a windscreen in place, particularly at wind speeds above 20 km/h (12 mph). Manufacturers' instructions shall be followed with respect to meter limitations under windy conditions. When wind speeds approach or exceed 20 km/h, headphones shall be used to monitor the sound level meter output or the sound level meter indicator shall be carefully observed to determine if fluctuations correspond to wind speed or actual sound sources. Data obtained during intervals when wind is influencing the measurements shall not be used. No measurements shall be made when steady wind speeds exceed 20 km/h.

7.2 Measurable precipitation almost always influences outdoor sound levels. For example, tires rolling on a paved surface result in higher sound levels when the pavement is wet. Also, fallen snow may affect the propagation of sound so that sound levels may be different with and without fallen snow. For these reasons, making measurements during precipitation or when pavement is wet or snow covered is discouraged. If it is necessary to obtain data when ground surfaces are wet or snow covered, the conditions shall be carefully described in the report. High humidity can influence certain microphones: manufacturers' instructions should be closely followed under these conditions.

7.3 This guide is not intended to evaluate impulse noise because Type 2 sound level meters operating in "fast" or "slow" modes do not accurately or precisely measure impulse noise. If occasional impulses occur during the survey, estimation of their magnitude may be attempted using the fastest available meter response, either "fast," or "impulse. The maximum meter reading, the meter response setting, and the repetition rate within the measurement set shall be reported. Whenever most of the sound level meter readings in any measurement set are influenced by impulse noise, this guide shall not be used.

7.4 Occasionally it is necessary to measure sources of pure tone noise perceived as a "buzz, "hum," or "whistle." Since both the operator's body and reflections can significantly influence the sound level meter indication when tones are present the report must include observations of tonal noise when present.

7.5 Electromagnetic radiation from high voltage transmission lines, or strong television or radio signals may affect they sound level meter indication. The operator should use caution when these are nearby. Such electrical interference problems, he they occur, might result in wild and unexpected swings of the sound level meter indicator or upward indications even when the instrument is turned off. These effects may be audible through monitoring headphones. This is the most effective way to detect these conditions and other anomalies.

7.6 Temperature inversions and other meteorological conditions may strongly influence the propagation of sound over long distances. Therefore, when sound from sources at horizontal distances of about 500 m (1600 it) or more need to be measured, an acoustical specialist should be consulted.

7.7 During certain times of the year, naturally occurring moods such as from birds or insects (crickets, locusts) may dominate A-weighted sound levels particularly during evening and nighttime periods. Such noises should be noted in the report. Where possible, an effort may be made to document their influence by making measurements at different times or different locations to document conditions with and without such naturally occurring sound.

8. Procedure

8.1 Preparation of Equipment - Prepare the sound level meter for use as follows:

8.1.1 Check the battery condition indicator (recheck every 15 to 30 min during the measurement set). Check and calibrate instrument clock with time.nist.gov time signal.

8.1.2 Verify calibration of the sound level meter in accordance with the manufacturer's instructions

8.1.3 Place the windscreen over the microphone.

8.1.4 Set the weighting to "A."

8.1.5 Set the response to "slow" or as required in 7.3 (unless otherwise specified).

8.1.6 Select a range so that the sound level meter reading is on scale.

8.1.7 Support the instrument and orient the microphone in accordance with the manufacturer's instructions. In the absence of a specified height, position the microphone between 1.2m (4 ft) and 1.5m (5 ft) above the ground.

8.2 Selecting Measurement Locations and Times:

8.2.1 Survey Around a Site Boundary -Follow procedures in 8.2.1.1 - 8.2.1.5 when it is necessary to measure A-weighted sound levels at the boundary of a site.

8.2.1.1 Select the time periods of the survey. In general, the time of day that each measurement set is obtained should be such that the sound levels are representative of a specific condition. The period of operation of a time-varying or time-restricted source may also dictate the time to measure. In the absence of specified time periods the following shall apply: day (7 am through 7pm). (2) evening (7 pm through 10pm.) and (3) night (10 pm through 7 am).

(1) Unless otherwise specified, at least one measurement set within each time period should be taken. For example, if the source is predominantly traffic noise, it may be useful to subdivide the daytime period into "rush" hours (that is, from 7 to 9 am and from 4 to 6 pm and "non-rush" hours for purposes of comparing noise levels with and without peak traffic flow.

(2) Both a weekday (Monday to Friday) and a weekend day (Saturday or Sunday) should be monitored if a difference in sound levels is expected unless otherwise specified. Whenever a particular noise source tends to dominate the measured sound level only intermittently, the survey shall include periods with and without the source present, as two different measurement sets.

8.2.1.2 The sound level meter may be used in selecting the locations on the basis of sound level. For each time period, walk the site boundary, measure and note the trend of sound levels. Select a minimum of two locations to meet one or more of the following:

(1) Local maximum, the location where the highest A-weighted sound level is observed.

(2) Local minimum, the location where the lowest A-weighted sound level is observed.

8.2.1.3 Alternatively, locations may be selected for other reasons:

(1) Sensitive Locations, considering sound sources and receivers either inside or outside the site, including upper floors of nearby structures.

(2) Locations Nearest to a Community, considering sound sources within the site.

(3) Intermediate Locations, locations selected so that the indicated sound level at adjacent locations might not differ by more than 5 dB.

(4) Other Locations (1) so that locations are separated by no more than one-half the site perimeter, (2) so that such conditions as variable terrain, acoustical barriers adjacent to site activities, and presence of adjoining structures are considered.

Note 1 -The location of the microphone, relative to barriers and large reflecting surfaces influences they indicated sound level. It is extremely important to record the location of the microphone relative to other objects.

(5) Measurement locations should be chosen so that they are at least 1.5 m (5 ft) apart.

8.2.1.4 Measure the sound levels at each location in accordance with 8.3.1.

8:2.1.5 Measure the meteorological conditions in accordance with 8.3.2.

8.2.2 Survey at a Specified Location—Follow procedures in 8.2.2.1- 82.2.3 for those surveys where a particular sound source is being evaluated. These steps can be used to determine compliance with a criterion given in terms of A-weighted sound level at a specified location relative to the source. When a local ordinance or other requirement states the exact location of the microphone (that is, "4 ft from the center of the building facade and 4 ft off the ground"), these steps are applicable,

8.2.2.1 Select the time period(s) for the survey in accordance with 8.2.2.1. Note the period and the day of week the survey is conducted. An additional measurement set is recommended during the same time period with the source not operating. When a specific noise source is being evaluated, specify its mode of operation clearly for each measurement. For example, if the equipment cycles on and off, the sound levels and duration should be reported for each cycle.

8.2.2.2 Measure the sound levels at each location with and without the source operating in accordance with paragraph 8.3.1.

8.2.2.3 Measure the meteorological conditions in accordance with 8.3.2.

8.2.3 Survey to Find the Maximum Sound Level at a specifies Distance from a Source - follow procedures in 8.2.3.3 when a particular noise source is being evaluated and the applicable criterion specifies the maximum sound level at a given distance from the source. When an ordinance or regulation states that the microphone must he located at a fixed distance from the source (that is "10 ft. from the cooling tower in any direction, etc.'), this measurement procedure should be used.

8.2.3.1 Select the time period of the survey from those given in accordance with 8.2.1.1. Note the period and the day of week tile survey is conducted and the operating mode of the source, including- off.

8.2.3.2 Walk slowly and quietly along points at the specified distance from the source while measuring the sound level. Obtain a measurement set in accordance with 8.3.1 at the position where the A-weighted sound level from the test source appears highest. Repeat the measurements for each principal operating mode of the source.

8.2.3.3 Measure the meteorological conditions in accordance with 8.3.2.

8.3 Measuring and Recording the Data:

8.3.1 Obtain a measurement set using the sound level meter by reading the indication to the nearest decibel at approximately equal time intervals of from 5 s to 20 s. The operator should avoid visually averaging the movement of the sound level meter indicator. The reading should be obtained by glancing at the indicator and noting the sound level at that instant. Continue recording at the same interval until the number of observations is at least ten times the range of the readings in decibels. The range is the difference between the maximum and minimum sound levels (that is 90 dB — 80 dB = 10 dB. 10 dB X 10 = 100 observations required). A minimum of ten readings must be obtained.

8.3.2 Measure the wind speed, wind direction, relative humidity and dry bulb temperature, and note the general sky condition. This information shall he obtained for each day of the survey and is recommended for each measurement set or on an hourly basis, whichever is less.

Note 2- in place of direct measurement, data from National Oceanographic and Atmospheric Administration (NOAA) Weather is acceptable for all weather data except wind velocity values.

8.3.3 Record data as follows on suitable data sheets. See Fig. I for a sample data sheet.

8.3.3.1 Record the measurement locations on a map, plan, or char, and, when not obvious, indicate the reason for each selection, together with a brief description of the area, including ground cover.

8.9.3.2 Note the characteristics of the dominant noise sources and expected changes. Note any acoustical events such as intermittent operation of machinery aircraft, sound made by animals, and impulse noise events including estimated rate of occurrence.

8.3.3.3 Record the sound levels measured in accordance with 8 .9.1 in either tabular or graphical form.

8.3.3.4 Record the ambient temperature, relative humidity, barometric pressure, wind speed, wind direction, and sky condition measured in accordance with 8.9.2. If NOAA weather radio is used, record the station location the call letters, and the station frequency, or the source front which the data were taken.

8.9.3.5 Record the start time, stop time, and date of the measurements and the serial number, type, and manufacturer of the sound level meter, microphone, and calibrator.

8.3.3.6 Using the acoustical calibrator, record the sound level meter indication before and alter the measurement .set.

9. Report

9.1 The report shall include the following:

9.1.1 A tabulation of sound levels for each measurement set with identification of the location and time the data were obtained.

9.1.2 Information on the weighting network and meter response setting ("fast' or "slow," etc.) used for the measurements.

9.1.9 Calibration data including time of calibrations. If applicable, battery checks should also be noted.

9.1 .4 Meteorological data including notations of wet pavement or fallen snow.

9.1.5 A schematic map of the area showing:

9.1.5.1 Measurement locations.

9.1.5.2 Nearby sensitive noise receivers,

9.1.5.3 Location of potential future noise receivers within the area,

9.1.5.4 Identifiable noise sources,

9.1.5.5 Explanatory legend relating measurement locations and observation periods, if necessary,

9.1.5.6 Relevant topography and foliage.

9.1.5.7 Barrier locations including their height and other dimensions.

9.1.6 Instrument data, including manufacturer, model, and serial number, and dates of the last factory or laboratory calibration of the sound level meter and acoustical calibrator.

9.1.7 Times, dates, and durations of measurements, and the names and telephone numbers of persons making the measure.

9.1.8 A description of the measured sounds (steady. tonal, impulse) the identified or suspected sound sources, and the rate of repetition of any impulsive components.

9.1.9 A statement, to the extent true that this guide was followed. Any exceptions should be noted.

9.2 It is recommended that all raw data sheets, whether or not they are included in the report, be permanently retained.

10. Precision and Bias

10.1 Precision--The precision of this guide is estimated to be +/- 2 dB for the arithmetic mean sound level off a given measurement set. This precision is estimated from the prescribed ratio of ten to one (10:1) of the number of observations, to the range of observed sound levels. It is expected to hold true for most typical outdoor environmental data.

10.2 Bias – Bias is limited to the accuracy of the acoustical instruments (see ANSI S1.4-1971)

Appendix IV. Qualifications of Personnel

David Lord, Ph.D. June 26, 2006
Principal Consultant

David Lord works with architects, engineers, building contractors and public agencies to assess and solve problems in community noise and in room acoustics. Since 1986, Dr. Lord has provided acoustics consulting services in the counties of San Luis Obispo, Santa Barbara and Ventura, and for Vandenberg Air Force Base facilities. Dr. Lord is recognized as an acoustical consultant by several municipal and county planning authorities and the Department of Defense.

Community Noise
Projects range in scale and complexity from residential to commercial and institutional developments. Noise sources are evaluated against the Noise Element of the General Plan and the Uniform Building Code. Recent projects requiring noise mitigation include the following building types: a car wash, automobile service centers, a retail food market, a community theater, a water treatment plant, wineries, a boutique hotel, and a noise study of an Events Center in Santa Maria. Residential neighbor-noise assessments range from animal noise to motorcycle noise, to stationary mechanical noise.

Room Acoustics
Projects in room acoustics range in scale from 50- to 400-seat spaces. Consultation is with the architect early in design, or with the owner after a space is found to be acoustically deficient. Music sources are evaluated and matched to the shape, the volume and the absorptivity of the space, using energy/time/frequency analysis tools. Design of white-noise masking for acoustical privacy can be provided.

Instrumentation
Sound level measurements are made with multiple, state-of-the-art recording, integrating, Type I instruments and a Real Time Analyzer. Long-term total sound level monitoring is with high-resolution digital sound recorders. Instruments are factory calibrated annually to meet U.S. National Institute of Standards and Technology requirements. The American Society for Testing and Materials measurement protocols are used for all sound level measurements.

Expert Testimony
Expert testimony is given in dispute resolution involving noise conflicts and construction failure.

Qualifications
David Lord is a Professor Emeritus at California Polytechnic State University, San Luis Obispo, where he taught courses in community noise and acoustical engineering for more than 20 years. David Lord holds the Master of Architecture degree from U.C. Berkeley, with a specialization in architectural acoustics and the Ph.D. degree from the University of London.

Dr. Lord is a full member of the Acoustical Society of America, the American Institute of Physics, the Audio Engineering Society and the Institute of Noise Control Engineering.

Partial List of Recent Projects in California. References provided on request.

1. Bradley Square, Santa Maria, California; Housing Development 120 units. Transportation noise assessment, mitigation recommendations, noise-resistant construction design.

2. Por La Mar Nursery commercial horticulture development, worker housing, Santa Barbara / Goleta, California. Transportation noise assessment, noise resistant housing design.

3. Fess Parker Wine Center, Lompoc California, with Pults & Associates, Architects. CEQA Environmental Impact Assessment for Noise, City of Lompoc.

4. San Ysidro Ranch, Montecito, with Mechanical Engineering Consultants, Santa Barbara. Total sound level monitoring, recording, assessment and mitigation design.

5. Torch Operating Company, Orcutt, California; oil field operating sound levels, field monitoring and recording. Stationary noise assessments.

6. State Street, City of Santa Barbara, consultant to several entertainment establishments for entertainment noise mitigation and conflict resolution.

7. Expert testimony for Allen Hutkin, Attorney at Law, San Luis Obispo, noise nuisance cases.

8. Expert testimony for Bonne, Bridges, Mueller, O'Keefe & Nichols Attorneys, liability case.

9. Hope Avenue Condominiums, noise assessment and noise mitigation, City of Santa Barbara, California, with Lenvik & Minor, Architects.

10. San Luis Obispo County Office Building, consultant in acoustical privacy and acoustical security. County Department of General Services.

11. QAD Inc., Summerland, CA. Chiller installation noise assessment and mitigation design evaluation to County of Santa Barbara noise standards.

12. Acoustical privacy and acoustical security, design and construction details, for Department of Defense construction, Vandenberg A.F.B. All designs met United Facilities Guide Specifications.

Sound Level Assessment for

Townhomes
Orcutt Key Site 3
County of Santa Barbara, CA

requested by
SB Clark, LLC
300 Esplanade Dr. Suite 430
Oxnard Ca. 93030

September 18, 2008

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Sound Level Assessment for

Townhomes
Orcutt Key Site 3
County of Santa Barbara, CA

1.0 Description and Criteria

The purpose of this report is to assess existing and future background sound levels due to the dominant transportation noise source to the east of the parcel with potential impact on residential two-story townhome development. See the location of the site in relation to the transportation noise source in Figure 1. Site Plan, page 4. This sound level assessment is evaluated against community noise criteria contained in the County of Santa Barbara General Plan Noise Element Land Use Compatibility Guidelines, and the County of Santa Barbara Environmental Thresholds and Guidelines Manual. This report will describe the existing, baseline sound levels on and around the site, and future sound levels in outdoor activity areas of possible future residential development.

With regard to land use, potential noise conflict and noise mitigation measures, the noise level standards contained in the Noise Element of the General Plan of the County of Santa Barbara (rev. 1986) are used. The Noise Element sets a limit of LDN = 65 dBA for residential outdoor activity areas (pages 58-59) and a limit of LDN = 45 dBA for interior noise sensitive uses.

2.0 Existing Sound Levels

A site visit, observations and sound level measurements are described in the report from this office, dated June 29, 2006. Daily sound level predictions for the present study are based on the original sound level measurements and the published Average Daily Traffic values provided by Caltrans, in order to project accurate vehicle noise impacting primarily the east side of the parcel.

Heavy traffic on U.S. Highway 101, consisting of automobiles, semi tractor-trailers, agricultural trucks and motorcycles are clearly audible along the eastern portion of the site. The traffic flows at about 60 to 75 m.p.h., and consists of about 15 percent truck traffic, half of which are medium trucks (having two axles and six wheels). Because of their noise characteristics, buses and motorcycles are included in the medium truck category. The remaining half of the truck traffic is heavy trucks, having three or more axles and designed for the transportation of cargo with a gross weight greater than 25,000 lbs. Average Daily Traffic (ADT) count for this segment of U.S. Highway 101 which is listed by Caltrans as between 38,000 vehicles. Figure 2. Sound Level Contours, No Project shows the sound levels without buildings on the site. Figure 3. Sound Level Contours, No Mitigation shows the distribution of sound levels without noise

Figure 1. Site Plan

Site Plan showing location of dominant noise source to the east of the site.



Figure 2. Sound Level Contours, No Project

Site Plan showing sound level contours (LDN=dBA) before project is built.

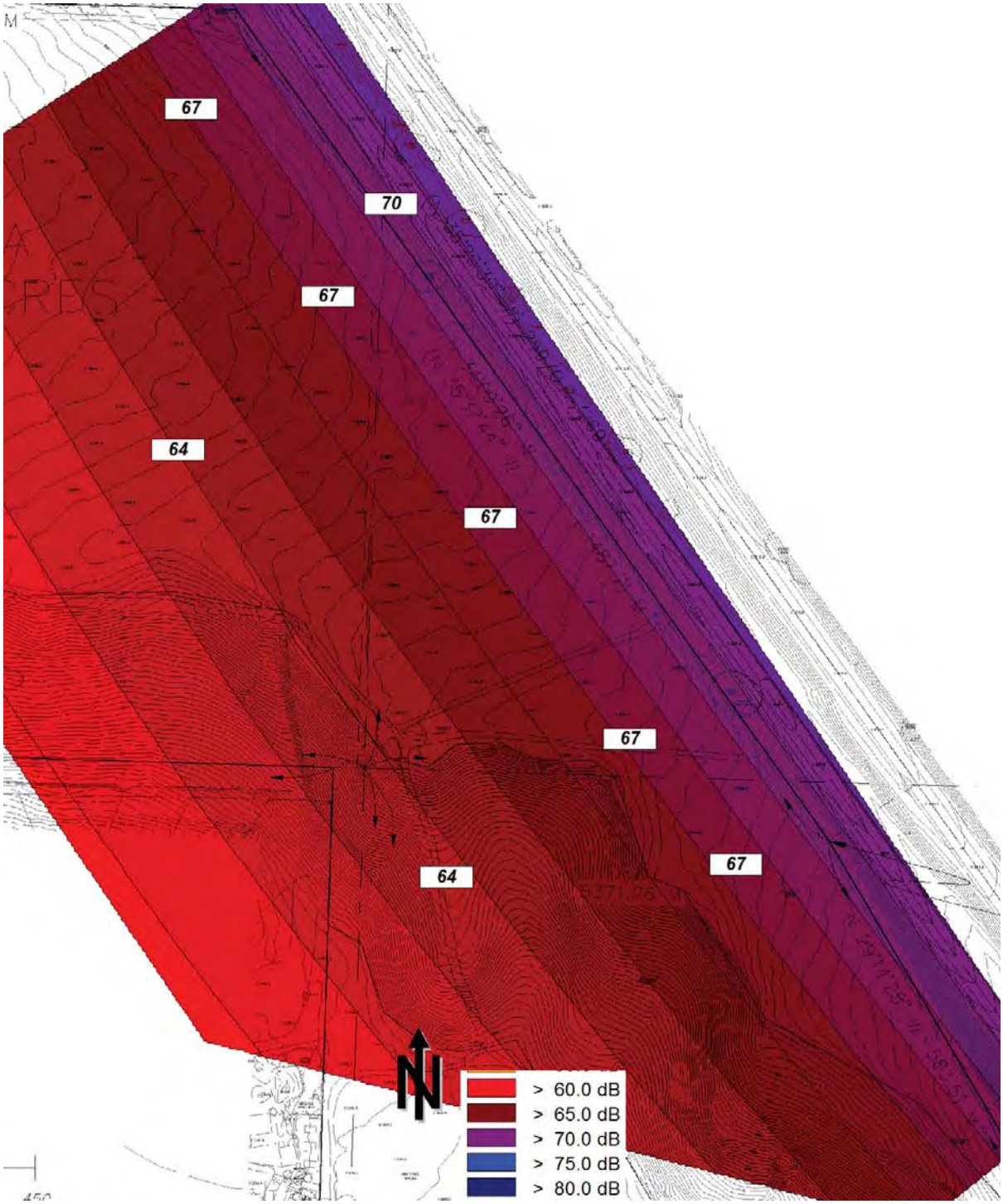


Figure 3. Sound Level Contours, No Mitigation

Site Plan showing sound level contours (LDN=dBA) with project, no site noise mitigation.

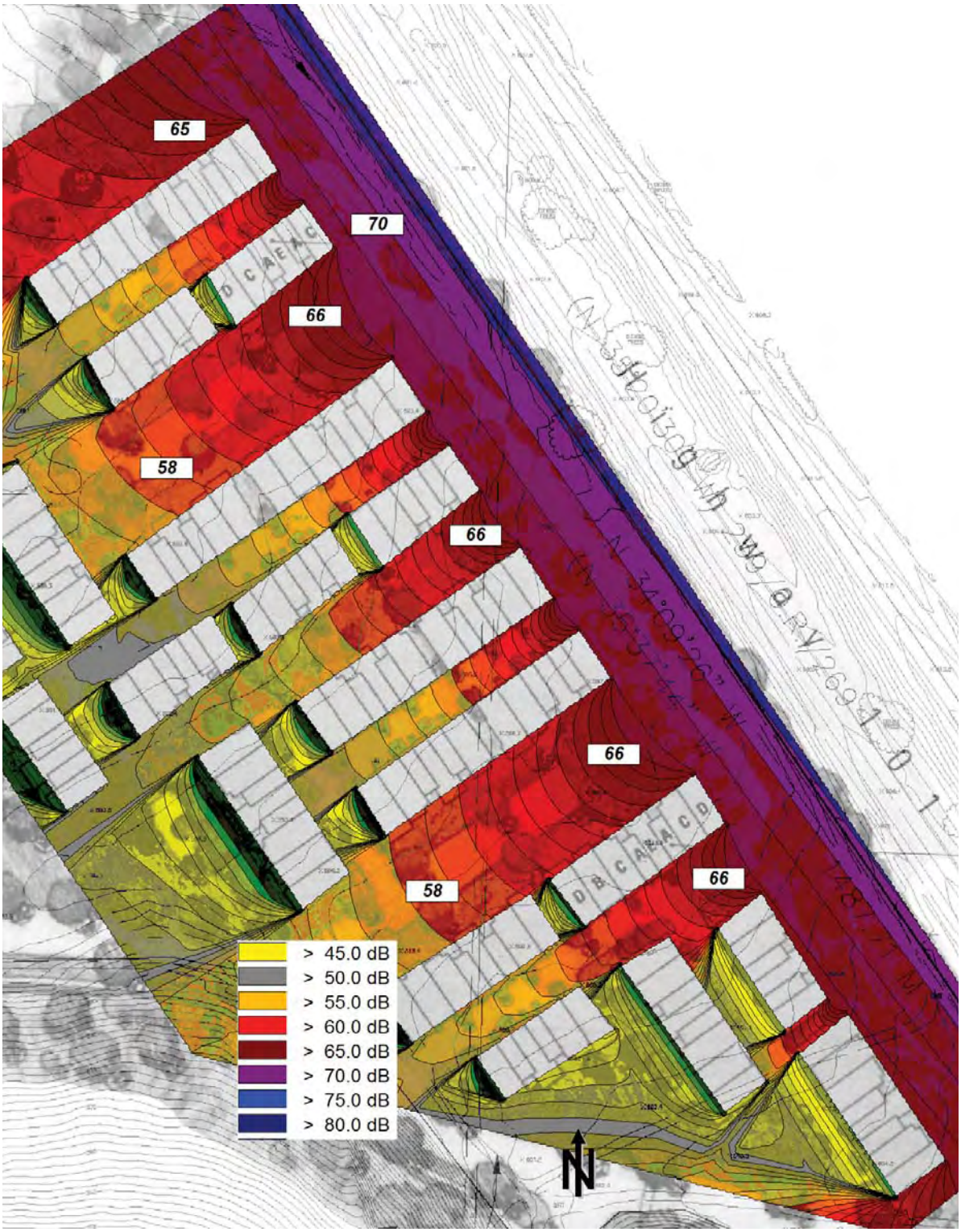


Figure 4. Sound Level Contours, with Mitigation

Site Plan showing sound level contours (LDN=dBA) with specific site mitigation.



Figure 5. Noise Barriers and Noise Source Relationship

Typical Unit Plan showing location of noise barriers in relation to noise source (see text).

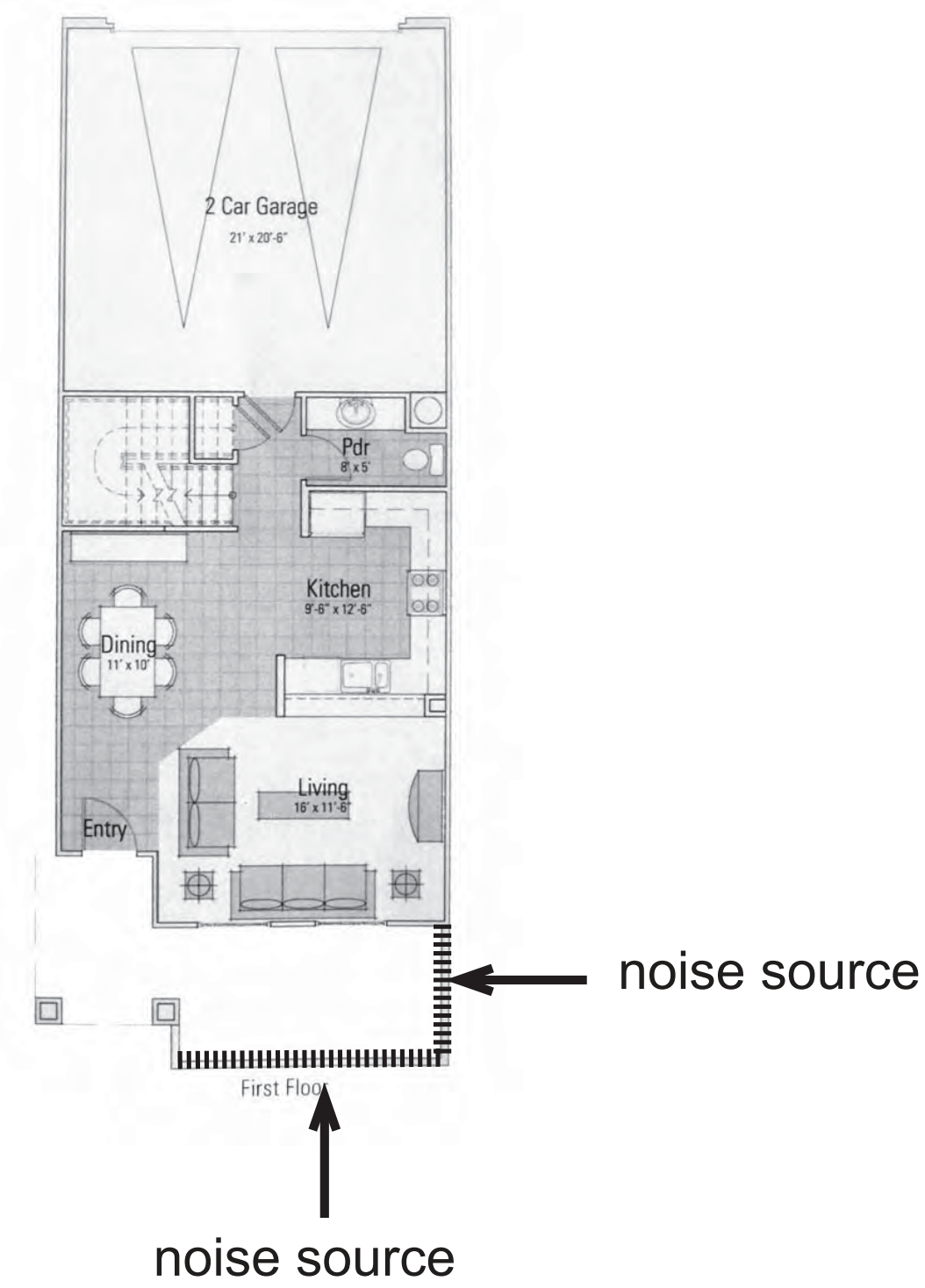
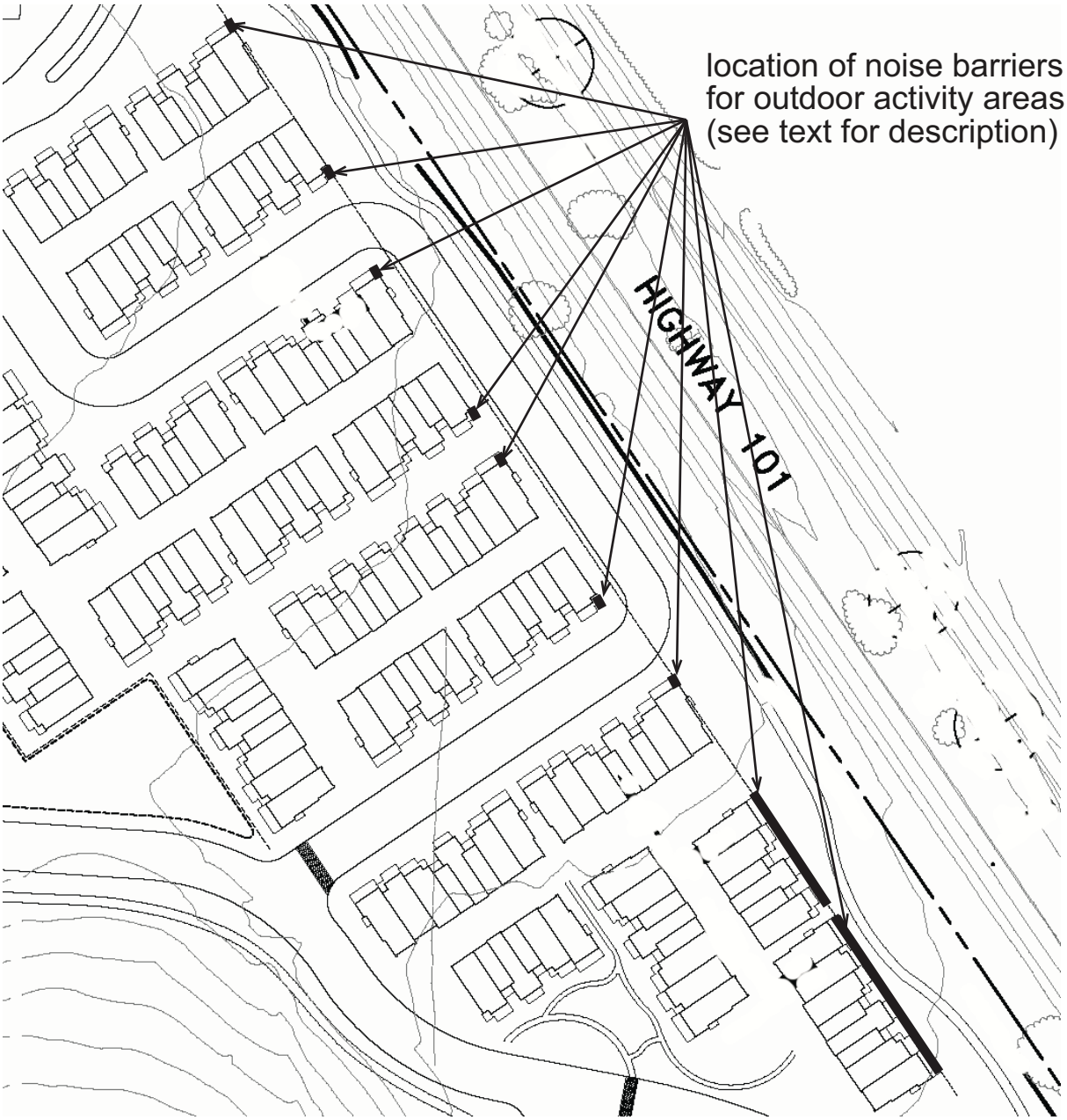


Figure 6. Location of Site Noise Barriers

Specific locations of noise barriers for outdoor activity areas.



mitigation. Figure 4. Sound Level Contours, with Mitigation shows the effect of added sound barrier walls.

3.0 Sound Level Contours

The sound level contours are generated from Caltrans data by the "Noise Contour Modeling" technique discussed on page 15 in APPENDIX II: Acoustical Modeling Methods. The location of the contours is affected by topography, the proposed future dwelling locations and heights, and by daily traffic volume on the transportation corridor, U.S. Highway 101.

4.0 Future Sound Levels

Future sound levels for this site will slowly increase as traffic volume increases. A projection of future growth was made by the Santa Barbara Association of Governments and published in its *2001 Travel Trends and 2030 Travel Forecast for Santa Barbara County.* The resulting effect on future sound levels is shown in Table 1. Growth in Sound Levels, on page 10. The resulting increase to the year 2020 will be less than one LDN = dBA across the site. Therefore the increase is less than significant.

5.0 Required Noise Mitigation

The following noise mitigation measures are required in order to attenuate sound levels below the County of Santa Barbara maximum of LDN = 65 dBA for outdoor activity areas and LDN = 45 dBA for interior sound levels

5.1 Solid Noise Barriers

Solid noise barriers are required in the approximate positions indicated in Figure 6. Location of Site Noise Barriers on page 9. The solid noise barriers are to be positioned in relation to the noise source as shown in the diagram, Figure 5. Noise Barriers and Noise Source

Table 1. Growth in Sound Levels

Growth rate estimates from Santa Barbara Association of Governments, *2001 Travel Trends and 2030 Travel Forecast for Santa Barbara County*

Growth of Noise from Average Daily Traffic Figures

David Lord, Acoustics Consulting 299 Albert Dr. San Luis Obispo, CA 93405

Orcutt, CA KS-3

1.6 % per year traffic growth rate to the year 2020

Calculation of added noise sources

			((10^-16)*10^(D9/10))
present noise level (LDN)	64.0	dBA	intensity= **2.51E-10** W/cm^2
present traffic flow	38000	ADT	(average daily traffic)
future traffic flow	46000	ADT	**0.8** dBA additional
future noise level (LDN)	**64.8**	dBA	10*LOG10(D13/D12)

Relationship on page 8. Solid noise barriers shall be six feet in height with reference to finish floor level of nearby dwelling unit. Acceptable materials for solid barriers are masonry, or stucco, or minimum 3/4 inch exterior plywood, or laminated glazing or any combination. However, all construction joints of the solid noise barrier shall be sealed with a resilient acoustical caulking in order to make the overall noise barrier assembly completely airtight. Any open drainage holes, cracks or seams in the construction will seriously degrade the performance of the noise barrier.

5.2 Required Noise Resistant Construction

The following construction is required for east-facing elevations of the dwelling units nearest the noise source, U.S. Highway 101. The following construction specification will result in an acoustical performance which gives less than LDN = 45 dBA interior noise level for habitable spaces located along the east elevation, where construction assemblies face the transportation noise source.

Noise mitigation may fail to perform if each and every following recommendation is not followed. A small crackor air leak in the construction may completely compromise all other sound-proofing.

Vents and roof penetrations: Soffit vents, eave vents, dormer vents and other wall and roof penetrations shall be located on the walls and roofs facing away from the noise source (located on the north, west and south elevation) wherever possible. If kitchens or bathrooms are located on the east side, remote venting to other elevations is required. If vents are required to be located facing the noise source, a 90 degree bend shall be incorporated in the design of the ductwork or vent opening.

Walls: Only the east-facing exterior walls closest to the transportation noise sources require noise mitigation. Any wall enclosing habitable spaces nearest the noise source shall be constructed with an S.T.C. (Sound Transmission Class) rating of 30 or greater. For instance, stucco exterior or fiber-cement panel siding, with 30 pound felt on 5/8" sheathing, on 2" x 6" stud walls with R-21 fiber glass batt insulation and a layer of 5/8" Type X Gypsum Board will provide an S.T.C. rating of 30 or greater. Metal studs are preferable to wood studs for noise resistance.

Construction of the east-facing walls must include the liberal use of non-hardening acoustical sealant at all construction joints, including the header and footer construction and the edges and corners of gypsum board intersecting ceiling, walls and floor, especially behind papered joints. Apply resilient acoustical sealant (Johns Manville or equivalent) to gaps at intersecting walls, ceiling and floor before taping and spackling Gypsum Board in conventional manner. Seal all peripheries and apertures and joints around windows.

Acoustic Leaks: Common acoustic leaks, such as electrical outlets, pipes, vents, ducts, flues and other breaks in the integrity of the wall, ceiling or roof insulation and construction on the east sides of the dwelling units nearest transportation noise source shall receive special attention during construction. All construction openings and joints

through the gypsum board on east-facing walls shall be insulated, sealed and caulked with expanding foam and a resilient, non-hardening caulking material, as appropriate. All such openings and joints shall be airtight to maintain sound isolation.

Windows: To meet the interior LDN 45 DBA requirements, windows for habitable spaces on all floors of affected elevation facing the noise source shall be of doubleglazed construction and installed in accordance with the recommendations of the manufacturer. The windows shall be fully gasketed, with an S.T.C. rating of 30 or better, as determined in testing by an accredited acoustical laboratory. An example that meets this requirement is Milgard Quiet Line windows. Doors: More than 90% of all exterior noise comes in through windows and doors. To meet the interior LDN 45 DBA requirements, doors directly facing the noise source shall be solid core with sound dampening and fully gasketed, sealed jambs and grouted frames, with an overall S.T.C. rating of 30 or better, as determined in testing by an accredited acoustical laboratory.

Exception: Doors meeting the following “Double Door Construction” criteria shall be considered to meet the S.T.C. 30 rating:

6.0 Discussion and Conclusion.

Mitigated sound levels for outdoor activity areas at the east side of the proposed development do not exceed the County of Santa Barbara maximum level of LDN = 65 dBA, and will not result in interior levels greater than LDN = 45 dBA if the required construction methods and materials are used on the elevations facing the noise source.

7.0 REFERENCES

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2. American Society for Testing and Materials. 2004. *ASTM E 1014 - 84 (Reapproved 2000) Standard Guide for Measurement of Outdoor A-Weighted Sound Levels.*

3. Berglund, Birgitta, World Health Organization. 1999. *Guidelines for Community Noise* chapter 4, Guideline Values.

4. Bolt, Beranek and Newman. 1973. *Fundamentals and Abatement of Highway Traffic Noise*, Report No. PB-222-703. Prepared for Federal Highway Administration.

5. California Department of Finance. 2007. *California Strategic Growth Plan.*

6. California Department of Transportation (Caltrans). 1982. *Caltrans Transportation Laboratory Manual.*

7. _____. 1998. *Caltrans Traffic Noise Analysis Protocol For New Highway Construction and Highway Reconstruction Projects*.

8. _____. 2006. *California Transportation Plan 2025*, chapter 6.

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10. County of Santa Barbara. . *City of Santa Barbara General Plan, Noise Element.*

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13. Harris, Cyril.M., editor. 1979 *Handbook of Noise Control*.

8.0 APPENDIX I: Notes, Definitions

TERM	DEFINITION
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the LEQ level.
Background Noise Level	The underlying, ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the L90 percentile noise level.
Sound Level, dB	Sound Level. Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals, SLOW time response, in accordance with ANSI S1.4-1971 (R1976) Unit: decibels(dB).
dBA or dB(A):	A-weighted sound level. The ear does not respond equally to all frequencies, but is less sensitive at low and high frequencies than it is at medium or speech range frequencies. Thus, to obtain a single number representing the sound level of a noise containing a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are dBA. The A-weighted sound level is also called the noise level.
Equivalent Sound Level LEQ	Because sound levels can vary markedly in intensity over a short period of time, some method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, one describes ambient sounds in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called LEQ. In this report, both a 15 minute and an hourly period is used.
Percentile Sound Level (Ln)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., L90)
Subjective Loudness Changes.	In addition to precision measurement of sound level changes, there is a subjective characteristic which describes how most people respond to sound: •A change in sound level of 3 dBA is *barely perceptible* by most listeners. •A change in level of 6 dBA is *clearly perceptible*. •A change of 10 dBA is perceived by most people as being *twice* (or *half*) as loud.
Time weighting	Different, internationally recognized, meter damping characteristics are available on sound level measuring instruments: Slow (S), Fast (F) and Impulse (I). In this community sound level measurement, the Fast (F) response time is used.

9.0 APPENDIX II: Acoustical Modeling Methods

Roadway Traffic Noise Analysis

The traffic noise data was used to calibrate the noise modeling program using the algorithms of the Federal Highway Administration Highway Traffic Noise Model (TNM 2.5). The TNM 2.5 model is the analytical method currently favored for traffic noise prediction by most state and local agencies. It is applied to federal and state roadway projects by the California Department of Transportation (Caltrans). The model is based upon the CALVENO noise emission factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the project site. In addition, sound level measurements were performed over 24-hour periods at two locations to describe ambient sound levels in the project area, and to derive suitable LDN day/ night traffic noise distribution factors for traffic noise modeling.

Noise Contour Modeling

Noise contours incorporating the measured sound level values were generated using CADNA/A, an acoustical modeling program that incorporates the TNM 2.5 algorithms, and which was developed to predict hourly Leq values for free-flowing traffic conditions. This computer modeling tool, made by Datakustik GmbH, is an internationally accepted acoustical modeling software program, used by many acoustics and noise control professional offices in the U.S. and abroad. The software has been validated by comparison with actual values in many different settings. The program has a high level of reliability and follows methods specified by the International Standards Organization in their ISO 9613-2 standard, "Acoustics – Attenuation of sound during propagation outdoors, Part 2: General Method of Calculation." The standard states that, "this part of ISO 9613 specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level … under meteorological conditions favorable to propagation from sources of known sound emissions. These conditions are for downwind propagation … under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night."

The computer modeling software takes into account source sound power levels, surface reflection and absorption, atmospheric absorption, geometric divergence, meteorological conditions, walls, barriers, berms, and terrain variations. The CADNA/A software uses a grid of receivers covering the project site.

10.0 Qualifications of Preparer

David Lord, Ph.D., Principal Consultant

For more than 20 years, David Lord has worked with architects, engineers, building contractors and public agencies to assess and solve problems in acoustics, noise and vibration. Dr. Lord is recognized as an acoustical consultant by several municipal and county planning departments and has provided acoustical consulting services for projects located in the following counties in California: San Luis Obispo, Santa Barbara, Orange, San Bernardino, Ventura and Los Angeles. David Lord is approved by the Department of Defense as an acoustical consultant at Vandenberg Air Force Base and at the Naval Facilities Engineering Command, Port Hueneme.

Community Noise Assessment

Projects have ranged in scale and complexity from residential to commercial and institutional developments. All noise assessments rigorously follow Caltrans and ASTM standard procedures, while adhering to local planning standards and noise ordinances and the Uniform Building Code. Recent projects include: Environmental Impact Report noise chapter for a Metrolink station in Orange County; noise assessment for an automobile service center, a retail food market, a community theater, a water treatment plant, various wineries, a boutique hotel, a remote, 600 acre religious retreat site, an annual rodeo and tractor pull event, a metal salvage yard, etc. Residential neighbor-noise assessments range from animal noise to motorcycle noise, to stationary mechanical noise issues.

Room Acoustics

Consulting projects undertaken in room acoustics range in scale from 50- to 400-seat spaces, such as church sanctuaries and restaurants. Consultation begins preferably with the architect early in design and continues through construction and occupancy. Music sources are evaluated and matched to the shape, the volume and the absorptivity of the space, using energy/time/frequency analysis tools. Recent projects include the Katsuya Restaurant at Hollywood and Vine; the Vina Robles Winery Refectory, and the United Methodist Church, San Luis Obispo.

Instrumentation

Sound and vibration measurements are made with multiple, state-of-the-art, data-logging, integrating, Type I instruments and a real time analyzer. Long-term total sound monitoring is conducted with high-resolution digital sound recorders. Sound transmission and reverberation studies are made with a real-time analyzer following ASTM procedures. Each instrument is factory calibrated annually to meet U.S. National Institute of Standards and Technology requirements and has a current Certificate of Calibration and Conformance.

Recent Projects in California. Partial list; References provided on request.

1. Bradley Square, Santa Maria, California; Housing Development 120 units. Transportation noise assessment, mitigation recommendations, noise-resistant construction design.

2. Por La Mar Nursery commercial horticulture development, worker housing, Santa Barbara / Goleta, California. Transportation noise assessment, noise resistant housing design.

3. Fess Parker Wine Center, Lompoc California, with Pults & Associates, Architects. CEQA Environmental Impact Assessment for Noise, City of Lompoc.

4. San Ysidro Ranch, Montecito, with Mechanical Engineering Consultants, Santa Barbara. Total sound level monitoring, recording, assessment and mitigation design.

5. Santa Maria Country Club, Santa Maria, California; room acoustics solutions for conference, dining and meeting rooms.

6. State Street, City of Santa Barbara, consultant to several entertainment establishments for entertainment noise mitigation and conflict resolution.

7. Expert testimony for Allen Hutkin, Attorney at Law, San Luis Obispo, noise nuisance cases.

8. Environmental Impact Report, Noise Impact Assessment for Enos Ranchos and Mahoney Ranch General Plan Amendment/Zone Change/Specific Plan Amendment/Annexation, Santa Maria, CA, with Science Applications International Corporation (SAIC)

9. Environmental Impact Report, Noise Impact Assessment, including rail noise issues, for Westgate Metrolink Station, Placentia, CA, with Crawford, Multari and Clark Associates.

10. Expert testimony for William S. Walter, Attorney, eminent domain compensation case, San Luis Obispo, CA.

11. QAD Inc., Summerland, CA. Chiller installation noise assessment and mitigation design evaluation to meet County of Santa Barbara noise standards.

Academic Qualifications

David Lord is a Professor Emeritus of Architecture at California Polytechnic State University, San Luis Obispo, where he developed the curriculum and taught courses in community noise and acoustical engineering.

David Lord holds the Master of Architecture degree from the University of California, Berkeley, with a specialization in architectural acoustics. David Lord earned the Ph.D. degree from the University of London, Bartlett School of Architecture.

Memberships

David Lord is a member of the American Society of Heating, Refrigerating and Air Conditioning Engineers, the Acoustical Society of America, the American Institute of Physics, the Institute of Noise Control Engineering, and the Audio Engineering Society.

Sound Level Assessment for

Single-Family Detached Dwellings
Orcutt Key Site 3
County of Santa Barbara, CA

requested by
SB Clark, LLC
300 Esplanade Dr. Suite 430
Oxnard Ca. 93030

October 30, 2008

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Sound Level Assessment for

Single-Family Detached Dwellings
Orcutt Key Site 3
County of Santa Barbara, CA

1.0 Description and Criteria

The purpose of this report is to assess existing and future background sound levels due to the dominant transportation noise source to the east of the parcel with potential impact on the single family detached lots adjacent to Hwy 101 that are north and south of the multifamily area, described in the Report dated September 18, 2008. Some of these homes are inside a 65 CNEL zone and potentially need mitigation similar to the multifamily units adjacent to U.S. Highway 101. The subjects of this study are lots 47, 48 & 49 for the single family cluster to the north and to the south lots 123, 129 through 137 and lot 167.

See the location of the site in relation to the transportation noise source in Figure 1. Site Plan, page 4. This sound level assessment is evaluated against community noise criteria contained in the County of Santa Barbara General Plan Noise Element Land Use Compatibility Guidelines, and the County of Santa Barbara Environmental Thresholds and Guidelines Manual. This report will describe the existing, baseline sound levels on and around the site, and future sound levels in outdoor activity areas of possible future residential development.

With regard to land use, potential noise conflict and noise mitigation measures, the noise level standards contained in the Noise Element of the General Plan of the County of Santa Barbara (rev. 1986) are used. The Noise Element sets a limit of LDN = 65 dBA for residential outdoor activity areas (pages 58-59) and a limit of LDN = 45 dBA for interior noise sensitive uses.

2.0 Existing Sound Levels

A site visit, observations and sound level measurements are described in the report from this office, dated June 29, 2006. Daily sound level predictions for the present study are based on the original sound level measurements and the published Average Daily Traffic values provided by Caltrans, in order to project accurate vehicle noise impacting primarily the east side of the parcel.

Heavy traffic on U.S. Highway 101, consisting of automobiles, semi tractor-trailers, agricultural trucks and motorcycles are clearly audible along the eastern portion of the site. The traffic flows at about 60 to 75 m.p.h., and consists of about 15 percent truck traffic, half of which are medium trucks (having two axles and six wheels). Because of their noise characteristics, buses and motorcycles are included in the medium truck category. The remaining half of the truck traffic is heavy trucks, having three or more axles and designed for the transportation of

Figure 1. Site Plan

Site Plan showing location of lots in this study; noise source is U.S. Hwy 101 to the east of the site.

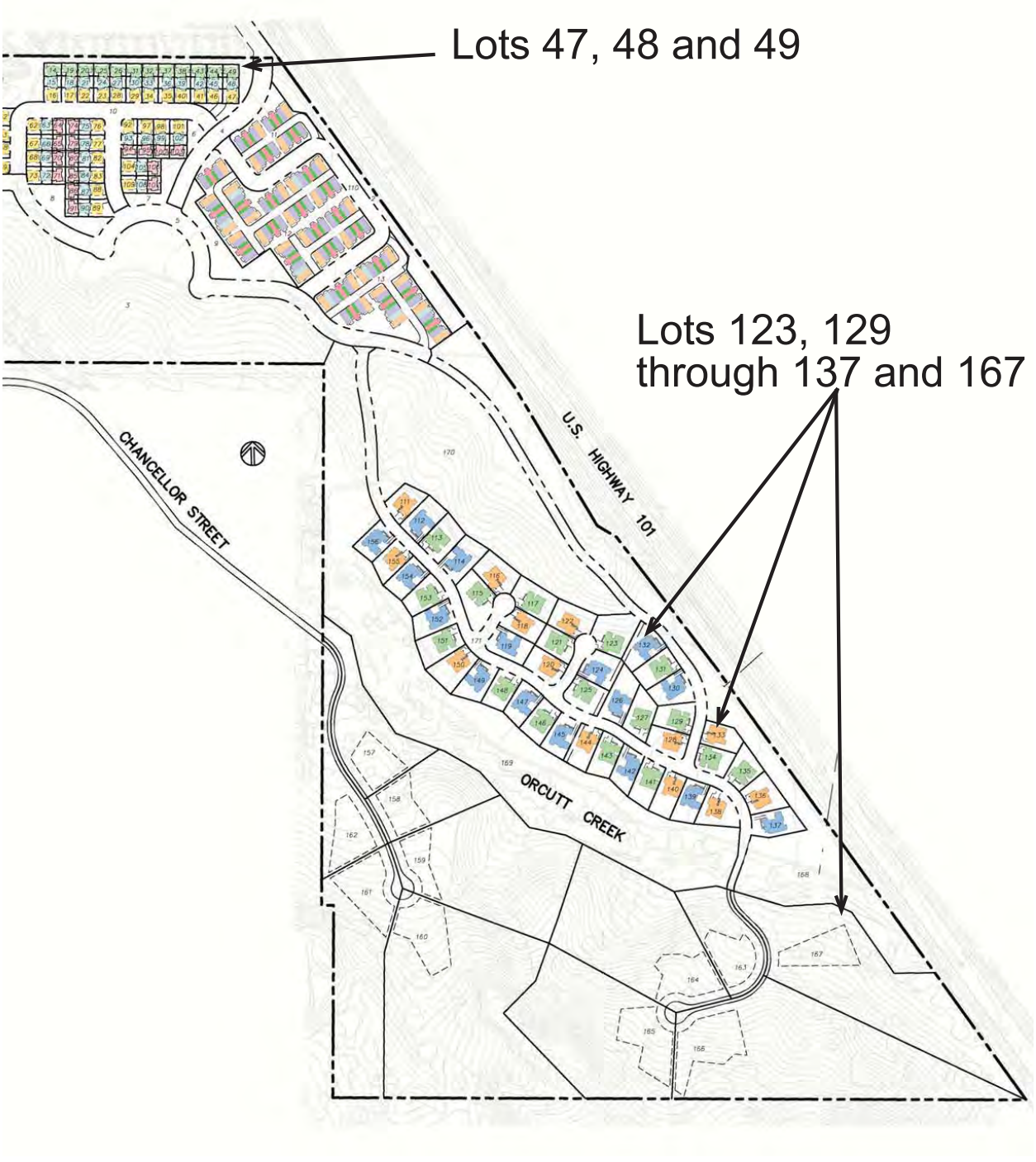


Figure 2. Noise Contours

Site Plan showing lots 47, 48 and 49 with generic required noise barrier(s) for side yards -- see text for full explanation and specification.

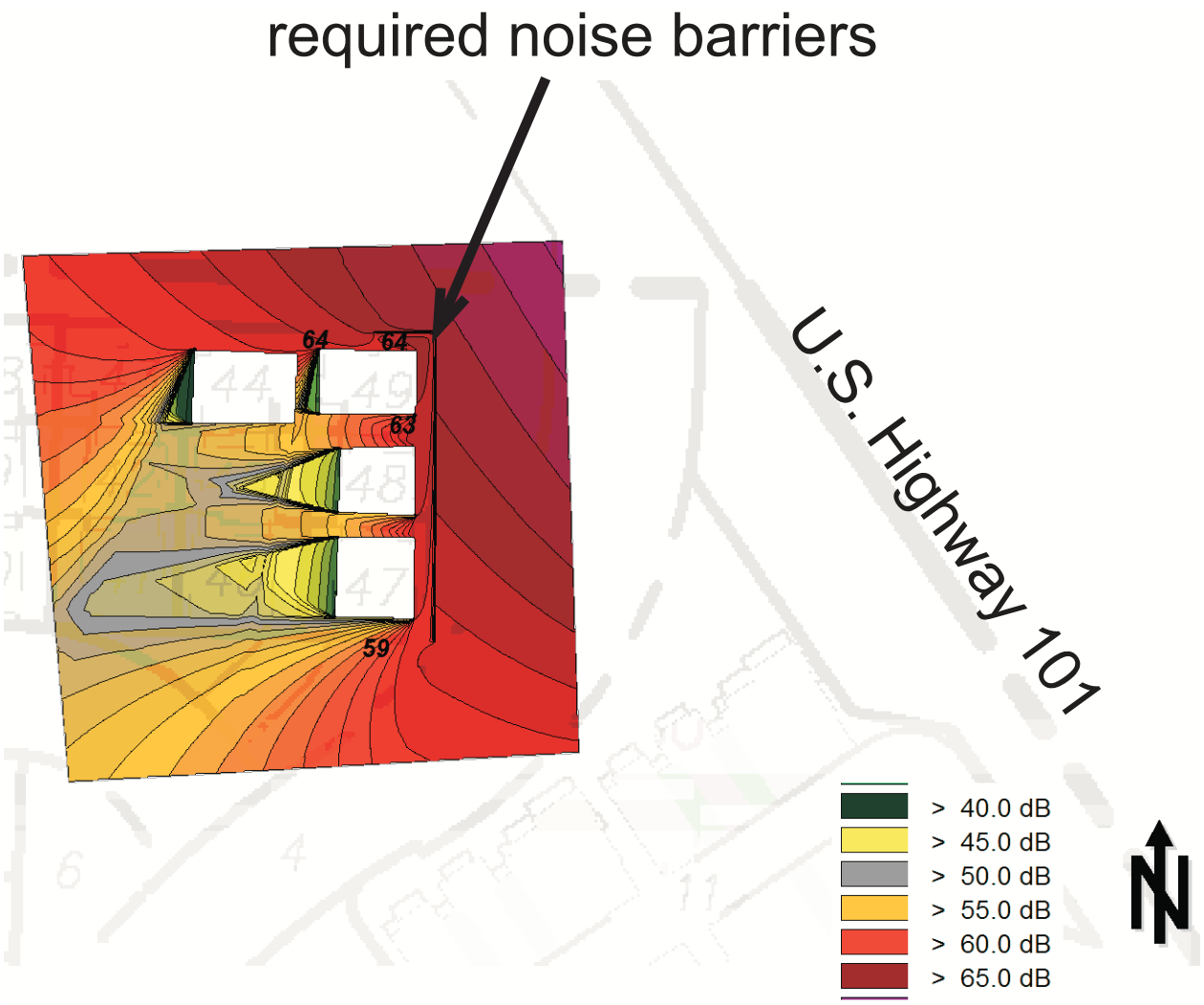
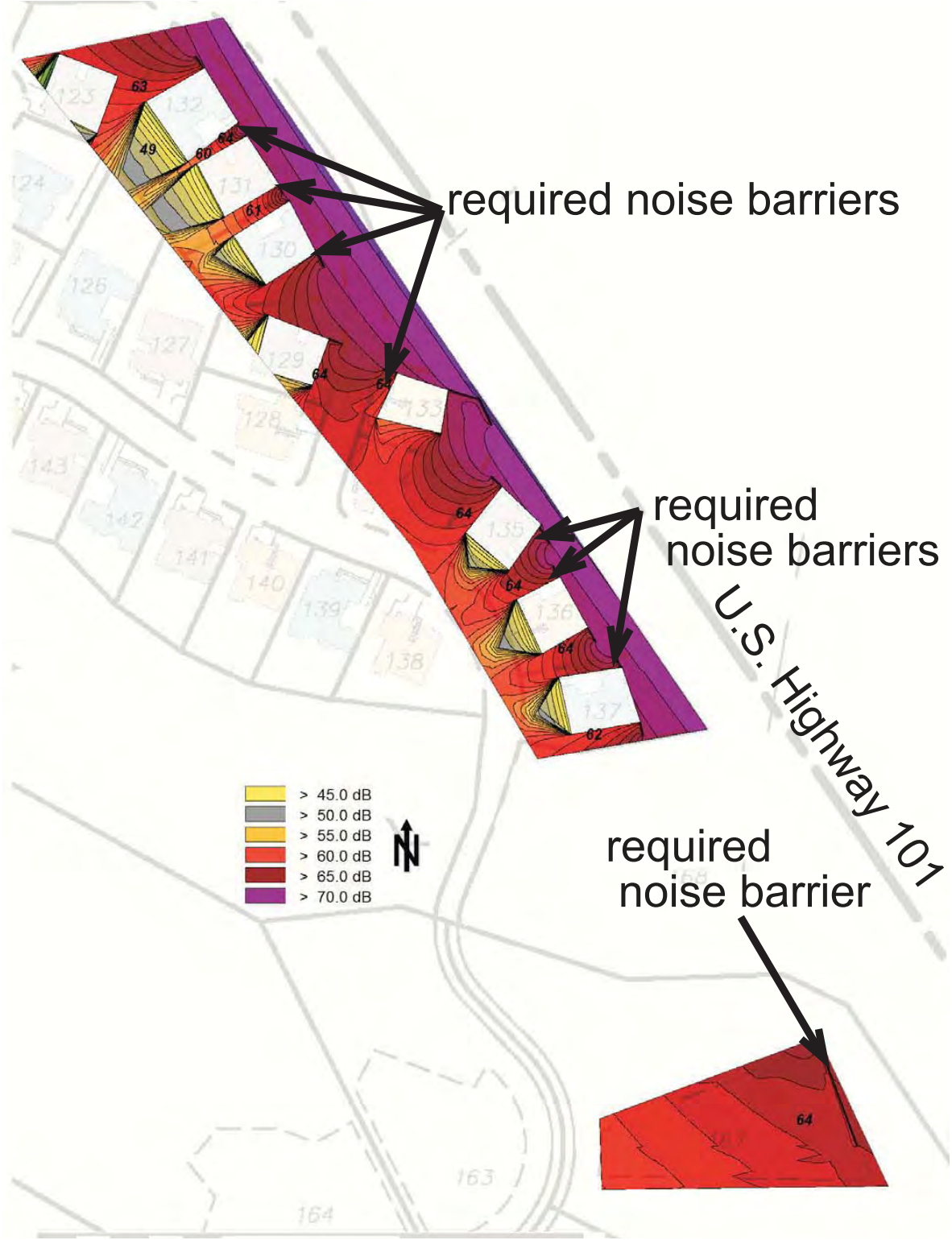


Figure 3. Noise Contours

Site Plan showing lots 123, 129 through 137 and lot 167, with generic required noise barrier(s) for side yards -- see text for full explanation and specification.



cargo with a gross weight greater than 25,000 lbs. Average Daily Traffic (ADT) count for this segment of U.S. Highway 101 which is listed by Caltrans as between 38,000 vehicles. Figure 2. Noise Contours and Figure 3 Noise Contours show the sound levels with proposed buildings in place, with required mitigation showing the effect of added sound barrier walls on outdoor activity areas.

3.0 Sound Level Contours

The sound level contours are generated from Caltrans data by the "Noise Contour Modeling" technique discussed on page 11 in APPENDIX II: Acoustical Modeling Methods. The location of the contours is affected by topography, the proposed future dwelling locations and heights, and by daily traffic volume on the transportation corridor, U.S. Highway 101.

4.0 Required Noise Mitigation

The following noise mitigation measures are required in order to attenuate sound levels below the County of Santa Barbara maximum of LDN = 65 dBA for outdoor activity areas and LDN = 45 dBA for interior sound levels

4.1 Solid Noise Barriers

Solid noise barriers are required in the approximate positions indicated in Figures 2 and 3 on pages 5 and 6. The solid noise barriers are to be positioned in relation to the noise source to provide a noise reduction for side yards or back yards as necessary. Solid noise barriers shall be six feet in height with reference to finish floor level of the proposed nearby dwelling unit. Acceptable materials for solid barriers are masonry, or stucco, or minimum 3/4 inch exterior plywood, or laminated glazing or any combination. However, all construction joints of the solid noise barrier shall be sealed with a resilient acoustical caulking in order to make the overall noise barrier assembly completely airtight. Any open drainage holes, cracks or seams in the construction will seriously degrade the performance of the noise barrier.

4.2 Required Noise Resistant Construction

The following construction is required for east-facing elevations of the proposed dwelling units nearest the noise source, U.S. Highway 101. The following construction specification will result in an acoustical performance which gives less than LDN = 45 dBA interior noise level for habitable spaces located along the east elevation, where construction assemblies face the transportation noise source.

Noise mitigation may fail to perform if each and every one of the following recommendations is not followed. A small crack or air leak in the construction may completely compromise all other sound-proofing.

Vents and roof penetrations: Soffit vents, eave vents, dormer vents and other wall and roof penetrations shall be located on the walls and roofs facing away from the noise source (located on the north, west and south elevation) wherever possible. If kitchens or bathrooms are located on the east side, remote venting to other elevations is required. If

vents are required to be located facing the noise source, a 90 degree bend shall be incorporated in the design of the ductwork or vent opening.

Walls: Only the east-facing exterior walls closest to the transportation noise sources require noise mitigation. Any wall enclosing habitable spaces nearest the noise source shall be constructed with an S.T.C. (Sound Transmission Class) rating of 30 or greater. For instance, stucco exterior or fiber-cement panel siding, with 30 pound felt on 5/8" sheathing, on 2" x 6" stud walls with R-21 fiber glass batt insulation and a layer of 5/8" Type X Gypsum Board will provide an S.T.C. rating of 30 or greater. Metal studs are preferable to wood studs for noise resistance.

Construction of the east-facing walls must include the liberal use of non-hardening acoustical sealant at all construction joints, including the header and footer construction and the edges and corners of gypsum board intersecting ceiling, walls and floor, especially behind papered joints. Apply resilient acoustical sealant (Johns Manville or equivalent) to gaps at intersecting walls, ceiling and floor before taping and spackling Gypsum Board in conventional manner. Seal all peripheries and apertures and joints around windows.

Acoustic Leaks: Common acoustic leaks, such as electrical outlets, pipes, vents, ducts, flues and other breaks in the integrity of the wall, ceiling or roof insulation and construction on the east sides of the dwelling units nearest transportation noise source shall receive special attention during construction. All construction openings and joints through the gypsum board on east-facing walls shall be insulated, sealed and caulked with expanding foam and a resilient, non-hardening caulking material, as appropriate. All such openings and joints shall be airtight to maintain sound isolation.

Windows and Doors: To meet the interior LDN 45 DBA requirements, windows for habitable spaces on all floors of affected elevation facing the noise source shall be of doubleglazed construction and installed in accordance with the recommendations of the manufacturer. The windows shall be fully gasketed, with an S.T.C. rating of 30 or better, as determined in testing by an accredited acoustical laboratory. An example that meets this requirement is Milgard Quiet Line windows. Doors: More than 90% of all exterior noise comes in through windows and doors. To meet the interior LDN 45 DBA requirements, doors directly facing the noise source shall be solid core with sound dampening and fully gasketed, sealed jambs and grouted frames, with an overall S.T.C. rating of 30 or better, as determined in testing by an accredited acoustical laboratory.

5.0 Discussion and Conclusion.

Mitigated sound levels for outdoor activity areas at the east side of the proposed development do not exceed the County of Santa Barbara maximum level of LDN = 65 dBA, and will not result in interior sound levels greater than LDN = 45 dBA if the required construction methods and materials are used on the elevations facing the noise source as described in this report. If windows for ventilation that face the noise source are required to be shut for noise reduction, a mechanical ventilation system shall be necessary.

6.0 REFERENCES

1. American National Standards Institute, Inc. 2004. *ANSI 1994 American National Standard Acoustical Terminology*. ANSI S.1.-1994, (R2004) , New York, NY.

2. American Society for Testing and Materials. 2004. *ASTM E 1014 - 84 (Reapproved 2000) Standard Guide for Measurement of Outdoor A-Weighted Sound Levels.*

3. Berglund, Birgitta, World Health Organization. 1999. *Guidelines for Community Noise* chapter 4, Guideline Values.

4. Bolt, Beranek and Newman. 1973. *Fundamentals and Abatement of Highway Traffic Noise*, Report No. PB-222-703. Prepared for Federal Highway Administration.

5. California Department of Finance. 2007. *California Strategic Growth Plan.*

6. California Department of Transportation (Caltrans). 1982. *Caltrans Transportation Laboratory Manual.*

7. _____. 1998. *Caltrans Traffic Noise Analysis Protocol For New Highway Construction and Highway Reconstruction Projects*.

8. _____. 2006. *California Transportation Plan 2025*, chapter 6.

9. California Resources Agency. 2007. *Title 14. California Code of Regulations* Chapter 3. Guidelines for Implementation of the California Environmental Quality Act Article 5. Preliminary Review of Projects and Conduct of Initial Study Sections, 15060 to 15065.

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12. Federal Highway Administration. 2006. *FHWA Roadway Construction Noise Model User's Guide Final Report.* FHWA-HEP-05-054 DOT-VNTSC-FHWA-05-01.

13. Harris, Cyril.M., editor. 1979 *Handbook of Noise Control*.

7.0 APPENDIX I: Notes, Definitions

TERM	DEFINITION
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the LEQ level.
Background Noise Level	The underlying, ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the L90 percentile noise level.
Sound Level, dB	Sound Level. Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals, SLOW time response, in accordance with ANSI S1.4-1971 (R1976) Unit: decibels(dB).
dBA or dB(A):	A-weighted sound level. The ear does not respond equally to all frequencies, but is less sensitive at low and high frequencies than it is at medium or speech range frequencies. Thus, to obtain a single number representing the sound level of a noise containing a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are dBA. The A-weighted sound level is also called the noise level.
Equivalent Sound Level LEQ	Because sound levels can vary markedly in intensity over a short period of time, some method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, one describes ambient sounds in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called LEQ. In this report, both a 15 minute and an hourly period is used.
Percentile Sound Level (Ln)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., L90)
Subjective Loudness Changes.	In addition to precision measurement of sound level changes, there is a subjective characteristic which describes how most people respond to sound: •A change in sound level of 3 dBA is *barely perceptible* by most listeners. •A change in level of 6 dBA is *clearly perceptible*. •A change of 10 dBA is perceived by most people as being *twice* (or *half*) as loud.
Time weighting	Different, internationally recognized, meter damping characteristics are available on sound level measuring instruments: Slow (S), Fast (F) and Impulse (I). In this community sound level measurement, the Fast (F) response time is used.

8.0 APPENDIX II: Acoustical Modeling Methods

Roadway Traffic Noise Analysis

The traffic noise data was used to calibrate the noise modeling program using the algorithms of the Federal Highway Administration Highway Traffic Noise Model (TNM 2.5). The TNM 2.5 model is the analytical method currently favored for traffic noise prediction by most state and local agencies. It is applied to federal and state roadway projects by the California Department of Transportation (Caltrans). The model is based upon the CALVENO noise emission factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the project site. In addition, sound level measurements were performed over 24-hour periods at two locations to describe ambient sound levels in the project area, and to derive suitable LDN day/ night traffic noise distribution factors for traffic noise modeling.

Noise Contour Modeling

Noise contours incorporating the measured sound level values were generated using CADNA/A, an acoustical modeling program that incorporates the TNM 2.5 algorithms, and which was developed to predict hourly Leq values for free-flowing traffic conditions. This computer modeling tool, made by Datakustik GmbH, is an internationally accepted acoustical modeling software program, used by many acoustics and noise control professional offices in the U.S. and abroad. The software has been validated by comparison with actual values in many different settings. The program has a high level of reliability and follows methods specified by the International Standards Organization in their ISO 9613-2 standard, "Acoustics – Attenuation of sound during propagation outdoors, Part 2: General Method of Calculation." The standard states that, "this part of ISO 9613 specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level … under meteorological conditions favorable to propagation from sources of known sound emissions. These conditions are for downwind propagation … under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night."

The computer modeling software takes into account source sound power levels, surface reflection and absorption, atmospheric absorption, geometric divergence, meteorological conditions, walls, barriers, berms, and terrain variations. The CADNA/A software uses a grid of receivers covering the project site.

9.0 Qualifications of Preparer

David Lord, Ph.D., Principal Consultant

For more than 20 years, David Lord has worked with architects, engineers, building contractors and public agencies to assess and solve problems in acoustics, noise and vibration. Dr. Lord is recognized as an acoustical consultant by several municipal and county planning departments and has provided acoustical consulting services for projects located in the following counties in California: San Luis Obispo, Santa Barbara, Orange, San Bernardino, Ventura and Los Angeles. David Lord is approved by the Department of Defense as an acoustical consultant at Vandenberg Air Force Base and at the Naval Facilities Engineering Command, Port Hueneme.

Community Noise Assessment

Projects have ranged in scale and complexity from residential to commercial and institutional developments. All noise assessments rigorously follow Caltrans and ASTM standard procedures, while adhering to local planning standards and noise ordinances and the Uniform Building Code. Recent projects include: Environmental Impact Report noise chapter for a Metrolink station in Orange County; noise assessment for an automobile service center, a retail food market, a community theater, a water treatment plant, various wineries, a boutique hotel, a remote, 600 acre religious retreat site, an annual rodeo and tractor pull event, a metal salvage yard, etc. Residential neighbor-noise assessments range from animal noise to motorcycle noise, to stationary mechanical noise issues.

Room Acoustics

Consulting projects undertaken in room acoustics range in scale from 50- to 400-seat spaces, such as church sanctuaries and restaurants. Consultation begins preferably with the architect early in design and continues through construction and occupancy. Music sources are evaluated and matched to the shape, the volume and the absorptivity of the space, using energy/time/frequency analysis tools. Recent projects include the Katsuya Restaurant at Hollywood and Vine; the Vina Robles Winery Refectory, and the United Methodist Church, San Luis Obispo.

Instrumentation

Sound and vibration measurements are made with multiple, state-of-the-art, data-logging, integrating, Type I instruments and a real time analyzer. Long-term total sound monitoring is conducted with high-resolution digital sound recorders. Sound transmission and reverberation studies are made with a real-time analyzer following ASTM procedures. Each instrument is factory calibrated annually to meet U.S. National Institute of Standards and Technology requirements and has a current Certificate of Calibration and Conformance.

Recent Projects in California. Partial list; References provided on request.

1. Bradley Square, Santa Maria, California; Housing Development 120 units. Transportation noise assessment, mitigation recommendations, noise-resistant construction design.

2. Por La Mar Nursery commercial horticulture development, worker housing, Santa Barbara / Goleta, California. Transportation noise assessment, noise resistant housing design.

3. Fess Parker Wine Center, Lompoc California, with Pults & Associates, Architects. CEQA Environmental Impact Assessment for Noise, City of Lompoc.

4. San Ysidro Ranch, Montecito, with Mechanical Engineering Consultants, Santa Barbara. Total sound level monitoring, recording, assessment and mitigation design.

5. Santa Maria Country Club, Santa Maria, California; room acoustics solutions for conference, dining and meeting rooms.

6. State Street, City of Santa Barbara, consultant to several entertainment establishments for entertainment noise mitigation and conflict resolution.

7. Expert testimony for Allen Hutkin, Attorney at Law, San Luis Obispo, noise nuisance cases.

8. Environmental Impact Report, Noise Impact Assessment for Enos Ranchos and Mahoney Ranch General Plan Amendment/Zone Change/Specific Plan Amendment/Annexation, Santa Maria, CA, with Science Applications International Corporation (SAIC)

9. Environmental Impact Report, Noise Impact Assessment, including rail noise issues, for Westgate Metrolink Station, Placentia, CA, with Crawford, Multari and Clark Associates.

10. Expert testimony for William S. Walter, Attorney, eminent domain compensation case, San Luis Obispo, CA.

11. QAD Inc., Summerland, CA. Chiller installation noise assessment and mitigation design evaluation to meet County of Santa Barbara noise standards.

Academic Qualifications

David Lord is a Professor Emeritus of Architecture at California Polytechnic State University, San Luis Obispo, where he developed the curriculum and taught courses in community noise and acoustical engineering.

David Lord holds the Master of Architecture degree from the University of California, Berkeley, with a specialization in architectural acoustics. David Lord earned the Ph.D. degree from the University of London, Bartlett School of Architecture.

Memberships

David Lord is a member of the American Society of Heating, Refrigerating and Air Conditioning Engineers, the Acoustical Society of America, the American Institute of Physics, the Institute of Noise Control Engineering, and the Audio Engineering Society.

Sound Level Assessment for

Detached Homes
Orcutt Key Site 3
County of Santa Barbara, CA

requested by
SB Clark, LLC
300 Esplanade Dr. Suite 430
Oxnard Ca. 93030

November 2, 2009

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Sound Level Assessment for

Detached Homes
Orcutt Key Site 3
County of Santa Barbara, CA

1.0 Description and Criteria

The purpose of this report is to assess existing and future background sound levels due to the dominant transportation noise source to the east of the parcel with potential impact on detached homes on lots 50, 51, 56, 57, 62, 63, 68, 69, 74, 75, 80, 81, 84 & 85. See the location of the site in relation to the transportation noise source in Figure 1. Site Plan, page 4. This sound level assessment is evaluated against community noise criteria contained in the County of Santa Barbara General Plan Noise Element Land Use Compatibility Guidelines, and the County of Santa Barbara Environmental Thresholds and Guidelines Manual. This report will describe the existing, baseline sound levels on and around the site, and future sound levels in outdoor activity areas of possible future residential development.

With regard to land use, potential noise conflict and noise mitigation measures, the noise level standards contained in the Noise Element of the General Plan of the County of Santa Barbara (rev. 1986) are used. The Noise Element sets a limit of LDN = 65 dBA for residential outdoor activity areas (pages 58-59) and a limit of LDN = 45 dBA for interior noise sensitive uses.

2.0 Existing Sound Levels

A site visit, observations and sound level measurements are described in the report from this office, dated June 29, 2006. Daily sound level predictions for the present study are based on the original sound level measurements and the published Average Daily Traffic values provided by Caltrans, in order to project accurate vehicle noise impacting primarily the east side of the parcel.

Heavy traffic on U.S. Highway 101, consisting of automobiles, semi tractor-trailers, agricultural trucks and motorcycles are clearly audible along the eastern portion of the site. The traffic flows at about 60 to 75 m.p.h., and consists of about 15 percent truck traffic, half of which are medium trucks (having two axles and six wheels). Because of their noise characteristics, buses and motorcycles are included in the medium truck category. The remaining half of the truck traffic is heavy trucks, having three or more axles and designed for the transportation of cargo with a gross weight greater than 25,000 lbs. Average Daily Traffic (ADT) count for this segment of U.S. Highway 101 which is listed by Caltrans as between 38,000 vehicles. Figure 2. Sound Level Contours, No Project shows the sound levels without buildings on the site. Figure 3. Sound Level Contours, No Mitigation shows the distribution of sound levels without noise

Figure 1. Site Plan

Site Plan showing location of dominant noise source to the east of the site.

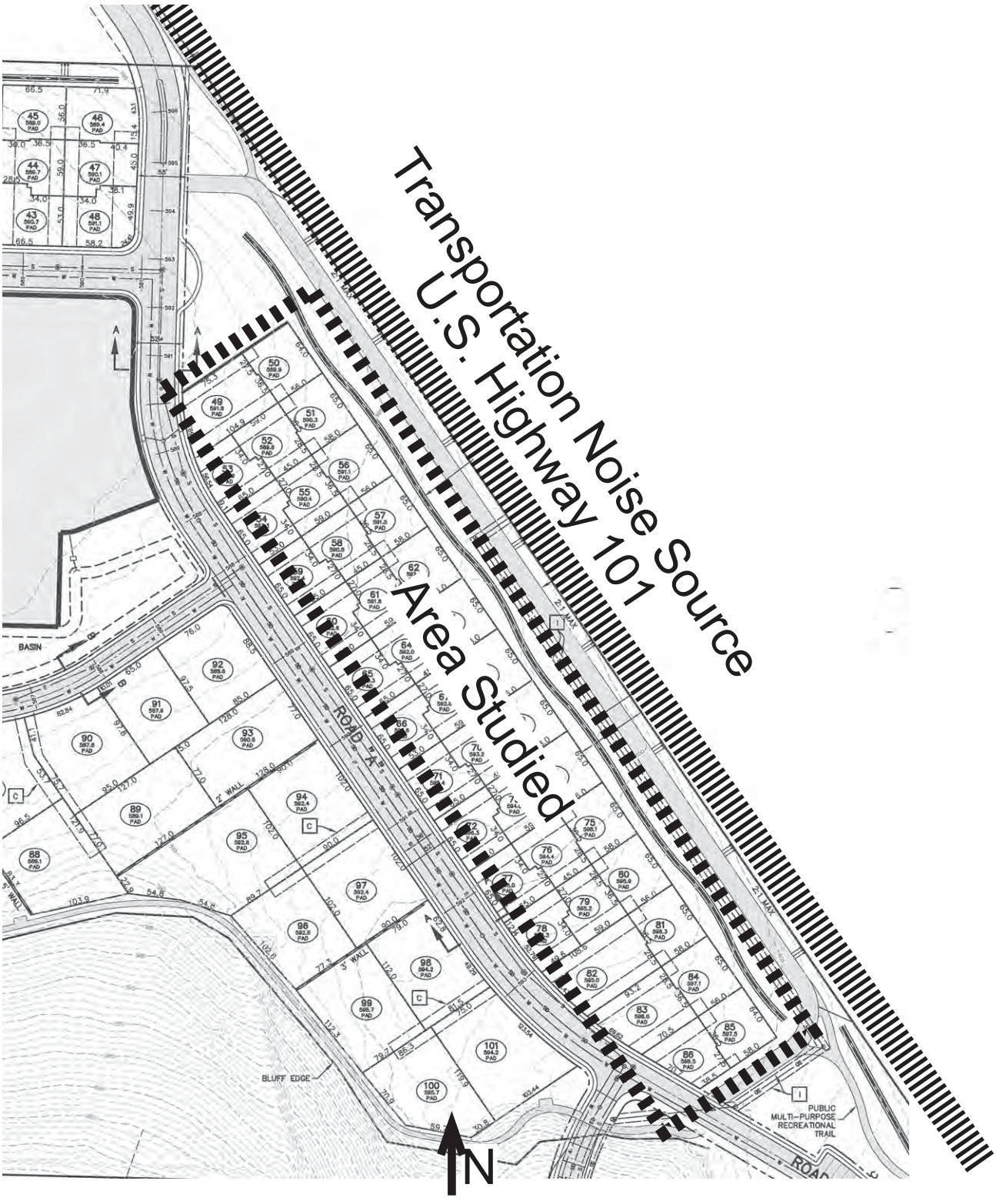


Figure 2. Sound Level Contours, No Project

Site Plan showing sound level contours (LDN=dBA) before project is built.

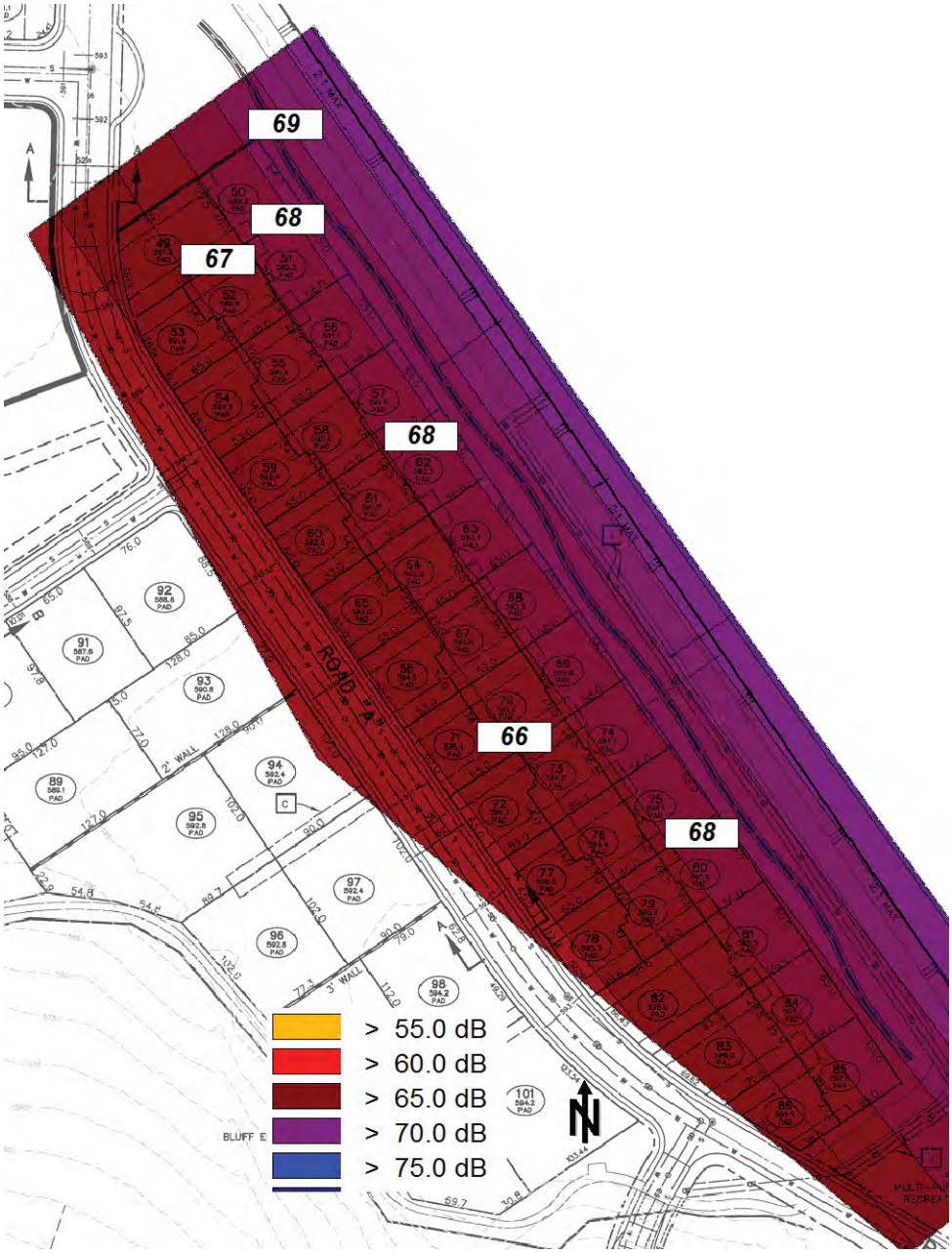


Figure 3. Sound Level Contours, No Mitigation

Site Plan showing sound level contours (LDN=dBA) with project, no site noise mitigation.

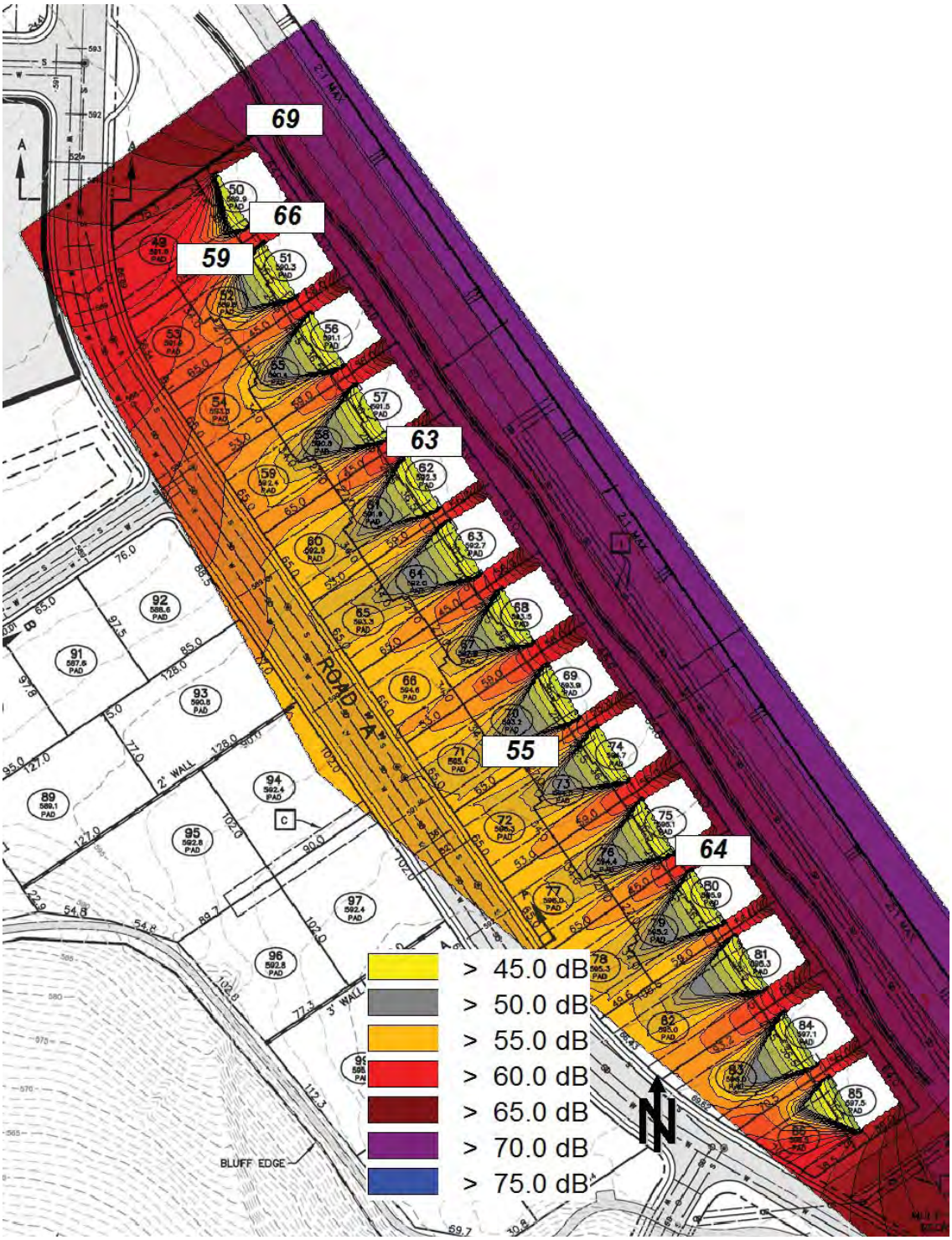


Figure 4. Sound Level Contours, with Mitigation

Site Plan showing sound level contours (LDN=dBA) with specific site mitigation.

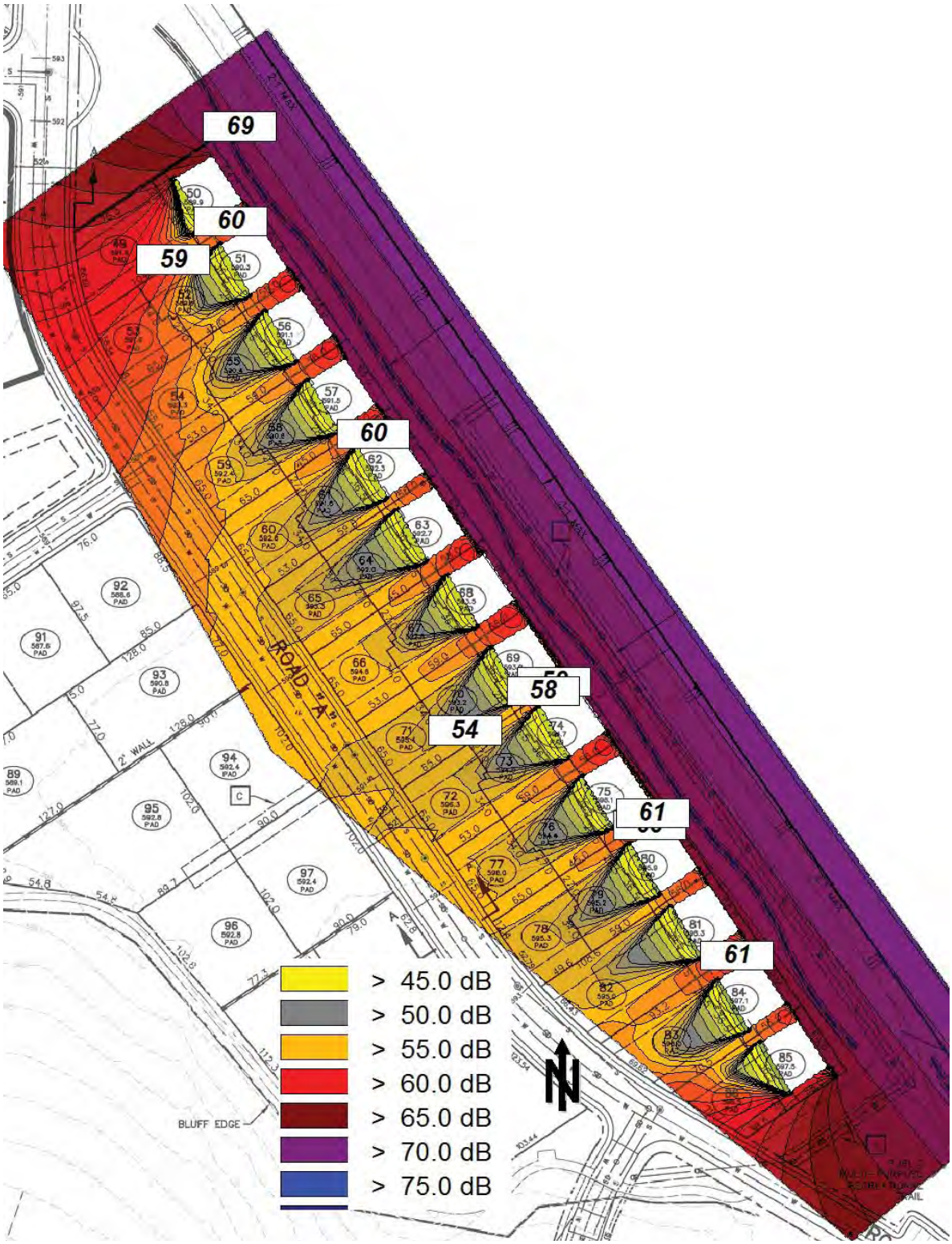
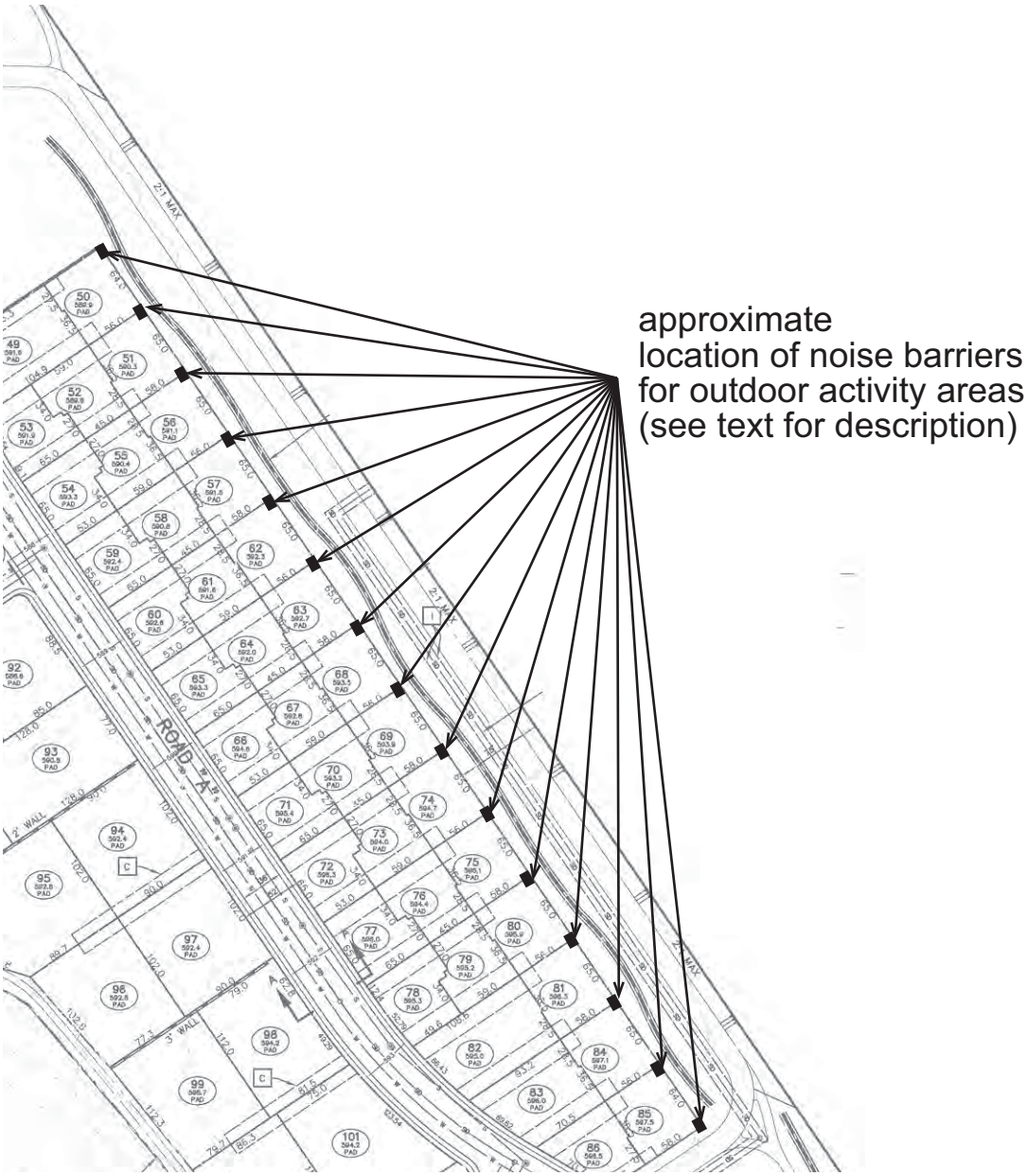


Figure 5. Location of Site Noise Barriers

Specific locations of noise barriers for outdoor activity areas.



mitigation. Figure 4. Sound Level Contours, with Mitigation shows the effect of added sound barrier walls.

3.0 Sound Level Contours

The sound level contours are generated from Caltrans data by the "Noise Contour Modeling" technique discussed on page 14 in APPENDIX II: Acoustical Modeling Methods. The location of the contours is affected by topography, the proposed future dwelling locations and heights, and by daily traffic volume on the transportation corridor, U.S. Highway 101.

4.0 Future Sound Levels

Future sound levels for this site will slowly increase as traffic volume increases. A projection of future growth was made by the Santa Barbara Association of Governments and published in its *2001 Travel Trends and 2030 Travel Forecast for Santa Barbara County.* The resulting effect on future sound levels is shown in Table 1. Growth in Sound Levels, on page 9. The resulting increase to the year 2020 will be less than one LDN = dBA across the site. Therefore the increase is less than significant.

5.0 Required Noise Mitigation

The following noise mitigation measures are required in order to attenuate sound levels below the County of Santa Barbara maximum of LDN = 65 dBA for outdoor activity areas and LDN = 45 dBA for interior sound levels

5.1 Solid Noise Barriers

Solid noise barriers are required in the approximate positions indicated in Figure 5. Location of Site Noise Barriers on page 8 to be located between dwelling units. Solid noise barriers shall be six feet in height with reference to finish floor level of nearby dwelling unit.

Table 1. Growth in Sound Levels

Growth rate estimates from Santa Barbara Association of Governments, *2001 Travel Trends and 2030 Travel Forecast for Santa Barbara County*

Growth of Noise from Average Daily Traffic Figures

David Lord, Acoustics Consulting 299 Albert Dr. San Luis Obispo, CA 93405

Orcutt, CA KS-3

1.6 % per year traffic growth rate to the year 2020

Calculation of added noise sources

				((10^-16)*10^(D9/10))
present noise level (LDN)	64.0	dBA	intensity=	**2.51E-10** W/cm^2
present traffic flow	38000	ADT	(average daily traffic)	
future traffic flow	46000	ADT	**0.8**	dBA additional
future noise level (LDN)	**64.8**	dBA	10*LOG10(D13/D12)	

The noise barriers will provide noise protection for side-yard outdoor areas. Acceptable materials for solid barriers are masonry, or stucco, or minimum 3/4 inch exterior plywood, or laminated glazing or any combination. However, all construction joints of the solid noise barrier shall be sealed with a resilient acoustical caulking in order to make the overall noise barrier assembly completely airtight. Any open drainage holes, cracks or seams in the construction will seriously degrade the performance of the noise barrier.

5.2 Required Noise Resistant Construction

Ordinary dwelling unit construction is not likely to result in sufficiently quiet interior spaces, and therefore enhanced construction methods and materials are detailed below. The objective of noise resistant construction is to reduce exterior noise levels to less than LDN = 45 dBA in interior habitable spaces. This may be achieved by a performance specification which requires testing the interior habitable spaces after construction is complete to verify that interior sound levels are less than LDN = 45 dBA. An alternative to testing is for construction materials and methods to adhere to the following prescriptive specification:

The following prescriptive construction specification is required for east-facing elevations of the dwelling units nearest the transportation noise source, U.S. Highway 101. The following construction specification will result in an acoustical performance which gives less than LDN = 45 dBA interior noise level for habitable spaces located along the east elevation, where construction assemblies face the transportation noise source.

Noise mitigation may fail to perform if each and every one of the following recommendations is not followed. A small crack or air leak in the construction may completely compromise all other sound-proofing.

Vents and roof penetrations: Soffit vents, eave vents, dormer vents and other wall and roof penetrations shall be located on the walls and roofs facing away from the noise source (located on the north, west and south elevation) wherever possible. If kitchens or bathrooms are located on the east side, remote venting to other elevations is required. If vents are required to be located facing the noise source, a 90 degree bend shall be incorporated in the design of the ductwork or vent opening. Use of patented foam insulationsolutions, such as Icynene spray foam insulation or equivalent, in walls, floors, and ceiling cavity / roof construction will allow elimination of soffit vents and gable end vents, thereby eliminating a significant path for noise penetration.

Walls: Only the east-facing exterior walls closest to the transportation noise sources require noise mitigation. Any wall enclosing habitable spaces nearest the noise source shall be constructed with an S.T.C. (Sound Transmission Class) rating of 30 or greater. For instance, stucco exterior or fiber-cement panel siding, with 30 pound felt on 5/8" sheathing, on 2" x 6" stud walls with R-21 fiber glass batt insulation and a layer of 5/8" Type X Gypsum Board will provide an S.T.C. rating of 30 or greater. Metal studs are preferable to wood studs for noise resistance.

Construction of the east-facing walls must include the liberal use of non-hardening

acoustical sealant at all construction joints, including the header and footer construction and the edges and corners of gypsum board intersecting ceiling, walls and floor, especially behind papered joints. Apply resilient acoustical sealant (Johns Manville or equivalent) to gaps at intersecting walls, ceiling and floor before taping and spackling Gypsum Board in conventional manner. Seal all peripheries and apertures and joints around windows.

Acoustic Leaks: Common acoustic leaks, such as electrical outlets, pipes, vents, ducts, flues and other breaks in the integrity of the wall, ceiling or roof insulation and construction on the east sides of the dwelling units nearest transportation noise source shall receive special attention during construction. All construction openings and joints through the gypsum board on east-facing walls shall be insulated, sealed and caulked with expanding foam and a resilient, non-hardening caulking material, as appropriate. All such openings and joints shall be airtight to maintain sound isolation.

Windows: To meet the interior LDN 45 DBA requirements, windows for habitable spaces on all floors of affected elevation facing the noise source shall be of doubleglazed construction and installed in accordance with the recommendations of the manufacturer. The windows shall be fully gasketed, with an S.T.C. rating of 30 or better, as determined in testing by an accredited acoustical laboratory. An example that meets this requirement is Milgard Quiet Line windows.

Doors: More than 90% of all exterior noise comes in through windows and doors. To meet the interior LDN 45 DBA requirements, doors directly facing the noise source shall be solid core with sound dampening and fully gasketed, sealed jambs and grouted frames, with an overall S.T.C. rating of 30 or better, as determined in testing by an accredited acoustical laboratory.

6.0 Discussion and Conclusion.

Mitigated sound levels for outdoor activity areas between proposed dwelling units of the proposed development do not exceed the County of Santa Barbara maximum level of LDN = 65 dBA, and will not result in interior levels greater than LDN = 45 dBA if the required noise barriers and required construction methods and materials are used on the elevations facing the noise source.

7.0 REFERENCES

1. American National Standards Institute, Inc. 2004. *ANSI 1994 American National Standard Acoustical Terminology*. ANSI S.1.-1994, (R2004) , New York, NY.

2. American Society for Testing and Materials. 2004. *ASTM E 1014 - 84 (Reapproved 2000) Standard Guide for Measurement of Outdoor A-Weighted Sound Levels.*

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13. Harris, Cyril.M., editor. 1979 *Handbook of Noise Control*.

8.0 APPENDIX I: Notes, Definitions

TERM	DEFINITION
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise or sound at a given location. The ambient level is typically defined by the LEQ level.
Background Noise Level	The underlying, ever-present lower level noise that remains in the absence of intrusive or intermittent sounds. Distant sources, such as traffic, typically make up the background. The background level is generally defined by the L90 percentile noise level.
Sound Level, dB	Sound Level. Ten times the common logarithm of the ratio of the square of the measured A-weighted sound pressure to the square of the standard reference pressure of 20 micropascals, SLOW time response, in accordance with ANSI S1.4-1971 (R1976) Unit: decibels(dB).
dBA or dB(A):	A-weighted sound level. The ear does not respond equally to all frequencies, but is less sensitive at low and high frequencies than it is at medium or speech range frequencies. Thus, to obtain a single number representing the sound level of a noise containing a wide range of frequencies in a manner representative of the ear's response, it is necessary to reduce the effects of the low and high frequencies with respect to the medium frequencies. The resultant sound level is said to be A-weighted, and the units are dBA. The A-weighted sound level is also called the noise level.
Equivalent Sound Level LEQ	Because sound levels can vary markedly in intensity over a short period of time, some method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, one describes ambient sounds in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called LEQ. In this report, both a 15 minute and an hourly period is used.
Percentile Sound Level (Ln)	The noise level exceeded during n percent of the measurement period, where n is a number between 0 and 100 (e.g., L90)
Subjective Loudness Changes.	In addition to precision measurement of sound level changes, there is a subjective characteristic which describes how most people respond to sound: •A change in sound level of 3 dBA is *barely perceptible* by most listeners. •A change in level of 6 dBA is *clearly perceptible*. •A change of 10 dBA is perceived by most people as being *twice* (or *half*) as loud.
Time weighting	Different, internationally recognized, meter damping characteristics are available on sound level measuring instruments: Slow (S), Fast (F) and Impulse (I). In this community sound level measurement, the Fast (F) response time is used.

9.0 APPENDIX II: Acoustical Modeling Methods

Roadway Traffic Noise Analysis

The traffic noise data was used to calibrate the noise modeling program using the algorithms of the Federal Highway Administration Highway Traffic Noise Model (TNM 2.5). The TNM 2.5 model is the analytical method currently favored for traffic noise prediction by most state and local agencies. It is applied to federal and state roadway projects by the California Department of Transportation (Caltrans). The model is based upon the CALVENO noise emission factors for automobiles, medium trucks and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the project site. In addition, sound level measurements were performed over 24-hour periods at two locations to describe ambient sound levels in the project area, and to derive suitable LDN day/night traffic noise distribution factors for traffic noise modeling.

Noise Contour Modeling

Noise contours incorporating the measured sound level values were generated using CADNA/A, an acoustical modeling program that incorporates the TNM 2.5 algorithms, and which was developed to predict hourly Leq values for free-flowing traffic conditions. This computer modeling tool, made by Datakustik GmbH, is an internationally accepted acoustical modeling software program, used by many acoustics and noise control professional offices in the U.S. and abroad. The software has been validated by comparison with actual values in many different settings. The program has a high level of reliability and follows methods specified by the International Standards Organization in their ISO 9613-2 standard, "Acoustics – Attenuation of sound during propagation outdoors, Part 2: General Method of Calculation." The standard states that, "this part of ISO 9613 specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources. The method predicts the equivalent continuous A-weighted sound pressure level under meteorological conditions favorable to propagation from sources of known sound emissions. These conditions are for downwind propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs at night."

The computer modeling software takes into account source sound power levels, surface reflection and absorption, atmospheric absorption, geometric divergence, meteorological conditions, walls, barriers, berms, and terrain variations. The CADNA/A software uses a grid of receivers covering the project site.

10.0 Qualifications of Preparer

David Lord, Ph.D., Principal Consultant

For more than 20 years, David Lord has worked with architects, engineers, building contractors and public agencies to assess and solve problems in acoustics, noise and vibration. Dr. Lord is recognized as an acoustical consultant by several municipal and county planning departments and has provided acoustical consulting services for projects located in the following counties in California: San Luis Obispo, Santa Barbara, Orange, San Bernardino, Ventura and Los Angeles. David Lord is approved by the Department of Defense as an acoustical consultant at Vandenberg Air Force Base and at the Naval Facilities Engineering Command, Port Hueneme.

Community Noise Assessment

Projects have ranged in scale and complexity from residential to commercial and institutional developments. All noise assessments rigorously follow Caltrans and ASTM standard procedures, while adhering to local planning standards and noise ordinances and the Uniform Building Code. Recent projects include: Environmental Impact Report noise chapter for a Metrolink station in Orange County; noise assessment for an automobile service center, a retail food market, a community theater, a water treatment plant, various wineries, a boutique hotel, a remote, 600 acre religious retreat site, an annual rodeo and tractor pull event, a metal salvage yard, etc. Residential neighbor-noise assessments range from animal noise to motorcycle noise, to stationary mechanical noise issues.

Room Acoustics

Consulting projects undertaken in room acoustics range in scale from 50- to 400-seat spaces, such as church sanctuaries and restaurants. Consultation begins preferably with the architect early in design and continues through construction and occupancy. Music sources are evaluated and matched to the shape, the volume and the absorptivity of the space, using energy/time/frequency analysis tools. Recent projects include the Katsuya Restaurant at Hollywood and Vine; the Vina Robles Winery Refectory, and the United Methodist Church, San Luis Obispo.

Instrumentation

Sound and vibration measurements are made with multiple, state-of-the-art, data-logging, integrating, Type I instruments and a real time analyzer. Long-term total sound monitoring is conducted with high-resolution digital sound recorders. Sound transmission and reverberation studies are made with a real-time analyzer following ASTM procedures. Each instrument is factory calibrated annually to meet U.S. National Institute of Standards and Technology requirements and has a current Certificate of Calibration and Conformance.

Recent Projects in California. Partial list; References provided on request.

1. Bradley Square, Santa Maria, California; Housing Development 120 units. Transportation noise assessment, mitigation recommendations, noise-resistant construction design.

2. Por La Mar Nursery commercial horticulture development, worker housing, Santa Barbara / Goleta, California. Transportation noise assessment, noise resistant housing design.

3. Fess Parker Wine Center, Lompoc California, with Pults & Associates, Architects. CEQA Environmental Impact Assessment for Noise, City of Lompoc.

4. San Ysidro Ranch, Montecito, with Mechanical Engineering Consultants, Santa Barbara. Total sound level monitoring, recording, assessment and mitigation design.

5. Santa Maria Country Club, Santa Maria, California; room acoustics solutions for conference, dining and meeting rooms.

6. State Street, City of Santa Barbara, consultant to several entertainment establishments for entertainment noise mitigation and conflict resolution.

7. Expert testimony for Allen Hutkin, Attorney at Law, San Luis Obispo, noise nuisance cases.

8. Environmental Impact Report, Noise Impact Assessment for Enos Ranchos and Mahoney Ranch General Plan Amendment/Zone Change/Specific Plan Amendment/Annexation, Santa Maria, CA, with Science Applications International Corporation (SAIC)

9. Environmental Impact Report, Noise Impact Assessment, including rail noise issues, for Westgate Metrolink Station, Placentia, CA, with Crawford, Multari and Clark Associates.

10. Expert testimony for William S. Walter, Attorney, eminent domain compensation case, San Luis Obispo, CA.

11. QAD Inc., Summerland, CA. Chiller installation noise assessment and mitigation design evaluation to meet County of Santa Barbara noise standards.

Academic Qualifications

David Lord is a Professor Emeritus of Architecture at California Polytechnic State University, San Luis Obispo, where he developed the curriculum and taught courses in community noise and acoustical engineering.

David Lord holds the Master of Architecture degree from the University of California, Berkeley, with a specialization in architectural acoustics. David Lord earned the Ph.D. degree from the University of London, Bartlett School of Architecture.

Memberships

David Lord is a member of the American Society of Heating, Refrigerating and Air Conditioning Engineers, the Acoustical Society of America, the American Institute of Physics, the Institute of Noise Control Engineering, and the Audio Engineering Society.

6a Existing_Clark Avenue_WestofStillwell_Rd

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	1867.0
Average automobile speed (mph):	45.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	45.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	70.1

6b Existing_Clark Avenue_EASTofStillwell_Rd

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	1778.0
Average automobile speed (mph):	45.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	45.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	69.9

6c Existing_Stillwell

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	185.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	30.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	54.7

6d Existing_Sunny

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	92.0
Average automobile speed (mph):	15.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	15.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	45.4

7a Existing+Proj_Clark Avenue_WestofStillwell_Rd

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	1910.0
Average automobile speed (mph):	45.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	45.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	70.2

7b Existing+Proj_Clark Avenue_EASTofStillwell_Rd

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	1827.0
Average automobile speed (mph):	45.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	45.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	70.0

7c Existing+Proj_Stillwell

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	206.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	30.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	55.1

7d Existing+Project+Sunny

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	156.0
Average automobile speed (mph):	15.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	15.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	47.7

8a Cumulative_Clark Avenue_WestofStillwell_Rd

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	1573.0
Average automobile speed (mph):	45.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	45.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	69.4

8b Cumulative_Clark Avenue_EASTofStillwell_Rd

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	1895.0
Average automobile speed (mph):	45.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	45.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	70.2

8c Cumulative_Stillwell

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	635.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	30.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	60.0

8d Cumulative_Sunny

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	708.0
Average automobile speed (mph):	15.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	15.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	54.2

9a Cumul+Proj_Clark Avenue_WestofStillwell_Rd

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	1607.0
Average automobile speed (mph):	45.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	45.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	69.4

9b Cumul+Proj_Clark Avenue_EASTofStillwell_Rd

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	1943.0
Average automobile speed (mph):	45.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	45.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	70.3

9c Cumul+Proj_Stillwell

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	659.0
Average automobile speed (mph):	30.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	30.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	60.2

9d Cumul+Proj_Sunny

* * * * CASE INFORMATION * * * *

* * * * Results calculated with TNM Version 2.5 * * * *

* * * * TRAFFIC VOLUME/SPEED INFORMATION * * * *

Automobile volume (v/h):	772.0
Average automobile speed (mph):	15.0
Medium truck volume (v/h):	0.1
Average medium truck speed (mph):	15.0
Heavy truck volume (v/h):	0.0
Average heavy truck speed (mph):	0.0
Bus volume (v/h):	0.0
Average bus speed (mph):	0.0
Motorcycle volume (v/h):	0.0
Average Motorcycle speed (mph):	0.0

* * * * TERRAIN SURFACE INFORMATION * * * *

Terrain surface: hard

* * * * RECEIVER INFORMATION * * * *

DESCRIPTION OF RECEIVER # 1

Residences

Distance from center of 12-ft wide, single lane roadway (ft):	50.0
A-weighted Hourly Equivalent Sound Level without Barrier (dBA):	54.6

Appendix H

Sewer Study



Key Site 3
Orcutt, CA

Sewer Study

SB Clark, LLC

W.O. 16527.12

PREPARED BY:

Project Manager: Brianna Daniels, P.E.
Project Engineer: Jonathan Zukowski, E.I.T.

November 2013

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EXECUTIVE SUMMARY

SB Clark, LLC is planning to construct a residential development on Key Site 3 of the Orcutt Community Plan. The proposed development will consist of 125 detached single family homes and 160 multi-family townhomes on approximately 139 acres.

The subject property is within the Laguna County Sanitation District's (LCSD or District) boundary and will be served by a connection to existing LCSD facilities. Sewer service via a connection to the District's Solomon Creek sewer trunk extension at Stillwell and Orcutt Creek was considered and analyzed in this study.

Study results are consistent with the 2009 Sewer Collection System Master Plan conducted by Penfield & Smith (P&S) for the District. According to the study, parts of the existing Solomon Creek Trunk Sewer have insufficient capacity to convey peak build-out flows from Blosser Road to Bradley Road. Key site 3 is one of the sites contributing to this condition and will pay appropriate impact fees for these improvements to be completed as a separate project by the Laguna County Sanitation District.

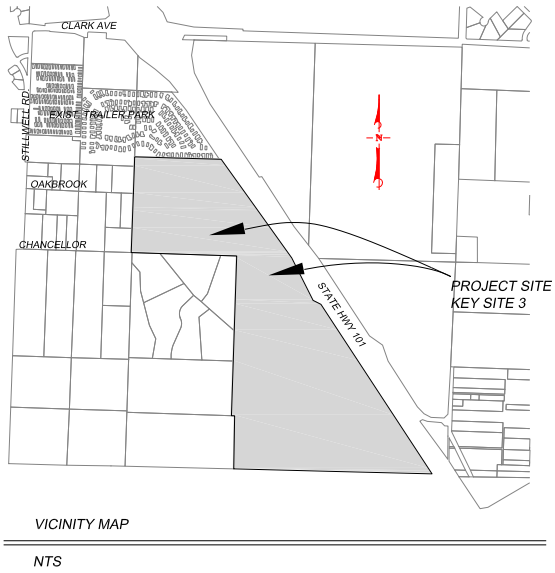
The proposed Key Site 3 on-site sewer collection system consists of a network of 6-inch and 8-inch PVC pipes which convey flows into the Solomon Creek Trunk Sewer. The collection system will conform to Laguna County Sanitation District Standard Specifications for the Construction of Sanitary Sewers. Proposed gravity sewer improvements will be dedicated to LCSD for management and future maintenance.

PURPOSE

The purpose of this report is to document proposed on-site and off-site sewer improvements for the Key Site 3 property. Off-site analysis references the 2009 Laguna County Sanitation District Sewer Collection System Master Plan for determination of trunk sewer capacity and identification of appropriate upgrades to said offsite facilities and documentation of existing sewer plant capacity and contributing flows.

BACKGROUND

Key Site 3 consists of approximately 139 acres, located on the southeastern section of the Orcutt Community Planning Area. Key Site 3 is bounded by Highway 101 on the northeast, the Sunny Hills mobile home park on the north, ranchettes to the west, and the undeveloped Solomon Hills to the South (see vicinity map below). Existing site topography includes approximately 43 acres in the upper mesa where elevations vary between 570 to 605-ft, approximately 45 acres in the central plain area where elevations vary from 548 to 590-ft, and approximately 60 acres located south of the central plain area where elevations vary from 590 to 720-ft. The proposed development consists of 125 detached single family homes and 160 multi-family townhomes on the northern area.



The Key Site 3 property is within the LCSD service boundary. The LCSD sewer infrastructure consists of a wastewater reclamation facility, a network of trunk sewers and collection pipes, and variety of methods for disposal of treated effluent (recycled water). All sewer facilities within District boundaries are currently managed and maintained by the LCSD.

Previous Studies and Conclusions

Penfield & Smith previously conducted a pipe capacity study addressing wastewater flows and pipe capacity along the Solomon Creek Trunk Sewer. The referenced study is as follows:

1. "Laguna County Sanitation District Sewer Collection System Master Plan" Prepared by Penfield & Smith, dated June 2009.

The referenced study included a capacity analysis for the existing Laguna Sanitation District Sewer Collection System and concluded the following:

- Portions of the Solomon Creek Trunk Sewer require pipeline size increases as specified by the sewer collection system master plan to meet peak build out sewage flow. The upgrades specified in the Sewer System Master Plan require future upgrades due to increased flow from Key Sites 1, 2, 3, 7, 10 (north),11, B C, F, and Terrace Ranch. All Improvements will be located immediately southeast of the intersection of Clark Avenue and Highway 135 and will require approximately 1,550 feet of 10" pipe to be upgraded to 15" pipe at an estimated cost of $416,000 and approximately 1,050 feet of 12" pipe to be upgraded to 15" pipe at an estimated cost of $280,300.

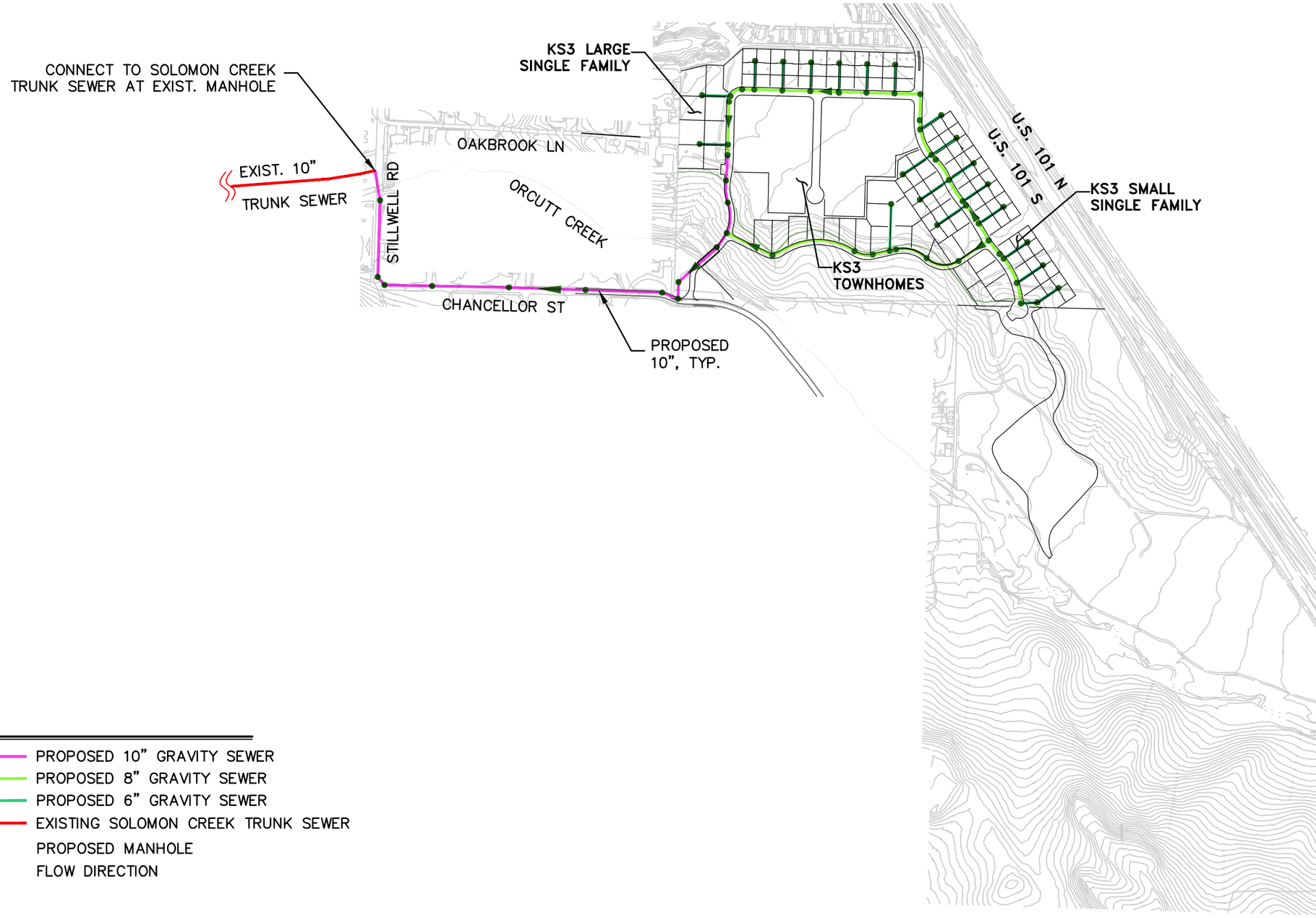
Based on the Orcutt Community Plan and current knowledge of the contributing Key Sites, Key Site 3 contributes approximately 32% of the build-out flow as identified in the Master Plan document. Key Site 3 will pay their fair share of the required impact fees to Laguna County Sanitation District for the future construction of these improvements. It is anticipated that these improvements will be constructed as a future County Improvement Project. For purposes of the Key Site 3 Project Specific EIR, no additional disturbance will be generated as part of these improvements.

ANALYSIS

The preliminary on-site sewer system for Key Site 3 has been designed in accordance with the current Laguna County Sanitation District Standard Specifications for the Construction of Sanitary Sewers.

Proposed On-site Sewer Collection

Flow from the Upper Mesa system will be collected by 6" and 8" PVC pipes and routed to a 10" PVC pipe which will carry all site flow across Orcutt Creek to Chancellor Street. Offsite flow will continue along Chancellor Street via a new 10" pipe. This 10" collector pipe then connects to the 10" Solomon Creek trunk main at Stillwell Road and Orcutt Creek. See Figure 1, sheet 4 for proposed sewer layout.



LEGEND

- PROPOSED 10" GRAVITY SEWER
- PROPOSED 8" GRAVITY SEWER
- PROPOSED 6" GRAVITY SEWER
- EXISTING SOLOMON CREEK TRUNK SEWER
- PROPOSED MANHOLE
- FLOW DIRECTION

S:\ VCAD\ Work \ 16527 \ SEWER STUDY FIGURES \ Figure2_SewerStudy_KS3.dwg

Orcutt Key Site No. 3 — SB Clark, LLC

Proposed Sanitary Sewer System

Figure 1

N

0 250 500

Penfield & Smith
Engineering • Surveying • Planning
• Construction Management •

Key Site 3 Wastewater Demands

The following site specific wastewater demands are based on Table 1 of the 2009 Laguna County Sanitation District Sewer Collection System Master Plan.

Table 1

Orcutt Key Site 3
Wastewater Demand by Zone

Zone	Use	Units	Demand[1] (CFS/Unit)	Q_{AVG} CFS (GPM)	Q_{PEAK}[2] CFS (GPM)
Upper Mesa Residential Development					
1	Small Single-Family Residential	97	0.00034/unit	0.033 (14.8)	0.079 (35.5) P.F.** = 2.40
2	Multi-Family Residential (Townhomes)	160	0.00035/unit	0.056 (25.1)	0.224 (100.5) P.F.* = 4.06
3	Large Single-Family Residential	28	0.00034/unit	0.010 (4.3)	0.023 (10.3) P.F.** = 2.40
Project Wastewater Demand Totals				**0.099 cfs (44.2 gpm) (0.064 MGD)**	**0.326 cfs (146.3 gpm) (0.211 MGD)**

Notes:

1. Unit demands per Sewer Collection System Master Plan, Table 1
2. Peak flow factor is approximated as follows:
   $Q_{peak, CFS} = P.F. \times Q_{avg, CFS}$
   $P.F. = (18 + P^{0.5})/ (4 + P^{0.5})$
   *Peak flow value per Sewer Collection System Master Plan, Equation 1 where P is the population served by the system in thousands. Occupants per household assumed as 2.8 per the 2000 United States Census for the County of Santa Barbara.
   **Peak flow value per Sewer Collection System Master Plan for Single Family Home units.

Disposal Facility Capacity

LCSD currently collects, treats, and disposes approximately 2.3 to 2.4 million gallons per day (MGD) of wastewater. All of this water is recycled and used for irrigation purposes on District land and various off-site locations. According to Martin Wilder of LCSD, the District has a current disposal capacity of 2.7 MGD. The disposal facilities are currently at approximately 87% capacity, with an available capacity of 0.3 to 0.4 MGD.

Existing LCSD disposal facilities have sufficient capacity to handle both the projected average and peak sewage generation from Key Site No.3. Average wastewater flow from Key Site 3 is calculated to be 0.064 MGD, equating to a total plant increase of approximately 2.7%. Peak flow from Key Site 3 is calculated to be 0.211 MGD, an increase of approximately 8.8%.

Treatment/Reclamation Plant Capacity

LCSD effluent is treated to disinfected tertiary levels including screening, primary clarification, bio-filtration, secondary clarification, and membrane filtration (including reverse osmosis for a portion of flow). The reclamation plant is regulated by the Regional Water Quality Control Board of San Luis Obispo under Waste Discharge Requirements and Master Reclamation Permit Order 01-042. The plant has a permitted/rated capacity of 3.7 MGD, currently at 65% capacity with an available capacity of 1.3 MGD.

The design capacity of the LCSD treatment plant (3.7 MGD) exceeds the current LCSD disposal capacity (2.7 MGD). The anticipated average and peak flows of Key Site 3 are within the design capacity of the LCSD disposal facilities. Therefore, the treatment plant has sufficient existing capacity for anticipated Key Site 3 demands.

Proposed On-site Sewer Design

The proposed on-site collection system will consist of a network of 6-inch PVC laterals routed to 8-inch mains collecting into a 10” PVC pipe which conveys flows offsite along Chancellor Street (See Figure 1).

Collection system design is evaluated by pipe carrying capacity under peak flow conditions and flow velocity under average and peak daily flow. Flow velocity shall not be less than 2.0 ft/sec at design peak flow and 1.5 ft/sec at average daily flow to maintain self-cleaning velocity. Peak flow depth shall not exceed 50% of the pipe carrying capacity (½ full) in accordance with Section 6.02 of the LCSD Standard Specifications. Calculated pipe capacities based on LCSD design standards are summarized in Tables 2 and 3. These design standards serve as guidelines only, and each proposed pipe must be individually analyzed to insure standards are met.

Table 2
Orcutt Key Site 3
Pipe Capacity Analysis: Peak Flow Conditions

Pipe Size	Design Minimum Slope	Peak Flow Capacity @ ½ full (GPM)	Design Peak Flow Depth (% full)	Design Peak Flow Velocity (ft/sec)
10”	0.25%	246	50%	2.00
8”	0.33%	156	50%	2.00
6”	0.49%	88	50%	2.00

Table 3
Orcutt Key Site 3
Flow Velocity Analysis: Average Daily Flow

Pipe Size	Minimum Design Slope	Min. Average Daily Flow @ Design Slope (GPM)	Average Daily flow Velocity (ft/sec)
10”	0.25%	83	1.50
8”	0.33%	55	1.50
6”	0.49%	30	1.50

Financial Participation

The proposed on-site sewer system facilities for Key Site 3 serve only the proposed development, providing no significant benefit to the existing District system. Therefore, no District financial participation is anticipated for the on-site sewer system improvements.

Recommended offsite upgrades to the District’s Solomon Creek Trunk Sewer provide significant benefit to the existing LCSD system. It is anticipated the District will be

responsible for funding a portion of the recommended upgrades to the existing sewer trunk and appurtenances. These upgrades ensure the system has sufficient capacity as sewage demands increase to build-out levels. As indicated in this analysis, there are deficiencies in the Solomon Creek Trunk Sewer Trunk at existing peak flows conditions.

The District may require a sewer connection fee for new developments, including Key Site 3. Financial participation from other developments should reference the 2009 Sewer System master Plan with regards to impacts on the existing system and the need for improvements to existing trunk lines.

SUMMARY AND CONCLUSION

Pending LCSD's final determination of financial participation to be required of developers for offsite upgrades, the District may want to plan for a phased approach to the upgrades, replacing portions of the trunk sewer at one time. If the District pursues this route, it may want to adopt a program to periodically meter flows at various locations along the subject pipeline to monitor both sewage flows and pipe capacity. However, the District may decide to pursue an expedited approach upgrading the entire subject pipeline per these recommendations.

Based on this study, sewage flows from the Key Site 3 development will not adversely impact the LCSD Wastewater Treatment and Reclamation Plant, nor the LCSD effluent disposal facilities.

Sewer system infrastructure within Key Site 3 will consist of a network of 6-inch, 8-inch and 10-inch PVC gravity sewers. A new 10" collection line will connect the proposed system to the Solomon Creek trunk main. All new construction will be specified in accordance with current LCSD standards and dedicated to the District upon completion.

Appendix A

Wastewater Demand Calculations

Penfield & Smith

ENGINEERS, SURVEYORS, PLANNERS

BY: JTZ **DATE:** 11/12/2013 **SUBJECT** Demand Calcs for Key Site No. 3 **JOB NO:** 16527.12

CHKD. BY: **DATE:** Sewer Study

Small Single Family Homes (97 units, upper mesa)

Average Day Flow per Unit	0.00034	CFS/Unit
Area Population*	271.6	
Peaking Factor***	2.40	

Multi-Family Townhomes (160 units, upper mesa)

Average Day Flow per Unit	0.00035	CFS/Unit
Area Population*	448.0	
Peaking Factor**	4.00	

Large Single Family Homes (28 units, upper mesa)

Average Day Flow per Unit	0.00034	CFS/Unit
Area Population*	78.4	
Peaking Factor***	2.40	

*****Population equall to 2.8 per unit per 200 US Census for Santa Barbara County

**Peaking Factor per equation 1 of the 2009 sewer master plan. P.F. = (18+P^0.5)/(4+P^0.5), where P=population in thousands

***Peaking Factor for Single Family Homes per LCSD Sewer System Master Plan

Residential Sewage Generation Summary

Area	Flow Per Unit (CFS)	Units	Average Day Flow Generation (CFS)	Average Day Flow Generation (GPM)	Peaking Factor	Peak Flow Generation (CFS)	Peak Flow Generation (GPM)
Small Single Family	0.00034	97.00	0.033	14.8	2.40	0.079	35.5
Multi-Family	0.00035	160.00	0.056	25.1	4.00	0.224	100.5
Large Single Family (Mesa)	0.00034	28.00	0.010	4.3	2.40	0.023	10.3
		Total	0.089	39.9		0.303	136.0

Appendix B

Wastewater Pipe Hydraulics

PIPE HYDRAULIC CALCULATOR

(Based on Manning's Equation, Open channel flow)

PROJECT: Orcutt Key Site No. 3
LOCATION: Orcutt
CLIENT: SB Clark, LLC
W.O. #: 16527.12

PENFIELD & SMITH, INC.
210 E. Enos Drive, Suite A
SANTA MARIA, CA. 93454
805-925-2345

CALCULATED BY: ALG
DATE: 10/20/11
CHECKED BY:
DATE: *
DIRECTORY:

Flow is calulcated in	gpm
Slope (decimal form) =	0.0050
Pipe Diameter (in) =	6
Mannings "n" =	0.013

Capacity (d/D)	Flow (gpm)	V (fps)
50%	89.033	2.021
67%	140.552	2.239
75%	162.375	2.290
90%	189.783	2.272

Flow (gpm)										
d/D	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090
0.00	0.000	0.027	0.120	0.286	0.531	0.855	1.261	1.750	2.322	2.978
0.10	3.718	4.540	5.446	6.434	7.505	8.656	9.887	11.198	12.586	14.052
0.20	15.594	17.210	18.899	20.660	22.492	24.392	26.360	28.393	30.491	32.650
0.30	34.871	37.151	39.487	41.879	44.324	46.821	49.367	51.961	54.600	57.282
0.40	60.006	62.769	65.570	68.405	71.272	74.170	77.096	80.048	83.023	86.019
0.50	89.033	92.064	95.108	98.163	101.227	104.296	107.368	110.441	113.511	116.576
0.60	119.633	122.678	125.710	128.725	131.720	134.691	137.636	140.552	143.434	146.279
0.70	149.084	151.846	154.559	157.222	159.828	162.375	164.858	167.272	169.613	171.876
0.80	174.055	176.144	178.139	180.032	181.818	183.487	185.033	186.447	187.717	188.834
0.90	189.783	190.550	191.115	191.456	191.543	191.335	190.776	189.774	188.162	185.539
1.00	178.067									

Velocity "V" (fps)										
d/D	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090
0.00	0.000	0.180	0.285	0.372	0.449	0.519	0.584	0.645	0.703	0.758
0.10	0.811	0.861	0.909	0.956	1.001	1.044	1.086	1.127	1.167	1.205
0.20	1.243	1.279	1.315	1.349	1.383	1.416	1.448	1.479	1.510	1.539
0.30	1.568	1.597	1.624	1.651	1.678	1.703	1.729	1.753	1.777	1.800
0.40	1.823	1.845	1.867	1.888	1.908	1.928	1.948	1.967	1.985	2.003
0.50	2.021	2.038	2.054	2.070	2.085	2.100	2.115	2.128	2.142	2.155
0.60	2.167	2.179	2.190	2.201	2.212	2.221	2.231	2.239	2.248	2.256
0.70	2.263	2.269	2.275	2.281	2.286	2.290	2.294	2.297	2.300	2.302
0.80	2.303	2.304	2.303	2.303	2.301	2.298	2.295	2.291	2.286	2.279
0.90	2.272	2.263	2.253	2.242	2.228	2.213	2.194	2.173	2.145	2.109
1.00	2.021									

PIPE HYDRAULIC CALCULATOR

(Based on Manning's Equation, Open channel flow)

PROJECT: Orcutt Key Site No. 3
LOCATION: Orcutt
CLIENT: SB Clark, LLC
W.O. #: 16527.05

PENFIELD & SMITH, INC.
210 E. Enos Drive, Suite A
SANTA MARIA, CA. 93454
805-925-2345

CALCULATED BY: ALG
DATE: 10/20/11
CHECKED BY:
DATE: *
DIRECTORY:

		Capacity (d/D)	Flow (gpm)	V (fps)
Flow is calulcated in	gpm			
Slope (decimal form) =	0.0050	50%	191.745	2.448
Pipe Diameter (in) =	8	67%	302.695	2.713
Mannings "n" =	0.013	75%	349.695	2.775
		90%	408.722	2.752

Flow (gpm)

d/D	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090
0.00	0.000	0.058	0.258	0.617	1.143	1.842	2.716	3.769	5.002	6.414
0.10	8.006	9.778	11.729	13.857	16.162	18.641	21.293	24.115	27.106	30.263
0.20	33.583	37.063	40.701	44.494	48.438	52.531	56.769	61.148	65.665	70.317
0.30	75.099	80.008	85.040	90.192	95.458	100.835	106.318	111.904	117.588	123.365
0.40	129.231	135.182	141.212	147.318	153.494	159.735	166.036	172.393	178.800	185.252
0.50	191.745	198.271	204.827	211.407	218.004	224.614	231.230	237.847	244.459	251.060
0.60	257.643	264.203	270.733	277.225	283.675	290.074	296.417	302.695	308.902	315.030
0.70	321.072	327.019	332.863	338.596	344.210	349.695	355.042	360.242	365.283	370.155
0.80	374.848	379.349	383.645	387.722	391.567	395.163	398.492	401.536	404.273	406.677
0.90	408.722	410.373	411.590	412.325	412.511	412.065	410.860	408.702	405.231	399.581
1.00	383.489									

Velocity "V" (fps)

d/D	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090
0.00	0.000	0.218	0.345	0.450	0.544	0.629	0.708	0.782	0.852	0.918
0.10	0.982	1.043	1.101	1.158	1.212	1.265	1.316	1.366	1.414	1.460
0.20	1.506	1.550	1.593	1.635	1.675	1.715	1.754	1.792	1.829	1.865
0.30	1.900	1.934	1.968	2.000	2.032	2.064	2.094	2.124	2.153	2.181
0.40	2.208	2.235	2.262	2.287	2.312	2.336	2.360	2.383	2.405	2.427
0.50	2.448	2.468	2.488	2.507	2.526	2.544	2.562	2.578	2.595	2.610
0.60	2.625	2.640	2.653	2.667	2.679	2.691	2.702	2.713	2.723	2.732
0.70	2.741	2.749	2.757	2.763	2.769	2.775	2.779	2.783	2.786	2.788
0.80	2.790	2.791	2.790	2.789	2.787	2.784	2.780	2.775	2.769	2.761
0.90	2.752	2.742	2.730	2.716	2.699	2.680	2.658	2.632	2.599	2.555
1.00	2.448									

PIPE HYDRAULIC CALCULATOR

(Based on Manning's Equation, Open channel flow)

PROJECT: Orcutt Key Site No. 3
LOCATION: Orcutt
CLIENT: SB Clark, LLC
W.O. #: 16527.05

PENFIELD & SMITH, INC.
210 E. Enos Drive, Suite A
SANTA MARIA, CA. 93454
805-925-2345

CALCULATED BY: ALG
DATE: 10/20/11
CHECKED BY:
DATE: *
DIRECTORY:

		Capacity (d/D)	Flow (gpm)	V (fps)
Flow is calulcated in	gpm			
Slope (decimal form) =	0.0050	50%	347.656	2.841
Pipe Diameter (in) =	10	67%	548.823	3.148
Mannings "n" =	0.013	75%	634.040	3.220
		90%	741.062	3.194

Flow (gpm)										
d/D	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090
0.00	0.000	0.105	0.467	1.118	2.072	3.339	4.925	6.834	9.069	11.629
0.10	14.517	17.729	21.266	25.125	29.304	33.799	38.607	43.724	49.147	54.870
0.20	60.889	67.200	73.796	80.673	87.825	95.245	102.929	110.869	119.059	127.493
0.30	136.164	145.065	154.189	163.528	173.076	182.825	192.768	202.895	213.201	223.675
0.40	234.312	245.101	256.035	267.105	278.302	289.618	301.043	312.569	324.186	335.885
0.50	347.656	359.490	371.376	383.306	395.268	407.252	419.248	431.246	443.234	455.202
0.60	467.139	479.032	490.871	502.643	514.337	525.940	537.440	548.823	560.077	571.188
0.70	582.142	592.924	603.521	613.916	624.095	634.040	643.735	653.161	662.302	671.136
0.80	679.645	687.805	695.594	702.987	709.958	716.478	722.515	728.033	732.995	737.355
0.90	741.062	744.056	746.263	747.594	747.933	747.123	744.939	741.026	734.732	724.489
1.00	695.312									

Velocity "V" (fps)										
d/D	0.000	0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090
0.00	0.000	0.253	0.400	0.522	0.631	0.730	0.821	0.907	0.989	1.066
0.10	1.139	1.210	1.278	1.344	1.407	1.468	1.527	1.585	1.640	1.694
0.20	1.747	1.798	1.848	1.897	1.944	1.990	2.035	2.079	2.122	2.164
0.30	2.205	2.244	2.283	2.321	2.358	2.394	2.430	2.464	2.498	2.531
0.40	2.563	2.594	2.624	2.654	2.683	2.711	2.738	2.765	2.791	2.816
0.50	2.841	2.864	2.887	2.910	2.931	2.952	2.972	2.992	3.011	3.029
0.60	3.046	3.063	3.079	3.094	3.109	3.123	3.136	3.148	3.160	3.171
0.70	3.181	3.190	3.199	3.207	3.213	3.220	3.225	3.229	3.233	3.236
0.80	3.237	3.238	3.238	3.237	3.234	3.231	3.226	3.220	3.213	3.204
0.90	3.194	3.181	3.167	3.151	3.132	3.110	3.085	3.054	3.016	2.965
1.00	2.841									

Appendix I

Traffic and Circulation Study

KEY SITE 3 RESIDENTIAL PROJECT
Traffic and Circulation Study

Orcutt, County of Santa Barbara

November 18, 2013

W.O. 16527.12

Prepared By:

Penfield & Smith

111 East Victoria Street
Santa Barbara, CA 93101

tel 805-963-9532
fax 805-966-9801

www.penfieldsmith.com

EXECUTIVE SUMMARY

The project proposes to construct 28 single family dwellings and 97 clustered single family units of varying size, for a total of 125 units, on the currently vacant site. An additional 160 multi-family units were approved by the County for Key Site 3 as part the *Santa Barbara Housing Element Focused Rezone Program,* and are therefore not included in the project.

Primary access to the site is proposed via Sunny Hills Road, which will be realigned to the west from its current location and connect to Clark Avenue opposite the main entrance for Key Site 1. Secondary gated access to Key Site 3 is proposed via a connection to Chancellor Street.

The project is expected to generate 995 average daily trips (ADT), with 70 trips occurring during the AM peak hour and 88 occurring in the PM peak hour. Level of service analyses were completed for four roadway segments, and for four intersections along Clark Avenue for the AM and PM peak hours for existing and cumulative traffic conditions with and without the project.

Roadway Analysis

The roadway analysis indicated that the roadway segments of Clark Avenue in the vicinity of the site, Stillwell Road and Sunny Hills Road would operate at LOS C or better under existing + project and cumulative + project traffic conditions. The project would not generate any impacts on the study area roadway segments.

Intersection Analysis

Existing intersection levels of service were calculated based on intersection AM and PM peak hour turning volumes and vehicle delay data collected in 2011. The level of service analysis indicated that all study area intersections operate at LOS C or better during the AM and PM peak hours.

The existing plus project intersection analysis indicated that the project would generate a project-specific impact at the Clark Avenue/U.S. 101 Southbound Ramps intersection by adding more than 15 trips to the intersection during the PM peak hour, which is forecast to operate in the LOS D range, thereby exceeding County thresholds.

Cumulative traffic conditions were derived from the *Housing Element Focused Rezone Program EIR*. The cumulative forecast assumes development of the approved and pending projects in Orcutt and Santa Maria, incorporates regional growth, and construction of several planned and programmed intersection and roadway improvements that would affect traffic patterns in the Orcutt area. The cumulative forecast also incorporates the development of 160 multifamily housing units on Key Site 3, which was approved by the County as part of the *Housing Element Focused Rezone Program EIR*.

The cumulative analysis indicated that the Clark Avenue/U.S. 101 Interchange would operate at LOS E/F under cumulative and cumulative + project conditions. The project would generate a

cumulative impact at the interchange during the PM peak hour by exceeding the County's cumulative thresholds.

The intersection level of service analysis is summarized in the following table.

Summary of Intersection Level of Service Analysis

Intersection	Time	Existing Year 2011		Existing + Project		Cumulative		Cumulative + Project	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Clark Avenue/ Stillwell Road	AM	0.50	LOS A	0.52	LOS A	0.56	LOS A	0.58	LOS A
	PM	0.48	LOS A	0.50	LOS A	0.67	LOS B	0.68	LOS B
Clark Avenue/ Sunny Hills Road	AM	16.4	LOS C	17.7	LOS C	0.53	LOS A	0.54	LOS A
	PM	13.7	LOS B	14.1	LOS B	0.68	LOS B	0.69	LOS B
Clark Avenue/ Hwy 101 SB Ramps	AM	23.8	LOS C	24.4	LOS C	**41.6**	**LOS E**	**42.0**	**LOS E**
	PM	23.4	LOS C	**25.7**	**LOS D**	**>50.0**	**LOS F**	**>50.0**	**LOS F**
Clark Avenue/ Hwy 101 NB Ramps	AM	15.1	LOS C	15.7	LOS C	17.2	LOS B	18.2	LOS B
	PM	21.3	LOS C	21.9	LOS C	**33.8**	**LOS D**	**36.5**	**LOS E**

Bolded values exceed County acceptable standard.

Mitigations

The Orcutt Transportation Improvement Plan (OTIP) includes a project to install traffic signals at the Clark Avenue Interchange. However, Caltrans staff have indicated that existing traffic volumes do not satisfy traffic signal warrants at the Southbound Ramps, and does not support installation of a traffic signal at this location. Evaluation of several mitigation options (Orcutt Village Marketplace Traffic and Circulation Study, January 2008, and the PSR-PDS for the Clark Avenue Interchange, March 2013) indicated that the Southbound Ramps intersection can remain unsignalized if the following improvements are implemented at the interchange:

1. Reconstruction of the Clark Avenue/U.S. 101 Northbound Ramps intersection. This includes realignment of the U.S. 101 Northbound On-Ramp to the east opposite the Off-Ramp, widening of the off-ramp to provide two separate turning lanes and widening of the on-ramp to provide two receiving lanes.
2. Signalization of the Clark Avenue/U.S. 101 Northbound Ramps intersection. The existing + project peak hour volumes would satisfy peak hour signal warrants.
3. Restripe of both ramp intersections and the overpass to maximize eastbound flow to the Northbound On-Ramp.
4. Minor Widening of the south side of Clark Avenue between the realigned Sunny Hills Road and the U.S. 101 Southbound Ramps to provide two eastbound travel lanes
5. Minor widening of the Southbound Off-Ramp to improve the operation of the southbound free right-turn lane

The signalized U.S. 101 Northbound Ramps intersection would operate at LOS A under project-specific and cumulative + project conditions. Signalization of the U.S. 101 Northbound Ramps intersections would platoon traffic and provide gaps for off-ramp traffic to enter Clark Avenue. The proposed improvements would also balance the heavy eastbound traffic flow over two lanes along Clark Avenue, on the overpass and onto the Northbound Ramps. The result is a reduction of delay at the Southbound Ramps, thereby mitigating the project's project-specific impact at this intersection.

The cumulative PM peak hour traffic volumes at the Southbound Ramps would satisfy the traffic signal peak hour warrants. The project's cumulative impacts will be mitigated by realigning and signalization of the Southbound Ramps, in addition to the realignment and signalization of the Northbound Ramps, which is the project-specific mitigation. The mitigated levels of service are shown in the table below.

Mitigated AM and PM Peak Hour
Intersection Level of Service

Intersection	AM Peak Hour		PM Peak Hour	
	Existing + Project LOS	Cumulative + Project LOS	Existing + Project LOS	Cumulative + Project LOS
Clark Ave/U.S. 101 SB Ramps	N/A	0.49/LOS A	15.8 sec/LOS C	0.46/LOS A
Clark Ave/U.S. 101 NB Ramps	N/A	0.53/LOS A	0.52 sec/LOS A	0.61/LOS B

It is noted that the realignment and signalization of the Northbound and Southbound Ramps are included in the OTIP fee program.

The ultimate cross section of Clark Avenue upon construction of Key Sites 1- 3 will be two travel lanes, a landscaped center median, turning bays at intersections, sidewalks, and a Class II bike lanes in both directions from Stillwell Road to the U.S. Highway 101. Sunny Hills Road will be realigned opposite the main entrance of Key Site 1. It was recommended that the minimum storage length for the left-turn lane on Sunny Hills Road should be 200 feet, and the westbound left-turn lane on Clark Avenue should have a minimum storage length of 240 feet to accommodate cumulative turning volumes.

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Appendix 1- County Roadway Classifications and Levels of Service Standards
Appendix 2- AM and PM Peak Hour Intersection Counts
Appendix 3- Intersection Levels of Service Calculation Worksheets
Appendix 4-Clark/101 PSR-PDS

INTRODUCTION

Penfield & Smith, in coordination with the County of Santa Barbara, has prepared the following traffic and circulation study for the Key Site 3 Residential Project. The traffic analysis includes an assessment of the existing and future traffic conditions within the study area, determines the trip generation and trip distribution for the proposed development, evaluates the potential traffic impacts to the vicinity roadways and intersections, and provides mitigations where applicable. An evaluation of the site access plan is also provided.

The Orcutt Community Plan FEIR[1] identifies 45 "Key Sites" located throughout the Orcutt planning area. The project site is identified as Key Site 3. In order to streamline future permitting, the County of Santa Barbara enabled interested Key Site property owners to receive an expanded level of environmental review for their property. These "mini EIRs" examined the impacts associated with potential development scenarios on the "Key Sites" and were then incorporated into the Community Plan FEIR. Thus, a development proposal that is consistent with the scenario studied in the EIR could use the CEQA tiering process to incorporate the site-specific analysis and findings as part of their future development proposal. The FEIR has been used as basis for this analysis and is incorporated by reference.

STUDY AREA

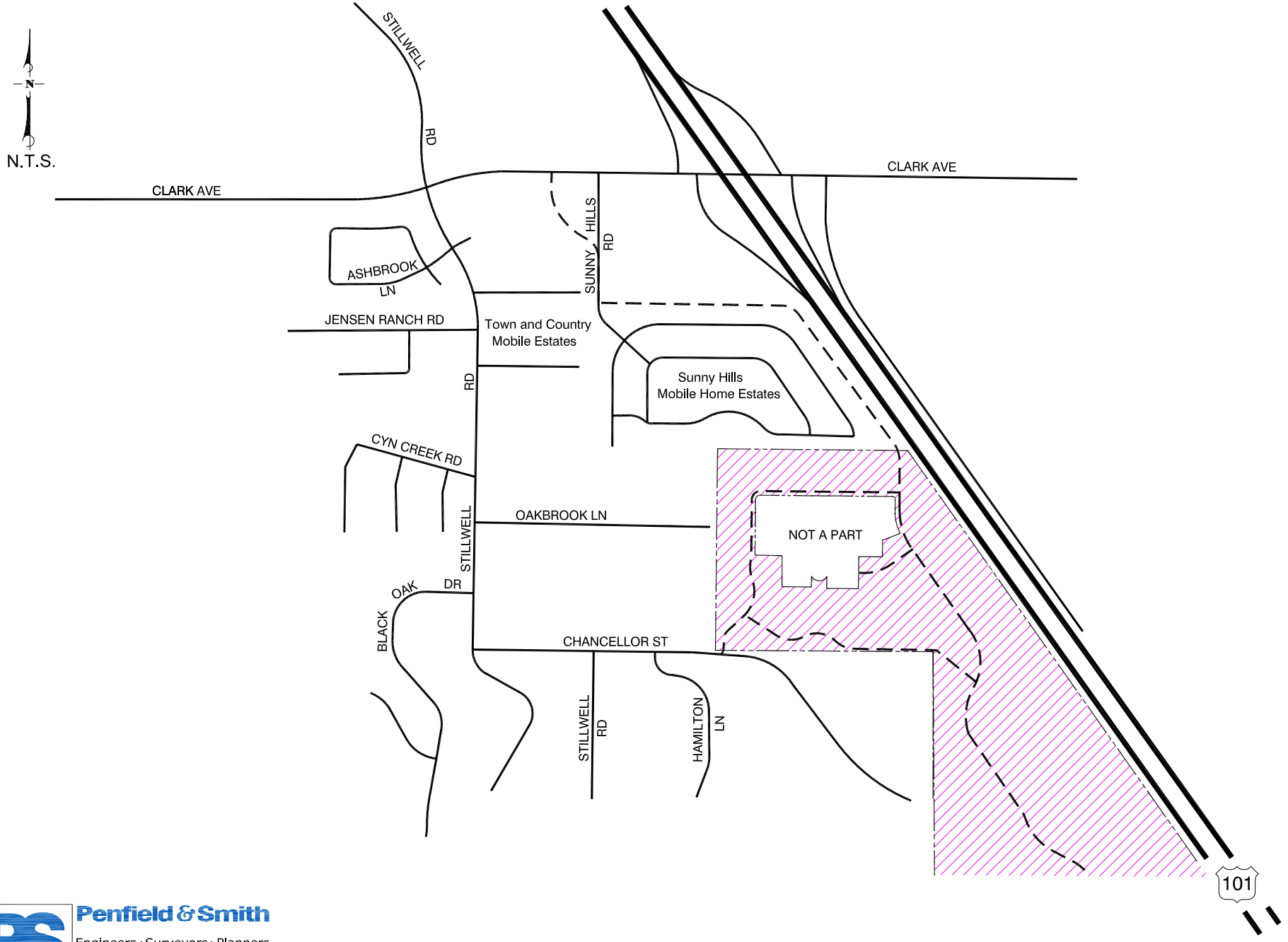
The project study area is located in the southeastern section of the Orcutt Planning Area and is generally bounded by Highway 101 to the east, Sunny Hills Mobile Home Park to the north, Orcutt Hills to the south, and existing residential to the west. The location of the project is illustrated in Exhibit 1. Based on the Orcutt Community Plan FEIR, the following intersections have been included in the traffic study:

1. Clark Avenue at Stillwell Road;
2. Clark Avenue at Sunny Hills Road;
3. Clark Avenue at U.S. Highway 101 Southbound Ramps; and
4. Clark Avenue at U.S. Highway 101 Northbound Ramps.

PROJECT DESCRIPTION

The project site is located south of the Sunny Hills Mobile Home Park and west of Highway 101. Surrounding land uses include the currently undeveloped Key Site 2 and the Sunny Hills Mobile Home Park to the north, undeveloped land to the south, U.S. Highway 101 to the east, and residences to the west. The project proposes to construct a total of 125 clustered single family residential units. The preliminary site plan is illustrated in Exhibit 2.

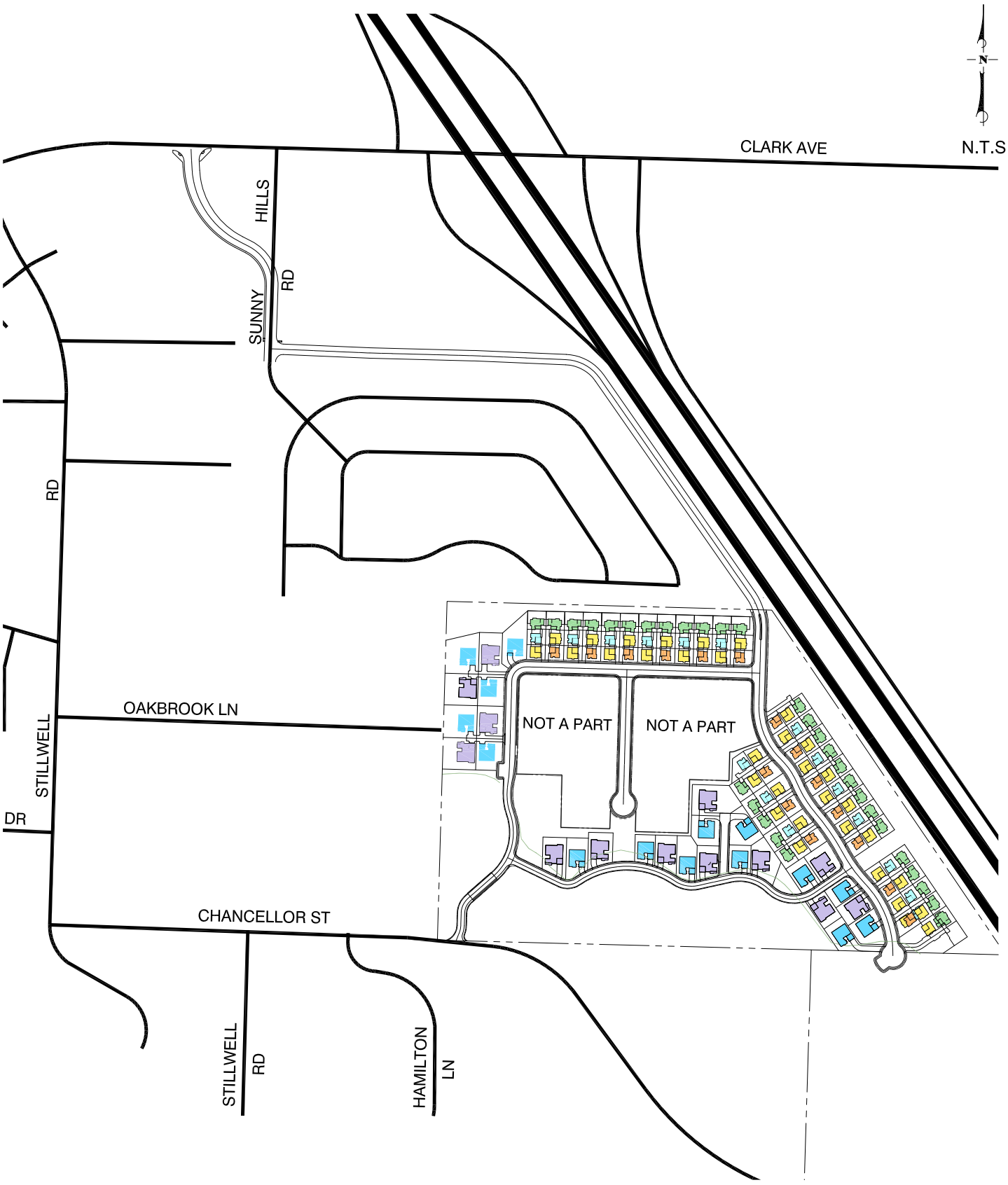
[1] Orcutt Community Plan Update, Final Environmental Impact Report, County of Santa Barbara, December 2005.



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EXHIBIT 1
PROJECT LOCATION/STREET NETWORK
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EXHIBIT 2
PROJECT SITE PLAN
KEY SITE 3, ORCUTT, CA

Primary access to the site is proposed via Sunny Hills Road, which will be realigned to the west from its current location and connect to Clark Avenue opposite the main entrance for Key Site 1. The Orcutt Community Plan FEIR identified two alternatives, one "preferred" and one "acceptable", for aligning Sunny Hills Road to accommodate future development of Key Sites 1, 2 and 3. Key Sites 1 and 2 are proposing to construct the "preferred" alignment, which realigns Sunny Hills Road to the west through Key Site 2. Secondary gated access to Key Site 3 is proposed via a connection to Chancellor Street.

STUDY METHODOLOGY

Level of Service Criteria

To identify the operating condition at the study area roadways and intersections, a level of service (LOS) ranking scale was used. This scale compares traffic volumes to roadway and intersection capacity and assigns a letter value to this relationship. The letter scale ranges from A to F with LOS A representing free flow conditions and LOS F representing congested conditions. To determine levels of service for signalized intersections, the Intersection Capacity Utilization Methodology (ICU) was used and the results are shown as a volume to capacity ratio. Level of service for the unsignalized intersections in the study area were calculated using the methodologies outlined in the Highway Capacity Manual (HCM)[2] and the results are presented as seconds of delay. The level of service criteria is summarized in Table 1 below. The County's acceptable standard is LOS C.

[2] Highway Capacity Manual, Transportation Research Board, 2010.

Table 1
Intersection Level of Service Criteria

LOS	Signalized intersections (V/C Ratio)	Unsignalized intersections (Sec. of delay)	Definition
A	< 0.60	≤ 10	Conditions of free unobstructed flow, no delays and all signal phases sufficient in duration to clear all approaching vehicles.
B	0.61 – 0.70	> 10 and ≤ 15	Conditions of stable flow, very little delay, a few phases are unable to handle all approaching vehicles.
C	0.71- 0.80	> 15 and ≤ 25	Conditions of stable flow, delays are low to moderate, full use of peak direction signal phases is experienced.
D	0.81 – 0.90	> 25 and ≤ 35	Conditions approaching unstable flow, delays are moderate to heavy, significant signal time deficiencies are experienced for short durations during the peak traffic period.
E	0.91 – 1.00	> 35 and ≤ 50	Conditions of unstable flow, delays are significant, signal phase timing is generally insufficient, congestion exists for extended duration throughout the peak period.
F	> 1.00	> 50	Conditions of forced flow, travel speeds are low and volumes are well above capacity. This condition is often caused when vehicles released by an upstream signal are unable to proceed because of back-ups from a downstream signal

Source: Highway Capacity Manual, 2010 Edition.

Traffic Impact Thresholds

The County's CEQA Thresholds and the standards contained in the Orcutt Community Plan were applied to evaluate the project's consistency with County policy and to determine if any potential traffic impacts would be associated with the project. The applicable traffic thresholds are outlined below.

County of Santa Barbara CEQA Thresholds

The Environmental Thresholds and Guidelines Manual (County of Santa Barbara, 1992) provides criteria by which to evaluate a project's environmental impacts according to the California Environmental Quality Act (CEQA). The thresholds for traffic impacts are listed below.

Threshold Criteria

The impacts of project-generated traffic are assessed against the following County thresholds. A significant traffic impact occurs when:

1. The addition of project traffic to an intersection increases the volume to capacity (V/C) ratio by the value provided below or sends at least 5, 10, or 15 trips to intersections operating at LOS F, E or D.

Level of Service (including project)	Increase in V/C Greater than
A	0.20
B	0.15
C	0.10
	or the addition of
D	15 trips
E	10 trips
F	5 trips

2. Project access to a major road or arterial road would require a driveway that would create an unsafe situation or a new traffic signal or major revisions to an existing traffic signal.

3. Project adds traffic to a roadway that has design features (e.g. narrow width, road side ditches, sharp curves, poor sight distance, inadequate pavement structure) or receives use which would be incompatible with substantial increase in traffic (e.g. Rural roads with use by farm equipment, livestock, horseback riding, or residential roads with heavy pedestrian or recreational use, etc.) that will become potential safety problems with the addition of project or cumulative traffic. Exceedence of the roadway's designated Circulation Element Capacity may indicate the potential for the occurrence of the above impacts.

4. Project traffic would utilize a substantial portion of an intersection(s) capacity where the intersection is currently operating at acceptable levels of service (A-C) but with cumulative traffic would degrade to or approach LOS D (V/C 0.81) or lower. Substantial is defined as a minimum change of 0.03 for intersections which would operate from 0.80 to 0.85 and a change of 0.02 for intersections which would operate from 0.86 to 0.90, and 0.01 for intersections operating at anything lower.

Orcutt Community Plan Standards for Determination of Project Consistency

Consistency Standards for Primary Roadways (P-1 through P-3)

1. For Primary roadways segments, a project is considered consistent with the Community Plan where the Estimated Future Volume does not exceed the Acceptable Capacity.

2. For Primary roadway segments where the Estimated Future Volume exceeds the Acceptable Capacity, a project is considered consistent with the Community Plan if: 1) intersections affected by traffic assigned from the project operate at or above minimum level of service standards, or 2) if the project provides a contribution toward an alternative transportation project (as defined in the OTIP) that is deemed to offset the effects of project-generated traffic.

EXISTING CONDITIONS

Existing Roadway Network

U.S. Highway 101 (U.S. 101) extends along the Pacific Coast between Los Angeles and San Francisco. Within Santa Barbara County, this four to six-lane highway provides the principal route between Orcutt and the cities of Buellton, Goleta and Santa Barbara to the south, and the cities of Santa Maria and San Luis Obispo to the north. Access between U.S. Highway 101 and the project site is provided via the Clark Avenue Interchange.

Bradley Road is a four-lane arterial that extends north from Stubblefield Road to Santa Maria Way. Bradley Road is designated as a Primary 2 roadway. The intersection with Clark Avenue are signalized.

Clark Avenue is an east-west arterial that extends through the Orcutt area from Dominion Road east of U.S. Highway 101 to State Route 1 to the west. Clark Avenue contains four lanes west of Stillwell Road. The roadway contains three travel lanes between Stillwell Road and U.S. 101; the eastbound direction is striped to one travel lane. The segment east of U.S. 101 contains two travel lanes. The speed limit in the project vicinity is 45 MPH. The intersection with Stillwell Road is signalized. The intersections with the U.S. Highway 101 ramps and Sunny Hills Road are unsignalized. Clark Avenue is designated as a Primary 2 roadway.

Stillwell Road is a two-lane collector road that would provide emergency access to the project site. The roadway extends south of Clark Avenue until it terminates at Chancellor Street. The speed limit on Stillwell Road is 30 MPH. Stillwell Road is designated as a Secondary 3 roadway.

Sunny Hills Road is a Secondary 3 roadway that extends south of Clark Avenue through Key Site 2. The roadway provides access to the Sunny Hills Mobile Home Park. Sunny Hills Road has a speed limit of 15 MPH. Sunny Hills Road is proposed to be realigned to the west and

connect to Clark Avenue directly opposite the main driveway for Key Site 1. The new intersection will be controlled by a traffic signal.

Existing Roadway Operations

Existing average daily traffic (ADT) volumes were derived from the *Housing Element Focused Rezone Program EIR*[3] for the segments of Clark Avenue and Sunny Hills Road within the study-area based on the peak hour traffic volumes at the intersections within the vicinity of the site. A comparison of the ADT volumes with the County's design capacities (included in the Technical Appendix) indicate that the critical roadway segments in the study area currently operate at LOS A. The roadway classification and design capacities for Clark Avenue, as presented in the Orcutt Community Plan, are summarized below.

Table 2
Existing Roadway Levels of Service

Roadway	Segment	Existing ADT	Classification	LOS C Threshold	Existing LOS
Clark Avenue	Bradley Rd to Stillwell Rd	16,100 ADT	Primary 2	34,000 ADT	LOS A
Clark Avenue	Stillwell Rd to U.S. 101	15,800 ADT	Primary 2	24,100 ADT[1]	LOS A
Stillwell Road	South of Clark Ave	1,800 ADT	Secondary 3	6,300 ADT	LOS A
Sunny Hills Road	South of Clark Ave	800 ADT	Secondary 3	6,300 ADT	LOS A

[1] LOS C threshold for 3-lane roadway (24,100 ADT) based on median between 2-lane roadway (14,300 ADT) and 4-lane roadway (34,000 ADT).

Table 2 indicates that all roadways within the study area operate in the LOS A range, which meets County standards.

Existing Intersection Operations

Turning volume counts at the existing study intersections were collected by Penfield & Smith for the AM and PM peak commute periods (7AM to 9AM and 4PM to 6PM) in June and September, 2011. In addition, vehicle delay data was collected for the intersections of Clark Avenue with the U.S. 101 Northbound and Southbound Ramps, which are unsignalized. The existing lane geometry and intersection control is shown in Exhibit 3 and the AM and PM peak hour volumes are illustrated in Exhibits 4 and 5.

[3] Housing Element Focused Rezone Program Environmental Impact Report, Santa Barbara County, Adopted February 2009.

Levels of service were calculated for the study-area intersections based on the existing peak hour traffic volumes, intersection geometries and level of service methodology outlined previously. The existing intersection levels of service are summarized in Table 3. As shown, all the study intersections currently operate at LOS C or better during both peak hours, which is considered acceptable based on County standards.

Table 3
Existing Peak Hour Levels of Service

Intersection	Traffic Control	AM Peak Hour V/C Ratio or Delay	PM Peak Hour V/C Ratio or Delay
Clark Avenue/Stillwell Road	Signal	0.50/LOS A	0.48/LOS A
Clark Avenue/Sunny Hills Road	One-Way Stop	16.4 sec/LOS C	13.7 sec/LOS B
Clark Avenue/U.S. 101 SB Ramps	One-Way Stop	23.8 sec/LOS C	23.4 sec/LOS C
Clark Avenue/U.S. 101 NB Ramps	One-Way Stop	15.1 sec/LOS C	21.3 sec/LOS C

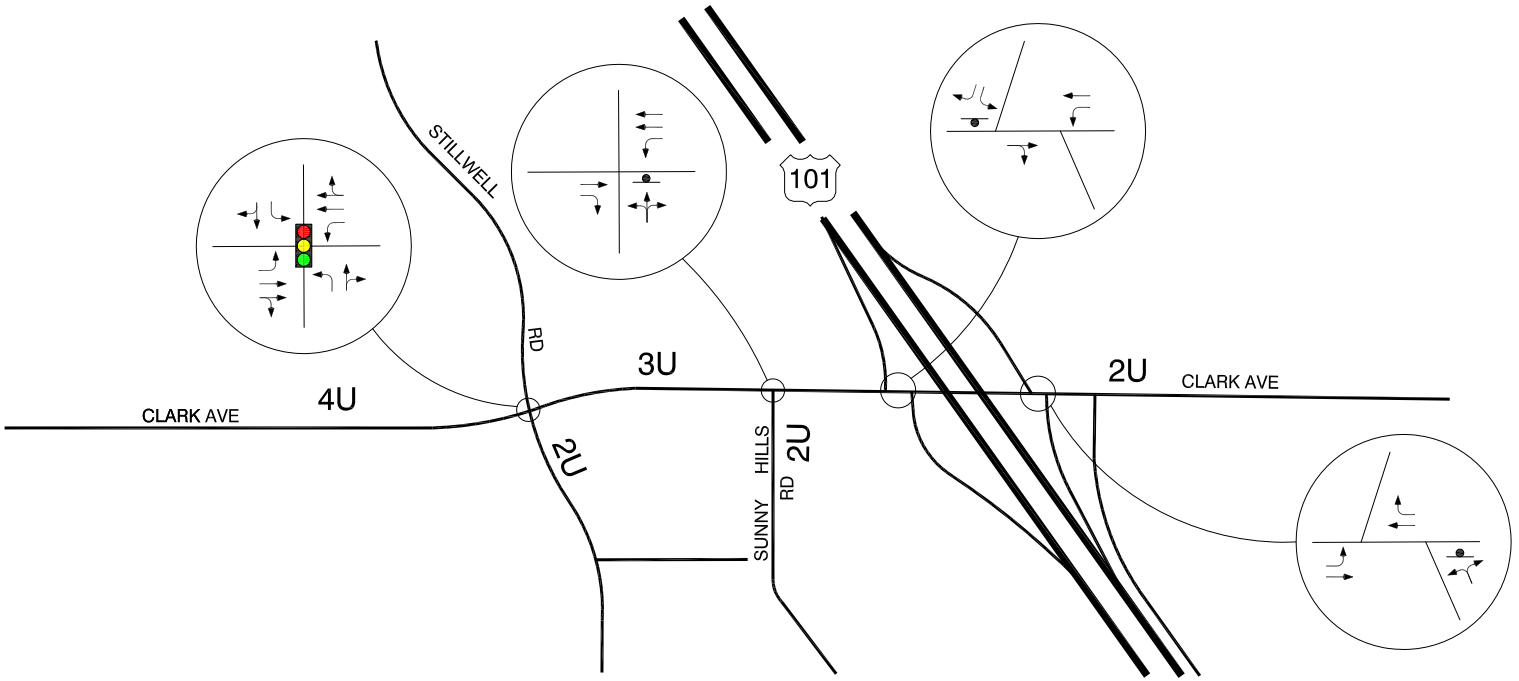
Levels of service for unsignalized intersections based on average delay per vehicle.
Bolded values exceed County acceptable standard.

LEGEND

- Intersection Lane Geometry
2U - Two-Lane Undivided Roadway
- Traffic Signal
- Stop Sign

N

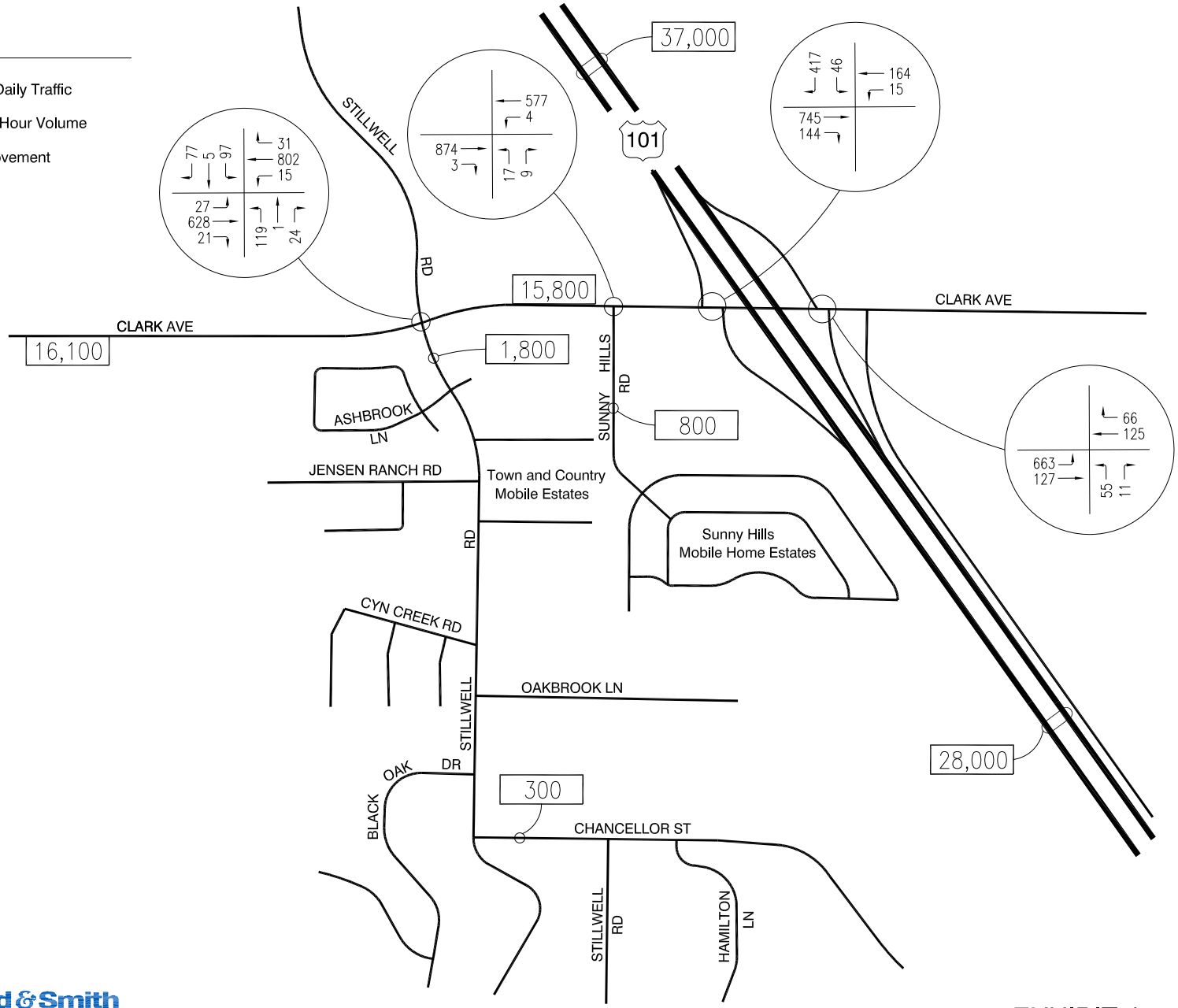
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EXHIBIT 3
EXISTING ROADWAY AND INTERSECTION GEOMETRY
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EXHIBIT 4
EXISTING ADT AND AM PEAK HOUR TRAFFIC VOLUMES
KEY SITE 3, ORCUTT, CA

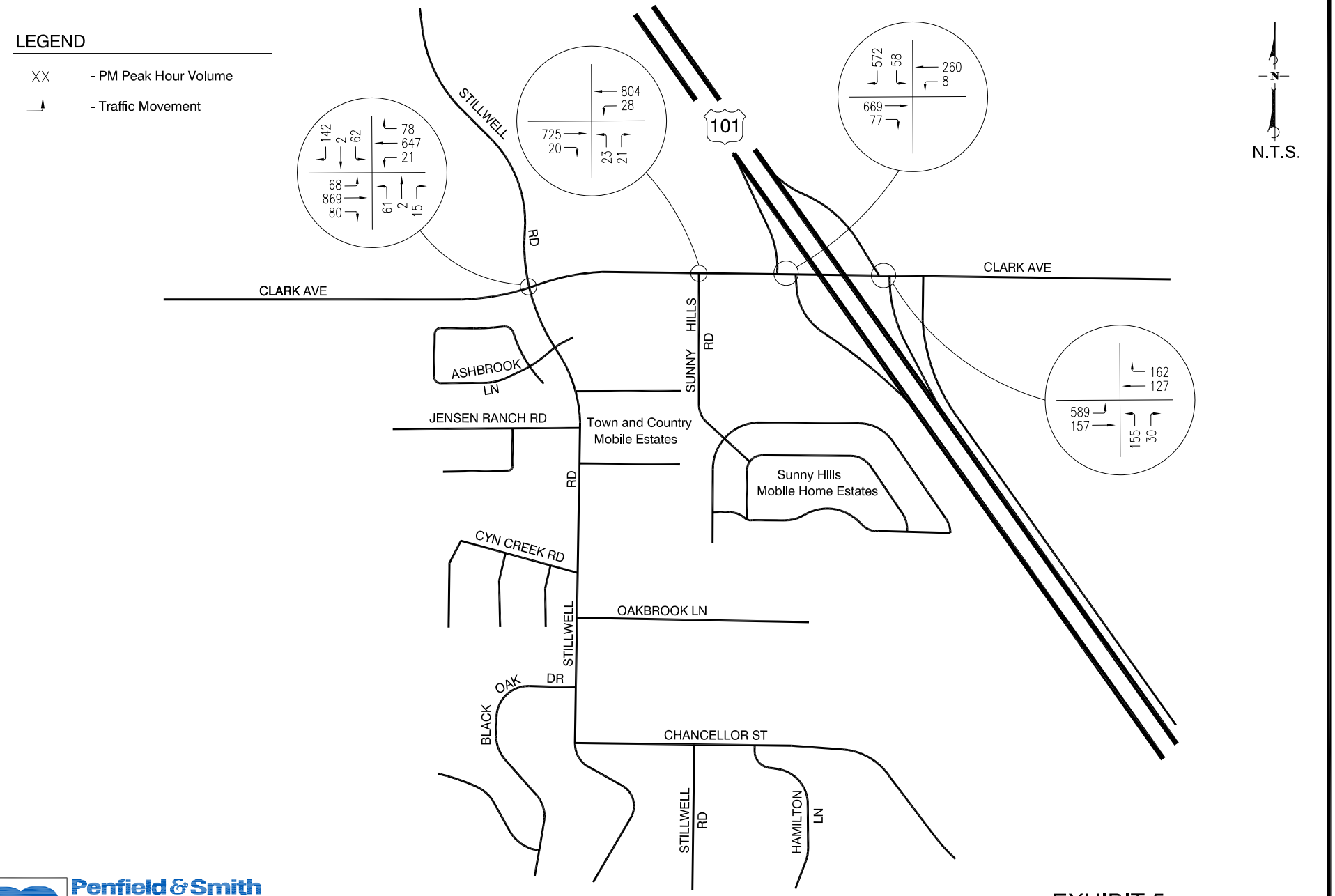


EXHIBIT 5
EXISTING PM PEAK HOUR TRAFFIC VOLUMES
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PROJECT-SPECIFIC ANALYSIS

Project Trip Generation

The project proposes to construct 28 single family dwellings and a mix of 97 one-story and two-story residential units of varying size. Review of published trip generation data indicated that the land uses *Single-Family Detached Housing (Land Use #210)* and *Planned Unit Development (Land Use #270)* contained in the ITE's *Trip Generation* manual[4] would provide the best "fit" for the proposed development. The trip generation rates are shown in Table 4.

Table 4
Project Trip Generation Rates

Land Use	ITE Code	Daily Rate	AM Peak Hour Rate			PM Peak Hour Rate		
			In	Out	Total	In	Out	Total
Single Family Residential	210	9.52	0.188	0.562	0.75	0.630	0.370	1.00
Planned Unit Development	270	7.50	0.112	0.398	0.51	0.403	0.217	0.62

The trip generation estimates are summarized in Table 5. The proposed development is expected to generate 995 daily trips, with 70 trips occurring during the AM peak hour and 88 trips occurring in the PM peak hour.

Table 5
Project Trip Generation

Land Use	Size	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			In	Out	Total	In	Out	Total
Single Family Residential	28 Units	267	5	16	21	18	10	28
Planned Unit Development	97 units	728	11	38	49	39	21	60
Total	**125 units**	**995**	**16**	**54**	**70**	**57**	**31**	**88**

Project Trip Distribution

Project generated trips were distributed and assigned to the street network based on the location of the project site, trip distribution patterns derived from the Orcutt Traffic Model, and a

[4] Trip Generation, Institute of Transportation Engineers, 9th Edition, 2012.

knowledge of the local street network and travel patterns, type of existing land uses and traffic flows in the Orcutt area. The project traffic was distributed as follows:

Table 6
Project Trip Distribution

Street (to/from)	Direction	Percentage of Project Trips
U.S. 101	North	35%
	South	15%
Clark Avenue	East	0%
	West	48%
Local	-	2%
Total		**100%**

The distribution percentages and the project-added average daily and peak hour traffic volumes are illustrated in Exhibits 6 and 7.

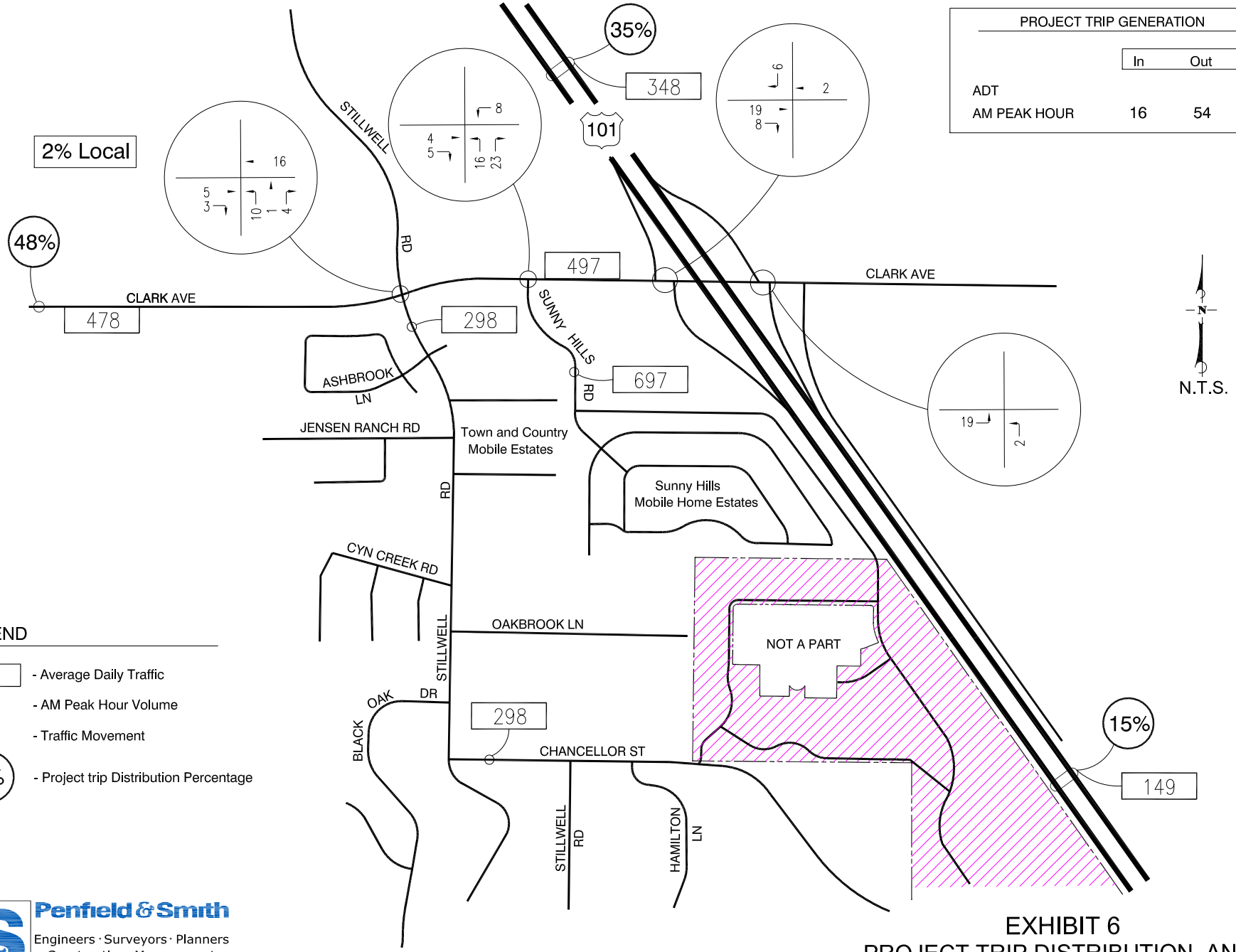
Project-Specific Roadway Operations

Roadway operations for the segments in the study area were evaluated assuming project-specific conditions. The project would add 631 ADT to Clark Avenue west of Stillwell Road, 657 ADT to Clark Avenue east of Stillwell Road and 658 ADT to Clark Avenue east Sunny Hills Road. The project would add 697 ADT to Sunny Hills Road south of Clark Avenue. Table 7 shows the existing + project ADT and level of service for the critical roadway segments.

Table 7
Existing + Project Roadway Levels of Service

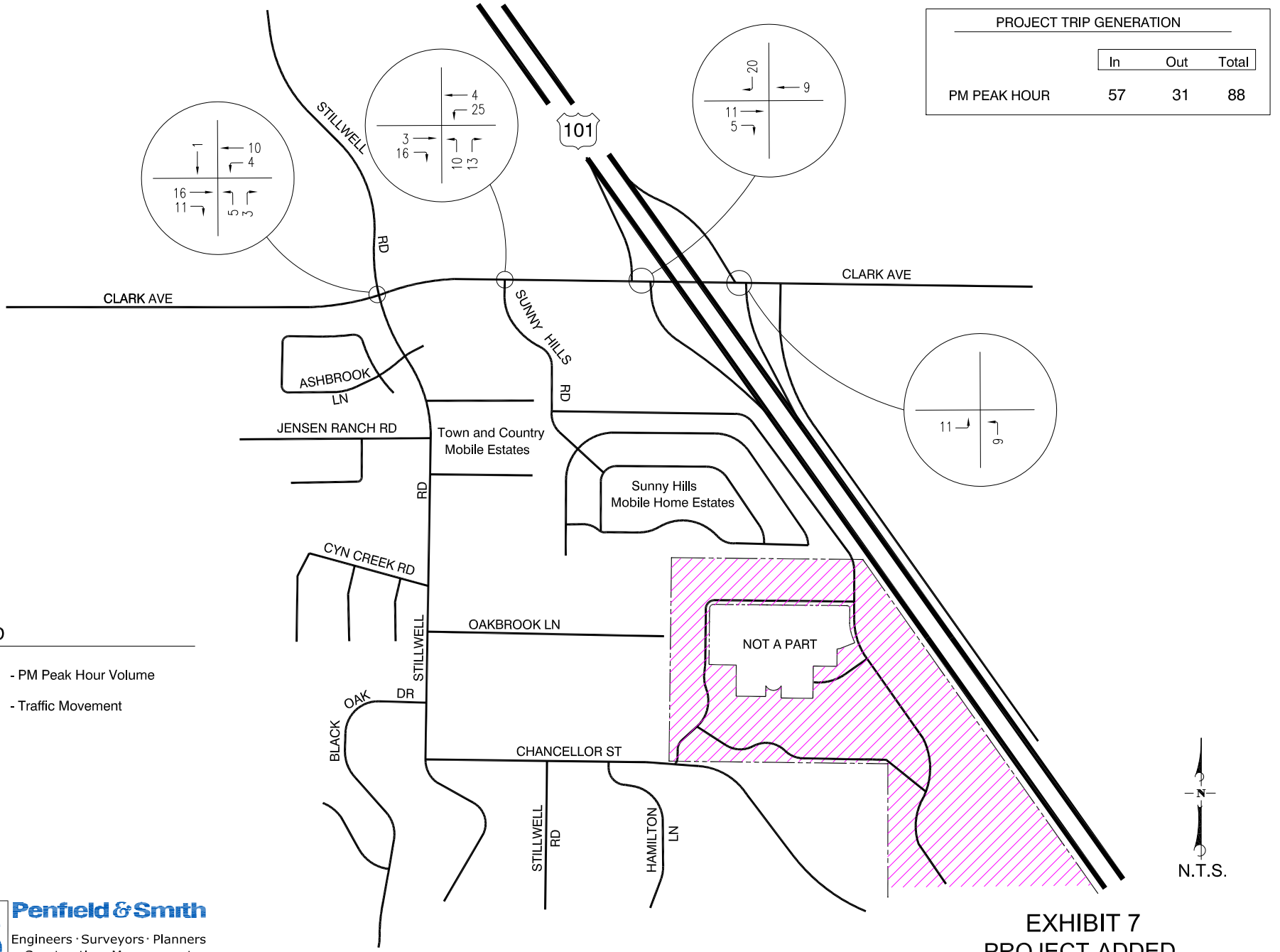
Roadway	Segment	Existing + Project ADT	Classification	LOS C Threshold	Existing + Project LOS
Clark Avenue	Bradley Rd to Stillwell Rd	16,578 ADT	Primary 2	34,000 ADT	LOS A
Clark Avenue	Stillwell Rd to U.S. 101	16,297 ADT	Primary 2	24,100 ADT[1]	LOS A
Stillwell Road	South of Clark Ave	2,098 ADT	Secondary 3	6,300 ADT	LOS A
Sunny Hills Road	South of Clark Ave	1,497 ADT	Secondary 3	6,300 ADT	LOS A

[1] LOS C threshold for 4-lane roadway is 34,000 ADT. LOS C threshold for 3-lane roadway (24,100 ADT) based on median between 2-lane roadway (14,300 ADT) and 4-lane roadway (34,000 ADT).



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EXHIBIT 6
PROJECT TRIP DISTRIBUTION AND PROJECT-ADDED AM PEAK HOUR TRIPS
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EXHIBIT 7
PROJECT-ADDED PM PEAK HOUR TRIPS
KEY SITE 3, ORCUTT, CA

The roadway level of service data contained in Table 7 indicates that the segments of Clark Avenue within the study-area and Sunny Hills Road would continue to operate at LOS A under project-specific conditions. The project would therefore not generate any project-specific roadway impacts.

Project-Specific Intersection Operations

Project-generated traffic volumes were added to the existing peak hour traffic volumes and levels of service were recalculated assuming existing + project conditions. The existing + project traffic volumes are illustrated in Exhibits 8 and 9. Tables 8 and 9 summarize the LOS calculations.

Table 8
AM Peak Hour
Existing + Project Intersection Level of Service

Intersection	Existing LOS	Existing + Project LOS	Change in V/C or Delay	Project - Added Trips	Impact?
Clark Ave/Stillwell Rd	0.50/LOS A	0.52/LOS A	0.02	39 trips	No
Clark Ave/Sunny Hills Rd	16.4 sec/LOS C	17.7 sec/LOS C	1.3 sec	58 trips	No
Clark Ave/U.S. 101 SB Ramps	23.8 sec/LOS C	24.4 sec/LOS C	0.6 sec	35 trips	No
Clark Ave/U.S. 101 NB Ramps	15.1 sec/LOS C	15.7 sec/LOS C	0.6 sec	21 trips	No

Table 9
PM Peak Hour
Existing + Project Intersection Level of Service

Intersection	Existing LOS	Existing + Project LOS	Change in V/C or Delay	Project - Added Trips	Impact?
Clark Ave/Stillwell Rd	0.48/LOS A	0.50/LOS A	0.02	50 trips	No
Clark Ave/Sunny Hills Rd	13.7 sec/LOS B	14.1 sec/LOS B	0.4 sec	75 trips	No
Clark Ave/U.S. 101 SB Ramps	23.4 sec/LOS C	**25.7 sec/LOS D**	2.3 sec	45 trips	**Yes**
Clark Ave/U.S. 101 NB Ramps	21.3 sec/LOS C	21.9 sec/LOS C	0.6 sec	20 trips	No

Bolded values exceed County acceptable standard.

The level of service data contained in tables 8 and 9 indicate that the study area intersections are expected to operate at LOS C or better during the AM peak hour under project-specific conditions. The project would generate a project-specific impact at the Clark Avenue/U.S. 101 Southbound Ramps intersection during the PM peak hour by adding more than 15 PHT to the intersection, which would operate at LOS D under existing plus project conditions.

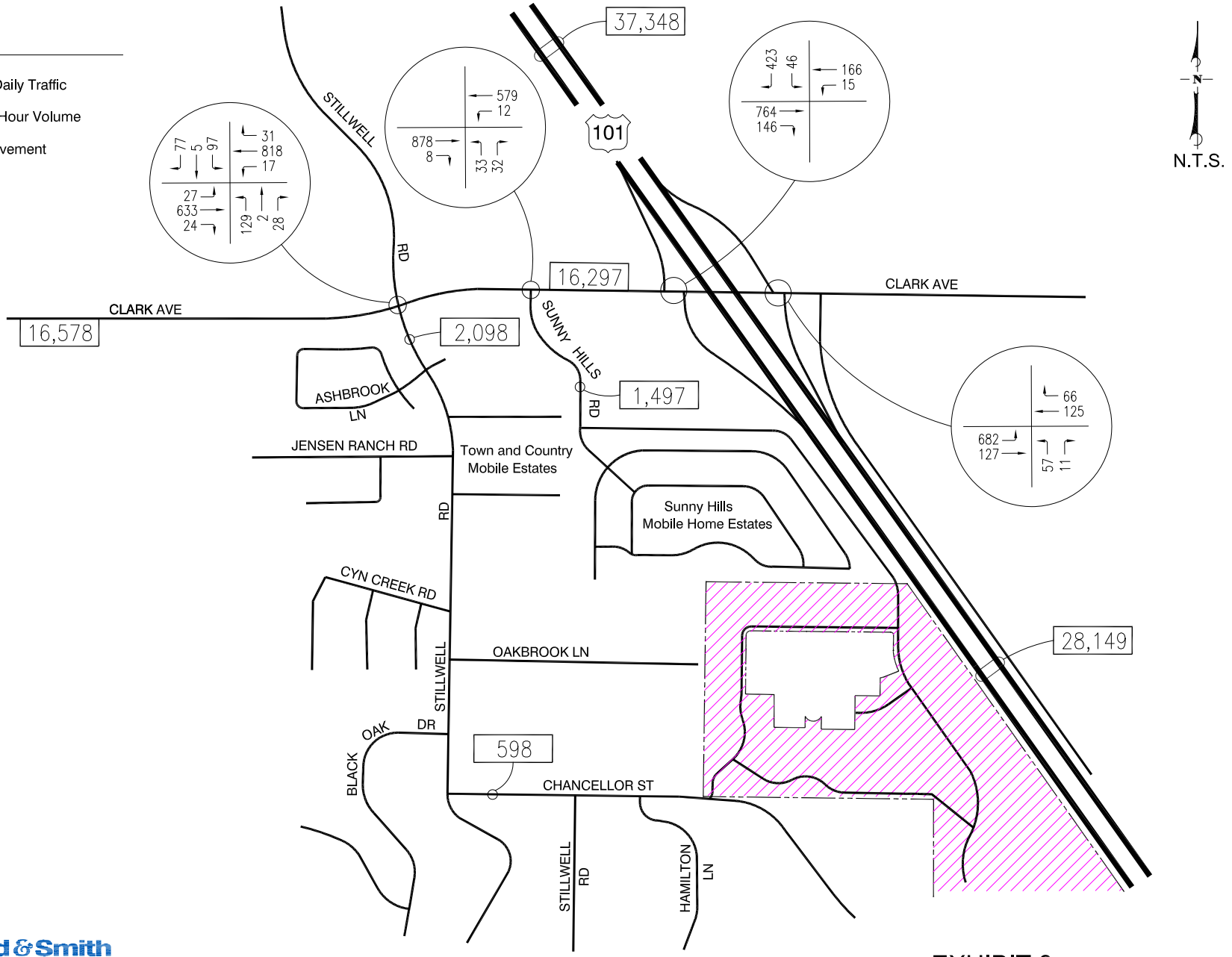


EXHIBIT 8
EXISTING+PROJECT ADT AND
AM PEAK HOUR TRAFFIC VOLUMES
KEY SITE 3, ORCUTT, CA

Penfield & Smith
Engineers · Surveyors · Planners
· Construction Management ·
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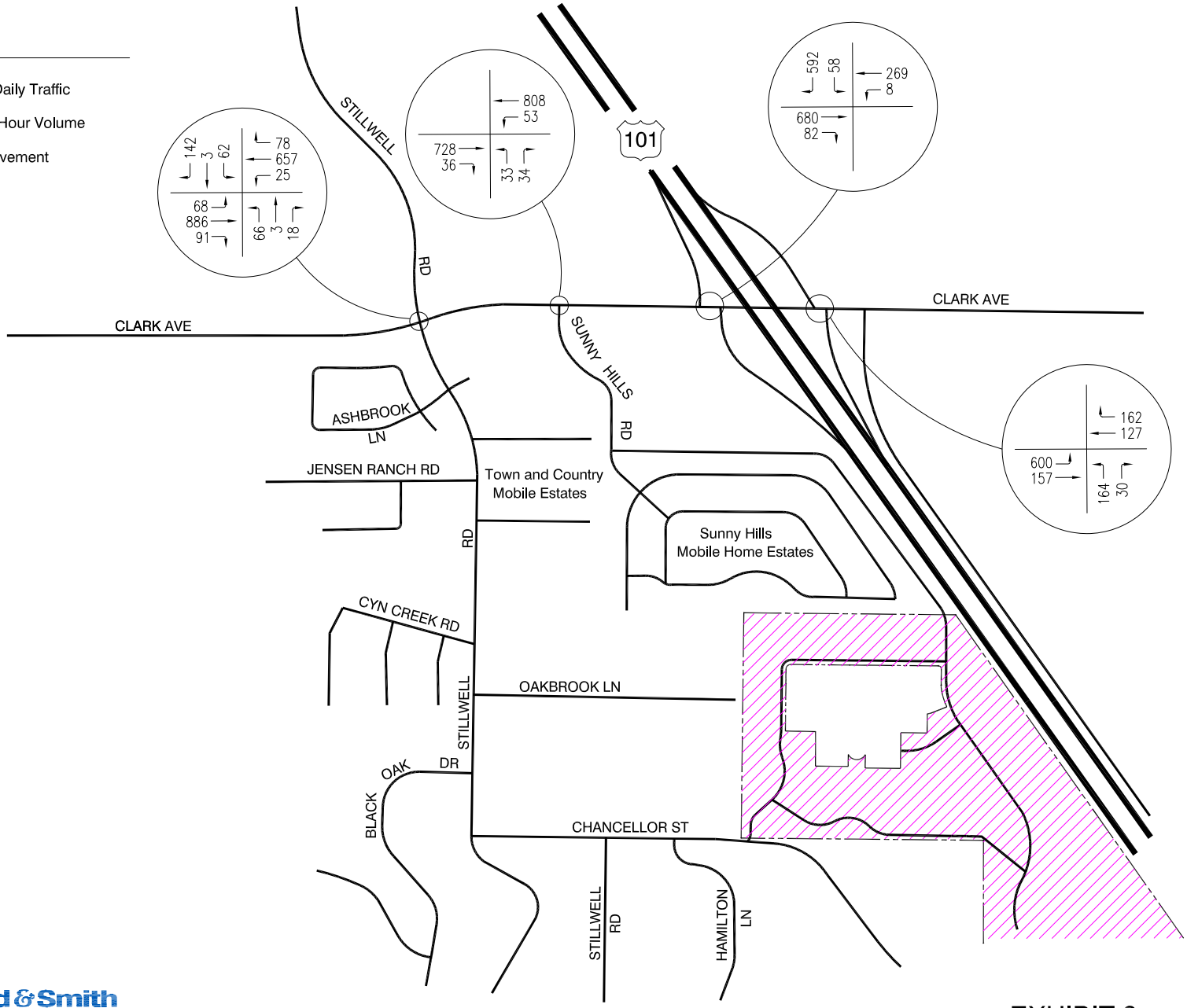


EXHIBIT 9
EXISTING+PROJECT PM PEAK HOUR TRAFFIC VOLUMES
KEY SITE 3, ORCUTT, CA

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Several improvements have been developed in coordination with Caltrans and County staff to improve operations at the Clark Avenue Interchange. These improvements, which are outlined in the Mitigations section, would mitigate the project specific impact at the Clark Avenue/U.S. 101 Southbound Ramps intersection.

It is noted that with the development of Key Sites 1 and 3, Sunny Hills Road is proposed to be realigned to the west and signalized at its new intersection with Clark Avenue. The new signalized intersection would operate at LOS A during both peak hours under existing plus project conditions.

Project Access

Primary access to Key Site 3 is proposed via Sunny Hills Road, which will be realigned to the west through Key Site 2 and connect to Clark Avenue opposite the future main entrance to Key Site 1. The new Clark Avenue/Sunny Hills Road intersection will serve as primary access for Key Sites 1, 2 and 3. Exhibit 10 shows the proposed roadway alignment of Sunny Hills Road.

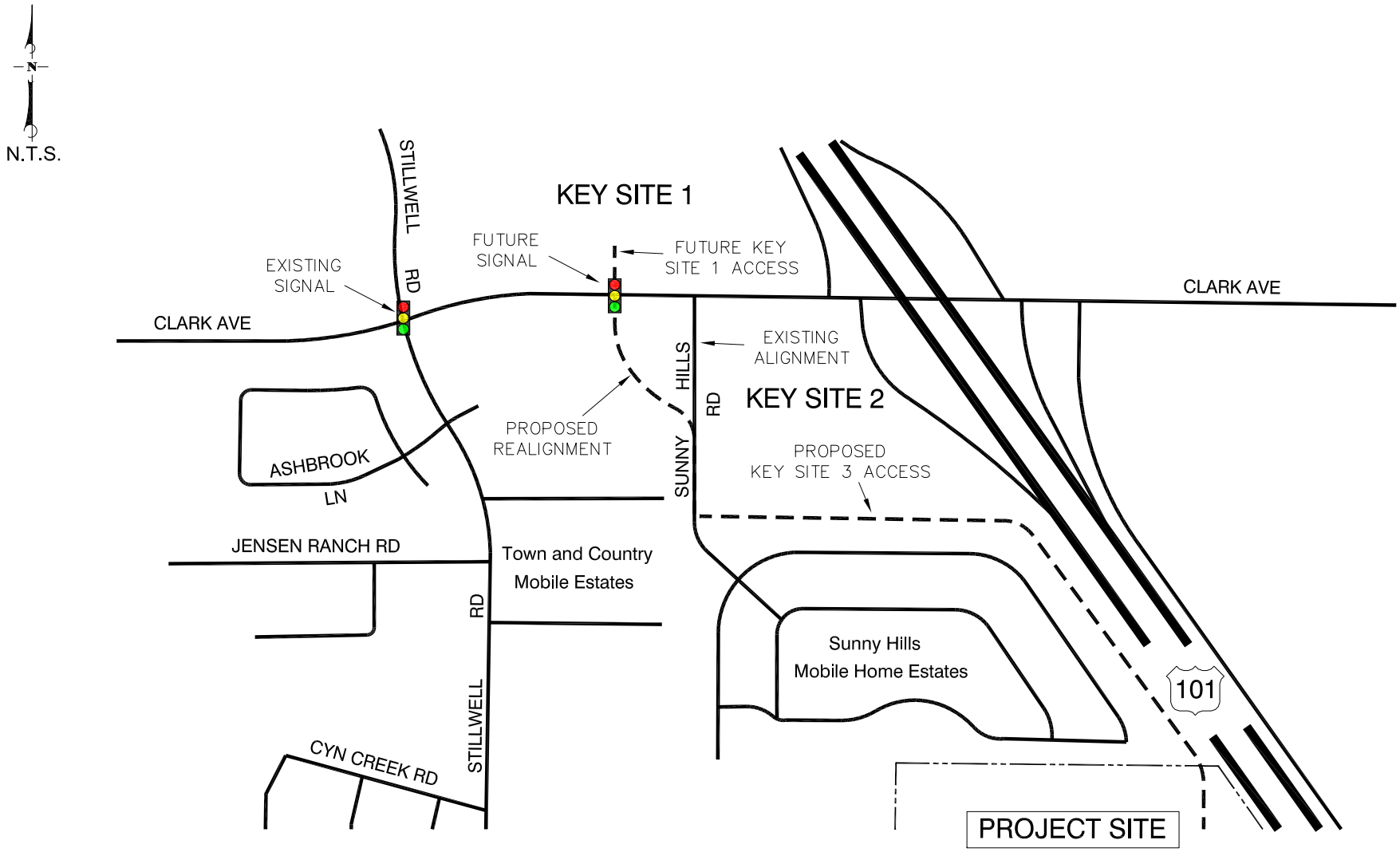
Under project-specific conditions, the new Clark Avenue/Sunny Hills Road intersection would have three legs. Table 8 and 9 show that the intersection would operate in the LOS B-C range with a stop sign on Sunny Hills Road. Under cumulative conditions, with traffic from Key Sites 1 and 2, the intersection will be signalized, and operate in the LOS B range.

Sunny Hills Road should be constructed to Secondary 1 roadway standards. The northbound approach to the intersection should contain a separate left-turn lane with a minimum storage length of 200 feet. The westbound left-turn lane on Clark Avenue should have a minimum storage length of 240 feet to accommodate cumulative turning volumes.

Secondary access to the site is proposed via a gated connection to Chancellor Street, an east-west two-lane street which connects to Stillwell Road. Chancellor Street is a private road west of Hamilton Lane. The segment of Chancellor Street from the Key Site 3 easement to Stillwell Road will be improved according to County roadway standards. The project is expected to add 298 average daily trips to Chancellor Street, which is expected to carry approximately 600 ADT under project-specific conditions and 900 ADT under cumulative + project conditions.

Proposed Roadway Improvements

The Orcutt Transportation Improvement Plan (OTIP) identifies public improvements to be completed as a part of the development of Key Sites 1, 2, and 3. Specifically, the OTIP identifies the need to dedicate easements to the County for the construction of a Class I bike path/public trail through Site 3 that is integrated with the internal circulation plan and landscape plan and connects with the primary access point at Clark Avenue. It also requires limiting primary access off of Clark Avenue to one signalized intersection, which requires the realignment of Sunny Hills Drive to the west. As discussed above, this requirement will be met with the development of Key Site 1.

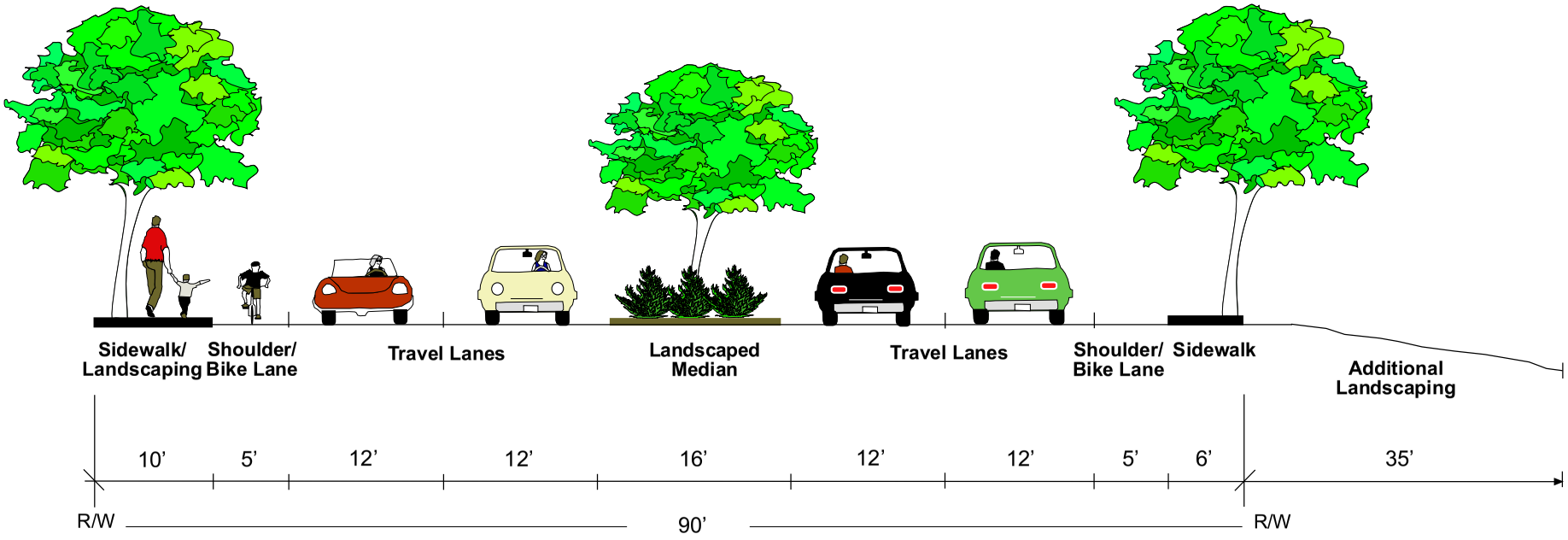


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EXHIBIT 10
PROJECT ACCESS AND ROADWAY REALIGNMENT
KEY SITE 3, ORCUTT, CA

Proposed Clark Avenue Roadway Improvements



CLARK AVENUE PROPOSED CROSS-SECTION

LOOKING EAST

As discussed previously, this requirement will be met by Key Site 3 by constructing the proposed realignment of Sunny Hills Road and construction of the south leg of the new Clark Avenue/Sunny Hills Road intersection. The OTIP also identifies the need to construct a landscaped raised median and other improvements on Clark Avenue along the frontage of Key Sites 1 and 2 from U.S. Highway 101 to Stillwell Road. The proposed Clark Avenue cross-section is illustrated in Exhibit 11. As shown, Clark Avenue would be widened to four 12-foot travel lanes (two travel lanes in each direction), a 16-foot landscaped center median, 5-foot bike lanes and an approximately 6 to 10-foot wide sidewalk on both sides of the street. All improvements would take place within existing County and State right-of-way and will be coordinated with the development of all three Key Sites. Key Site 1 would widen the north side of Clark Avenue as frontage improvement, construct its main entrance as north leg of the new Clark Avenue/Sunny Hills Road intersection, and install traffic signals. Key Site 2 would widen the south side of Clark Avenue as frontage improvement. Key Site 3 would construct the south leg of the new Clark Avenue/Sunny Hills Road intersection.

Stillwell Road Extension. Study area circulation network improvements include a connection between Stillwell Road and Stubblefield Road to the west. The proposed alignment extends southerly from Black Oak Road and then westerly to connect to Stubblefield Road. The Rice Ranch Specific Plan, located at the southern terminus of Bradley Road, includes a circulation system designed to connect with the Stillwell Road Extension. The proposed extension provides an alternative east-west route for Key Site 3 traffic. Also, improvements will be made at the intersection of Chancellor and Stillwell, including adding a knuckle, bringing the intersection up to County standards. The cumulative traffic volumes are shown in Exhibits 12 and 13

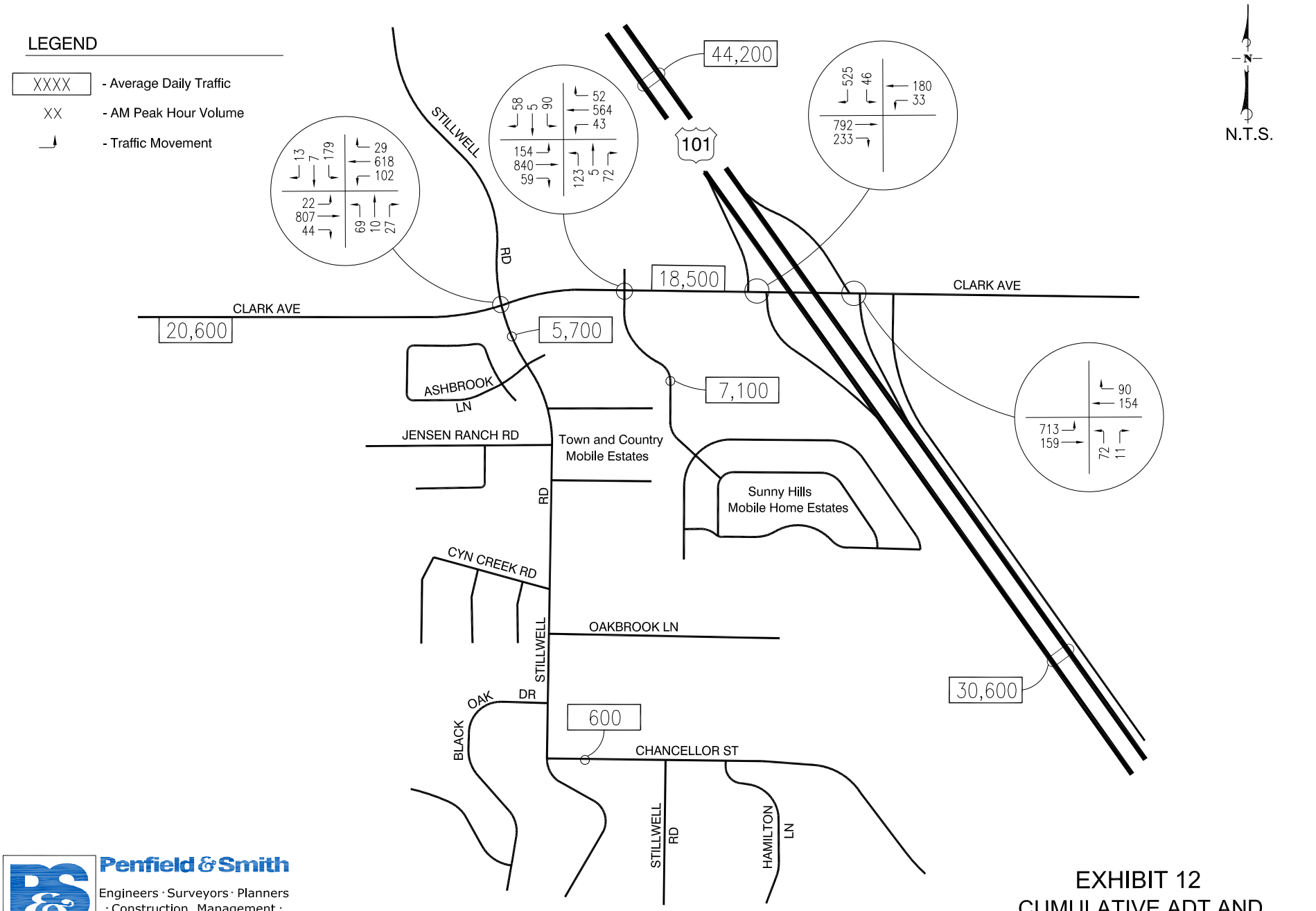
CUMULATIVE CONDITIONS

Cumulative Traffic Forecasts and Roadway Network Improvements

Cumulative traffic forecasts were derived from the *Housing Element Focused Rezone Program EIR*. The cumulative forecast assumes development of the approved and pending projects in Orcutt and Santa Maria, incorporates regional growth, and construction of several planned and programmed intersection and roadway improvements that would affect traffic patterns in the Orcutt area. The cumulative forecast also assumes development of 160 multifamily housing units on Key Site 3, which was approved by the County as part of the *Housing Element Focused Rezone Program EIR*.

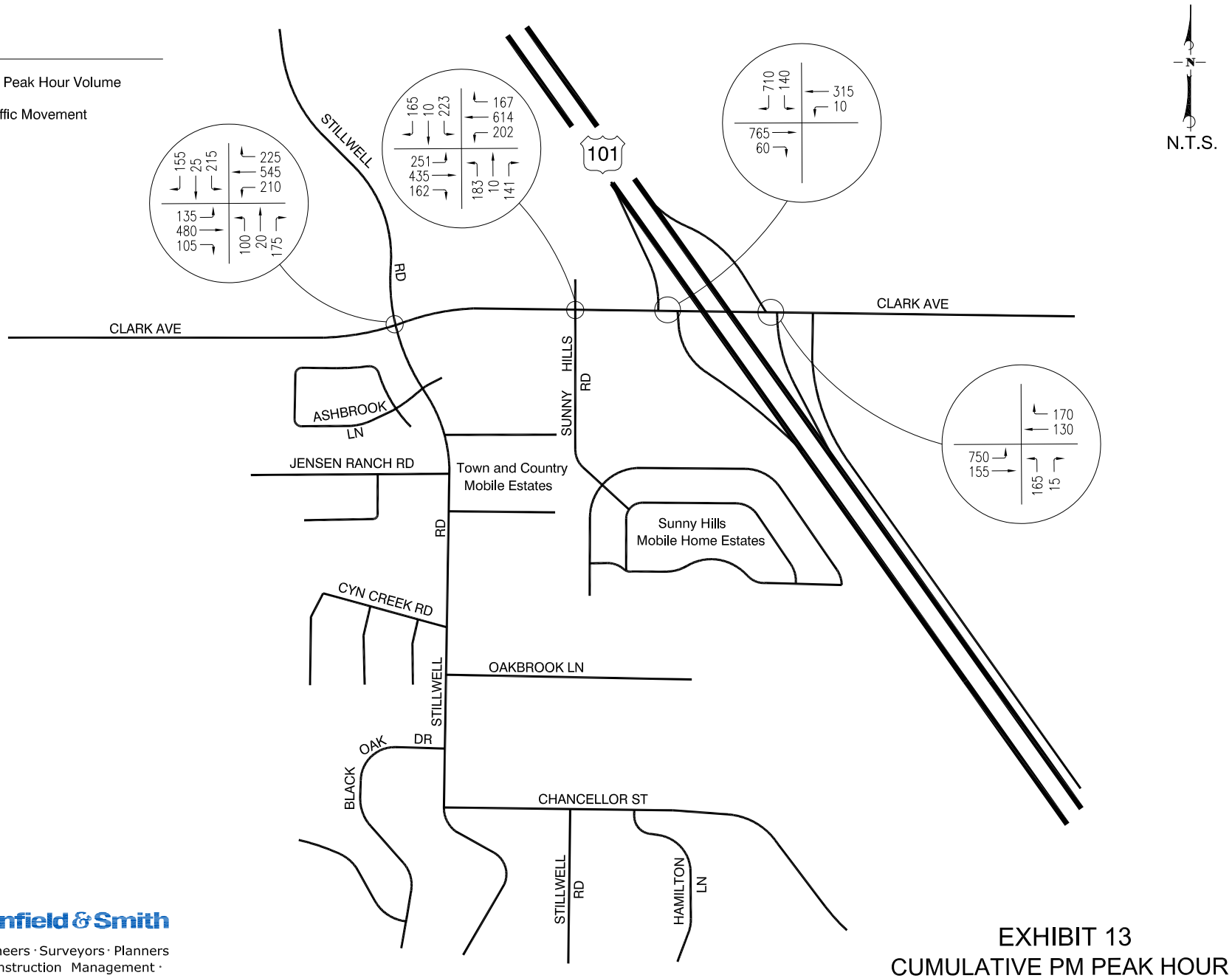
The cumulative scenario includes several roadway improvements that would change traffic flow patterns in the Orcutt/Santa Maria area. The improvements that affect traffic flow in the study area are discussed below.

Union Valley Parkway Extension. This capital improvement project will extend Union Valley Parkway as a four lane limited-access expressway from a new interchange at U.S. Highway 101 to Blosser Road, and ultimately to State Route 1. The new interchange will be located approximately one and one-quarter mile north of Clark Avenue and will provide a primary east-west arterial connection to the western end of Orcutt.



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EXHIBIT 12
CUMULATIVE ADT AND AM PEAK HOUR TRAFFIC VOLUMES
KEY SITE 3, ORCUTT, CA



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EXHIBIT 13
CUMULATIVE PM PEAK HOUR TRAFFIC VOLUMES
KEY SITE 3, ORCUTT, CA

Cumulative + Project Roadway Operations

Cumulative average daily traffic volumes were derived from the *Housing Element Focused Rezone Program EIR* and were adjusted to reflect updated traffic data for Key Site 1 and Key Site 3, and revised access for Key Site 3. The roadway analysis includes the widening of Clark Avenue between U.S. 101 and Stillwell Road to four travel lanes. Table 10 shows the future and cumulative + project average daily traffic volumes at the critical roadway segments.

Table 10
Cumulative + Project Roadway Levels of Service

Roadway	Segment	Cumulative ADT	Cumulative + Project ADT	LOS C Threshold	Cumulative + Project LOS
Clark Avenue	Bradley Rd to Stillwell Rd	20,600 ADT	21,078 ADT	34,000 ADT	LOS B
Clark Avenue	Stillwell Rd to U.S. 101	18,500 ADT	18,997 ADT	34,000 ADT	LOS A
Stillwell Road	South of Clark Ave	5,700 ADT	5,998 ADT	6,300 ADT	LOS C
Sunny Hills Road	South of Clark Ave	7,100 ADT	7,797 ADT	9,300 ADT[1]	LOS B

[1] LOS C threshold for Secondary 1 roadway.

Table 10 indicates that the critical roadway segments would continue to operate acceptably under cumulative + project conditions. The cumulative analysis assumes buildout of Key Site 2 and construction of Sunny Hills Road through Key Site 2 pursuant to Secondary 1 standards to serve both the Key Site 1 and Key Site 2.

Cumulative + Project Intersection Operations

Intersection levels of service were recalculated for the study area intersections assuming the cumulative peak hour traffic volumes shown in Exhibits 12 and 13. Project traffic was then added to the cumulative intersection volumes and the intersection levels of service were recalculated assuming cumulative + project conditions. The cumulative + project peak hour traffic volumes are presented in Exhibits 14 and 15. Tables 11 and 12 present the intersection level of service and increase in V/C ratio or intersection delay.

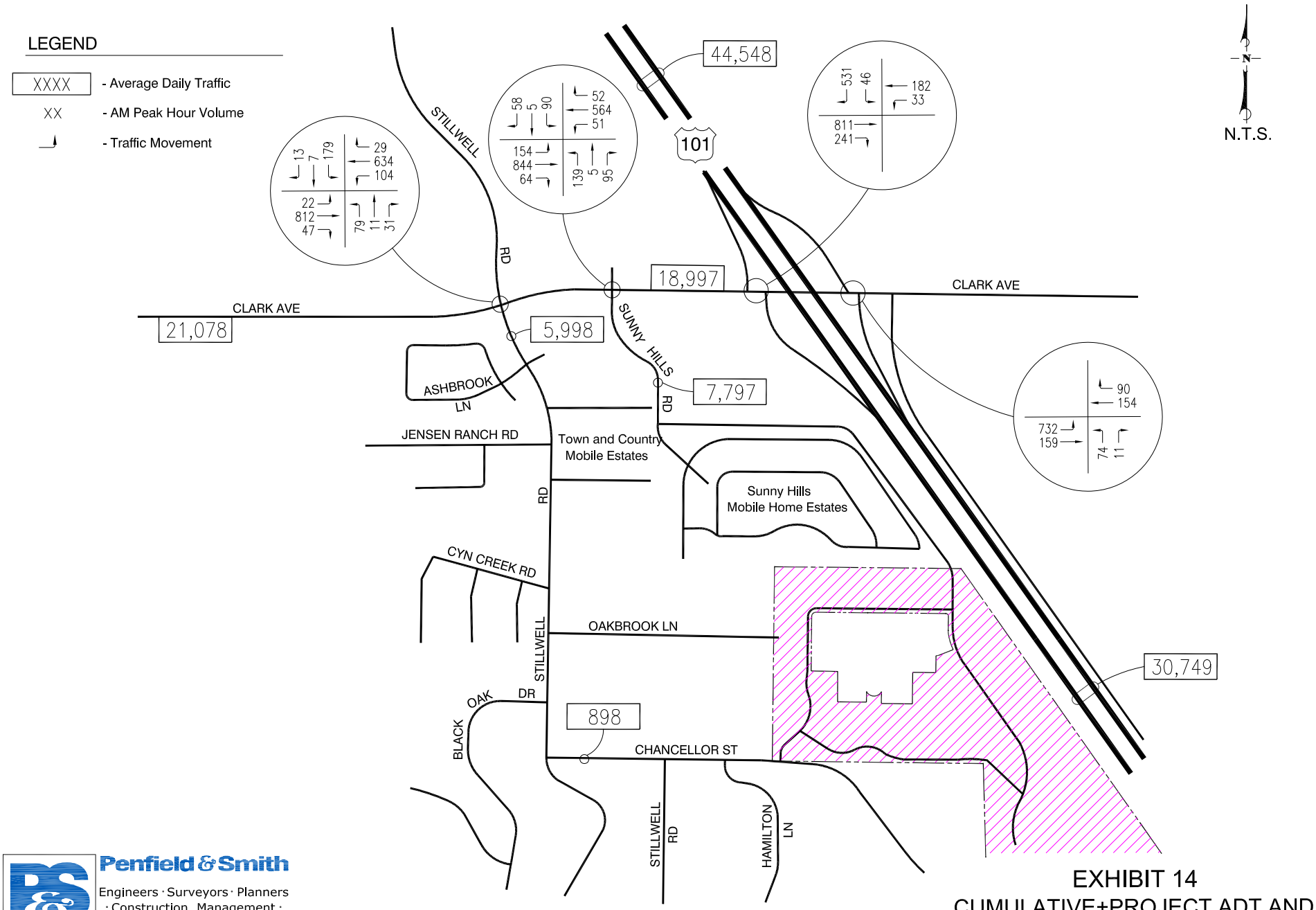
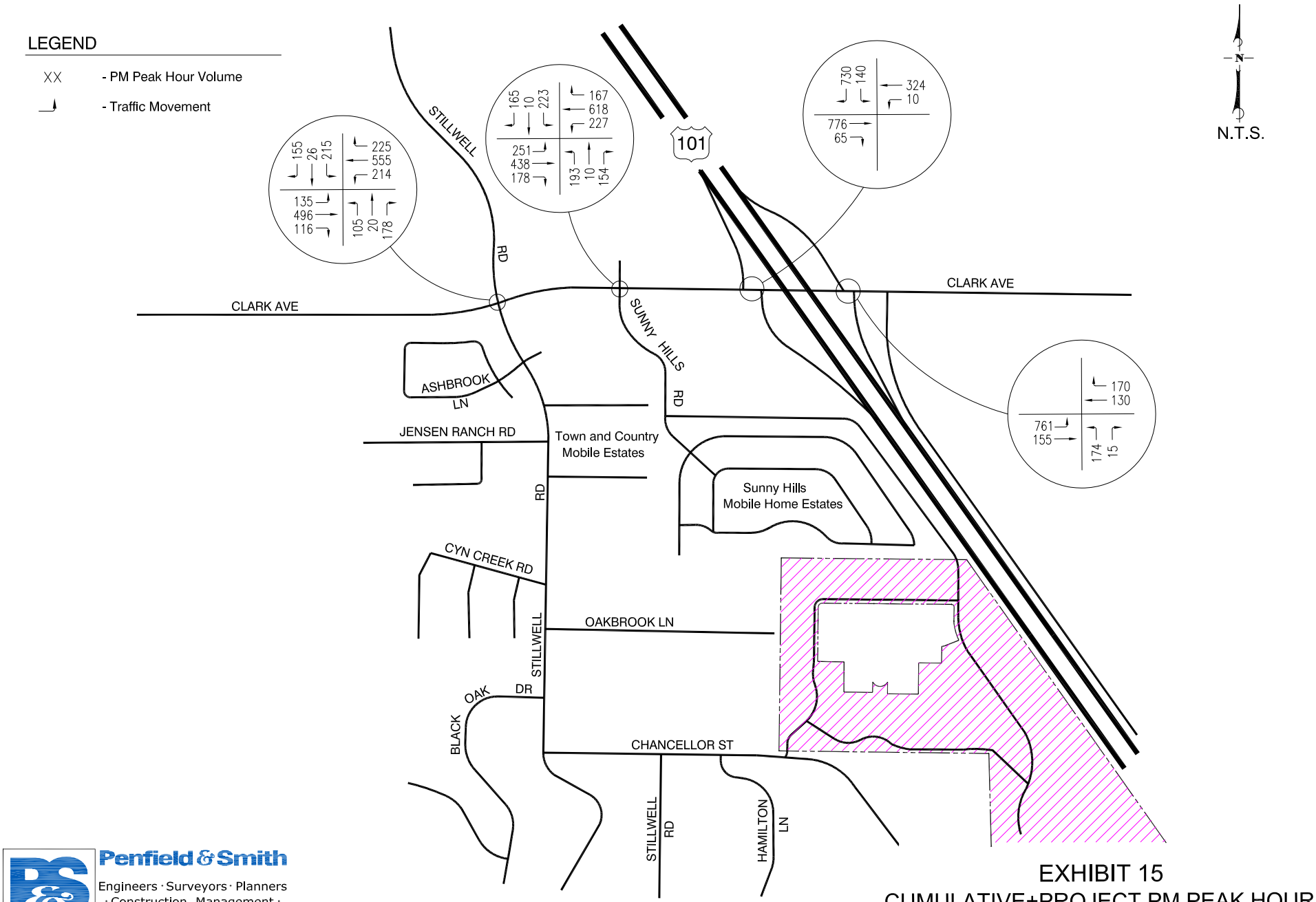


EXHIBIT 14
CUMULATIVE+PROJECT ADT AND
AM PEAK HOUR TRAFFIC VOLUMES
KEY SITE 3, ORCUTT, CA

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EXHIBIT 15
CUMULATIVE+PROJECT PM PEAK HOUR TRAFFIC VOLUMES
KEY SITE 3, ORCUTT, CA

Table 11
AM Peak Hour
Cumulative + Project Intersection Level of Service

Intersection	Cumulative LOS	Cumulative + Project LOS	Change in V/C or Delay	Project - Added Trips	Impact?
Clark Ave/Stillwell Rd	0.56/LOS A	0.58/LOS A	0.02	39 trips	No
Clark Ave/Sunny Hills Rd	0.53/LOS A	0.54/LOS A	0.01	56 trips	No
Clark Ave/U.S. 101 SB Ramps	**41.6 sec/LOS E**	**42.0 sec/LOS E**	0.4 sec	35 trips	No
Clark Ave/U.S. 101 NB Ramps	17.2 sec/LOS C	18.2 sec/LOS C	1.0 sec	21 trips	No

Bolded values exceed County acceptable standard.

Table 12
PM Peak Hour
Cumulative + Project Intersection Level of Service

Intersection	Cumulative LOS	Cumulative + Project LOS	Change in V/C or Delay	Project - Added Trips	Impact?
Clark Ave/Stillwell Rd	0.67/LOS B	0.68/LOS B	0.01	50 trips	No
Clark Ave/Sunny Hills Rd	0.68/LOS B	0.69/LOS B	0.01	71 trips	No
Clark Ave/U.S. 101 SB Ramps	**>50.0 sec/LOS F**	**>50.0 sec/LOS F**	n/a	45 trips	**Yes**
Clark Ave/U.S. 101 NB Ramps	**33.8 sec/LOS D**	**36.5 sec/LOS E**	2.7 sec	20 trips	**Yes**

Bolded values exceed County acceptable standard.

Tables 11 and 12 indicate that the project would generate a cumulative impact at the Clark Avenue/U.S. 101 Interchange during the PM peak hour. Several improvements for the Clark Avenue corridor adjacent to the project have been developed in coordination with Caltrans and County staff to improve roadway and intersection operations under project-specific and cumulative conditions. These improvements, which are outlined in the Mitigations section, would mitigate the project's cumulative impact at the Clark Avenue/U.S. 101 Southbound Ramps intersection.

ORCUTT COMMUNITY PLAN CONSISTENCY

The Orcutt Community Plan contains a number of policies, development standards, and actions for each Key Site to be used to guide development on the sites. The following table lists the traffic related development standards specific to Key Site 3 and where appropriate provides a discussion of how the project maintains consistency with these standards.

Table 13
Orcutt Community Plan Development Standards for Key Site 3

Development Standard	Development Standard	Consistent?
Development Standard KS3-7:	Primary access to the site shall be from the frontage road along U.S. Hwy 101. The existing easement over Site 2 shall be renegotiated to accommodate development of Site 3 and to align with the "preferred access point" intersection. The developer shall coordinate with P&D, Public Works Transportation Division and the Fire Department to ensure appropriate secondary access from Oakbrook Lane.	Yes
Development Standard KS3-8:	The developer shall construct access road improvements along the eastern boundary of Sunny Hills Mobile Home Park in coordination with development on Site 2. Improvements shall include standard County Roadway frontage improvements, landscape screening from U.S. Hwy 101, and a separated, public off road trail. The County shall establish a reimbursement mechanism to allow the costs of such improvements to be shared on a pro-rate basis with the developer Site 2 Once the access road to Site 3 enters the developable area, it should be located away from U.S. Hwy 101.	Yes

MITIGATION MEASURES

Project-Specific Mitigations

The traffic analysis completed for the Orcutt Village Marketplace (Key Site 1)[5] and the PSR-PDS for the Clark Avenue Interchange[6] identified the following roadway and intersection improvements to mitigate project-specific impacts at the Clark Avenue/U.S. 101 Southbound Ramps intersection:

1. Reconstruction of the Clark Avenue/U.S. 101 Northbound Ramps intersection. This includes realignment of the U.S. 101 Northbound On-Ramp to the east opposite the Off-Ramp, widening of the off-ramp to provide two separate turning lanes and widening of the on-ramp to provide two receiving lanes.
2. Signalization of the Clark Avenue/U.S. 101 Northbound Ramps intersection. The existing + project peak hour volumes would satisfy peak hour signal warrants.
3. Restripe of both ramp intersections and the overpass to maximize eastbound flow to the Northbound On-Ramp.
4. Minor Widening of the south side of Clark Avenue between the realigned Sunny Hills Road and the U.S. 101 Southbound Ramps to provide two eastbound travel lanes
5. Minor widening of the Southbound Off-Ramp to improve the operation of the southbound free right-turn lane

[5] Orcutt Village Marketplace, Revised Traffic and Circulation Study, P&S, January 2008.
[6] Project Study Report – Project Development Support, U.S. 101 at the Clark Avenue Interchange, P&S, March 2103.

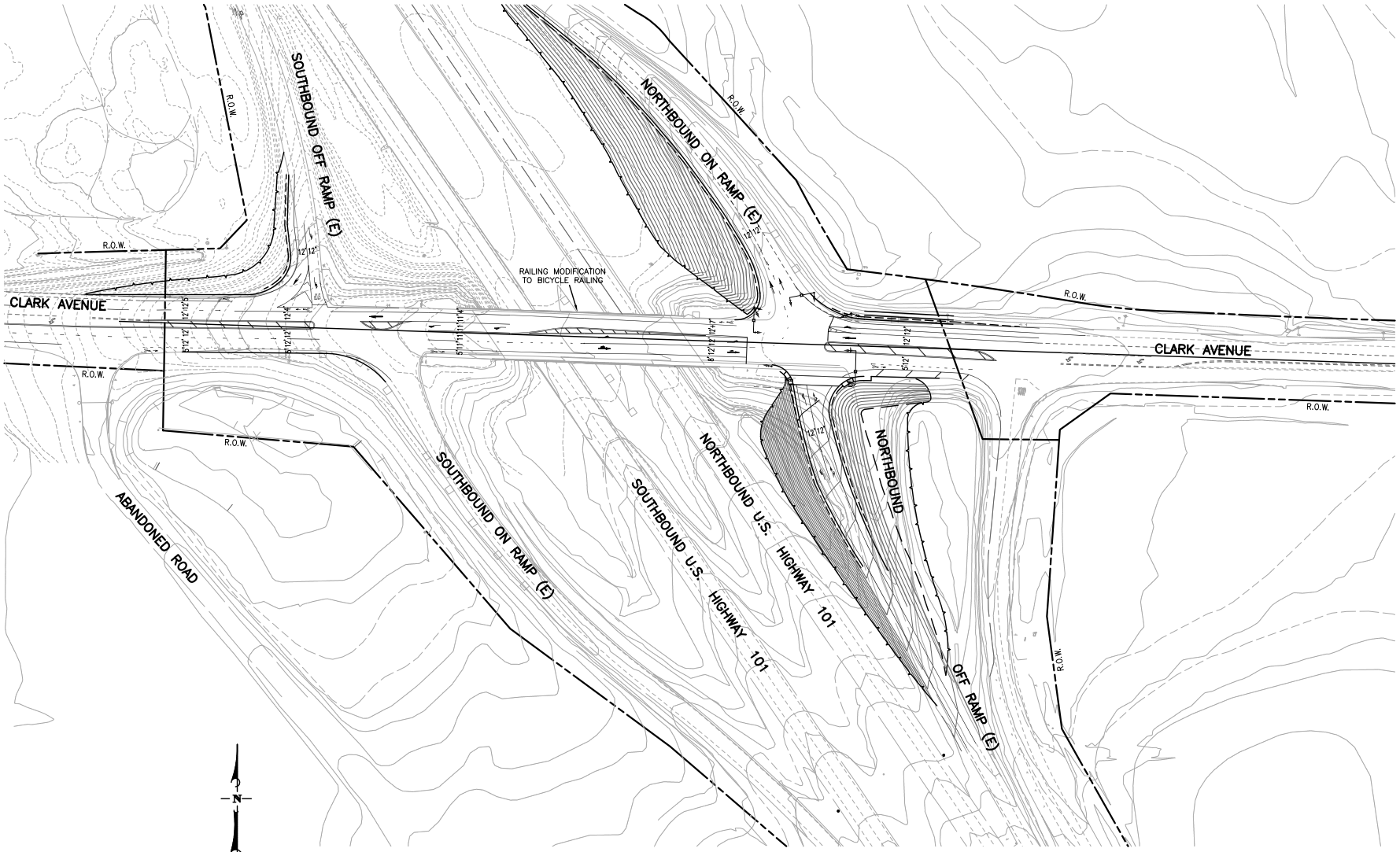
Exhibit 16 illustrates the proposed improvements. The signalized U.S. 101 Northbound Ramps intersection would operate at LOS B or better under project-specific and cumulative + project conditions. The signalization of the Sunny Hills Road and U.S. 101 Northbound Ramps intersections will platoon traffic and provide gaps for side street traffic to enter Clark Avenue. In addition, the proposed improvements balances the heavy eastbound traffic flow over two lanes along Clark Avenue, on the overpass and onto the Northbound On-Ramp. Signalization and balancing eastbound traffic reduces delays at the Southbound Ramps, thereby mitigating the project's project-specific impact at the Clark Avenue/U.S. 101 Southbound Ramps intersection. The mitigated levels of service are shown in Table 14. Further analysis using Synchro software shows that the proposed improvements would accommodate the expected 95th percentile queues at the intersections. It is noted that the realignment and signalization of the Northbound Ramps are included in the OTIP fee program.

Cumulative Mitigations

The project would generate cumulative impacts at the Clark Avenue/U.S. 101 Southbound Ramps intersection during the AM and PM peak hours. The Orcutt Transportation Improvement Plan (OTIP) includes a project to realign the ramps and install traffic signals at the Clark Avenue Interchange. The cumulative volumes at the Southbound Ramps would meet peak hour traffic signal warrants. Realignment of the Southbound On-Ramp and installation of a traffic signal would result in LOS A operations. The Northbound Ramps intersection, realigned and signalized as part of the project-specific mitigation, would operate at LOS B or better under cumulative conditions. The project's contributions to the OTIP program would mitigate its cumulative impact.

Table 14
Mitigated AM and PM Peak Hour
Intersection Level of Service

Intersection	Mitigated AM Peak Hour		Mitigated PM Peak Hour	
	Existing + Project LOS	Cumulative + Project LOS	Existing + Project LOS	Cumulative + Project LOS
Clark Ave/U.S. 101 SB Ramps	n/a	0.49/LOS A	15.8 sec/LOS C	0.46/LOS A
Clark Ave/U.S. 101 NB Ramps	n/a	0.53/LOS A	0.52/LOS A	0.61/LOS B



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EXHIBIT 16

CLARK AVE/U.S. HIGHWAY 101 INTERCHANGE
PROJECT-SPECIFIC MITIGATION

Orcutt Community Plan FEIR Mitigations

The Orcutt Community Plan FEIR lists the following site-specific mitigation measures that would be required to reduce potentially significant project-specific impacts (Class II) to less than significant. The project, as proposed, will implement all of the required measures to mitigate the project impacts.

Table 15
Orcutt Community Plan FEIR Site-Specific Mitigation

Mitigation Measure	Mitigation Required	Mitigation Met?
KS3-CIRC-1	The developer shall pay off-site Transportation Impact Fees as specified by the Public Works Department, for funds for future (cumulative) improvements required in the OPA.	Yes
Mitigation KS3-CIRC-2	Full access to the site along Clark Avenue should be limited to one signalized intersection, which shall be aligned with revised access to the mobile home park and Sites 2 and 3.	Yes. The primary access to the site, which is planned for signalization, is proposed to be aligned conform the preferred Sunny Hills Road alignment.

CONGESTION MANAGEMENT PROGRAM (CMP) ANALYSIS

The Santa Barbara County Association of Governments (SBCAG) has developed a set of traffic impact guidelines to assess impacts of land use decisions made by local jurisdictions on regional transportation facilities located within the Congestion Management Program (CMP) roadway system. The SBCAG Congestion Management Program establishes a minimum intersection level of service of LOS D. The following guidelines were developed by SBCAG to determine the significance of potential traffic impacts on the regional CMP system.

- For any roadway or intersection operating at LOS A or B, a decrease of two levels of service from project added traffic;
- For any roadway or intersection operating at LOS C, project-added traffic that results in a LOS D or worse; and
- For any intersection with existing congestion, the following project-added trips constitute a significant impact:

  - 20 peak hour critical movement trips for LOS D.
  - 10 peak hour critical movement trips for LOS E.
  - 10 peak hour critical movement trips for LOS F.

- For freeway or highway segments with existing congestion, the following project-added trips constitute a significant impact:

  - 100 peak hour critical movement trips for LOS D.
  - 50 peak hour critical movement trips for LOS E.
  - 50 peak hour critical movement trips for LOS F.

Potential Impacts & Mitigations

Intersections. The intersection of Clark Avenue with Bradley Road is included in the CMP network. Existing and cumulative PM peak hour traffic volumes for the intersection were derived from the *Housing Element Focused Rezone Program EIR.* The level of service worksheets included in the Technical Appendix indicate that the intersection would operate at LOS A (V/C 0.60) under existing plus project conditions, and at LOS C (V/C 0.73) under cumulative + project conditions. The project would therefore not generate any impacts at the intersection based on the CMP thresholds outlined previously.

Freeways. The project would add 25 AM PHT and 31 PM PHT to U.S. 101 north of Clark Avenue, and 10 AM PHT and 14 PM PHT to U.S. 101 south of Clark Avenue. The 2009 CMP monitoring report indicates that the U.S. 101 segments in the project vicinity operate in the LOS A/B range in during the peak hour periods. Based on the CMP impact criteria (minimum of 100 peak hour trips in each direction at LOS D operations), the project would not significantly impact the U.S. 101.

■ ■ ■

TECHNICAL APPENDIX

Appendix 1

County Roadway Classifications and Levels of Service Standards

Roadway Classifications

Classification	Purpose and Design Factors	Design Capacity		LOS C Threshold[1]	
		2 Lane	4 Lane	2 Lane	4 Lane
Primary 1	Roadways designed to serve primarily non-residential development. Roadways would have a minimum of 12-foot wide lanes with shoulders and few curb cuts. Signals would be spaced at 1 mile or more intervals.	19,900	47,760	15,900	38,200
Primary 2	Roadways which serve a high proportion of non-residential development with some residential lots and few or no driveway curb cuts. Lane widths are a minimum of 12 feet with well spaced curb cuts. Signals intervals at a minimum of 1/2 mile.	17,900	42,480	14,300	34,000
Primary 3	Roadways designed to serve non-residential development and residential development. More frequent driveways are acceptable. Potential signal intervals of 1/2-1/4 mile.	15,700	37,680	12,500	30,100
Secondary 1	Roadways designed to primarily serve non-residential development and large lot residential development with well spaced driveways. Roadways would be 2 lanes with infrequent driveways. Signal would generally occur at intersections with primary roads.	11,600	NA	9,300	NA
Secondary 2	Roadways designed to serve residential and non-residential land uses. Roadways would be 2 lanes with close to moderately spaced driveways.	9,100	NA	7,300	NA
Secondary 3	Roadways designed to primarily serve residential with small to medium lots. Roadways are 2 lanes with more frequent driveways.	7,900	NA	6,300	NA

[1] Defined as 80% of Design Capacity.
Source: Santa Barbara County Public Works, Transportation Division.

Appendix 2

AM and PM Peak Hour Intersection Counts

ITM Peak Hour Summary

Prepared by:

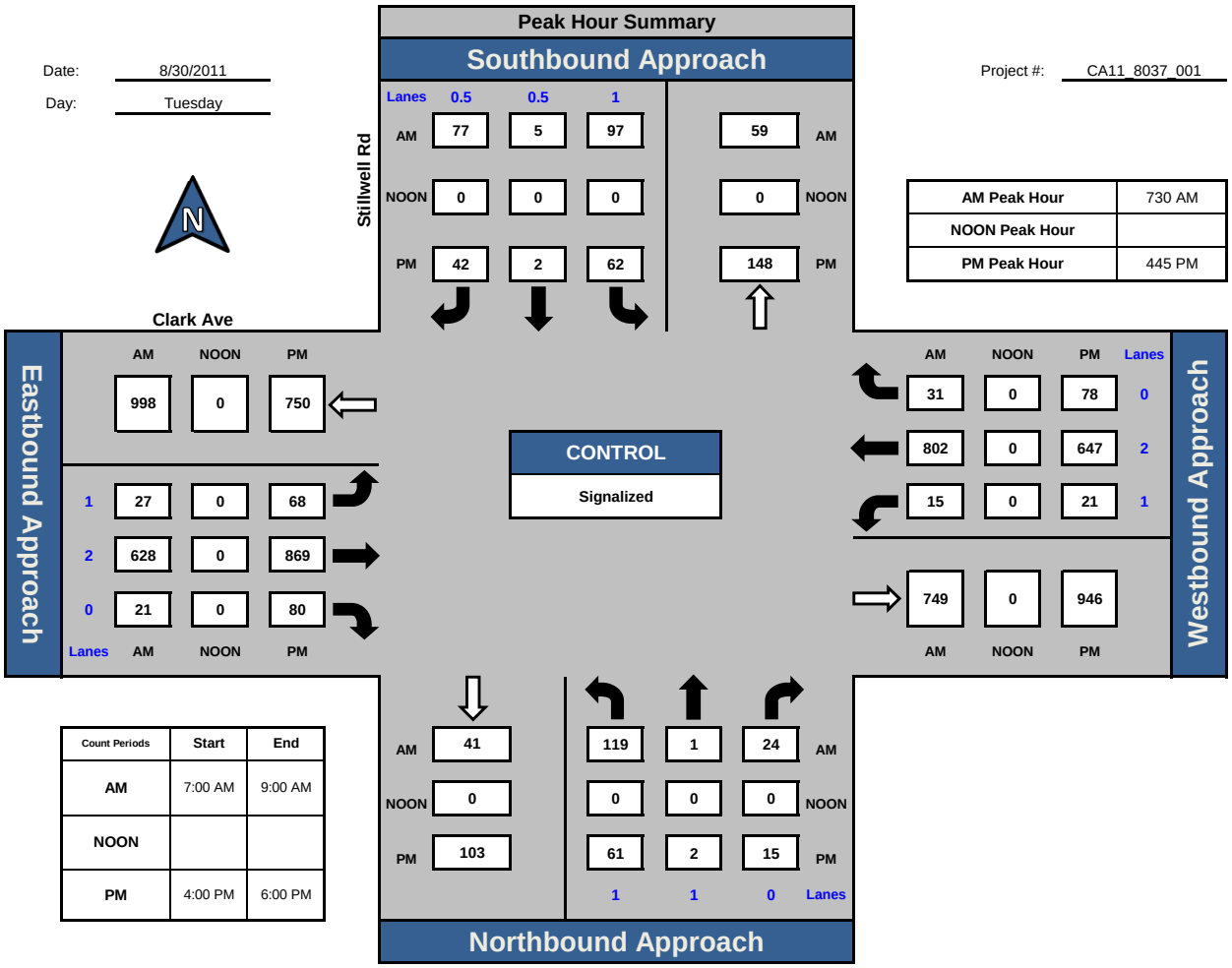
National Data & Surveying Services

Stillwell Rd and Clark Ave , City of Orcutt

Date: 8/30/2011

Day: Tuesday

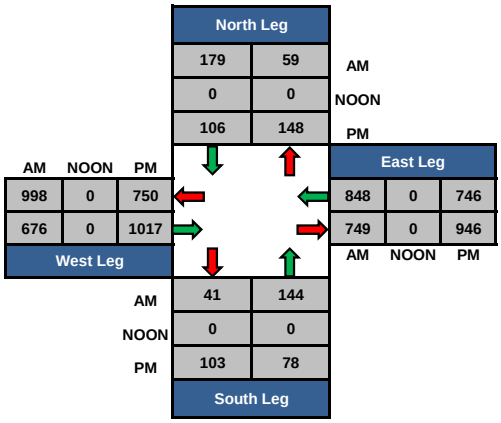
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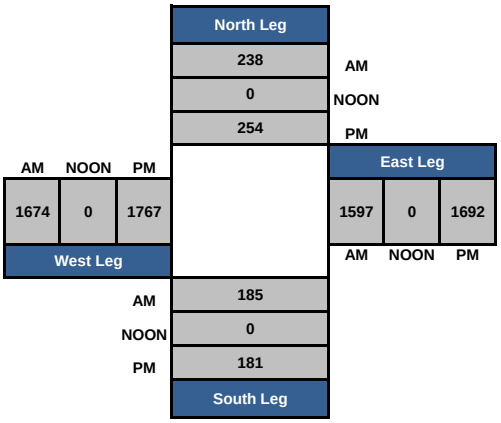
AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

National Data & Surveying Services

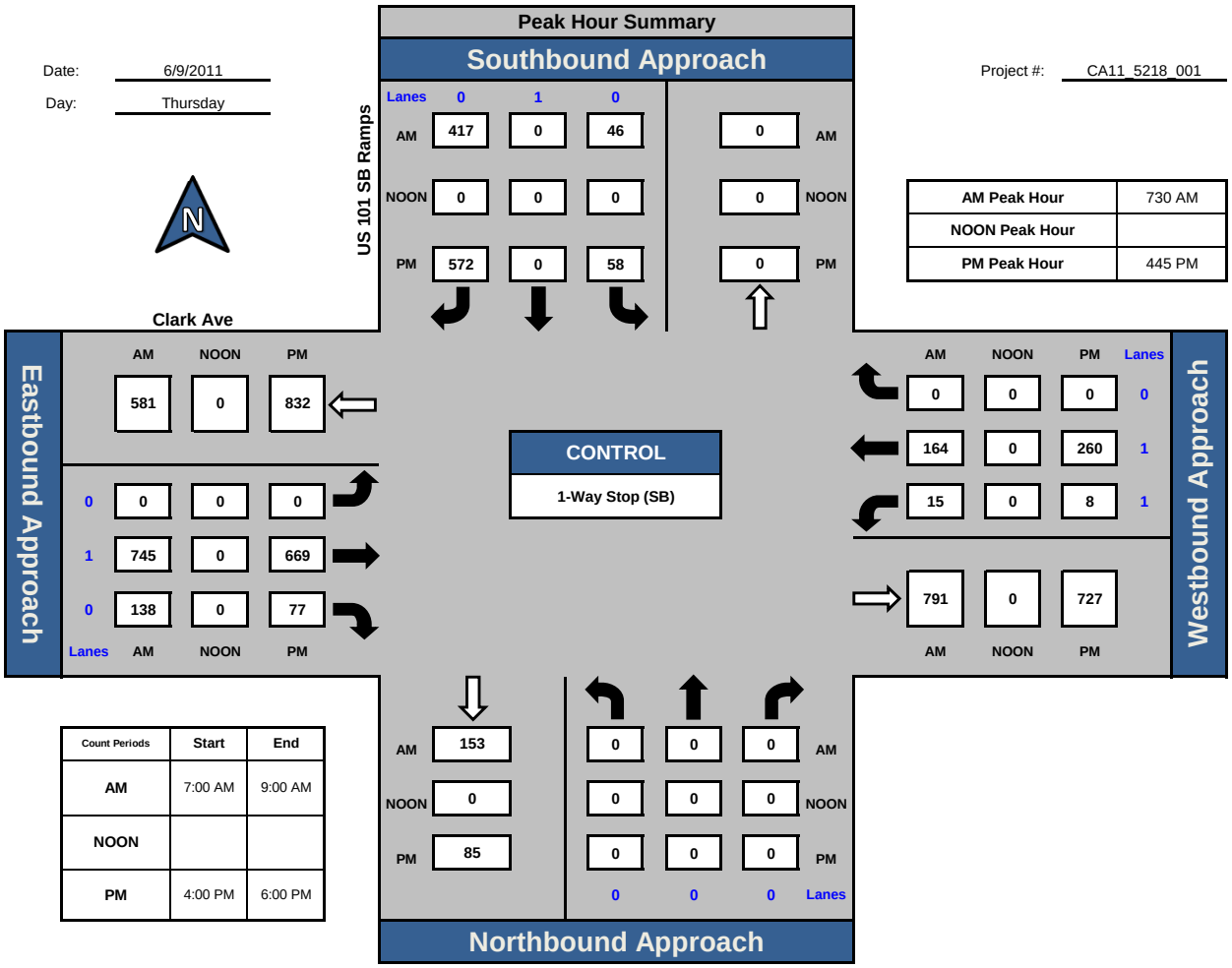
US 101 SB Ramps and Clark Ave , City of Orcutt

Date: 6/9/2011

Day: Thursday

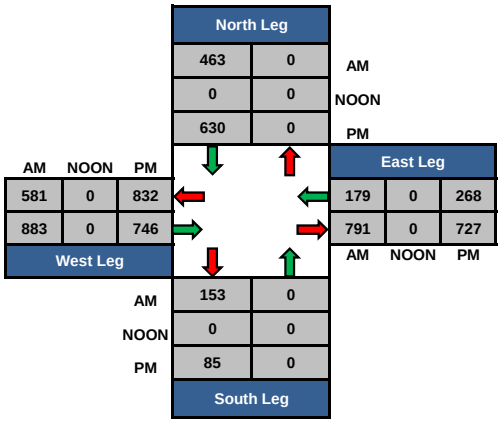
Project #: CA11_5218_001

AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	445 PM

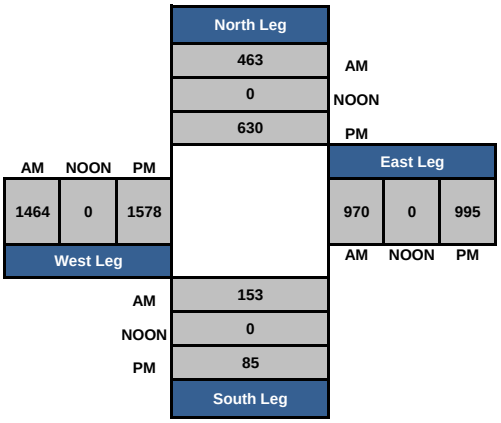


Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

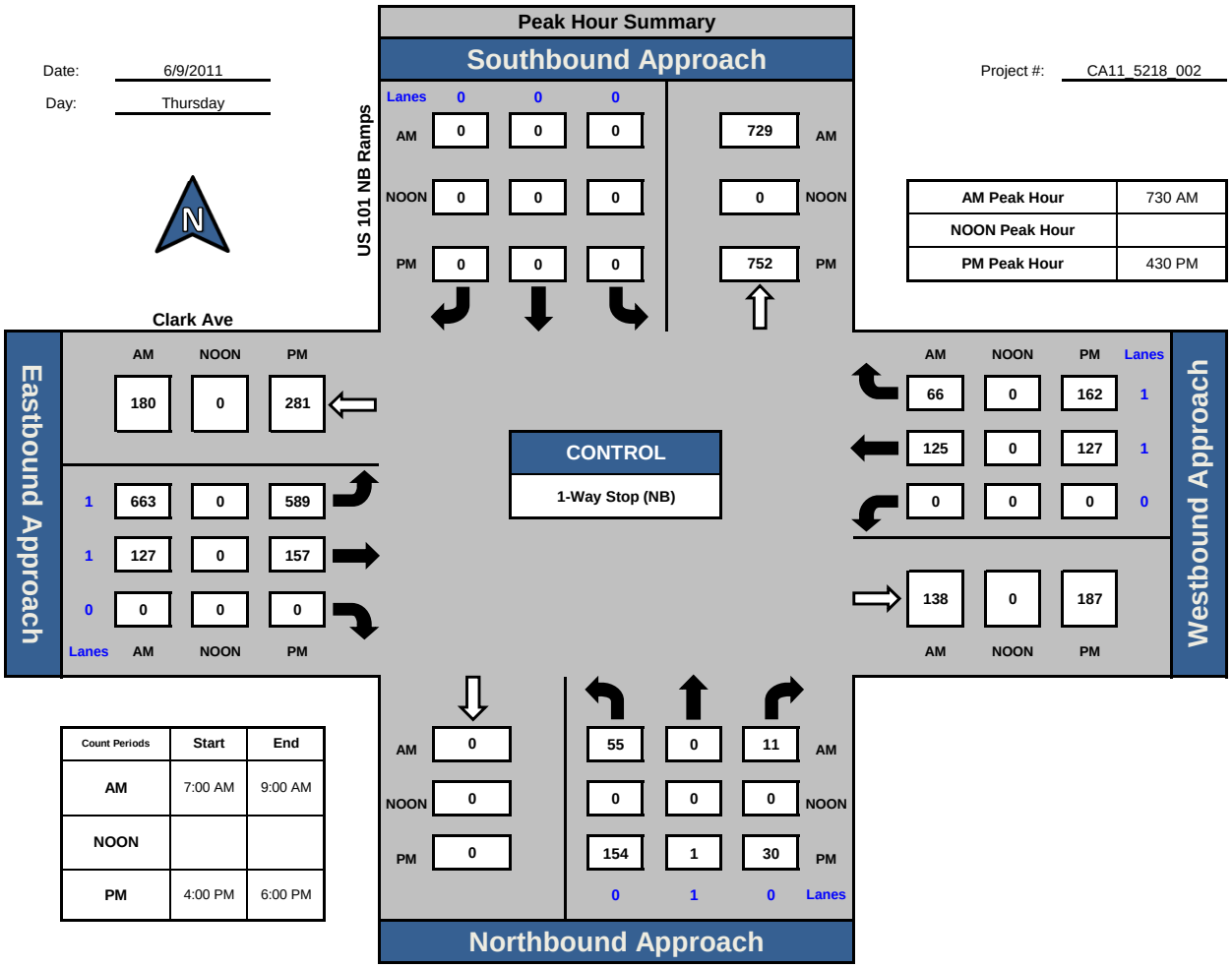
National Data & Surveying Services

US 101 NB Ramps and Clark Ave , City of Orcutt

Date: 6/9/2011

Day: Thursday

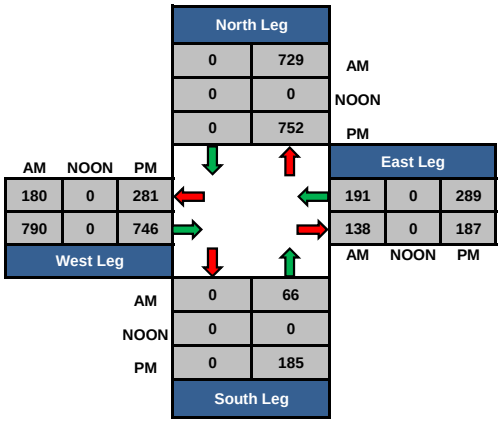
Project #: CA11_5218_002



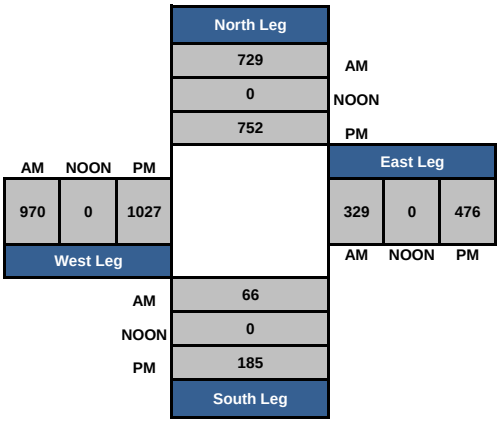
AM Peak Hour	730 AM
NOON Peak Hour	
PM Peak Hour	430 PM

Count Periods	Start	End
AM	7:00 AM	9:00 AM
NOON		
PM	4:00 PM	6:00 PM

Total Ins & Outs



Total Volume Per Leg



Appendix 3

Intersection Levels of Service Calculation Worksheets

1. **Clark Ave/Stillwell Rd**
2. **Clark Ave/Sunny Hills Rd**
3. **Clark Ave/U.S. 101 SB Ramps**
4. **Clark Ave/U.S. 101 NB Ramps**
5. **Clark Ave/Bradley Rd**

1. CLARK AVE/STILLWELL RD

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 1
NORTH/SOUTH STREET: Stillwell Road
EAST/WEST STREET: Clark Avenue
SCENARIO: Existing
TIME PERIOD: AM Peak Hour
COUNT DATE: 8/30/11
WORK ORDER #: 16527.00

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	119	1	24	97	5	77	27	628	21	15	802	31
Project Trips	10	1	4	0	0	0	0	5	3	0	16	0
GEOMETRY	L	TR		L	TR		L	T TR		L	T TR	

	Level of Service Calculations					
Move-ment	Lanes		Volume		V/C Ratio	
	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	119	130	0.07 *	0.08 *
NBT	1.0	1,600	1	2	0.02	0.02
NBR	0.0	0	24	29	0.00	0.00
SBL	1.0	1,600	97	97	0.06	0.06
SBT	1.0	1,600	5	5	0.05 *	0.05 *
SBR	0.0	0	77	77	0.00	0.00
EBL	1.0	1,600	27	27	0.02 *	0.02 *
EBT	2.0	3,200	628	633	0.20	0.21
EBR	0.0	0	21	24	0.00	0.00
WBL	1.0	1,600	15	17	0.01	0.01
WBT	2.0	3,200	802	818	0.26 *	0.27 *
WBR	0.0	0	31	31	0.00	0.00
N/S Critical Movements					0.12	0.13
E/W Critical Movements					0.28	0.29
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.50	0.52
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio
Right Turn Conditions:

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 1
NORTH/SOUTH STREET: Stillwell Road
EAST/WEST STREET: Clark Avenue
SCENARIO: Cumulative Conditions
TIME PERIOD: AM Peak Hour
COUNT DATE:
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	69	10	27	179	7	13	22	807	44	102	618	29
Project Trips	10	1	4	0	0	0	0	5	3	0	16	0
GEOMETRY	L	TR		L	TR		L	T TR		L	T TR	

Move-ment	Lanes		Volume		V/C Ratio	
	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	69	80	0.04	0.05
NBT	1.0	1,600	10	11	0.02 *	0.03 *
NBR	0.0	0	27	32	0.00	0.00
SBL	1.0	1,600	179	179	0.11 *	0.11 *
SBT	1.0	1,600	7	7	0.01	0.01
SBR	0.0	0	13	13	0.00	0.00
EBL	1.0	1,600	22	22	0.01	0.01
EBT	2.0	3,200	807	812	0.27 *	0.27 *
EBR	0.0	0	44	47	0.00	0.00
WBL	1.0	1,600	102	104	0.06 *	0.07 *
WBT	2.0	3,200	618	634	0.20	0.21
WBR	0.0	0	29	29	0.00	0.00
N/S Critical Movements					0.13	0.14
E/W Critical Movements					0.33	0.34
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.56	0.58
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio
Right Turn Conditions:

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 1
NORTH/SOUTH STREET: Stillwell Road
EAST/WEST STREET: Clark Avenue
SCENARIO: Existing
TIME PERIOD: PM Peak Hour
COUNT DATE: 8/30/11
WORK ORDER #: 16527.00

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
PM Peak	61	2	15	62	2	42	68	869	80	21	647	78
Project Trips	5	0	3	0	1	0	0	16	11	4	10	0
GEOMETRY	L	TR		L	TR		L	T TR		L	T TR	

	Level of Service Calculations					
Move-ment	Lanes		Volume		V/C Ratio	
	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	61	66	0.04 *	0.04 *
NBT	1.0	1,600	2	3	0.01	0.01
NBR	0.0	0	15	19	0.00	0.00
SBL	1.0	1,600	62	62	0.04	0.04
SBT	1.0	1,600	2	3	0.03 *	0.03 *
SBR	0.0	0	42	42	0.00	0.00
EBL	1.0	1,600	68	68	0.04	0.04
EBT	2.0	3,200	869	886	0.30 *	0.31 *
EBR	0.0	0	80	92	0.00	0.00
WBL	1.0	1,600	21	26	0.01 *	0.02 *
WBT	2.0	3,200	647	658	0.23	0.23
WBR	0.0	0	78	78	0.00	0.00
N/S Critical Movements					0.07	0.07
E/W Critical Movements					0.31	0.33
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.48	0.50
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio
Right Turn Conditions:

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 1
NORTH/SOUTH STREET: Stillwell Road
EAST/WEST STREET: Clark Avenue
SCENARIO: Cumulative Conditions
TIME PERIOD: PM Peak Hour
COUNT DATE:
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
PM Peak	100	20	175	215	25	155	135	480	105	210	545	225
Project Trips	5	0	3	0	1	0	0	16	11	4	10	0
GEOMETRY	L	TR		L	TR		L	T TR		L	T TR	

Move-ment	Level of Service Calculations					
	Lanes		Volume		V/C Ratio	
	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	100	105	0.06	0.07
NBT	1.0	1,600	20	21	0.12 *	0.13 *
NBR	0.0	0	175	179	0.00	0.00
SBL	1.0	1,600	215	215	0.13 *	0.13 *
SBT	1.0	1,600	25	26	0.11	0.11
SBR	0.0	0	155	155	0.00	0.00
EBL	1.0	1,600	135	135	0.08 *	0.08 *
EBT	2.0	3,200	480	497	0.18	0.19
EBR	0.0	0	105	117	0.00	0.00
WBL	1.0	1,600	210	215	0.13	0.13
WBT	2.0	3,200	545	556	0.24 *	0.24 *
WBR	0.0	0	225	225	0.00	0.00
N/S Critical Movements					0.25	0.26
E/W Critical Movements					0.32	0.32
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.67	0.68
Level of Service (LOS)					B	B

Notes: V/C - Volume to Capacity Ratio
Right Turn Conditions:

2. CLARK AVE/SUNNY HILLS RD

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*Clark Avenue/Sunny Hills Rd*
Agency/Co.	*P&S*	Jurisdiction	*Santa Barbara County*
Date Performed	*08/15/2011*	Analysis Year	*Existing Conditions*
Analysis Time Period	*AM Peak Hour*		
Project Description			
East/West Street: *Clark Avenue*		North/South Street: *Sunny Hills Road*	
Intersection Orientation: *East-West*		Study Period (hrs): *1.00*	

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*874*	*3*	*4*	*577*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*874*	*3*	*4*	*577*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*1*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*17*		*9*			
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*17*	*0*	*9*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
v (veh/h)		*4*		*26*				
C (m) (veh/h)		*779*		*315*				
v/c		*0.01*		*0.08*				
95% queue length		*0.02*		*0.27*				
Control Delay (s/veh)		*9.6*		*17.5*				
LOS		*A*		*C*				
Approach Delay (s/veh)	--	--		*17.5*				
Approach LOS	--	--		*C*				

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	Clark Avenue/Sunny Hills Rd
Agency/Co.	P&S	Jurisdiction	Santa Barbara County
Date Performed	08/15/2011	Analysis Year	Existing + Project
Analysis Time Period	AM Peak Hour		

Project Description	16527.12
East/West Street:	Clark Avenue
North/South Street:	Sunny Hills Rd
Intersection Orientation:	East-West
Study Period (hrs):	1.00

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		878	8	12	577	
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	878	8	12	577	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	0	1	1	1	2	0
Configuration		T	R	L	T	
Upstream Signal		0			1	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	33		32			
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	33	0	32	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L		LR				
v (veh/h)		12		65				
C (m) (veh/h)		773		319				
v/c		0.02		0.20				
95% queue length		0.05		0.76				
Control Delay (s/veh)		9.7		19.2				
LOS		A		C				
Approach Delay (s/veh)	--	--	19.2					
Approach LOS	--	--	C					

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INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 2
NORTH/SOUTH STREET: Sunny Hills Road
EAST/WEST STREET: Clark Avenue
SCENARIO: Cumulative Conditions
TIME PERIOD: AM Peak Hour
COUNT DATE: Cumulative Traffic Volumes
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	123	5	72	90	5	58	154	840	59	43	564	52
Project Trips	16	0	23	0	0	0	0	4	5	8	0	0
GEOMETRY	L	TR		L	TR		L	T TR		L	T TR	

	Level of Service Calculations					
Move-ment	Lanes		Volume		V/C Ratio	
	Lane	Capacity	Future	Project	Future	Project
NBL	1.0	1,600	123	139	0.08 *	0.09 *
NBT	1.0	1,600	5	5	0.05	0.06
NBR	0.0	0	72	95	0.00	0.00
SBL	1.0	1,600	90	90	0.06	0.06
SBT	1.0	1,600	5	5	0.04 *	0.04 *
SBR	0.0	0	58	58	0.00	0.00
EBL	1.0	1,600	154	154	0.10	0.10
EBT	2.0	3,200	840	845	0.28 *	0.28 *
EBR	0.0	0	59	64	0.00	0.00
WBL	1.0	1,600	43	50	0.03 *	0.03 *
WBT	2.0	3,200	564	566	0.19	0.19
WBR	0.0	0	52	52	0.00	0.00
N/S Critical Movements					0.12	0.13
E/W Critical Movements					0.31	0.31
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.53	0.54
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio
Right Turn Conditions:

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*Clark Avenue/Sunny Hills Rd*
Agency/Co.	*P&S*	Jurisdiction	*Santa Barbara County*
Date Performed	*08/15/2011*	Analysis Year	*Existing Conditions*
Analysis Time Period	*PM Peak Hour*		
Project Description	*Key Site 3*		
East/West Street:	*Clark Avenue*	North/South Street:	
Intersection Orientation:	*East-West*	Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*725*	*20*	*28*	*804*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*725*	*20*	*28*	*804*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*1*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*23*		*21*			
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*23*	*0*	*21*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
v (veh/h)		*28*		*44*				
C (m) (veh/h)		*872*		*358*				
v/c		*0.03*		*0.12*				
95% queue length		*0.10*		*0.42*				
Control Delay (s/veh)		*9.3*		*16.5*				
LOS		*A*		*C*				
Approach Delay (s/veh)	--	--		*16.5*				
Approach LOS	--	--		*C*				

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*Clark Avenue/Sunny Hills Rd*
Agency/Co.	*P&S*	Jurisdiction	*Santa Barbara County*
Date Performed	*08/15/2011*	Analysis Year	*Existing+Project*
Analysis Time Period	*PM Peak Hour*		
Project Description	*Key Site 3*		
East/West Street:	*Clark Avenue*	North/South Street:	
Intersection Orientation:	*East-West*	Study Period (hrs):	*1.00*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*728*	*36*	*53*	*808*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*728*	*36*	*53*	*808*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Two Way Left Turn Lane*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*1*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*33*		*34*			
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*33*	*0*	*34*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*		*LR*				
v (veh/h)		*53*		*67*				
C (m) (veh/h)		*858*		*349*				
v/c		*0.06*		*0.19*				
95% queue length		*0.20*		*0.71*				
Control Delay (s/veh)		*9.5*		*17.8*				
LOS		*A*		*C*				
Approach Delay (s/veh)	--	--		*17.8*				
Approach LOS	--	--		*C*				

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INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 2
NORTH/SOUTH STREET: Sunny Hills Road
EAST/WEST STREET: Clark Avenue
SCENARIO: Cumulative Conditions
TIME PERIOD: PM Peak Hour
COUNT DATE: Cumulative Traffic Volumes
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
PM Peak	183	10	141	223	10	165	251	435	162	202	614	167
Project Trips	10	0	13	0	0	0	0	3	16	25	4	0
GEOMETRY	L	TR		L	TR		L	T TR		L	T TR	

	Level of Service Calculations					
Move-	Lanes		Volume		V/C Ratio	
ment	Lane	Capacity	Future	Project	Future	Project
NBL	1.0	1,600	183	194	0.11	0.12
NBT	1.0	1,600	10	10	0.09 *	0.10 *
NBR	0.0	0	141	154	0.00	0.00
SBL	1.0	1,600	223	223	0.14 *	0.14 *
SBT	1.0	1,600	10	10	0.11	0.11
SBR	0.0	0	165	165	0.00	0.00
EBL	1.0	1,600	251	251	0.16 *	0.16 *
EBT	2.0	3,200	435	439	0.14	0.14
EBR	1.0	1,600	162	179	0.06	0.06
WBL	1.0	1,600	202	227	0.13	0.14
WBT	2.0	3,200	614	619	0.19 *	0.19 *
WBR	1.0	1,600	167	167	0.00	0.08
N/S Critical Movements					0.23	0.24
E/W Critical Movements					0.35	0.35
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.68	0.69
Level of Service (LOS)					B	B

Notes: V/C - Volume to Capacity Ratio
Right Turn Conditions:

3. CLARK AVE/U.S. 101 SOUTHBOUND RAMPS

INTERSECTION DELAY WORKSHEET
ORCUTT
101 SB RAMPS / CLARK AVE
AM PEAK HOUR: 7:30 - 8:30
6/9/2011 - THURSDAY
15 SECOND INTERVALS
APPROACH: SB Right-Turn + SB Left-Turn + WB Left-Turn + 0

Time Ending	Vehicles in Queue																				Total Approach
7:35 AM	7	3	2	8	4	1	2	3	3	0	0	3	0	5	4	2	4	3	2	0	
7:40 AM	1	1	2	2	6	4	3	1	4	3	3	1	1	3	2	3	4	2	3	2	
7:45 AM	3	2	5	1	3	2	1	10	5	2	3	5	1	2	1	0	8	5	5	3	141
7:50 AM	6	0	1	0	2	3	4	1	0	4	1	2	4	1	3	1	7	2	1	1	
7:55 AM	6	6	0	11	13	8	4	6	4	3	1	1	3	1	3	2	1	2	2	3	
8:00 AM	1	4	0	3	3	4	2	3	2	1	1	0	0	1	5	8	9	1	3	1	150
8:05 AM	3	2	3	1	2	0	0	1	0	0	3	6	4	1	1	2	2	1	2	3	
8:10 AM	2	1	2	0	0	1	2	3	1	6	5	1	2	1	1	1	2	3	0	2	
8:15 AM	2	0	0	0	6	0	0	3	0	0	2	2	3	2	2	2	1	4	1	1	85
8:20 AM	1	1	1	2	1	0	2	1	0	2	4	11	7	2	1	1	2	4	0	4	
8:25 AM	1	3	5	5	5	0	1	5	4	3	1	1	1	0	3	2	1	3	7	3	
8:30 AM	3	0	5	6	4	0	2	0	1	3	3	3	3	0	1	0	1	3	4	3	102
Subtotal:	36	23	26	39	49	23	23	37	24	27	27	36	29	19	27	24	42	33	30	26	478

Total Vehicles in Queue: 600

Total Delay = 600 vehicles x 15 seconds = 9000 seconds

Average Delay Per Vehicle = 9000 seconds / 478 vehicles

18.8 Stop delay (seconds per vehicle) + 5 seconds control = 23.8 Seconds/Vehicle

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 SB ON RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING CONDITIONS*
Analysis Time Period	*AM PEAK HOUR*		

Project Description	*WO 17281.02*
East/West Street:	*CLARK AVE*
Intersection Orientation:	*East-West*
North/South Street:	*U.S. 101 SB ON RAMP*
Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*791*	*138*	*15*	*164*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*0.92*	*0.92*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*859*	*149*	*16*	*178*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*						
v (veh/h)		*16*						
C (m) (veh/h)		*151*						
v/c		*0.11*						
95% queue length		*0.35*						
Control Delay (s/veh)		*31.6*						
LOS		*D*						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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23.1

$\Delta = 0.7$

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 SB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/201188*	Analysis Year	*EXISTING CONDITIONS*
Analysis Time Period	*AM PEAK HOUR*		

Project Description *19587.01*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 SB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*883*			*164*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*1.00*	*1.00*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*959*	*0*	*0*	*178*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*46*		*417*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.92*	*1.00*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*49*	*0*	*453*
Percent Heavy Vehicles	*4*	*0*	*4*	*4*	*0*	*4*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						*L*		*R*
v (veh/h)						*49*		*453*
C (m) (veh/h)						*166*		*661*
v/c						*0.30*		*0.69*
95% queue length						*1.16*		*5.41*
Control Delay (s/veh)						*35.5*		*21.5*
LOS						*E*		*C*
Approach Delay (s/veh)	--	--				*22.8*		
Approach LOS	--	--				*C*		

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Δ=0.7

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 SB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	EXISTING + PROJECT
Analysis Time Period	AM PEAK HOUR		

Project Description	WO 17281.02
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 SB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		810	144	15	166	
Peak-Hour Factor, PHF	1.00	0.92	0.92	0.92	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	880	156	16	180	0
Percent Heavy Vehicles	0	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L						
v (veh/h)		16						
C (m) (veh/h)		142						
v/c		0.11						
95% queue length		0.37						
Control Delay (s/veh)		33.5						
LOS		D						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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23.7 + 0.7 = 24.4

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 SB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING+PROJECT CONDITIONS*
Analysis Time Period	*AM PEAK HOUR*		

Project Description *19587.01*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 SB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*902*			*166*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*1.00*	*1.00*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*980*	*0*	*0*	*180*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*46*		*423*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.92*	*1.00*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*49*	*0*	*459*
Percent Heavy Vehicles	*4*	*0*	*4*	*4*	*0*	*4*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						*L*		*R*
v (veh/h)						*49*		*459*
C (m) (veh/h)						*160*		*659*
v/c						*0.31*		*0.70*
95% queue length						*1.22*		*5.62*
Control Delay (s/veh)						*37.1*		*22.0*
LOS						*E*		*C*
Approach Delay (s/veh)	--	--				*23.5*		
Approach LOS	--	--				*C*		

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23.7 + 0.7 = 24.4

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 SB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	CUMULATIVE CONDITIONS
Analysis Time Period	AM PEAK HOUR		

Project Description	WO 17281.02
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 SB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		838	233	33	180	
Peak-Hour Factor, PHF	1.00	0.92	0.92	0.92	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	910	253	35	195	0
Percent Heavy Vehicles	0	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L						
v (veh/h)		35						
C (m) (veh/h)		108						
v/c		0.32						
95% queue length		1.26						
Control Delay (s/veh)		53.6						
LOS		F						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 SB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/201188*	Analysis Year	*CUMULATIVE CONDITIONS*
Analysis Time Period	*AM PEAK HOUR*		

Project Description *19587.01*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 SB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*1025*			*180*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*1.00*	*1.00*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*1114*	*0*	*0*	*195*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*46*		*525*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.92*	*1.00*	*0.92*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*49*	*0*	*570*
Percent Heavy Vehicles	*4*	*0*	*4*	*4*	*0*	*4*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						*L*		*R*
v (veh/h)						*49*		*570*
C (m) (veh/h)						*125*		*647*
v/c						*0.39*		*0.88*
95% queue length						*1.65*		*10.58*
Control Delay (s/veh)						*51.3*		*37.9*
LOS						*F*		*E*
Approach Delay (s/veh)	--	--				*38.9*		
Approach LOS	--	--				*E*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 SB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	CUMULATIVE+PROJECT
Analysis Time Period	AM PEAK HOUR		

Project Description	WO 17281.02
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 SB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		857	241	33	182	
Peak-Hour Factor, PHF	1.00	0.92	0.92	0.92	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	931	261	35	197	0
Percent Heavy Vehicles	0	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L						
v (veh/h)		35						
C (m) (veh/h)		101						
v/c		0.35						
95% queue length		1.37						
Control Delay (s/veh)		58.5						
LOS		F						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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42.0

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 SB OFF RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/201188	Analysis Year	CUMULATIVE+PROJECT
Analysis Time Period	AM PEAK HOUR		

Project Description	19587.01
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 SB OFF RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		1052			182	
Peak-Hour Factor, PHF	1.00	0.92	1.00	1.00	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	1143	0	0	197	0
Percent Heavy Vehicles	0	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		T			T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				46		531
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.92	1.00	0.92
Hourly Flow Rate, HFR (veh/h)	0	0	0	49	0	577
Percent Heavy Vehicles	4	0	4	4	0	4
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			1
Lanes	0	0	0	1	0	1
Configuration				L		R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						L		R
v (veh/h)						49		577
C (m) (veh/h)						119		645
v/c						0.41		0.89
95% queue length						1.75		11.06
Control Delay (s/veh)						55.0		39.9
LOS						F		E
Approach Delay (s/veh)	--	--				41.0		
Approach LOS	--	--				E		

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INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 5 **MITIGATED INTERSECTION**
NORTH/SOUTH STREET: U.S. 101 SB Ramps
EAST/WEST STREET: Clark Avenue
SCENARIO: Cumulative + Project
TIME PERIOD: AM Peak Hour
COUNT DATE:
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	0	0	0	64	0	525	0	792	233	33	180	0
Project Trips	0	0	0	0	0	6	0	19	8	0	2	0
GEOMETRY					LT	R		T TR		L	T	

Movement	Lanes Lane	Capacity	Volume Base	Project	V/C Ratio Base	Project
NBL	0.0	0	0	0	0.00	0.00
NBT	0.0	0	0	0	0.00	0.00
NBR	0.0	0	0	0	0.00	0.00
SBL	0.0	0	64	64	0.00	0.00
SBT	1.0	1,600	0	0	0.04 *	0.04 *
SBR	1.0 (a)	1,600	525	531	0.00	0.00
EBL	0.0	0	0	0	0.00	0.00
EBT	2.0	3,200	792	811	0.32 *	0.33 *
EBR	0.0	0	233	241	0.00	0.00
WBL	1.0	1,600	33	33	0.02 *	0.02 *
WBT	1.0	1,600	180	182	0.11	0.11
WBR	0.0	0	0	0	0.00	0.00
N/S Critical Movements					0.04	0.04
E/W Critical Movements					0.34	0.35
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.48	0.49
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio
(a) Free right-turn lane

INTERSECTION DELAY WORKSHEET
ORCUTT
101 SB RAMPS / CLARK AVE
PM PEAK HOUR: 4:45 - 5:45
6/9/2011 - THURSDAY
15 SECOND INTERVALS
APPROACH: SB Right-Turn + SB Left-Turn + WB Left-Turn + 0

Time Ending	Vehicles in Queue																				Total Approach
4:50 PM	2	2	1	4	3	8	6	5	3	4	2	1	5	3	3	4	3	1	1	3	
4:55 PM	3	0	1	4	3	0	1	4	3	6	1	1	2	0	3	3	6	7	4	1	
5:00 PM	0	2	3	2	4	1	3	0	2	5	4	6	9	6	5	8	7	5	3	0	149
5:05 PM	2	4	3	4	2	2	1	0	2	3	3	1	3	2	0	0	3	6	0	4	
5:10 PM	1	3	2	4	2	5	2	0	1	2	6	0	7	4	4	2	5	1	4	1	
5:15 PM	5	4	4	3	5	5	2	6	9	5	7	1	2	4	3	6	2	4	3	2	152
5:20 PM	1	2	2	6	4	10	7	4	3	4	3	4	3	1	3	3	4	6	2	3	
5:25 PM	0	3	4	3	0	0	3	1	2	7	9	8	2	2	2	2	8	12	7	5	
5:30 PM	2	7	4	6	2	1	3	3	5	2	0	2	1	2	6	4	2	5	5	0	177
5:35 PM	2	2	1	3	1	0	0	0	1	2	3	9	1	4	0	3	5	4	6	1	
5:40 PM	1	0	1	6	5	4	6	5	4	3	5	8	6	5	2	2	2	1	6	1	
5:45 PM	1	9	5	3	2	2	1	0	2	3	4	2	4	1	3	3	3	8	3	3	160
Subtotal:	20	38	31	48	33	38	35	28	37	46	47	43	45	34	34	40	50	60	44	24	638

Total Vehicles in Queue: 775

Total Delay = 775 vehicles x 15 seconds = 11625 seconds

Average Delay Per Vehicle = 11625 seconds / 638 vehicles

18.2 Stop delay (seconds per vehicle) + 5 seconds control = 23.2 Seconds/Vehicle

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 SB ON RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING CONDITIONS*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *WO 17281.02*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 SB ON RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*727*	*77*	*8*	*260*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*0.92*	*0.92*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*790*	*83*	*8*	*282*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*1*	*1*	*0*
Configuration			*TR*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*						
v (veh/h)		*8*						
C (m) (veh/h)		*140*						
v/c		*0.06*						
95% queue length		*0.18*						
Control Delay (s/veh)		*32.3*						
LOS		*D*						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 SB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING CONDITIONS*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *19587.01*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 SB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*746*			*260*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*1.00*	*1.00*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*810*	*0*	*0*	*282*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*58*		*572*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.92*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*63*	*0*	*572*
Percent Heavy Vehicles	*4*	*0*	*4*	*4*	*0*	*4*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						*L*		*R*
v (veh/h)						*63*		*572*
C (m) (veh/h)						*196*		*764*
v/c						*0.32*		*0.75*
95% queue length						*1.32*		*6.93*
Control Delay (s/veh)						*31.8*		*22.3*
LOS						*D*		*C*
Approach Delay (s/veh)	--	--				*23.3*		
Approach LOS	--	--				*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 SB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	EXISTING+PROJECT
Analysis Time Period	PM PEAK HOUR		

Project Description	WO 17281.02
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 SB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		738	82	8	269	
Peak-Hour Factor, PHF	1.00	0.92	0.92	0.92	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	802	89	8	292	0
Percent Heavy Vehicles	0	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L						
v (veh/h)		8						
C (m) (veh/h)		135						
v/c		0.06						
95% queue length		0.19						
Control Delay (s/veh)		33.3						
LOS		D						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 SB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING+PROJECT*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *19587.01*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 SB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*762*			*269*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*1.00*	*1.00*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*828*	*0*	*0*	*292*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*58*		*592*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.92*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*63*	*0*	*592*
Percent Heavy Vehicles	*4*	*0*	*4*	*4*	*0*	*4*	
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						*L*		*R*
v (veh/h)						*63*		*592*
C (m) (veh/h)						*188*		*755*
v/c						*0.34*		*0.78*
95% queue length						*1.39*		*7.86*
Control Delay (s/veh)						*33.5*		*24.8*
LOS						*D*		*C*
Approach Delay (s/veh)	--	--				*25.6*		
Approach LOS	--	--				*D*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK AVE & U.S.101 SB ON
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	08/11/2011	Analysis Year	EXISTING+PROJECT MITIGATED
Analysis Time Period	PM PEAK HOUR		

Project Description	16527.12
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 SB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		738	82	8	269	
Peak-Hour Factor, PHF	1.00	0.92	0.92	0.92	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	802	89	8	292	0
Percent Heavy Vehicles	0	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	1	1	0
Configuration		T	TR	L	T	
Upstream Signal		0			1	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	0.92	1.00	0.92	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	4	0	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L						
v (veh/h)		8						
C (m) (veh/h)		744						
v/c		0.01						
95% queue length		0.03						
Control Delay (s/veh)		9.9						
LOS		A						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	Clark Ave&U.S. 101 SB Off-Ramp
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	08/11/2011	Analysis Year	EXISTING+PROJECT MITIGATED
Analysis Time Period	PM PEAK HOUR		

Project Description	16527.12
East/West Street:	CLARK AVE
North/South Street:	U.S.101 SB OFF-RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		762			269	
Peak-Hour Factor, PHF	0.92	0.92	1.00	1.00	0.92	0.92
Hourly Flow Rate, HFR (veh/h)	0	828	0	0	292	0
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	2	0	0	1	0
Configuration		T			T	
Upstream Signal		0			1	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				58		
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.92	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	63	0	0
Percent Heavy Vehicles	0	0	0	4	0	4
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	1	0	0
Configuration				L		

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						L		
v (veh/h)						63		
C (m) (veh/h)						377		
v/c						0.17		
95% queue length						0.59		
Control Delay (s/veh)						16.5		
LOS						C		
Approach Delay (s/veh)	--	--				16.5		
Approach LOS	--	--				C		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	905	Intersection	CLARK/U.S.101 SB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	CUMULATIVE CONDITIONS
Analysis Time Period	PM PEAK HOUR		

Project Description	WO 17281.02
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 SB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		905	60	10	315	
Peak-Hour Factor, PHF	1.00	0.92	0.92	0.92	0.92	1.00
Hourly Flow Rate, HFR (veh/h)	0	983	65	10	342	0
Percent Heavy Vehicles	0	--	--	4	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	1	1	0
Configuration			TR	L	T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		L						
v (veh/h)		10						
C (m) (veh/h)		99						
v/c		0.10						
95% queue length		0.33						
Control Delay (s/veh)		45.4						
LOS		E						
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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> 50.0

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 SB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*cumulative*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *19587.01*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 SB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*825*			*315*	
Peak-Hour Factor, PHF	*1.00*	*0.92*	*1.00*	*1.00*	*0.92*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*896*	*0*	*0*	*342*	*0*
Percent Heavy Vehicles	*0*	--	--	*4*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*140*		*710*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.92*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*152*	*0*	*710*
Percent Heavy Vehicles	*4*	*0*	*4*	*4*	*0*	*4*	
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*1*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration						*L*		*R*
v (veh/h)						*152*		*710*
C (m) (veh/h)						*156*		*709*
v/c						*0.97*		*1.00*
95% queue length						*7.30*		*16.38*
Control Delay (s/veh)						*123.1*		*58.2*
LOS						*F*		*F*
Approach Delay (s/veh)	--	--				*69.7*		
Approach LOS	--	--				*F*		

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INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 5 **MITIGATED INTERSECTION**
NORTH/SOUTH STREET: U.S. 101 SB Ramps
EAST/WEST STREET: Clark Avenue
SCENARIO: Cumulative + Project
TIME PERIOD: PM Peak Hour
COUNT DATE:
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	0	0	0	140	0	710	0	765	60	10	315	0
Project Trips	0	0	0	0	0	20	0	11	5	0	9	0
GEOMETRY					LT	R		T TR		L	T	

	Level of Service Calculations					
Move-ment	Lanes Lane	Capacity	Volume Base	Project	V/C Ratio Base	Project
NBL	0.0	0	0	0	0.00	0.00
NBT	0.0	0	0	0	0.00	0.00
NBR	0.0	0	0	0	0.00	0.00
SBL	0.0	0	140	140	0.00	0.00
SBT	1.0	1,600	0	0	0.09 *	0.09 *
SBR	1.0 (a)	1,600	710	730	0.00	0.00
EBL	0.0	0	0	0	0.00	0.00
EBT	2.0	3,200	765	776	0.26 *	0.26 *
EBR	0.0	0	60	65	0.00	0.00
WBL	1.0	1,600	10	10	0.01 *	0.01 *
WBT	1.0	1,600	315	324	0.20	0.20
WBR	0.0	0	0	0	0.00	0.00
N/S Critical Movements					0.09	0.09
E/W Critical Movements					0.27	0.27
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.46	0.46
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio
(a) Free right-turn lane

4. CLARK AVE/U.S. 101 NORTHBOUND RAMPS

INTERSECTION DELAY WORKSHEET
ORCUTT
101 NB RAMPS / CLARK ST
AM PEAK HOUR: 7:00 - 8:00
6/9/2011 - THURSDAY
15 SECOND INTERVALS
APPROACH: EB LT + 0 + NB LTR + 0

Time Ending	Vehicles in Queue																				Total Approach
7:35 AM	0	0	0	0	0	4	3	1	0	0	2	0	2	0	1	2	3	0	0	0	
7:40 AM	0	0	2	1	2	2	0	0	1	4	3	4	3	0	3	0	1	0	4	4	
7:45 AM	3	3	3	0	1	2	3	2	2	1	0	0	2	1	0	2	3	2	0	0	174
7:50 AM	0	0	2	3	3	2	0	1	2	0	2	2	1	0	3	5	9	11	5	2	
7:55 AM	2	2	1	0	0	2	0	3	6	5	4	5	5	4	0	1	1	0	0	0	
8:00 AM	4	1	2	4	4	4	2	4	4	2	0	0	3	0	2	2	3	0	3	8	215
8:05 AM	8	6	4	3	3	8	5	3	0	2	4	3	5	7	5	0	2	3	2	2	
8:10 AM	2	1	2	1	2	6	4	2	2	2	3	4	2	1	2	1	0	2	6	7	
8:15 AM	10	6	3	1	2	0	3	1	1	2	2	1	1	1	0	1	1	0	2	0	193
8:20 AM	1	0	1	1	0	0	2	0	0	1	0	0	2	5	4	3	3	4	1	0	
8:25 AM	1	1	2	1	2	0	2	2	2	0	1	4	1	2	1	0	3	4	3	4	
8:30 AM	2	2	0	0	3	0	2	3	0	1	1	7	4	1	4	2	2	0	0	1	147
Subtotal:	33	22	22	15	22	30	26	22	20	20	22	30	31	22	25	19	31	26	26	28	729

Total Vehicles in Queue: 492

Total Delay = 492 vehicles x 15 seconds = 7380 seconds

Average Delay Per Vehicle = 7380 seconds / 729 vehicles

10.1 Stop delay (seconds per vehicle) + 5 seconds control = 15.1 Seconds/Vehicle

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB ON RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING CONDITIONS*
Analysis Time Period	*AM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB ON RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*663*	*127*			*180*	*66*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*1.00*	*1.00*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*770*	*147*	*0*	*0*	*209*	*76*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*							
v (veh/h)	*770*							
C (m) (veh/h)	*1182*							
v/c	*0.65*							
95% queue length	*5.10*							
Control Delay (s/veh)	*13.5*							
LOS	*B*							
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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13.3

Δ= 1.8

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING CONDITIONS*
Analysis Time Period	*AM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*127*			*191*	
Peak-Hour Factor, PHF	*1.00*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*145*	*0*	*0*	*219*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*55*		*11*			
Peak-Hour Factor, PHF	*0.87*	*0.87*	*0.87*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*63*	*0*	*12*	*0*	*0*	*0*
Percent Heavy Vehicles	*4*	*4*	*4*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*Y*			*N*	
Storage		*1*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				*LR*				
v (veh/h)				*75*				
C (m) (veh/h)				*693*				
v/c				*0.11*				
95% queue length				*0.36*				
Control Delay (s/veh)				*11.7*				
LOS				*B*				
Approach Delay (s/veh)	--	--	*11.7*					
Approach LOS	--	--	*B*					

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133

Δ = 1.8

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 NB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	EXISTING+PROJECT CONDITIONS
Analysis Time Period	AM PEAK HOUR		

Project Description	WO 16527.12
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 NB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	682	127			182	66
Peak-Hour Factor, PHF	0.86	0.86	1.00	1.00	0.86	0.86
Hourly Flow Rate, HFR (veh/h)	793	147	0	0	211	76
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L							
v (veh/h)	793							
C (m) (veh/h)	1180							
v/c	0.67							
95% queue length	5.52							
Control Delay (s/veh)	14.1							
LOS	B							
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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13.9 + 1.8 = 15.7

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 NB OFF RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	EXISTING+PROJECT CONDITIONS
Analysis Time Period	AM PEAK HOUR		

Project Description	WO 16527.12
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 NB OFF RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		127			191	
Peak-Hour Factor, PHF	1.00	0.87	1.00	1.00	0.87	0.87
Hourly Flow Rate, HFR (veh/h)	0	145	0	0	219	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	2	0
Configuration		T			T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	57		11			
Peak-Hour Factor, PHF	0.87	0.87	0.87	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	65	0	12	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				LR				
v (veh/h)				77				
C (m) (veh/h)				689				
v/c				0.11				
95% queue length				0.38				
Control Delay (s/veh)				11.7				
LOS				B				
Approach Delay (s/veh)	--	--	11.7					
Approach LOS	--	--	B					

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13.9 + 1.8 = 15.7

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 4 **MITIGATED INTERSECTION**
NORTH/SOUTH STREET: U.S. 101 NB Ramps
EAST/WEST STREET: Clark Avenue **SPLIT PHASED**
SCENARIO: Existing + Project
TIME PERIOD: AM Peak Hour
COUNT DATE:
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	55	0	11	0	0	0	663	127	0	0	126	66
Project Trips	2	0	0	0	0	0	19	0	0	0	0	0
GEOMETRY	L	TR					L	LT			T	R

Move-ment	Level of Service Calculations					
	Lanes		**Volume**		**V/C Ratio**	
	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	55	57	0.03 *	0.04 *
NBT	1.0	1,600	0	0	0.01	0.01
NBR	0.0	0	11	11	0.00	0.00
SBL	0.0	0	0	0	0.00	0.00
SBT	0.0	0	0	0	0.00 *	0.00 *
SBR	0.0	0	0	0	0.00	0.00
EBL	0.0	0	663	682	0.00	0.00
EBT	2.0	3,200	127	127	0.25 *	0.25 *
EBR	0.0	0	0	0	0.00	0.00
WBL	0.0	0	0	0	0.00	0.00
WBT	1.0	1,600	126	126	0.08 *	0.08 *
WBR	1.0	1,600	66	66	0.04	0.04
N/S Critical Movements					0.03	0.04
E/W Critical Movements					0.33	0.33
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.46	0.47
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 NB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	CUMULATIVE CONDITIONS
Analysis Time Period	AM PEAK HOUR		

Project Description	WO 16527.12
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 NB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	713	159			226	90
Peak-Hour Factor, PHF	0.86	0.86	1.00	1.00	0.86	0.86
Hourly Flow Rate, HFR (veh/h)	829	184	0	0	262	104
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L							
v (veh/h)	829							
C (m) (veh/h)	1096							
v/c	0.76							
95% queue length	7.59							
Control Delay (s/veh)	17.7							
LOS	C							
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*CUMULATIVE CONDITIONS*
Analysis Time Period	*AM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*159*			*244*	
Peak-Hour Factor, PHF	*1.00*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*182*	*0*	*0*	*280*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*72*		*11*			
Peak-Hour Factor, PHF	*0.87*	*0.87*	*0.87*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*82*	*0*	*12*	*0*	*0*	*0*
Percent Heavy Vehicles	*4*	*4*	*4*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*Y*			*N*	
Storage		*1*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				*LR*				
v (veh/h)				*94*				
C (m) (veh/h)				*595*				
v/c				*0.16*				
95% queue length				*0.56*				
Control Delay (s/veh)				*12.9*				
LOS				*B*				
Approach Delay (s/veh)	--	--	*12.9*					
Approach LOS	--	--	*B*					

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB ON RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*CUMULATIVE+PROJECT*
Analysis Time Period	*AM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB ON RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*732*	*159*			*228*	*90*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*1.00*	*1.00*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*851*	*184*	*0*	*0*	*265*	*104*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*							
v (veh/h)	*851*							
C (m) (veh/h)	*1093*							
v/c	*0.78*							
95% queue length	*8.28*							
Control Delay (s/veh)	*18.8*							
LOS	*C*							
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB OFF-RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*CUMULATIVE+PROJECT*
Analysis Time Period	*AM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*159*			*244*	
Peak-Hour Factor, PHF	*1.00*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*182*	*0*	*0*	*280*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)			*11*			
Peak-Hour Factor, PHF	*0.87*	*0.87*	*0.87*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*86*	*0*	*12*	*0*	*0*	*0*
Percent Heavy Vehicles	*4*	*4*	*4*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*Y*			*N*	
Storage		*1*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				*LR*				
v (veh/h)				*98*				
C (m) (veh/h)				*591*				
v/c				*0.17*				
95% queue length				*0.59*				
Control Delay (s/veh)				*13.0*				
LOS				*B*				
Approach Delay (s/veh)	--	--	*13.0*					
Approach LOS	--	--	*B*					

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INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 4 **MITIGATED INTERSECTION**
NORTH/SOUTH STREET: U.S. 101 NB Ramps
EAST/WEST STREET: Clark Avenue **SPLIT PHASED**
SCENARIO: Cumulative + Project
TIME PERIOD: AM Peak Hour
COUNT DATE:
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	72	0	11	0	0	0	713	159	0	0	154	90
Project Trips	2	0	0	0	0	0	19	0	0	0	0	0
GEOMETRY	L	TR					L	LT			T	R

Move-ment	Level of Service Calculations					
	Lanes		**Volume**		**V/C Ratio**	
	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	72	74	0.05 *	0.05 *
NBT	1.0	1,600	0	0	0.01	0.01
NBR	0.0	0	11	11	0.00	0.00
SBL	0.0	0	0	0	0.00	0.00
SBT	0.0	0	0	0	0.00 *	0.00 *
SBR	0.0	0	0	0	0.00	0.00
EBL	0.0	0	713	732	0.00	0.00
EBT	2.0	3,200	159	159	0.27 *	0.28 *
EBR	0.0	0	0	0	0.00	0.00
WBL	0.0	0	0	0	0.00	0.00
WBT	1.0	1,600	154	154	0.10 *	0.10 *
WBR	1.0	1,600	90	90	0.06	0.06
N/S Critical Movements					0.05	0.05
E/W Critical Movements					0.37	0.38
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.52	0.53
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio

INTERSECTION DELAY WORKSHEET
ORCUTT
U.S. 101 NB RAMPS / CLARK AVE
PM PEAK HOUR: 4:30 - 5:30
6/9/2011 - THURSDAY
15 SECOND INTERVALS
APPROACH: EB LT + 0 + NB LTR + 0

Time Ending	Vehicles in Queue																				Total Approach
4:35 PM	1	3	6	2	1	2	1	3	2	3	1	7	5	3	4	3	1	5	5	2	
4:40 PM	0	2	2	0	1	8	9	7	9	4	3	1	6	4	9	6	2	1	3	8	
4:45 PM	6	4	3	7	4	3	7	5	2	1	8	8	5	4	2	3	2	0	1	0	207
4:50 PM	5	8	5	2	0	5	4	2	8	6	3	0	0	0	0	1	2	2	2	5	
4:55 PM	11	10	8	6	5	3	3	1	2	6	3	1	4	3	0	1	0	5	4	1	
5:00 PM	0	0	0	5	7	3	1	1	0	0	2	12	11	10	12	14	13	12	12	7	203
5:05 PM	3	1	6	6	2	2	4	0	1	2	3	2	1	4	3	2	3	8	10	5	
5:10 PM	1	0	4	1	2	3	9	7	7	7	4	3	3	2	0	1	1	1	7	5	
5:15 PM	2	1	3	4	1	2	0	3	0	3	0	2	1	0	0	1	2	2	1	6	175
5:20 PM	8	5	0	5	9	9	11	9	9	11	8	6	6	5	1	0	2	2	0	0	
5:25 PM	2	3	4	0	1	0	1	1	0	1	3	3	4	3	5	6	6	5	3	0	
5:30 PM	1	2	1	1	0	0	0	0	2	0	0	0	6	7	3	2	1	1	0	7	188
Subtotal:	40	39	42	39	33	40	50	39	42	44	38	45	52	45	39	40	35	44	48	46	773

Total Vehicles in Queue: 840

Total Delay = 840 vehicles x 15 seconds = 12600 seconds

Average Delay Per Vehicle = 12600 seconds / 773 vehicles

16.3 Stop delay (seconds per vehicle) + 5 seconds control = 21.3 Seconds/Vehicle

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB ON RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING CONDITIONS*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB ON RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*589*	*157*			*282*	*162*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*1.00*	*1.00*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*684*	*182*	*0*	*0*	*327*	*188*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*							
v (veh/h)	*684*							
C (m) (veh/h)	*988*							
v/c	*0.69*							
95% queue length	*5.85*							
Control Delay (s/veh)	*16.4*							
LOS	*C*							
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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15.8 observed = 21.3

Δ = 5.5

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 NB OFF RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	EXISTING CONDITIONS
Analysis Time Period	PM PEAK HOUR		

Project Description	WO 16527.12
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 NB OFF RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		157			289	
Peak-Hour Factor, PHF	1.00	0.87	1.00	1.00	0.87	0.87
Hourly Flow Rate, HFR (veh/h)	0	180	0	0	332	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	2	0
Configuration		T			T	
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	155		30			
Peak-Hour Factor, PHF	0.87	0.87	0.87	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	178	0	34	0	0	0
Percent Heavy Vehicles	4	4	4	0	0	0
Percent Grade (%)		0			0	
Flared Approach		Y			N	
Storage		1			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration		LR				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				LR				
v (veh/h)				212				
C (m) (veh/h)				622				
v/c				0.34				
95% queue length				1.51				
Control Delay (s/veh)				13.8				
LOS				B				
Approach Delay (s/veh)	--	--	13.8					
Approach LOS	--	--	B					

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15.8 observed = 21.3

Δ = 5.5

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 NB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	EXISTING+PROJECT
Analysis Time Period	PM PEAK HOUR		

Project Description	WO 16527.12
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 NB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	600	157			291	162
Peak-Hour Factor, PHF	0.86	0.86	1.00	1.00	0.86	0.86
Hourly Flow Rate, HFR (veh/h)	697	182	0	0	338	188
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L							
v (veh/h)	697							
C (m) (veh/h)	978							
v/c	0.71							
95% queue length	6.31							
Control Delay (s/veh)	17.2							
LOS	C							
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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16.4 + 5.5 = 21.9

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*EXISTING+PROJECT*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*157*			*289*	
Peak-Hour Factor, PHF	*1.00*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*180*	*0*	*0*	*332*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

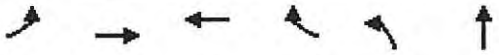
Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*164*		*30*			
Peak-Hour Factor, PHF	*0.87*	*0.87*	*0.87*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*188*	*0*	*34*	*0*	*0*	*0*
Percent Heavy Vehicles	*4*	*4*	*4*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*Y*			*N*	
Storage		*1*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				*LR*				
v (veh/h)				*222*				
C (m) (veh/h)				*620*				
v/c				*0.36*				
95% queue length				*1.62*				
Control Delay (s/veh)				*14.0*				
LOS				*B*				
Approach Delay (s/veh)	--	--	*14.0*					
Approach LOS	--	--	*B*					

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16.4 + 5.5 = 21.9



Lane Group	EBL	EBT	WBT	WBR	NBL	NBT
Lane Group Flow (vph)	404	419	138	176	178	33
v/c Ratio	0.55	0.56	0.46	0.43	0.54	0.04
Control Delay	19.7	20.0	26.6	7.4	27.6	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.7	20.0	26.6	7.4	27.6	0.1
Queue Length 50th (ft)	106	111	46	0	59	0
Queue Length 95th (ft)	#286	#297	83	41	102	0
Internal Link Dist (ft)		581	245			289
Turn Bay Length (ft)				250		
Base Capacity (vph)	731	742	487	551	463	989
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.56	0.28	0.32	0.38	0.03

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 4 **MITIGATED INTERSECTION**
NORTH/SOUTH STREET: U.S. 101 NB Ramps
EAST/WEST STREET: Clark Avenue **SPLIT PHASED**
SCENARIO: Existing + Project
TIME PERIOD: PM Peak Hour
COUNT DATE: 06/11
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	155	0	30	0	0	0	589	157	0	0	127	162
Project Trips	9	0	0	0	0	0	11	0	0	0	0	0
GEOMETRY	L	TR					L	LT			T	R

	Level of Service Calculations					
Move-	Lanes		Volume		V/C Ratio	
ment	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	155	164	0.10 *	0.10 *
NBT	1.0	1,600	0	0	0.02	0.02
NBR	0.0	0	30	30	0.00	0.00
SBL	0.0	0	0	0	0.00	0.00
SBT	0.0	0	0	0	0.00 *	0.00 *
SBR	0.0	0	0	0	0.00	0.00
EBL	0.0	0	589	600	0.00	0.00
EBT	2.0	3,200	157	157	0.23 *	0.24 *
EBR	0.0	0	0	0	0.00	0.00
WBL	0.0	0	0	0	0.00	0.00
WBT	1.0	1,600	127	127	0.08 *	0.08 *
WBR	1.0	1,600	162	162	0.10	0.10
N/S Critical Movements					0.10	0.10
E/W Critical Movements					0.31	0.32
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.51	0.52
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	DJL	Intersection	CLARK/U.S.101 NB ON RAMP
Agency/Co.	P&S	Jurisdiction	SB COUNTY
Date Performed	06/17/2011	Analysis Year	CUMULATIVE CONDITIONS
Analysis Time Period	PM PEAK HOUR		

Project Description	WO 16527.12
East/West Street:	CLARK AVE
North/South Street:	U.S. 101 NB ON RAMP
Intersection Orientation:	East-West
Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	750	155			295	170
Peak-Hour Factor, PHF	0.86	0.86	1.00	1.00	0.86	0.86
Hourly Flow Rate, HFR (veh/h)	872	180	0	0	343	197
Percent Heavy Vehicles	4	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	1	1	0	0	1	1
Configuration	L	T			T	R
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	L							
v (veh/h)	872							
C (m) (veh/h)	965							
v/c	0.90							
95% queue length	13.18							
Control Delay (s/veh)	31.6							
LOS	D							
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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283 + 55 = 33.8

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*CUMULATIVE CONDITIONS*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*155*			*300*	
Peak-Hour Factor, PHF	*1.00*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*178*	*0*	*0*	*344*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*165*		*15*			
Peak-Hour Factor, PHF	*0.87*	*0.87*	*0.87*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*189*	*0*	*17*	*0*	*0*	*0*
Percent Heavy Vehicles	*4*	*4*	*4*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*Y*			*N*	
Storage		*1*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				*LR*				
v (veh/h)				*206*				
C (m) (veh/h)				*584*				
v/c				*0.35*				
95% queue length				*1.58*				
Control Delay (s/veh)				*14.5*				
LOS				*B*				
Approach Delay (s/veh)	--	--	*14.5*					
Approach LOS	--	--	*B*					

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283 + 55 = 33.8

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB ON RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*CUMULATIVE+PROJECT*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB ON RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*761*	*155*			*304*	*170*
Peak-Hour Factor, PHF	*0.86*	*0.86*	*1.00*	*1.00*	*0.86*	*0.86*
Hourly Flow Rate, HFR (veh/h)	*884*	*180*	*0*	*0*	*353*	*197*
Percent Heavy Vehicles	*4*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*1*	*1*	*0*	*0*	*1*	*1*
Configuration	*L*	*T*			*T*	*R*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration						

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*L*							
v (veh/h)	*884*							
C (m) (veh/h)	*956*							
v/c	*0.92*							
95% queue length	*14.25*							
Control Delay (s/veh)	*34.9*							
LOS	*D*							
Approach Delay (s/veh)	--	--						
Approach LOS	--	--						

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31.0 + 5.5 = 36.5

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*DJL*	Intersection	*CLARK/U.S.101 NB OFF RAMP*
Agency/Co.	*P&S*	Jurisdiction	*SB COUNTY*
Date Performed	*06/17/2011*	Analysis Year	*CUMULATIVE+PROJECT*
Analysis Time Period	*PM PEAK HOUR*		

Project Description *WO 16527.12*	
East/West Street: *CLARK AVE*	North/South Street: *U.S. 101 NB OFF RAMP*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*155*			*300*	
Peak-Hour Factor, PHF	*1.00*	*0.87*	*1.00*	*1.00*	*0.87*	*0.87*
Hourly Flow Rate, HFR (veh/h)	*0*	*178*	*0*	*0*	*344*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*174*		*15*			
Peak-Hour Factor, PHF	*0.87*	*0.87*	*0.87*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*199*	*0*	*17*	*0*	*0*	*0*
Percent Heavy Vehicles	*4*	*4*	*4*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*Y*			*N*	
Storage		*1*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration		*LR*				

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration				*LR*				
v (veh/h)				*216*				
C (m) (veh/h)				*582*				
v/c				*0.37*				
95% queue length				*1.71*				
Control Delay (s/veh)				*14.8*				
LOS				*B*				
Approach Delay (s/veh)	--	--	*14.8*					
Approach LOS	--	--	*B*					

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31.0 + 5.5 = 36.5

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 4 **MITIGATED INTERSECTION**
NORTH/SOUTH STREET: U.S. 101 NB Ramps
EAST/WEST STREET: Clark Avenue **SPLIT PHASED**
SCENARIO: Cumulative + Project
TIME PERIOD: PM Peak Hour
COUNT DATE:
WORK ORDER #: 16527

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
AM Peak	165	0	15	0	0	0	750	155	0	0	130	170
Project Trips	9	0	0	0	0	0	11	0	0	0	0	0
GEOMETRY	L	TR					L	LT			T	R

	Level of Service Calculations					
Move-ment	Lanes		Volume		V/C Ratio	
	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	165	174	0.10 *	0.11 *
NBT	1.0	1,600	0	0	0.01	0.01
NBR	0.0	0	15	15	0.00	0.00
SBL	0.0	0	0	0	0.00	0.00
SBT	0.0	0	0	0	0.00 *	0.00 *
SBR	0.0	0	0	0	0.00	0.00
EBL	0.0	0	750	761	0.00	0.00
EBT	2.0	3,200	155	155	0.28 *	0.29 *
EBR	0.0	0	0	0	0.00	0.00
WBL	0.0	0	0	0	0.00	0.00
WBT	1.0	1,600	130	130	0.08	0.08
WBR	1.0	1,600	170	170	0.11 *	0.11 *
N/S Critical Movements					0.10	0.11
E/W Critical Movements					0.28	0.29
Right Turn Critical Movement					0.11	0.11
Clearance Interval					0.10	0.10
ICU					0.59	0.61
Level of Service (LOS)					A	B

Notes: V/C - Volume to Capacity Ratio

5. CLARK AVE/BRADLEY RD

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 5
NORTH/SOUTH STREET: Bradley Road
EAST/WEST STREET: Clark Avenue
SCENARIO: Existing + Project Conditions
TIME PERIOD: PM Peak Hour
COUNT DATE:
WORK ORDER #: #######

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
PM Peak	161	234	54	221	224	89	157	544	59	211	523	114
Project Trips	0	0	1	11	0	0	0	12	0	1	6	6
GEOMETRY	L	T	TR	L	T	TR	LL	T	TR	LL	T	TR

	Level of Service Calculations					
Move-	**Lanes**		**Volume**		**V/C Ratio**	
ment	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	161	161	0.10	0.10
NBT	2.0	3,200	234	234	0.09 *	0.09 *
NBR	0.0	0	54	55	0.00	0.00
SBL	1.0	1,600	221	232	0.14 *	0.15 *
SBT	2.0	3,200	224	224	0.10	0.10
SBR	0.0	0	89	89	0.00	0.00
EBL	2.0	3,200	157	157	0.05	0.05
EBT	2.0	3,200	544	556	0.19 *	0.19 *
EBR	0.0	0	59	59	0.00	0.00
WBL	2.0	3,200	211	212	0.07 *	0.07 *
WBT	2.0	3,200	523	529	0.20	0.20
WBR	0.0	0	114	120	0.00	0.00
N/S Critical Movements					0.23	0.24
E/W Critical Movements					0.26	0.26
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.59	0.60
Level of Service (LOS)					A	A

Notes: V/C - Volume to Capacity Ratio
Right Turn Conditions:

INTERSECTION CAPACITY UTILIZATION

INTERSECTION NUMBER: 5
NORTH/SOUTH STREET: Bradley Road
EAST/WEST STREET: Clark Avenue
SCENARIO: Cumulative + Project Conditions
TIME PERIOD: PM Peak Hour
COUNT DATE:
WORK ORDER #: #######

VOLUMES	Northbound			Southbound			Eastbound			Westbound		
	L	T	R	L	T	R	L	T	R	L	T	R
PM Peak	205	400	30	310	575	85	190	595	135	150	605	130
Project Trips	0	0	1	11	0	0	0	12	0	1	6	6
GEOMETRY	L	T	TR	L	T	TR	LL	T	TR	LL	T	TR

	Level of Service Calculations					
Move-	**Lanes**		**Volume**		**V/C Ratio**	
ment	Lane	Capacity	Base	Project	Base	Project
NBL	1.0	1,600	205	205	0.13 *	0.13 *
NBT	2.0	3,200	400	400	0.13	0.13
NBR	0.0	0	30	31	0.00	0.00
SBL	1.0	1,600	310	321	0.19	0.20
SBT	2.0	3,200	575	575	0.21 *	0.21 *
SBR	0.0	0	85	85	0.00	0.00
EBL	2.0	3,200	190	190	0.06 *	0.06 *
EBT	2.0	3,200	595	607	0.23	0.23
EBR	0.0	0	135	135	0.00	0.00
WBL	2.0	3,200	150	151	0.05	0.05
WBT	2.0	3,200	605	611	0.23 *	0.23 *
WBR	0.0	0	130	136	0.00	0.00
N/S Critical Movements					0.34	0.34
E/W Critical Movements					0.29	0.29
Right Turn Critical Movement					0.00	0.00
Clearance Interval					0.10	0.10
ICU					0.73	0.73
Level of Service (LOS)					C	C

Notes: V/C - Volume to Capacity Ratio
Right Turn Conditions:

District 05 – Santa Barbara County – U.S. 101 - Post Mile 82.18
Program Code – 20.XX.400.100
Project Number 0513000057
October/2013

Project Study Report-Project Development Support (PSR-PDS)

To

Request Approval of a Locally Funded Project to Proceed to PA/ED Phase

On U.S. 101 at the Clark Avenue Interchange

PROJECT SPONSOR:

Scott McGolpin, Director, Public Works Department, Santa Barbara County, *PROJECT SPONSOR*

Project Sponsor accepts risks identified in this PSR-PDS and attached Risk Register

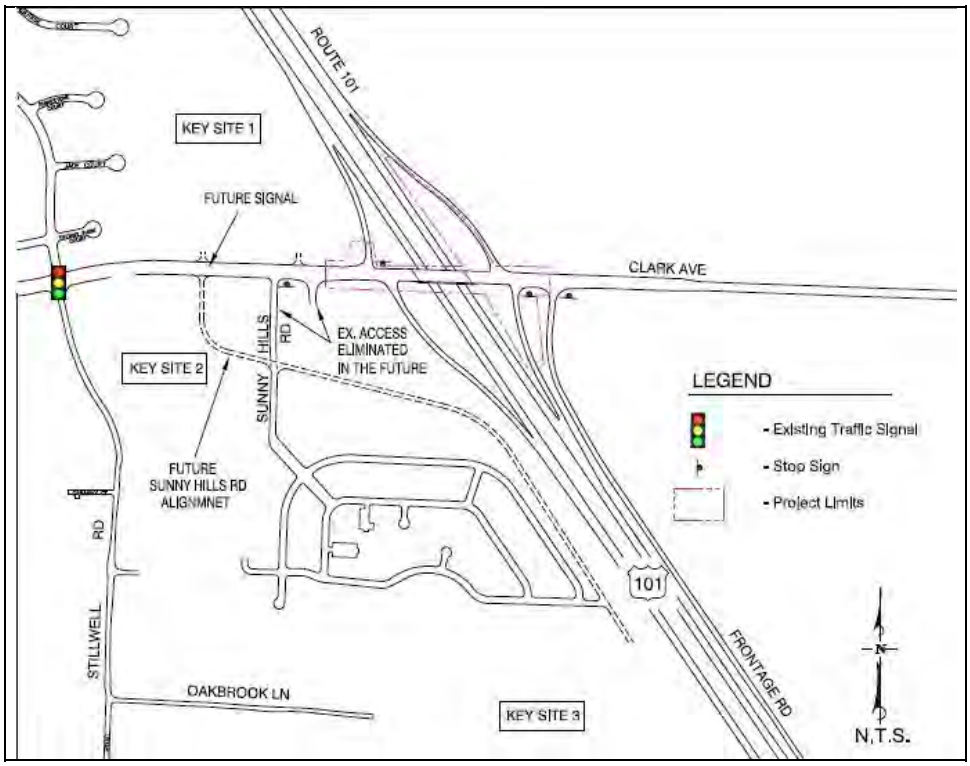
APPROVAL RECOMMENDED:

Paul Martinez, *CALTRANS PROJECT MANAGER*

APPROVED:

Tim Gubbins, *DISTRICT 5 DIRECTOR* *DATE*

Vicinity Map



This project study report-project development support has been prepared under the direction of the following registered civil engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

REGISTERED CIVIL ENGINEER *DATE*



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1.0 INTRODUCTION

Brief Project Description:

The *Orcutt Community Plan FEIR*[1] identified the need for improvements to the Clark Avenue interchange to provide acceptable operations under future traffic conditions. These improvements included alignment and signalization of the Northbound and Southbound Ramps. The project costs for these improvements were included in the *Orcutt Transportation Improvement Program* (OTIP), which collects traffic impact fees from developments within the Orcutt area. The realignment and signalization project is also currently included in the County's *Capital Improvement Program (CIP).*

Pursuant to the OTIP, the realignment and signalization project was identified to mitigate the project-specific impact generated by the Orcutt Village Marketplace (Key Site 1)[2], located directly west and north of the interchange. The traffic study completed for the Orcutt Village Marketplace (Key Site 1) found that the U.S. 101 Southbound Ramps/Clark Avenue intersection would operate below Caltrans and County standards. The source of the deficiency is the southbound left-turn movement, consisting of 58 vehicles per hour (vph) that would operate in the LOS F range during the PM peak hour. However, due to the low volumes of left turning ramp volumes and lack of a documented collision history, traffic signal warrants are not met at this location.

While there is no immediately projected operational deficiency at the northbound U.S. 101 Ramps/Clark Avenue intersection, it has experienced an average of over 2 broadside collisions per year over the past 10 years. In 2010, the most recent year for which there is full records, there were 5 reported broadside collisions. It has been determined that realignment and signalization of the Northbound Ramps would provide for acceptable levels of service at the Southbound Ramps by creating sufficient gaps in Clark Avenue traffic and reducing off ramp left-turn delays and reduce the occurrence of right angle collisions at the Northbound Ramps.

The purpose of this report is to obtain approval to continue to the PA/ED Phase for improvements to the U.S. 101/Clark Avenue Interchange, located in Orcutt, CA, in Santa Barbara County. The PA/ED completion milestone is 2014 and the anticipated funding year for construction is 2015. Four project alternatives were studied to address near-term future operational deficiencies at the U.S. 101 Southbound Ramps/Clark Intersection and

[1] *Orcutt Community Plan FEIR (95-EIR-1),* County of Santa Barbara, 1995.
Orcutt Community Plan Update, Final Environmental Impact Report, County of Santa Barbara, December 2005.
[2] *Orcutt Village Marketplace,* Traffic and Circulation Study, Penfield & Smith, 2007.

an increase in correctable broadside collisions at the U.S. 101 Northbound Ramps/Clark Intersection. These include:

- **No Build Alternativ**e. The No Build Alternative assumes that no improvements are constructed at the interchange.
- **Build Alternative 1 (Build Alternative assumed for estimating resources) -** Realignment and signalization of the Northbound Ramps.
- **Build Alternative 2** - Reconfiguration of the Northbound On-Ramp to provide a Northbound loop ramp.
- **Build Alternative 3** - Reconfiguration of the Northbound Ramps to a roundabout.

The Build Alternative 1 (Build Alternative assumed for estimating resources) includes:

- Realignment of U.S. 101 Northbound Off-Ramp to the west to align with the Northbound On-Ramp;
- Widening of the U.S. 101 Northbound On-Ramp at Clark Avenue to provide two receiving lanes;
- Signalization of the Clark Avenue/U.S. 101 Northbound Ramps;
- Restriping of the Clark Avenue overcrossing transitioning from:
    - Two 11’ eastbound through lanes, an 11’ westbound through lane and an 11’ westbound left turn lane, and 4’ (westbound) and 5’ (eastbound) bike lanes/shoulders at the Southbound Ramps, to;
    - Three 11’ eastbound (dual left and one through) lanes, an 11’ westbound through lane, and 4’ bike lanes/shoulders at the Northbound Ramps;
- Widening of the Southbound Off-Ramp to improve the operation of the southbound free right-turn lane;
- Widening of Clark Avenue west of the U.S. 101 Southbound Ramps to accommodate the transition between the proposed striping modifications on the overcrossing and the existing striping west of the interchange;
- Widening of Clark Avenue east of the U.S. 101 Northbound Ramps to provide a bike lane and align westbound lanes with modified striping on the overcrossing;
- Modification of the existing vehicle railing on the north side of the overcrossing to meet the height requirements for a Bicycle Railing;
- Minor overlay work to existing asphalt pavement in poor condition.

Table 1
Project Summary

Project Limits	05–SB–101, PM 82.18
Number of Alternatives	4
Capital Outlay Support for PA/ED	$250,000
Capital Outlay Construction Cost Range	$1.7 - 2.2 million
Capital Outlay Right-of-Way Cost Range	$0
Funding Source	Local developer fees (OTIP) and Highway Safety Improvement Program (HSIP)
Type of Facility	Freeway ramps and local arterial roadway
Number of Structures	0
Anticipated Environmental Determination or Document	CE
Project Development Category	5

Other approvals required are:

PA/ED – Project Report, Categorical Exemption
Fact Sheets for Mandatory/Advisory Design Standards

2.0 BACKGROUND

Description of facility

The U.S. 101 in the vicinity of the project is oriented in a north-south direction and contains two 12-foot travel lanes, a four-foot inside shoulder and an eight-foot outside shoulder in each direction. The northbound and southbound lanes are separated by a 70 feet wide depressed median.

Clark Avenue is an east-west arterial that extends through the Orcutt area from Dominion Road east of U.S. 101 to State Route 1. West of U.S. 101, the roadway is comprised of two westbound travel lanes and one eastbound travel lane, divided by a median two way left turn lane. East of U.S. 101, the roadway is one travel lane in each direction. The posted speed limit on Clark Avenue is 45 MPH.

Stillwell Road, 1300’ west of the interchange is the nearest signalized intersection. The intersections of Clark Avenue with Sunny Hills Road, U.S. 101 SB Ramps, U.S. 101 NB

Ramps, and the Frontage Road east of U.S. 101 are unsignalized and the side streets are stop-controlled.

The Clark Avenue interchange is a compact diamond interchange (Type L-1). The north and southbound on and off-ramps are each offset by approximately 90 feet, which has been observed to contribute to delays and potentially collisions at the ramp intersections. Preliminary review of the existing single lane freeway entrances and exits in both directions indicates that the freeway connections appear to conform to current Caltrans design standards. The geometry of the existing diamond interchange is illustrated in Attachment B, Exhibit A.

The U.S. 101/Clark Avenue overcrossing is 61 feet wide overall. A 5-foot wide sidewalk exists on the south side and a 2-foot wide curb/buffer is present adjacent to the northern bridge railing, leaving 54 feet curb-to-curb on the bridge deck. The overcrossing is striped with a 12-foot through lane in each direction and 11-foot back-to-back left-turn lanes. A three-foot shoulder exists on the south side. The northern portion of the overcrossing (approximately 15 feet) is striped off to facilitate free right-turns from the Southbound Off-Ramp.

Stopping sight distance requirements for a minimum design speed of 45 mph are met on Clark Avenue and corner sight distance at both the Northbound and Southbound Ramps are also met for a minimum design speed of 45 mph. A sag vertical curve on Clark Avenue approximately one-quarter mile east of the interchange may temporarily obstruct corner sight distance from the Northbound Ramps to approaching westbound vehicles on Clark Avenue, but corner sight distance exceeds requirements for 65 mph approach speeds.

No formalized bicycle or pedestrian facilities are currently provided along Clark Avenue in the vicinity of the interchange. Shoulders of varying widths are used by cyclists and pedestrians on either side of the interchange.

Public improvements, consisting of widening Clark Avenue to a four lane divided arterial and relocation and signalization of Sunny Hills Drive approximately 700’ west of the southbound ramps, will be made as a condition of the development of properties along Clark Avenue, west of U.S. 101. The evaluation of the interchange alternatives in this report takes into account these anticipated changes on Clark Avenue.

Project Sponsors / Proponents – Agency Involvement

The County of Santa Barbara is sponsoring this project. It has obtained funding from a variety of sources; including grant funding that has deadlines for its use. As such, the County has been meeting with Caltrans staff over the past several months to establish the purpose and need for the project and to develop a project scope that would respond to the purpose and need and meet the implementation schedule as dictated by the funding timelines.

3.0 PURPOSE AND NEED

Purpose:

The primary project objectives are to:

1) Provide LOS C or better, per County and Caltrans thresholds, at the Clark Avenue Interchange ramp intersections following project completion through Year 2035 traffic conditions.
2) Reduce the occurrence of broadside collisions at the U.S. 101 Northbound Ramps/Clark Avenue intersection.

Secondary project objectives include:

3) Provide Class II bike lanes meeting State design standards within the State right-of-way.
4) Maintain compliance with the Americans with Disabilities Act for the existing sidewalk between the ramps.

Need:

Based on traffic volume projections contained in the County of Santa Barbara's *Santa Maria-Orcutt Traffic Model*, the U.S. 101 / Clark Avenue Interchange is projected to operate in the level of service (LOS) E-F range under Year 2035 traffic conditions.

The ramp accident data indicates that the collision rate at the Northbound On-Ramp is 0.76 collisions per million vehicle miles (mvm), which is slightly higher than the average rate of 0.75 collisions per mvm. The collision rate for the Northbound Off-Ramp and the Southbound Ramps are lower than the average collision rate.

The intersection collision data indicates that 23 broadside collisions have occurred over an 11 year period (2000 – 2010) at the Northbound Ramps and 5 broadside collisions occurred in 2010. CAMUTCD Traffic signal warrants completed by Caltrans staff for the U.S. 101 Northbound Ramps/Clark Avenue intersection indicate that Warrant 3 – Peak Hour and Warrant 7 – Crash Experience Warrant are satisfied.

The County of Santa Barbara's Bicycle Master Plan designates Clark Avenue as a Class II bike facility and it is a bike route of regional significance in Northern Santa Barbara County. However, bike lanes are currently not provided on the U.S. 101/ Clark Avenue overcrossing.

4.0 TRAFFIC ENGINEERING PERFORMANCE ASSESSMENT

4.1 Traffic Forecasts

Traffic Forecasts – Existing traffic conditions were assessed based on intersection turning movement counts and vehicle delay studies completed in September 2011. Future (Year 2035) traffic conditions were evaluated using Buildout traffic forecasts developed by the County's *Santa Maria-Orcutt Traffic Model,* which includes Buildout land uses and street system modifications envisioned over the next 20 years, pursuant to the City of Santa Maria and County of Santa Barbara's General Plans. These Buildout volumes were developed for the *Union Valley Parkway (UVP) Extension/Interchange Project EIR*[3]. County staff compared the Buildout land uses and street network data used to develop traffic volumes for the *UVP Extension/Interchange Project EIR* with the most current Buildout land use and street network data, and found that no changes that would affect the traffic model output have occurred. The UVP EIR Buildout traffic forecasts are therefore considered to represent the most updated Buildout (Year 2035) forecasts. Exhibits 1 and 2 contained in the Traffic Engineering Performance Assessment show the Existing and Year 2035 peak hour volumes, respectively.

4.2 Traffic Analysis Results

Intersection Levels of Service - The existing delay and levels of service are presented in Table 2. As shown, the interchange currently operates in the LOS C-D range. The highest delay is experienced at the southbound left-turn movement at the Southbound Ramps.

[3] *Union Valley Parkway Extension/Interchange Project Supporting Technical Studies for Environmental Impact Report/Environmental Assessment,* Rincon Consultants, July 2008.

Table 2
U.S. 101/Clark Avenue Interchange
Existing PM Peak Hour Levels of Service

	U.S. 101 NB Ramps/Clark Ave		U.S. 101 SB Ramps/Clark Ave	
Traffic Scenario	**Delay**	**LOS**	**Delay**	**LOS**
Existing (2011) Conditions	25.0 sec	LOS C	**31.9 sec**	**LOS D**

Bolded values exceed County and Caltrans level of service standards.

The Year 2035 level of service calculations for the No Build Alternative and the Proposed Project (Build Alternative 1) are summarized In Table 3.

Table 3
U.S. 101/Clark Avenue Interchange
2035 PM Peak Hour Levels of Service

Build Alternative	**Intersection**	**Traffic Control**	**Delay**	**LOS**
No Build	Clark Ave/U.S. 101 NB Clark Ave/U.S. 101 SB	Stop Sign Stop Sign	**44.3 sec** **>50.0 sec**	**LOS E** **LOS F**
Alternative 1	Clark Ave/ U.S. 101 NB Clark Ave/ U.S. 101 SB	Signal Stop Sign	16.4 sec 21.5 sec	LOS B LOS C
Alternative 2	Clark Ave/ U.S. 101 NB Clark Ave/ U.S. 101 SB	Signal Stop Sign	8.4 sec 21.3 sec	LOS A LOS C
Alternative 3	Clark Ave/ U.S. 101 NB Clark Ave/ U.S. 101 SB	Yield Stop Sign	14.2 sec **27.5 sec**	LOS B **LOS D**

Bolded values exceed County and Caltrans level of service standards.

No Build Alternative – The interchange would operate in the LOS E-F range with significant delays and queuing at all stopped approaches.

Build Alternative 1 – The interchange is forecast to operate at LOS C, which would meet Caltrans and County of Santa Barbara standards. The proposed restripe of the overcrossing to two eastbound through lanes at the Southbound Ramps, and the restripe of the eastbound approach at the Northbound Ramps to two dedicated left-turn lanes and a through lane, would provide for acceptable levels of service at the Southbound Ramps. By balancing eastbound traffic over two lanes, sufficient gaps are created for southbound left-turn traffic to turn onto Clark Avenue with acceptable delays during the peak hour.

Build Alternative 2 - The Clark Ave/U.S. 101 Northbound Ramps intersection would operate at LOS A. The Clark Ave/U.S. 101 SB Ramps intersection would operate at LOS C assuming that the intersection remains unsignalized. The reduction in delay for Southbound Off-Ramp left-turn traffic is because eastbound traffic is being balanced over two lanes, creating sufficient gaps for Southbound Off-Ramp traffic to turn left onto Clark Avenue with acceptable delays during the peak hour.

Build Alternative 3 - The Clark Ave/U.S. 101 Northbound Ramps intersection would operate in the LOS B range if designed according to multilane roundabout standards. The Clark Ave/U.S. 101 Southbound Ramps intersection would operate at LOS D assuming that the intersection remains unsignalized, indicating that insufficient gaps would be provided at the Southbound Ramps to provide acceptable levels of service.

Intersection Queuing - Table 4 shows the 95th percentile queues for the proposed project (Build Alternative 1). As shown, the proposed improvements would accommodate the 95th percentile queues.

Table 4
U.S. 101/Clark Avenue Interchange
2035 PM Peak Hour 95th Percentile Queue Lengths

	U.S. 101 NB Ramps/Clark Ave				U.S. 101 SB Ramps/Clark Ave			
Intersection	**NB**	**SB**	**EB**	**WB**	**NB**	**SB**	**EB**	**WB**
Proposed Project (Alternative 1)	242’	-	147’	138’	-	50’	-	25’
Available Storage	300’	-	390’	N/A	-	100’	-	100’

5.0 DEFICIENCIES

Primary Deficiencies

Level of Service

Near-term future traffic increases associated with recently approved or proposed developments (Key Site 1 and Key Site 3) and long-term (Buildout) development in the Orcutt and Santa Maria areas will deteriorate the level of service for the ramp intersections to unacceptable levels. As discussed, LOS E-F conditions are expected under future conditions, resulting in excessive delays and queuing at most of the stopped intersection approaches (see Section 4).

Safety Data - Ramps

Collision data obtained from Caltrans (TASAS Table B) for the ramps is summarized in Table 5. As shown, the actual collision rate at the Northbound On-Ramp is 0.76 collisions per MVM, which is slightly higher than the average rate of 0.75 collisions per MVM.

Table 5
U.S. 101 NB and SB Ramps
Accident Data (2007-2010)

Location	No. of Accidents				Accident Rate			
	Total	Fat	Inj	F+I	F+I	Total	Average F+I	Average Total
Northbound On-Ramp	6	0	4	4	0.51	0.76	0.26	0.75
Northbound Off-Ramp	1	0	0	0	0.0	0.53	0.42	1.20
Southbound On-Ramp	1	0	0	0	0.0	0.53	0.26	0.75
Southbound Off-Ramp	6	0	2	2	0.27	0.80	0.42	1.20

Fat= fatality, Inj= injury

Safety Data - Intersections

Collision data for the ramp intersections for the period from 2000 – 2010 was obtained from the Department of California Highway Patrol (SWIRTS report), and is summarized in Table 6. A total of 27 collisions were recorded at the Clark Avenue/U.S. 101 Northbound Ramps, of which 23 collisions were broadside collisions. One broadside collision recorded in 2010 resulted in a fatality. The collision type and recurrence can be attributed to the existing intersection geometry and control. The calculated collision rate for the Clark Avenue/U.S. 101 Northbound Ramps is 0.54 collisions per MEV, which is higher than the average rate of 0.30 collisions per MEV. The calculated collision rate for the Clark Avenue/U.S. 101 Southbound Ramps is 0.11 collisions per MEV, which is lower than the average rate of 0.30 collisions per MEV.

Table 6
U.S. 101/Clark Avenue Interchange
Accident Experience (2000-2010)

	Year										
Accident Type	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Rear End	0/1	0/1	-	-	-	-	-	1/1	-	-	-
Left Turn	-	-	-	-	-	-	-	-	-	-	-
Right Turn	-	-	-	-	-	-	-	-	-	-	-
Fixed Object	-	1/0	-	0/1	-	-	-	1/0	-	0/1	1/0
Head On	-	-	-	-	-	-	-	-	-	-	-
Overturned	-	-	-	-	-	-	-	-	-	-	-
Broadside	2/0	2/0	2/0	1/0	3/0	1/2	2/0	3/0	1/0	1/0	5/0
Sideswipe	-	-	-	-	-	-	-	-	-	-	-
Pedestrian	-	-	-	-	-	-	-	-	-	-	-
TOTAL	2/1	3/1	2/0	1/1	3/0	1/2	2/0	5/1	1/0	1/1	6/0

#/# = Northbound Ramps/Southbound Ramps.

Secondary Deficiencies

Bike Lanes

No bike lanes are designated on the Clark Avenue Overcrossing. A 3-foot wide shoulder is currently striped on the south side and a 15’ wide chevron-painted area exists on the north side.

Sidewalks

A 5-foot minimum width sidewalk exists as a part of the bridge deck. New sidewalks and curb ramps were recently reconstructed between the bridge deck and the ramps on either side. No sidewalks exist on Clark Avenue to the east of the interchange and the nearest sidewalk west of the interchange is at the intersection of Stillwell Road (1,300’ west of the interchange). Sidewalks are planned as conditions of future development along Clark Avenue between Stillwell Road and the interchange.

Frontage Road Spacing

The existing Frontage Road, east of the interchange is located approximately 50-feet (measured curb return to curb return) east of the U.S. 101 Northbound On-Ramp. The Highway Design Manual (Index 504(3)) requires a 400-foot minimum spacing.

6.0 CORRIDOR AND SYSTEM PLANNING

6.1 Caltrans District System Management Plan

The *District System Management Plan (DSMP)* [4] serves as the 20-year vision document for District 5 in carrying out its responsibilities as owner/operator of the State transportation system. It is a strategic planning document describing how the state corridors will be managed and developed through the year 2025. The U.S. 101 is prioritized as a focus route in the DSMP. The purpose and need of this project is aligned with the strategies of the District 5 System Management Plan, which include:

- *Improve Safety and Security, All Modes*
  The proposed project will address a documented safety deficiency (broadside collisions) at the northbound ramps by aligning and signalizing the ramps.
- *Maintain and Preserve Transportation Systems*
  The proposed project involves minor roadway/ramp widening, striping changes and traffic signal improvements that do not require major structure modifications or right of way acquisitions.
- *Improve Mobility*
  The proposed project will provide bike lanes that currently do not exist on Clark Avenue, consistent with the County of Santa Barbara's Bicycle Master Plan. It also includes a sidewalk connection in an area that will become more urbanized under Orcutt buildout conditions.
- *Support Economic Vitality*
  The proposed project will support the economic development of the Orcutt community by mitigating the impacts of the Orcutt Village Marketplace and other development envisioned in the Orcutt Community Plan. Clark Avenue is also a primary access route to and from the Vandenberg Spaceport and this project will support access and mobility between the Spaceport and U.S. 101.
- *Preserve and Enhance the Environment*
  The proposed project provides minimal anticipated impacts to the environment. The project involves realignment or widening of roadways within previously disturbed areas, avoids known environmentally sensitive areas and requires no acquisition of right-of-way.

[4] *District System Management Plan for District 5*, Caltrans, July 2005.

- *Reflect Community Values*
  The proposed project most closely reflects the improvements envisioned in the community planning documents (Orcutt Community Plan, Orcutt Transportation Improvement Program, Orcutt Village Marketplace EIR, etc.) dating back to the mid 1990's. These planning efforts included the solicitation of broad public input and support.

6.2 Caltrans Route Transportation Concept Report

The *U.S. 101 Transportation Concept Report (TCR)*[5] is a long-term planning document for U.S. 101 in District 5. The Transportation Concept Report evaluates current and projected conditions along the route and establishes a 20-year planning vision or concept; and recommends long-term improvements to achieve the concept. The improvements identified in a TCR are not necessarily tied to a funding source, nor does the document project future funding scenarios. Collectively the TCRs provide the basis for developing the Transportation System Development Program (TSDP) and the State Transportation Improvement Program (STIP) which do address funding availability and are project specific.

Construction of system-wide operational improvements is included in the U.S. 101 TCR as part of recommended actions to provide capacity to accommodate forecasted traffic demands along the corridor. The proposed improvements to the U.S. 101/Clark Avenue Interchange would be consistent with the Transportation Concept Report's recommended actions as it would accommodate forecasted traffic demands along the corridor.

6.3 Caltrans Corridor System Management Plan

The *U.S. 101 Corridor System Management Plan (CSMP)*[6] is a planning tool that identifies strategies to achieve the greatest efficiency and sustainability of the transportation system. This is developed through integration of data and input from a partnership-based process to support transportation planning goals and efforts of the State, regional and local agencies. It integrates management of various travel modes (transit, cars, trucks, bicycles) and infrastructure (roads, highways, information systems, bike routes). The CSMP establishes a process to manage a set of transportation components within a corridor as a system rather than independent units. The objectives of the CSMP are to reduce travel time or delay on all modes, reduce traffic congestion, improve connectivity between modes and facilities, and expand mobility options along the corridor.

[5] *Transportation Concept Report for U.S. U.S. 101 in Caltrans District 5,* Caltrans, October 2001.
[6] *U.S. U.S. 101 Corridor System Management Plan,* Caltrans, November 2011.

The primary purpose of the U.S. 101 CSMP is to develop strategies to manage the corridor and sustain existing transportation investments. Operational improvements are included in its management strategies to be pursued to manage U.S. 101. While not included in the current programmed projects, improvements to the U.S. 101/Clark Avenue Interchange are consistent with the CSMP objectives described above, as the project aims to reduce travel time and delays, and reduce traffic congestion.

6.4 Federal Transportation Improvement Program

The Federal Transportation Improvement Program (FTIP) serves as a short-term program for the use of anticipated federal transportation funds to maintain, operate and improve the region's multi-modal circulation system. The 2013 FTIP identifies all federally funded highway, transit and other surface transportation projects in the county (along with their funding sources) that are scheduled for implementation in the FY 12/13 to FY 15/16. It also includes projects that are subject to federally required action or are regionally significant. The FTIP must be financially constrained by year.

Projects in the FTIP are specifically identified in SBCAG's adopted Regional Transportation Plan (RTP) as discussed in the following section. U.S. 101/Clark Avenue Interchange Improvement Project is included in the 2013 FTIP and will be funded through the *Highway Safety Improvement Program (HSIP).*

6.5 Regional Transportation Plan

The Regional Transportation Plan (RTP)[7] is a long-range planning document that defines how the region plans to invest in the transportation system over 20+ years based on regional goals, multi-modal transportation needs for people and goods, and estimates of available funding. The RTP must now include a Sustainable Communities Strategy as required by California Senate Bill SB 375. The Sustainable Communities Strategy (SCS) is a component of the RTP, newly required by SB 375, that sets forth a forecasted development pattern for the region, which, when integrated with the transportation network and other transportation measures and policies, will reduce greenhouse gas (GHG) emissions from passenger vehicles and light trucks to achieve the GHG reduction targets set by the California Air Resources Board. The proposed improvements to the U.S. 101/Clark Avenue Interchange is consistent with the goals of the RTP by satisfying the following objectives:

[7] *2040 Regional Transportation Plan*, SBCAG, November 2011.

- *Preserve Open Space and Agricultural Land*
  The proposed project involves realignment or widening of roadways within the existing right-of-way and avoids impacts to the adjacent agricultural parcels.
- *Promote transit use and alternative transportation*
  The proposed interchange improvements include enhancements to pedestrian and bicycle facilities and proposes to retain the existing park-and-ride lot which is located on Frontage Road directly east of the interchange.
- *Reduce Travel Times for All Modes and Reduce Congestion*
  The proposed project would make operational improvements at the interchange, and thereby reduce travel times and congestion.
- *Employ best available transportation system management (TSM) technologies to make travel reliable and convenient*
  Interchange improvements would include lane assignment and traffic signal improvements, including traffic signal interconnect, and potentially data collection systems that enhance the capacity of the existing system.

The U.S. 101/Clark Avenue Interchange Improvement Project is included in the 2040 RTP as a programmed project.

6.6 Caltrans Complete Streets

Complete Streets implements Deputy Directive-64-RI that provides guidance to integrate the transportation system. It aims to provide safe mobility for all users, including motorists, bicyclists, pedestrians and transit riders. The project is consistent with its policies by satisfying the following objectives:

- *Providing Options and Access for Non-Drivers*
  The proposed interchange improvements include enhancements to pedestrian and bicycle facilities, improving pedestrian and bicycle circulation.
- *Decreasing Vehicle Trips, Air Pollutants and Greenhouse Gas Emissions*
  The proposed project improves traffic circulation by reducing delays thereby reducing air pollutants and greenhouse gas emissions.

6.7 Caltrans Context Sensitive Solutions

Caltrans uses *Context Sensitive Solutions* as an approach to plan, design, construct, maintain, and operate its transportation system. These solutions use innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals. The project is consistent with this approach by promoting multimodal transportation and

coordinating its design with the urban boundary, rural character and adjacent future development along Clark Avenue.

6.7 Santa Barbara County Bicycle Master Plan

The county of Santa Barbara Bicycle Master Plan includes the segment of Clark Avenue from State Route 1 to Dominion Road as a (Class II) Bike Route. The project would be consistent with the Bicycle Master Plan by providing Class II bike lanes on the overcrossing.

6.8 Santa Barbara County Orcutt Community Plan

The *Orcutt Community Plan (OCP) FEIR* identified the need for improvements to the Clark Avenue interchange to provide acceptable operations under future traffic conditions. These improvements included Realignment and signalization of the Northbound and Southbound Ramps. The project costs for these improvements were included in the *Orcutt Transportation Improvement Program* (OTIP), which collects traffic impact fees from developments within the Orcutt area. Construction of the proposed project would be consistent with the OTIP project requirements.

The OCP includes improvement standards for Clark Avenue west of U.S. 101 that will be implemented as frontage improvement for future development, including construction of sidewalks that will provide pedestrian connectivity between the residential and commercial uses to the west of U.S. 101 and the agricultural uses and park-and-ride lot to the east of U.S. 101.

7.0 ALTERNATIVES

This section describes the project alternatives considered in this report, and evaluates the effectiveness of each alternative in providing acceptable levels of service and improving safety at the project location. This section also discusses design issues, right-of-way impacts, other constraints, and provides a cost estimate for each alternative.

7.1 Alternatives Considered

Four Alternatives were identified and evaluated as part of this study, and are described below and illustrated in the interchange layouts included in Attachment B. All build alternatives were designed to accommodate an STAA – Standard design vehicle.

No Build Alternative

The No Build Alternative takes no action to improve the U.S. 101/Clark Avenue Interchange. The No Build Alternative determines the operational and environmental consequences of providing no improvements, and establishes the baseline conditions to which the "Build" Alternatives are compared. The No Build Alternative geometry is illustrated in Exhibit A included in Attachment B. As stated previously, the ramp intersections are projected to degrade to below acceptable operations with future development west of U.S. 101 and a history of broadside collisions has been identified at the U.S. 101 Northbound Ramps/Clark Avenue intersection. The No Build alternative does not adequately address these deficiencies.

Build Alternative 1

Build Alternative 1 (Exhibit B in Attachment B) proposes to retain the existing compact diamond configuration. Because traffic signal warrants are not satisfied under existing and short-term future conditions, the Southbound Off-Ramp will continue to be controlled by a stop sign. The following improvements are proposed for the U.S. 101 Northbound Ramps/Clark Avenue intersection:

- Realignment of U.S. 101 Northbound Off-Ramp to the west to align with the Northbound On-Ramp;
- Widening of the U.S. 101 Northbound On-Ramp at Clark Avenue to provide two receiving lanes;
- Signalization of the Clark Avenue/U.S. 101 Northbound Ramps;
- Restriping of the Clark Avenue overcrossing transitioning from:
    - Two 11' eastbound through lanes, an 11' westbound through lane and an 11' westbound left turn lane, and 4' (westbound) and 5' (eastbound) bike lanes/shoulders at the Southbound Ramps, to;
    - Three 11' eastbound (dual left and through) lanes, an 11' westbound through lane, and 4' bike lanes/shoulders at the Northbound Ramps;
- Minor widening of the Southbound Off-Ramp to improve the operation of the southbound free right-turn lane;
- Minor widening of Clark Avenue west of the U.S. 101 Southbound Ramps to accommodate the transition between the proposed striping modifications on the overcrossing and the existing striping west of the interchange.
- Modification of the existing vehicle railing on the north side of the overcrossing to meet the height requirements for a Bicycle Railing.
- Minor overlay work to existing asphalt pavement in poor condition.

Design of the traffic signal at the Northbound Ramps should incorporate stubbing out a conduit for future signal interconnect to the potential signal at the southbound ramp and the planned traffic signal at the future Clark Avenue/Sunny Hills Road intersection, to be located approximately 750 feet west of the interchange.

The westbound approach of the U.S. 101 Northbound Ramps/Clark Avenue intersection contains a through lane and a right-turn lane. The length of the westbound right-turn lane is 700 feet. To minimize exposure of bicyclists, the length of the westbound right-turn lane has been reduced and a 6-foot wide bike lane has been added.

The existing pedestrian facilities along the south side of the overcrossing are in compliance with ADA requirements contained in Design Information Bulletin (DIB) 82-04 and will be maintained.

The proposed project satisfies the purpose and need in the following ways:

1. The proposed striping on Clark Avenue and signalization of the northbound ramps will provide for acceptable traffic operations at the interchange
2. The proposed traffic signal at the northbound ramps is a proven countermeasure for right angle collisions and is projected to reduce delays at both the ramp intersections to acceptable levels under Year 2035 traffic conditions.
3. The proposed shoulders will meet State standards for bike lanes.
4. The existing sidewalk and curb ramps on the south side of Clark Avenue conforming to DIB 82-04 will be maintained.

Construction of this alternative can be phased in order to minimize the amount of time the ramps are closed during construction. The new off-ramp could be constructed while keeping the existing off-ramp in operation. A short term closure of the off-ramp will be required for paving transitions between the new and existing off-ramp. Once complete, traffic can be diverted to the new off-ramp and the existing ramp can be demolished. Soil from the existing off-ramp may then be re-used for the widening of the on-ramp. Temporary concrete barriers will need to be placed along the sawcut of the left shoulder, and the right shoulder will need to be reduced in order to allow room for traffic to flow on the on-ramp during construction of the on-ramp widening. Construction staging will likely occur between the U.S. 101 mainline and the ramps; as well as between the Northbound Off-ramp and the Frontage Road.

Build Alternative 2

Build Alternative 2 proposes to reconfigure the Northbound Ramps to a partial cloverleaf (Type L-9) configuration. Build Alternative 2, included as Exhibit C in Attachment B, includes the following improvements:

- Realignment of U.S. 101 Northbound Off-Ramp to the east and construction of a dual lane loop onramp;
- Maintaining the existing U.S. 101 Northbound On-Ramp at Clark Avenue for westbound right turns;
- Signalization of the Clark Avenue/U.S. 101 Northbound Ramps;
- Restriping of the Clark Avenue overcrossing at the Northbound Ramps with:
    - Two 11' eastbound through lanes, an 11' westbound through lane and an 11' westbound left turn lane, and 4' (westbound) and 5' (eastbound) bike lanes/shoulders at the Southbound Ramps;
    - Two 12' eastbound (right-turn and shared right-turn/through) travel lanes and one 12' westbound travel lane at the Northbound Ramps.
- Minor widening of Clark Avenue west of the U.S. 101 Southbound Ramps to accommodate the transition between the proposed striping modifications on the overcrossing and the existing striping west of the interchange.
- Realignment of the Clark Avenue/Frontage Road intersection 400' to the east.
- Modification of the existing vehicle railing on the north side of the overcrossing to meet the height requirements for a Bicycle Railing.
- Minor overlay work to existing asphalt pavement in poor condition.

Build Alternative 2 would require excavation of the embankment adjacent to the overcrossing abutment in order to provide lateral clearance for the new loop on-ramp. Build Alternative 2 would relocate of the Northbound Off-Ramp to the existing location of Frontage Road, thereby necessitating right-of-way acquisition and impacts to adjacent agricultural land associated with relocation of the Frontage Road. These factors in combination, would add significant complexity and cost to the project.

The proposed traffic signal would address the broadside collisions at the Northbound Ramps. Build Alternative 2 would also improve operations at the interchange; however the proposed dual right-turn movement would create an obstacle to both bicyclists and pedestrians at this intersection. A single lane loop on-ramp was also evaluated, but it was determined that the uneven lane loading on the eastbound approach resulted in insufficient gaps for the southbound left turns at the Southbound Off-Ramp, resulting in unacceptable delays at this intersection (refer to the traffic analysis contained in the

TEPA). Alternative 2 was therefore determined to not fully satisfy the established purpose and need for this project and was eliminated from further consideration.

Build Alternative 3

Build Alternative 3 proposes to reconfigure the Northbound Ramps to a roundabout. A planning level assessment of the roundabout alternative was performed per the guidelines contained in *Roundabouts: an Informational Guide*[8]. Because the ultimate design of a multi-lane roundabout is an iterative process dependent upon a multitude of geometric considerations, no formal exhibit was developed at this stage.

Similar to the Build Alternatives 1 and 2, the eastbound approach to the interchange would require two lanes to balance eastbound traffic on the overcrossing in order to reduce delays at the Southbound Ramps. A dual lane roundabout would therefore be required. Planning level calculations indicate a roundabout with an inscribed diameter of approximately 200 feet would be required to accommodate the peak hour volumes and STAA truck turning requirements. Additional area would be required for improvements to accommodate bikes and pedestrians in the roundabout. The roundabout would impact existing utilities and require acquisition of additional right-of-way.

Construction of a roundabout would address the broadside collisions at the Northbound Ramps, allow for the striping of bike lanes and preservation of the existing sidewalk on the U.S. 101 overcrossing. However, the traffic analysis contained in the TEPA indicates that Build Alternative 3 would not provide acceptable levels of service at the Southbound Ramps under 2035 conditions. Build Alternative 3 does not meet the purpose and need of the project and was therefore excluded from further consideration.

Additional Build Alternatives Considered

A Build Alternative was considered that would reconfigure the interchange to a Diverging Diamond Interchange (DDI). This interchange design is relatively new and has been constructed in several States (Missouri, Kentucky, Utah and Tennessee). While the DDI configuration would provide for acceptable operations and improved safety, DDI Design criteria applied and approved by the FHWA and other DOT's have not yet been adopted by Caltrans. In addition, the DDI configuration would have to be built in its entirety and cannot be phased, as proposed by the County. Pursuing the DDI Build Alternative would clearly result in a process that would exceed time deadlines associated with the available grant funding and was therefore excluded from further consideration.

[8] *Roundabouts: an Informational Guide*, Second Edition, Transportation Research Board, 2010.

7.2 Proposed Project Cost Estimate

Cost estimates were developed to evaluate the projected costs associated with roadway, intersection and structure modifications. The cost estimates are conceptual only. A cost estimate worksheet is included as Attachment C. Table 7 summarizes the Build Alternative cost estimate calculations and Table 8 summarizes the Design Standard Risk Assessment.

Table 7
Build Alternative 1 – Cost Estimate

Cost	**Build Alternative 1**
Roadways	$ 2,215,000.00
Structures	$ 35,000.00
Right-of-Way	-
Total Cost	$ 2,250,000.00

Table 8
Build Alternative 1
Design Standards Risk Assessment

Location	**HDM Design Standard not Met**	**HDM Section**	**Probability of Design Exception Approval (None, Low, Medium, High,)**	**Justification for Probability Rating**
NB Off- Ramp at Clark Ave	Ramp superelevation	202.2	Low	There is insufficient data to evaluate the proposed exception at this time
Overcrossing (south side)	Minimum bridge sidewalk width of 6’	208.4	Low	There is insufficient data to evaluate the proposed exception at this time
Overcrossing	Minimum lane width of 12’	301.1	Low	There is insufficient data to evaluate the proposed exception at this time
NB Off-Ramp	Minimum embankment slope of 4:1	304.1	Low	There is insufficient data to evaluate the proposed exception at this time
Overcrossing (SB Ramps)	Minimum left-turn lane width of 12’	405.2	Low	There is insufficient data to evaluate the proposed exception at this time
Frontage Road (east of NB Ramps)	Minimum distance of 400’ between ramp intersections and local road intersection	504.3	Low	There is insufficient data to evaluate the proposed exception at this time

8.0 RIGHT-OF-WAY

The proposed project does not propose any new right-of-way. See Attachment G for worksheets.

Utilities:

Preliminary contact has been made with the utility providers in the area. No major conflicts with existing utilities are currently anticipated. Currently identified conflicts involve street light relocations, culvert extensions/modifications and protection of Verizon duct casing crossing the Northbound On-Ramp.

9.0 STAKEHOLDER INVOLVEMENT

As mentioned previously, the need for future improvements to the interchange were identified during the development of the Orcutt Community Plan in the mid 1990's. The development of this plan involved a large number of stakeholders including residents, and County staff. The need for improvements at the interchange was more eminent during the environmental review of development applications for Key Sites 1 and 3, beginning in 2007. This was a public process, subject to review and approval by County and Caltrans staff.

The identified need for operational improvements, combined with the increase in broadside collisions in recent years prompted the County to initiate study of project alternatives for the interchange. For approximately the past one and one-half years, stakeholder involvement has consisted primarily of County staff. Once funding opportunities became available (approximately September 2012), Caltrans became an active stakeholder in the project scoping discussions.

The deadlines associated with the use of the funding (HSIP) have become a key consideration for the County in developing project alternatives. After consulting with Caltrans staff, it was determined that the simpler the project, (i.e. no impacts to right of way or environmentally sensitive areas) the better the chances for an expedited review and approval of a PSR-PDS. An expedited PSR-PDS, followed by PA/ED and PS&E moving forward on a parallel path was determined to be best course of action for preserving the available grant funding for this project.

10.0 ENVIRONMENTAL DETERMINATION/DOCUMENTATION

A Preliminary Environmental Analysis Report (PEAR) has been prepared for the proposed project. The California Department of Transportation (Caltrans) would act as the Lead Agency for the preparation of both the California Environmental Quality Act

(CEQA) document and the National Environmental Policy Act (NEPA) document. A Categorical Exemption (CEQA) and a Categorical Exclusion (NEPA) are anticipated for this project. This environmental document level has been selected based upon a preliminary review of the potential resources within the project limits, which indicates the project does not have the potential for significant impacts. Further studies discussed below would be required to confirm this determination.

Environmental approval is estimated to take approximately 3 months. It is anticipated multiple environmental studies and reports will be required for this project including (but not limited to): a Natural Environment Study; a Historic Property Survey Report, including an Archaeological Survey Report; an Air Quality Study; a Noise Study Report; an Initial Site Assessment and Preliminary Site Investigation for hazardous waste and a Water Quality Study. In addition a Scenic Resource Evaluation may be required.

11.0 FUNDING

Funding for the proposed project is outlined in table 9. The Highway Safety Improvement Program (HSIP) funding requires 10% in local matching funds The Orcutt Transportation Improvement (OTIP) program consists of developer impact fees.

Table 9
Proposed Project
Capital Outlay Project Estimate (x$1000)

	Cost Estimate	Funding	
		HSIP	OTIP/Local Funds
R/W	-	-	-
Construction Engineering and Construction	$ 2,250	$ 900	$ 1,350
Total	**$ 2,250**	**$ 900**	**$ 1,350**

Capital Outlay Support Estimate

The capital outlay support estimate is $340,000, broken down as follows:

$125,000 PSR-PDS
$165,000 PS&E
$50,000 PA/ED
$340,000 TOTAL

12.0 SCHEDULE

Table 10
Project Schedule

Project Milestones		Scheduled Delivery Date (Month/Day/Year)
PROGRAM PROJECT	M015	December 1, 2013
BEGIN ENVIRONMENTAL	M020	May 1, 2014
PA/ED	M200	September 30, 2014

The anticipated funding fiscal year for construction is 2014/15.

13.0 RISKS

The most immediate risks to the project are as follows:

Schedule:

1. PSR-PDS is not approved on schedule and causes either delay of PA/ED and PS&E approval and ultimately loss of grant funding.

2. Fact Sheets for design exceptions are not approved in time for funding allocation.

3. Other design scope changes or additions are made to the proposed alternative by Caltrans that result in additional review time and/or design and construction costs that exceed the project schedule and budget.

4. Significant utility conflicts with proposed alternative are discovered that affect the cost or schedule of the project.

5. Detailed environmental studies indicate resources that will potentially be impacted by the project and require environmental documentation beyond a CE.

Given that the County of Santa Barbara is the lead agency and secured all of the funding for the project, they are the sole owner of all of the risks. The County has been in discussion with Caltrans regarding the purpose, need and project alternatives, in attempt to work cooperatively to manage these risks. The best strategy for managing these risks is to follow a quality control process for all materials submitted to Caltrans and to communicate early and often with the responsible Caltrans staff, in order to understand how to best present and justify the project.

14.0 FHWA COORDINATION

This project is considered to be an Assigned Project in accordance with the current Federal Highway Administration (FHWA) and Department of Transportation (Caltrans) Joint Stewardship and Oversight Agreement.

15.0 DISTRICT CONTACTS

Project Manager:	Paul Martinez	Paul.Martinez@dot.ca.gov
Design Manager:	John Fouche	John.Fouche@dot.ca.gov
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Right-of-Way Manager:	Nancy Johnson	Nancy.Johnson@dot.ca.gov
Traffic Operations:	Paul McClintic	Paul.Mcclintic@dot.ca.gov
Traffic Safety:	Scott Morris	Scott.Morris@dot.ca.gov

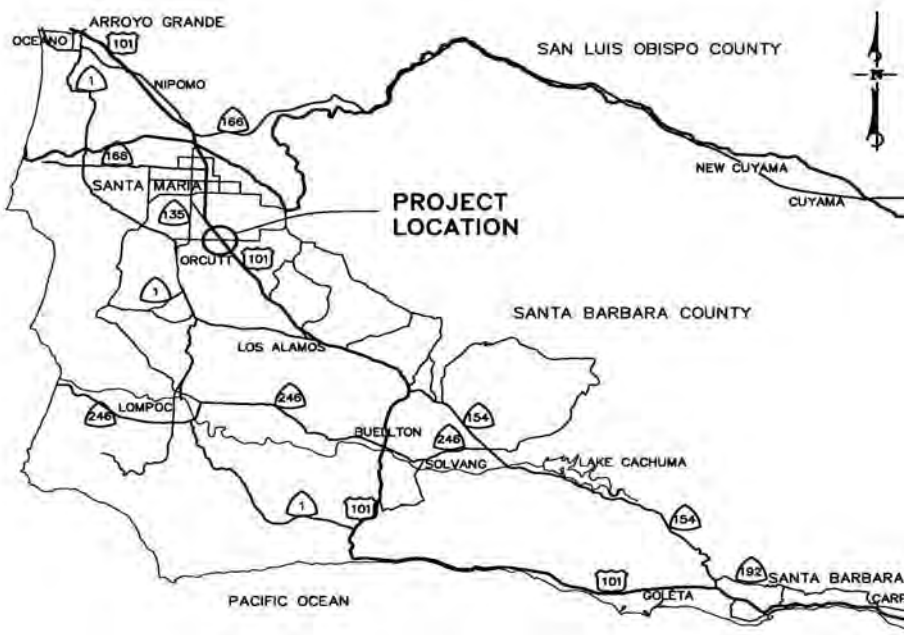
16.0 PROJECT REVIEWS

Field Review_____ Date_____
District Maintenance_____ Date_____
District Traffic Safety Engineer_____ Date_____
District Safety Review_____ Date_____
HQ Design Coordinator_____ Date_____
Project Manager_____ Date_____

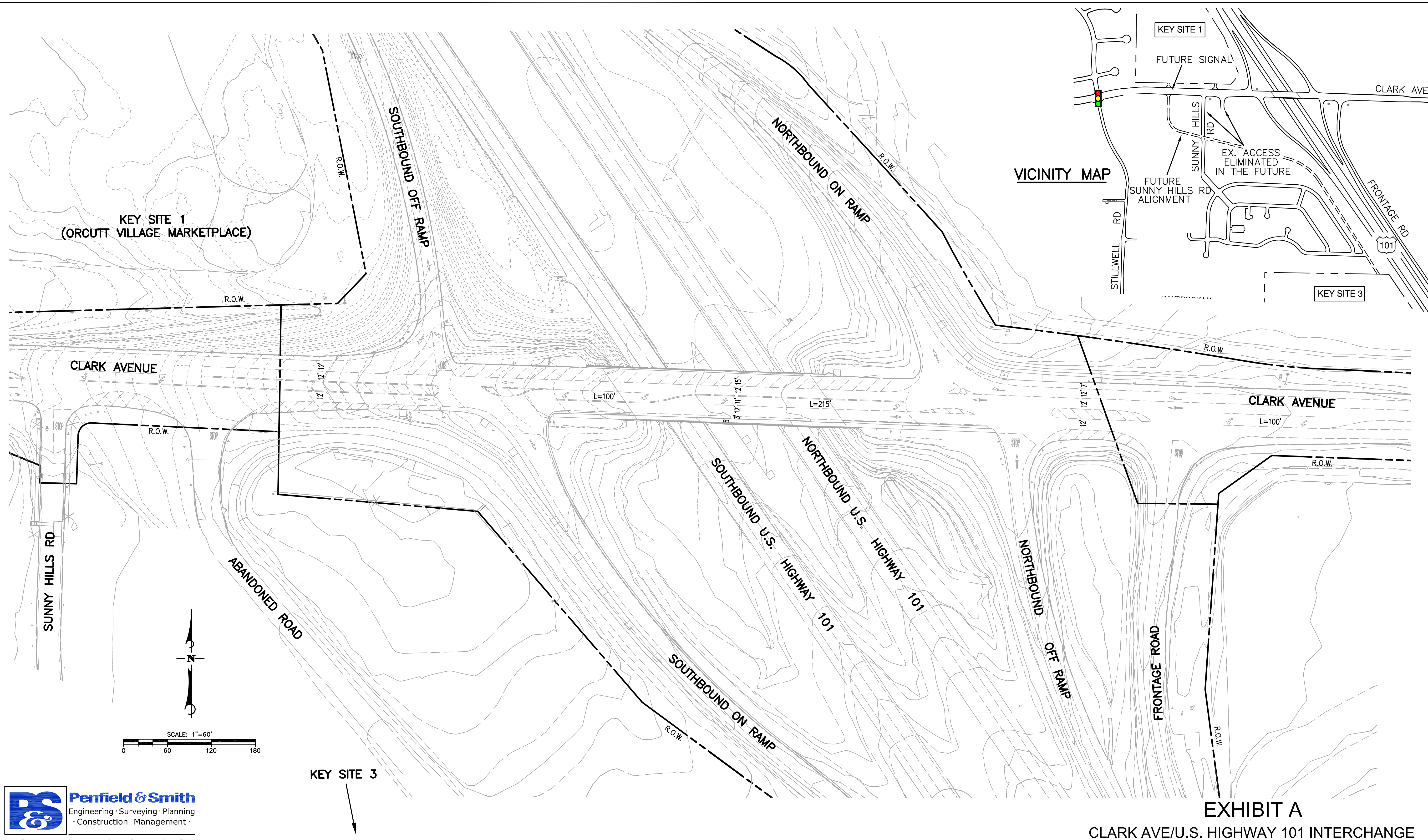
17.0 ATTACHMENTS

Attachment A – Project Vicinity Map
Attachment B - Exhibits A-C – Project Alternative Layouts
Attachment C – Capital Outlay Estimate
Attachment D - Typical Cross Sections (Alternative 1)
Attachment E – Preliminary Environmental Analysis Report (PEAR)
Attachment F – Transportation Planning Scoping Information Sheet
Attachment G – Right of Way Cost Estimate Worksheets
Attachment H – Risk Register

Attachment A – Project Vicinity Map



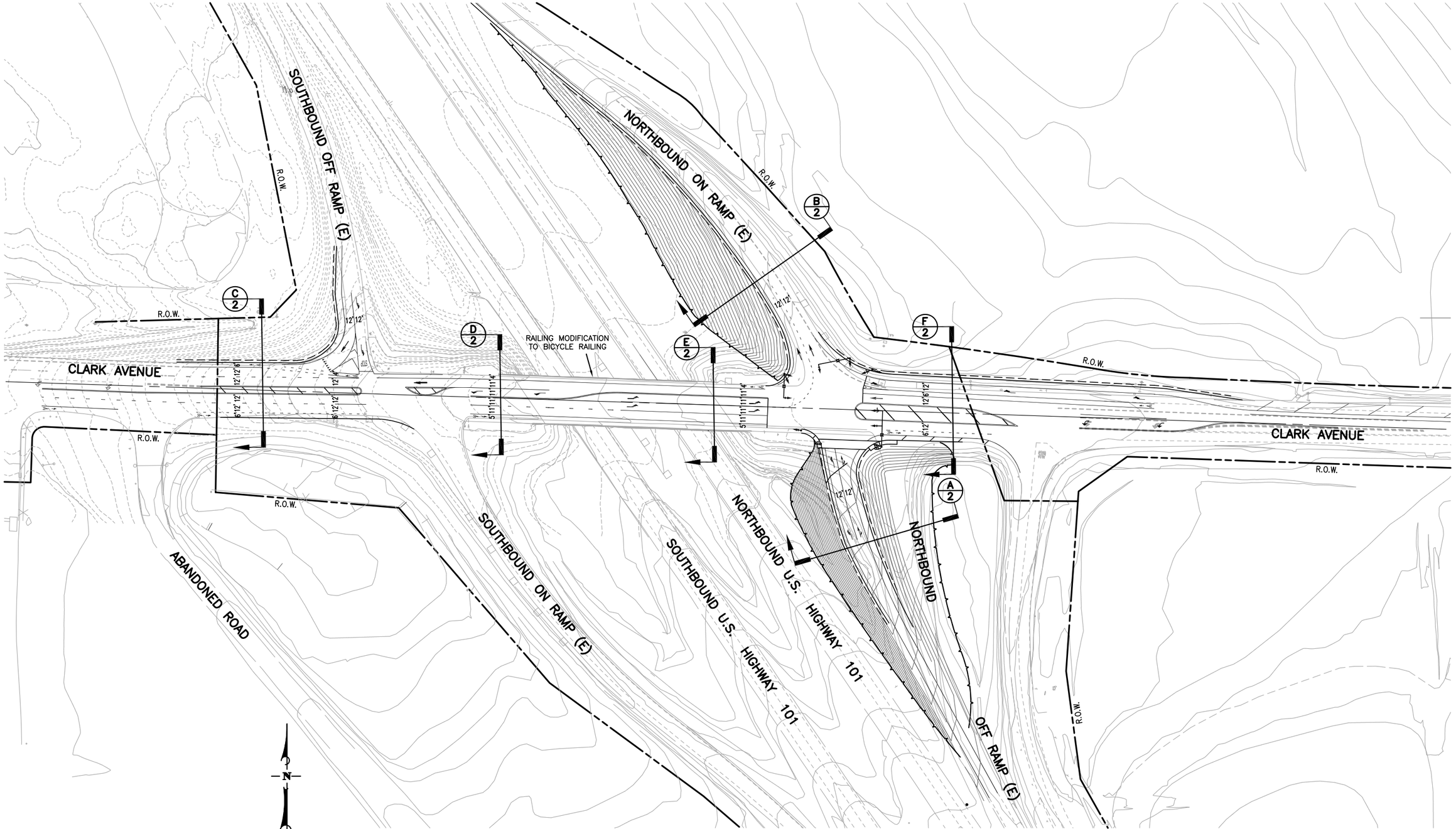
Attachment B - Exhibits A-C – Build Alternative Layouts



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Phone: (805) 963-9532 Fax: (805) 966-9801

EXHIBIT A

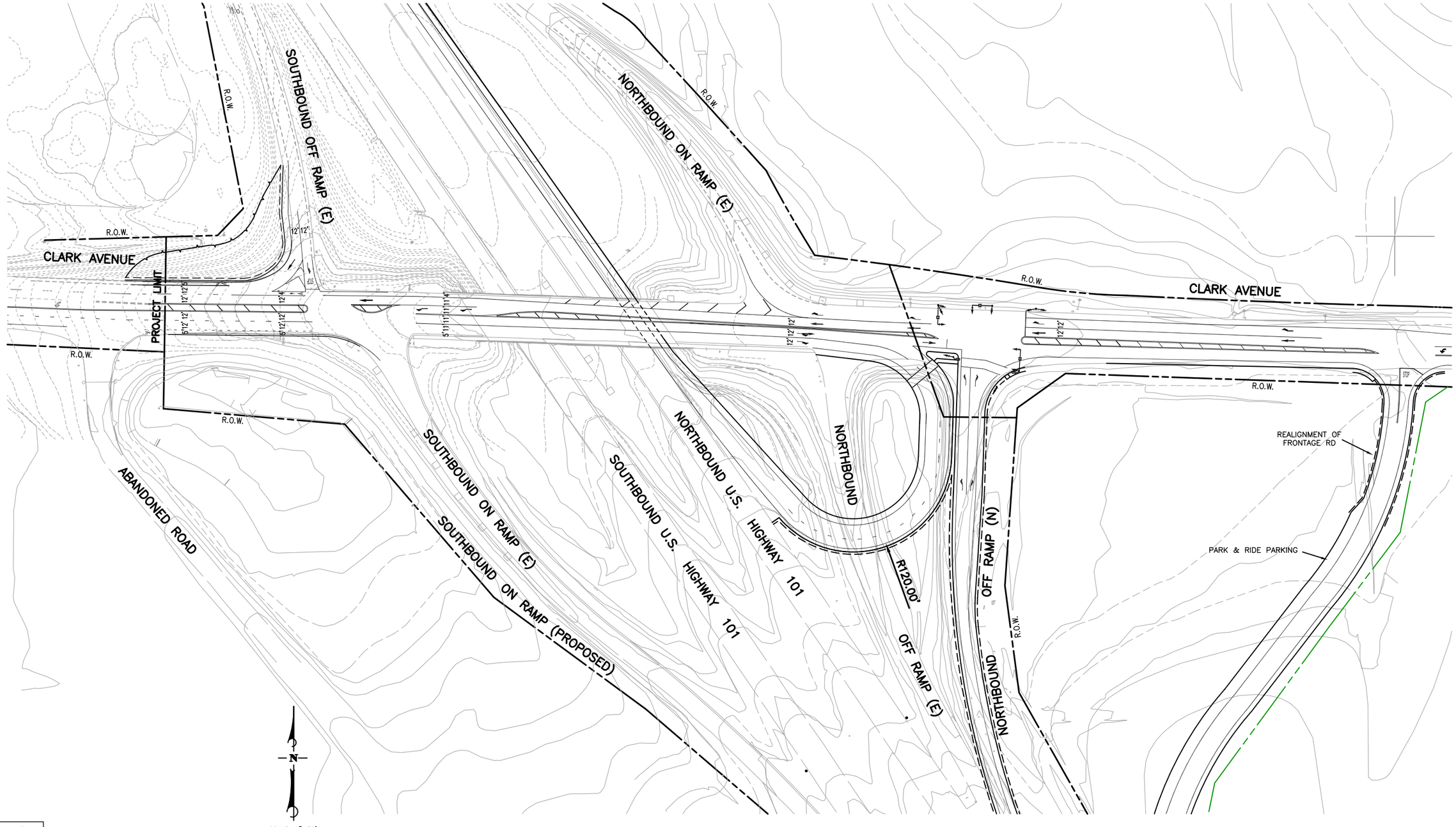
CLARK AVE/U.S. HIGHWAY 101 INTERCHANGE
EXISTING GEOMETRY



Penfield & Smith
Engineering · Surveying · Planning
· Construction Management ·
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801

EXHIBIT B

CLARK AVE/U.S. HIGHWAY 101 INTERCHANGE
BUILD ALTERNATIVE 1



Penfield & Smith
Engineering · Surveying · Planning
· Construction Management ·
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801

EXHIBIT C

CLARK AVE/U.S. HIGHWAY 101 INTERCHANGE
BUILD ALTERNATIVE 2

Attachment C – Capital Outlay Estimate

CONSTRUCTION COST ESTIMATE

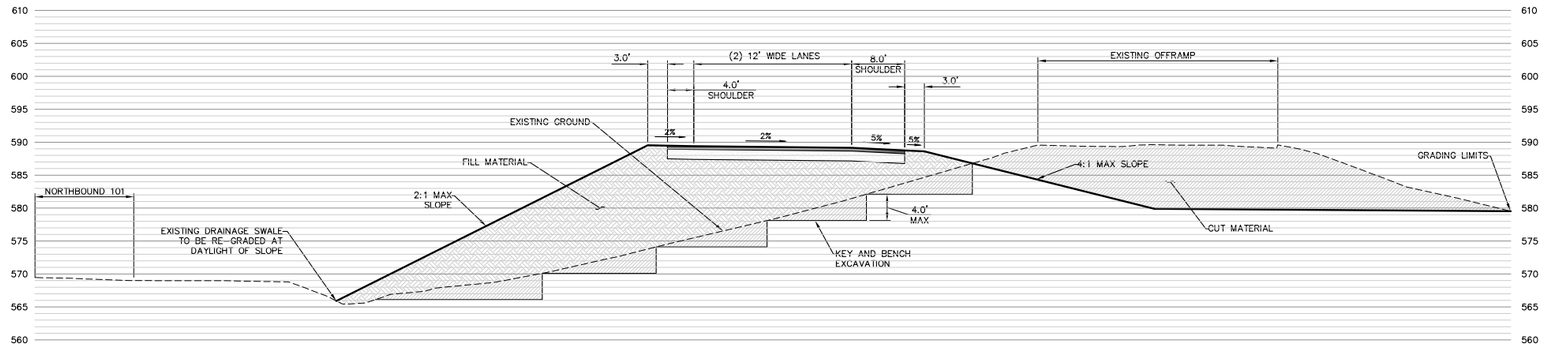
Penfield & Smith, Inc.
111 E. Victoria Street
Santa Barbara, CA 93101
(805) 963-9532

Project: Clark Interchange
Location: Orcutt, California
Client: County of Santa Barbara
W.O. No.: 19587.01
Date: 23-Oct-13
Calc'd By: NPZ
Path Name: W:\work\
File Name: Construction Cost Estimate.xlsx

Alternative 1 - Cost Summary

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
	Section 1. Roadway Items				$554,910
	Section 2. Pavement Structural Section				$200,022
	Section 3. Drainage				$10,150
	Section 4. Specialty Items				$100,800
	Section 5. Traffic Items				$291,600
	Section 6. Planting and Irrigation				$160,000
	Section 7. Roadside Management				$56,920
	Section 8. Minor Items (Subtotal 1-7) x (5-10%)			10%	$137,440
	Section 9. Roadway Moblization (Subtotal 1-8) x (10%)			10%	$151,184
	Section 10. Roadway Additions Supplemental Work (Subtotal 1-8) x (5-10%)			10%	$151,184
	Contingencies (Subtotal 1-8) x (10%)			10%	$151,184
			Total Roadway Items (Sections 1-10):		**$2,000,000**
			Construction Engineering		$250,000
			Total		**$2,250,000**

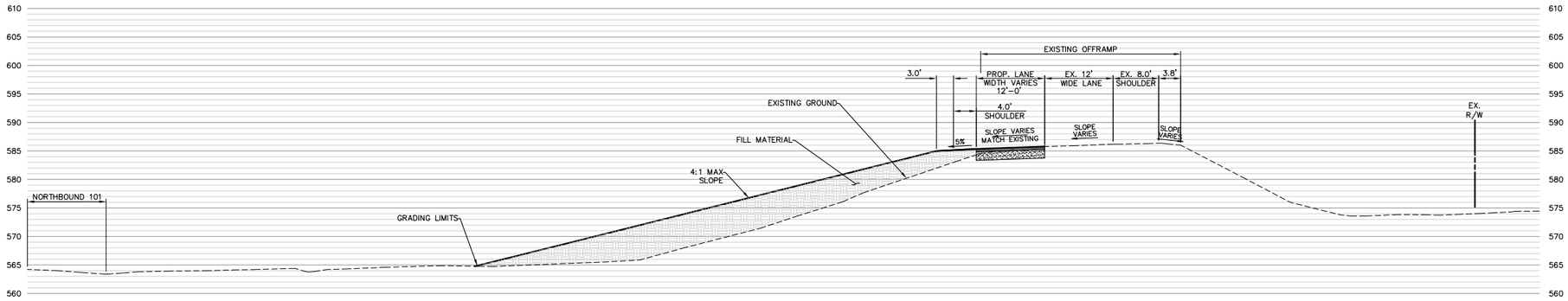
Attachment D – Proposed Project Typical Cross Sections



TYPICAL SECTION: NORTHBOUND OFF-RAMP

SCALE: 1"=10'

(A)



TYPICAL SECTION: NORTHBOUND ON-RAMP

SCALE: 1"=10'

(B)

DESIGN DESIGNATION

U.S. 101 NORTHBOUND OFF-RAMP		U.S. 101 NORTHBOUND ON-RAMP	
DESIGN SPEED (V):	50 MPH	DESIGN SPEED (V):	50 MPH
ADT (2015):	1,850 ADT	ADT (2015):	7,510 ADT
ADT (2035);	3,250 ADT	ADT (2035);	8,350 ADT
DHV:	325 VPH	DHV:	835 VPH
D:	100%	D:	100%
ESAL:	3,700,000	ESAL:	15,100,000
T:	12%	T:	12%
TI_{20}:	10.5	TI_{20}:	12.5
CLIMATE REGION:	SOUTH COAST	CLIMATE REGION:	SOUTH COAST

ATTACHMENT D – PROPOSED PROJECT RAMP CROSS SECTIONS

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISIONS	APPD.

Penfield & Smith
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· Construction Management ·
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801

DESIGN_____ CHECKED _____

PROJECT ENGINEER DATE:_____
PROJECT ENGINEER
R.C.E.

NAME OF REVIEWING AGENCY

REVIEWED BY: NAME OF REVIEWER

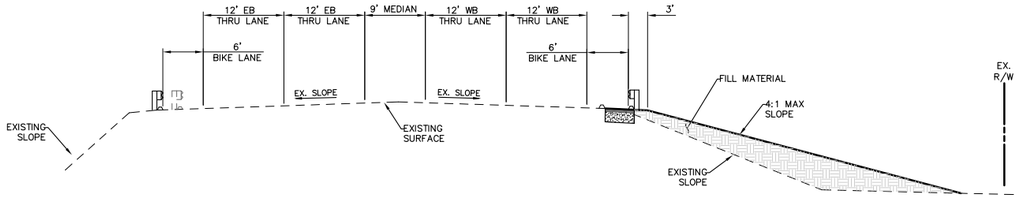
SIGNATURE DATE

U.S. 101/CLARK AVENUE
NORTHBOUND OFF RAMP
TYPICAL SECTIONS
ORCUTT, COUNTY OF SANTA BARBARA

P&S PROJECT NO. 19587.01
SHEET 1 OF 2
PLAN DATE MARCH 11, 2013

PLOT SCALE:1:1 PLOT DATE:3/20/2013 8:59:18 AM PLOT BY:Dennis Lammers 36-ENG SAVE DATE: 3/20/2013 8:57:54 AM

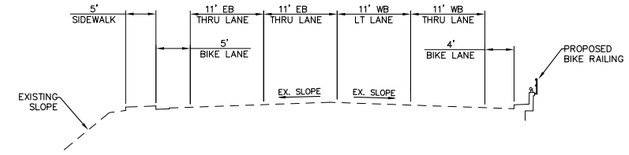
DRAWING:C:\Vcad\work\19587\interchange design\psr-pds exhibits\build alt 1_sections.dwg



TYPICAL SECTION: CLARK AVE WEST OF U.S.101

SCALE: 1"=10'

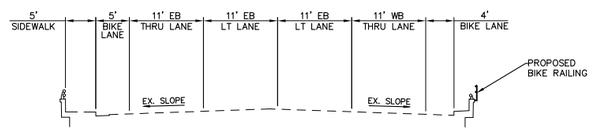
C/2



TYPICAL SECTION: CLARK AVE OVERCROSSING – WEST END

SCALE: 1"=10'

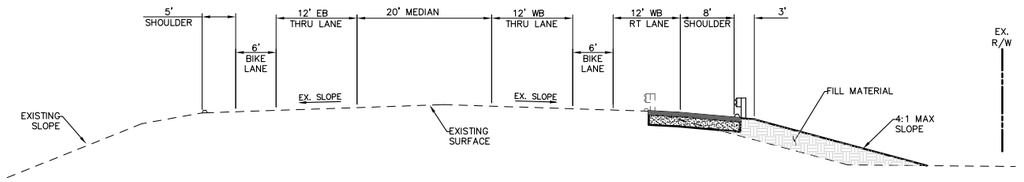
D/2



TYPICAL SECTION: CLARK AVE OVERCROSSING – EAST END

SCALE: 1"=10'

E/2



TYPICAL SECTION: CLARK AVE EAST OF U.S. 101

SCALE: 1"=10'

F/2

DESIGN DESIGNATION

CLARK AVENUE

DESIGN SPEED (V):	50 MPH
ADT (2015):	12,200 ADT
ADT (2035);	15,500 ADT
DHV:	1,415 VPH
D:	65%
ESAL:	12,300,000
T:	12%
TI_{20}:	12
CLIMATE REGION:	SOUTH COAST

ATTACHMENT D – CLARK AVENUE CROSS SECTIONS

FOR REDUCED PLANS
ORIGINAL SCALE IN INCHES
0 1 2 3

NO.	DATE	REVISIONS	APPD.

Penfield & Smith
Engineering · Surveying · Planning · Construction Management ·
111 East Victoria Street, Santa Barbara, CA 93101
Phone: (805) 963-9532 Fax: (805) 966-9801

DESIGN_____ CHECKED _____

PROJECT ENGINEER _____ DATE:_____
PROJECT ENGINEER
R.C.E.

NAME OF REVIEWING AGENCY

REVIEWED BY: NAME OF REVIEWER

_____ _____
SIGNATURE DATE

U.S. 101/CLARK AVENUE
NORTHBOUND OFF RAMP
TYPICAL SECTIONS
ORCUTT, COUNTY OF SANTA BARBARA

P&S PROJECT NO. 19587.01
SHEET 2 OF 2
PLAN DATE OCTOBER 23, 2013

36-ENG SAVE DATE:10/24/2013 1:55:21 PM PLOT BY:Dennis Lommers PLOT DATE:10/24/2013 1:56:24 PM PLOT SCALE:1:1

DRAWING:c:\acad\work\19587\interchange design\per-pds exhibits\build alt 1_sections.dwg

Attachment E – Preliminary Environmental Analysis Report (PEAR)

Attachment F – Transportation Planning Scoping Information Sheet

ARTICLE 4 Transportation Planning Scoping Information Sheet

PROJECT INFORMATION

District	County	Route	Post Miles	Project ID No/ Expenditure Authorization No.
05	Santa Barbara	101	82.18	EA 05-1F100

Project Name and Description : U.S. 101 / Clark Avenue Interchange Improvements – Safety and operational improvements at the U.S. 101 / Clark Avenue Interchange that include realignment, widening and signalization of the northbound ramps and minor widening of the southbound offramp and Clark Avenue.

Prepared by:

District Information Sheet Point of Contact*:	Name: Paul Martinez	Functional Unit:	Project Management

* The District Information Sheet Point of Contact is responsible for completing Project Information, PDT Team and Stakeholder Information, and coordinating the completion of project-related information with the Transportation Planning Stakeholders. Upon completion, provides the Transportation Planning PDT Representative and Project Manager with a copy of the Information Sheet.

Project Development Team (PDT) Information		
Title	**Name**	**Phone Number**
Project Manager	Paul Martinez	(805) 549-3407
Project Engineer	John Fouche	
Transportation Planning PDT Representative**		

Transportation Planning Stakeholder Information		
Title	**Name**	**Phone Number**
Regional Planner		
System Planner		
Local Development-Intergovernmental Review (LD-IGR) Planner		
Community Planner		
Goods Movement Planner		
Transit Planner		
Bicycle and Pedestrian Coordinator		
Park and Ride Coordinator		
Native American Liaison		
Other Coordinators:	Scott Morris (Safety)	

Project Purpose and Need** – The project objectives are to:

1) Provide LOS C or better, per County and Caltrans thresholds, at the Clark Avenue Interchange ramp intersections following project completion through Year 2035 traffic conditions.
2) Reduce the occurrence of broadside collisions at the U.S. 101 Northbound Ramps/Clark Avenue intersection.
3) Provide Class II bike lanes meeting State design standards within the State right-of-way.
4) Maintain existing ADA compliant sidewalk between the ramps,

Based on traffic volume projections contained in the County of Santa Barbara's Santa Maria-Orcutt Traffic Model, the U.S. 101 / Clark Avenue Interchange is projected to operate in the level of service (LOS) E-F range under Year 2035 traffic conditions.

Collision data indicates that 23 broadside collisions have occurred over an 11 year period (2000 – 2010) at the Northbound Ramps and 5 broadside collisions occurred in 2010. CAMUTCD Traffic signal warrants completed by Caltrans staff for the U.S. 101 Northbound Ramps/Clark Avenue intersection indicate that Warrant 3 – Peak Hour and Warrant 7 – Crash Experience Warrant are satisfied.

The County of Santa Barbara's Bicycle Master Plan designates Clark Avenue as a Class II bike facility and it is a bike route of regional significance in Northern Santa Barbara County. However, bike lanes are currently not provided on the U.S. 101/ Clark Avenue overcrossing.

** The Transportation Planning PDT Representative is responsible for providing the PDT with the system-wide and corridor level deficiencies identified by Transportation Planning. The PDT uses the information provided by Transportation Planning to develop the purpose and need with contributions from other Caltrans functional units and external stakeholders at the initiation of the PID and is refined throughout the PID process. As the project moves past the project initiation stage and more data becomes available, the purpose and need is refined. For additional information on purpose and need see: www.dot.ca.gov/hq/env/emo/purpose_need.htm

1. Project Funding:

a	List all known and potential funding sources and percent splits: (ie. State Transportation Improvement Program (STIP)/State Highway Operations and Protection Program (SHOPP)/Transportation Enhancement (TE)/Environmental Enhancement and Mitigation (EEM)/Safe Routes to School (SR2S)/etc.).
	$900,000 HSIP with remainder to be funded by developer impact fees
b	Is this a measure project? Yes__/No_x_. If yes, name and describe the measure.

2. Regional Planning:

a	Name of and contact information for Metropolitan Planning Organization (MPO) or Regional Transportation Planning Agency (RTPA).
	SBCAG
b	Name of and contact information for local jurisdiction (City or County)
	Brittany Heaton – (805) 568-3035
c	Provide the page number and project description as identified in the Regional Transportation Plan (RTP) and the date of adoption, or provide an explanation if not in RTP.
	2008 RTP, Page PL-5 "Clark Avenue and U.S.101 - Relocate on and off ramps and install signals"
d	Provide nexus between the RTP objectives and the project to establish the basis for the project purpose and need. The proposed project includes is aligned with the stated objectives in the RTP in that it: • Avoids impacts to the adjacent agricultural parcels. • Enhances pedestrian and bicycle facilities and retains the existing park-and-does not impact the park and ride lot east of the interchange. • Reduces travel times and congestion. • Enhances the capacity of the existing system.
e	Is the project located in an area susceptible to sea-level rise?
	No

f	Name of Air Quality Management District (AQMD)
	Santa Barbara County Air Pollution Control District
g	If the project is located in a federal non-attainment or attainment-maintenance area is the project: N/A
	• Regionally Significant? (per 40 (Code of Federal Regulations (CFR) 93.101) Y__/N__
	• Exempt from conformity? (per 40 CFR 93.126 and 93.128) Y__/N__
	• Exempt from regional analysis? (per 40 CFR 93.127) Y__/N__
	• Not exempt from conformity (must meet all requirements)? Y__/N__

3. Native American Consultation and Coordination:

a	If project is within or near an Indian Reservation or Rancheria? If so, provide the name of Tribe.
	N/A
b	Has/have the Tribal Government(s) been consulted? Y___/N__. If no, why not?
c	If the project requires Caltrans to use right-of-way on trust or allotted lands, this information needs to be included as soon as possible as a key topic in the consultation with the Tribe(s). Has the Tribe been consulted on this topic? Y___/N__. If no, why not?
d	Has the Bureau of Indian Affairs (BIA) been notified? Y__/N__
e	Have all applicable Tribal laws, ordinances and regulations [Tribal Employment Rights Ordinances (TERO), etc.] been reviewed for required contract language and coordination?
f	If the Tribe has a TERO, is there a related Memorandum of Understanding between the District and the Tribe?
g	Has the area surrounding the project been checked for prehistoric, archeological, cultural, spiritual, or ceremonial sites, or areas of potentially high sensitivity? If such areas exist, has the Tribe, Native American Heritage Commission or other applicable persons or entities been consulted?
h	If a Native American monitor is required for this project, will this cost be reflected in cost estimates?
i	In the event of project redesign, will the changes impact a Native American community as described above in d, e, or h?

4. System Planning:

a	Is the project consistent with the DSMP? Y__/N_X_. If yes document approval date. If no, explain.
	No improvements to U.S. 101 mainline, so not included in DSMP.
b	Is the project identified in the TSDP? Y__/N_X_? If yes, document approval date____. If no, explain.
	No improvements to U.S. 101 mainline, so not included in TSDP.
c	Is the project identified in the TCR/RCR or CSMP? Y__/N_X_. If yes, document approval date___. If no, explain. Is the project consistent with the future route concept? Y__/N__. If no, explain.
d	Provide the Concept Level of Service (LOS) through project area.
	LOS D
e	Provide the Concept Facility – include the number of lanes. Does the Concept Facility include High Occupancy Vehicle lanes? Y__/N_X_.
	Four
f	Provide the Ultimate Transportation Corridor (UTC) – include the number of lanes. Does the UTC include High Occupancy Vehicle Lanes? Y__/N_X_.
	Six
g	Describe the physical characteristics of the corridor through the project area (i.e. flat, rolling or

	mountainous terrain...).
	Rolling terrain
h	Is the highway in an urban or rural area? Urban_X_/Rural__. Provide Functional Classification.
	Urban Principal Arterial
i	Is facility a freeway, expressway or conventional highway?
	Freeway
j	Provide Route Designations: (i.e. Interregional Transportation Strategic Plan (ITSP) High Emphasis or Focus Route, Surface Transportation Assistance Act (STAA) Route, Scenic Route…).
	NHS, IRS, Focus Route. National Truck Network, State Hwy Extra Legal Load
k	Describe the land uses adjacent to project limits (i.e. agricultural, industrial…).
	Currently agricultural, planned development to residential and commercial on the west side of U.S. 101.
l	Describe any park and ride facility needs identified in the TCR/CSMP, local plans, and RTP.
	Park and Ride Lot exists on the frontage road east of the interchange.
m	Describe the Forecasted 10 and 20-year Vehicle Miles Traveled (VMT), Annual Average Daily Traffic (AADT), and Peak Hour truck data in the TCR. Include the source and year of Forecast, and names and types of traffic and travel demand analysis tools used.
	61,000 AADT (2020 TCR) 7% trucks (2010 TCR)
n	Has analysis on Daily Vehicle Hours of Delay (DVHD) from the Highway Congestion Monitoring Program (HICOMP) been completed and included? Y__/N_X_.

5. Local Development – Intergovernmental Review (LD-IGR):

List LD-IGR projects that may directly or indirectly impact the proposed Caltrans project or that the proposed Caltrans project may impact. (Attach additional project information if needed.)

LD-IGR Project Information		**Project**
a	County-Route-Postmile & Distance to Development.	Key Sites 1 and 3, north and south of Clark Avenue, immediately west of U.S.101
b	Development name, type, and size.	Orcutt Village Marketplace, Shopping Center Key Site 3 – 125 DU
c	Local agency and/or private sponsor, and contact information.	Santa Barbara County Planning (805) 934-6250
d	California Environmental Quality Act (CEQA) status and Implementation Date.	Approved.
e	If project includes federal funding, National Environmental Policy Act (NEPA) status.	Pending
f	All vehicular and non-vehicular unmitigated impacts and planned mitigation measures including Transportation Demand Management (TDM) and Transportation System Management (TSM) that would affect Caltrans facilities.	Impact and mitigation is similar to purpose and need and proposed project.
g	Approved mitigation measures and implementing party.	See above. County of Santa Barbara
h	Value of constructed mitigation and/or amount of funds provided.	~$2 million. Traffic impact fees to be paid by developer.

i	Encroachment Permit, Transportation Permit, Traffic Management Plan, or California Transportation Commission (CTC) Access approvals needed.	N/A
j	Describe relationship to Regional Blueprint, General Plans, or County Congestion Management Plans.	N/A
k	Inclusion in a Regional Transportation Plan Sustainable Community Strategy or Alternative Planning Strategy?	Orcutt Community Plan
l	Regional or local mitigation fee program in place?	Orcutt Transportation Improvement Program (OTIP)

6. Community Planning:

	INITIAL PID INFORMATION
a	Has lead agency staff worked with any neighborhood/community groups in the area of the proposed improvements? Y_X_/N__. If yes, summarize the process and its results including any commitments made to the community. If no, why not?
	Orcutt Community Plan
b	Are any active/completed/proposed Environmental Justice (EJ) or Community-Based Transportation (CBTP) Planning Grants in the project area? Y__/N_X_. If yes, summarize the project, its location, and whether/how it may interact with the proposed project.
c	Describe any community participation plans for this PID including how recommendations will be incorporated and/or addressed. Has a context sensitive solutions (CSS) approach been applied? Y__/N_X_
	FINAL PID INFORMATION
d	How will the proposed transportation improvements impact the local community? Is the project likely to create or exacerbate existing environmental or other issues, including public health and safety, air quality, water quality, noise, environmental justice or social equity? Y__/N_X_. Describe issues, concerns, and recommendations (from sources including neighborhood/community groups) and what measures will be taken to reduce existing or potential negative effects.
e	Does this highway serve as a main street? Y__/N_X_. If yes, what main street functions and features need to be protected or preserved?

7. Freight Planning:

	INITIAL PID INFORMATION
a	Identify all modal and intermodal facilities that may affect or be affected by the project.
	None
	FINAL PID INFORMATION
b	Describe how the design of this project could facilitate or impede Goods Movement and relieve choke points both locally and statewide through grade separations, lane separations, or other measures (e.g., special features to accommodate truck traffic and at-grade railroad crossings).
	N/A
c	Describe how the project integrates and interconnects with other modes (rail, maritime, air, etc.). Do possibilities exist for an intermodal facility or other features to improve long-distance hauling, farm-to-market transportation and/or accessibility between warehouses, storage facilities, and terminals?
	N/A
d	Is the project located in a high priority goods movement area, included in the Goods Movement Action

	Plan (GMAP) or on a Global Gateways Development Program (GGDP) route? Y__/N_X_. If yes, describe.
e	Is the project on a current and/or projected high truck volume route [e.g., Average Annual Daily Truck Traffic (AADTT) of 5 axle trucks is greater than 3000]? Yes__/N__. If yes, describe how the project addresses this demand.
	Geometric layout takes into account STAA turning radii
f	If the project is located near an airport, seaport, or railroad depot, describe how circulation (including truck parking) needs are addressed.
	N/A
g	Describe any other freight issues.
	N/A

8. Transit (bus, light rail, commuter rail, intercity rail, high speed rail):

	INITIAL PID INFORMATION
a	List all local transit providers that operate within the corridor.
	N/A
b	Have transit agencies been contacted for possible project coordination? Y__/N__. If no, why not?
	N/A
c	Describe existing transit services and transit features (bus stops, train crossings, and transit lines) within the corridor.
	N/A
d	Describe transit facility needs identified in short- and long-range transit plans and RTP. Describe how these future plans affect the corridor.
	N/A
	FINAL PID INFORMATION
e	Describe how the proposed project integrates transit and addresses impacts to transit services and transit facilities.
	N/A
f	Have transit alternatives and improvement features been considered in this project? Y__/N__ If yes, describe. If no, why not?
	N/A

9. Bicycle:

	INITIAL PID INFORMATION
a	Does the facility provide for bicyclist safety and mobility needs? If no, please explain.
	Yes, bike lanes are added where none currently exist.
b	Are any improvements for bicyclist safety and mobility proposed for this facility by any local agencies or included in bicycle master plans? If yes, describe (including location, time frame, funding, etc.).
	Clark Avenue is included as a Class II facility in the County's Bike Master Plan
c	Are there any external bicycle advocacy groups and bicycle advisory committees that should be included in the project stakeholder list? If so, provide contact information.
	No.
	FINAL PID INFORMATION
d	Will bicycle travel deficiencies be corrected? How or why not?
	Bike lanes will be added where none currently exist.
e	How will this project affect local agency plans for bicycle safety and mobility improvements?

	It will fulfill goals in the County's Bike Master Plan
f	If the project is the construction of a new freeway or modification to an existing freeway, will it sever or destroy existing provisions for bicycle travel? If yes, describe how bicycle travel provisions will be included in this project.
	N/A

10. Pedestrian including Americans with Disabilities Act (ADA):

	INITIAL PID INFORMATION
a	Does this facility provide for pedestrian safety and mobility needs? If so, describe pedestrian facilities. Do continuous and well-maintained sidewalks exist? Are pedestrians forced to walk in the roadway at any locations due to lack of adequate pedestrian facilities? Please explain.
	The project area is rural in nature. A sidewalk exists on the south side of Clark between the ramps and will be maintained.
b	Are pedestrian crossings located at reasonable intervals?
	Yes for the current pedestrian demand. There is currently no reason to cross to the north side of the street until Stillwell Road, where a signalized crossing exists. As land is developed on the north side of Clark, a new signalized crossing will be installed as a condition of the development.
c	Are all pedestrian facilities within the corridor ADA accessible and in compliance with Federal and State ADA laws and regulations?
	The existing sidewalk is 5' wide and is accessible, but does not meet the Caltrans minimum standard of 6' on overcrossings.
	FINAL PID INFORMATION
d	Will pedestrian travel deficiencies be corrected? How or why not?
	No changes to the existing pedestrian facilities are proposed. Continuous sidewalks west of U.S. 101 will be installed as a condition of future development.
e	How will this project affect local agency plans for pedestrian safety and mobility improvements?
	The project will implement bike lanes on Clark Avenue as envisioned in the Bicycle Master Plan.
f	If the project is the construction of a new freeway or modification to an existing freeway, will it sever or destroy existing provisions for pedestrian travel? If yes, describe how pedestrian travel provisions will be included in this project.
	N/A
g	Are there any external pedestrian advocacy groups and advisory committees that should be included in the project stakeholder list? If so, provide contact information.
	No
h	Have ADA barriers as noted in the District's ADA Transition Plan been identified within the project limits? If not included in the project, provide justification and indicate whether District Design coordinator approval was obtained.
	No barriers identified.

11. Equestrian:

	INITIAL PID INFORMATION
a	If this corridor accommodates equestrian traffic, describe any project features that are being considered to improve safety for equestrian and vehicular traffic?
	N/A
	FINAL PID INFORMATION
b	Have features that accommodate equestrian traffic been identified? If so, are they included a part of this project? Describe. If no, why not?
	N/A

12. Intelligent Transportation Systems (ITS):

	INITIAL PID INFORMATION
a	Have ITS features such as closed-circuit television cameras, signal timing, multi-jurisdictional or multimodal system coordination been considered in the project? Y__/N_X_. If yes, describe. If no,

	explain.
	Not at this stage.
	FINAL PID INFORMATION
b	Have ITS features been identified? If so, are they included a part of this project? Describe. If no, why not?
	Not at this stage.

Attachment G – Right of Way Cost Estimate Worksheets

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

R/W UTILITY ESTIMATE WORKSHEET AND R/W DATA SHEET INSTRUCTIONS

(Form #)

EXHIBIT
13-EX-6 (REV 4/2009)

Date _____
Post Mile _____
Expenditure Authorization _____

Description of Project:

_____
_____
_____
_____

Estimate for: ☐ Preliminary Route Estimate (Alternate No. _____)
☐ R/W Data Sheet (Preferred Alternate)

Evidence of Utilities:

☒ Gas ☒ Electric ☒ Telephone ☒ Cable TV ☐ Water ☐ Public Drainage/Irrigation
☐ Sewer ☐ Fiber Optics ☐ Other (Explain in "Remarks")

Anticipated Utility Relocations:

☒ Gas ☒ Electric ☒ Telephone ☒ Cable TV ☐ Water ☐ Public Drainage/Irrigation
☐ Sewer ☐ Fiber Optics ☐ Other (Explain in "Remarks")

Estimated Cost of Utility Relocations:

100	L.F. of Gas Line	@ $ 100. /L.F.	=	$ 10,000	RS MEANS 33 60 10 112 2320	
65	L.F. of UG Electric Line	@ $ 9.35 /L.F.	=	$ 608	RS MEANS 33 71 19.17 0400	
65	L.F. of UG Telephone Line	@ $ 9.35 /L.F.	=	$ 608		
	Wood Poles (Telephone)	@ $ /Pole	=	$		
	Wood Poles (Electric)	@ $ /Pole	=	$		
1	Joint Poles	@ $ 2700 /Pole	=	$ 2700	33 71 16.20 0220	
	Steel Poles	@ $ /Pole	=	$		
	Steel Towers	@ $ /Tower	=	$		
	L.F. of Water Line	@ $ /L.F.	=	$		
	Fire Hydrants	@ $ /F.H.	=	$		
	L.F. of Sewer Line	@ $ /L.F.	=	$		
	L.F. of Fiber Optics Line	@ $ /L.F.	=	$		
3	Other (Explain)	@ $ 1650 /EA	=	$ 4950	33 71 16.20 0500	
RESET GUY WIRES, ELEC. COMM / RELOCATE		75,000 EA		75,000	ESTIMATE	
		TOTAL ESTIMATE (State's Share)	=	$ 93,866		

Remarks:

_____
_____
_____
_____

Attachment H – Risk Register

LEVEL 1 - RISK REGISTER		Project Name:	Clark Avenue at U.S.101 Improvements			DIST- EA	05-1F100	Project Manager	Paul Martinez		
Risk Identification						Risk Rating		Risk Response			
Status	ID #	Type	Category	Title	Risk Statement	Current status/assumptions	Priority Rating	Rationale for Rating	Strategy	Response Actions	Risk Owner	Updated
Active	1	Threat	Design	Incomplete design	Inaccurate, incomplete or sub-standard plans and estimates could delay project approvals and risk loss of funding.	Survey and design not yet started.	Medium	Design has been taken further than a typical PSR-PDS, but questions still remain about required design exceptions.	Avoid	Verify that the survey file and design work is accurate and complete. Follow QC procedures.	County/P&S	3/22/2013
Active	2	Threat	Environmental	CEQA Challenge	Potential lawsuits may challenge the environmental report, delaying the start of construction or threatening loss of funding.	Environmental studies beyond preparation of the PEAR have not yet started.	Low	Project is contained in Orcutt Community Plan and is anticipated to have minimal to no impacts.	Accept	Address concerns of stakeholders and public during environmental process	Caltrans	3/22/2013
Active	3	Threat	R/W	Utility delays	Delays associated with unanticipated utility relocations and utility company timelines may delay the project.	Utility requests for information have been sent and preliminary information received and compiled.	Medium	Only preliminary utility coordination performed.	Mitigate	Follow County/Caltrans utility coordination procedures.	County/P&S	3/22/2013
Active	4	Threat	Construction	Buried Objects	Unanticipated buried man-made objects uncovered during construction require removal and disposal resulting in additional costs.		Low	Constructing in previously disturbed area with good as-built records.	Mitigate	Include a Supplemental Work item to cover this risk.	County/P&S	3/22/2013
Active	5	Threat	Design	Environmental Mitigation	A design change that is outside of the parameters contemplated is required in order to mitigate an unanticipated environmental impact, due to concurrent PA&ED and PS&E phases.	Preliminary reviews of proposed project have been favorable, however, design exception approval is stated to be at high risk with information currently provided.	High	See design exceptions.	Avoid	Monitor design changes against ED to avoid reassessment of ED unless the opportunity outweighs the threat. Also begin Fact Sheet early in order to provide additional information to get more assurance that critical exceptions are approvable.	County/P&S	3/22/2013
Active	6	Threat	Design	Geotechnical Issues	Unanticipated geotechnical issues encountered requiring design changes.	No geotechnical investigations have been performed.	Low	Most soil will involve reuse of existing fill that has shown no evidence of geotechnical issues.	Mitigate	Contact geotechnical testing and get comply with geotechnical recommendations.	Geotechnical Consultant	3/22/2013
Active	7	Threat	Design	Design Exceptions	Unforeseen design exceptions or known design exceptions not approved, requiring major design changes and adding significant costs to the project.	Design exception approval is stated to be at high risk with information currently provided.	High	Caltrans has indicated a high risk level based on information provided thus far.	Mitigate	Begin Fact Sheet early in order to provide additional information to get more assurance that critical exceptions are approvable.	County/P&S	3/22/2013
Active	8	Threat	Construction	Hazardous Materials	Hazardous materials encountered during preliminary testing or construction will require an on-site storage area and potential additional costs to dispose	No records of hazardous materials in the project area have been found.	Medium	Only preliminary investigation have been performed thus far.	Mitigate	Conduct further research and field visit.	Caltrans	3/22/2013
Active	9	Threat	Environmental	Sensitive Species	Investigations find suitable habitat for or evidence of sensitive state and federal listed biological species	Studies not yet initiated.	Medium	PEAR indicates impacts are not anticipated, but a NES is yet to be performed	Mitigate	Conduct NES and comply with mitigation measures or alter design to avoid impacts if possible	County/Rincon	3/22/2013
Active	10	Threat	Environmental	Jurisdictional Waters	Swale flowing through the project site is found to be jurisdictional.	Preliminary study shows not jurisdictional.	Medium	PEAR indicates preliminary studies indicate that swale is not jurisdictional, but further studies may be required.	Mitigate	Determine need for further study and get determination on status of swale.	County/Rincon	3/22/2013
Active	11	Threat	Environmental	Tree Impacts	Unanticipated tree removal may require additional study and replacement plantings may be required, creating project delays and adding cost to the project.	Survey work not yet performed.	Medium	Lack of specific survey information makes it difficult to determine whether proposed graded slope of offramp will impact grove of trees.	Mitigate	Conduct survey to determine exact location of trees relative to proposed toe of slope. Weigh costs of tree removal against cost of alternative designs.	County/P&S	3/22/2013
Active	12	Threat	Environmental	Cultural Resources	HPSR and Phase I ASR find cultural resources in the project area requiring additional consultation with SHPO, adding delays and other as yet unknown mitigations, adding delays and costs to the project.	Cultural resource studies not yet initiated.	Medium	PEAR indicates that project has a low potential to impact cultural resources, but the HPSR and Phase I ASR have not yet been performed.	Mitigate	Perform studies to determine impacts and potential mitigations. Alter design as feasible to mitigate impact.	County/P&S/ Rincon	3/22/2013

Appendix J

Preliminary Drainage Study

Key Site 3
Orcutt, CA

Preliminary Drainage Study

SB Clark, LLC

W.O. 16527.12

PREPARED BY:

Project Manager: Brianna Daniels, P.E.
Project Engineer: Jonathan Zukowski, E.I.T.

November 2013

Penfield & Smith

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Executive Summary

This report quantifies site hydrology and preliminary basin sizing for the proposed Orcutt Key Site 3 (KS 3) Property. The 139-acre property is located in Orcutt California and is currently undeveloped.

This report is in accordance with the requirements set forth by the Santa Barbara County Flood Control District (SBCFCD) and the Central Coast Regional Water Quality Control Board (CCRWQCB). Each requirement for post-development flood control and storm-water quality management was thoroughly analyzed and the more stringent requirement, where a requirement from the SBCFCD and CCRWQCD overlap, was used for this analysis. In accordance with flood control requirements, the allowed post-development peak discharge shall be equal to or less than pre-development peak runoff for the 2-, 5-, 10-, 25-, 50-, and 100-yr storms with the maximum outflow discharge of 0.07 cfs/acre from a 25 year storm event. For water quality requirements the post-development conditions must also retain the runoff from the 95th percentile storm event. Two retention basins are proposed to mitigate peak discharge and meet the runoff retention and storm-water quality requirements put forth by the SBCFCD and the CCRWQCB.

The existing site consists of the Upper Mesa, Central Plain, and Southern Hills. The Upper Mesa is relatively flat and drains to the northwest to an existing channel that continues to Orcutt Creek. The Central Plain is located down slope of the Upper Mesa, is generally flat in the area, and drains to the northwest to Orcutt Creek. The Southern Hills drains north, directly to Orcutt Creek.

The proposed development, which is entirely on the Upper Mesa, consists of 125 single family on approximately 33 acres. The County of Santa Barbara previously approved an additional 160 multi-family units known as the MR-O area. This report analyzes the ultimate condition with the proposed 125 units and the previously approved 160 units. Two (2) retention basins will be developed to meet runoff retention, storm-water quality and peak discharge requirements set forth by the CCRWQCB and SBCFCD.

Post-development flow from 92% of the developed site will be routed via a storm drain system to a single deep retention basin proposed to be located within the Central Plain. The Post-development flow from the other 8% of the developed site will be routed via a storm drain system to a single deep retention basin at the south-west corner of the Upper Mesa near the site entrance from Chancellor Street. For this report, deep basins are defined as greater than 2 feet of water depth, with 1 foot of freeboard and 4:1 side slopes. The proposed retention basins will discharge to Orcutt Creek, with peak discharge limited to or below existing conditions in accordance with SBCFCD and CCRWQCB requirements. Offsite drainage will be routed directly to Orcutt Creek via proposed storm drain piping.

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Appendix B: Post-Development Drainage Conditions
Appendix C: HydroCAD Model Output Data
Appendix D: Basin Percolation Rates & 95th Percentile Storm Retention Requirements

Introduction

This report quantifies site hydrology, preliminary basin sizing and water quality requirements for the proposed Orcutt Key Site 3 (KS 3) Property.

Project Setting

The 139-acre property is located in Orcutt, California. The boundaries of this property include Sunny Hills mobile home park to the North, undeveloped Solomon Hills to the South, US Highway 101 to the East and ranchettes to the West. The site is currently undeveloped and characterized into three sections, Upper Mesa, Central Plain, and Southern Hills as shown in Figure 1.

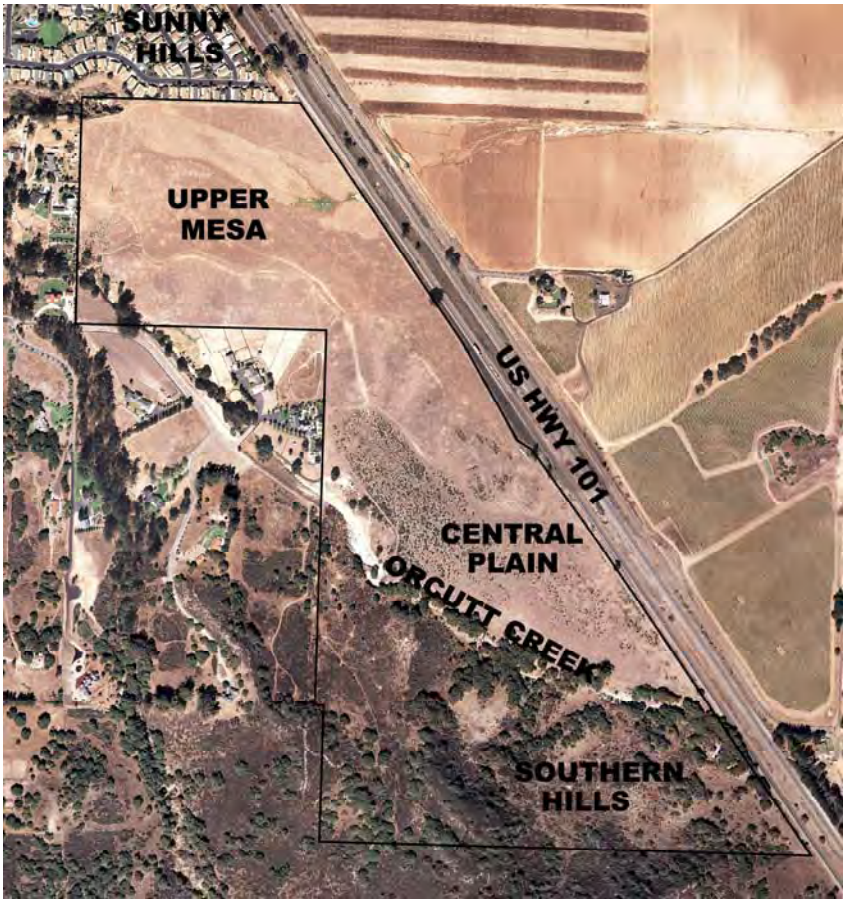


Figure 1: Key Site 3 Vicinity Map

Project Description

EXISTING SITE CONDITIONS

The Upper Mesa is relatively flat and drains to the northwest, to an existing channel that flows west to Orcutt Creek. The Central Plain is located down slope of the Upper Mesa, is generally flat in the area to be developed, and drains to the northwest, also to Orcutt Creek. The Southern Hills drains north, directly to Orcutt Creek. See Figure 2 below.

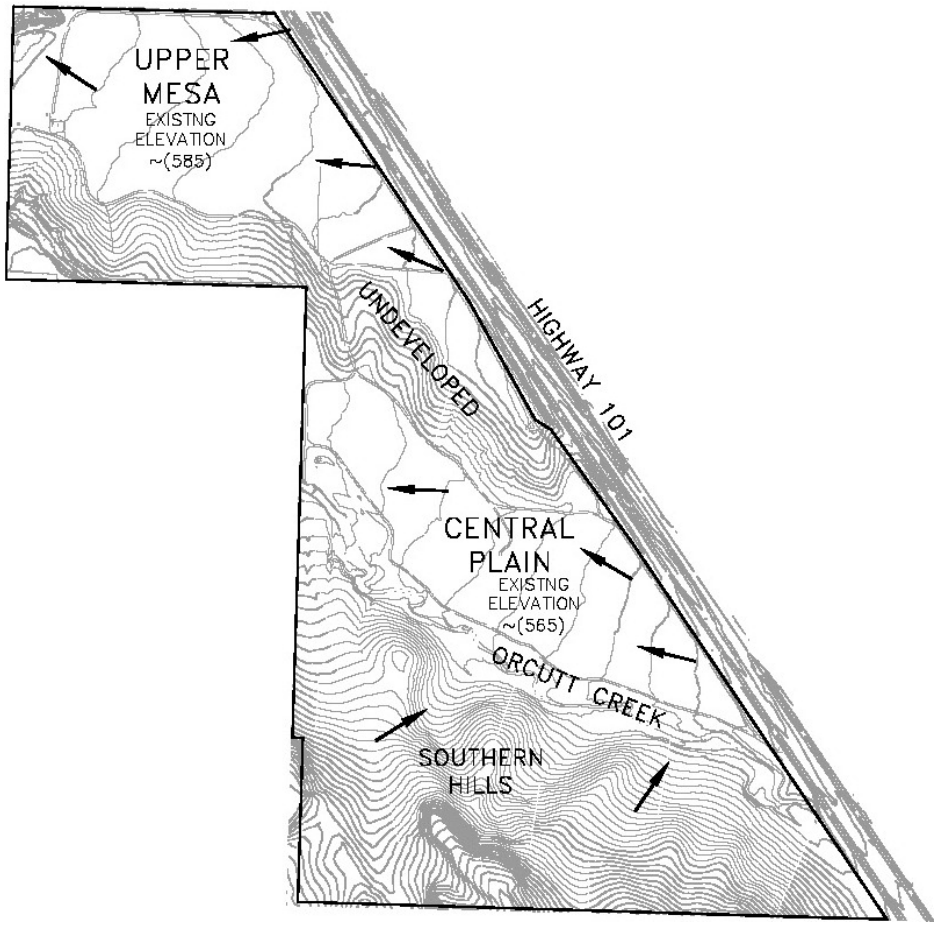


Figure 2. Existing Drainage Areas & Flow Patterns

ORCUTT CREEK

An Orcutt Creek floodway and floodplain analysis was prepared under separate cover. FEMA received and approved a Letter of Map Revision (LOMR) to define Floodway & Floodplain limits through the KS 3 property.

OFFSITE

Three existing pipes convey offsite drainage onto Key Site 3. In addition, tributary Highway 101 runoff currently passes through the Central Plain to Orcutt Creek. All offsite flow, from the existing pipes and Highway 101 surface drainage, will be conveyed directly to Orcutt Creek via proposed piping as shown in Figure 3.

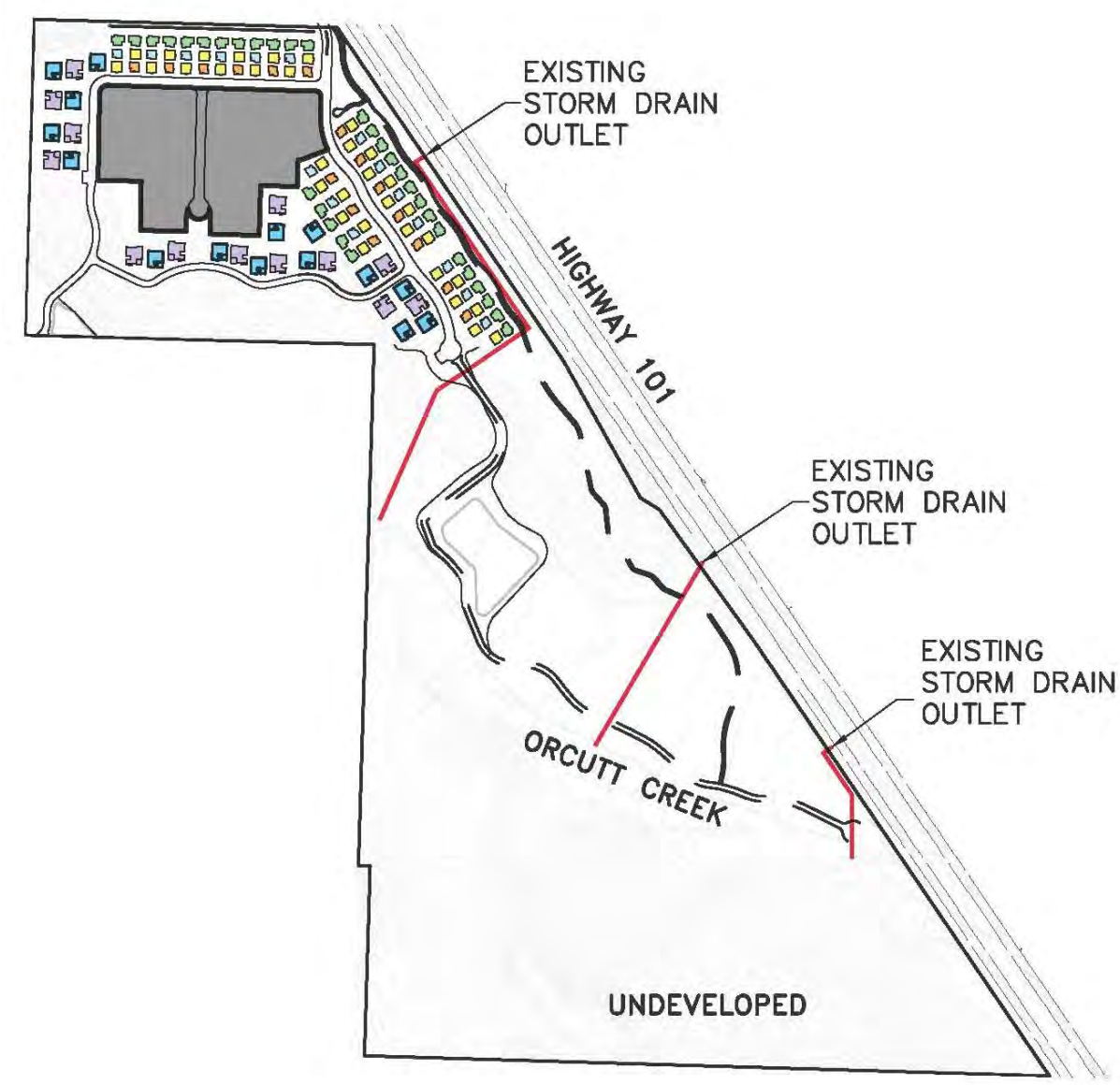


Figure 3. Offsite Drainage Conveyed to Orcutt Creek

PROPOSED PROJECT

The proposed development of the Upper Mesa consists of 125 single family and 160 multifamily units on approximately 33 acres. The proposed development layout is shown in Figure 4.

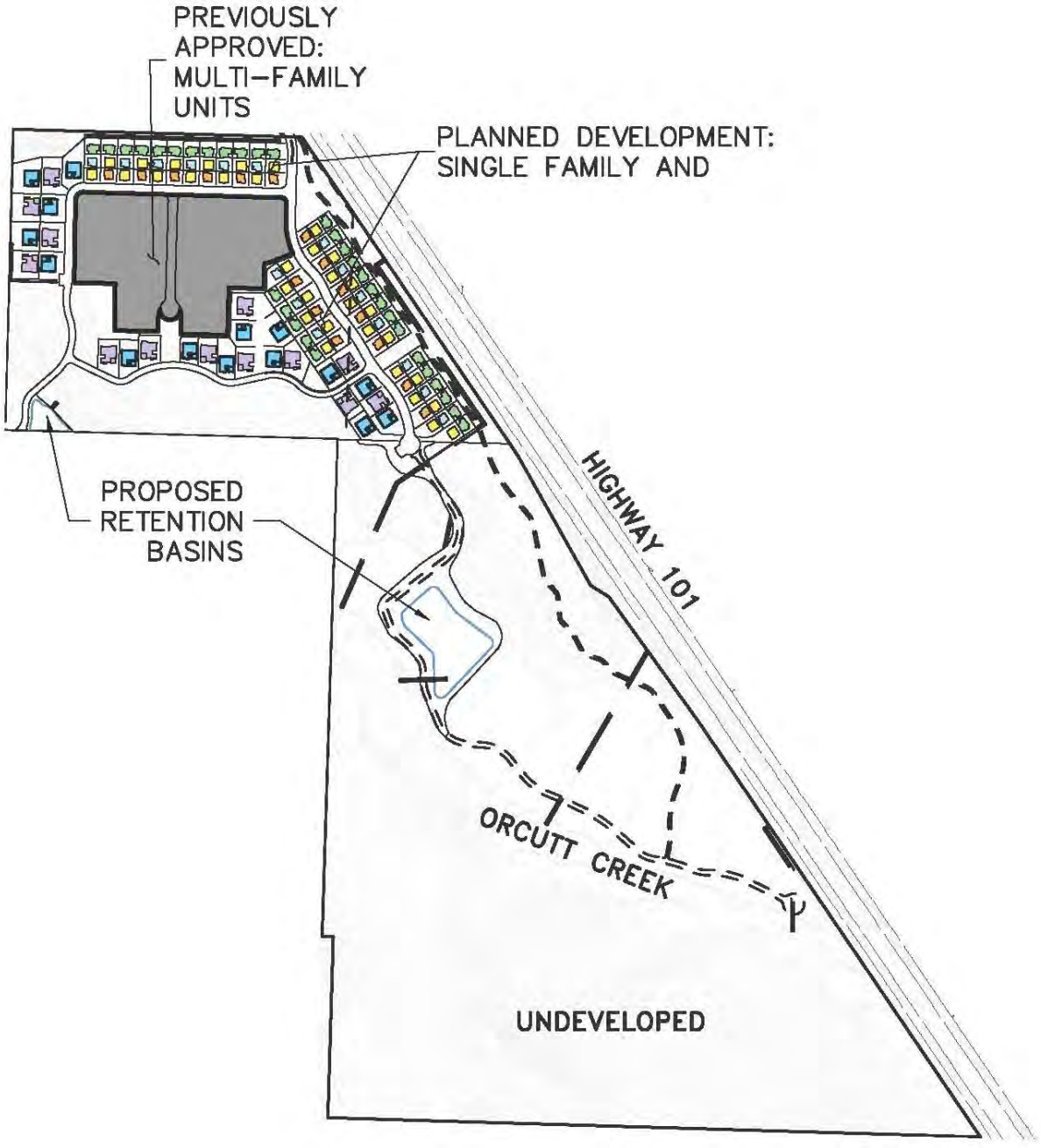


Figure 4. Proposed Development

Flood Control Analysis

PURPOSE

The purpose of this analysis is to determine pre- and post- development site hydrology and preliminary basin sizing for the proposed KS 3 development.

JURISDICTIONAL REQUIREMENTS

In accordance with the Santa Barbara County Flood Control District (SBCFCD) and the Central Coast Regional Water Quality Control Board (CCRWQCB) requirements, the allowed post-development peak discharge shall be equal to or less than pre-development peak runoff for the 2-, 5-, 10-, 25-, 50-, and 100-yr storms with the maximum outflow discharge from a 25 year storm event not exceeding 0.07 cfs/acre. In addition, the runoff from the 95th percentile storm event shall be retained via Low Impact Development Measures. To meet said requirements and optimize the Low Impact Development Measures, two retention basins are proposed for development.

WATER QUALITY MEASURES

Source Control site design includes roof drains for single family lots to be directed through vegetated yard swales to promote infiltration as a first measure of treatment. Treatment Control measures include low flow swales within developed catchment areas and retention basins to promote infiltration of the runoff from the 95th percentile storm event. Basin footprints were sized to allow time for settling of fine particles and associated pollutants.

METHODOLOGY

HydroCAD 8.5 was used to determine site hydrology and basin sizing. Site runoff was modeled for the 2-, 5-, 10-, 25-, 50-, and 100-year return intervals.

1. Drainage Subareas: Pre- and post-development drainage areas were delineated based on existing topography and proposed conditions. Tributary offsite flow was not considered as it will be routed directly to Orcutt Creek.
2. Time of concentration (Tc): Tc was determined for both pre and post-development conditions. The SCS/NRCS TR-55 method was used for sheet flow and shallow concentrated flow.
3. Curve Number (CN): CN values were based on proposed improvements, as well as soils information derived through the Natural Resource Conservation Service (NRCS) Web Soil Survey. http://websoilsurvey.nrcs.usda.gov/app/
4. Runoff Calculation: Runoff hydrographs were calculated using the SBUH method, assuming a 24-hour storm duration, SCS Type I storm distribution, and a 2.0 Antecedent Moisture Condition. Runoff for the 95th Percentile Storm event was calculated using the CCRWQCB's methodology provided in the "Post-Construction Storm Water Management Requirements for Development Projects in the Central Coast" (Resolution No. R3-2012-0025).
5. Routing Calculation: Pond routing was calculated per the Storage-Indication Method.
6. Exfiltration: Exfiltration was not considered.

PRE-DEVELOPMENT DRAINAGE AREAS

The Central Plain is a single drainage area while the Upper Mesa is comprised of several drainage areas. The majority of the Upper Mesa drains to the northwest corner of the property to an existing channel that continues to Orcutt Creek. The areas just along the bluff of the Upper Mesa drain directly to the Creek. The Central Plain drains to the northwest to reach Orcutt Creek near to the west property line. Per the NCRS custom soils report, included in Appendix A of this report, the Upper Mesa is comprised of 56.8% Garey Sandy Loam (2-9% slopes), 26.7% Marina Sand (9-30% slopes), 13.9% Marina Sand (2-9% slopes), 1.8% Sandy Alluvial Land, and 0.7% Elder Sandy Loam (2-9% slopes). The Central Plain consists of 35.4% Marina Sand (9-30% slopes), 28.0% Betteravia Loamy Sand (5-15% slopes), 26.5% Betteravia Loamy Sand (0-5% slopes), 7.8% Garey Sandy Loam (2-9% slopes) and 2.3% Sandy Alluvial Land.

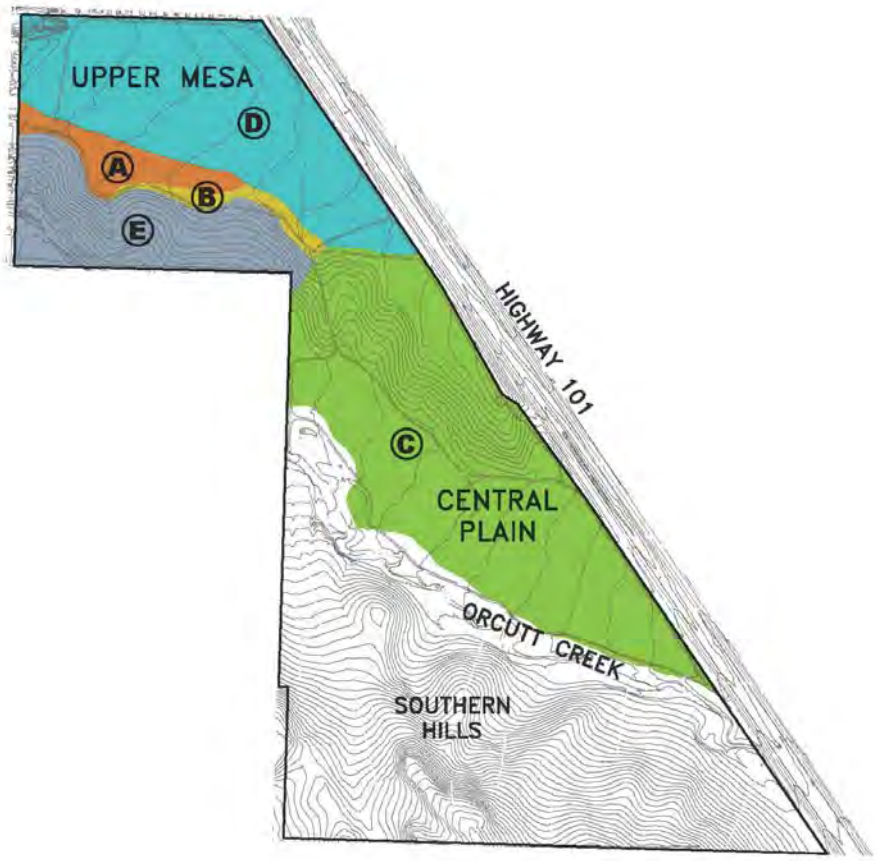


Figure 5. Pre-Development Drainage Areas

Appendix A describes the characteristics of each drainage area in detail and includes Tc routes and NRCS data for existing soil types. The Time of Concentration, Tc, is the time required for a particle of water to travel from the most hydrologically remote location in a catchment area to the point of collection. The Tc, was determined using HydroCAD which utilizes the SCS/NRCS method for calculations and soil type data. The length and location of the each catchment area's Tc route was derived from topographical maps and is shown in Appendix A.

Pre-development drainage area characteristics are listed in Table 1.

Area	Acreage	Surface Description	Tc (min)	CN
A	3.45	Grassland/Range	34.2	69
B	1.55	Grassland/Range	19.2	69
C	37.60	Grassland/Range	53.6	74
D	23.42	Grassland/Range	59.7	69
E	11.80	Grassland/Range	20.1	69

Table 1. Pre-Development Drainage Area Data

POST-DEVELOPMENT DRAINAGE AREAS

Post-development drainage areas were delineated based on proposed site development and grading. Most of the developed area (sub-catchment areas 1, 2, 5, 6, 7, 8, 9 & 11) will drain to Retention Basin #1 while sub-catchment areas 3, 4, & 10 will drain to Retention Basin #2. Sub-catchments A, C and E are primarily undeveloped and will drain directly to Orcutt Creek. The runoff for sub-catchments A, C and E was not included in the maximum peak discharge requirement of 0.07 cfs/acre from a 25 year storm event or the 95th percentile storm event retention requirements because these sub-catchment areas have no proposed disturbance or development. Appendix B describes the characteristics of each drainage area in detail.

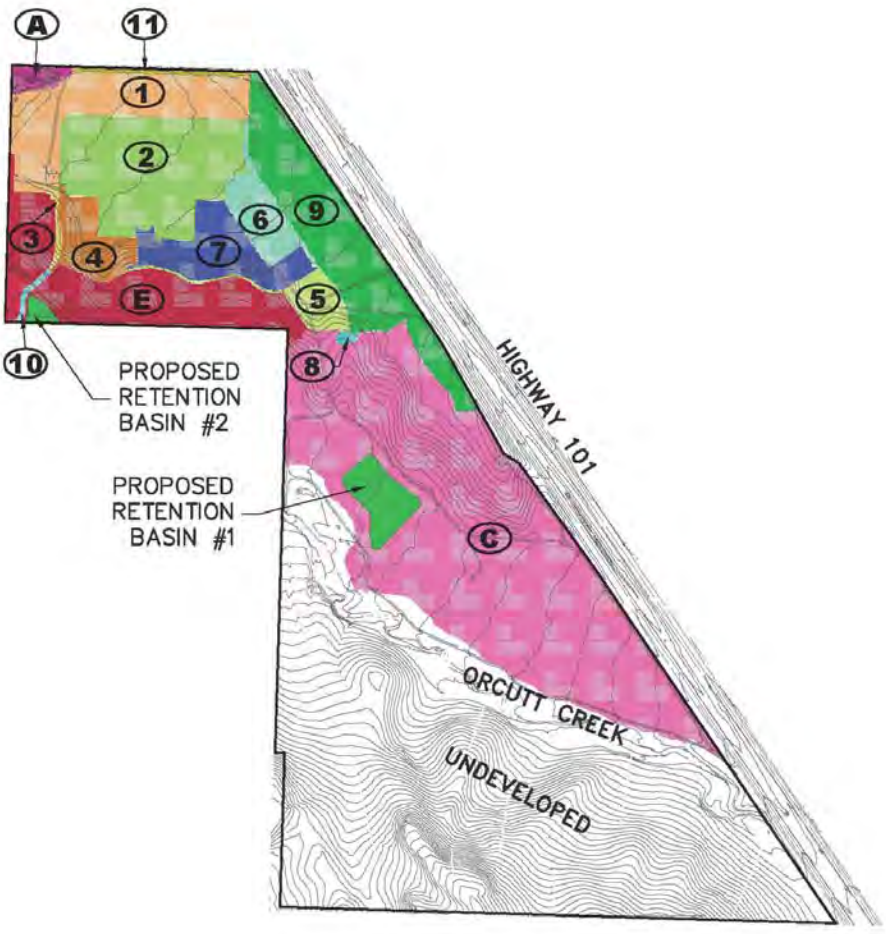


Figure 6. Post-Development Drainage Areas

The Tc for each post-development sub-catchment area was found using the method previously described for the pre-development conditions. The length and location of the each catchment area's Tc route was derived from proposed grading and topographical maps and is shown in Appendix B.

Post-development drainage area characteristics are listed in Table 2.

Area	Acreage	Surface Description	Tc (min)	CN
1	6.273	1/4 & 1/8 Acre Lots	17.2	82
2	8.670	1/8 Acre Lots	24.8	86
3	0.212	Graded & Road	1.9	95
4	2.167	1/4 Acre Lots & Park	4.6	71
5	1.474	1/4 Acre Lots	17.9	81
6	2.060	1/8 Acre Lots	38.2	87
7	3.572	1/4 Acre Lots & Park	13.8	75
8	0.113	Paved Road	2.7	98
9	8.408	1/4 Acre Lots & Park	37.4	82
10	0.166	Paved Road	1.3	98
11	0.449	Graded & Swale	11.7	87
A	0.631	Undeveloped & Graded	24.3	70
C	32.794	Undeveloped & Trails	73.5	76
E	8.149	Undeveloped & Graded	16.3	71

Table 2. Post-Development Drainage Area Data

BASIN DESIGN FOR PEAK DISCHARGE

Basin size and outlet design was based on retaining the runoff from the 95th percentile storm event, which is discussed in the Water Quality Analysis portion of this report, and limiting post-development peak discharge to less than or equal to pre-development conditions for the 2-, 5-, 10-, 25-, 50-, and 100-year return intervals and less than or equal to 0.07 cfs/acre for the 25-yr storm event. Peak discharge from the developed site will be attenuated to meet the peak discharge requirements via 2 retention basins; 1 deep basin located in the Central Plain and a 1 deep basin within the Upper Mesa. Deep basins are defined as greater than 2 feet of water depth, with 1 foot of freeboard and 4:1 side slopes. Because there is no development or disturbance proposed in sub-catchments A, C and E, the runoff from said sub-catchments, will drain directly to Orcutt Creek and was not considered in the outlet discharge requirement of less than or equal to 0.07 cfs/acre for the 25-yr storm event from developed basins.

In accordance with the SBCFCD requirements, the final discharge location for both Retention Basin #1 and Retention Basin #2 will be Orcutt Creek. Pre-development Upper Mesa drainage to the existing channel at the northwest corner of the property will be re-routed to reach Orcutt Creek within the KS 3 property. Final outlet and basin design will be configured to best replicate existing conditions for all storm events while meeting SBCFCD requirements.

Drainage to Retention Basin #1

Sub-catchments 1, 2, 5, 6, 7, 8, 9 & 11 have a developed area of approximately 31 acres. All storm-water runoff from said sub-catchments will be collected in Retention Basin #1. Storm-water runoff greater than the 95th percentile storm event collecting in Retention Basin #1 will then be discharged to Orcutt Creek at equal to or less than the peak discharge requirements set forth by the SBCFCD. The invert elevation for the proposed outlet pipe of Retention Basin #1 will be located above the 100-yr flood plain elevation, therefore, no tail-water condition was assumed in pond routing for Retention Basin #1. Flood way and flood plain elevations were

taken from a Letter of Map Revision (LOMR) to define Floodway & Floodplain limits approved by FEMA.

Figure 7 shows the potential location for Retention Basin #1 and the outlet location into Orcutt Creek. Final basin design will be dependent on site grading and storm drain improvements.

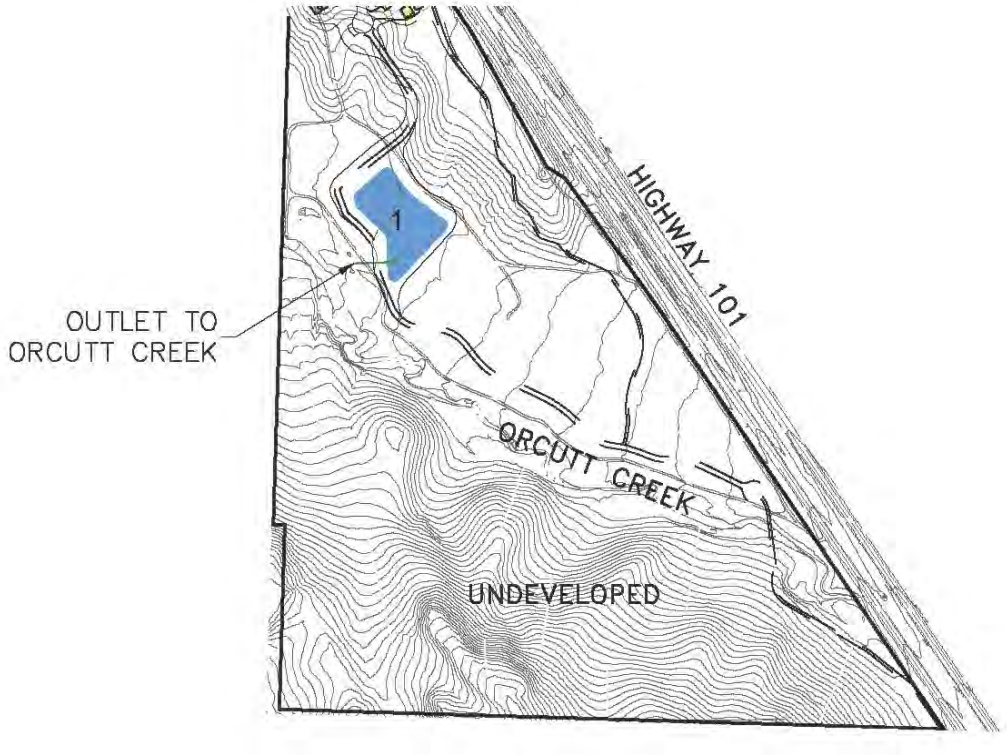


Figure 7. Potential Retention Basin #1 Location

Design information for the identified potential basin is listed in Table 3.

Basin	Max Water Depth (ft)	Basin Depth	Side Slope	Shallow/Deep	Storage Volume* (Ac-ft)
#1	14	15	4:1	Deep	21.57

Table 3. Potential Basin #1 Characteristics

*Storage volume based on a maximum water depth of fourteen feet.

Drainage to Retention Basin #2

Sub-catchments 3, 4, and 10 have a developed area of approximately 2.5 acres. All storm-water runoff from said sub-catchment areas will be collected in Retention Basin #2. Storm-water runoff greater than the 95th percentile storm event being collected in Retention Basin #2 will then be discharged to Orcutt Creek at equal to or less than the peak discharge requirements set forth by the SBCFCD. Because the invert elevation of the outlet pipe for Retention Basin #2 is located below the 100-yr flood plain elevation a tail-water condition of 3-feet above the basin

bottom was assumed when modeling pond routing. 100-yr Flood plain elevations were assumed per a LOMR to define Floodway & Floodplain limits approved by FEMA.

Figure 8 shows the potential location for Retention Basin #2 and its outlet location into Orcutt Creek. Final basin design will be dependent on site grading and storm drain improvements.

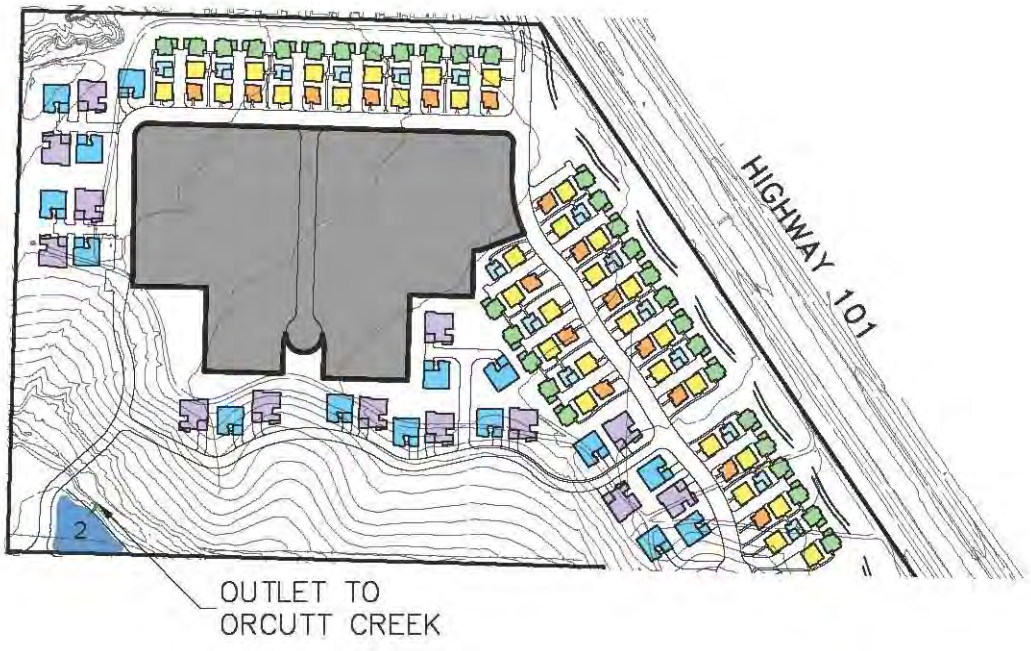


Figure 8. Potential Retention Basin #2 Location

Design information for the identified potential basin location is listed in Table 5.

Basin	Max Water Depth (ft)	Basin Depth	Side Slope	Shallow/Deep	Storage Volume* (Ac-ft)
#2	3	4	4:1	Deep	0.48

Table 4. Potential Basin #2 Characteristics

*Storage volume based on a maximum water depth of three feet.

Maximum 25-year Peak Discharge from Basin #1 and Basin #2

According to SBCFCD requirements, the allowed post-development peak discharge shall be equal to or less than pre-development peak runoff for the 2-, 5-, 10-, 25-, 50-, and 100-yr storms and the maximum outflow discharge from developed areas should be equal to or less than 0.07 cfs/acre from a 25 year storm event. Post -development peak flows from the retention basins were analyzed for the 25 year storm event requirement and used in pond routing to meet said requirements.

The cumulative post-development discharge from both retention basins for the 25-yr return period is shown in Table 5.

Total Site Condition	Catchment Area (ac)	Q25 (cfs)	Q25 (cfs)/ac
Post-Development	33.563	0.42	**0.01**

Table 5. Post-Development 25 year Peak Discharge

The combined post-development 25 year peak discharge from both basins meets the maximum peak discharge requirement of equal to or less than 0.07 cfs/acre set forth by the SBCFCD.

Maximum Peak Discharge for 2-, 5-, 10-, 25-, 50, & 100-year Storm Events

Santa Barbara County Flood Control District and the Central Coast Regional Water Quality Control Board set forth requirements for maximum peak discharge from a developed site. The more stringent of these requirements was used in this analysis. The collective runoff from the total site was used to analyze the maximum peak discharge for the 2-, 5-, 10-, 25-, 50-, and 100-yr return periods. This collective runoff is comprised of the discharge from both retention basins and the runoff from sub-catchments A, C, and E being discharged into Orcutt Creek. Sub-catchments A, C and E area are primarily undeveloped, but because they include grading for the access roads, the retention basins, and trails in the Central Plain, they were included in the analysis for flood control requirements.

The pre- and post-development peak flows (cfs) from the total site are given in table 6.

Total Site Runoff	Q100	Q50	Q25	Q10	Q5	Q2
Pre-Development	35.60	27.95	20.88	12.25	6.59	1.48
Post-Development	21.66	17.31	12.77	7.72	4.32	1.15
Percent Reduction	39.16%	38.07%	38.84%	36.98%	34.45%	22.30%

Table 6. Pre- and Post-Development Total Site Runoff

The post-development peak discharges for the total site meet the maximum peak discharge requirements set forth by the SBCFCD for 2-, 5-, 10-, 25-, 50-, and 100-yr storms.

Complete HydroCAD output is included as Appendix C – HydroCAD Model Output Data.

Water Quality and Runoff Retention Analysis

Background and Approach

Key Site 3 is a unique site, located directly adjacent to Orcutt Creek. All surface runoff is currently directed to the Orcutt Creek through a variety of outlet conditions. This runoff includes drainage entering the site from Highway 101, and offsite drainage. As discussed in this drainage report, there are two main drainage areas on the site: the Upper Mesa and the Central Plain. The Upper Mesa/Bluff area drains to a wash, which ultimately drains to the Orcutt Creek. The Central Plain area surface drains directly to the creek. This area also accepts and conveys offsite drainage from Highway 101.

The proposed site design for Key Site 3 incorporates a number of water quality BMP's in an effort to minimize any negative impacts of the development itself. Proposed roadways are narrow where possible to decrease impervious area. No impervious surfaces are currently proposed in the Central Plain area. To meet water quality and retention requirements set forth by the CCRWQCB, the two proposed retention basins are designed to attenuate discharge and retain the runoff volume from the 95th percentile storm event. The accumulated storm-water runoff will then be treated via soil infiltration within each retention basin. The footprint areas of each retention basin were sized to allow percolation of the accumulated storm-water run-off within 48-hrs into the surrounding soil. In addition to the retention basins, the development of the site utilizes vegetated swales and attempts to minimize impervious surfaces. Actual storm drain pipes and catch basin inlets were kept to a minimum in order to allow for natural flow across a media filter prior to discharge into the Orcutt Creek. The final design and landscaping

plans intend to utilize porous pave blocks where possible to provide emergency access and maintain a "green" feel in these locations.

Water Quality and Retention Volume

The site is broken up into two distinct drainage areas: The Upper Mesa and the Central Plain. The Upper Mesa contains the majority of the site development. This includes all of the residential lots, private roads, driveways, parks and Retention Basin #2. It has an average impervious area of 51%. The total tributary area for the Upper Mesa is 33.6 acres. The Central Plain consists of large open space areas, riparian areas, various multipurpose trails, and Retention Basin #1. The total area for the Central Plain is 35.2 acres. The tributary area in the Central Plain has no proposed disturbance or development and will not be draining into either basin. The remaining 69.8 acres is made up of creek bed, slopes, and untouched open space. The drainage in this remaining area is intended to be maintained in a natural, pre-development state and is not included as part of this analysis.

According to rainfall data records received from the Santa Barbara County Flood Control District (SBCFCD) for rain gauge #158 in Orcutt, CA, the 95th percentile storm event produces 1.52 inches of rainfall per hour within a 24 hour period. Each retention basin, using the 95th percentile rainfall data and its tributary area was individually sized to meet the runoff retention and water quality requirements set forth by the CCRWQCB. To calculate the runoff volume, the methodology for retention runoff from the CCRWQCB was used. The runoff volume used to size Retention Basin #1 includes the runoff captured from sub-catchment areas 1, 2, 5, 6, 7, 8, 9 & 11. The runoff volume used to size Retention Basin #2 includes the runoff volume captured from sub-catchment areas 3, 4 & 10. The storage volumes shown were calculated using the elevation of the lowest orifice as the water height for its respective retention basin.

The calculated 95th percentile storm event runoff data and retention basin storage volumes are given in table 7.

Basin	Catchment Area (Ac)	Imp. Area (%)	Runoff Coefficient - C	95th% Runoff Volume (Ac-ft)	Storage Volume (Ac-ft)
Basin #1	31.018	52.4	0.355	1.395	**4.406**
Basin #2	2.545	35.7	0.252	0.081	**0.250**

Table 7. 95th Percentile Runoff Volume for Retention Basin #1 & #2

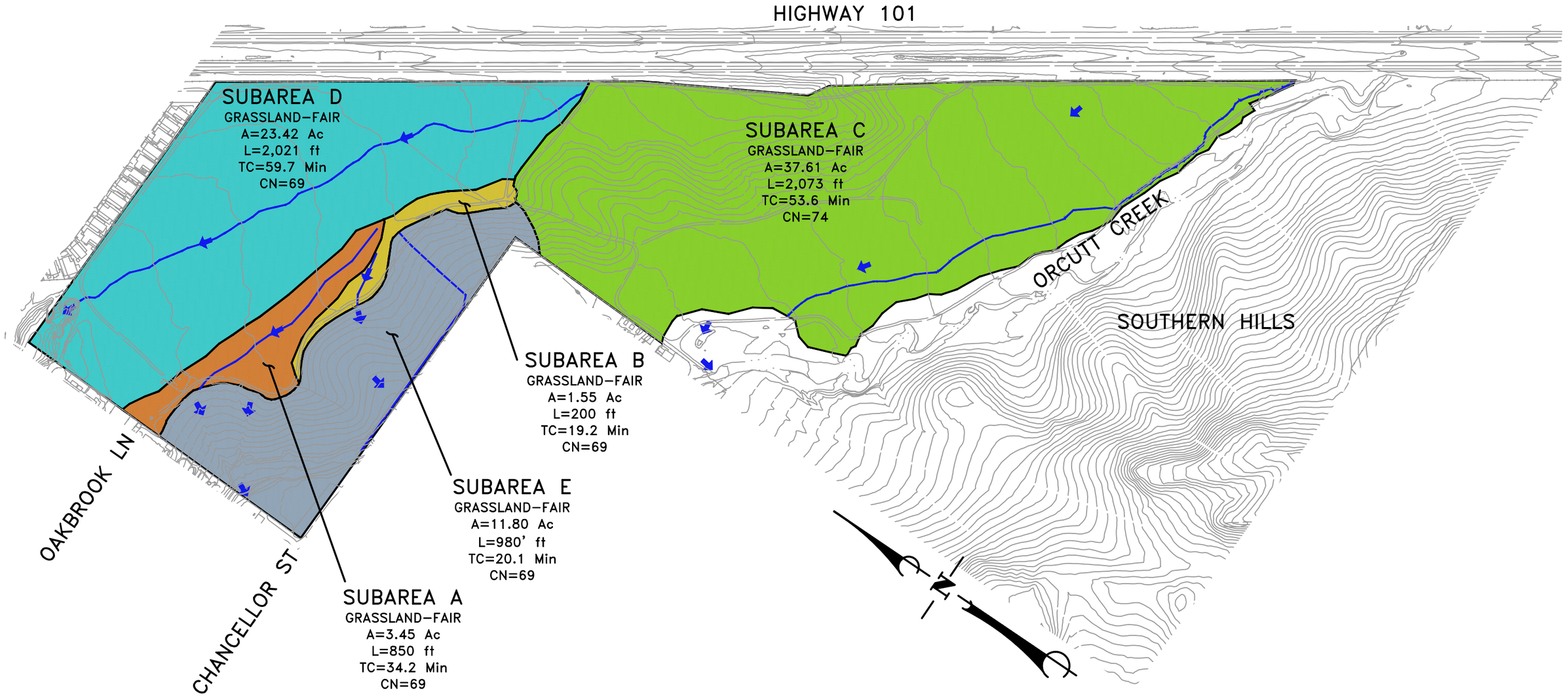
The storage volumes (*measured from the basin bottom to the invert of the lowest orifice*) of Retention Basin #1 and Retention Basin #2 meet the 95th percentile retention runoff volume and all other water quality requirements set forth by the CCRWQCB.

Calculations for percolation rates and the retention volumes are included as Appendix D – Retention Basin Percolation Rates & 95th Percentile Storm Retention Requirements.

Conclusion

The storm water retention facilities proposed within this study will mitigate post-development runoff to criteria as set forth by the SBCFCD and CCRWQCB. Each retention basin will retain the runoff produced by the 95th percentile storm event independently for its given sub-catchment areas and collectively attenuate the 2-, 5-, 10-, 25-, 50-, and 100-yr storm events and limit peak discharge to or below existing drainage conditions.

Appendix A



Penfield & Smith
Engineering • Surveying • Planning
• Construction Management •

16527.12

NOT TO SCALE

ORCUTT KEY SITE 3
APPENDIX A
PRE-DEVELOPMENT DRAINAGE AREAS
SANTA BARBARA COUNTY, CA

MAY 2013

S:\ACAD\Work\16527\DRAINAGE\Appendix A – Predevelopment Drainage Areas.dwg

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Northern Santa Barbara Area, California

Orcutt Key Site 3



May 1, 2009

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://soils.usda.gov/sqi/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://soils.usda.gov/contact/state_offices/).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means

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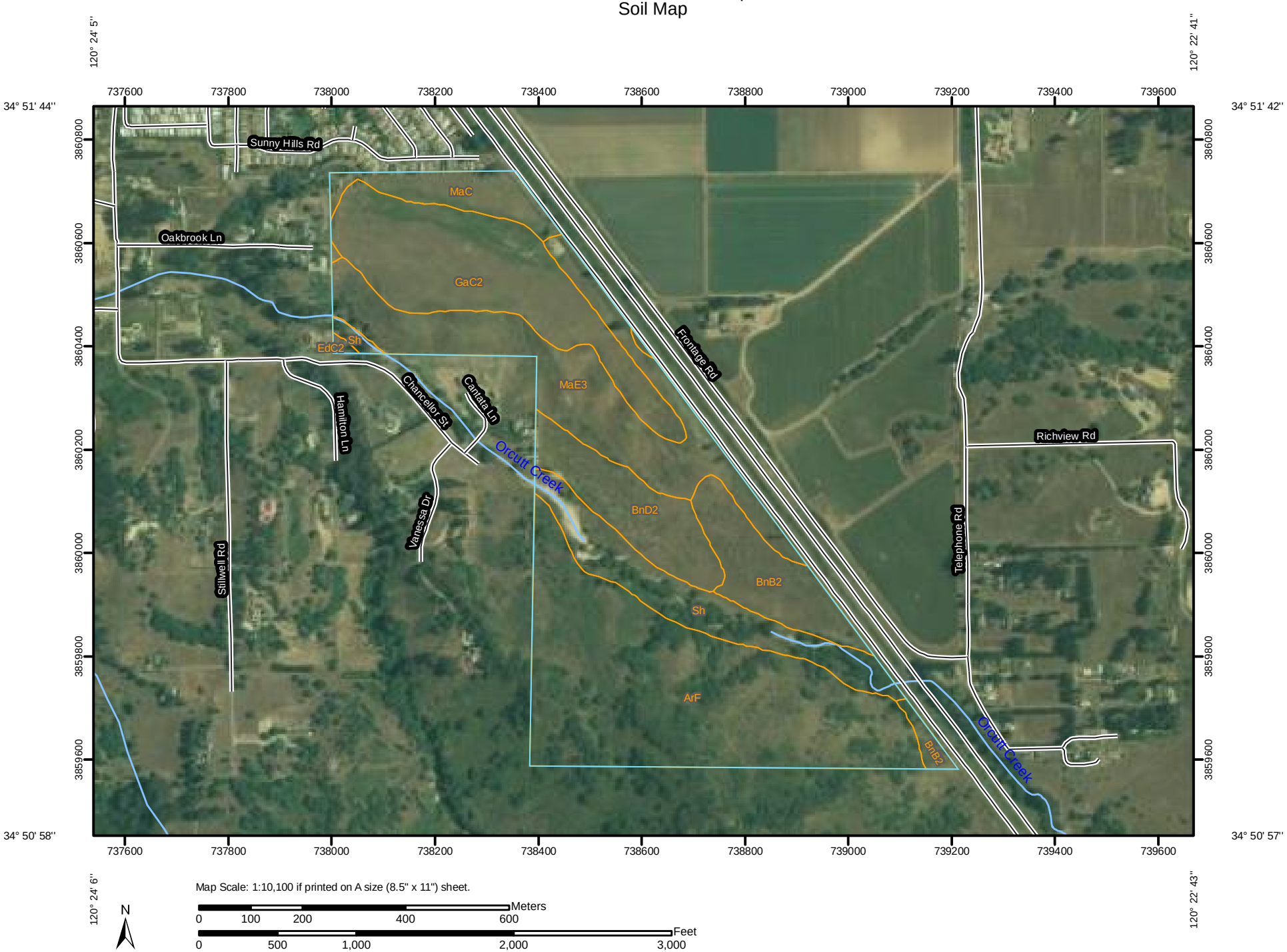
Contents

Preface.....2
Soil Map.....5
Soil Map.....6
Legend.....7
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Soil Information for All Uses.....9
Soil Properties and Qualities.....9
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Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:10,100 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
Survey Area Data: Version 6, Jan 3, 2008

Date(s) aerial images were photographed: 6/6/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Northern Santa Barbara Area, California (CA672)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
ArF	Arnold sand, 15 to 45 percent slopes	49.3	33.7%
BnB2	Betteravia loamy sand, dark variant, 0 to 5 percent slopes, eroded	11.4	7.8%
BnD2	Betteravia loamy sand, dark variant, 5 to 15 percent slopes, eroded	11.2	7.6%
EdC2	Elder sandy loam, 2 to 9 percent slopes, eroded	0.3	0.2%
GaC2	Garey sandy loam, 2 to 9 percent slopes, eroded	25.8	17.6%
MaC	Marina sand, 2 to 9 percent slopes	6.9	4.7%
MaE3	Marina sand, 9 to 30 percent slopes, severely eroded	26.8	18.4%
Sh	Sandy alluvial land	14.5	9.9%
Totals for Area of Interest		**146.2**	**100.0%**

Soil Information for All Uses

Soil Properties and Qualities

The Soil Properties and Qualities section includes various soil properties and qualities displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each property or quality.

Soil Qualities and Features

Soil qualities are behavior and performance attributes that are not directly measured, but are inferred from observations of dynamic conditions and from soil properties. Example soil qualities include natural drainage, and frost action. Soil features are attributes that are not directly part of the soil. Example soil features include slope and depth to restrictive layer. These features can greatly impact the use and management of the soil.

Hydrologic Soil Group

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

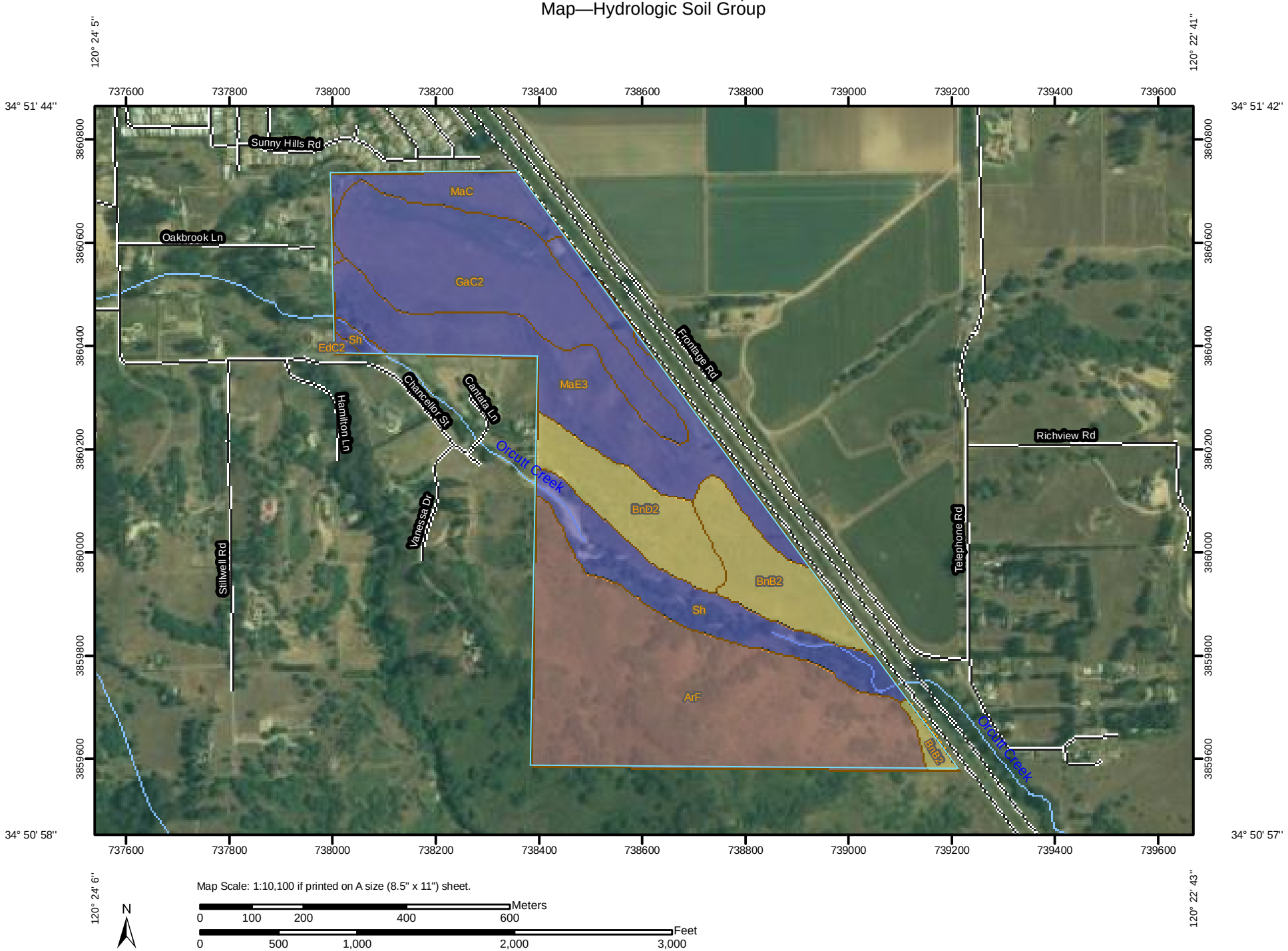
Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Custom Soil Resource Report
Map—Hydrologic Soil Group



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Units

Soil Ratings

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Political Features

- Cities

Water Features

- Oceans
- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:10,100 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 10N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Northern Santa Barbara Area, California
Survey Area Data: Version 6, Jan 3, 2008

Date(s) aerial images were photographed: 6/6/2005

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydrologic Soil Group

Hydrologic Soil Group— Summary by Map Unit — Northern Santa Barbara Area, California				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
ArF	Arnold sand, 15 to 45 percent slopes	A	49.3	33.7%
BnB2	Betteravia loamy sand, dark variant, 0 to 5 percent slopes, eroded	C	11.4	7.8%
BnD2	Betteravia loamy sand, dark variant, 5 to 15 percent slopes, eroded	C	11.2	7.6%
EdC2	Elder sandy loam, 2 to 9 percent slopes, eroded	B	0.3	0.2%
GaC2	Garey sandy loam, 2 to 9 percent slopes, eroded	B	25.8	17.6%
MaC	Marina sand, 2 to 9 percent slopes	B	6.9	4.7%
MaE3	Marina sand, 9 to 30 percent slopes, severely eroded	B	26.8	18.4%
Sh	Sandy alluvial land	B	14.5	9.9%
Totals for Area of Interest			**146.2**	**100.0%**

Rating Options—Hydrologic Soil Group

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Soil Reports

The Soil Reports section includes various formatted tabular and narrative reports (tables) containing data for each selected soil map unit and each component of each unit. No aggregation of data has occurred as is done in reports in the Soil Properties and Qualities and Suitabilities and Limitations sections.

The reports contain soil interpretive information as well as basic soil properties and qualities. A description of each report (table) is included.

Soil Physical Properties

This folder contains a collection of tabular reports that present soil physical properties. The reports (tables) include all selected map units and components for each map unit. Soil physical properties are measured or inferred from direct observations in the field or laboratory. Examples of soil physical properties include percent clay, organic matter, saturated hydraulic conductivity, available water capacity, and bulk density.

Physical Soil Properties

This table shows estimates of some physical characteristics and features that affect soil behavior. These estimates are given for the layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

The amount and kind of clay affect the fertility and physical condition of the soil and the ability of the soil to adsorb cations and to retain moisture. They influence shrink-

swell potential, saturated hydraulic conductivity (Ksat), plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Saturated hydraulic conductivity (Ksat) refers to the ease with which pores in a saturated soil transmit water. The estimates in the table are expressed in terms of micrometers per second. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Saturated hydraulic conductivity (Ksat) is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In this table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil.

Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the

Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and Ksat. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind and/or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook."

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Reference:
United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. (http://soils.usda.gov)

Physical Soil Properties– Northern Santa Barbara Area, California														
Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
ArF—Arnold sand, 15 to 45 percent slopes														
Arnold	0-23	-96-	- 2-	0- 3- 5	1.60-1.70	42.00-141.00	0.05-0.07	0.0-2.9	0.5-1.0	.17	.20	4	1	180
	23-55	-94-	- 1-	0- 5- 10	1.60-1.70	42.00-141.00	0.05-0.09	0.0-2.9	0.0-0.5	.17	.17			
	55-59	—	—	—	—	1.40-4.00	—	—	—					
BnB2—Betteravia loamy sand, dark variant, 0 to 5 percent slopes, eroded														
Betteravia variant	0-26	-84-	- 9-	5- 8- 10	1.60-1.70	42.00-141.00	0.06-0.08	0.0-2.9	1.0-3.0	.24	.28	4	2	134
	26-38	-67-	-19-	10-14- 18	1.60-1.70	0.42-1.40	0.04-0.06	0.0-2.9	0.5-0.7	.32	.37			
	38-50	-67-	-19-	10-14- 18	1.50-1.60	14.00-42.00	0.10-0.12	0.0-2.9	0.0-0.5	.32	.37			
	50-61	-84-	- 9-	5- 8- 10	1.60-1.70	42.00-141.00	0.06-0.08	0.0-2.9	0.0	.28	.32			
BnD2—Betteravia loamy sand, dark variant, 5 to 15 percent slopes, eroded														
Betteravia variant	0-26	-84-	- 9-	5- 8- 10	1.60-1.70	42.00-141.00	0.06-0.08	0.0-2.9	1.0-3.0	.24	.28	4	2	134
	26-38	-67-	-19-	10-14- 18	1.60-1.70	0.42-1.40	0.04-0.06	0.0-2.9	0.5-0.7	.32	.37			
	38-50	-67-	-19-	10-14- 18	1.50-1.60	14.00-42.00	0.10-0.12	0.0-2.9	0.0-0.5	.32	.37			
	50-61	-84-	- 9-	5- 8- 10	1.60-1.70	42.00-141.00	0.06-0.08	0.0-2.9	0.0	.28	.32			

Physical Soil Properties– Northern Santa Barbara Area, California														
Map symbol and soil name	**Depth**	**Sand**	**Silt**	**Clay**	**Moist bulk density**	**Saturated hydraulic conductivity**	**Available water capacity**	**Linear extensibility**	**Organic matter**	**Erosion factors**			**Wind erodibility group**	**Wind erodibility index**
										Kw	**Kf**	**T**		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
EdC2—Elder sandy loam, 2 to 9 percent slopes, eroded														
Elder	0-23	-67-	-20-	8-13- 18	1.45-1.55	14.00-42.00	0.10-0.14	0.0-2.9	1.0-3.0	.20	.24	5	3	86
	23-35	-67-	-20-	8-13- 18	1.50-1.60	14.00-42.00	0.10-0.14	0.0-2.9	0.5-0.7	.28	.32			
	35-72	-71-	-17-	8-13- 18	1.45-1.55	14.00-42.00	0.14-0.16	0.0-2.9	0.0-0.5	.28	.32			
GaC2—Garey sandy loam, 2 to 9 percent slopes, eroded														
Garey	0-27	-69-	-24-	5- 8- 10	1.50-1.60	14.00-42.00	0.10-0.12	0.0-2.9	0.6-1.0	.37	.37	5	3	86
	27-47	-67-	-23-	5-10- 15	1.70-1.80	0.42-14.00	0.08-0.12	0.0-2.9	0.0	.37	.37			
	47-70	-81-	-17-	0- 3- 5	1.50-1.60	4.00-14.00	0.06-0.08	0.0-2.9	0.0	.43	.43			
MaC—Marina sand, 2 to 9 percent slopes														
Marina	0-27	-96-	- 2-	0- 3- 5	1.60-1.70	42.00-141.00	0.05-0.08	0.0-2.9	0.5-1.0	.24	.24	5	1	180
	27-50	-96-	- 2-	1- 3- 5	1.60-1.70	4.00-14.00	0.06-0.10	0.0-2.9	0.0-0.5	.37	.37			
	50-88	-96-	- 2-	0- 3- 5	1.60-1.70	42.00-141.00	0.04-0.07	0.0-2.9	0.0	.24	.24			

Physical Soil Properties– Northern Santa Barbara Area, California														
Map symbol and soil name	**Depth**	**Sand**	**Silt**	**Clay**	**Moist bulk density**	**Saturated hydraulic conductivity**	**Available water capacity**	**Linear extensibility**	**Organic matter**	**Erosion factors**			**Wind erodibility group**	**Wind erodibility index**
										Kw	**Kf**	**T**		
	In	*Pct*	*Pct*	*Pct*	*g/cc*	*micro m/sec*	*In/In*	*Pct*	*Pct*					
MaE3—Marina sand, 9 to 30 percent slopes, severely eroded														
Marina	0-10	-96-	- 2-	0- 3- 5	1.60-1.70	42.00-141.00	0.05-0.08	0.0-2.9	0.5-1.0	.24	.24	4	1	180
	10-33	-96-	- 2-	1- 3- 5	1.60-1.70	4.00-14.00	0.06-0.10	0.0-2.9	0.0-0.5	.37	.37			
	33-60	-96-	- 2-	0- 3- 5	1.60-1.70	42.00-141.00	0.04-0.07	0.0-2.9	0.0	.24	.24			
Sh—Sandy alluvial land														
Sandy alluvial land	0-10	-96-	- 2-	0- 3- 5	1.50-1.70	42.00-141.00	0.05-0.08	0.0-2.9	0.5-1.0	.10	.15	5	1	180
	10-30	—	—	5-13- 20	1.50-1.70	14.00-42.00	0.08-0.15	0.0-2.9	0.0-0.5	.15	.20			
	30-60	—	—	5-13- 20	1.50-1.70	14.00-42.00	0.06-0.13	0.0-2.9	0.0	.15	.24			

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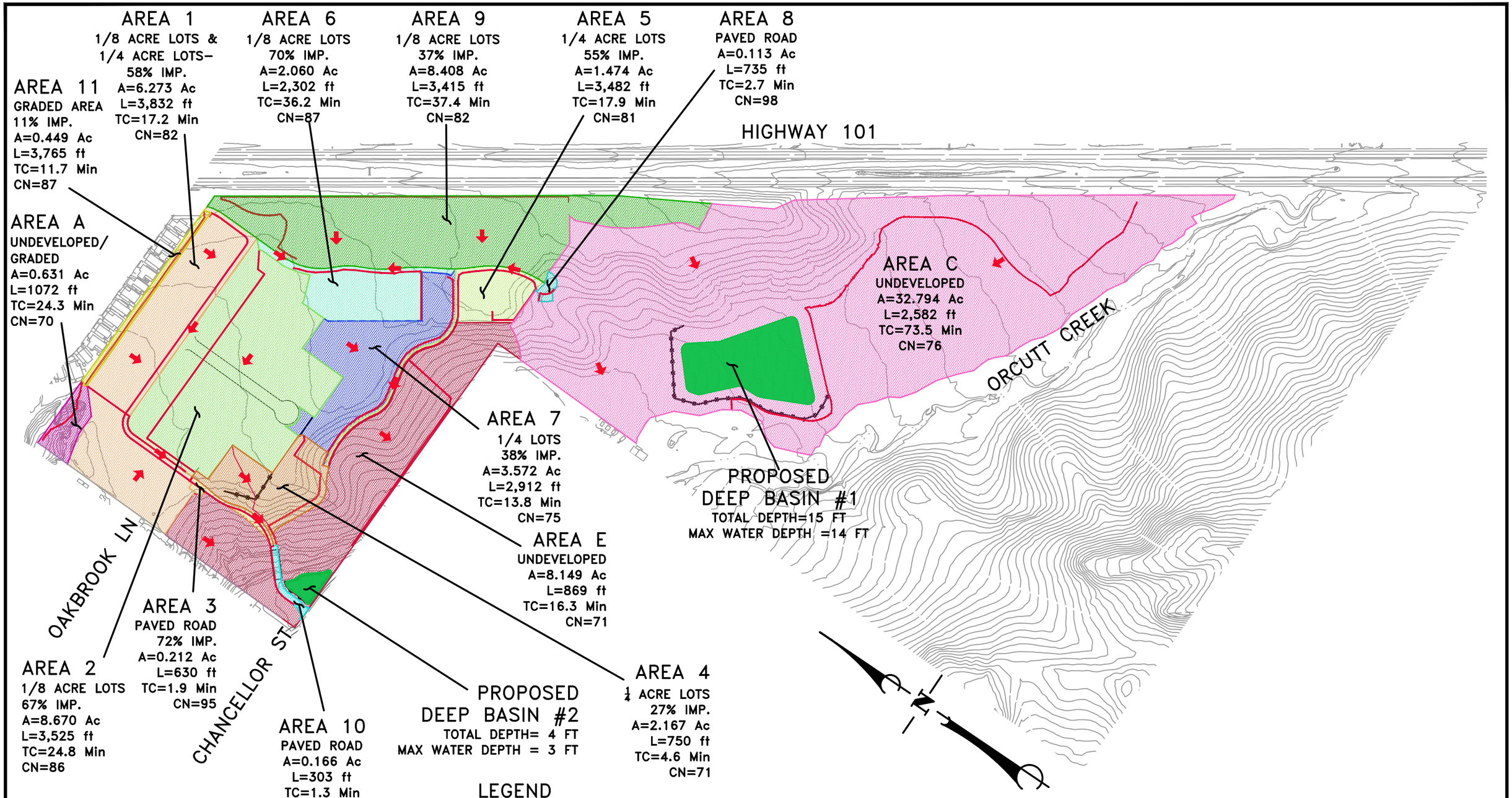
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Appendix B



Penfield & Smith
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16527.12

NOT TO SCALE

ORCUTT KEY SITE 3
APPENDIX B
POST-DEVELOPMENT DRAINAGE AREAS
SANTA BARBARA COUNTY, CA

NOVEMBER 2013

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Appendix C

Summary for Subcatchment A: Pre Dev A

Runoff = 0.05 cfs @ 13.01 hrs, Volume= 0.043 af, Depth> 0.15"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
3.450	69	Pasture/grassland/range, Fair, HSG B
3.450	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	200	0.0140	0.14		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
10.9	650	0.0200	0.99		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
34.2	850	Total			

Summary for Subcatchment B: Pre Dev B

Runoff = 0.02 cfs @ 12.75 hrs, Volume= 0.020 af, Depth> 0.15"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
1.550	69	Pasture/grassland/range, Fair, HSG B
1.550	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	197	0.0220	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"

Summary for Subcatchment C: Pre Dev C

Runoff = 0.96 cfs @ 11.48 hrs, Volume= 0.800 af, Depth> 0.26"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
17.500	69	Pasture/grassland/range, Fair, HSG B
17.260	79	Pasture/grassland/range, Fair, HSG C
2.847	69	Pasture/grassland/range, Fair, HSG B
37.607	74	Weighted Average
37.607	74	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	300	0.0280	0.20		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
29.1	1,773	0.0210	1.01		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
53.6	2,073	Total			

Summary for Subcatchment D: Pre Dev D

Runoff = 0.29 cfs @ 13.47 hrs, Volume= 0.284 af, Depth> 0.15"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
23.419	69	Pasture/grassland/range, Fair, HSG B
23.419	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	300	0.0180	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
30.5	1,721	0.0180	0.94		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
59.7	2,021	Total			

Summary for Subcatchment E: Pre Dev E

Runoff = 0.16 cfs @ 12.76 hrs, Volume= 0.149 af, Depth> 0.15"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
11.798	69	Pasture/grassland/range, Fair, HSG B
11.798	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	300	0.1360	0.38		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
7.1	680	0.0520	1.60		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
20.1	980	Total			

Summary for Subcatchment A: Pre Dev A

Runoff = 0.23 cfs @ 10.40 hrs, Volume= 0.134 af, Depth> 0.47"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
3.450	69	Pasture/grassland/range, Fair, HSG B
3.450	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	200	0.0140	0.14		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
10.9	650	0.0200	0.99		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
34.2	850	Total			

Summary for Subcatchment B: Pre Dev B

Runoff = 0.15 cfs @ 10.13 hrs, Volume= 0.061 af, Depth> 0.47"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
1.550	69	Pasture/grassland/range, Fair, HSG B
1.550	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	197	0.0220	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"

Summary for Subcatchment C: Pre Dev C

Runoff = 3.91 cfs @ 10.40 hrs, Volume= 2.059 af, Depth> 0.66"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
17.500	69	Pasture/grassland/range, Fair, HSG B
17.260	79	Pasture/grassland/range, Fair, HSG C
2.847	69	Pasture/grassland/range, Fair, HSG B
37.607	74	Weighted Average
37.607	74	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	300	0.0280	0.20		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
29.1	1,773	0.0210	1.01		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
53.6	2,073	Total			

Summary for Subcatchment D: Pre Dev D

Runoff = 1.21 cfs @ 10.83 hrs, Volume= 0.895 af, Depth> 0.46"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
23.419	69	Pasture/grassland/range, Fair, HSG B
23.419	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	300	0.0180	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
30.5	1,721	0.0180	0.94		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
59.7	2,021	Total			

Summary for Subcatchment E: Pre Dev E

Runoff = 1.09 cfs @ 10.14 hrs, Volume= 0.463 af, Depth> 0.47"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
11.798	69	Pasture/grassland/range, Fair, HSG B
11.798	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	300	0.1360	0.38		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
7.1	680	0.0520	1.60		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
20.1	980	Total			

Summary for Subcatchment A: Pre Dev A

Runoff = 0.49 cfs @ 10.15 hrs, Volume= 0.212 af, Depth> 0.74"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
3.450	69	Pasture/grassland/range, Fair, HSG B
3.450	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	200	0.0140	0.14		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
10.9	650	0.0200	0.99		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
34.2	850	Total			

Summary for Subcatchment B: Pre Dev B

Runoff = 0.32 cfs @ 10.11 hrs, Volume= 0.096 af, Depth> 0.74"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
1.550	69	Pasture/grassland/range, Fair, HSG B
1.550	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	197	0.0220	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"

Summary for Subcatchment C: Pre Dev C

Runoff = 6.71 cfs @ 10.28 hrs, Volume= 3.065 af, Depth> 0.98"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
17.500	69	Pasture/grassland/range, Fair, HSG B
17.260	79	Pasture/grassland/range, Fair, HSG C
2.847	69	Pasture/grassland/range, Fair, HSG B
37.607	74	Weighted Average
37.607	74	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	300	0.0280	0.20		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
29.1	1,773	0.0210	1.01		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
53.6	2,073	Total			

Summary for Subcatchment D: Pre Dev D

Runoff = 2.39 cfs @ 10.49 hrs, Volume= 1.417 af, Depth> 0.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
23.419	69	Pasture/grassland/range, Fair, HSG B
23.419	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	300	0.0180	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
30.5	1,721	0.0180	0.94		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
59.7	2,021	Total			

Summary for Subcatchment E: Pre Dev E

Runoff = 2.34 cfs @ 10.11 hrs, Volume= 0.731 af, Depth> 0.74"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
11.798	69	Pasture/grassland/range, Fair, HSG B
11.798	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	300	0.1360	0.38		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
7.1	680	0.0520	1.60		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
20.1	980	Total			

Summary for Subcatchment A: Pre Dev A

Runoff = 0.92 cfs @ 10.13 hrs, Volume= 0.324 af, Depth> 1.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
3.450	69	Pasture/grassland/range, Fair, HSG B
3.450	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	200	0.0140	0.14		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
10.9	650	0.0200	0.99		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
34.2	850	Total			

Summary for Subcatchment B: Pre Dev B

Runoff = 0.57 cfs @ 10.09 hrs, Volume= 0.147 af, Depth> 1.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
1.550	69	Pasture/grassland/range, Fair, HSG B
1.550	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	197	0.0220	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"

Summary for Subcatchment C: Pre Dev C

Runoff = 10.84 cfs @ 10.18 hrs, Volume= 4.458 af, Depth> 1.42"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
17.500	69	Pasture/grassland/range, Fair, HSG B
17.260	79	Pasture/grassland/range, Fair, HSG C
2.847	69	Pasture/grassland/range, Fair, HSG B
37.607	74	Weighted Average
37.607	74	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	300	0.0280	0.20		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
29.1	1,773	0.0210	1.01		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
53.6	2,073	Total			

Summary for Subcatchment D: Pre Dev D

Runoff = 4.29 cfs @ 10.37 hrs, Volume= 2.165 af, Depth> 1.11"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
23.419	69	Pasture/grassland/range, Fair, HSG B
23.419	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	300	0.0180	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
30.5	1,721	0.0180	0.94		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
59.7	2,021	Total			

Summary for Subcatchment E: Pre Dev E

Runoff = 4.26 cfs @ 10.09 hrs, Volume= 1.115 af, Depth> 1.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
11.798	69	Pasture/grassland/range, Fair, HSG B
11.798	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	300	0.1360	0.38		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
7.1	680	0.0520	1.60		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
20.1	980	Total			

Summary for Subcatchment A: Pre Dev A

Runoff = 1.27 cfs @ 10.13 hrs, Volume= 0.413 af, Depth> 1.44"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
3.450	69	Pasture/grassland/range, Fair, HSG B
3.450	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	200	0.0140	0.14		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
10.9	650	0.0200	0.99		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
34.2	850	Total			

Summary for Subcatchment B: Pre Dev B

Runoff = 0.78 cfs @ 10.08 hrs, Volume= 0.187 af, Depth> 1.45"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
1.550	69	Pasture/grassland/range, Fair, HSG B
1.550	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	197	0.0220	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"

Summary for Subcatchment C: Pre Dev C

Runoff = 14.17 cfs @ 10.10 hrs, Volume= 5.546 af, Depth> 1.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
17.500	69	Pasture/grassland/range, Fair, HSG B
17.260	79	Pasture/grassland/range, Fair, HSG C
2.847	69	Pasture/grassland/range, Fair, HSG B
37.607	74	Weighted Average
37.607	74	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	300	0.0280	0.20		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
29.1	1,773	0.0210	1.01		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
53.6	2,073	Total			

Summary for Subcatchment D: Pre Dev D

Runoff = 5.89 cfs @ 10.31 hrs, Volume= 2.764 af, Depth> 1.42"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
23.419	69	Pasture/grassland/range, Fair, HSG B
23.419	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	300	0.0180	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
30.5	1,721	0.0180	0.94		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
59.7	2,021	Total			

Summary for Subcatchment E: Pre Dev E

Runoff = 5.84 cfs @ 10.09 hrs, Volume= 1.421 af, Depth> 1.45"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
11.798	69	Pasture/grassland/range, Fair, HSG B
11.798	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	300	0.1360	0.38		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
7.1	680	0.0520	1.60		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
20.1	980	Total			

Summary for Subcatchment A: Pre Dev A

Runoff = 1.63 cfs @ 10.12 hrs, Volume= 0.505 af, Depth> 1.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
3.450	69	Pasture/grassland/range, Fair, HSG B
3.450	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	200	0.0140	0.14		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
10.9	650	0.0200	0.99		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
34.2	850	Total			

Summary for Subcatchment B: Pre Dev B

Runoff = 1.01 cfs @ 10.08 hrs, Volume= 0.229 af, Depth> 1.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
1.550	69	Pasture/grassland/range, Fair, HSG B
1.550	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.2	197	0.0220	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"

Summary for Subcatchment C: Pre Dev C

Runoff = 17.86 cfs @ 10.14 hrs, Volume= 6.660 af, Depth> 2.13"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
17.500	69	Pasture/grassland/range, Fair, HSG B
17.260	79	Pasture/grassland/range, Fair, HSG C
2.847	69	Pasture/grassland/range, Fair, HSG B
37.607	74	Weighted Average
37.607	74	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	300	0.0280	0.20		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
29.1	1,773	0.0210	1.01		**Shallow Concentrated Flow, Shallow Flow** Short Grass Pasture Kv= 7.0 fps
53.6	2,073	Total			

Summary for Subcatchment D: Pre Dev D

Runoff = 7.61 cfs @ 10.27 hrs, Volume= 3.386 af, Depth> 1.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
23.419	69	Pasture/grassland/range, Fair, HSG B
23.419	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.2	300	0.0180	0.17		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
30.5	1,721	0.0180	0.94		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
59.7	2,021	Total			

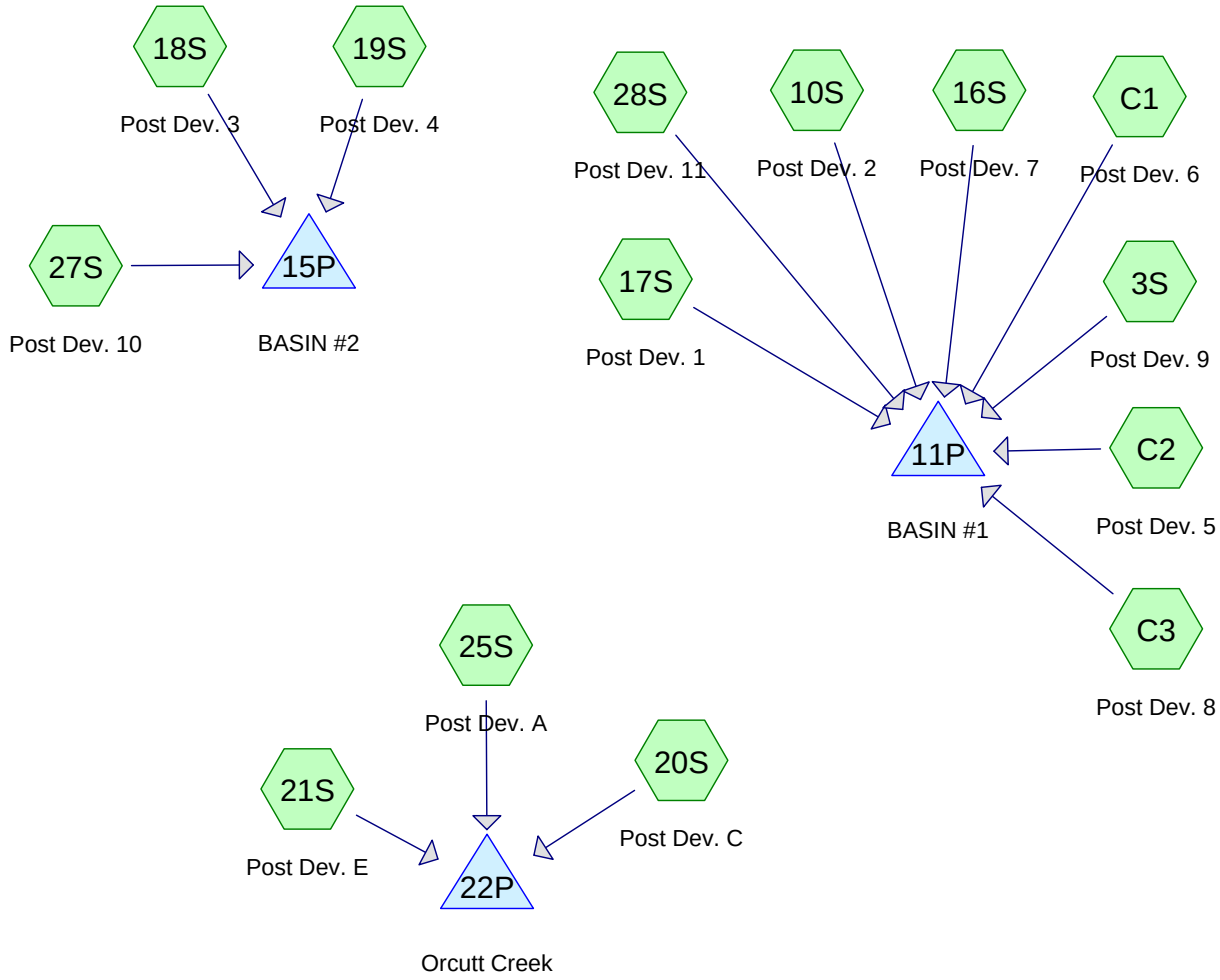
Summary for Subcatchment E: Pre Dev E

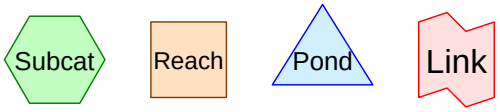
Runoff = 7.49 cfs @ 10.08 hrs, Volume= 1.740 af, Depth> 1.77"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
11.798	69	Pasture/grassland/range, Fair, HSG B
11.798	69	Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
13.0	300	0.1360	0.38		**Sheet Flow, Sheet Flow** Range n= 0.130 P2= 1.81"
7.1	680	0.0520	1.60		**Shallow Concentrated Flow, Shallow flow** Short Grass Pasture Kv= 7.0 fps
20.1	980	Total			





Routing Diagram for jtz-KS3_Post-Development
Prepared by Penfield and Smith Engineers, Inc., Printed 11/13/2013
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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
7.186	75	1/4 acre lots, 38% imp, HSG B (16S, 17S, 19S, C2)
16.940	85	1/8 acre lots, 65% imp, HSG B (3S, 10S, 17S, C1)
2.303	61	>75% Grass cover, Good, HSG B (3S, 16S, 19S)
0.831	82	Dirt roads, HSG B (20S)
0.337	85	Gravel roads, HSG B (3S)
6.074	86	Newly graded area, HSG B (3S, 18S, 20S, 21S, 25S, 28S)
22.429	69	Pasture/grassland/range, Fair, HSG B (3S, 20S, 21S, 25S)
15.526	79	Pasture/grassland/range, Fair, HSG C (20S)
3.316	98	Paved roads w/curbs & sewers (3S, 10S, 16S, 17S, 18S, 19S, 27S, C1, C2, C3)
0.194	89	Paved roads w/open ditches, 50% imp, HSG B (3S, 19S, 28S)
75.136	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
56.294	HSG B	3S, 10S, 16S, 17S, 18S, 19S, 20S, 21S, 25S, 28S, C1, C2
15.526	HSG C	20S
0.000	HSG D	
3.316	Other	3S, 10S, 16S, 17S, 18S, 19S, 27S, C1, C2, C3
75.136		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchr Numbers
0.000	7.186	0.000	0.000	0.000	7.186	1/4 acre lots, 38% imp	
0.000	16.940	0.000	0.000	0.000	16.940	1/8 acre lots, 65% imp	
0.000	2.303	0.000	0.000	0.000	2.303	>75% Grass cover, Good	
0.000	0.831	0.000	0.000	0.000	0.831	Dirt roads	
0.000	0.337	0.000	0.000	0.000	0.337	Gravel roads	
0.000	6.074	0.000	0.000	0.000	6.074	Newly graded area	
0.000	22.429	15.526	0.000	0.000	37.955	Pasture/grassland/range, Fair	
0.000	0.000	0.000	0.000	3.316	3.316	Paved roads w/curbs & sewers	
0.000	0.194	0.000	0.000	0.000	0.194	Paved roads w/open ditches, 50% imp	
0.000	**56.294**	**15.526**	**0.000**	**3.316**	**75.136**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	3S	0.00	0.00	80.0	0.1000	0.010	18.0	0.0	0.0
2	3S	0.00	0.00	876.0	0.0050	0.010	24.0	0.0	0.0
3	3S	0.00	0.00	689.0	0.0040	0.010	24.0	0.0	0.0
4	10S	0.00	0.00	896.0	0.0050	0.010	18.0	0.0	0.0
5	10S	0.00	0.00	876.0	0.0050	0.010	24.0	0.0	0.0
6	10S	0.00	0.00	689.0	0.0040	0.010	24.0	0.0	0.0
7	16S	0.00	0.00	952.0	0.0050	0.010	18.0	0.0	0.0
8	16S	0.00	0.00	346.0	0.0050	0.010	24.0	0.0	0.0
9	16S	0.00	0.00	689.0	0.0040	0.010	24.0	0.0	0.0
10	17S	0.00	0.00	38.0	0.0050	0.010	18.0	0.0	0.0
11	17S	0.00	0.00	896.0	0.0050	0.010	18.0	0.0	0.0
12	17S	0.00	0.00	876.0	0.0050	0.010	24.0	0.0	0.0
13	17S	0.00	0.00	689.0	0.0040	0.010	24.0	0.0	0.0
14	18S	0.00	0.00	24.0	0.0100	0.010	18.0	0.0	0.0
15	18S	0.00	0.00	172.0	0.0530	0.010	18.0	0.0	0.0
16	19S	0.00	0.00	172.0	0.0530	0.010	18.0	0.0	0.0
17	27S	0.00	0.00	47.0	0.0050	0.010	18.0	0.0	0.0
18	28S	0.00	0.00	202.0	0.0120	0.010	18.0	0.0	0.0
19	28S	0.00	0.00	320.0	0.0093	0.010	18.0	0.0	0.0
20	28S	0.00	0.00	896.0	0.0050	0.010	18.0	0.0	0.0
21	28S	0.00	0.00	876.0	0.0050	0.010	24.0	0.0	0.0
22	28S	0.00	0.00	689.0	0.0040	0.010	24.0	0.0	0.0
23	C1	0.00	0.00	80.0	0.1000	0.010	18.0	0.0	0.0
24	C1	0.00	0.00	876.0	0.0050	0.010	24.0	0.0	0.0
25	C1	0.00	0.00	689.0	0.0040	0.010	24.0	0.0	0.0
26	C2	0.00	0.00	952.0	0.0050	0.010	18.0	0.0	0.0
27	C2	0.00	0.00	346.0	0.0050	0.010	24.0	0.0	0.0
28	C2	0.00	0.00	689.0	0.0040	0.010	24.0	0.0	0.0
29	C3	0.00	0.00	31.0	0.1500	0.010	18.0	0.0	0.0
30	C3	0.00	0.00	629.0	0.0040	0.010	24.0	0.0	0.0

Time span=0.00-24.00 hrs, dt=0.10 hrs, 241 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 3S: Post Dev. 9 Runoff Area=8.408 ac 36.54% Impervious Runoff Depth>0.72"
Flow Length=3,415' Tc=37.4 min CN=73/98 Runoff=1.57 cfs 0.506 af

Subcatchment 10S: Post Dev. 2 Runoff Area=8.670 ac 66.89% Impervious Runoff Depth>1.07"
Flow Length=3,525' Tc=24.8 min CN=61/98 Runoff=3.47 cfs 0.771 af

Subcatchment 16S: Post Dev. 7 Runoff Area=3.572 ac 37.83% Impervious Runoff Depth>0.62"
Flow Length=2,912' Tc=13.8 min CN=61/98 Runoff=1.07 cfs 0.185 af

Subcatchment 17S: Post Dev. 1 Runoff Area=6.272 ac 57.34% Impervious Runoff Depth>0.92"
Flow Length=3,832' Tc=17.2 min CN=61/98 Runoff=2.59 cfs 0.482 af

Subcatchment 18S: Post Dev. 3 Runoff Area=0.212 ac 72.17% Impervious Runoff Depth>1.34"
Flow Length=630' Tc=1.9 min CN=86/98 Runoff=0.21 cfs 0.024 af

Subcatchment 19S: Post Dev. 4 Runoff Area=2.167 ac 27.17% Impervious Runoff Depth>0.46"
Flow Length=750' Tc=4.6 min CN=61/98 Runoff=0.64 cfs 0.083 af

Subcatchment 20S: Post Dev. C Runoff Area=32.794 ac 0.00% Impervious Runoff Depth>0.30"
Flow Length=2,582' Tc=73.5 min CN=76/0 Runoff=1.02 cfs 0.832 af

Subcatchment 21S: Post Dev. E Runoff Area=8.148 ac 0.00% Impervious Runoff Depth>0.17"
Flow Length=869' Tc=16.3 min CN=70/0 Runoff=0.12 cfs 0.116 af

Subcatchment 25S: Post Dev. A Runoff Area=0.631 ac 0.00% Impervious Runoff Depth>0.17"
Flow Length=1,072' Tc=24.3 min CN=70/0 Runoff=0.01 cfs 0.009 af

Subcatchment 27S: Post Dev. 10 Runoff Area=0.166 ac 100.00% Impervious Runoff Depth>1.59"
Flow Length=303' Tc=1.3 min CN=0/98 Runoff=0.20 cfs 0.022 af

Subcatchment 28S: Post Dev. 11 Runoff Area=0.449 ac 11.69% Impervious Runoff Depth>0.76"
Flow Length=3,765' Tc=11.7 min CN=85/98 Runoff=0.16 cfs 0.029 af

Subcatchment C1: Post Dev. 6 Runoff Area=2.060 ac 70.35% Impervious Runoff Depth>1.12"
Flow Length=2,302' Tc=36.2 min CN=61/98 Runoff=0.72 cfs 0.192 af

Subcatchment C2: Post Dev. 5 Runoff Area=1.474 ac 55.16% Impervious Runoff Depth>0.89"
Flow Length=3,482' Tc=17.9 min CN=61/98 Runoff=0.58 cfs 0.109 af

Subcatchment C3: Post Dev. 8 Runoff Area=0.113 ac 100.00% Impervious Runoff Depth>1.59"
Flow Length=735' Tc=2.7 min CN=0/98 Runoff=0.13 cfs 0.015 af

Pond 11P: BASIN #1 Peak Elev=561.58' Storage=2.287 af Inflow=10.28 cfs 2.289 af
Outflow=0.00 cfs 0.000 af

Pond 15P: BASIN #2 Peak Elev=525.03' Storage=0.129 af Inflow=1.04 cfs 0.129 af
Outflow=0.00 cfs 0.000 af

Pond 22P: Orcutt Creek

Inflow=1.15 cfs 0.957 af
Primary=1.15 cfs 0.957 af

Total Runoff Area = 75.136 ac Runoff Volume = 3.375 af Average Runoff Depth = 0.54"
77.17% Pervious = 57.981 ac 22.83% Impervious = 17.155 ac

Summary for Subcatchment 3S: Post Dev. 9

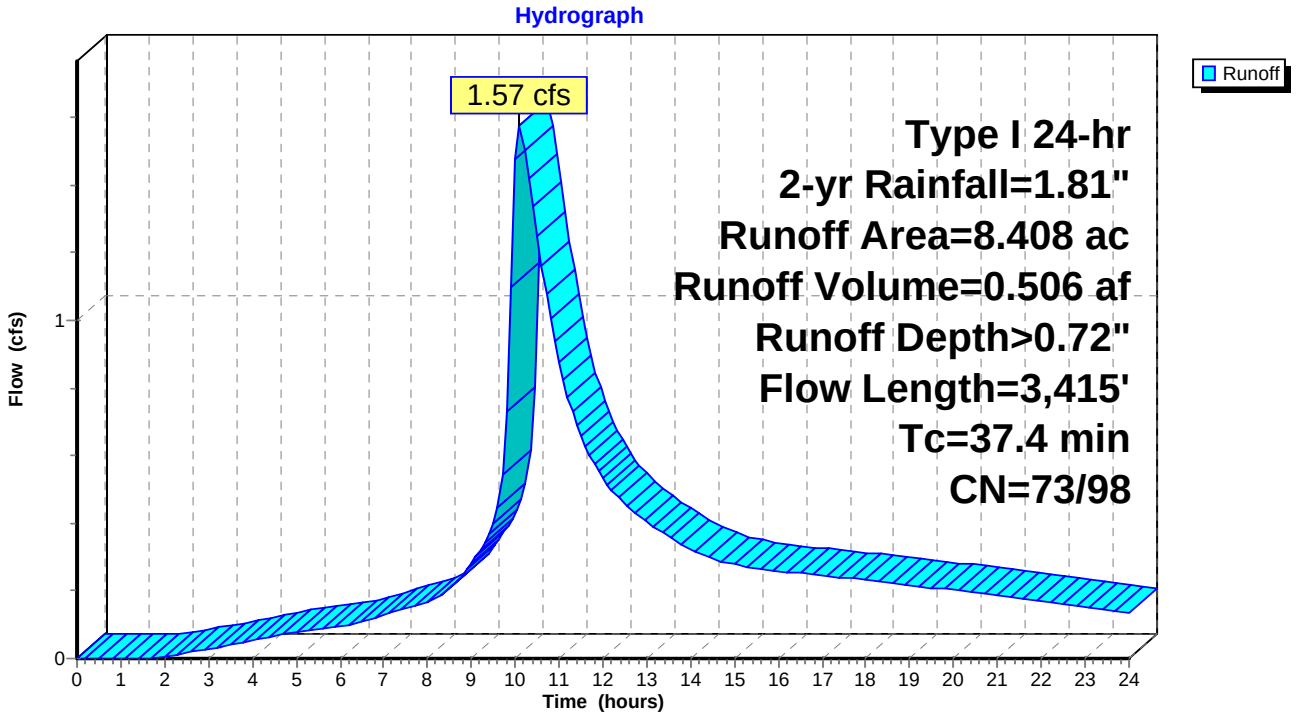
Runoff = 1.57 cfs @ 10.11 hrs, Volume= 0.506 af, Depth> 0.72"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
3.813	85	1/8 acre lots, 65% imp, HSG B
0.745	61	>75% Grass cover, Good, HSG B
0.558	98	Paved roads w/curbs & sewers
2.016	86	Newly graded area, HSG B
0.868	69	Pasture/grassland/range, Fair, HSG B
0.337	85	Gravel roads, HSG B
0.071	89	Paved roads w/open ditches, 50% imp, HSG B
8.408	82	Weighted Average
5.336		63.46% Pervious Area
3.072		36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0950	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
14.8	1,286	0.0093	1.45		**Shallow Concentrated Flow, NATURAL SWALE AT BOUNDARY** Grassed Waterway Kv= 15.0 fps
0.3	9	0.1720	0.45		**Sheet Flow, SHEET FLOW TO PATH** Fallow n= 0.050 P2= 1.81"
10.4	233	0.0210	0.37		**Sheet Flow, GRAVEL PATH** Fallow n= 0.050 P2= 1.81"
4.1	35	0.0444	0.14		**Sheet Flow, FLOW OFF PATH TO SWALE** Grass: Short n= 0.150 P2= 1.81"
0.8	104	0.0200	2.12		**Shallow Concentrated Flow, NATURAL SWALE TO GUTTER** Grassed Waterway Kv= 15.0 fps
0.7	81	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN #1** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
37.4	3,415	Total			

Subcatchment 3S: Post Dev. 9



Summary for Subcatchment 10S: Post Dev. 2

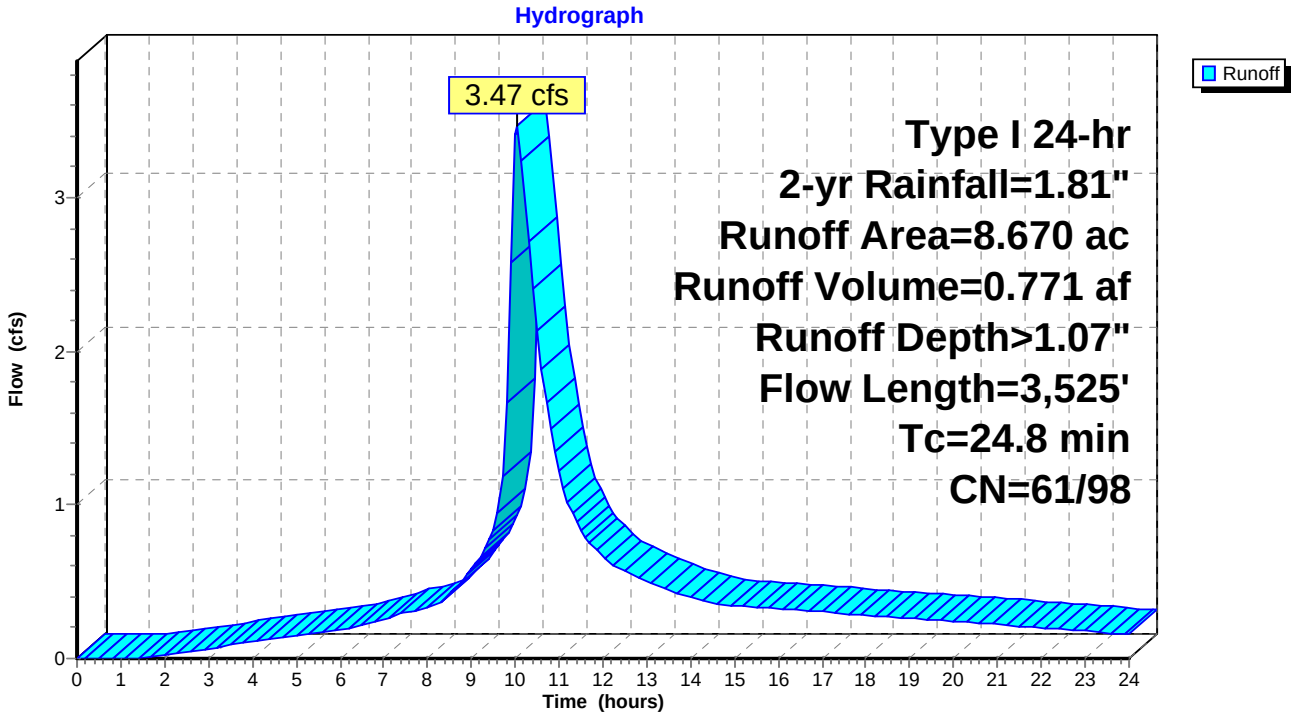
Runoff = 3.47 cfs @ 10.06 hrs, Volume= 0.771 af, Depth> 1.07"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
8.202	85	1/8 acre lots, 65% imp, HSG B
0.468	98	Paved roads w/curbs & sewers
8.670	86	Weighted Average
2.871		33.11% Pervious Area
5.799		66.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	69	0.0396	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
0.3	30	0.0100	1.50		**Shallow Concentrated Flow, FLOW TO DWY GUTTER** Grassed Waterway Kv= 15.0 fps
8.4	723	0.0050	1.44		**Shallow Concentrated Flow, DWY GUTTER FLOW** Paved Kv= 20.3 fps
0.0	23	0.2812	10.76		**Shallow Concentrated Flow, DWY GUTTER TO ROAD GUTTER** Paved Kv= 20.3 fps
1.9	219	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
24.8	3,525	Total			

Subcatchment 10S: Post Dev. 2



Summary for Subcatchment 16S: Post Dev. 7

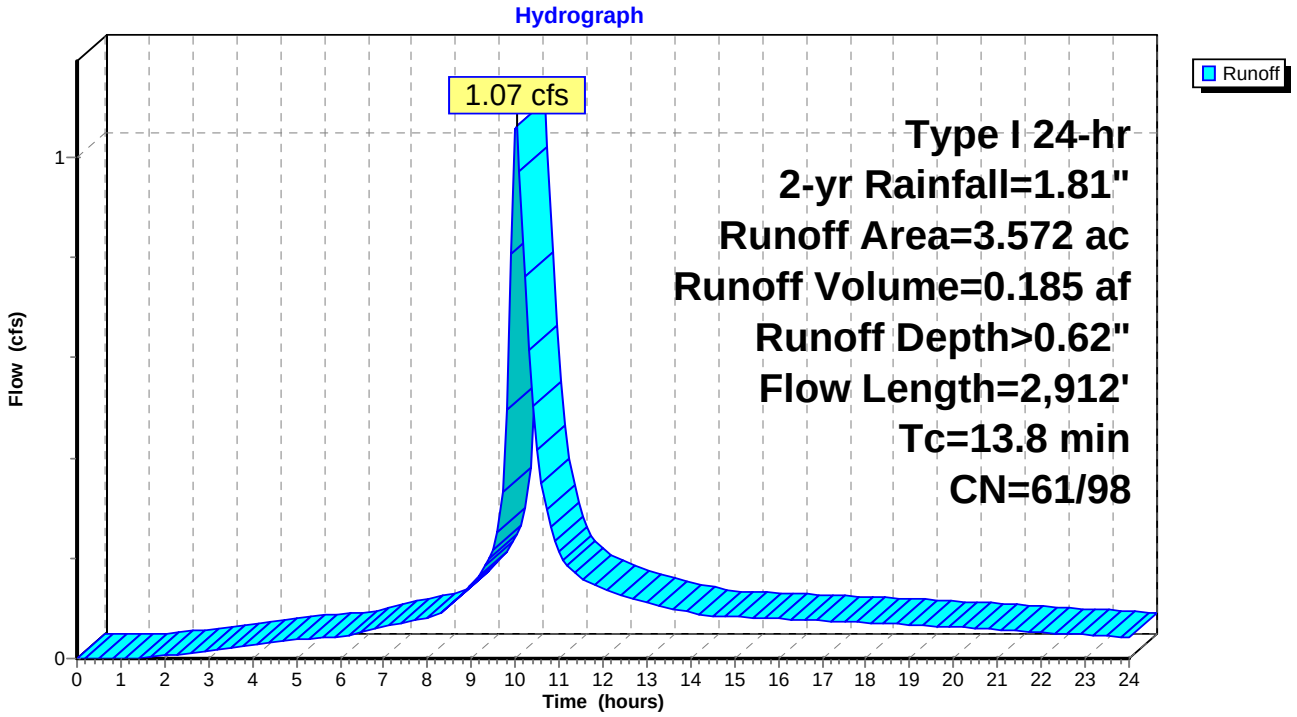
Runoff = 1.07 cfs @ 10.02 hrs, Volume= 0.185 af, Depth> 0.62"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
2.877	75	1/4 acre lots, 38% imp, HSG B
0.437	61	>75% Grass cover, Good, HSG B
0.258	98	Paved roads w/curbs & sewers
3.572	75	Weighted Average
2.221		62.17% Pervious Area
1.351		37.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	24	0.0675	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
1.1	145	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	396	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.4	203	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	157	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
13.8	2,912	Total			

Subcatchment 16S: Post Dev. 7



Summary for Subcatchment 17S: Post Dev. 1

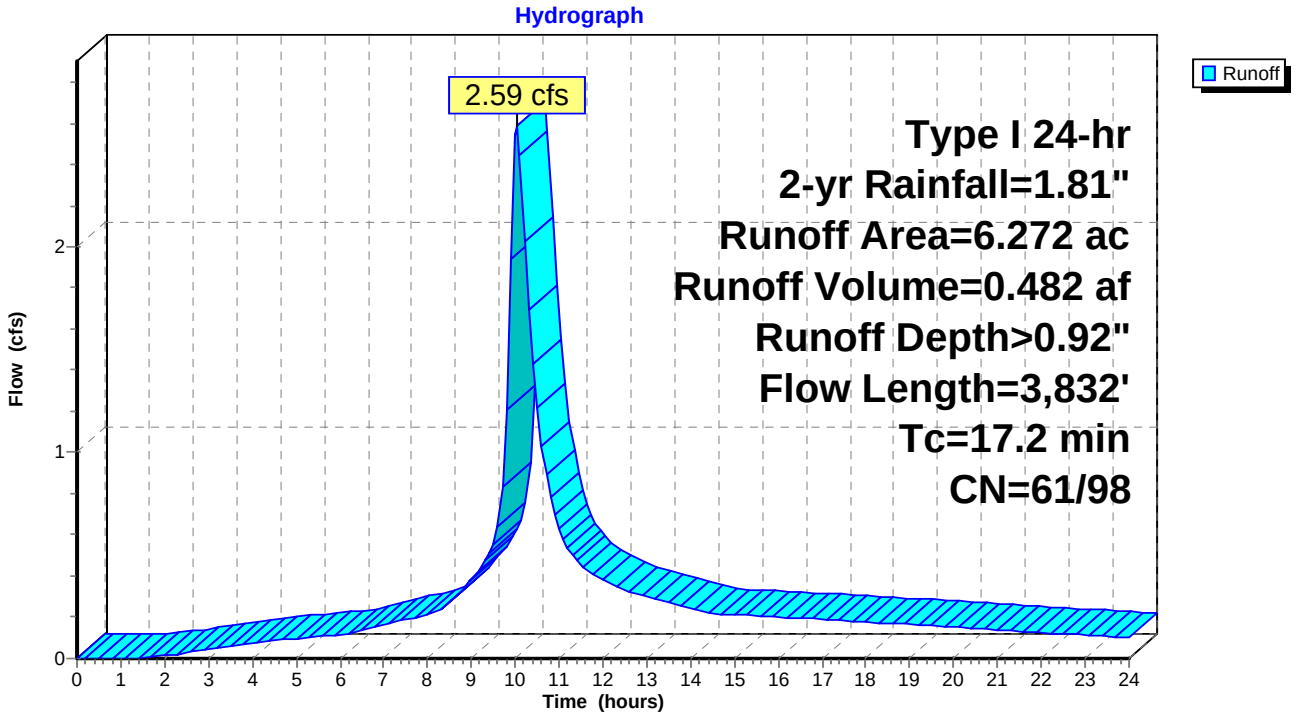
Runoff = 2.59 cfs @ 10.03 hrs, Volume= 0.482 af, Depth> 0.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
2.520	75	1/4 acre lots, 38% imp, HSG B
3.180	85	1/8 acre lots, 65% imp, HSG B
0.572	98	Paved roads w/curbs & sewers
6.272	82	Weighted Average
2.675		42.66% Pervious Area
3.597		57.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	11	0.2000	0.21		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
0.8	173	0.0300	3.52		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	121	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
3.4	503	0.0146	2.45		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
4.5	525	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	38	0.0050	5.46	9.66	**Pipe Channel, DI# TO DI#2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.2	3,832	Total			

Subcatchment 17S: Post Dev. 1



Summary for Subcatchment 18S: Post Dev. 3

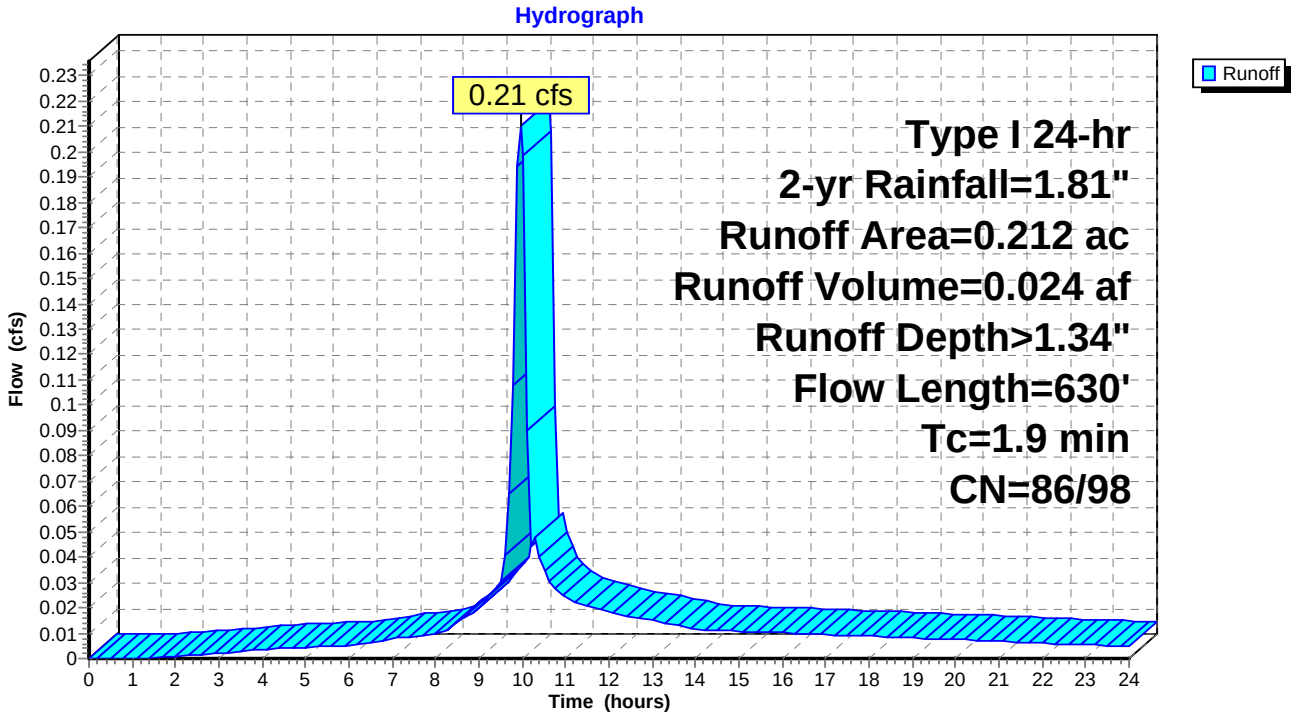
Runoff = 0.21 cfs @ 9.95 hrs, Volume= 0.024 af, Depth> 1.34"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
0.153	98	Paved roads w/curbs & sewers
0.059	86	Newly graded area, HSG B
0.212	95	Weighted Average
0.059		27.83% Pervious Area
0.153		72.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	16	0.0200	0.72		**Sheet Flow, CROWN TO GUTTER** Smooth surfaces n= 0.011 P2= 1.81"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	111	0.0758	5.59		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	65	0.1234	7.13		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	61	0.1332	7.41		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	101	0.1084	6.68		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	56	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	24	0.0100	7.73	13.66	**Pipe Channel, DI TO DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.9	630	Total			

Subcatchment 18S: Post Dev. 3



Summary for Subcatchment 19S: Post Dev. 4

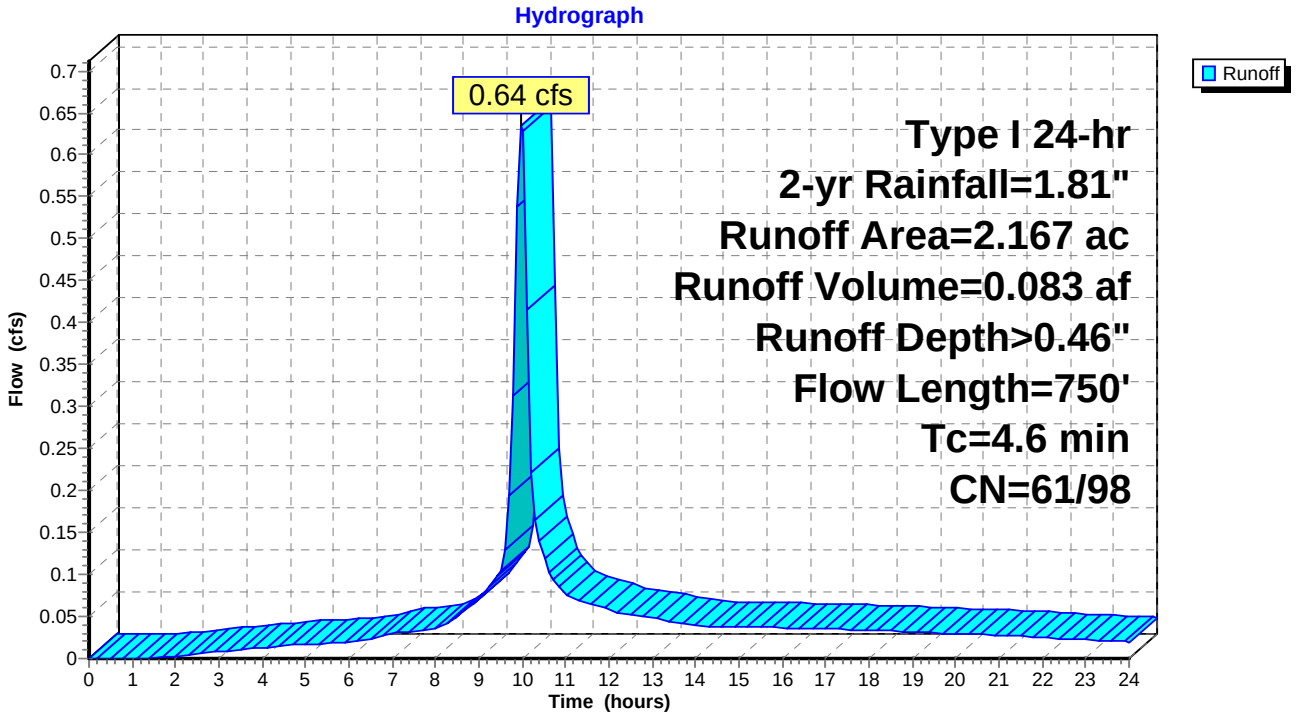
Runoff = 0.64 cfs @ 9.98 hrs, Volume= 0.083 af, Depth> 0.46"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
0.723	75	1/4 acre lots, 38% imp, HSG B
1.121	61	>75% Grass cover, Good, HSG B
0.305	98	Paved roads w/curbs & sewers
0.018	89	Paved roads w/open ditches, 50% imp, HSG B
2.167	71	Weighted Average
1.578		72.83% Pervious Area
0.589		27.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	28	0.5100	0.36		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
2.0	184	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY SWALE** Grassed Waterway Kv= 15.0 fps
0.8	290	0.0900	6.09		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	76	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
4.6	750	Total			

Subcatchment 19S: Post Dev. 4



Summary for Subcatchment 20S: Post Dev. C

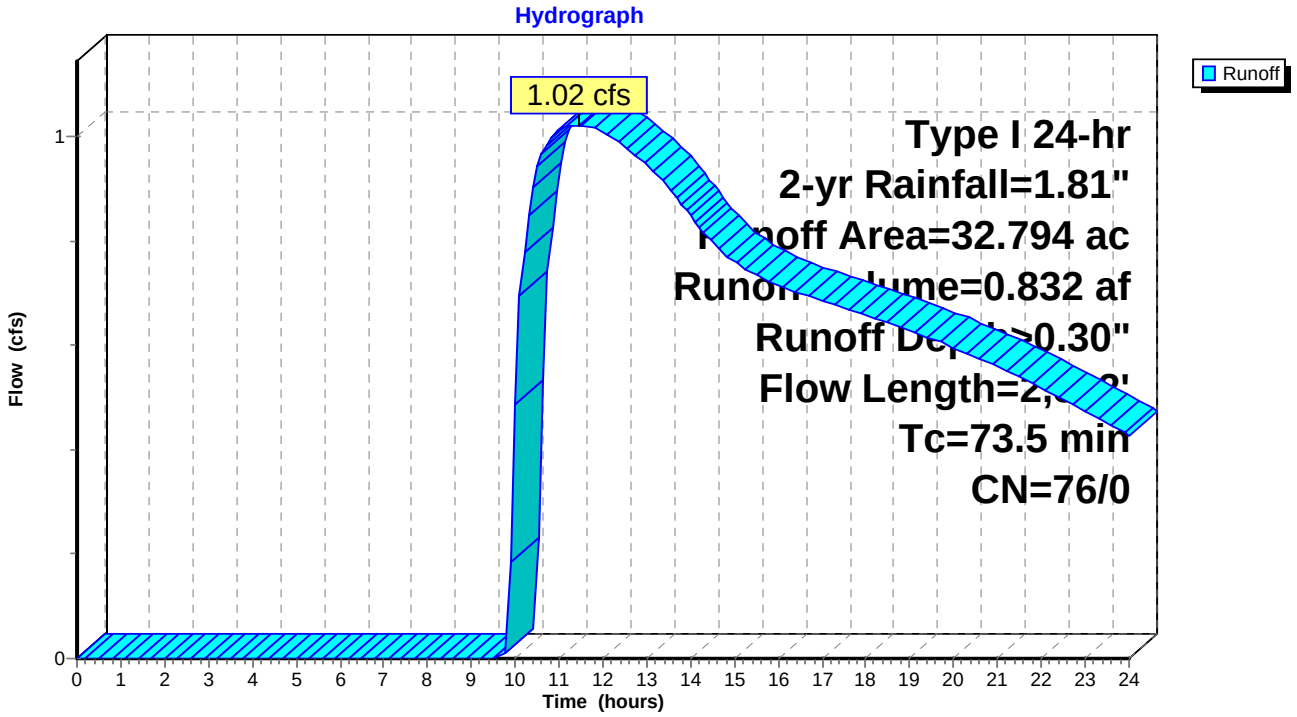
Runoff = 1.02 cfs @ 11.44 hrs, Volume= 0.832 af, Depth> 0.30"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
13.544	69	Pasture/grassland/range, Fair, HSG B
2.893	86	Newly graded area, HSG B
0.831	82	Dirt roads, HSG B
15.526	79	Pasture/grassland/range, Fair, HSG C
32.794	76	Weighted Average
32.794		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.8	300	0.0271	0.20		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
16.9	186	0.0271	0.18		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
8.8	442	0.0070	0.84		**Shallow Concentrated Flow, Flow at toe of path slope** Nearly Bare & Untilled Kv= 10.0 fps
2.1	303	0.0220	2.39		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
7.8	465	0.0200	0.99		**Shallow Concentrated Flow, Undeveloped flow to toe** Short Grass Pasture Kv= 7.0 fps
8.5	405	0.0028	0.79		**Shallow Concentrated Flow, Flow at toe of slope** Grassed Waterway Kv= 15.0 fps
0.7	49	0.0051	1.15		**Shallow Concentrated Flow, Flow at toe of slope** Unpaved Kv= 16.1 fps
3.2	393	0.0160	2.04		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
0.4	18	0.0020	0.72		**Shallow Concentrated Flow, Flow across path** Unpaved Kv= 16.1 fps
0.3	21	0.0391	1.38		**Shallow Concentrated Flow, Flow to creek** Short Grass Pasture Kv= 7.0 fps
73.5	2,582	Total			

Subcatchment 20S: Post Dev. C



Summary for Subcatchment 21S: Post Dev. E

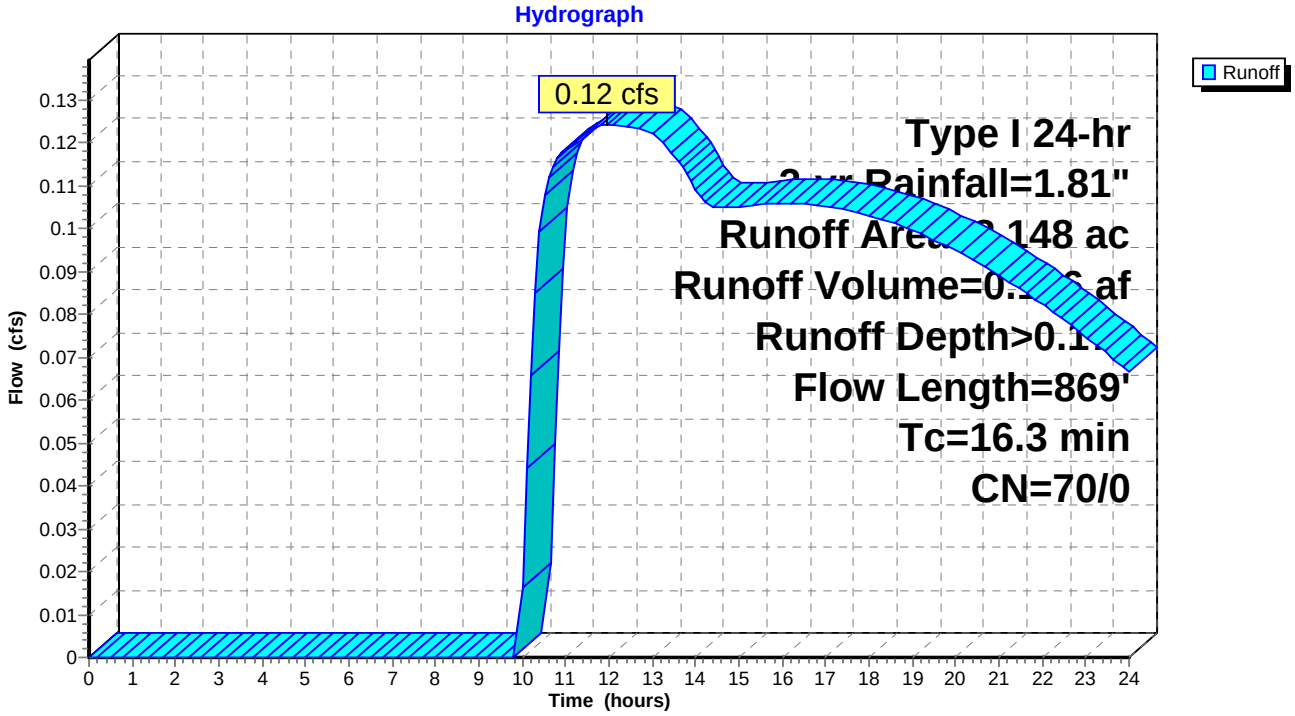
Runoff = 0.12 cfs @ 11.94 hrs, Volume= 0.116 af, Depth> 0.17"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
7.441	69	Pasture/grassland/range, Fair, HSG B
0.707	86	Newly graded area, HSG B
8.148	70	Weighted Average
8.148		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	18	0.5000	0.79		**Sheet Flow, Flow from graded area** Fallow n= 0.050 P2= 1.81"
9.0	189	0.1360	0.35		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
6.9	662	0.0520	1.60		**Shallow Concentrated Flow, Flow at boundary** Short Grass Pasture Kv= 7.0 fps
16.3	869	Total			

Subcatchment 21S: Post Dev. E



Summary for Subcatchment 25S: Post Dev. A

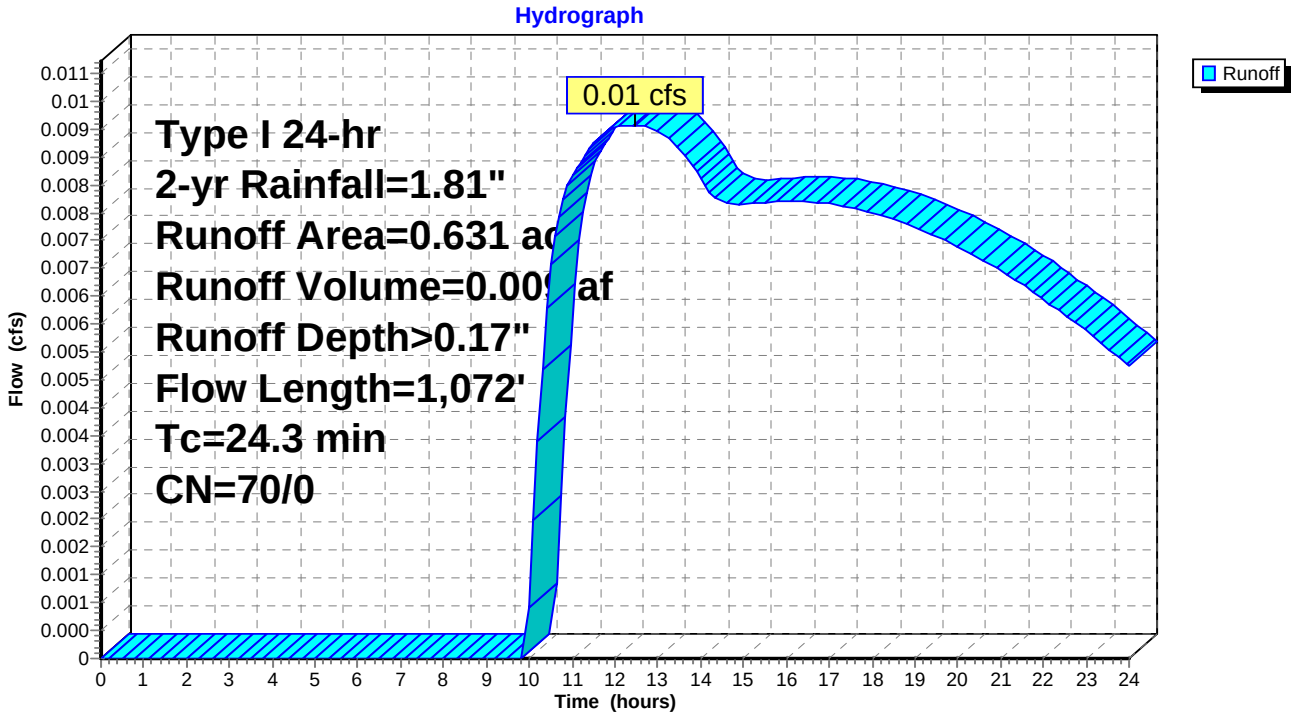
Runoff = 0.01 cfs @ 12.48 hrs, Volume= 0.009 af, Depth> 0.17"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
0.055	86	Newly graded area, HSG B
0.576	69	Pasture/grassland/range, Fair, HSG B
0.631	70	Weighted Average
0.631		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	39	0.0180	0.11		**Sheet Flow, Sheet flow to swale**
					Range n= 0.130 P2= 1.81"
11.6	789	0.0164	1.14	0.80	**Channel Flow, Concrete channel**
					Area= 0.7 sf Perim= 6.0' r= 0.12'
					n= 0.040 Earth, cobble bottom, clean sides
4.6	41	0.0350	0.15		**Sheet Flow, Flow from swale to undeveloped**
					Range n= 0.130 P2= 1.81"
0.9	26	0.8900	0.50		**Sheet Flow, Undeveloped sheet flow**
					Range n= 0.130 P2= 1.81"
1.5	177	0.0750	1.92		**Shallow Concentrated Flow, Undeveloped shallow flow**
					Short Grass Pasture Kv= 7.0 fps
24.3	1,072	Total			

Subcatchment 25S: Post Dev. A



Summary for Subcatchment 27S: Post Dev. 10

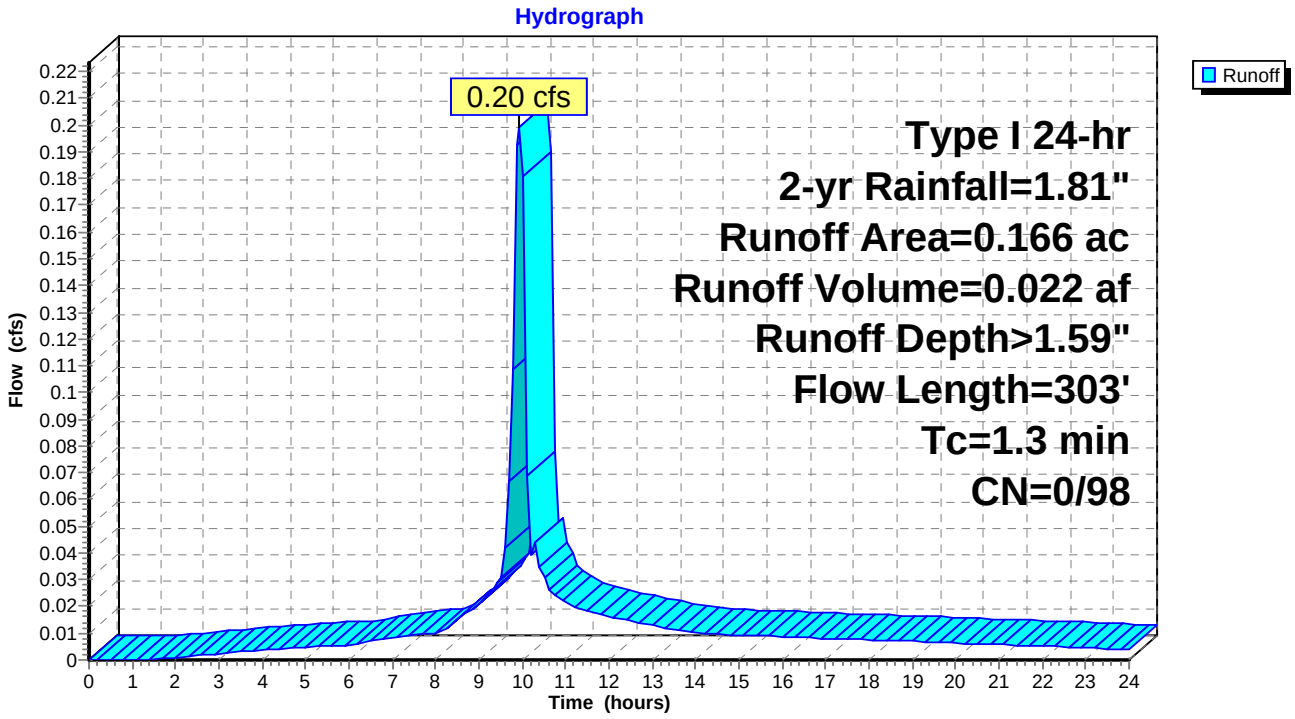
Runoff = 0.20 cfs @ 9.94 hrs, Volume= 0.022 af, Depth> 1.59"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
0.166	98	Paved roads w/curbs & sewers
0.166		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	12	0.0200	0.68		**Sheet Flow, Flow from Crown to Curb** Smooth surfaces n= 0.011 P2= 1.81"
0.4	133	0.0600	4.97		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.5	111	0.0367	3.89		**Shallow Concentrated Flow, Gutter Flow to DI** Paved Kv= 20.3 fps
0.1	47	0.0050	5.46	9.66	**Pipe Channel, SD Flow to Basin** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.3	303	Total			

Subcatchment 27S: Post Dev. 10



Summary for Subcatchment 28S: Post Dev. 11

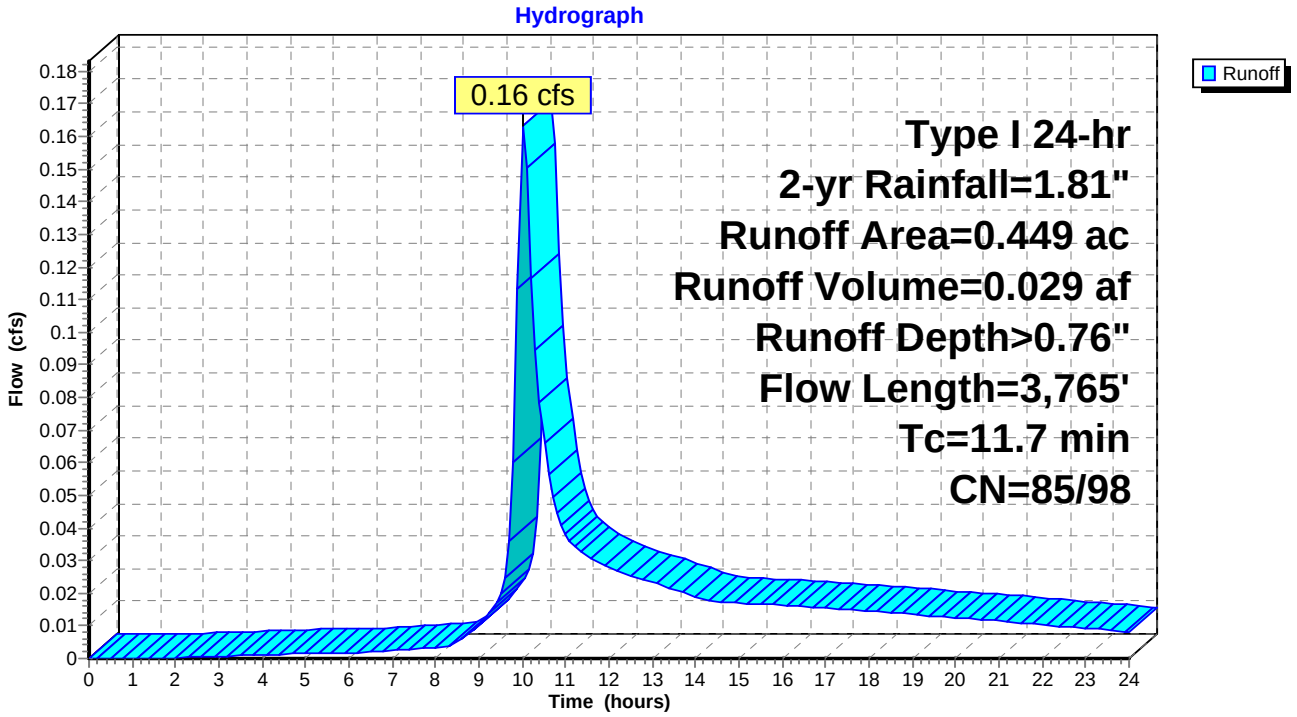
Runoff = 0.16 cfs @ 10.03 hrs, Volume= 0.029 af, Depth> 0.76"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
0.105	89	Paved roads w/open ditches, 50% imp, HSG B
0.344	86	Newly graded area, HSG B
0.449	87	Weighted Average
0.397		88.31% Pervious Area
0.052		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	22	0.2844	0.66		**Sheet Flow, Sheet flow to swale** Fallow n= 0.050 P2= 1.81"
3.2	760	0.0137	3.96	7.92	**Channel Flow, Flow in swale** Area= 2.0 sf Perim= 8.3' r= 0.24' n= 0.017 Concrete, unfinished
0.4	202	0.0120	8.47	14.96	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.7	320	0.0093	7.45	13.17	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD through MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD to Basin** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
11.7	3,765	Total			

Subcatchment 28S: Post Dev. 11



Summary for Subcatchment C1: Post Dev. 6

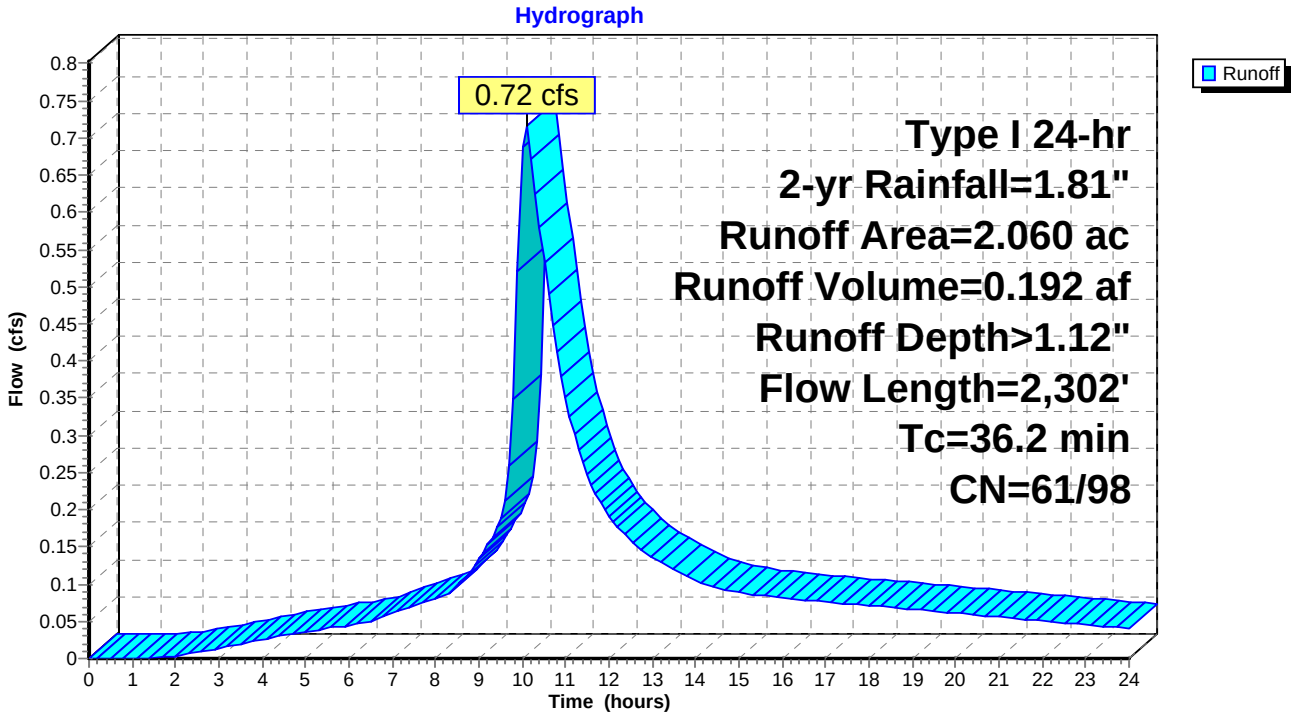
Runoff = 0.72 cfs @ 10.09 hrs, Volume= 0.192 af, Depth> 1.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
1.745	85	1/8 acre lots, 65% imp, HSG B
0.315	98	Paved roads w/curbs & sewers
2.060	87	Weighted Average
0.611		29.65% Pervious Area
1.449		70.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	180	0.0100	0.11		**Sheet Flow, Lot Flow** Grass: Short n= 0.150 P2= 1.81"
4.5	477	0.0075	1.76		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
36.2	2,302	Total			

Subcatchment C1: Post Dev. 6



Summary for Subcatchment C2: Post Dev. 5

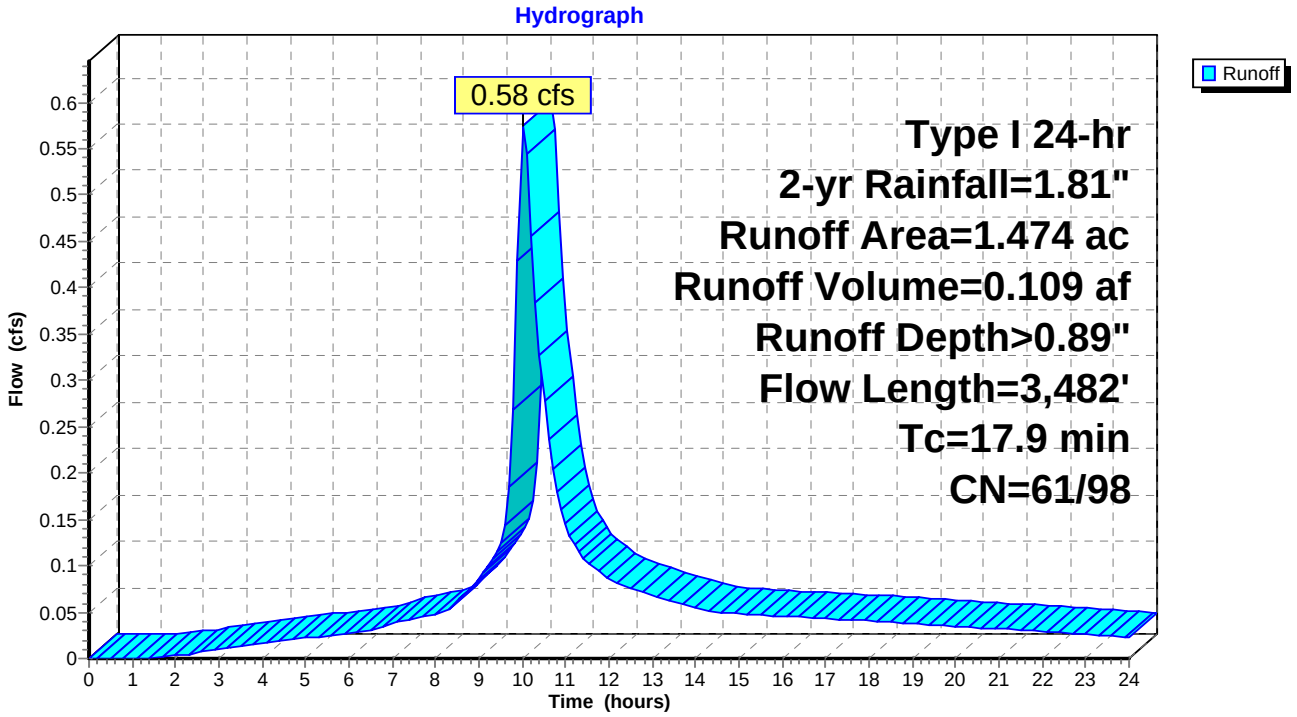
Runoff = 0.58 cfs @ 10.04 hrs, Volume= 0.109 af, Depth> 0.89"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
1.066	75	1/4 acre lots, 38% imp, HSG B
0.408	98	Paved roads w/curbs & sewers
1.474	81	Weighted Average
0.661		44.84% Pervious Area
0.813		55.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	169	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY GRASS SWALE** Grassed Waterway Kv= 15.0 fps
1.9	86	0.0100	0.76		**Sheet Flow, LOT SHEET FLOW/DRIVEWAY** Smooth surfaces n= 0.011 P2= 1.81"
0.3	38	0.0100	2.03		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.0	214	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.5	49	0.0073	1.73		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	28	0.0352	3.81		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.1	154	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	400	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.5	210	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.6	147	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.9	3,482	Total			

Subcatchment C2: Post Dev. 5



Summary for Subcatchment C3: Post Dev. 8

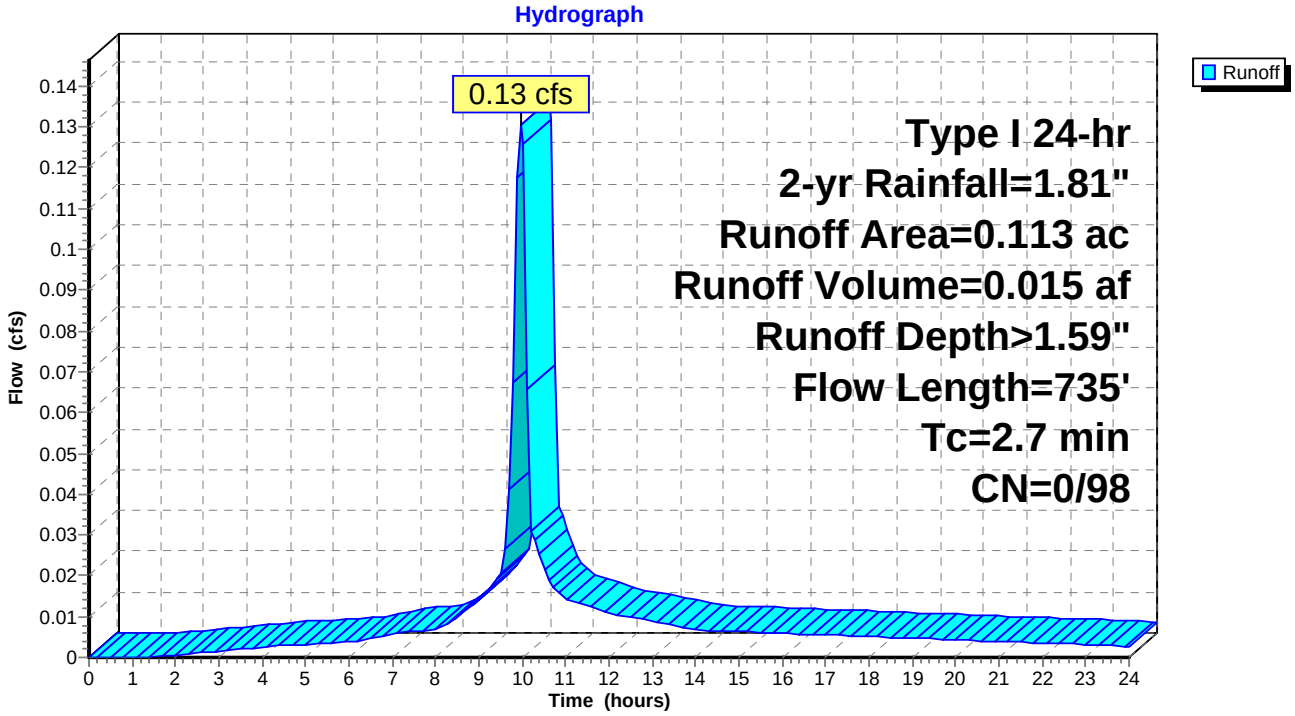
Runoff = 0.13 cfs @ 9.96 hrs, Volume= 0.015 af, Depth> 1.59"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 2-yr Rainfall=1.81"

Area (ac)	CN	Description
0.113	98	Paved roads w/curbs & sewers
0.113		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.0	31	0.1500	29.93	52.89	**Pipe Channel, SD FROM DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.8	629	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
2.7	735	Total			

Subcatchment C3: Post Dev. 8



Summary for Pond 11P: BASIN #1

Inflow Area = 31.018 ac, 52.38% Impervious, Inflow Depth > 0.89" for 2-yr event
Inflow = 10.28 cfs @ 10.04 hrs, Volume= 2.289 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Peak Elev= 561.58' @ 24.00 hrs Surf.Area= 0.999 ac Storage= 2.287 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

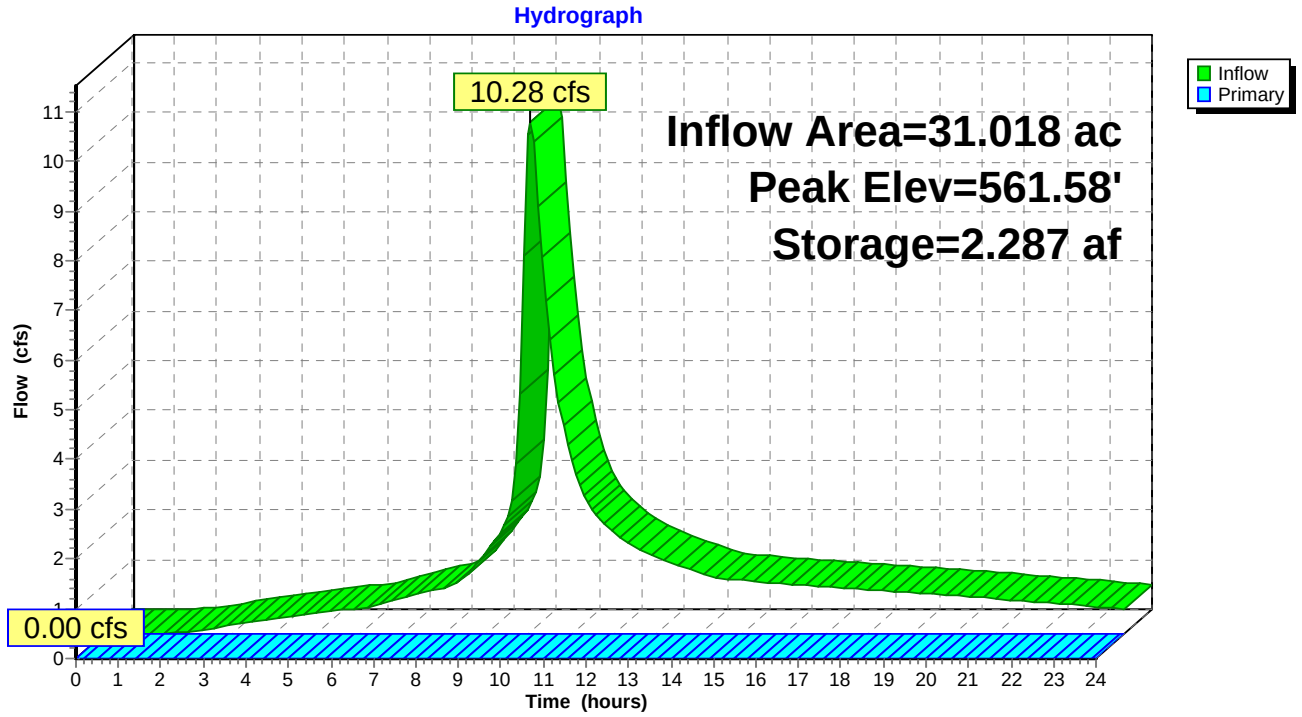
Volume	Invert	Avail.Storage	Storage Description
#1	559.00'	20.615 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
559.00	0.779	952.9	0.000	0.000	0.779
573.00	2.300	1,384.6	20.615	20.615	2.660

Device	Routing	Invert	Outlet Devices
#1	Primary	563.45'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	566.00'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	564.70'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	564.00'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	568.00'	**160.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=559.00' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: BASIN #1



Summary for Pond 15P: BASIN #2

Inflow Area = 2.545 ac, 35.67% Impervious, Inflow Depth > 0.61" for 2-yr event
Inflow = 1.04 cfs @ 9.97 hrs, Volume= 0.129 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 525.03' @ 24.00 hrs Surf.Area= 0.141 ac Storage= 0.129 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

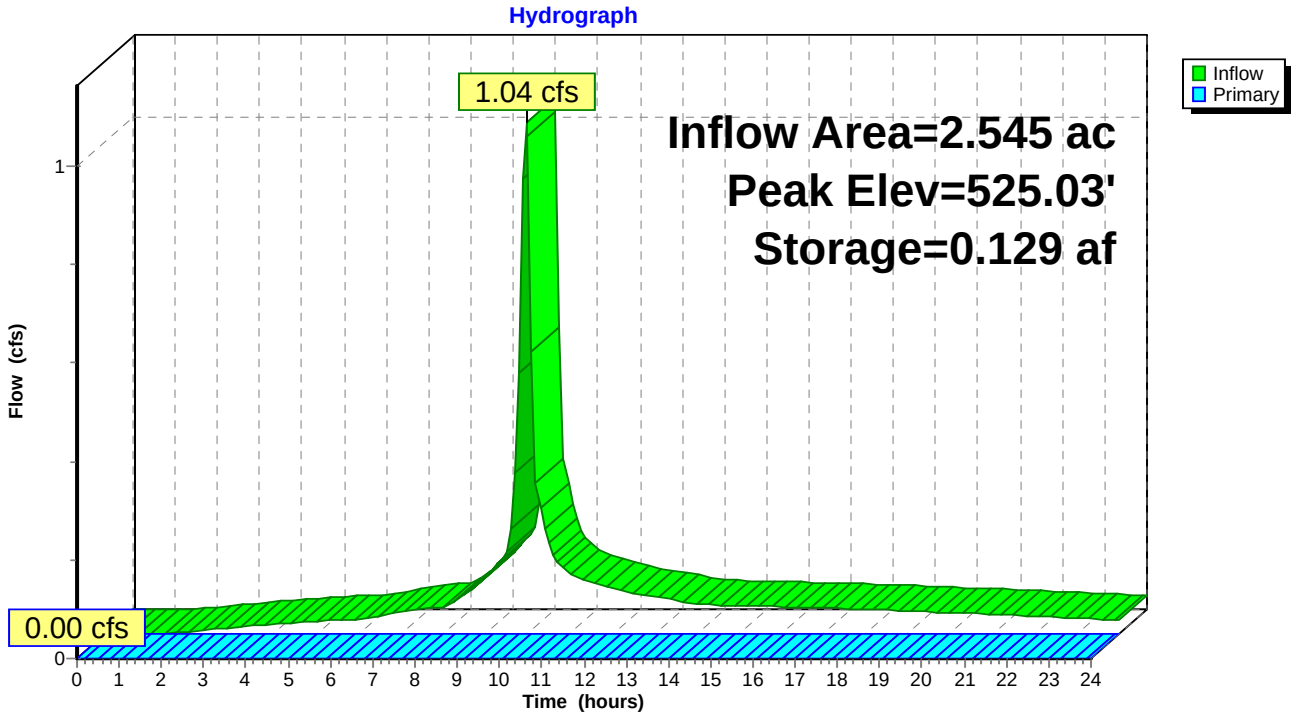
Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	0.474 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
524.00	0.109	314.9	0.000	0.000	0.109
527.00	0.213	427.1	0.474	0.474	0.263

Device	Routing	Invert	Outlet Devices
#1	Primary	525.80'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	527.00'	**40.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Primary	526.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=524.00' TW=103.00' (Fixed TW Elev= 103.00')
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 15P: BASIN #2

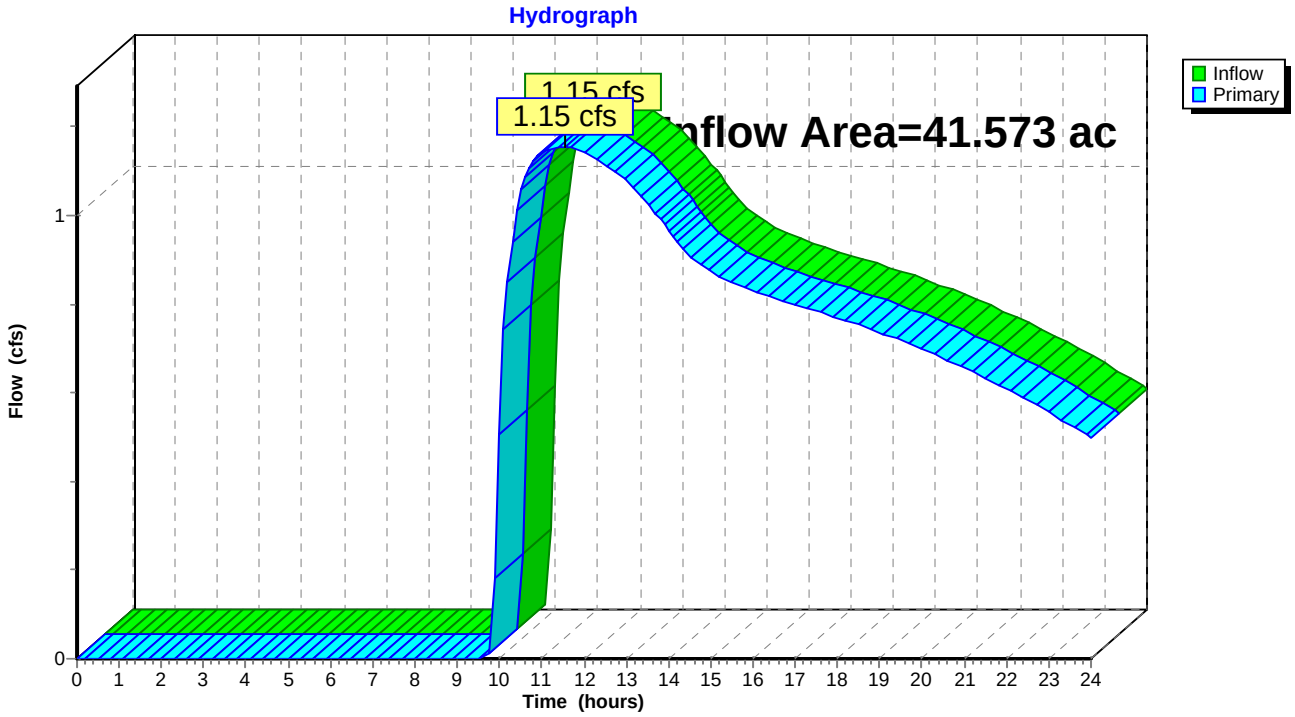


Summary for Pond 22P: Orcutt Creek

Inflow Area = 41.573 ac, 0.00% Impervious, Inflow Depth > 0.28" for 2-yr event
Inflow = 1.15 cfs @ 11.56 hrs, Volume= 0.957 af
Primary = 1.15 cfs @ 11.56 hrs, Volume= 0.957 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Pond 22P: Orcutt Creek



Time span=0.00-24.00 hrs, dt=0.10 hrs, 241 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 3S: Post Dev. 9 Runoff Area=8.408 ac 36.54% Impervious Runoff Depth>1.26"
Flow Length=3,415' Tc=37.4 min CN=73/98 Runoff=2.82 cfs 0.882 af

Subcatchment 10S: Post Dev. 2 Runoff Area=8.670 ac 66.89% Impervious Runoff Depth>1.66"
Flow Length=3,525' Tc=24.8 min CN=61/98 Runoff=5.16 cfs 1.202 af

Subcatchment 16S: Post Dev. 7 Runoff Area=3.572 ac 37.83% Impervious Runoff Depth>1.04"
Flow Length=2,912' Tc=13.8 min CN=61/98 Runoff=1.59 cfs 0.311 af

Subcatchment 17S: Post Dev. 1 Runoff Area=6.272 ac 57.34% Impervious Runoff Depth>1.46"
Flow Length=3,832' Tc=17.2 min CN=61/98 Runoff=3.85 cfs 0.764 af

Subcatchment 18S: Post Dev. 3 Runoff Area=0.212 ac 72.17% Impervious Runoff Depth>2.10"
Flow Length=630' Tc=1.9 min CN=86/98 Runoff=0.33 cfs 0.037 af

Subcatchment 19S: Post Dev. 4 Runoff Area=2.167 ac 27.17% Impervious Runoff Depth>0.82"
Flow Length=750' Tc=4.6 min CN=61/98 Runoff=0.94 cfs 0.148 af

Subcatchment 20S: Post Dev. C Runoff Area=32.794 ac 0.00% Impervious Runoff Depth>0.74"
Flow Length=2,582' Tc=73.5 min CN=76/0 Runoff=3.48 cfs 2.016 af

Subcatchment 21S: Post Dev. E Runoff Area=8.148 ac 0.00% Impervious Runoff Depth>0.51"
Flow Length=869' Tc=16.3 min CN=70/0 Runoff=1.00 cfs 0.346 af

Subcatchment 25S: Post Dev. A Runoff Area=0.631 ac 0.00% Impervious Runoff Depth>0.51"
Flow Length=1,072' Tc=24.3 min CN=70/0 Runoff=0.06 cfs 0.027 af

Subcatchment 27S: Post Dev. 10 Runoff Area=0.166 ac 100.00% Impervious Runoff Depth>2.39"
Flow Length=303' Tc=1.3 min CN=0/98 Runoff=0.30 cfs 0.033 af

Subcatchment 28S: Post Dev. 11 Runoff Area=0.449 ac 11.69% Impervious Runoff Depth>1.40"
Flow Length=3,765' Tc=11.7 min CN=85/98 Runoff=0.32 cfs 0.052 af

Subcatchment C1: Post Dev. 6 Runoff Area=2.060 ac 70.35% Impervious Runoff Depth>1.73"
Flow Length=2,302' Tc=36.2 min CN=61/98 Runoff=1.07 cfs 0.297 af

Subcatchment C2: Post Dev. 5 Runoff Area=1.474 ac 55.16% Impervious Runoff Depth>1.42"
Flow Length=3,482' Tc=17.9 min CN=61/98 Runoff=0.86 cfs 0.174 af

Subcatchment C3: Post Dev. 8 Runoff Area=0.113 ac 100.00% Impervious Runoff Depth>2.39"
Flow Length=735' Tc=2.7 min CN=0/98 Runoff=0.19 cfs 0.022 af

Pond 11P: BASIN #1 Peak Elev=562.91' Storage=3.702 af Inflow=15.84 cfs 3.706 af
Outflow=0.00 cfs 0.000 af

Pond 15P: BASIN #2 Peak Elev=525.62' Storage=0.218 af Inflow=1.56 cfs 0.218 af
Outflow=0.00 cfs 0.000 af

Pond 22P: Orcutt Creek

Inflow=4.32 cfs 2.389 af
Primary=4.32 cfs 2.389 af

Total Runoff Area = 75.136 ac Runoff Volume = 6.312 af Average Runoff Depth = 1.01"
77.17% Pervious = 57.981 ac 22.83% Impervious = 17.155 ac

Summary for Subcatchment 3S: Post Dev. 9

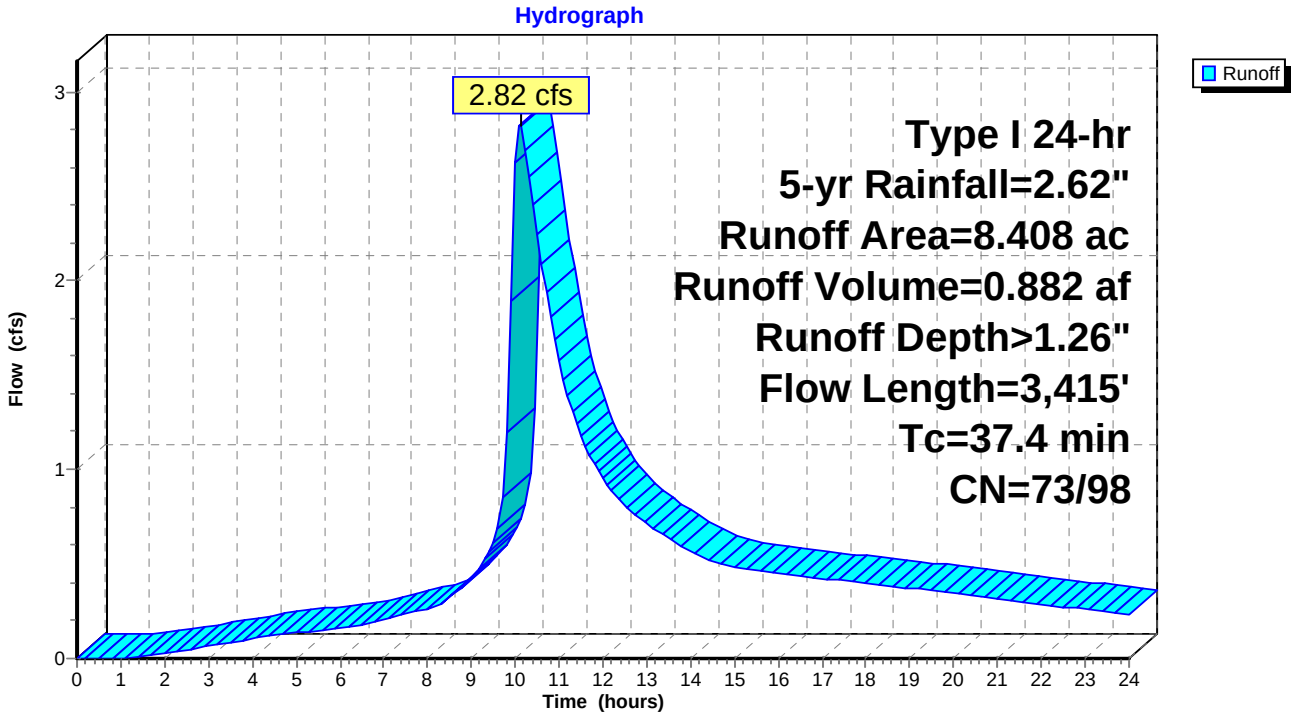
Runoff = 2.82 cfs @ 10.11 hrs, Volume= 0.882 af, Depth> 1.26"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
3.813	85	1/8 acre lots, 65% imp, HSG B
0.745	61	>75% Grass cover, Good, HSG B
0.558	98	Paved roads w/curbs & sewers
2.016	86	Newly graded area, HSG B
0.868	69	Pasture/grassland/range, Fair, HSG B
0.337	85	Gravel roads, HSG B
0.071	89	Paved roads w/open ditches, 50% imp, HSG B
8.408	82	Weighted Average
5.336		63.46% Pervious Area
3.072		36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0950	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
14.8	1,286	0.0093	1.45		**Shallow Concentrated Flow, NATURAL SWALE AT BOUNDARY** Grassed Waterway Kv= 15.0 fps
0.3	9	0.1720	0.45		**Sheet Flow, SHEET FLOW TO PATH** Fallow n= 0.050 P2= 1.81"
10.4	233	0.0210	0.37		**Sheet Flow, GRAVEL PATH** Fallow n= 0.050 P2= 1.81"
4.1	35	0.0444	0.14		**Sheet Flow, FLOW OFF PATH TO SWALE** Grass: Short n= 0.150 P2= 1.81"
0.8	104	0.0200	2.12		**Shallow Concentrated Flow, NATURAL SWALE TO GUTTER** Grassed Waterway Kv= 15.0 fps
0.7	81	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN #1** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
37.4	3,415	Total			

Subcatchment 3S: Post Dev. 9



Summary for Subcatchment 10S: Post Dev. 2

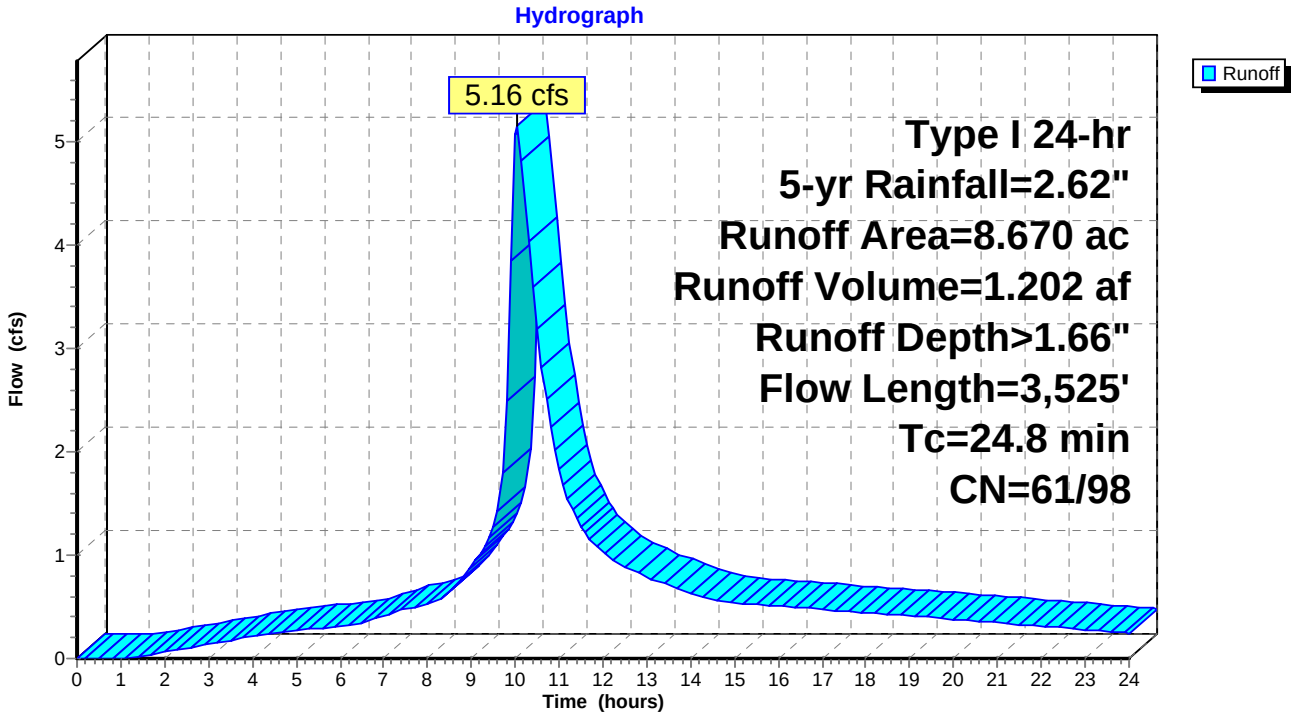
Runoff = 5.16 cfs @ 10.06 hrs, Volume= 1.202 af, Depth> 1.66"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
8.202	85	1/8 acre lots, 65% imp, HSG B
0.468	98	Paved roads w/curbs & sewers
8.670	86	Weighted Average
2.871		33.11% Pervious Area
5.799		66.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	69	0.0396	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
0.3	30	0.0100	1.50		**Shallow Concentrated Flow, FLOW TO DWY GUTTER** Grassed Waterway Kv= 15.0 fps
8.4	723	0.0050	1.44		**Shallow Concentrated Flow, DWY GUTTER FLOW** Paved Kv= 20.3 fps
0.0	23	0.2812	10.76		**Shallow Concentrated Flow, DWY GUTTER TO ROAD GUTTER** Paved Kv= 20.3 fps
1.9	219	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
24.8	3,525	Total			

Subcatchment 10S: Post Dev. 2



Summary for Subcatchment 16S: Post Dev. 7

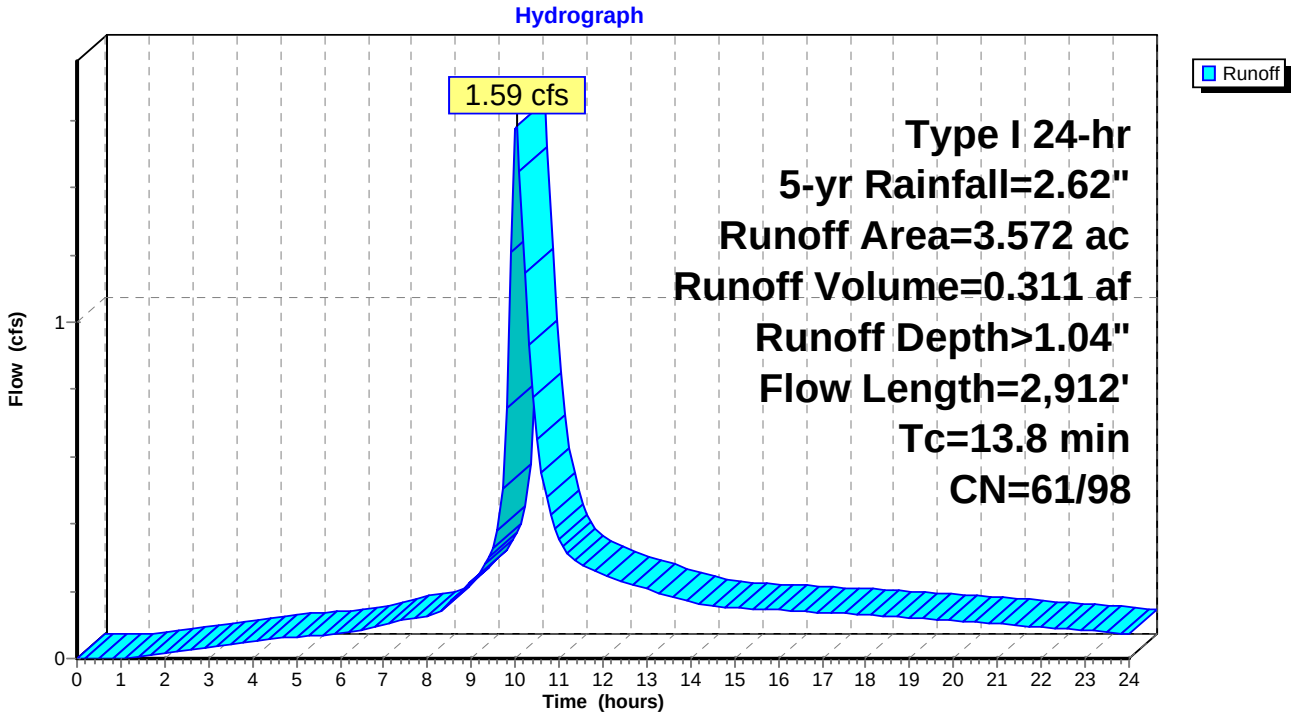
Runoff = 1.59 cfs @ 10.02 hrs, Volume= 0.311 af, Depth> 1.04"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
2.877	75	1/4 acre lots, 38% imp, HSG B
0.437	61	>75% Grass cover, Good, HSG B
0.258	98	Paved roads w/curbs & sewers
3.572	75	Weighted Average
2.221		62.17% Pervious Area
1.351		37.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	24	0.0675	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
1.1	145	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	396	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.4	203	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	157	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
13.8	2,912	Total			

Subcatchment 16S: Post Dev. 7



Summary for Subcatchment 17S: Post Dev. 1

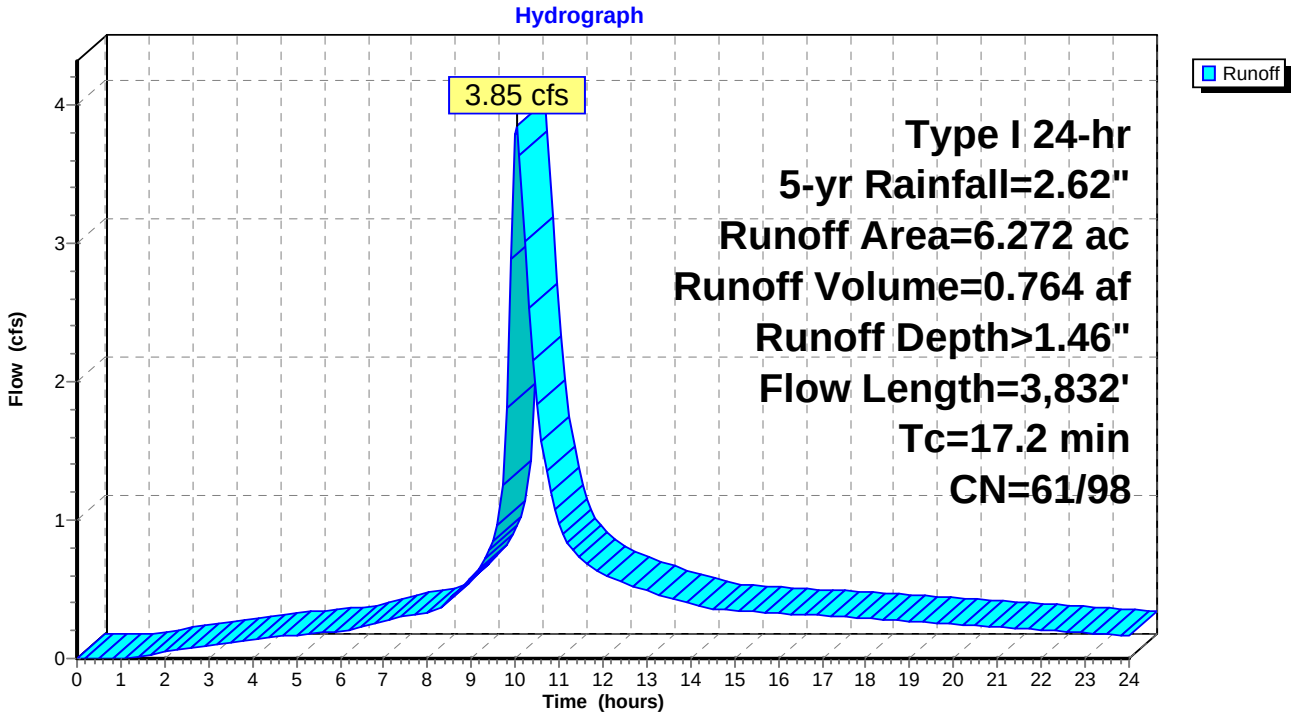
Runoff = 3.85 cfs @ 10.03 hrs, Volume= 0.764 af, Depth> 1.46"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
2.520	75	1/4 acre lots, 38% imp, HSG B
3.180	85	1/8 acre lots, 65% imp, HSG B
0.572	98	Paved roads w/curbs & sewers
6.272	82	Weighted Average
2.675		42.66% Pervious Area
3.597		57.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	11	0.2000	0.21		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
0.8	173	0.0300	3.52		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	121	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
3.4	503	0.0146	2.45		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
4.5	525	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	38	0.0050	5.46	9.66	**Pipe Channel, DI# TO DI#2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.2	3,832	Total			

Subcatchment 17S: Post Dev. 1



Summary for Subcatchment 18S: Post Dev. 3

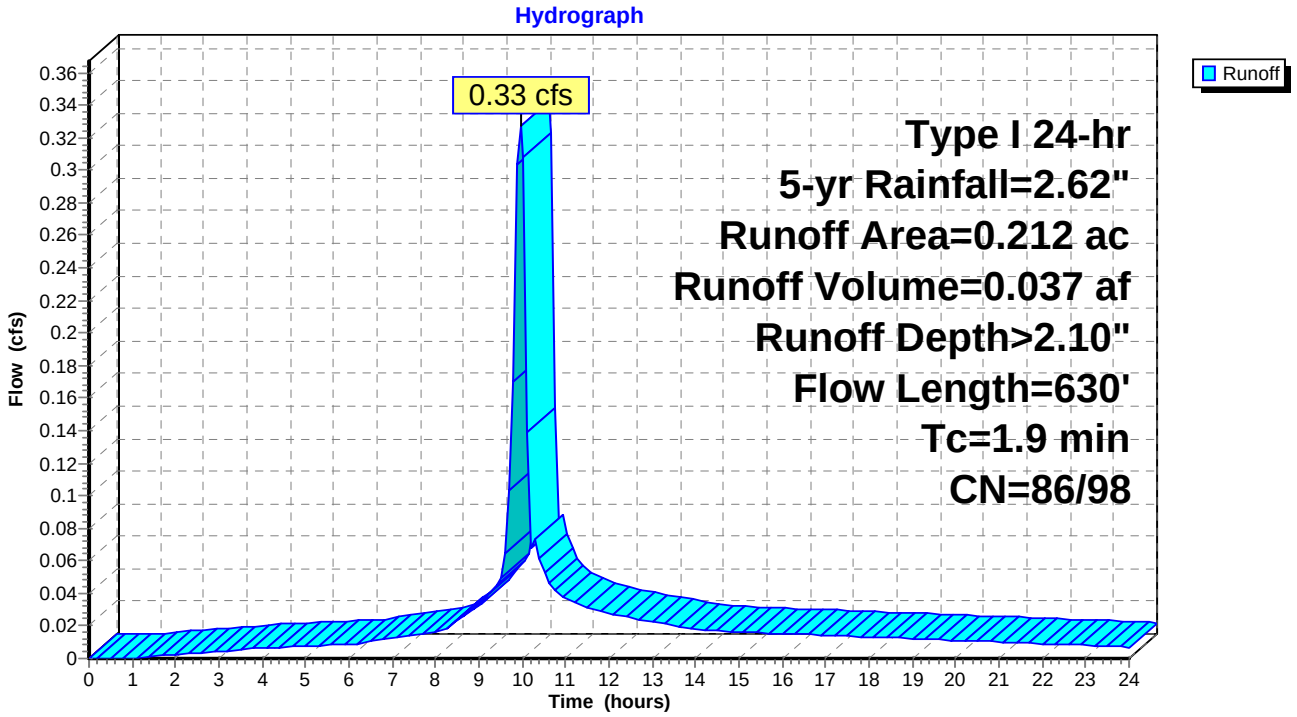
Runoff = 0.33 cfs @ 9.95 hrs, Volume= 0.037 af, Depth> 2.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
0.153	98	Paved roads w/curbs & sewers
0.059	86	Newly graded area, HSG B
0.212	95	Weighted Average
0.059		27.83% Pervious Area
0.153		72.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	16	0.0200	0.72		**Sheet Flow, CROWN TO GUTTER** Smooth surfaces n= 0.011 P2= 1.81"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	111	0.0758	5.59		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	65	0.1234	7.13		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	61	0.1332	7.41		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	101	0.1084	6.68		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	56	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	24	0.0100	7.73	13.66	**Pipe Channel, DI TO DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.9	630	Total			

Subcatchment 18S: Post Dev. 3



Summary for Subcatchment 19S: Post Dev. 4

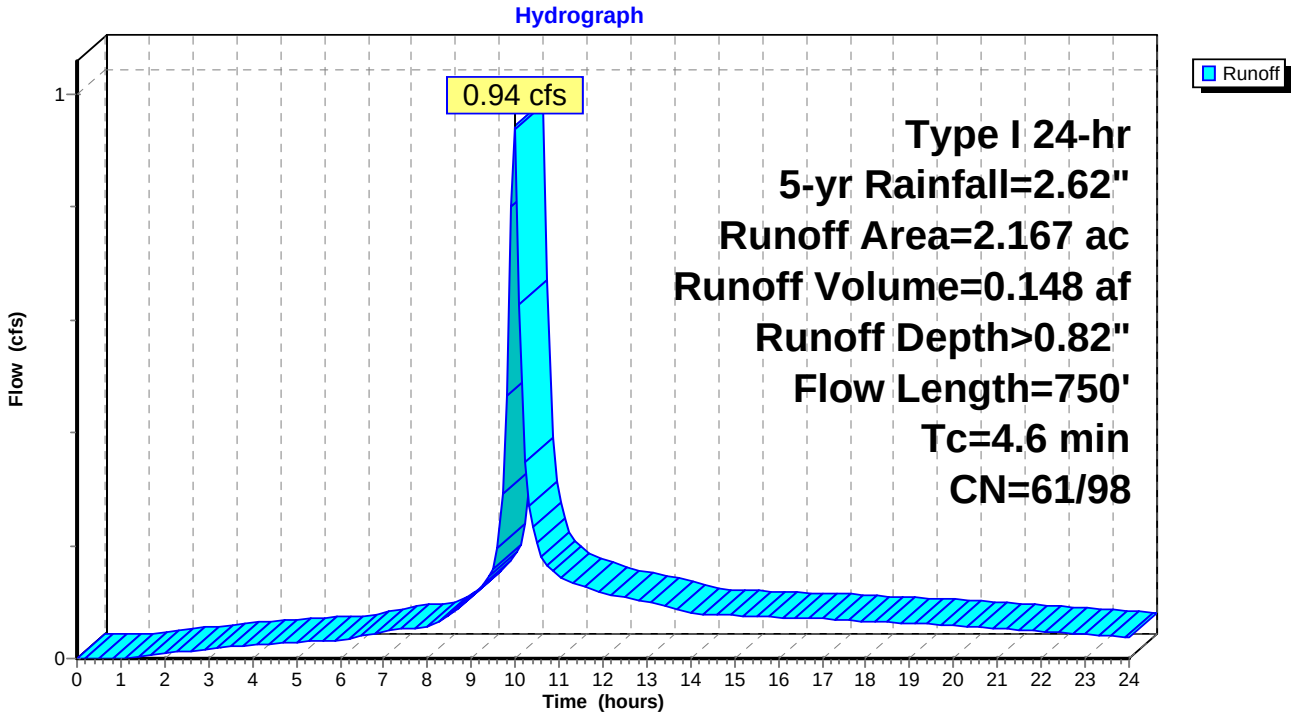
Runoff = 0.94 cfs @ 9.98 hrs, Volume= 0.148 af, Depth> 0.82"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
0.723	75	1/4 acre lots, 38% imp, HSG B
1.121	61	>75% Grass cover, Good, HSG B
0.305	98	Paved roads w/curbs & sewers
0.018	89	Paved roads w/open ditches, 50% imp, HSG B
2.167	71	Weighted Average
1.578		72.83% Pervious Area
0.589		27.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	28	0.5100	0.36		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
2.0	184	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY SWALE** Grassed Waterway Kv= 15.0 fps
0.8	290	0.0900	6.09		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	76	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
4.6	750	Total			

Subcatchment 19S: Post Dev. 4



Summary for Subcatchment 20S: Post Dev. C

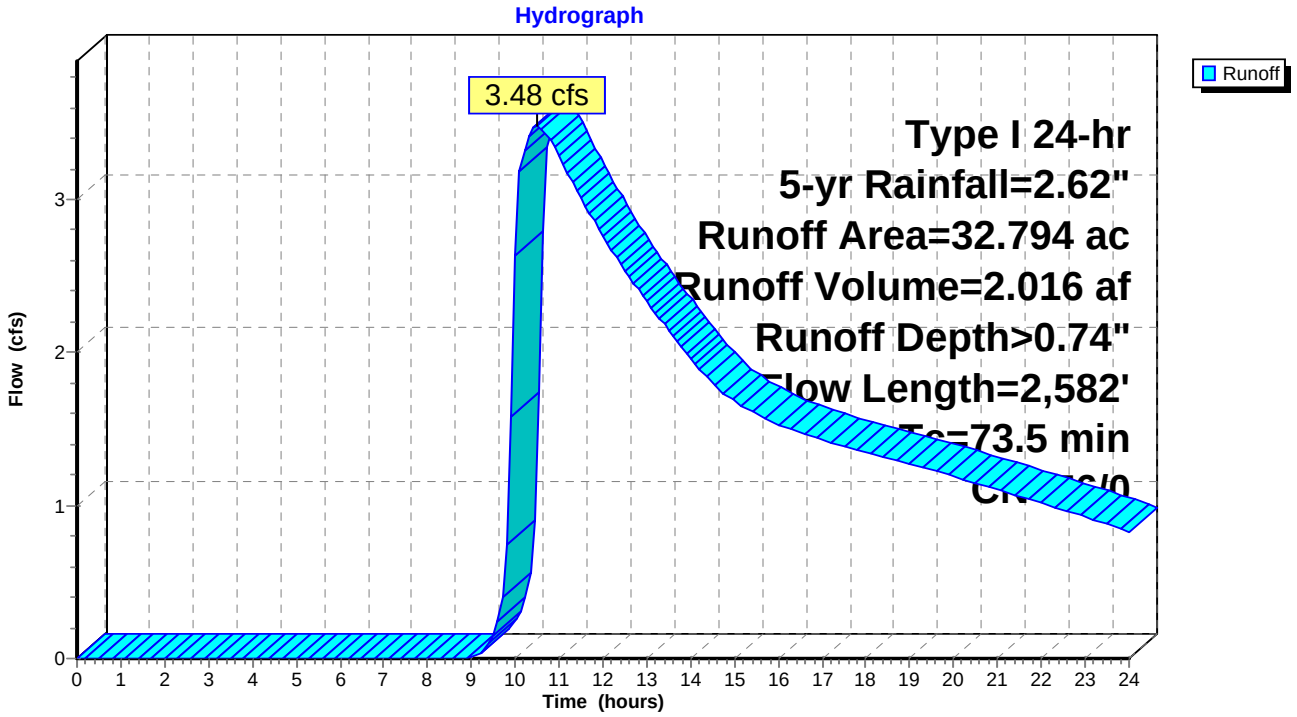
Runoff = 3.48 cfs @ 10.49 hrs, Volume= 2.016 af, Depth> 0.74"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
13.544	69	Pasture/grassland/range, Fair, HSG B
2.893	86	Newly graded area, HSG B
0.831	82	Dirt roads, HSG B
15.526	79	Pasture/grassland/range, Fair, HSG C
32.794	76	Weighted Average
32.794		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.8	300	0.0271	0.20		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
16.9	186	0.0271	0.18		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
8.8	442	0.0070	0.84		**Shallow Concentrated Flow, Flow at toe of path slope** Nearly Bare & Untilled Kv= 10.0 fps
2.1	303	0.0220	2.39		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
7.8	465	0.0200	0.99		**Shallow Concentrated Flow, Undeveloped flow to toe** Short Grass Pasture Kv= 7.0 fps
8.5	405	0.0028	0.79		**Shallow Concentrated Flow, Flow at toe of slope** Grassed Waterway Kv= 15.0 fps
0.7	49	0.0051	1.15		**Shallow Concentrated Flow, Flow at toe of slope** Unpaved Kv= 16.1 fps
3.2	393	0.0160	2.04		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
0.4	18	0.0020	0.72		**Shallow Concentrated Flow, Flow across path** Unpaved Kv= 16.1 fps
0.3	21	0.0391	1.38		**Shallow Concentrated Flow, Flow to creek** Short Grass Pasture Kv= 7.0 fps
73.5	2,582	Total			

Subcatchment 20S: Post Dev. C



Summary for Subcatchment 21S: Post Dev. E

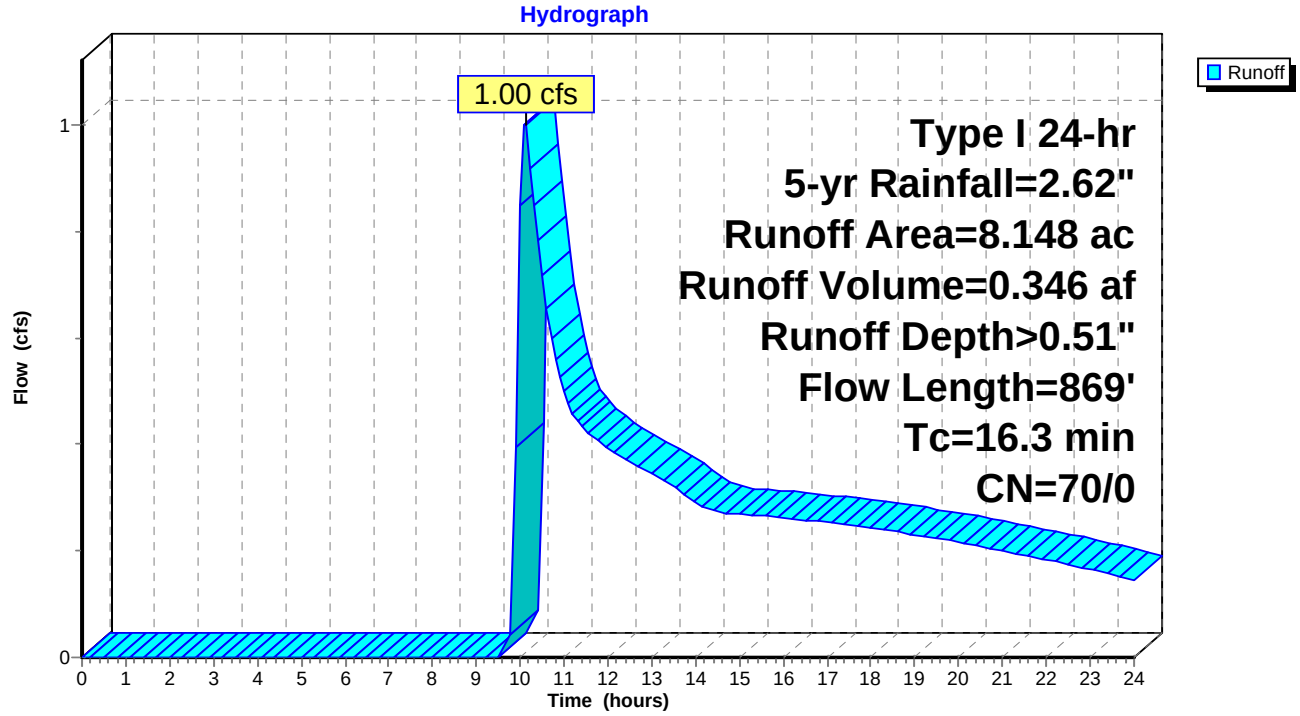
Runoff = 1.00 cfs @ 10.11 hrs, Volume= 0.346 af, Depth> 0.51"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
7.441	69	Pasture/grassland/range, Fair, HSG B
0.707	86	Newly graded area, HSG B
8.148	70	Weighted Average
8.148		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	18	0.5000	0.79		**Sheet Flow, Flow from graded area** Fallow n= 0.050 P2= 1.81"
9.0	189	0.1360	0.35		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
6.9	662	0.0520	1.60		**Shallow Concentrated Flow, Flow at boundary** Short Grass Pasture Kv= 7.0 fps
16.3	869	Total			

Subcatchment 21S: Post Dev. E



Summary for Subcatchment 25S: Post Dev. A

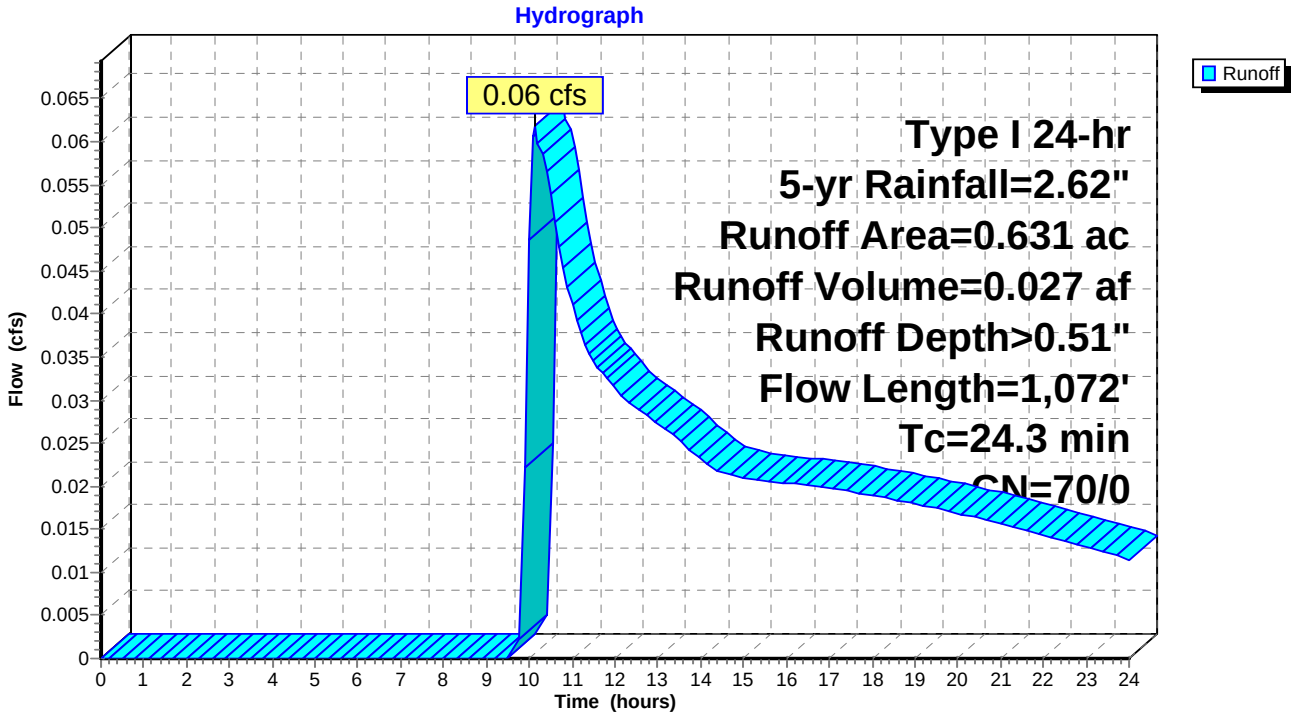
Runoff = 0.06 cfs @ 10.14 hrs, Volume= 0.027 af, Depth> 0.51"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
0.055	86	Newly graded area, HSG B
0.576	69	Pasture/grassland/range, Fair, HSG B
0.631	70	Weighted Average
0.631		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	39	0.0180	0.11		**Sheet Flow, Sheet flow to swale** Range n= 0.130 P2= 1.81"
11.6	789	0.0164	1.14	0.80	**Channel Flow, Concrete channel** Area= 0.7 sf Perim= 6.0' r= 0.12' n= 0.040 Earth, cobble bottom, clean sides
4.6	41	0.0350	0.15		**Sheet Flow, Flow from swale to undeveloped** Range n= 0.130 P2= 1.81"
0.9	26	0.8900	0.50		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
1.5	177	0.0750	1.92		**Shallow Concentrated Flow, Undeveloped shallow flow** Short Grass Pasture Kv= 7.0 fps
24.3	1,072	Total			

Subcatchment 25S: Post Dev. A



Summary for Subcatchment 27S: Post Dev. 10

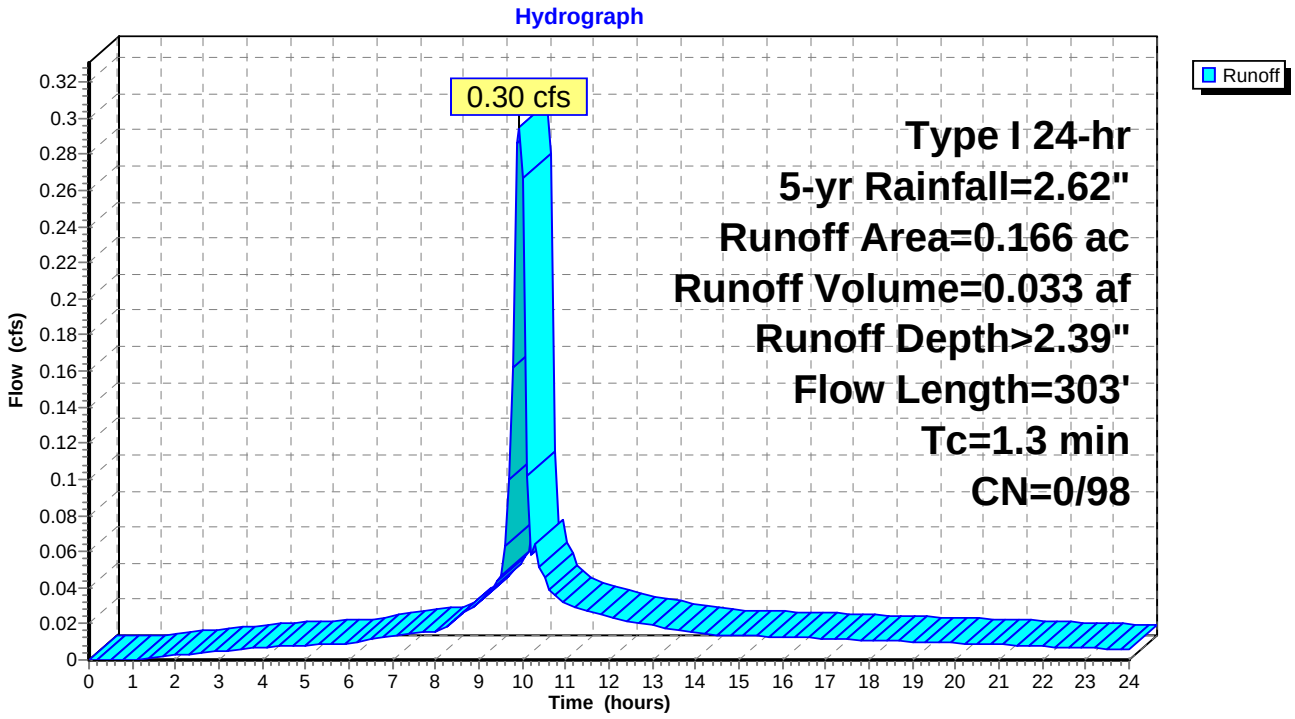
Runoff = 0.30 cfs @ 9.94 hrs, Volume= 0.033 af, Depth> 2.39"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
0.166	98	Paved roads w/curbs & sewers
0.166		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	12	0.0200	0.68		**Sheet Flow, Flow from Crown to Curb** Smooth surfaces n= 0.011 P2= 1.81"
0.4	133	0.0600	4.97		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.5	111	0.0367	3.89		**Shallow Concentrated Flow, Gutter Flow to DI** Paved Kv= 20.3 fps
0.1	47	0.0050	5.46	9.66	**Pipe Channel, SD Flow to Basin** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.3	303	Total			

Subcatchment 27S: Post Dev. 10



Summary for Subcatchment 28S: Post Dev. 11

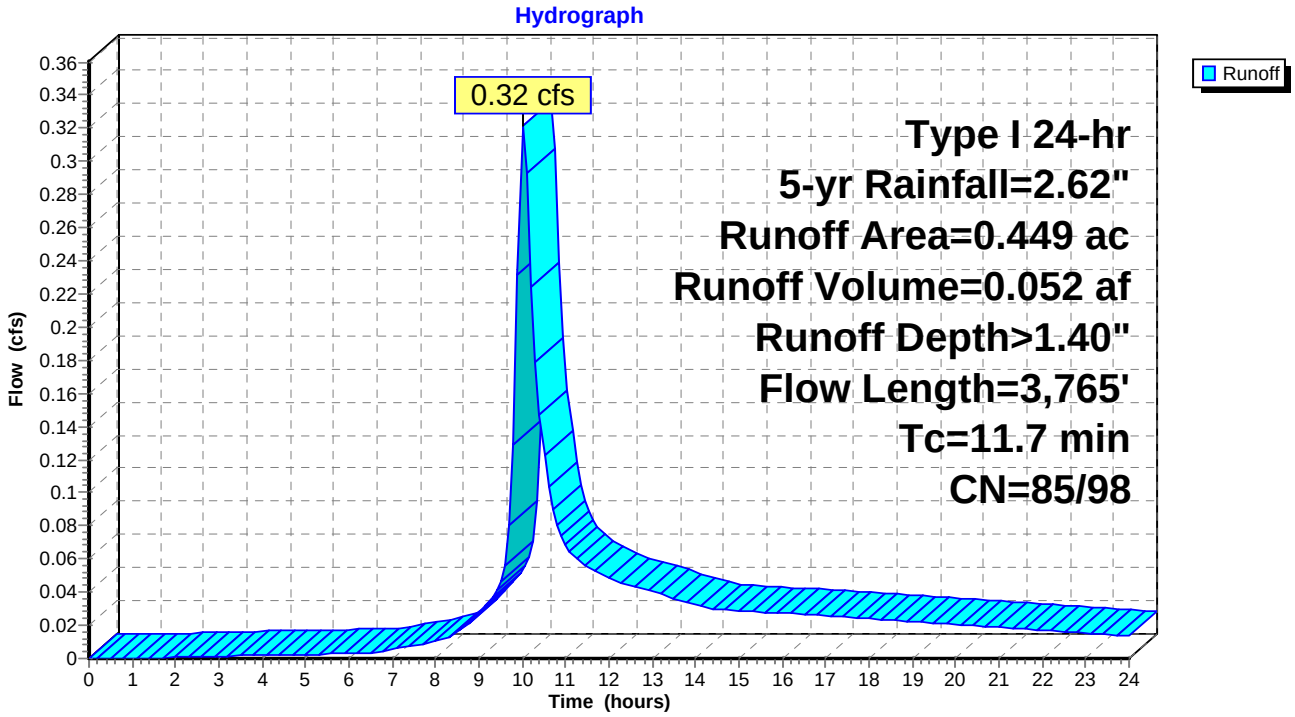
Runoff = 0.32 cfs @ 10.03 hrs, Volume= 0.052 af, Depth> 1.40"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
0.105	89	Paved roads w/open ditches, 50% imp, HSG B
0.344	86	Newly graded area, HSG B
0.449	87	Weighted Average
0.397		88.31% Pervious Area
0.052		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	22	0.2844	0.66		**Sheet Flow, Sheet flow to swale** Fallow n= 0.050 P2= 1.81"
3.2	760	0.0137	3.96	7.92	**Channel Flow, Flow in swale** Area= 2.0 sf Perim= 8.3' r= 0.24' n= 0.017 Concrete, unfinished
0.4	202	0.0120	8.47	14.96	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.7	320	0.0093	7.45	13.17	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD through MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD to Basin** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
11.7	3,765	Total			

Subcatchment 28S: Post Dev. 11



Summary for Subcatchment C1: Post Dev. 6

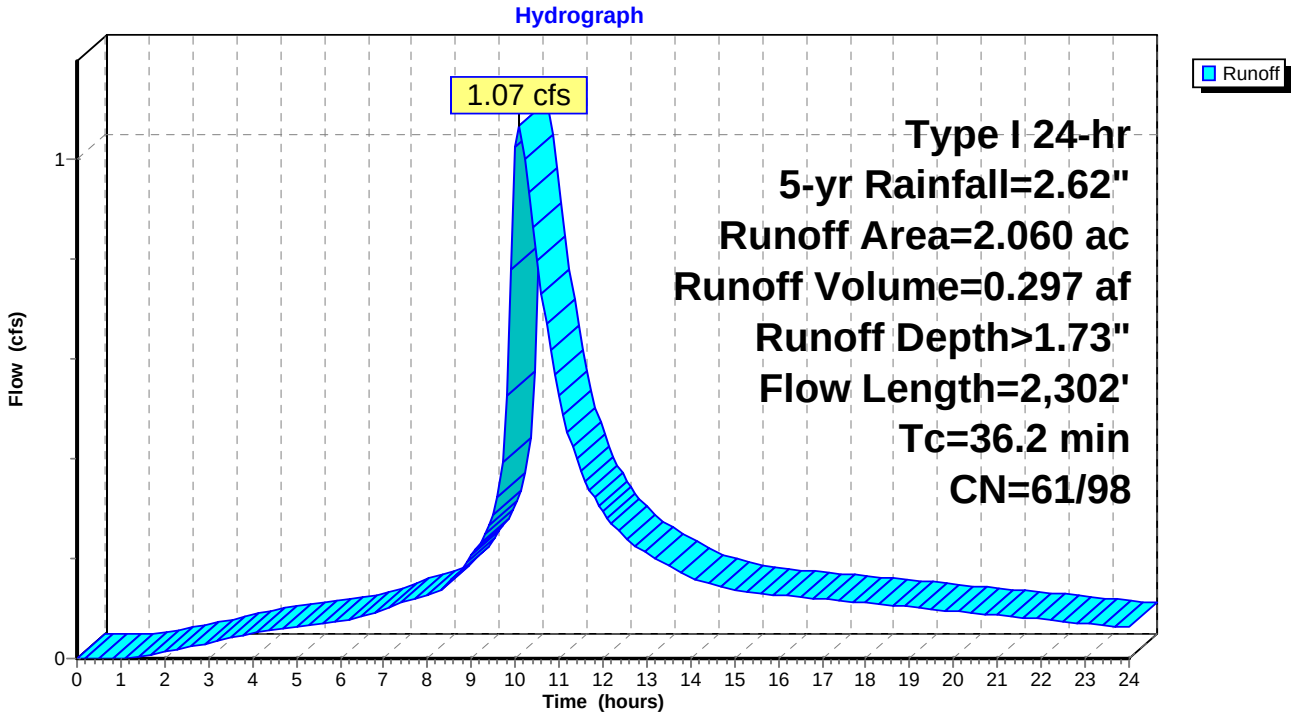
Runoff = 1.07 cfs @ 10.09 hrs, Volume= 0.297 af, Depth> 1.73"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
1.745	85	1/8 acre lots, 65% imp, HSG B
0.315	98	Paved roads w/curbs & sewers
2.060	87	Weighted Average
0.611		29.65% Pervious Area
1.449		70.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	180	0.0100	0.11		**Sheet Flow, Lot Flow** Grass: Short n= 0.150 P2= 1.81"
4.5	477	0.0075	1.76		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
36.2	2,302	Total			

Subcatchment C1: Post Dev. 6



Summary for Subcatchment C2: Post Dev. 5

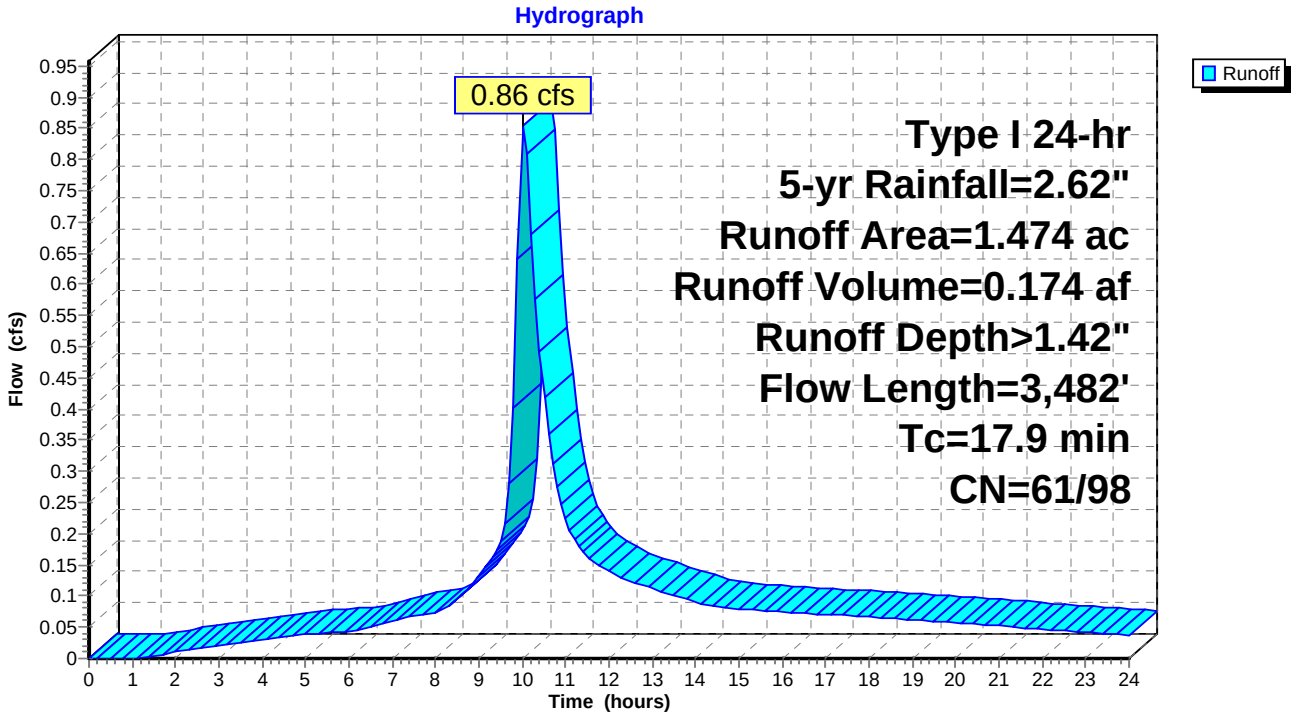
Runoff = 0.86 cfs @ 10.04 hrs, Volume= 0.174 af, Depth> 1.42"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
1.066	75	1/4 acre lots, 38% imp, HSG B
0.408	98	Paved roads w/curbs & sewers
1.474	81	Weighted Average
0.661		44.84% Pervious Area
0.813		55.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	169	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY GRASS SWALE** Grassed Waterway Kv= 15.0 fps
1.9	86	0.0100	0.76		**Sheet Flow, LOT SHEET FLOW/DRIVEWAY** Smooth surfaces n= 0.011 P2= 1.81"
0.3	38	0.0100	2.03		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.0	214	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.5	49	0.0073	1.73		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	28	0.0352	3.81		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.1	154	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	400	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.5	210	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.6	147	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.9	3,482	Total			

Subcatchment C2: Post Dev. 5



Summary for Subcatchment C3: Post Dev. 8

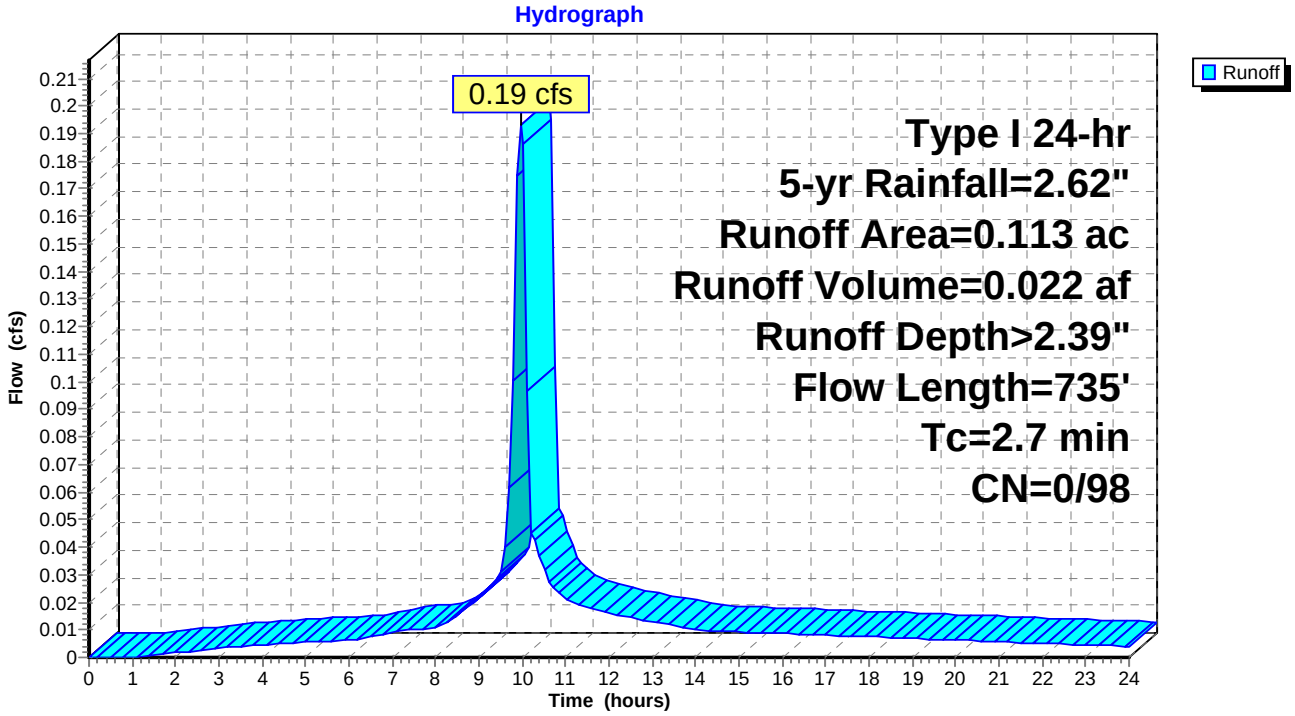
Runoff = 0.19 cfs @ 9.96 hrs, Volume= 0.022 af, Depth> 2.39"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 5-yr Rainfall=2.62"

Area (ac)	CN	Description
0.113	98	Paved roads w/curbs & sewers
0.113		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.0	31	0.1500	29.93	52.89	**Pipe Channel, SD FROM DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.8	629	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
2.7	735	Total			

Subcatchment C3: Post Dev. 8



Summary for Pond 11P: BASIN #1

Inflow Area = 31.018 ac, 52.38% Impervious, Inflow Depth > 1.43" for 5-yr event
Inflow = 15.84 cfs @ 10.05 hrs, Volume= 3.706 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Peak Elev= 562.91' @ 24.00 hrs Surf.Area= 1.123 ac Storage= 3.702 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

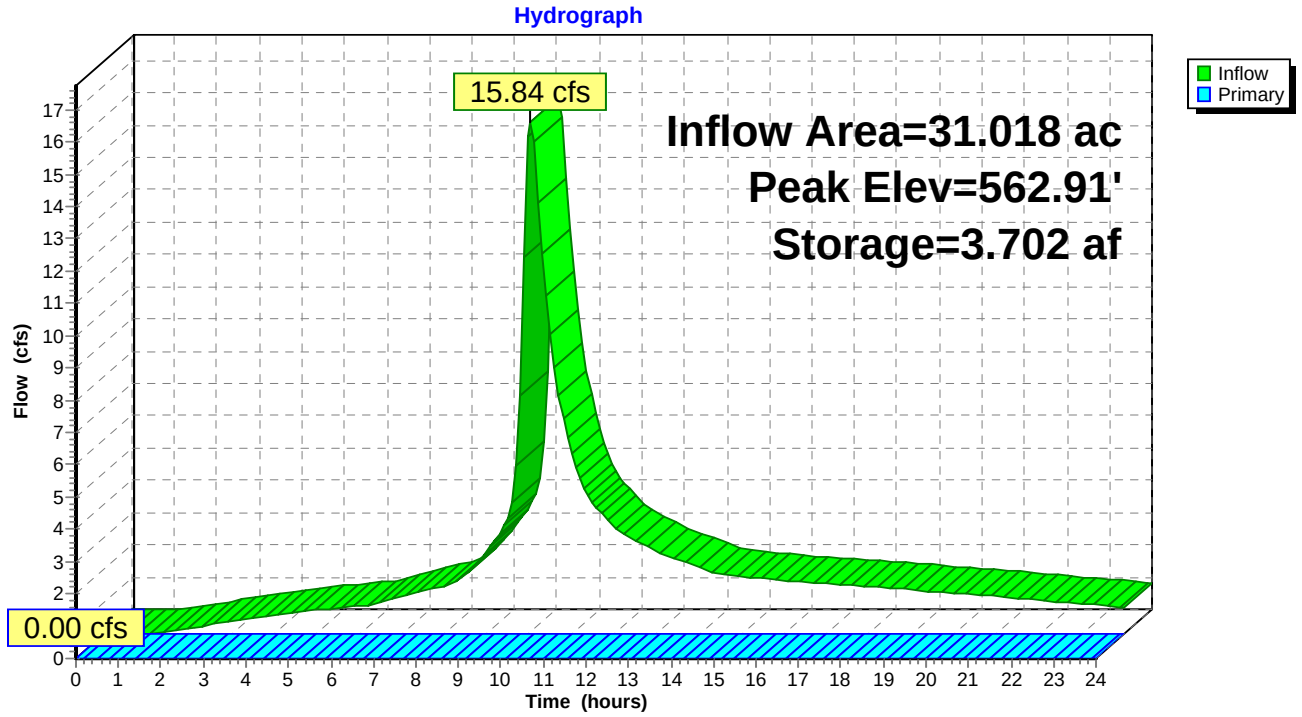
Volume	Invert	Avail.Storage	Storage Description
#1	559.00'	20.615 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
559.00	0.779	952.9	0.000	0.000	0.779
573.00	2.300	1,384.6	20.615	20.615	2.660

Device	Routing	Invert	Outlet Devices
#1	Primary	563.45'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	566.00'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	564.70'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	564.00'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	568.00'	**160.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=559.00' (Free Discharge)
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: BASIN #1



Summary for Pond 15P: BASIN #2

Inflow Area = 2.545 ac, 35.67% Impervious, Inflow Depth > 1.03" for 5-yr event
Inflow = 1.56 cfs @ 9.97 hrs, Volume= 0.218 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 525.62' @ 24.00 hrs Surf.Area= 0.161 ac Storage= 0.218 af

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= (not calculated: no outflow)

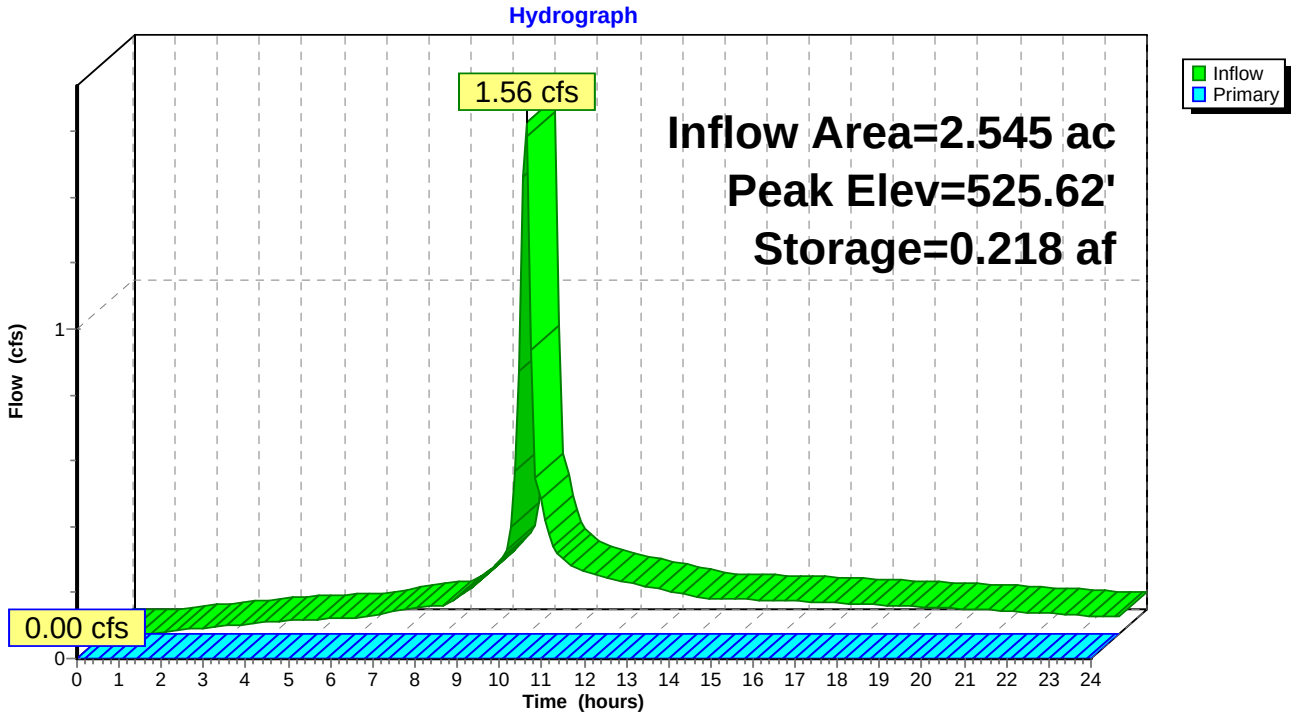
Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	0.474 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
524.00	0.109	314.9	0.000	0.000	0.109
527.00	0.213	427.1	0.474	0.474	0.263

Device	Routing	Invert	Outlet Devices
#1	Primary	525.80'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	527.00'	**40.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Primary	526.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=524.00' TW=103.00' (Fixed TW Elev= 103.00')
- **1=Orifice/Grate** (Controls 0.00 cfs)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 15P: BASIN #2

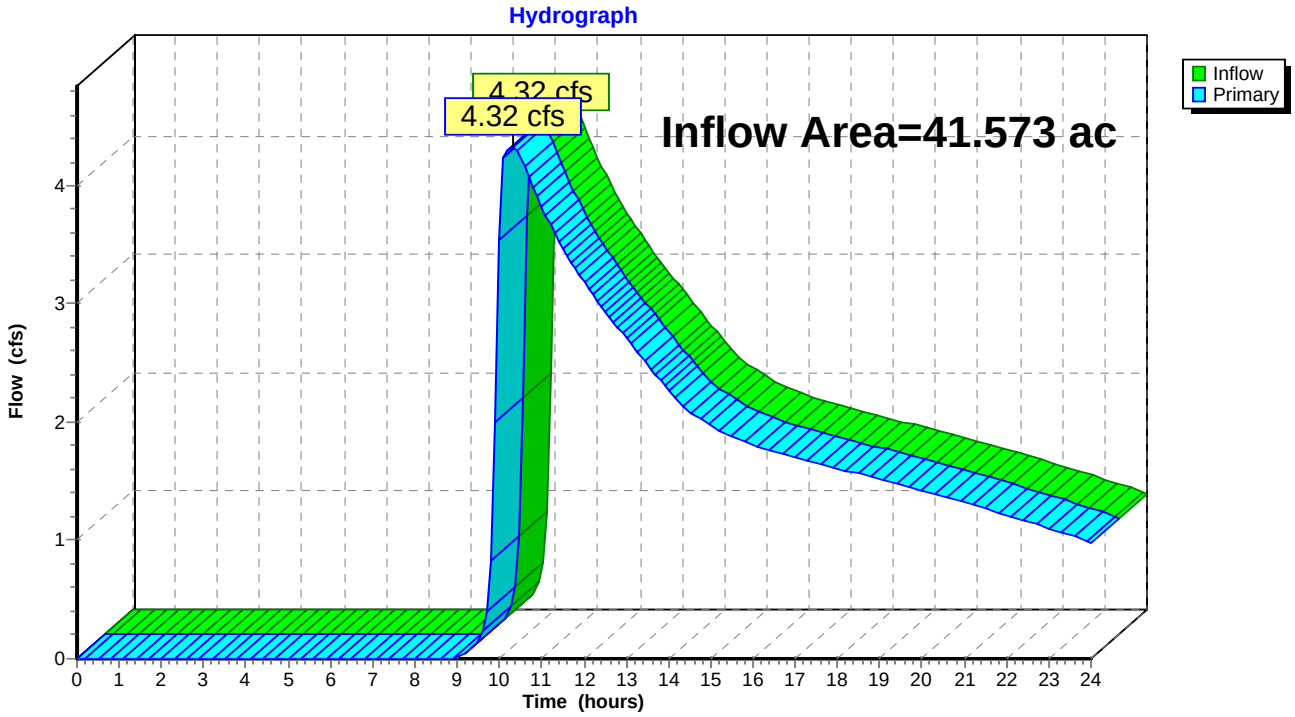


Summary for Pond 22P: Orcutt Creek

Inflow Area = 41.573 ac, 0.00% Impervious, Inflow Depth > 0.69" for 5-yr event
Inflow = 4.32 cfs @ 10.32 hrs, Volume= 2.389 af
Primary = 4.32 cfs @ 10.32 hrs, Volume= 2.389 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Pond 22P: Orcutt Creek



Time span=0.00-24.00 hrs, dt=0.10 hrs, 241 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 3S: Post Dev. 9 Runoff Area=8.408 ac 36.54% Impervious Runoff Depth>1.65"
Flow Length=3,415' Tc=37.4 min CN=73/98 Runoff=3.80 cfs 1.155 af

Subcatchment 10S: Post Dev. 2 Runoff Area=8.670 ac 66.89% Impervious Runoff Depth>2.08"
Flow Length=3,525' Tc=24.8 min CN=61/98 Runoff=6.35 cfs 1.501 af

Subcatchment 16S: Post Dev. 7 Runoff Area=3.572 ac 37.83% Impervious Runoff Depth>1.36"
Flow Length=2,912' Tc=13.8 min CN=61/98 Runoff=2.01 cfs 0.405 af

Subcatchment 17S: Post Dev. 1 Runoff Area=6.272 ac 57.34% Impervious Runoff Depth>1.84"
Flow Length=3,832' Tc=17.2 min CN=61/98 Runoff=4.76 cfs 0.964 af

Subcatchment 18S: Post Dev. 3 Runoff Area=0.212 ac 72.17% Impervious Runoff Depth>2.60"
Flow Length=630' Tc=1.9 min CN=86/98 Runoff=0.41 cfs 0.046 af

Subcatchment 19S: Post Dev. 4 Runoff Area=2.167 ac 27.17% Impervious Runoff Depth>1.10"
Flow Length=750' Tc=4.6 min CN=61/98 Runoff=1.25 cfs 0.199 af

Subcatchment 20S: Post Dev. C Runoff Area=32.794 ac 0.00% Impervious Runoff Depth>1.08"
Flow Length=2,582' Tc=73.5 min CN=76/0 Runoff=5.67 cfs 2.942 af

Subcatchment 21S: Post Dev. E Runoff Area=8.148 ac 0.00% Impervious Runoff Depth>0.79"
Flow Length=869' Tc=16.3 min CN=70/0 Runoff=2.02 cfs 0.538 af

Subcatchment 25S: Post Dev. A Runoff Area=0.631 ac 0.00% Impervious Runoff Depth>0.79"
Flow Length=1,072' Tc=24.3 min CN=70/0 Runoff=0.13 cfs 0.041 af

Subcatchment 27S: Post Dev. 10 Runoff Area=0.166 ac 100.00% Impervious Runoff Depth>2.92"
Flow Length=303' Tc=1.3 min CN=0/98 Runoff=0.36 cfs 0.040 af

Subcatchment 28S: Post Dev. 11 Runoff Area=0.449 ac 11.69% Impervious Runoff Depth>1.85"
Flow Length=3,765' Tc=11.7 min CN=85/98 Runoff=0.43 cfs 0.069 af

Subcatchment C1: Post Dev. 6 Runoff Area=2.060 ac 70.35% Impervious Runoff Depth>2.16"
Flow Length=2,302' Tc=36.2 min CN=61/98 Runoff=1.31 cfs 0.370 af

Subcatchment C2: Post Dev. 5 Runoff Area=1.474 ac 55.16% Impervious Runoff Depth>1.79"
Flow Length=3,482' Tc=17.9 min CN=61/98 Runoff=1.06 cfs 0.220 af

Subcatchment C3: Post Dev. 8 Runoff Area=0.113 ac 100.00% Impervious Runoff Depth>2.92"
Flow Length=735' Tc=2.7 min CN=0/98 Runoff=0.23 cfs 0.027 af

Pond 11P: BASIN #1 Peak Elev=563.77' Storage=4.696 af Inflow=19.94 cfs 4.712 af
Outflow=0.06 cfs 0.012 af

Pond 15P: BASIN #2 Peak Elev=525.95' Storage=0.272 af Inflow=1.99 cfs 0.285 af
Outflow=0.04 cfs 0.012 af

Pond 22P: Orcutt Creek

Inflow=7.62 cfs 3.522 af
Primary=7.62 cfs 3.522 af

Total Runoff Area = 75.136 ac Runoff Volume = 8.519 af Average Runoff Depth = 1.36"
77.17% Pervious = 57.981 ac 22.83% Impervious = 17.155 ac

Summary for Subcatchment 3S: Post Dev. 9

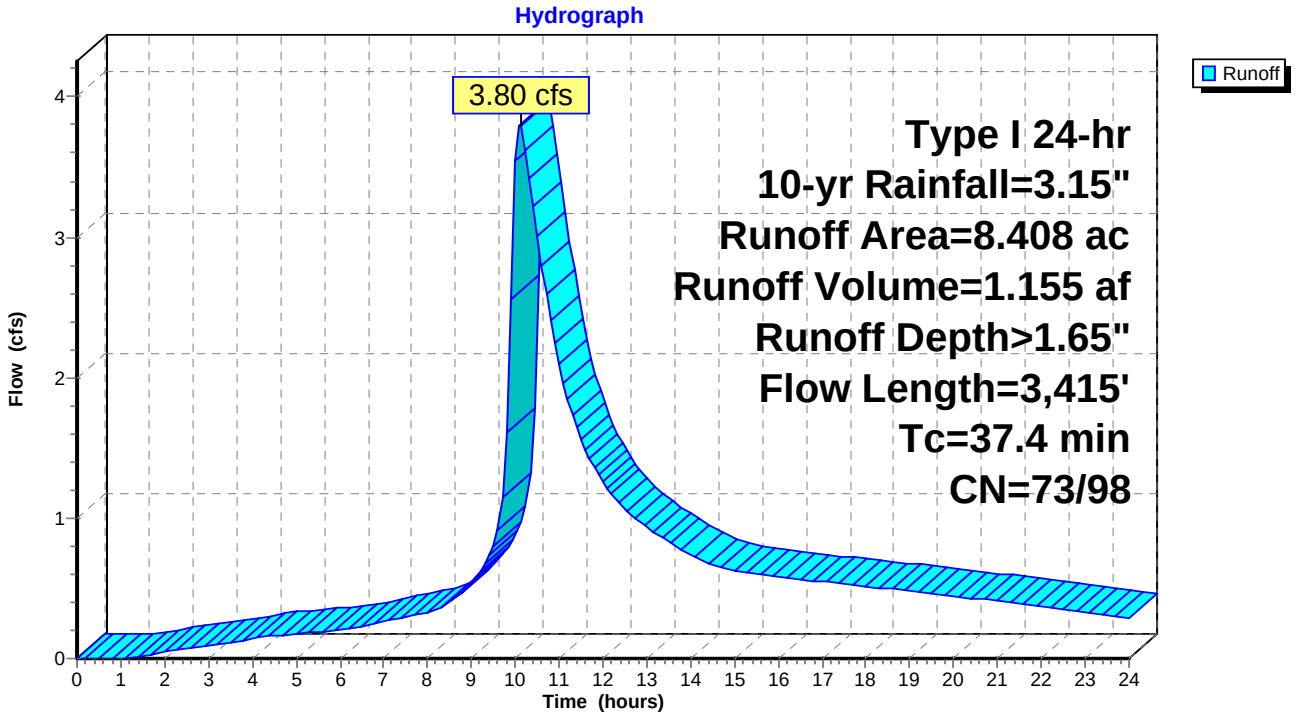
Runoff = 3.80 cfs @ 10.11 hrs, Volume= 1.155 af, Depth> 1.65"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
3.813	85	1/8 acre lots, 65% imp, HSG B
0.745	61	>75% Grass cover, Good, HSG B
0.558	98	Paved roads w/curbs & sewers
2.016	86	Newly graded area, HSG B
0.868	69	Pasture/grassland/range, Fair, HSG B
0.337	85	Gravel roads, HSG B
0.071	89	Paved roads w/open ditches, 50% imp, HSG B
8.408	82	Weighted Average
5.336		63.46% Pervious Area
3.072		36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0950	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
14.8	1,286	0.0093	1.45		**Shallow Concentrated Flow, NATURAL SWALE AT BOUNDARY** Grassed Waterway Kv= 15.0 fps
0.3	9	0.1720	0.45		**Sheet Flow, SHEET FLOW TO PATH** Fallow n= 0.050 P2= 1.81"
10.4	233	0.0210	0.37		**Sheet Flow, GRAVEL PATH** Fallow n= 0.050 P2= 1.81"
4.1	35	0.0444	0.14		**Sheet Flow, FLOW OFF PATH TO SWALE** Grass: Short n= 0.150 P2= 1.81"
0.8	104	0.0200	2.12		**Shallow Concentrated Flow, NATURAL SWALE TO GUTTER** Grassed Waterway Kv= 15.0 fps
0.7	81	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN #1** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
37.4	3,415	Total			

Subcatchment 3S: Post Dev. 9



Summary for Subcatchment 10S: Post Dev. 2

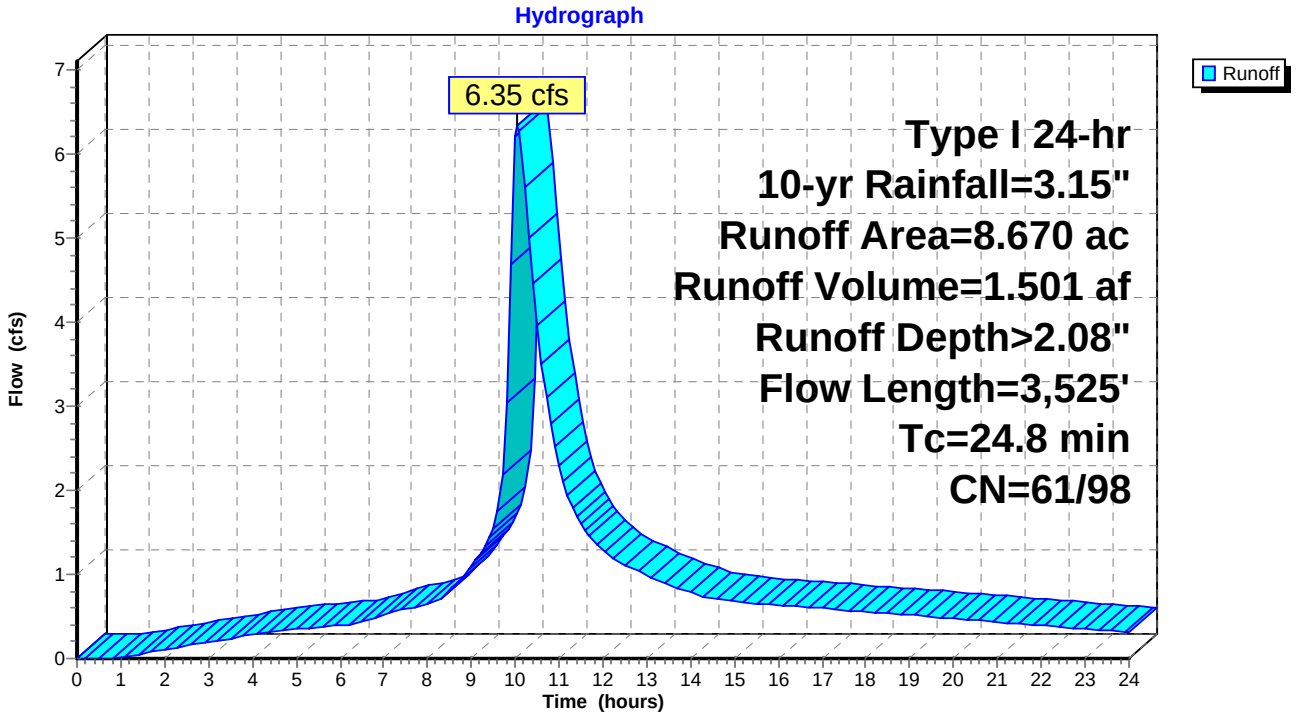
Runoff = 6.35 cfs @ 10.06 hrs, Volume= 1.501 af, Depth> 2.08"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
8.202	85	1/8 acre lots, 65% imp, HSG B
0.468	98	Paved roads w/curbs & sewers
8.670	86	Weighted Average
2.871		33.11% Pervious Area
5.799		66.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	69	0.0396	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
0.3	30	0.0100	1.50		**Shallow Concentrated Flow, FLOW TO DWY GUTTER** Grassed Waterway Kv= 15.0 fps
8.4	723	0.0050	1.44		**Shallow Concentrated Flow, DWY GUTTER FLOW** Paved Kv= 20.3 fps
0.0	23	0.2812	10.76		**Shallow Concentrated Flow, DWY GUTTER TO ROAD GUTTER** Paved Kv= 20.3 fps
1.9	219	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
24.8	3,525	Total			

Subcatchment 10S: Post Dev. 2



Summary for Subcatchment 16S: Post Dev. 7

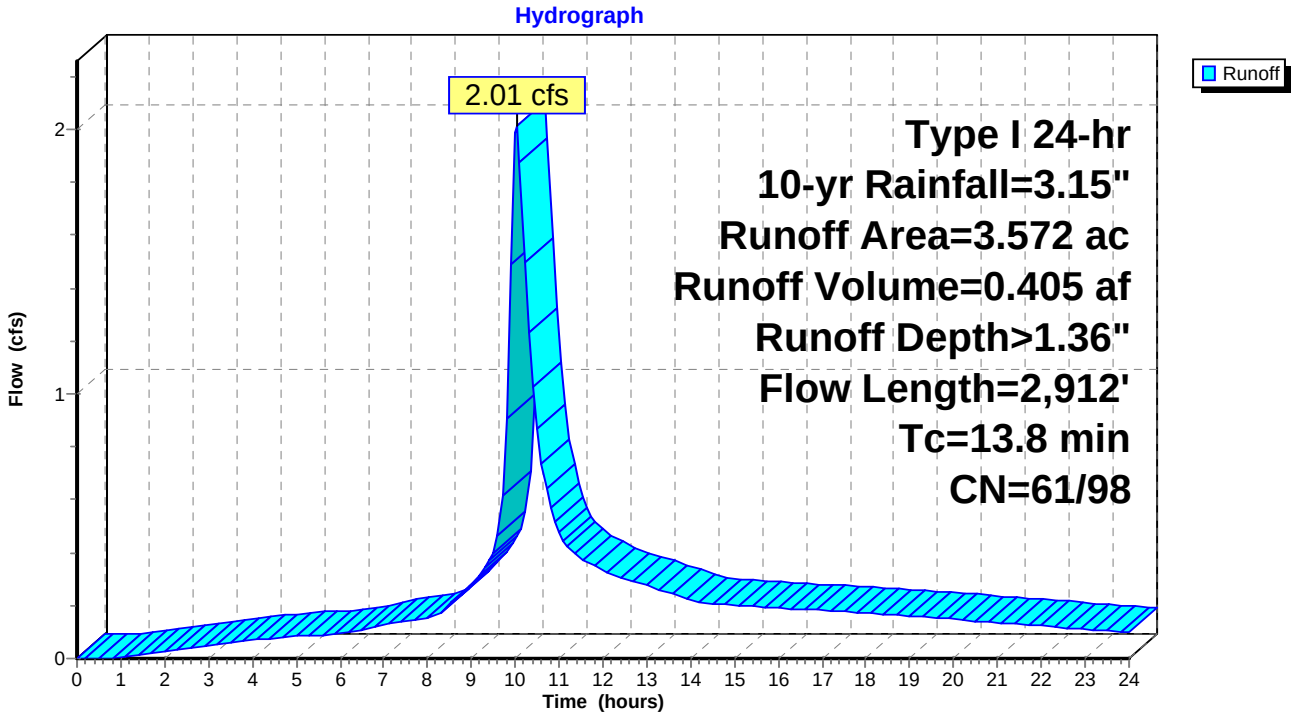
Runoff = 2.01 cfs @ 10.03 hrs, Volume= 0.405 af, Depth> 1.36"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
2.877	75	1/4 acre lots, 38% imp, HSG B
0.437	61	>75% Grass cover, Good, HSG B
0.258	98	Paved roads w/curbs & sewers
3.572	75	Weighted Average
2.221		62.17% Pervious Area
1.351		37.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	24	0.0675	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
1.1	145	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	396	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.4	203	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	157	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
13.8	2,912	Total			

Subcatchment 16S: Post Dev. 7



Summary for Subcatchment 17S: Post Dev. 1

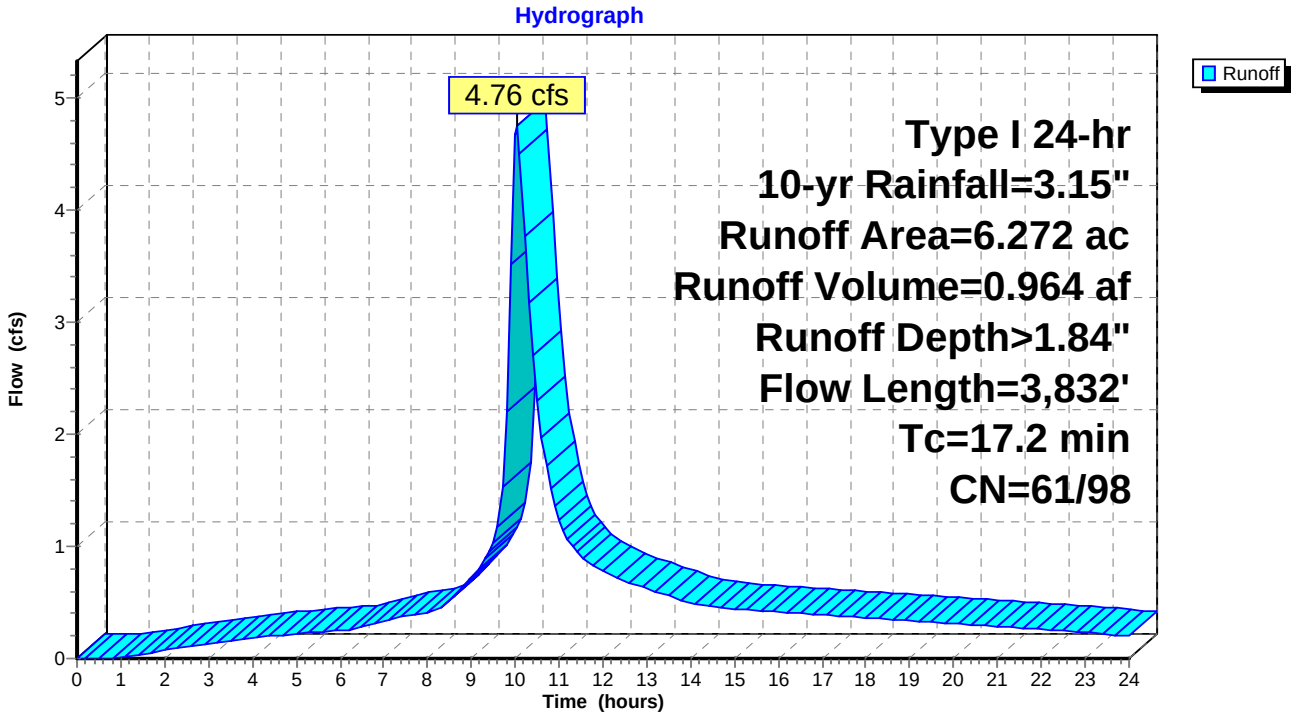
Runoff = 4.76 cfs @ 10.04 hrs, Volume= 0.964 af, Depth> 1.84"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
2.520	75	1/4 acre lots, 38% imp, HSG B
3.180	85	1/8 acre lots, 65% imp, HSG B
0.572	98	Paved roads w/curbs & sewers
6.272	82	Weighted Average
2.675		42.66% Pervious Area
3.597		57.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	11	0.2000	0.21		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
0.8	173	0.0300	3.52		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	121	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
3.4	503	0.0146	2.45		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
4.5	525	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	38	0.0050	5.46	9.66	**Pipe Channel, DI# TO DI#2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.2	3,832	Total			

Subcatchment 17S: Post Dev. 1



Summary for Subcatchment 18S: Post Dev. 3

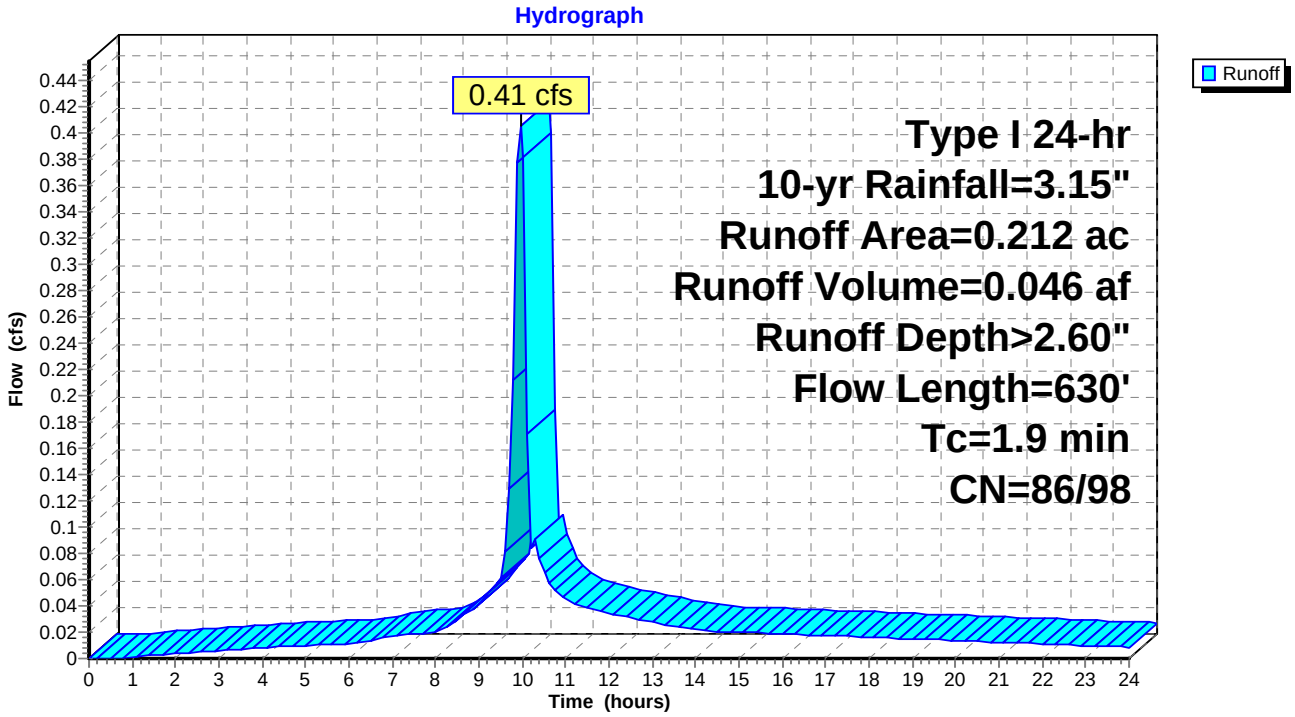
Runoff = 0.41 cfs @ 9.95 hrs, Volume= 0.046 af, Depth> 2.60"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
0.153	98	Paved roads w/curbs & sewers
0.059	86	Newly graded area, HSG B
0.212	95	Weighted Average
0.059		27.83% Pervious Area
0.153		72.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	16	0.0200	0.72		**Sheet Flow, CROWN TO GUTTER** Smooth surfaces n= 0.011 P2= 1.81"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	111	0.0758	5.59		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	65	0.1234	7.13		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	61	0.1332	7.41		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	101	0.1084	6.68		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	56	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	24	0.0100	7.73	13.66	**Pipe Channel, DI TO DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.9	630	Total			

Subcatchment 18S: Post Dev. 3



Summary for Subcatchment 19S: Post Dev. 4

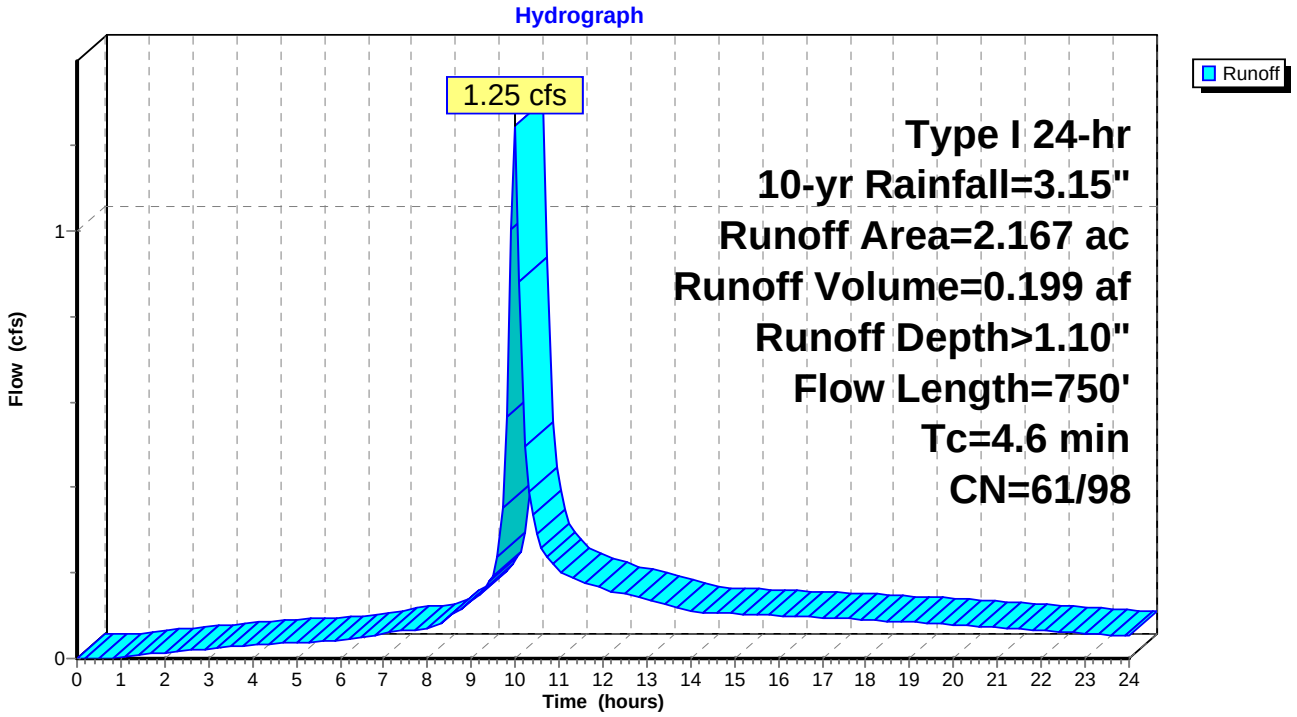
Runoff = 1.25 cfs @ 9.99 hrs, Volume= 0.199 af, Depth> 1.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
0.723	75	1/4 acre lots, 38% imp, HSG B
1.121	61	>75% Grass cover, Good, HSG B
0.305	98	Paved roads w/curbs & sewers
0.018	89	Paved roads w/open ditches, 50% imp, HSG B
2.167	71	Weighted Average
1.578		72.83% Pervious Area
0.589		27.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	28	0.5100	0.36		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
2.0	184	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY SWALE** Grassed Waterway Kv= 15.0 fps
0.8	290	0.0900	6.09		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	76	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
4.6	750	Total			

Subcatchment 19S: Post Dev. 4



Summary for Subcatchment 20S: Post Dev. C

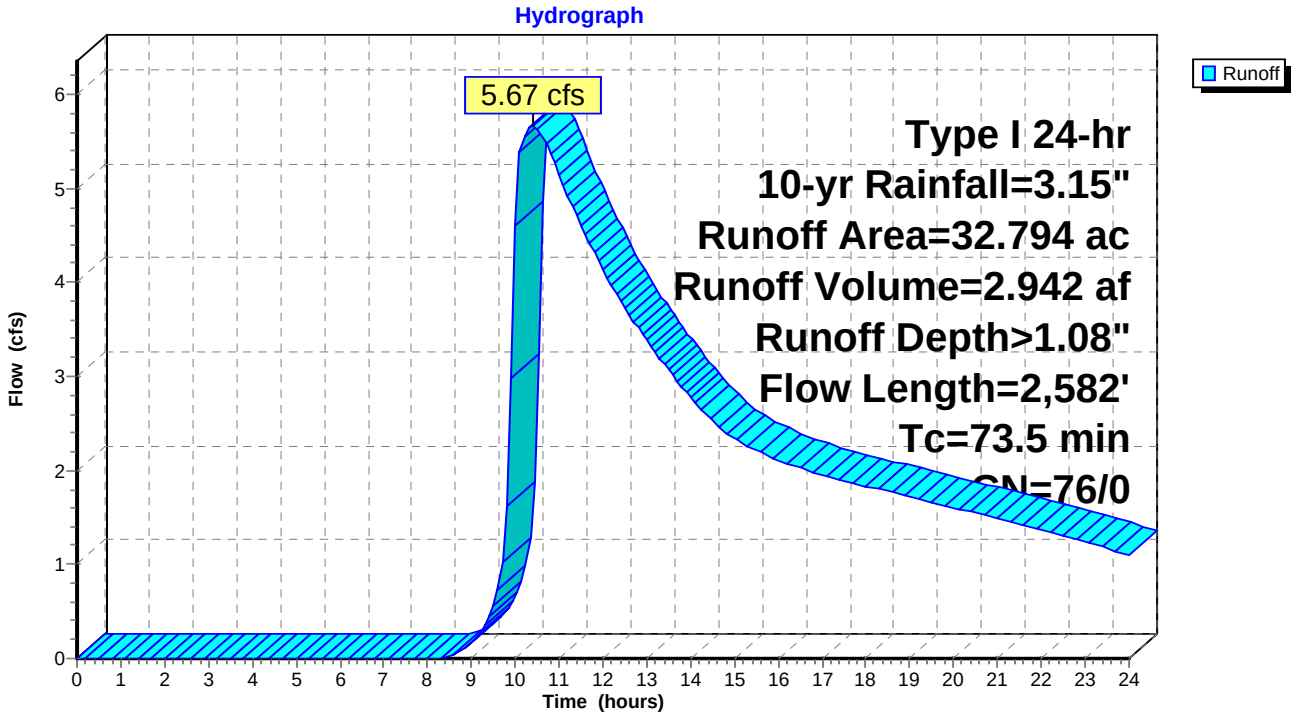
Runoff = 5.67 cfs @ 10.40 hrs, Volume= 2.942 af, Depth> 1.08"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
13.544	69	Pasture/grassland/range, Fair, HSG B
2.893	86	Newly graded area, HSG B
0.831	82	Dirt roads, HSG B
15.526	79	Pasture/grassland/range, Fair, HSG C
32.794	76	Weighted Average
32.794		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.8	300	0.0271	0.20		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
16.9	186	0.0271	0.18		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
8.8	442	0.0070	0.84		**Shallow Concentrated Flow, Flow at toe of path slope** Nearly Bare & Untilled Kv= 10.0 fps
2.1	303	0.0220	2.39		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
7.8	465	0.0200	0.99		**Shallow Concentrated Flow, Undeveloped flow to toe** Short Grass Pasture Kv= 7.0 fps
8.5	405	0.0028	0.79		**Shallow Concentrated Flow, Flow at toe of slope** Grassed Waterway Kv= 15.0 fps
0.7	49	0.0051	1.15		**Shallow Concentrated Flow, Flow at toe of slope** Unpaved Kv= 16.1 fps
3.2	393	0.0160	2.04		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
0.4	18	0.0020	0.72		**Shallow Concentrated Flow, Flow across path** Unpaved Kv= 16.1 fps
0.3	21	0.0391	1.38		**Shallow Concentrated Flow, Flow to creek** Short Grass Pasture Kv= 7.0 fps
73.5	2,582	Total			

Subcatchment 20S: Post Dev. C



Summary for Subcatchment 21S: Post Dev. E

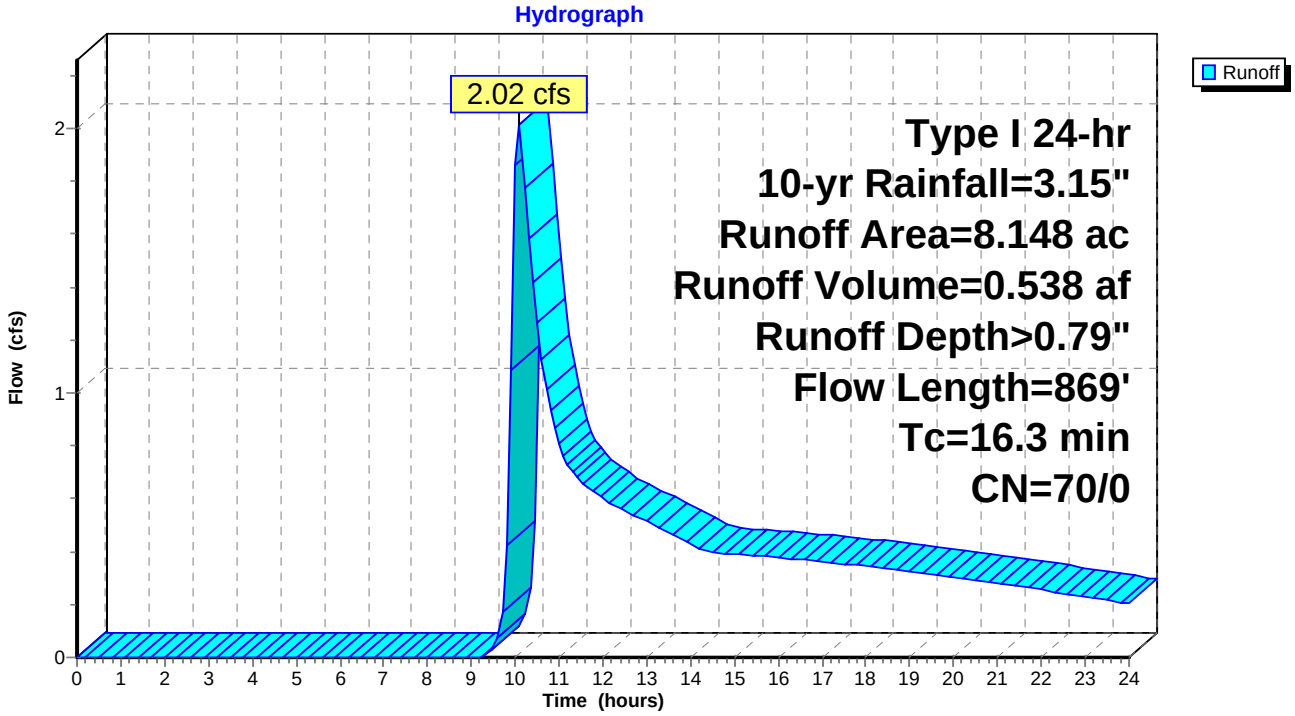
Runoff = 2.02 cfs @ 10.09 hrs, Volume= 0.538 af, Depth> 0.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
7.441	69	Pasture/grassland/range, Fair, HSG B
0.707	86	Newly graded area, HSG B
8.148	70	Weighted Average
8.148		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	18	0.5000	0.79		**Sheet Flow, Flow from graded area** Fallow n= 0.050 P2= 1.81"
9.0	189	0.1360	0.35		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
6.9	662	0.0520	1.60		**Shallow Concentrated Flow, Flow at boundary** Short Grass Pasture Kv= 7.0 fps
16.3	869	Total			

Subcatchment 21S: Post Dev. E



Summary for Subcatchment 25S: Post Dev. A

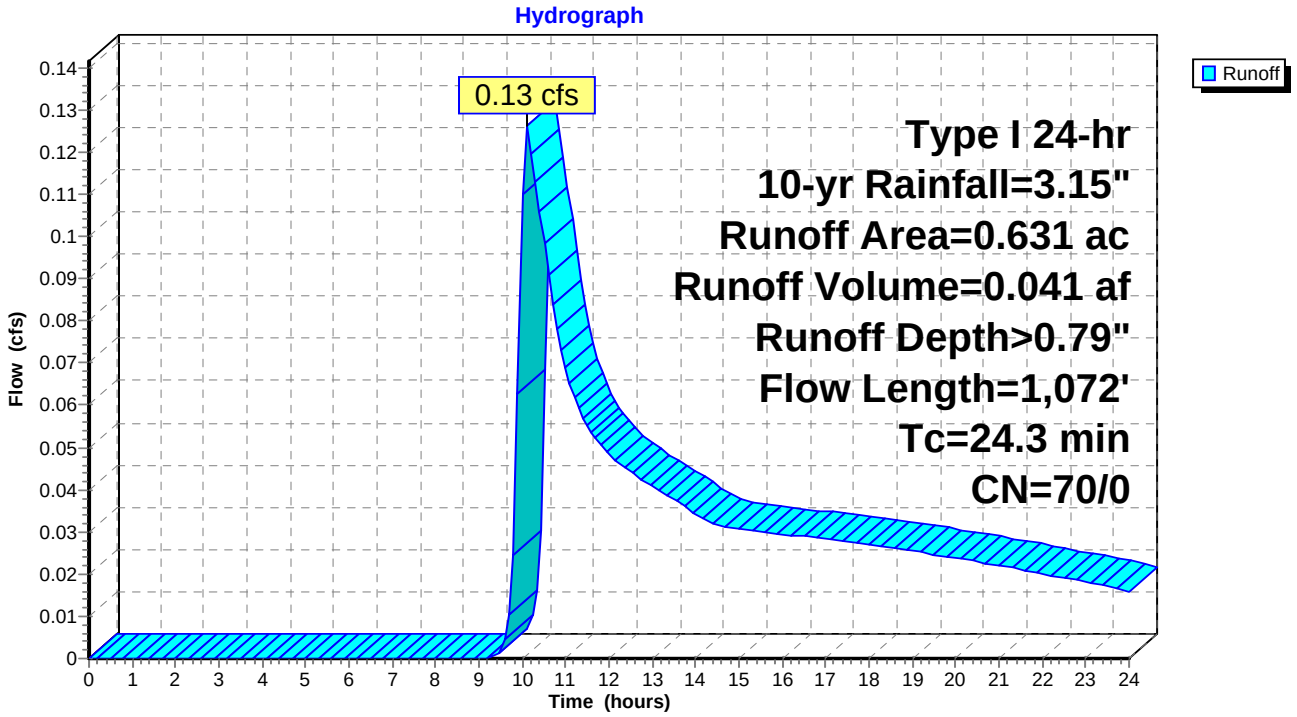
Runoff = 0.13 cfs @ 10.12 hrs, Volume= 0.041 af, Depth> 0.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
0.055	86	Newly graded area, HSG B
0.576	69	Pasture/grassland/range, Fair, HSG B
0.631	70	Weighted Average
0.631		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	39	0.0180	0.11		**Sheet Flow, Sheet flow to swale** Range n= 0.130 P2= 1.81"
11.6	789	0.0164	1.14	0.80	**Channel Flow, Concrete channel** Area= 0.7 sf Perim= 6.0' r= 0.12' n= 0.040 Earth, cobble bottom, clean sides
4.6	41	0.0350	0.15		**Sheet Flow, Flow from swale to undeveloped** Range n= 0.130 P2= 1.81"
0.9	26	0.8900	0.50		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
1.5	177	0.0750	1.92		**Shallow Concentrated Flow, Undeveloped shallow flow** Short Grass Pasture Kv= 7.0 fps
24.3	1,072	Total			

Subcatchment 25S: Post Dev. A



Summary for Subcatchment 27S: Post Dev. 10

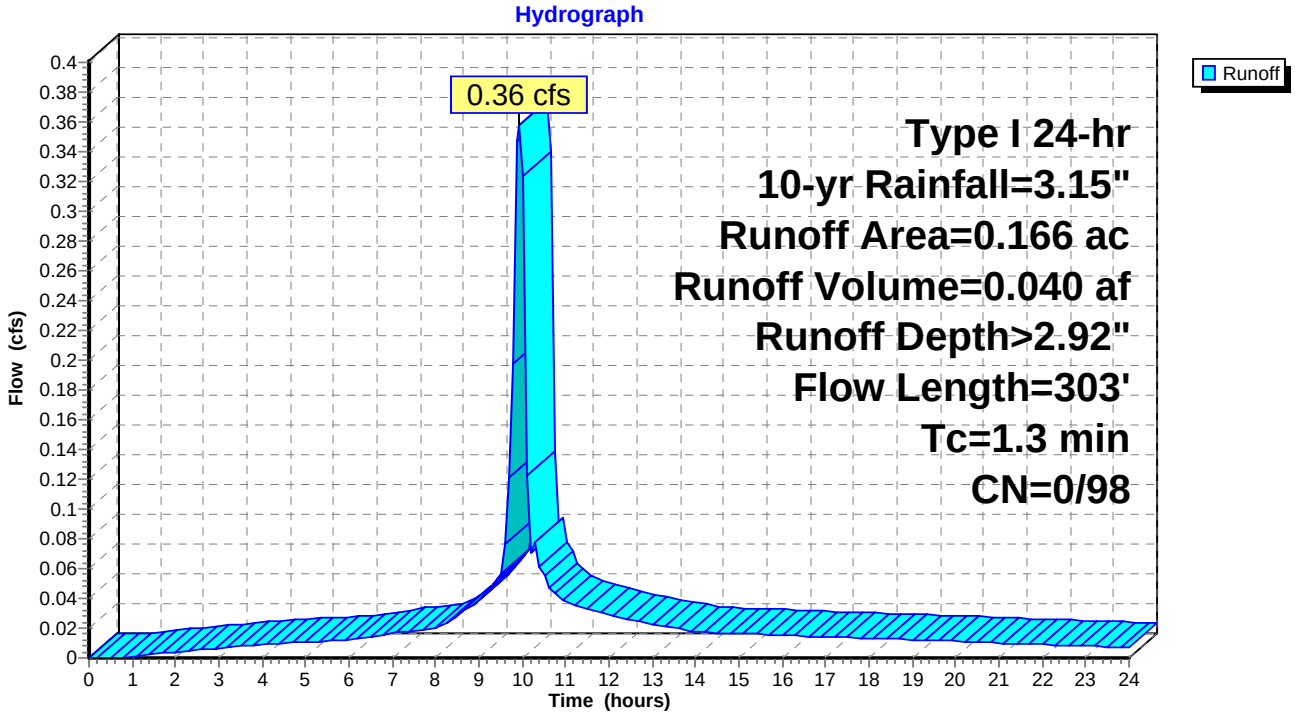
Runoff = 0.36 cfs @ 9.94 hrs, Volume= 0.040 af, Depth> 2.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
0.166	98	Paved roads w/curbs & sewers
0.166		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	12	0.0200	0.68		**Sheet Flow, Flow from Crown to Curb** Smooth surfaces n= 0.011 P2= 1.81"
0.4	133	0.0600	4.97		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.5	111	0.0367	3.89		**Shallow Concentrated Flow, Gutter Flow to DI** Paved Kv= 20.3 fps
0.1	47	0.0050	5.46	9.66	**Pipe Channel, SD Flow to Basin** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.3	303	Total			

Subcatchment 27S: Post Dev. 10



Summary for Subcatchment 28S: Post Dev. 11

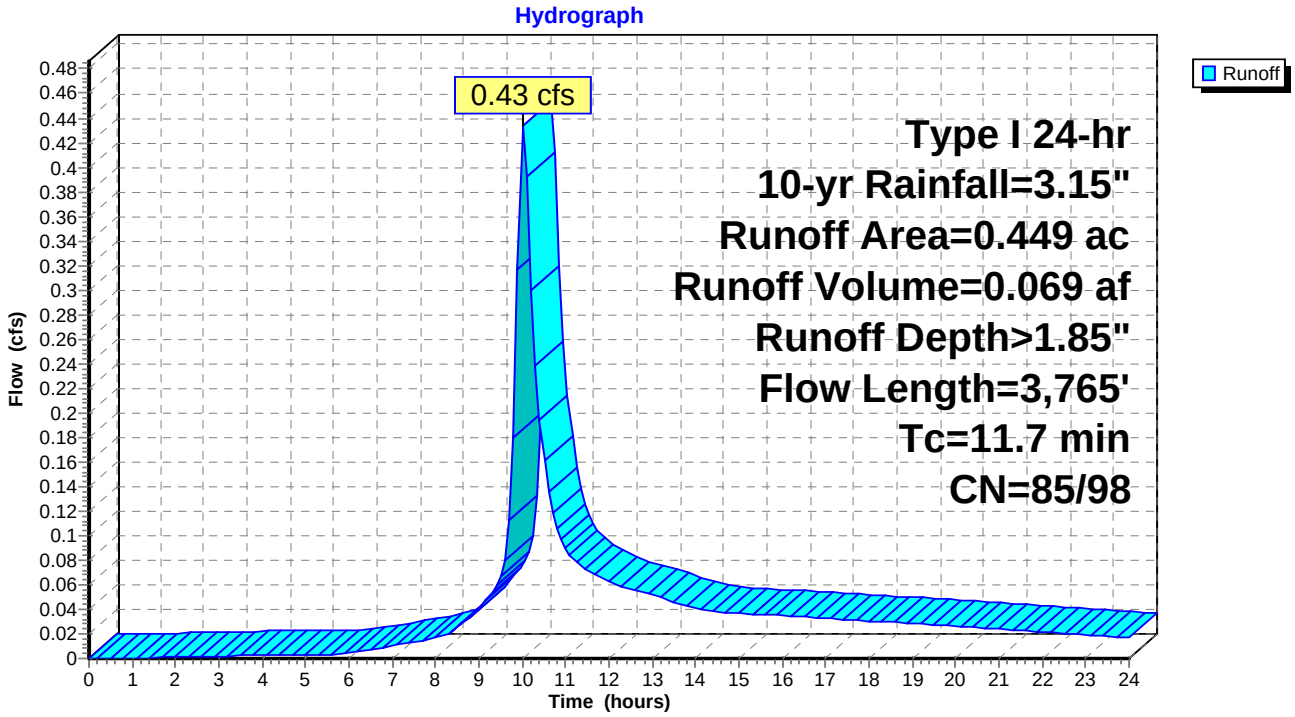
Runoff = 0.43 cfs @ 10.03 hrs, Volume= 0.069 af, Depth> 1.85"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
0.105	89	Paved roads w/open ditches, 50% imp, HSG B
0.344	86	Newly graded area, HSG B
0.449	87	Weighted Average
0.397		88.31% Pervious Area
0.052		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	22	0.2844	0.66		**Sheet Flow, Sheet flow to swale** Fallow n= 0.050 P2= 1.81"
3.2	760	0.0137	3.96	7.92	**Channel Flow, Flow in swale** Area= 2.0 sf Perim= 8.3' r= 0.24' n= 0.017 Concrete, unfinished
0.4	202	0.0120	8.47	14.96	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.7	320	0.0093	7.45	13.17	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD through MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD to Basin** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
11.7	3,765	Total			

Subcatchment 28S: Post Dev. 11



Summary for Subcatchment C1: Post Dev. 6

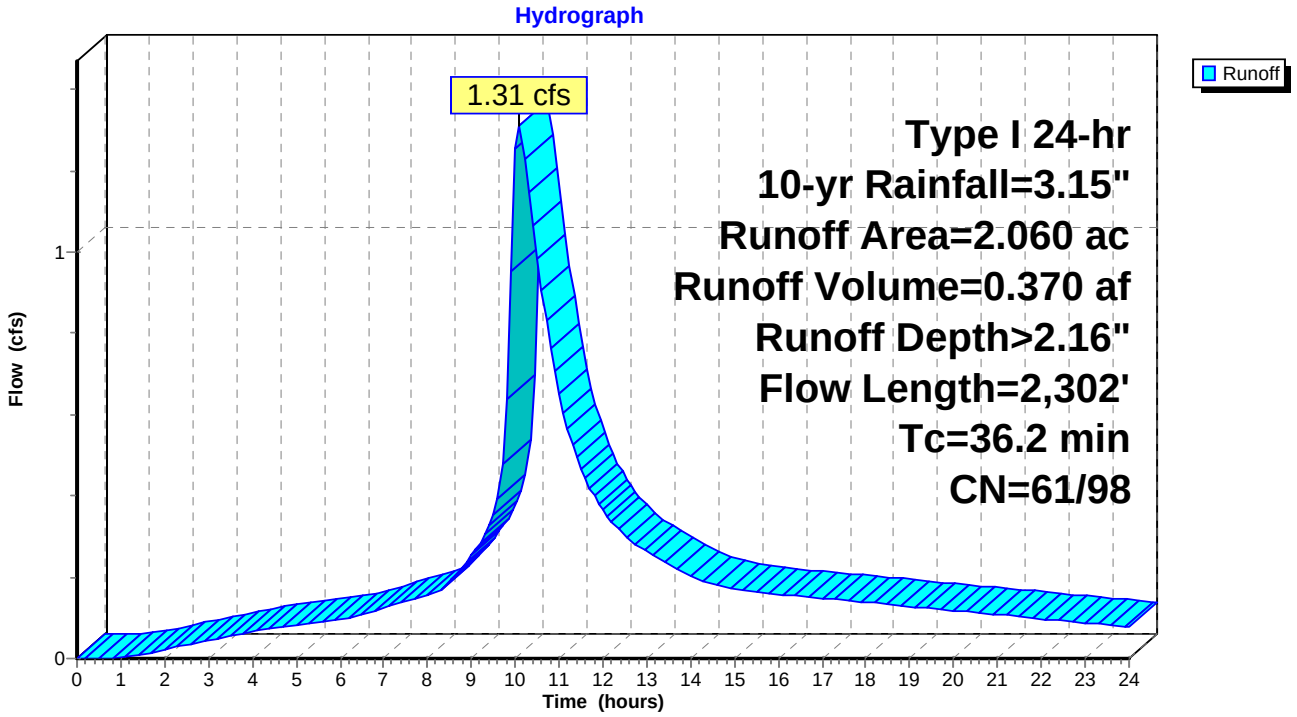
Runoff = 1.31 cfs @ 10.09 hrs, Volume= 0.370 af, Depth> 2.16"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
1.745	85	1/8 acre lots, 65% imp, HSG B
0.315	98	Paved roads w/curbs & sewers
2.060	87	Weighted Average
0.611		29.65% Pervious Area
1.449		70.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	180	0.0100	0.11		**Sheet Flow, Lot Flow** Grass: Short n= 0.150 P2= 1.81"
4.5	477	0.0075	1.76		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
36.2	2,302	Total			

Subcatchment C1: Post Dev. 6



Summary for Subcatchment C2: Post Dev. 5

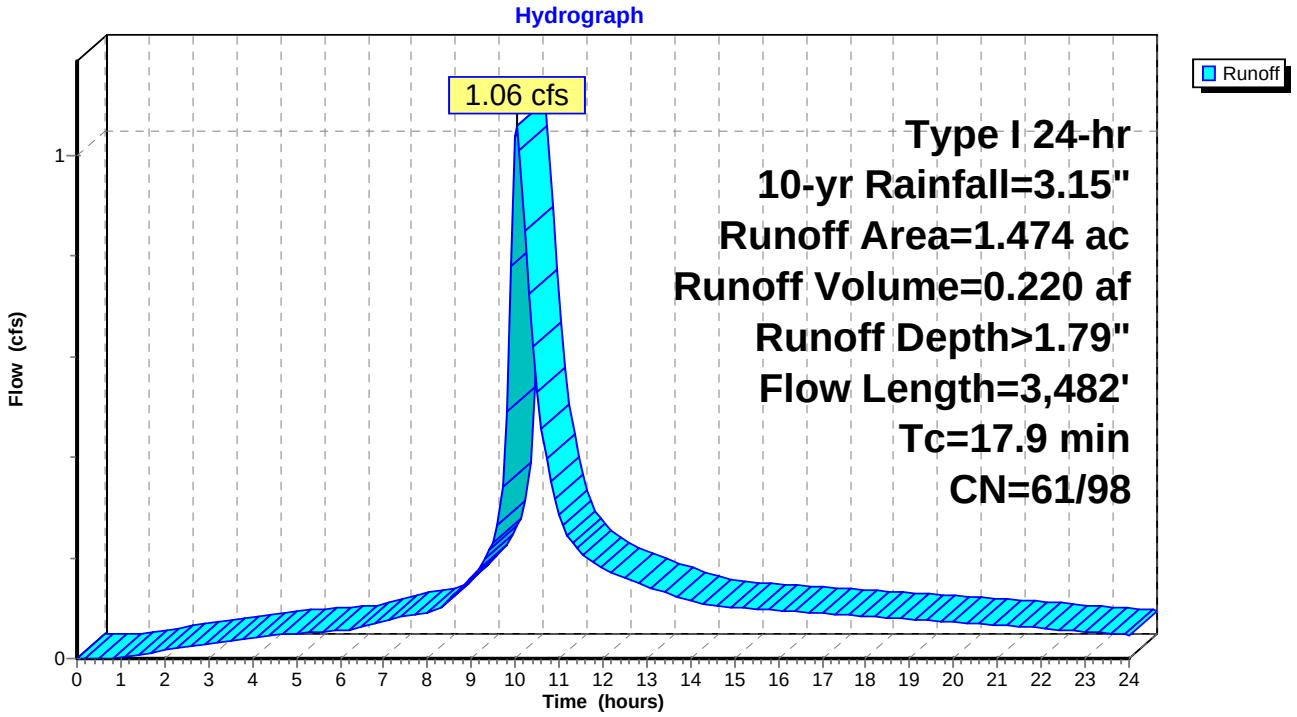
Runoff = 1.06 cfs @ 10.04 hrs, Volume= 0.220 af, Depth> 1.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
1.066	75	1/4 acre lots, 38% imp, HSG B
0.408	98	Paved roads w/curbs & sewers
1.474	81	Weighted Average
0.661		44.84% Pervious Area
0.813		55.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	169	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY GRASS SWALE** Grassed Waterway Kv= 15.0 fps
1.9	86	0.0100	0.76		**Sheet Flow, LOT SHEET FLOW/DRIVEWAY** Smooth surfaces n= 0.011 P2= 1.81"
0.3	38	0.0100	2.03		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.0	214	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.5	49	0.0073	1.73		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	28	0.0352	3.81		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.1	154	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	400	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.5	210	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.6	147	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.9	3,482	Total			

Subcatchment C2: Post Dev. 5



Summary for Subcatchment C3: Post Dev. 8

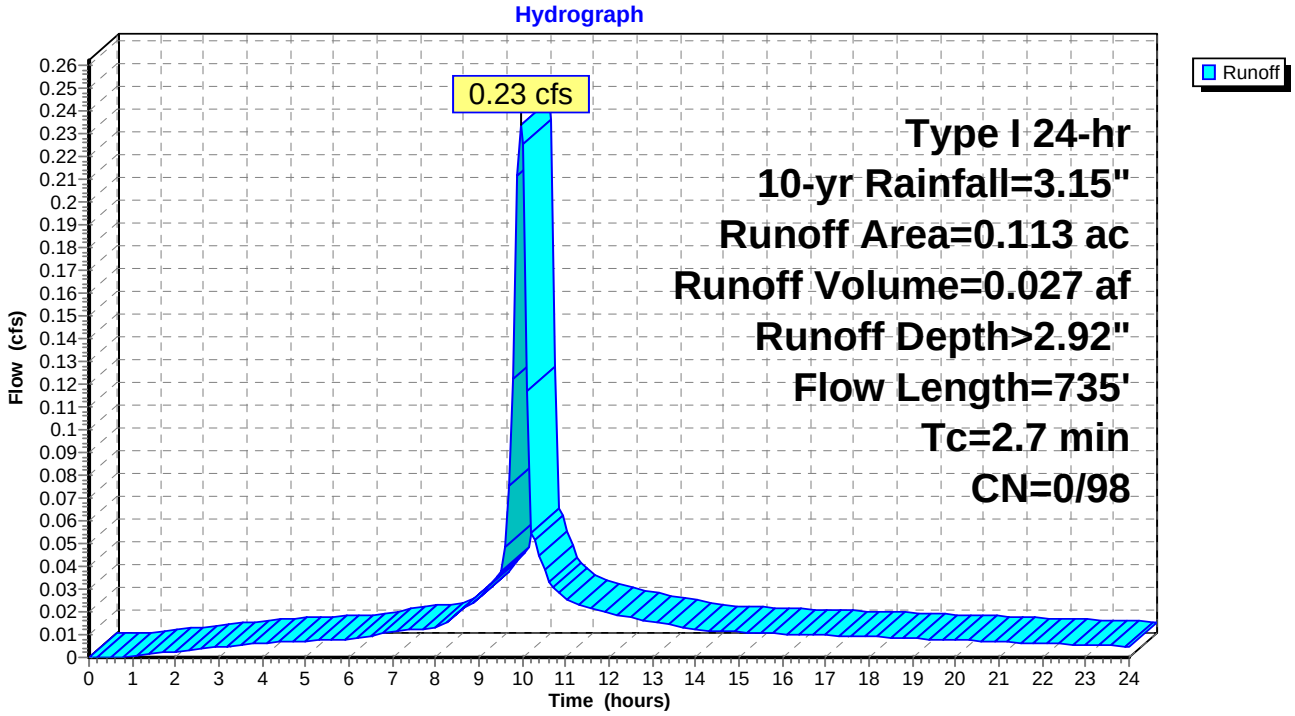
Runoff = 0.23 cfs @ 9.96 hrs, Volume= 0.027 af, Depth> 2.92"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 10-yr Rainfall=3.15"

Area (ac)	CN	Description
0.113	98	Paved roads w/curbs & sewers
0.113		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.0	31	0.1500	29.93	52.89	**Pipe Channel, SD FROM DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.8	629	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
2.7	735	Total			

Subcatchment C3: Post Dev. 8



Summary for Pond 11P: BASIN #1

Inflow Area = 31.018 ac, 52.38% Impervious, Inflow Depth > 1.82" for 10-yr event
Inflow = 19.94 cfs @ 10.05 hrs, Volume= 4.712 af
Outflow = 0.06 cfs @ 24.00 hrs, Volume= 0.012 af, Atten= 100%, Lag= 837.1 min
Primary = 0.06 cfs @ 24.00 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Peak Elev= 563.77' @ 24.00 hrs Surf.Area= 1.207 ac Storage= 4.696 af

Plug-Flow detention time= 1,260.8 min calculated for 0.012 af (0% of inflow)
Center-of-Mass det. time= 606.8 min (1,360.1 - 753.4)

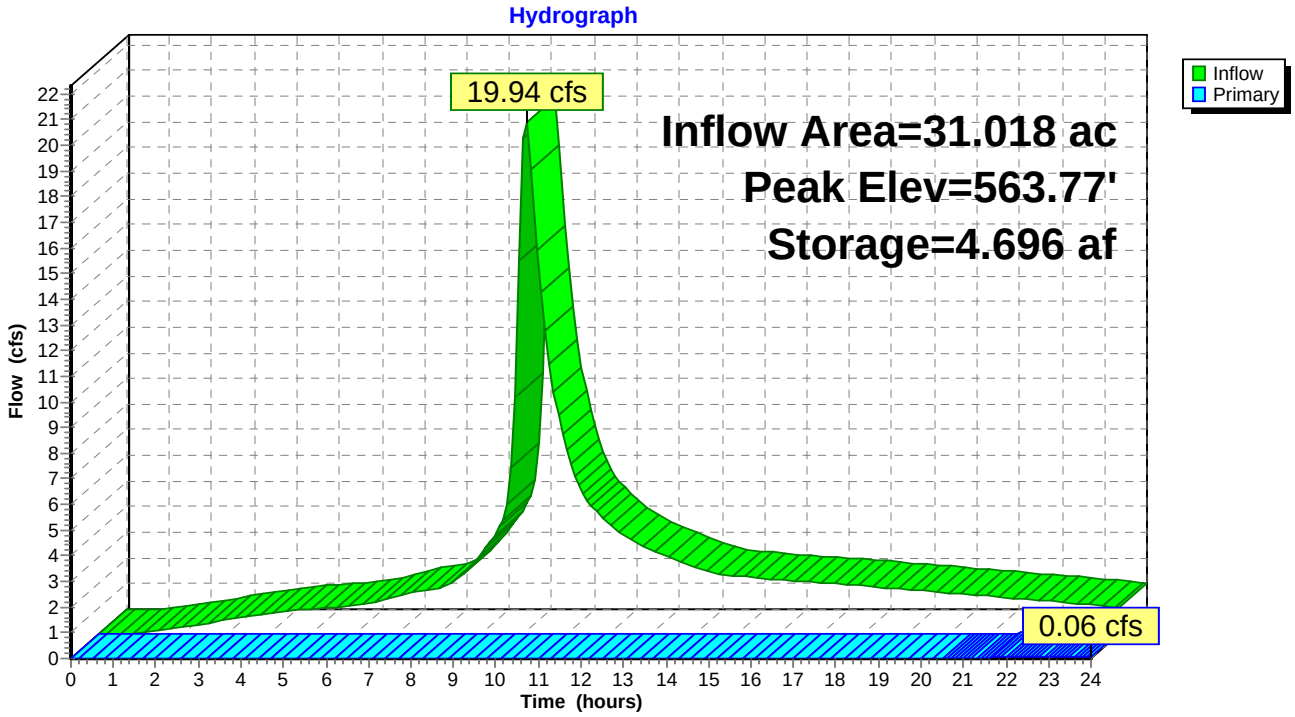
Volume	Invert	Avail.Storage	Storage Description
#1	559.00'	20.615 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
559.00	0.779	952.9	0.000	0.000	0.779
573.00	2.300	1,384.6	20.615	20.615	2.660

Device	Routing	Invert	Outlet Devices
#1	Primary	563.45'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	566.00'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	564.70'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	564.00'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	568.00'	**160.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.06 cfs @ 24.00 hrs HW=563.77' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.06 cfs @ 2.71 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: BASIN #1



Summary for Pond 15P: BASIN #2

Inflow Area = 2.545 ac, 35.67% Impervious, Inflow Depth > 1.34" for 10-yr event
Inflow = 1.99 cfs @ 9.97 hrs, Volume= 0.285 af
Outflow = 0.04 cfs @ 24.00 hrs, Volume= 0.012 af, Atten= 98%, Lag= 841.7 min
Primary = 0.04 cfs @ 24.00 hrs, Volume= 0.012 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 525.95' @ 24.00 hrs Surf.Area= 0.173 ac Storage= 0.272 af

Plug-Flow detention time= 1,100.6 min calculated for 0.012 af (4% of inflow)
Center-of-Mass det. time= 566.5 min (1,321.2 - 754.7)

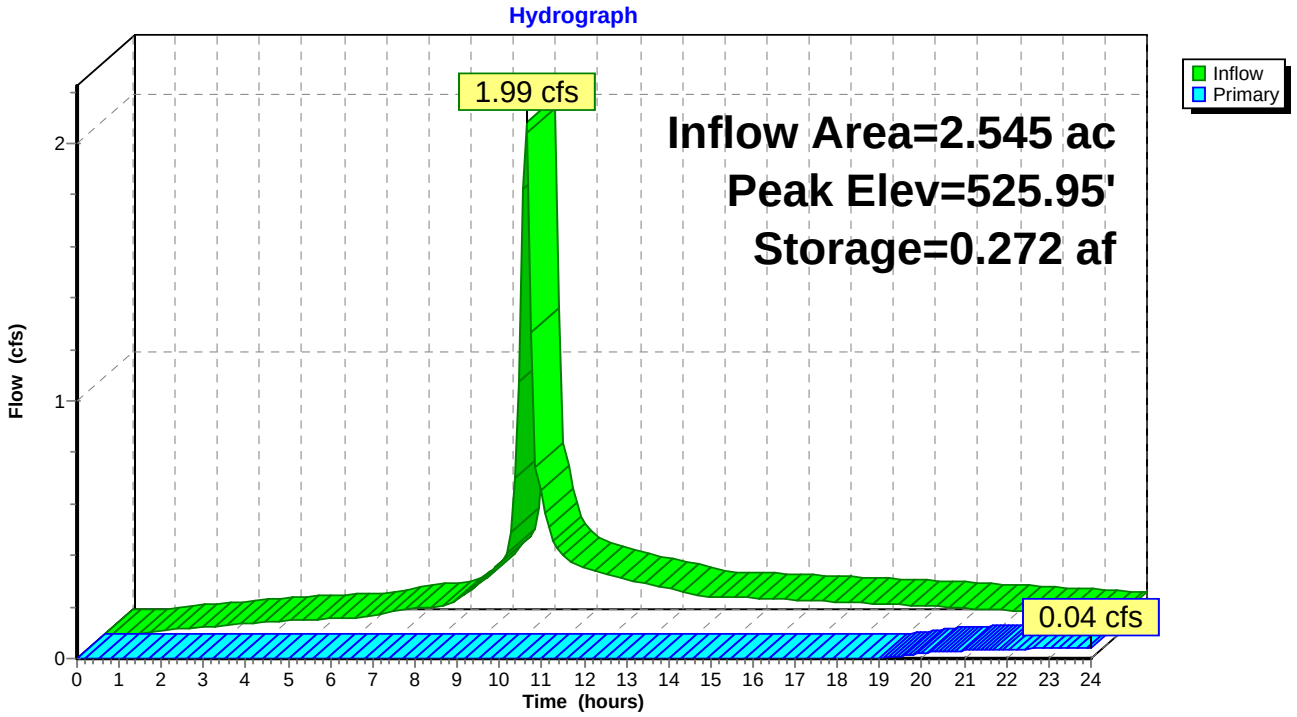
Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	0.474 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
524.00	0.109	314.9	0.000	0.000	0.109
527.00	0.213	427.1	0.474	0.474	0.263

Device	Routing	Invert	Outlet Devices
#1	Primary	525.80'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	527.00'	**40.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Primary	526.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.04 cfs @ 24.00 hrs HW=525.95' TW=103.00' (Fixed TW Elev= 103.00')
- **1=Orifice/Grate** (Orifice Controls 0.04 cfs @ 1.87 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Controls 0.00 cfs)

Pond 15P: BASIN #2

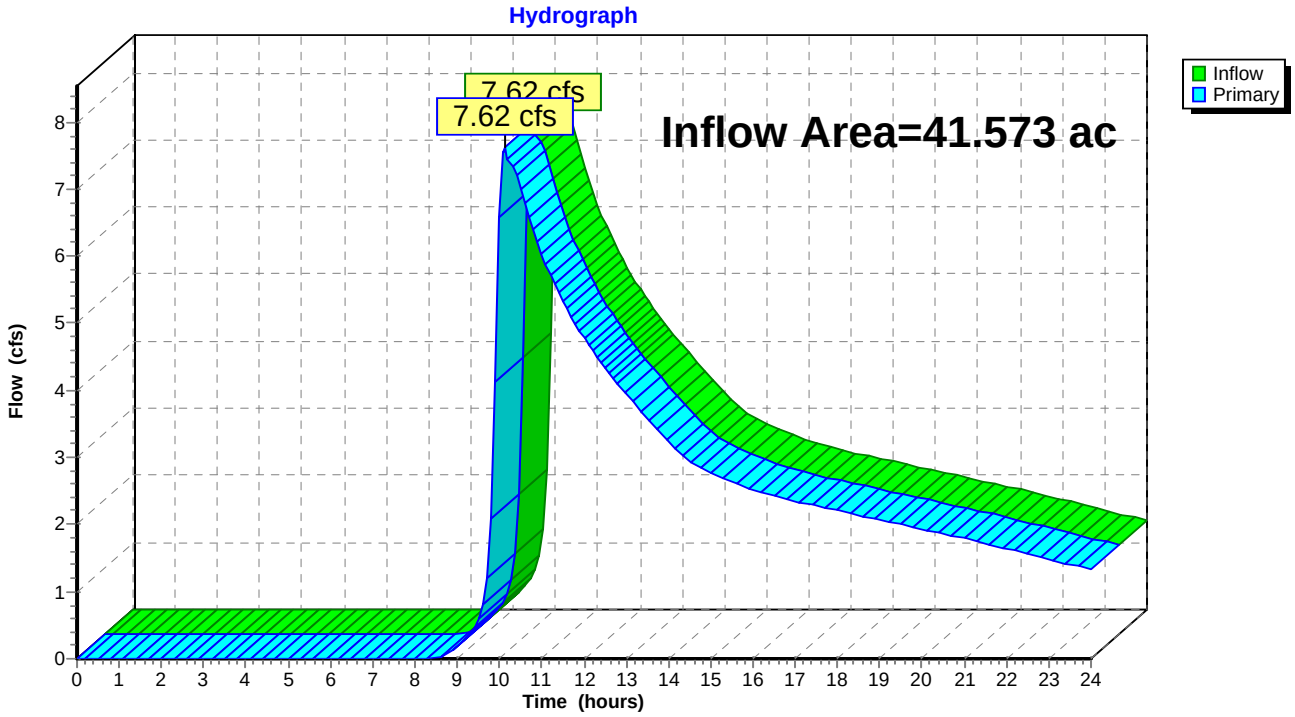


Summary for Pond 22P: Orcutt Creek

Inflow Area = 41.573 ac, 0.00% Impervious, Inflow Depth > 1.02" for 10-yr event
Inflow = 7.62 cfs @ 10.14 hrs, Volume= 3.522 af
Primary = 7.62 cfs @ 10.14 hrs, Volume= 3.522 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Pond 22P: Orcutt Creek



Time span=0.00-24.00 hrs, dt=0.10 hrs, 241 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 3S: Post Dev. 9 Runoff Area=8.408 ac 36.54% Impervious Runoff Depth>2.16"
Flow Length=3,415' Tc=37.4 min CN=73/98 Runoff=5.11 cfs 1.515 af

Subcatchment 10S: Post Dev. 2 Runoff Area=8.670 ac 66.89% Impervious Runoff Depth>2.61"
Flow Length=3,525' Tc=24.8 min CN=61/98 Runoff=7.95 cfs 1.887 af

Subcatchment 16S: Post Dev. 7 Runoff Area=3.572 ac 37.83% Impervious Runoff Depth>1.79"
Flow Length=2,912' Tc=13.8 min CN=61/98 Runoff=2.70 cfs 0.533 af

Subcatchment 17S: Post Dev. 1 Runoff Area=6.272 ac 57.34% Impervious Runoff Depth>2.35"
Flow Length=3,832' Tc=17.2 min CN=61/98 Runoff=6.06 cfs 1.226 af

Subcatchment 18S: Post Dev. 3 Runoff Area=0.212 ac 72.17% Impervious Runoff Depth>3.24"
Flow Length=630' Tc=1.9 min CN=86/98 Runoff=0.50 cfs 0.057 af

Subcatchment 19S: Post Dev. 4 Runoff Area=2.167 ac 27.17% Impervious Runoff Depth>1.49"
Flow Length=750' Tc=4.6 min CN=61/98 Runoff=1.80 cfs 0.269 af

Subcatchment 20S: Post Dev. C Runoff Area=32.794 ac 0.00% Impervious Runoff Depth>1.54"
Flow Length=2,582' Tc=73.5 min CN=76/0 Runoff=8.80 cfs 4.210 af

Subcatchment 21S: Post Dev. E Runoff Area=8.148 ac 0.00% Impervious Runoff Depth>1.20"
Flow Length=869' Tc=16.3 min CN=70/0 Runoff=3.54 cfs 0.812 af

Subcatchment 25S: Post Dev. A Runoff Area=0.631 ac 0.00% Impervious Runoff Depth>1.19"
Flow Length=1,072' Tc=24.3 min CN=70/0 Runoff=0.22 cfs 0.063 af

Subcatchment 27S: Post Dev. 10 Runoff Area=0.166 ac 100.00% Impervious Runoff Depth>3.57"
Flow Length=303' Tc=1.3 min CN=0/98 Runoff=0.44 cfs 0.049 af

Subcatchment 28S: Post Dev. 11 Runoff Area=0.449 ac 11.69% Impervious Runoff Depth>2.43"
Flow Length=3,765' Tc=11.7 min CN=85/98 Runoff=0.58 cfs 0.091 af

Subcatchment C1: Post Dev. 6 Runoff Area=2.060 ac 70.35% Impervious Runoff Depth>2.70"
Flow Length=2,302' Tc=36.2 min CN=61/98 Runoff=1.63 cfs 0.464 af

Subcatchment C2: Post Dev. 5 Runoff Area=1.474 ac 55.16% Impervious Runoff Depth>2.28"
Flow Length=3,482' Tc=17.9 min CN=61/98 Runoff=1.35 cfs 0.280 af

Subcatchment C3: Post Dev. 8 Runoff Area=0.113 ac 100.00% Impervious Runoff Depth>3.57"
Flow Length=735' Tc=2.7 min CN=0/98 Runoff=0.28 cfs 0.034 af

Pond 11P: BASIN #1 Peak Elev=564.74' Storage=5.920 af Inflow=25.64 cfs 6.030 af
Outflow=0.26 cfs 0.105 af

Pond 15P: BASIN #2 Peak Elev=526.04' Storage=0.287 af Inflow=2.70 cfs 0.376 af
Outflow=0.16 cfs 0.092 af

Pond 22P: Orcutt Creek

Inflow=12.35 cfs 5.085 af
Primary=12.35 cfs 5.085 af

Total Runoff Area = 75.136 ac Runoff Volume = 11.490 af Average Runoff Depth = 1.84"
77.17% Pervious = 57.981 ac 22.83% Impervious = 17.155 ac

Summary for Subcatchment 3S: Post Dev. 9

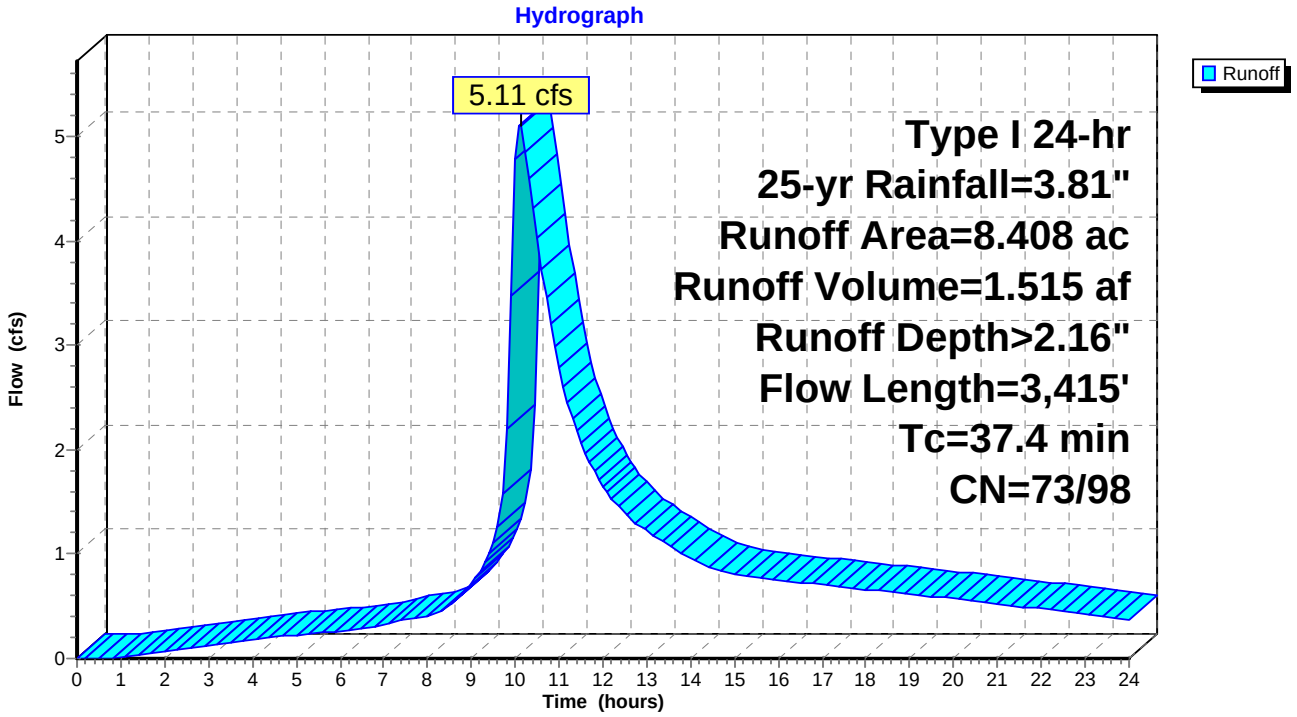
Runoff = 5.11 cfs @ 10.11 hrs, Volume= 1.515 af, Depth> 2.16"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
3.813	85	1/8 acre lots, 65% imp, HSG B
0.745	61	>75% Grass cover, Good, HSG B
0.558	98	Paved roads w/curbs & sewers
2.016	86	Newly graded area, HSG B
0.868	69	Pasture/grassland/range, Fair, HSG B
0.337	85	Gravel roads, HSG B
0.071	89	Paved roads w/open ditches, 50% imp, HSG B
8.408	82	Weighted Average
5.336		63.46% Pervious Area
3.072		36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0950	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
14.8	1,286	0.0093	1.45		**Shallow Concentrated Flow, NATURAL SWALE AT BOUNDARY** Grassed Waterway Kv= 15.0 fps
0.3	9	0.1720	0.45		**Sheet Flow, SHEET FLOW TO PATH** Fallow n= 0.050 P2= 1.81"
10.4	233	0.0210	0.37		**Sheet Flow, GRAVEL PATH** Fallow n= 0.050 P2= 1.81"
4.1	35	0.0444	0.14		**Sheet Flow, FLOW OFF PATH TO SWALE** Grass: Short n= 0.150 P2= 1.81"
0.8	104	0.0200	2.12		**Shallow Concentrated Flow, NATURAL SWALE TO GUTTER** Grassed Waterway Kv= 15.0 fps
0.7	81	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN #1** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
37.4	3,415	Total			

Subcatchment 3S: Post Dev. 9



Summary for Subcatchment 10S: Post Dev. 2

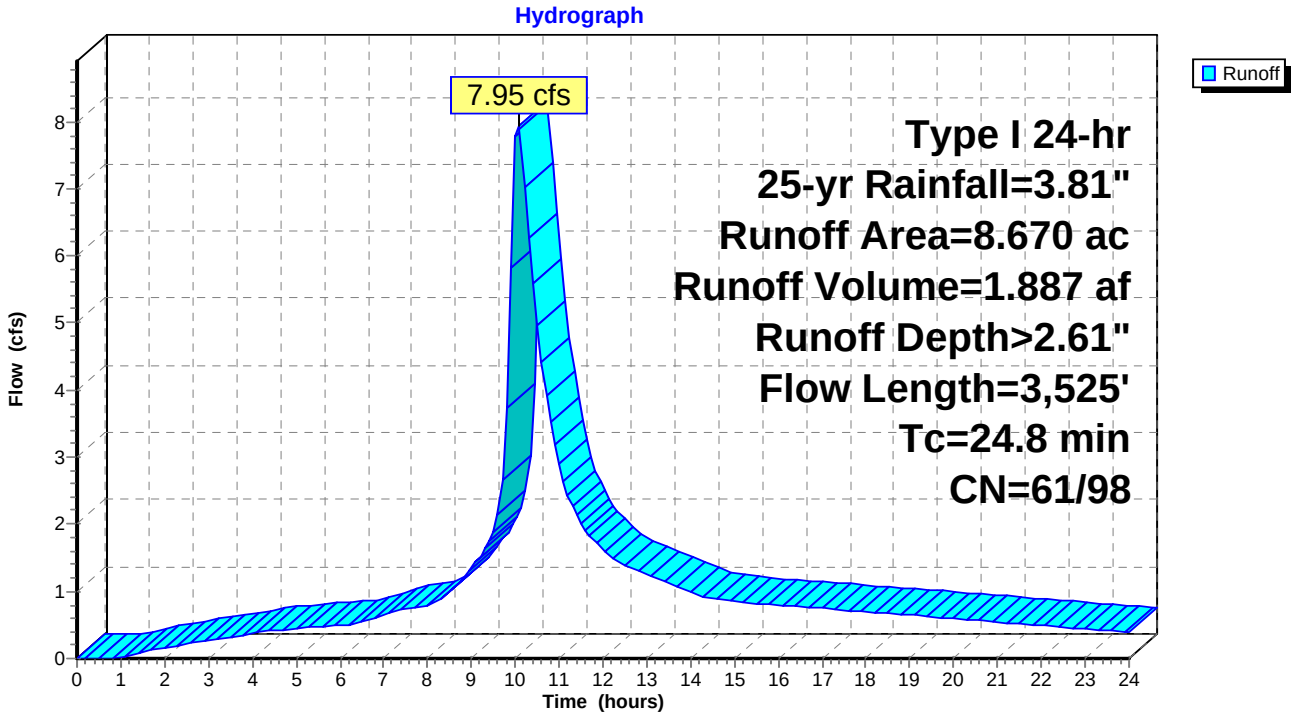
Runoff = 7.95 cfs @ 10.06 hrs, Volume= 1.887 af, Depth> 2.61"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
8.202	85	1/8 acre lots, 65% imp, HSG B
0.468	98	Paved roads w/curbs & sewers
8.670	86	Weighted Average
2.871		33.11% Pervious Area
5.799		66.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	69	0.0396	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
0.3	30	0.0100	1.50		**Shallow Concentrated Flow, FLOW TO DWY GUTTER** Grassed Waterway Kv= 15.0 fps
8.4	723	0.0050	1.44		**Shallow Concentrated Flow, DWY GUTTER FLOW** Paved Kv= 20.3 fps
0.0	23	0.2812	10.76		**Shallow Concentrated Flow, DWY GUTTER TO ROAD GUTTER** Paved Kv= 20.3 fps
1.9	219	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
24.8	3,525	Total			

Subcatchment 10S: Post Dev. 2



Summary for Subcatchment 16S: Post Dev. 7

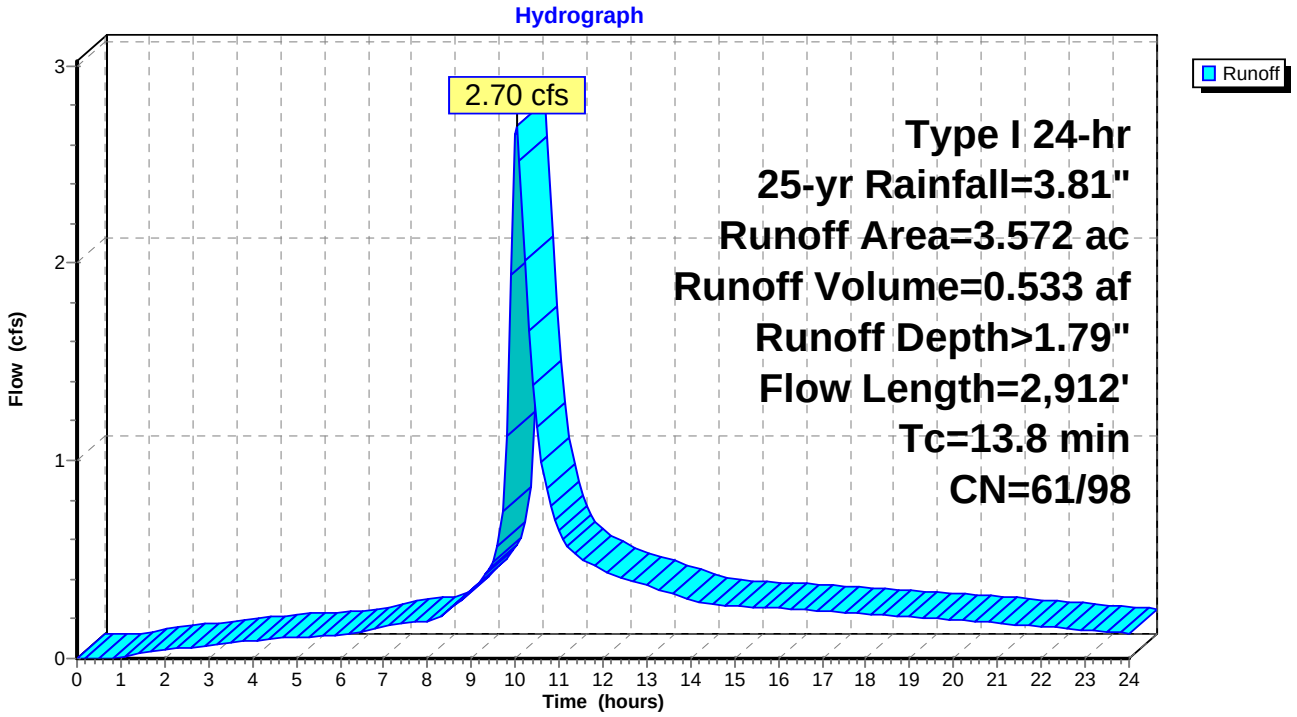
Runoff = 2.70 cfs @ 10.03 hrs, Volume= 0.533 af, Depth> 1.79"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
2.877	75	1/4 acre lots, 38% imp, HSG B
0.437	61	>75% Grass cover, Good, HSG B
0.258	98	Paved roads w/curbs & sewers
3.572	75	Weighted Average
2.221		62.17% Pervious Area
1.351		37.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	24	0.0675	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
1.1	145	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	396	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.4	203	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	157	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
13.8	2,912	Total			

Subcatchment 16S: Post Dev. 7



Summary for Subcatchment 17S: Post Dev. 1

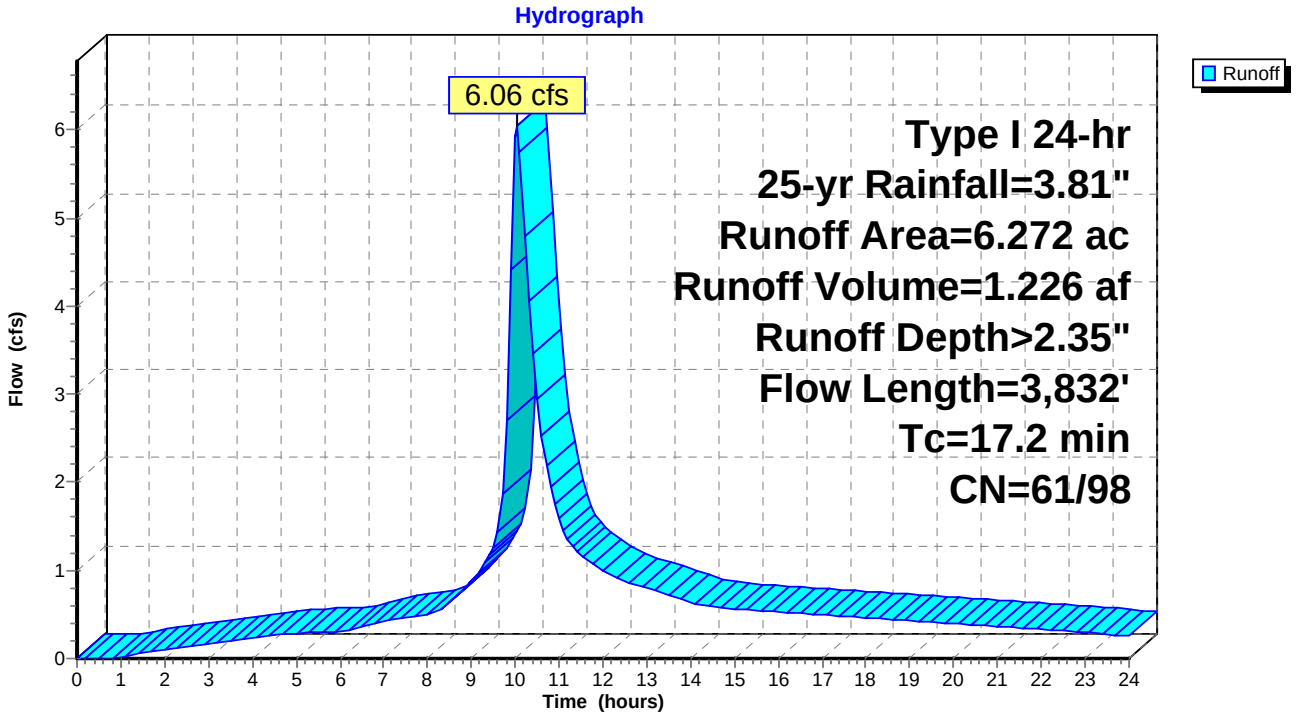
Runoff = 6.06 cfs @ 10.04 hrs, Volume= 1.226 af, Depth> 2.35"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
2.520	75	1/4 acre lots, 38% imp, HSG B
3.180	85	1/8 acre lots, 65% imp, HSG B
0.572	98	Paved roads w/curbs & sewers
6.272	82	Weighted Average
2.675		42.66% Pervious Area
3.597		57.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	11	0.2000	0.21		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
0.8	173	0.0300	3.52		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	121	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
3.4	503	0.0146	2.45		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
4.5	525	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	38	0.0050	5.46	9.66	**Pipe Channel, DI# TO DI#2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.2	3,832	Total			

Subcatchment 17S: Post Dev. 1



Summary for Subcatchment 18S: Post Dev. 3

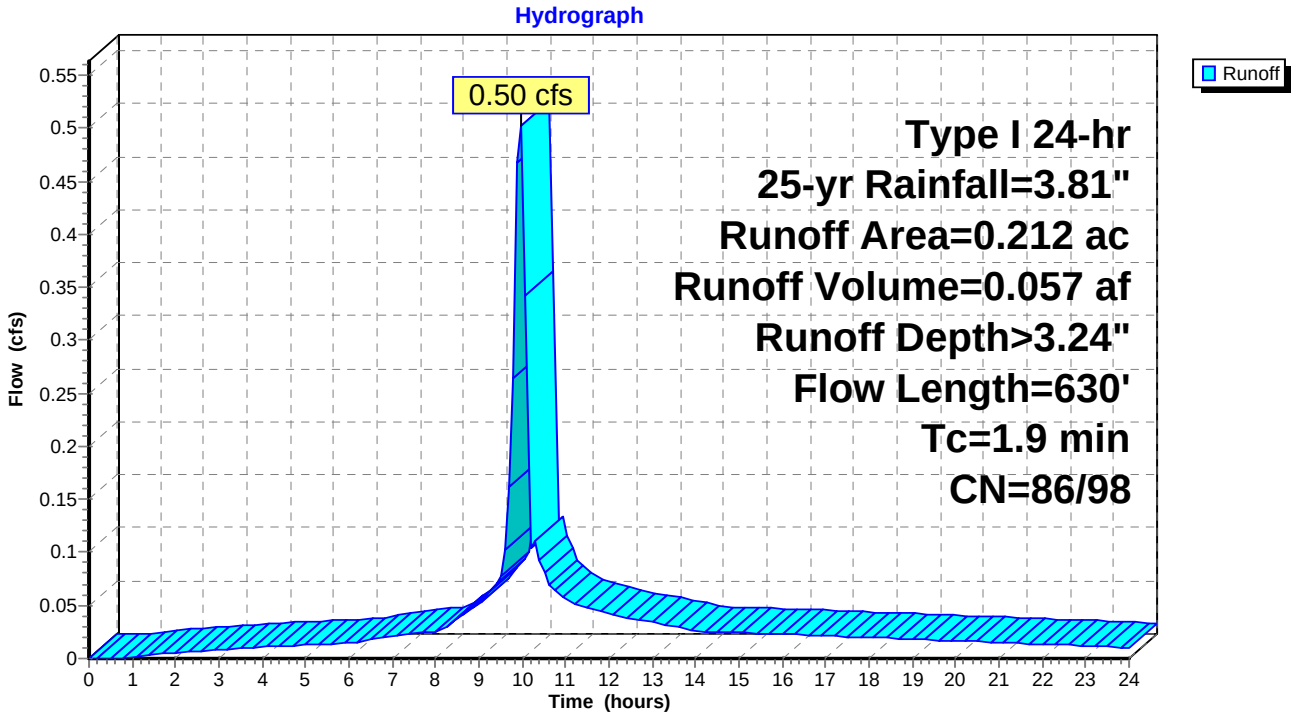
Runoff = 0.50 cfs @ 9.95 hrs, Volume= 0.057 af, Depth> 3.24"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
0.153	98	Paved roads w/curbs & sewers
0.059	86	Newly graded area, HSG B
0.212	95	Weighted Average
0.059		27.83% Pervious Area
0.153		72.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	16	0.0200	0.72		**Sheet Flow, CROWN TO GUTTER** Smooth surfaces n= 0.011 P2= 1.81"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	111	0.0758	5.59		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	65	0.1234	7.13		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	61	0.1332	7.41		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	101	0.1084	6.68		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	56	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	24	0.0100	7.73	13.66	**Pipe Channel, DI TO DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.9	630	Total			

Subcatchment 18S: Post Dev. 3



Summary for Subcatchment 19S: Post Dev. 4

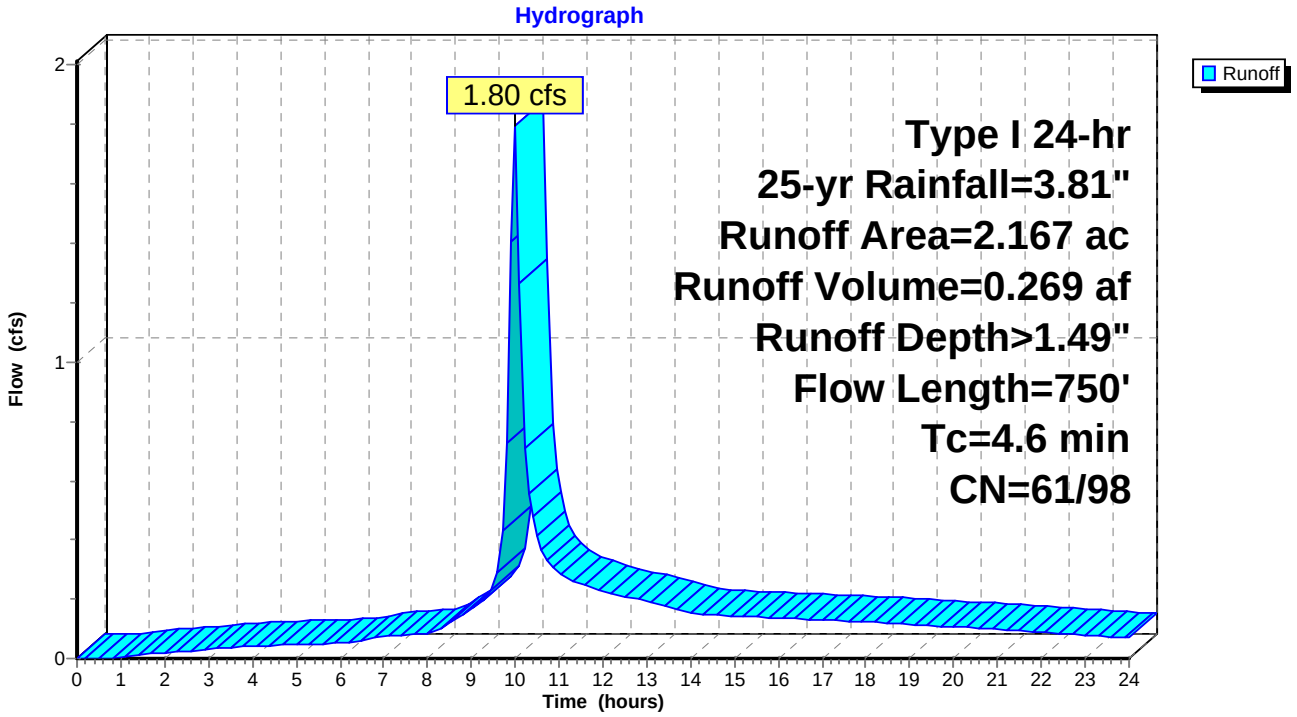
Runoff = 1.80 cfs @ 9.99 hrs, Volume= 0.269 af, Depth> 1.49"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
0.723	75	1/4 acre lots, 38% imp, HSG B
1.121	61	>75% Grass cover, Good, HSG B
0.305	98	Paved roads w/curbs & sewers
0.018	89	Paved roads w/open ditches, 50% imp, HSG B
2.167	71	Weighted Average
1.578		72.83% Pervious Area
0.589		27.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	28	0.5100	0.36		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
2.0	184	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY SWALE** Grassed Waterway Kv= 15.0 fps
0.8	290	0.0900	6.09		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	76	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
4.6	750	Total			

Subcatchment 19S: Post Dev. 4



Summary for Subcatchment 20S: Post Dev. C

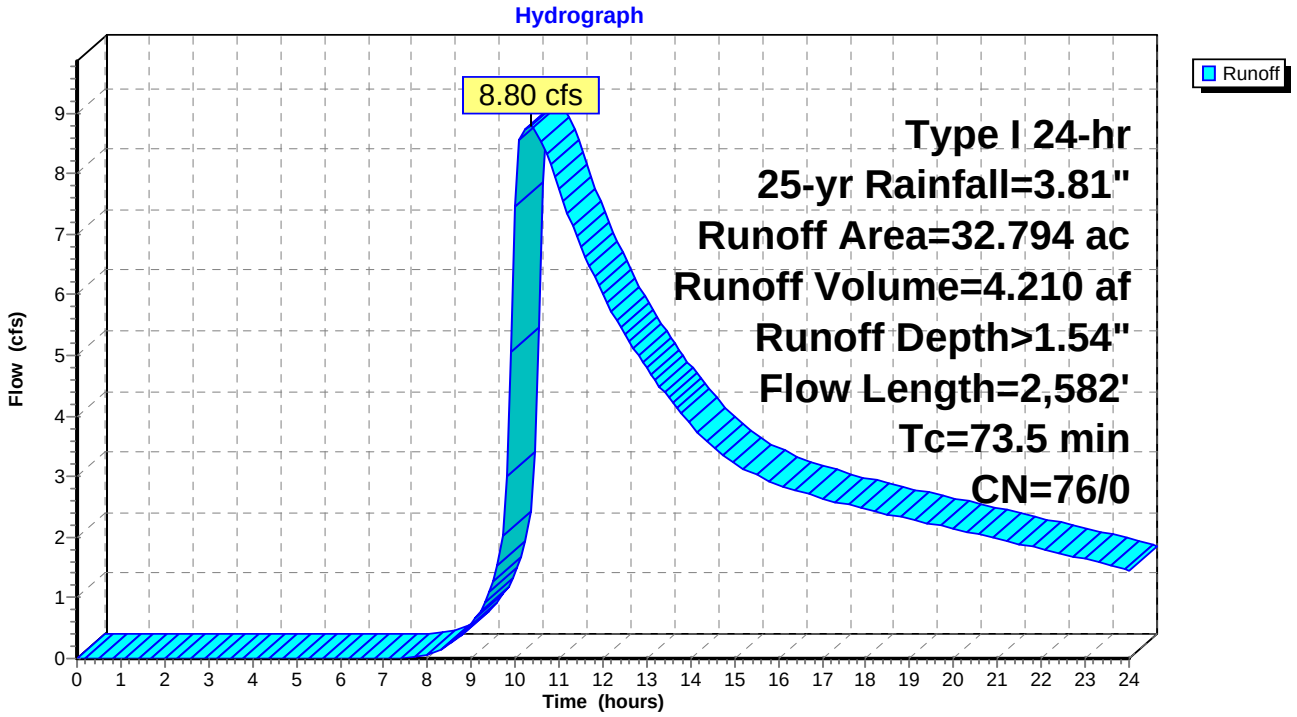
Runoff = 8.80 cfs @ 10.34 hrs, Volume= 4.210 af, Depth> 1.54"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
13.544	69	Pasture/grassland/range, Fair, HSG B
2.893	86	Newly graded area, HSG B
0.831	82	Dirt roads, HSG B
15.526	79	Pasture/grassland/range, Fair, HSG C
32.794	76	Weighted Average
32.794		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.8	300	0.0271	0.20		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
16.9	186	0.0271	0.18		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
8.8	442	0.0070	0.84		**Shallow Concentrated Flow, Flow at toe of path slope** Nearly Bare & Untilled Kv= 10.0 fps
2.1	303	0.0220	2.39		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
7.8	465	0.0200	0.99		**Shallow Concentrated Flow, Undeveloped flow to toe** Short Grass Pasture Kv= 7.0 fps
8.5	405	0.0028	0.79		**Shallow Concentrated Flow, Flow at toe of slope** Grassed Waterway Kv= 15.0 fps
0.7	49	0.0051	1.15		**Shallow Concentrated Flow, Flow at toe of slope** Unpaved Kv= 16.1 fps
3.2	393	0.0160	2.04		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
0.4	18	0.0020	0.72		**Shallow Concentrated Flow, Flow across path** Unpaved Kv= 16.1 fps
0.3	21	0.0391	1.38		**Shallow Concentrated Flow, Flow to creek** Short Grass Pasture Kv= 7.0 fps
73.5	2,582	Total			

Subcatchment 20S: Post Dev. C



Summary for Subcatchment 21S: Post Dev. E

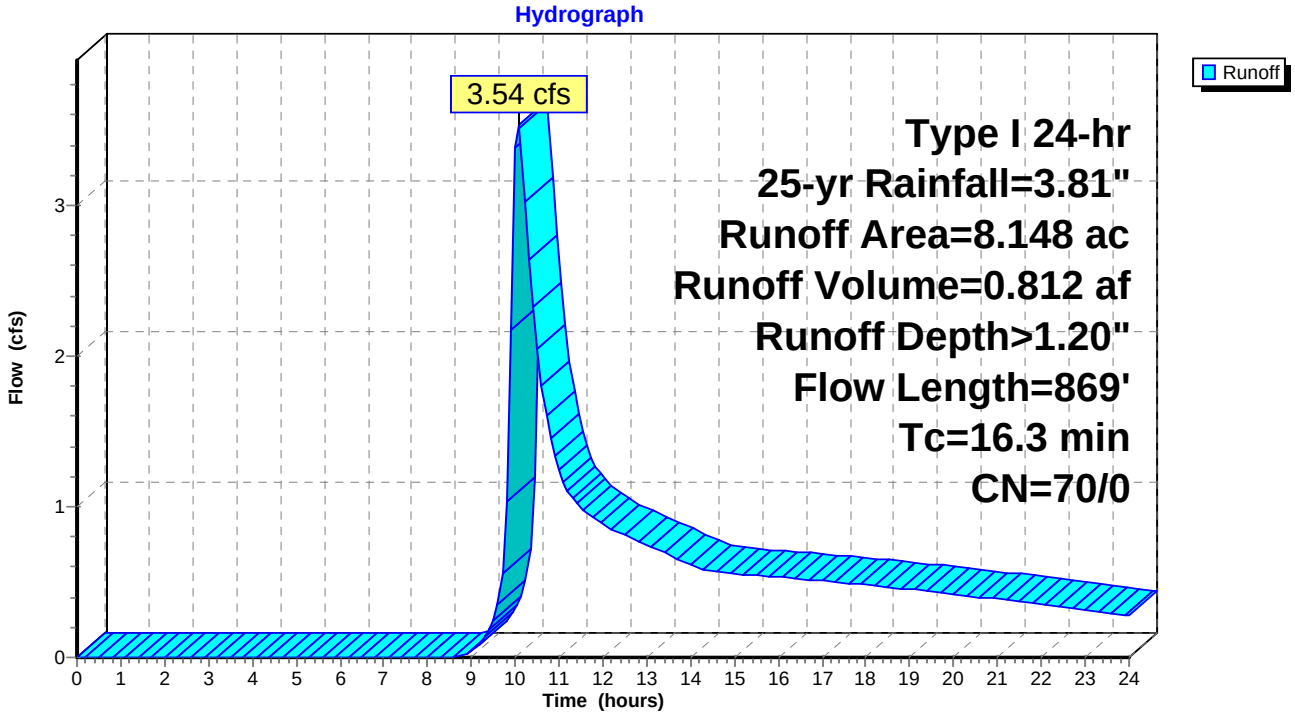
Runoff = 3.54 cfs @ 10.07 hrs, Volume= 0.812 af, Depth> 1.20"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
7.441	69	Pasture/grassland/range, Fair, HSG B
0.707	86	Newly graded area, HSG B
8.148	70	Weighted Average
8.148		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	18	0.5000	0.79		**Sheet Flow, Flow from graded area** Fallow n= 0.050 P2= 1.81"
9.0	189	0.1360	0.35		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
6.9	662	0.0520	1.60		**Shallow Concentrated Flow, Flow at boundary** Short Grass Pasture Kv= 7.0 fps
16.3	869	Total			

Subcatchment 21S: Post Dev. E



Summary for Subcatchment 25S: Post Dev. A

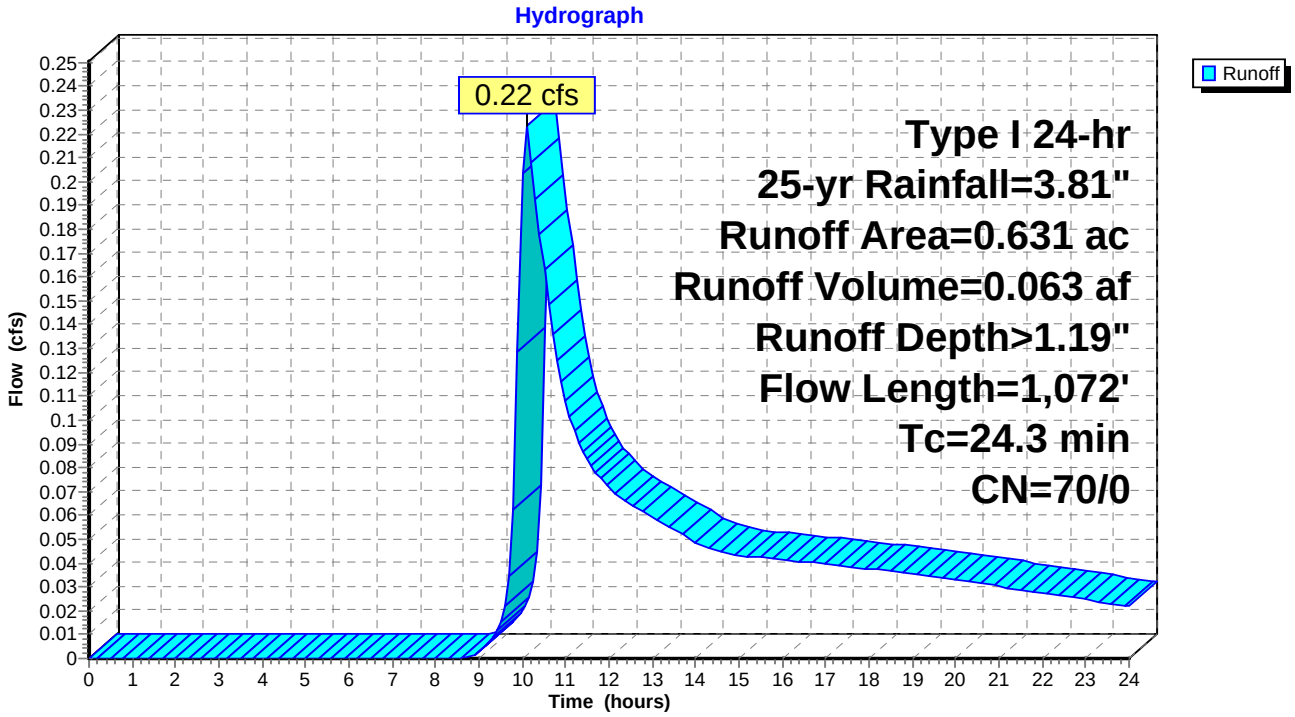
Runoff = 0.22 cfs @ 10.11 hrs, Volume= 0.063 af, Depth> 1.19"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
0.055	86	Newly graded area, HSG B
0.576	69	Pasture/grassland/range, Fair, HSG B
0.631	70	Weighted Average
0.631		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	39	0.0180	0.11		**Sheet Flow, Sheet flow to swale** Range n= 0.130 P2= 1.81"
11.6	789	0.0164	1.14	0.80	**Channel Flow, Concrete channel** Area= 0.7 sf Perim= 6.0' r= 0.12' n= 0.040 Earth, cobble bottom, clean sides
4.6	41	0.0350	0.15		**Sheet Flow, Flow from swale to undeveloped** Range n= 0.130 P2= 1.81"
0.9	26	0.8900	0.50		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
1.5	177	0.0750	1.92		**Shallow Concentrated Flow, Undeveloped shallow flow** Short Grass Pasture Kv= 7.0 fps
24.3	1,072	Total			

Subcatchment 25S: Post Dev. A



Summary for Subcatchment 27S: Post Dev. 10

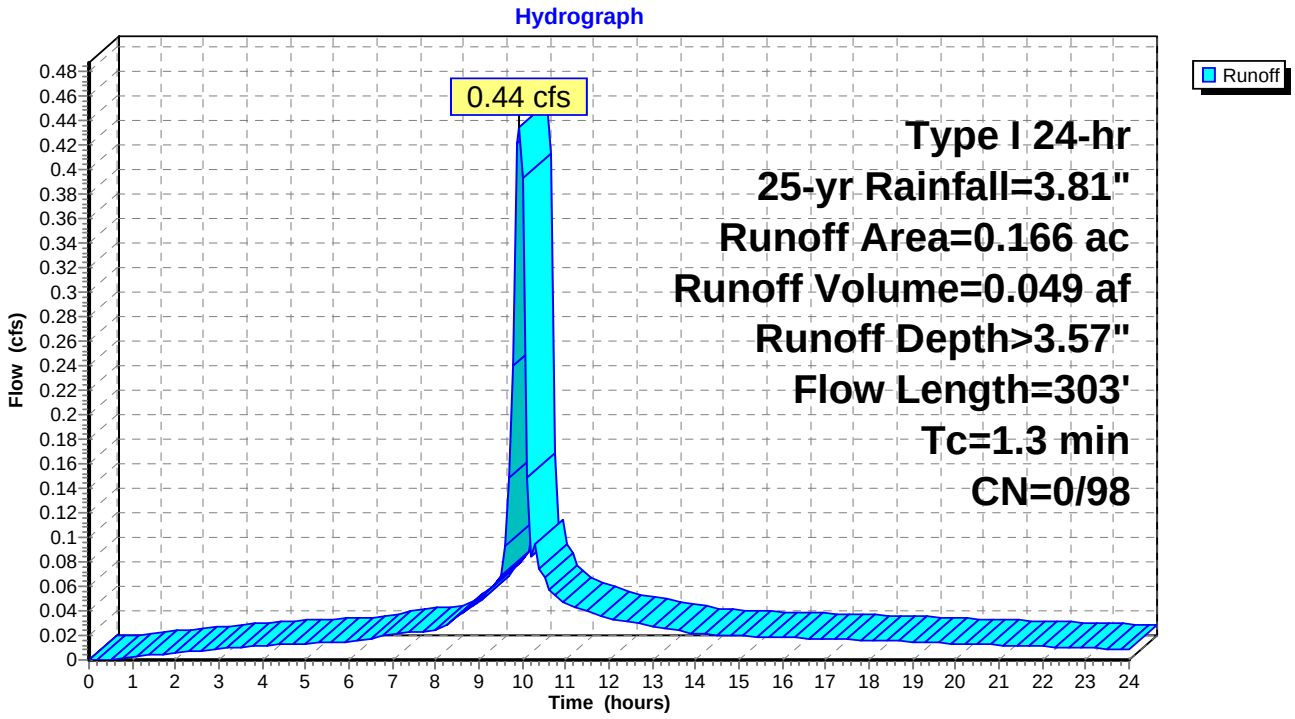
Runoff = 0.44 cfs @ 9.94 hrs, Volume= 0.049 af, Depth> 3.57"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
0.166	98	Paved roads w/curbs & sewers
0.166		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	12	0.0200	0.68		**Sheet Flow, Flow from Crown to Curb** Smooth surfaces n= 0.011 P2= 1.81"
0.4	133	0.0600	4.97		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.5	111	0.0367	3.89		**Shallow Concentrated Flow, Gutter Flow to DI** Paved Kv= 20.3 fps
0.1	47	0.0050	5.46	9.66	**Pipe Channel, SD Flow to Basin** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.3	303	Total			

Subcatchment 27S: Post Dev. 10



Summary for Subcatchment 28S: Post Dev. 11

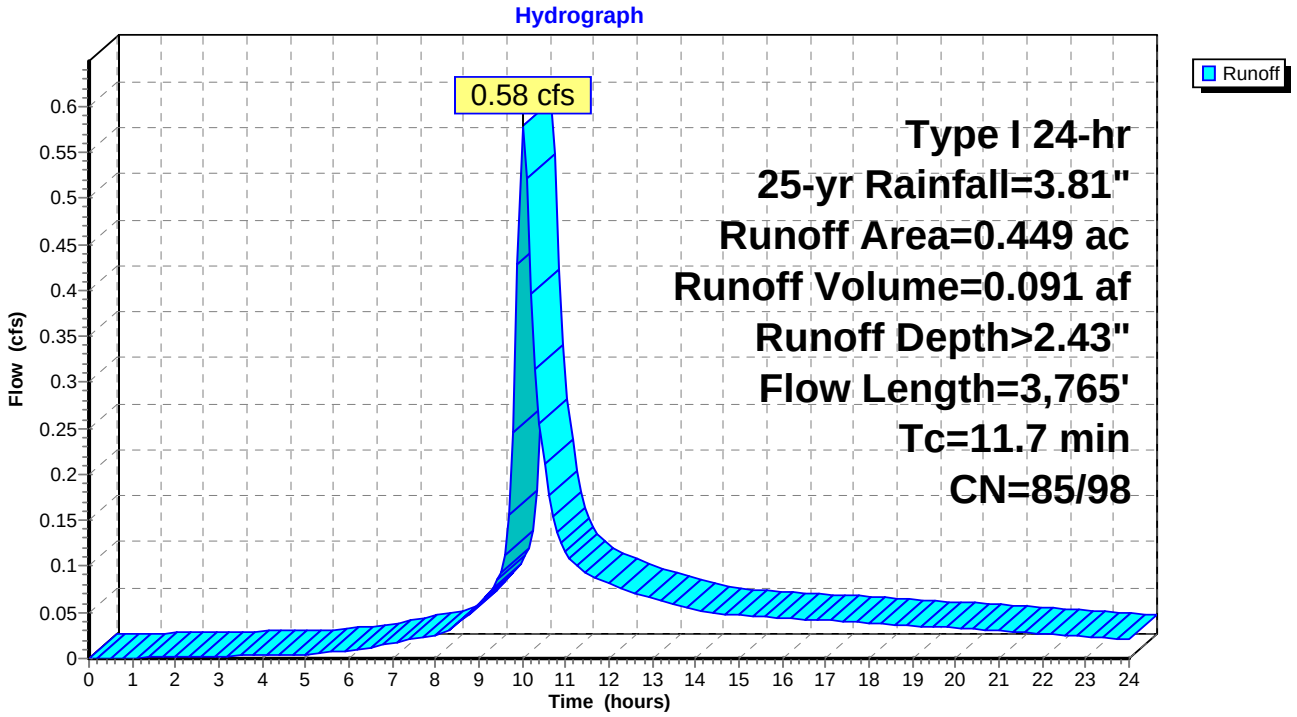
Runoff = 0.58 cfs @ 10.02 hrs, Volume= 0.091 af, Depth> 2.43"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
0.105	89	Paved roads w/open ditches, 50% imp, HSG B
0.344	86	Newly graded area, HSG B
0.449	87	Weighted Average
0.397		88.31% Pervious Area
0.052		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	22	0.2844	0.66		**Sheet Flow, Sheet flow to swale** Fallow n= 0.050 P2= 1.81"
3.2	760	0.0137	3.96	7.92	**Channel Flow, Flow in swale** Area= 2.0 sf Perim= 8.3' r= 0.24' n= 0.017 Concrete, unfinished
0.4	202	0.0120	8.47	14.96	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.7	320	0.0093	7.45	13.17	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD through MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD to Basin** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
11.7	3,765	Total			

Subcatchment 28S: Post Dev. 11



Summary for Subcatchment C1: Post Dev. 6

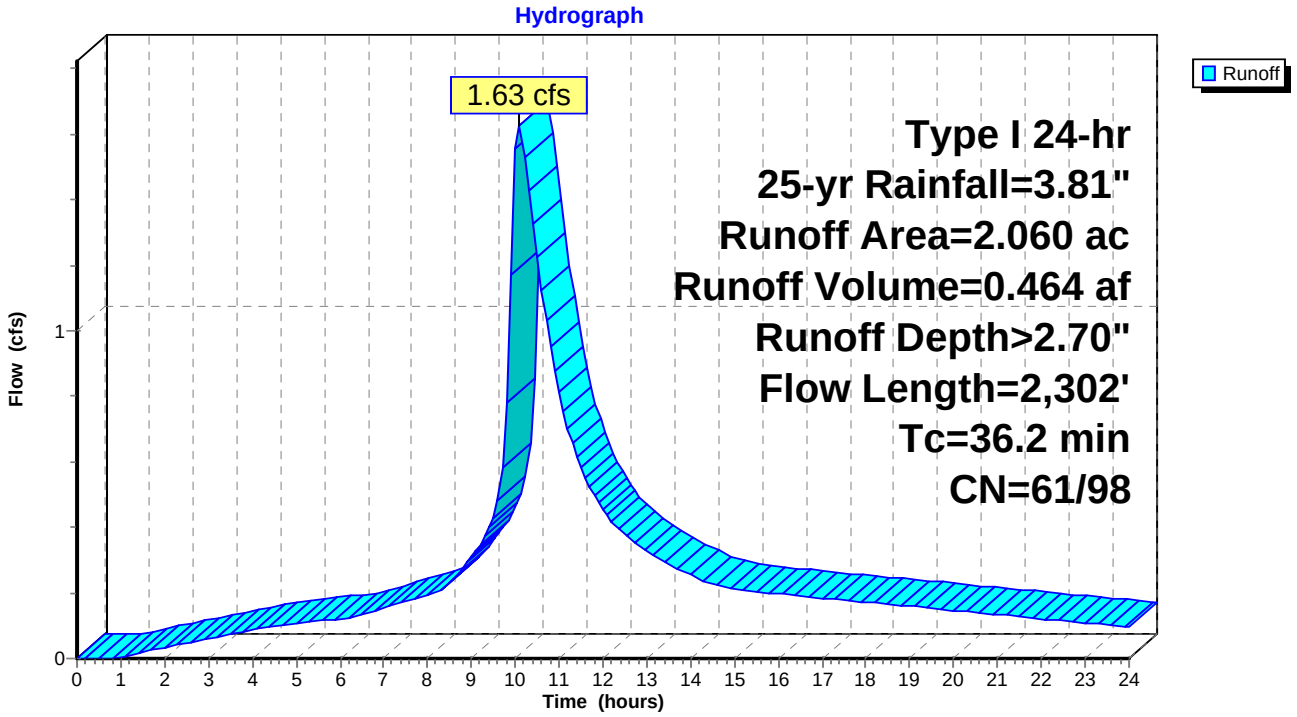
Runoff = 1.63 cfs @ 10.09 hrs, Volume= 0.464 af, Depth> 2.70"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
1.745	85	1/8 acre lots, 65% imp, HSG B
0.315	98	Paved roads w/curbs & sewers
2.060	87	Weighted Average
0.611		29.65% Pervious Area
1.449		70.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	180	0.0100	0.11		**Sheet Flow, Lot Flow** Grass: Short n= 0.150 P2= 1.81"
4.5	477	0.0075	1.76		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
36.2	2,302	Total			

Subcatchment C1: Post Dev. 6



Summary for Subcatchment C2: Post Dev. 5

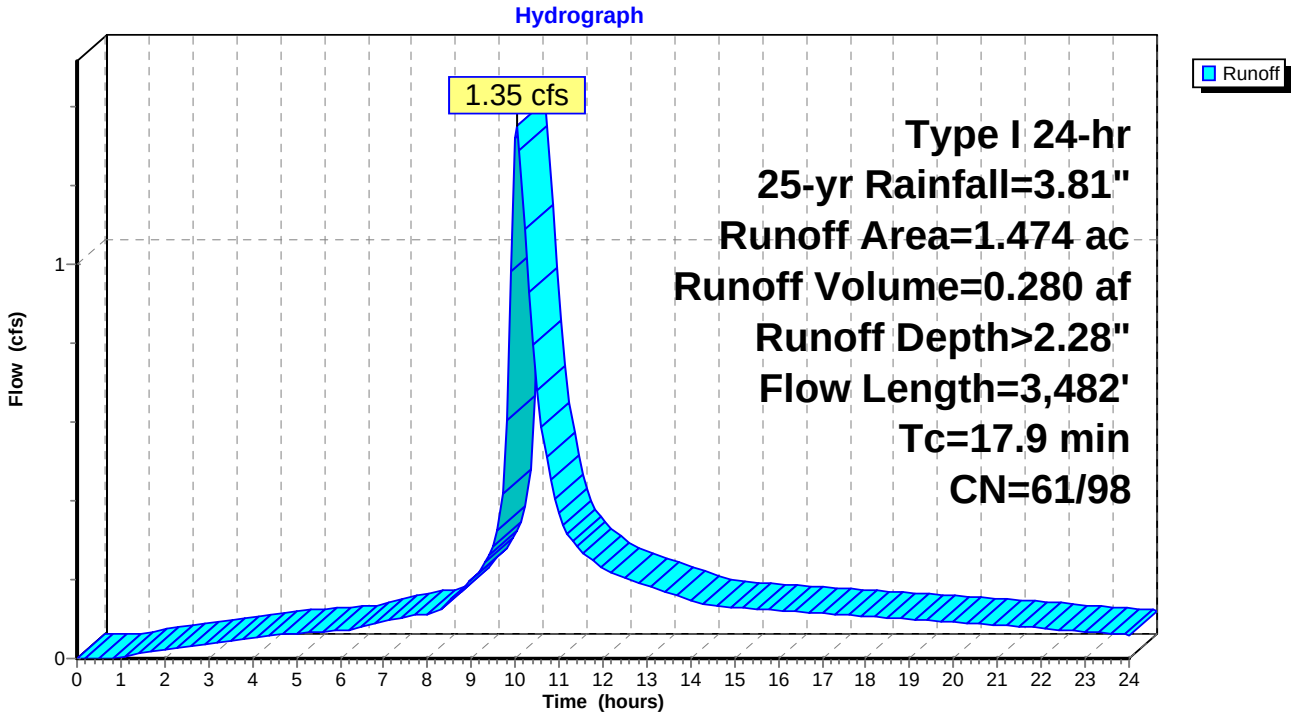
Runoff = 1.35 cfs @ 10.04 hrs, Volume= 0.280 af, Depth> 2.28"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
1.066	75	1/4 acre lots, 38% imp, HSG B
0.408	98	Paved roads w/curbs & sewers
1.474	81	Weighted Average
0.661		44.84% Pervious Area
0.813		55.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	169	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY GRASS SWALE** Grassed Waterway Kv= 15.0 fps
1.9	86	0.0100	0.76		**Sheet Flow, LOT SHEET FLOW/DRIVEWAY** Smooth surfaces n= 0.011 P2= 1.81"
0.3	38	0.0100	2.03		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.0	214	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.5	49	0.0073	1.73		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	28	0.0352	3.81		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.1	154	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	400	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.5	210	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.6	147	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.9	3,482	Total			

Subcatchment C2: Post Dev. 5



Summary for Subcatchment C3: Post Dev. 8

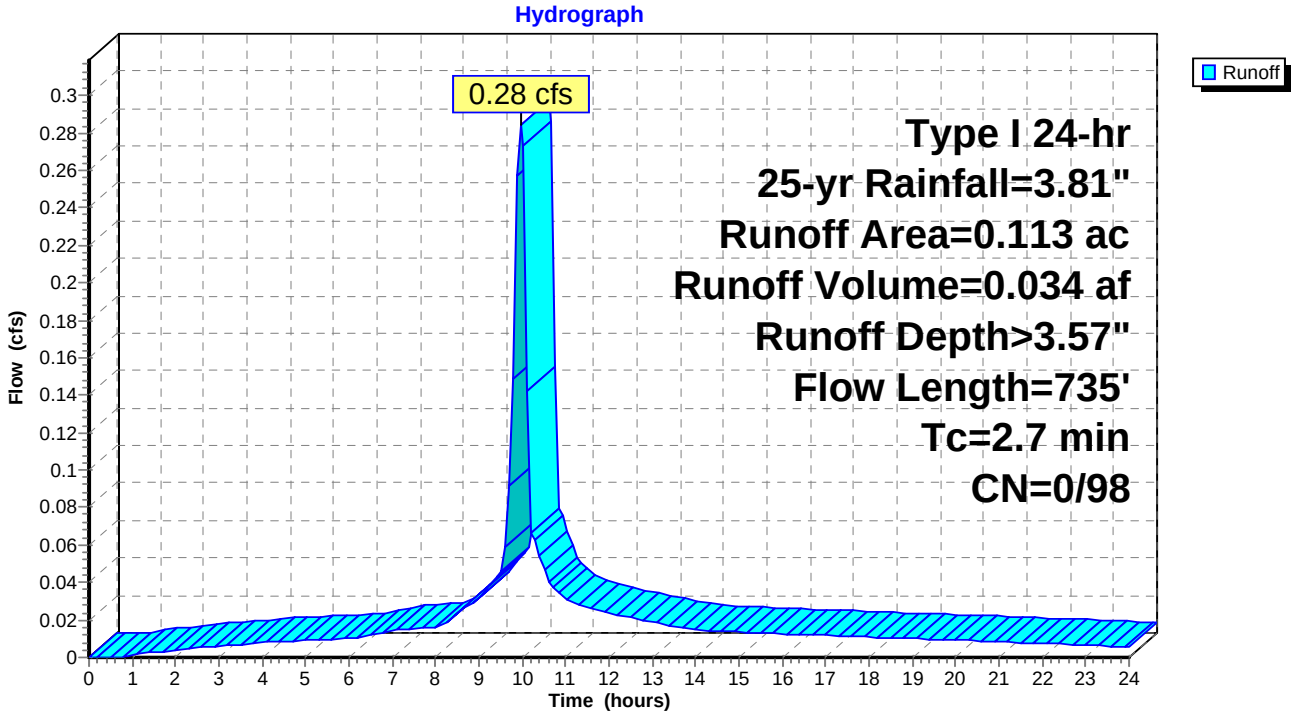
Runoff = 0.28 cfs @ 9.96 hrs, Volume= 0.034 af, Depth> 3.57"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 25-yr Rainfall=3.81"

Area (ac)	CN	Description
0.113	98	Paved roads w/curbs & sewers
0.113		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.0	31	0.1500	29.93	52.89	**Pipe Channel, SD FROM DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.8	629	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
2.7	735	Total			

Subcatchment C3: Post Dev. 8



Summary for Pond 11P: BASIN #1

Inflow Area = 31.018 ac, 52.38% Impervious, Inflow Depth > 2.33" for 25-yr event
Inflow = 25.64 cfs @ 10.05 hrs, Volume= 6.030 af
Outflow = 0.26 cfs @ 24.00 hrs, Volume= 0.105 af, Atten= 99%, Lag= 837.0 min
Primary = 0.26 cfs @ 24.00 hrs, Volume= 0.105 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Peak Elev= 564.74' @ 24.00 hrs Surf.Area= 1.306 ac Storage= 5.920 af

Plug-Flow detention time= 1,078.6 min calculated for 0.105 af (2% of inflow)
Center-of-Mass det. time= 482.7 min (1,234.7 - 752.0)

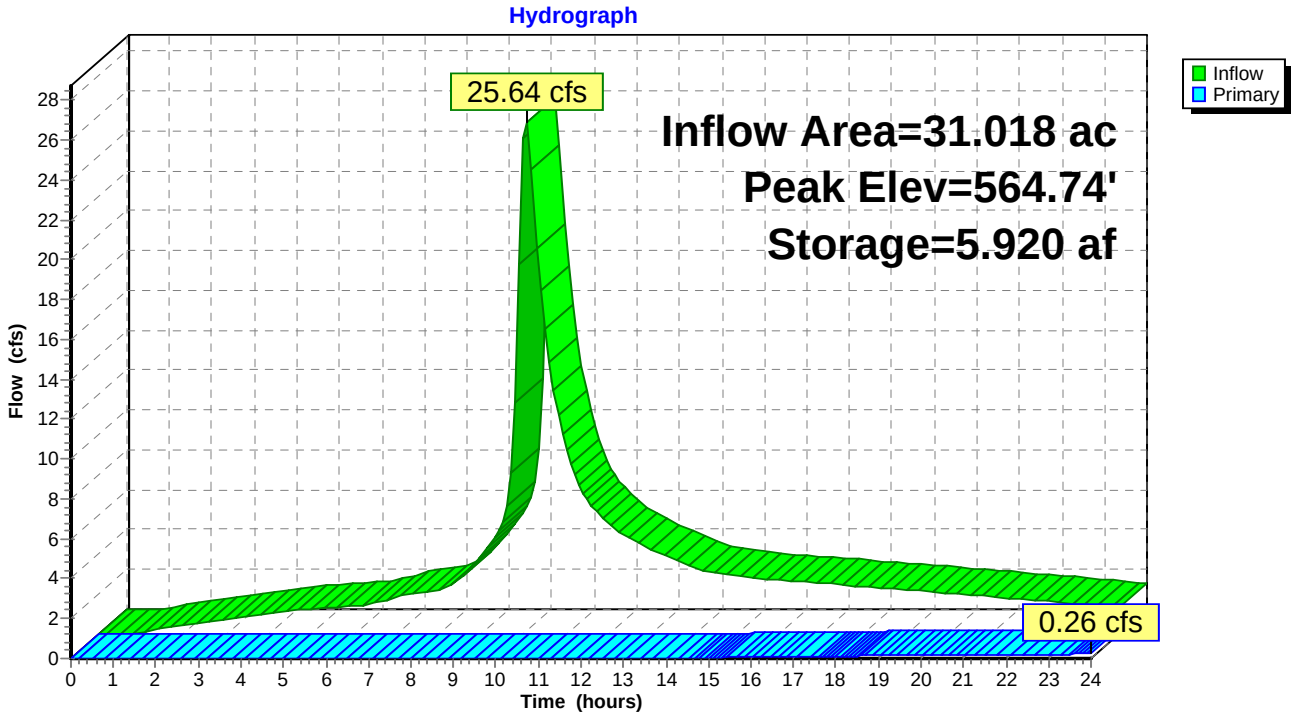
Volume	Invert	Avail.Storage	Storage Description
#1	559.00'	20.615 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
559.00	0.779	952.9	0.000	0.000	0.779
573.00	2.300	1,384.6	20.615	20.615	2.660

Device	Routing	Invert	Outlet Devices
#1	Primary	563.45'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	566.00'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	564.70'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	564.00'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	568.00'	**160.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.25 cfs @ 24.00 hrs HW=564.74' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.47 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Weir Controls 0.04 cfs @ 0.67 fps)
- **4=Orifice/Grate** (Orifice Controls 0.09 cfs @ 4.15 fps)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: BASIN #1



Summary for Pond 15P: BASIN #2

Inflow Area = 2.545 ac, 35.67% Impervious, Inflow Depth > 1.77" for 25-yr event
Inflow = 2.70 cfs @ 9.98 hrs, Volume= 0.376 af
Outflow = 0.16 cfs @ 17.99 hrs, Volume= 0.092 af, Atten= 94%, Lag= 481.1 min
Primary = 0.16 cfs @ 17.99 hrs, Volume= 0.092 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 526.04' @ 17.99 hrs Surf.Area= 0.176 ac Storage= 0.287 af

Plug-Flow detention time= 717.1 min calculated for 0.092 af (24% of inflow)
Center-of-Mass det. time= 418.0 min (1,173.8 - 755.8)

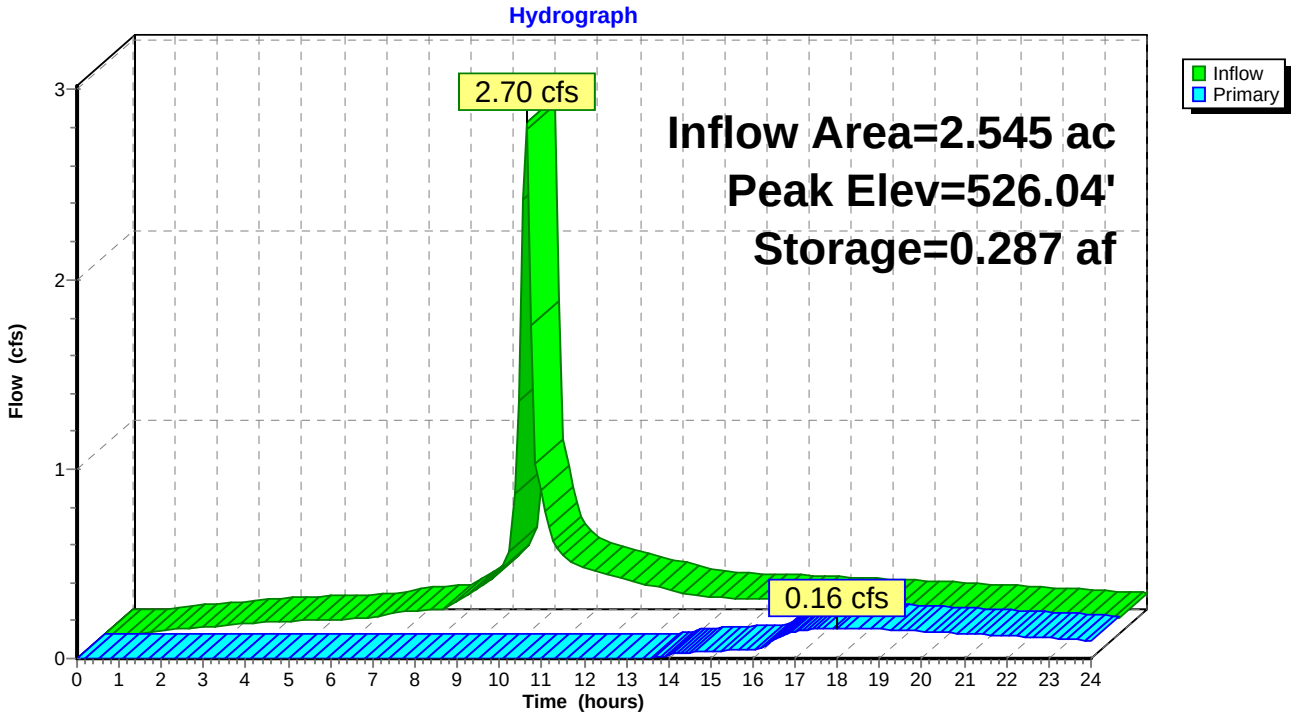
Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	0.474 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
524.00	0.109	314.9	0.000	0.000	0.109
527.00	0.213	427.1	0.474	0.474	0.263

Device	Routing	Invert	Outlet Devices
#1	Primary	525.80'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	527.00'	**40.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Primary	526.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.15 cfs @ 17.99 hrs HW=526.04' TW=103.00' (Fixed TW Elev= 103.00')
- **1=Orifice/Grate** (Orifice Controls 0.05 cfs @ 2.34 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Weir Controls 0.10 cfs @ 0.62 fps)

Pond 15P: BASIN #2

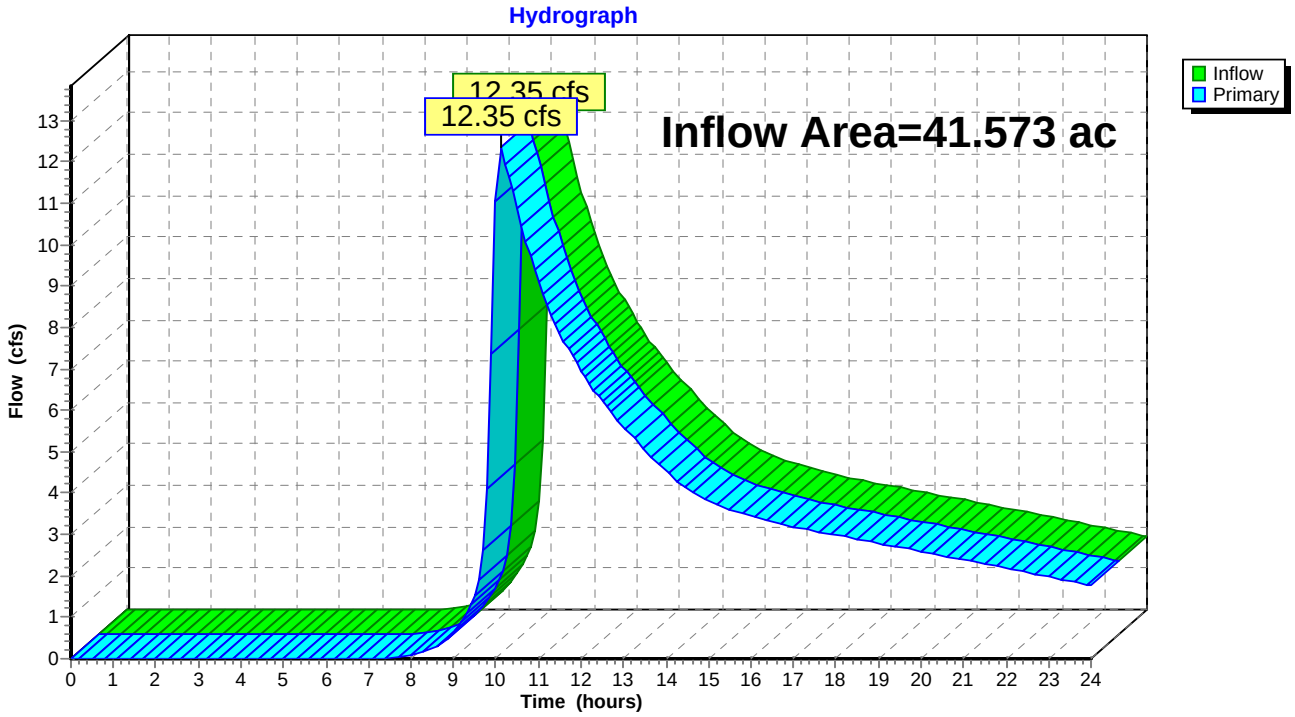


Summary for Pond 22P: Orcutt Creek

Inflow Area = 41.573 ac, 0.00% Impervious, Inflow Depth > 1.47" for 25-yr event
Inflow = 12.35 cfs @ 10.13 hrs, Volume= 5.085 af
Primary = 12.35 cfs @ 10.13 hrs, Volume= 5.085 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Pond 22P: Orcutt Creek



Time span=0.00-24.00 hrs, dt=0.10 hrs, 241 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 3S: Post Dev. 9 Runoff Area=8.408 ac 36.54% Impervious Runoff Depth>2.55"
Flow Length=3,415' Tc=37.4 min CN=73/98 Runoff=6.12 cfs 1.789 af

Subcatchment 10S: Post Dev. 2 Runoff Area=8.670 ac 66.89% Impervious Runoff Depth>3.01"
Flow Length=3,525' Tc=24.8 min CN=61/98 Runoff=9.17 cfs 2.175 af

Subcatchment 16S: Post Dev. 7 Runoff Area=3.572 ac 37.83% Impervious Runoff Depth>2.12"
Flow Length=2,912' Tc=13.8 min CN=61/98 Runoff=3.26 cfs 0.632 af

Subcatchment 17S: Post Dev. 1 Runoff Area=6.272 ac 57.34% Impervious Runoff Depth>2.72"
Flow Length=3,832' Tc=17.2 min CN=61/98 Runoff=7.07 cfs 1.423 af

Subcatchment 18S: Post Dev. 3 Runoff Area=0.212 ac 72.17% Impervious Runoff Depth>3.71"
Flow Length=630' Tc=1.9 min CN=86/98 Runoff=0.57 cfs 0.065 af

Subcatchment 19S: Post Dev. 4 Runoff Area=2.167 ac 27.17% Impervious Runoff Depth>1.80"
Flow Length=750' Tc=4.6 min CN=61/98 Runoff=2.25 cfs 0.325 af

Subcatchment 20S: Post Dev. C Runoff Area=32.794 ac 0.00% Impervious Runoff Depth>1.90"
Flow Length=2,582' Tc=73.5 min CN=76/0 Runoff=11.28 cfs 5.193 af

Subcatchment 21S: Post Dev. E Runoff Area=8.148 ac 0.00% Impervious Runoff Depth>1.52"
Flow Length=869' Tc=16.3 min CN=70/0 Runoff=4.77 cfs 1.029 af

Subcatchment 25S: Post Dev. A Runoff Area=0.631 ac 0.00% Impervious Runoff Depth>1.51"
Flow Length=1,072' Tc=24.3 min CN=70/0 Runoff=0.30 cfs 0.079 af

Subcatchment 27S: Post Dev. 10 Runoff Area=0.166 ac 100.00% Impervious Runoff Depth>4.05"
Flow Length=303' Tc=1.3 min CN=0/98 Runoff=0.49 cfs 0.056 af

Subcatchment 28S: Post Dev. 11 Runoff Area=0.449 ac 11.69% Impervious Runoff Depth>2.86"
Flow Length=3,765' Tc=11.7 min CN=85/98 Runoff=0.69 cfs 0.107 af

Subcatchment C1: Post Dev. 6 Runoff Area=2.060 ac 70.35% Impervious Runoff Depth>3.11"
Flow Length=2,302' Tc=36.2 min CN=61/98 Runoff=1.88 cfs 0.533 af

Subcatchment C2: Post Dev. 5 Runoff Area=1.474 ac 55.16% Impervious Runoff Depth>2.66"
Flow Length=3,482' Tc=17.9 min CN=61/98 Runoff=1.58 cfs 0.326 af

Subcatchment C3: Post Dev. 8 Runoff Area=0.113 ac 100.00% Impervious Runoff Depth>4.05"
Flow Length=735' Tc=2.7 min CN=0/98 Runoff=0.32 cfs 0.038 af

Pond 11P: BASIN #1 Peak Elev=565.24' Storage=6.587 af Inflow=30.07 cfs 7.024 af
Outflow=0.95 cfs 0.434 af

Pond 15P: BASIN #2 Peak Elev=526.05' Storage=0.290 af Inflow=3.27 cfs 0.447 af
Outflow=0.23 cfs 0.162 af

Pond 22P: Orcutt Creek

Inflow=16.13 cfs 6.302 af
Primary=16.13 cfs 6.302 af

Total Runoff Area = 75.136 ac Runoff Volume = 13.773 af Average Runoff Depth = 2.20"
77.17% Pervious = 57.981 ac 22.83% Impervious = 17.155 ac

Summary for Subcatchment 3S: Post Dev. 9

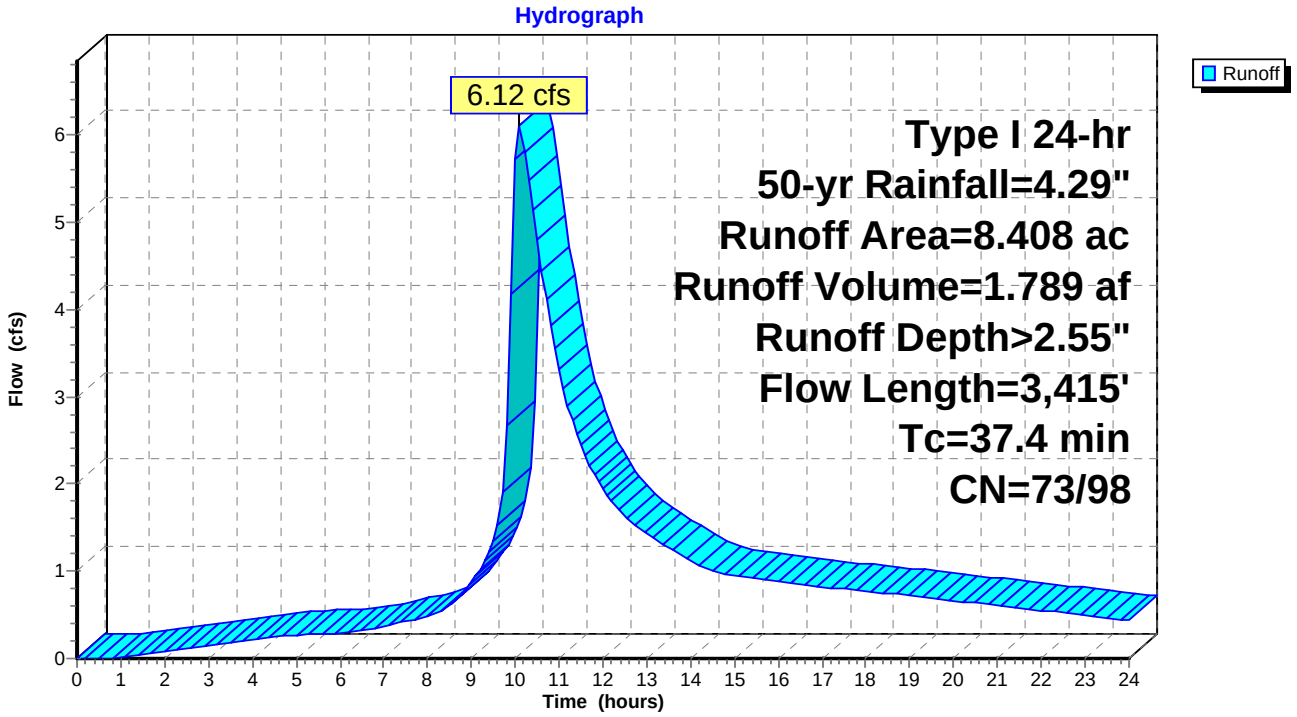
Runoff = 6.12 cfs @ 10.11 hrs, Volume= 1.789 af, Depth> 2.55"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
3.813	85	1/8 acre lots, 65% imp, HSG B
0.745	61	>75% Grass cover, Good, HSG B
0.558	98	Paved roads w/curbs & sewers
2.016	86	Newly graded area, HSG B
0.868	69	Pasture/grassland/range, Fair, HSG B
0.337	85	Gravel roads, HSG B
0.071	89	Paved roads w/open ditches, 50% imp, HSG B
8.408	82	Weighted Average
5.336		63.46% Pervious Area
3.072		36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0950	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
14.8	1,286	0.0093	1.45		**Shallow Concentrated Flow, NATURAL SWALE AT BOUNDARY** Grassed Waterway Kv= 15.0 fps
0.3	9	0.1720	0.45		**Sheet Flow, SHEET FLOW TO PATH** Fallow n= 0.050 P2= 1.81"
10.4	233	0.0210	0.37		**Sheet Flow, GRAVEL PATH** Fallow n= 0.050 P2= 1.81"
4.1	35	0.0444	0.14		**Sheet Flow, FLOW OFF PATH TO SWALE** Grass: Short n= 0.150 P2= 1.81"
0.8	104	0.0200	2.12		**Shallow Concentrated Flow, NATURAL SWALE TO GUTTER** Grassed Waterway Kv= 15.0 fps
0.7	81	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN #1** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
37.4	3,415	Total			

Subcatchment 3S: Post Dev. 9



Summary for Subcatchment 10S: Post Dev. 2

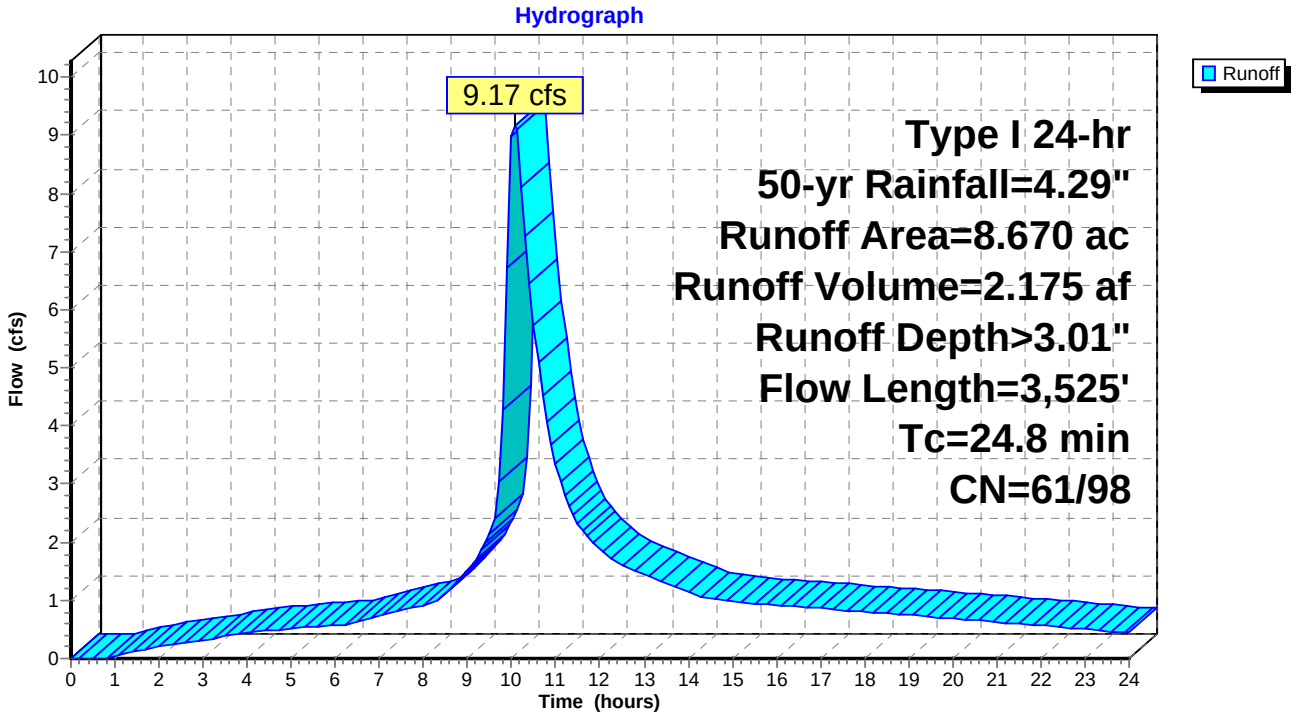
Runoff = 9.17 cfs @ 10.06 hrs, Volume= 2.175 af, Depth> 3.01"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
8.202	85	1/8 acre lots, 65% imp, HSG B
0.468	98	Paved roads w/curbs & sewers
8.670	86	Weighted Average
2.871		33.11% Pervious Area
5.799		66.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	69	0.0396	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
0.3	30	0.0100	1.50		**Shallow Concentrated Flow, FLOW TO DWY GUTTER** Grassed Waterway Kv= 15.0 fps
8.4	723	0.0050	1.44		**Shallow Concentrated Flow, DWY GUTTER FLOW** Paved Kv= 20.3 fps
0.0	23	0.2812	10.76		**Shallow Concentrated Flow, DWY GUTTER TO ROAD GUTTER** Paved Kv= 20.3 fps
1.9	219	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
24.8	3,525	Total			

Subcatchment 10S: Post Dev. 2



Summary for Subcatchment 16S: Post Dev. 7

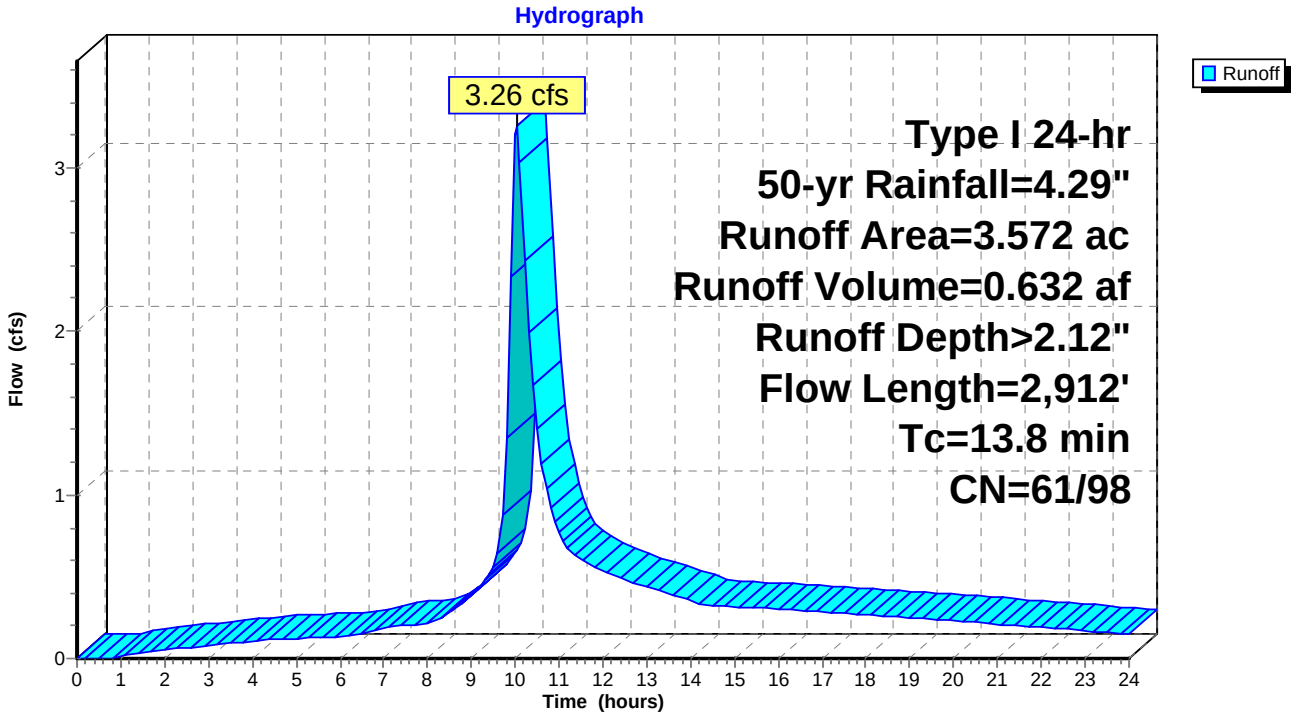
Runoff = 3.26 cfs @ 10.03 hrs, Volume= 0.632 af, Depth> 2.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
2.877	75	1/4 acre lots, 38% imp, HSG B
0.437	61	>75% Grass cover, Good, HSG B
0.258	98	Paved roads w/curbs & sewers
3.572	75	Weighted Average
2.221		62.17% Pervious Area
1.351		37.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	24	0.0675	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
1.1	145	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	396	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.4	203	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	157	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
13.8	2,912	Total			

Subcatchment 16S: Post Dev. 7



Summary for Subcatchment 17S: Post Dev. 1

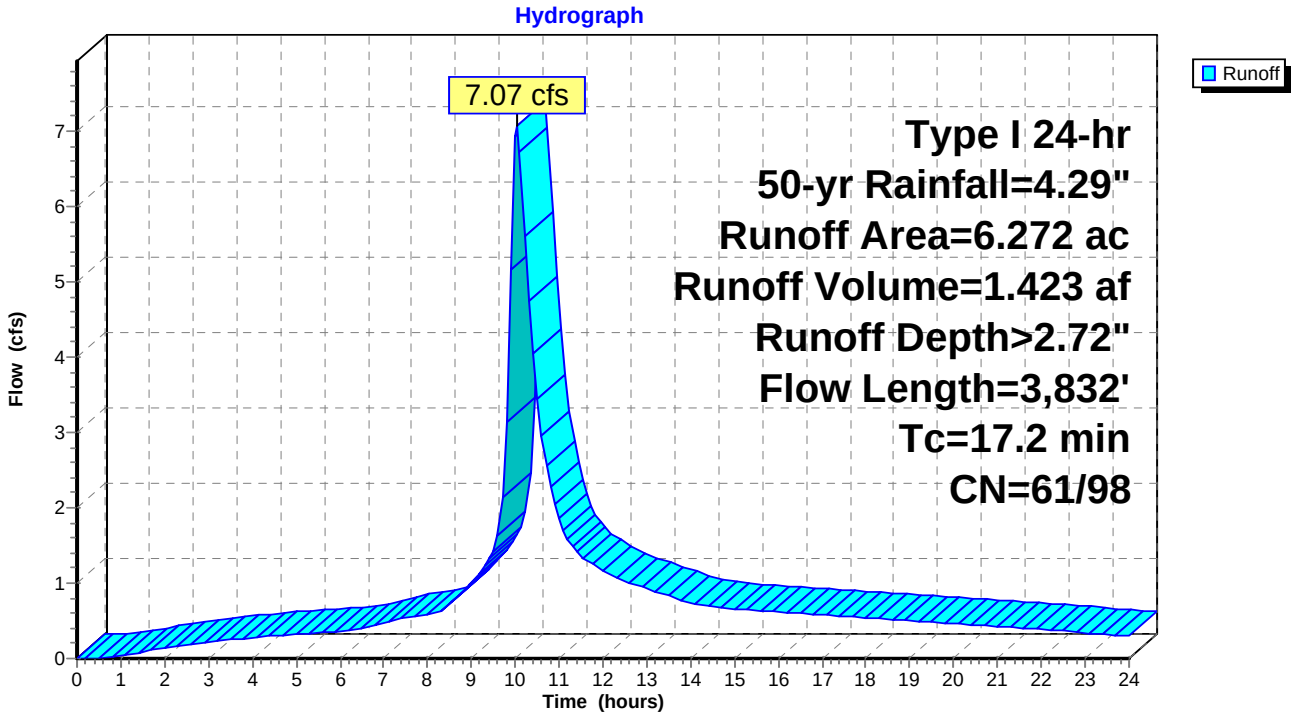
Runoff = 7.07 cfs @ 10.04 hrs, Volume= 1.423 af, Depth> 2.72"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
2.520	75	1/4 acre lots, 38% imp, HSG B
3.180	85	1/8 acre lots, 65% imp, HSG B
0.572	98	Paved roads w/curbs & sewers
6.272	82	Weighted Average
2.675		42.66% Pervious Area
3.597		57.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	11	0.2000	0.21		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
0.8	173	0.0300	3.52		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	121	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
3.4	503	0.0146	2.45		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
4.5	525	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	38	0.0050	5.46	9.66	**Pipe Channel, DI# TO DI#2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.2	3,832	Total			

Subcatchment 17S: Post Dev. 1



Summary for Subcatchment 18S: Post Dev. 3

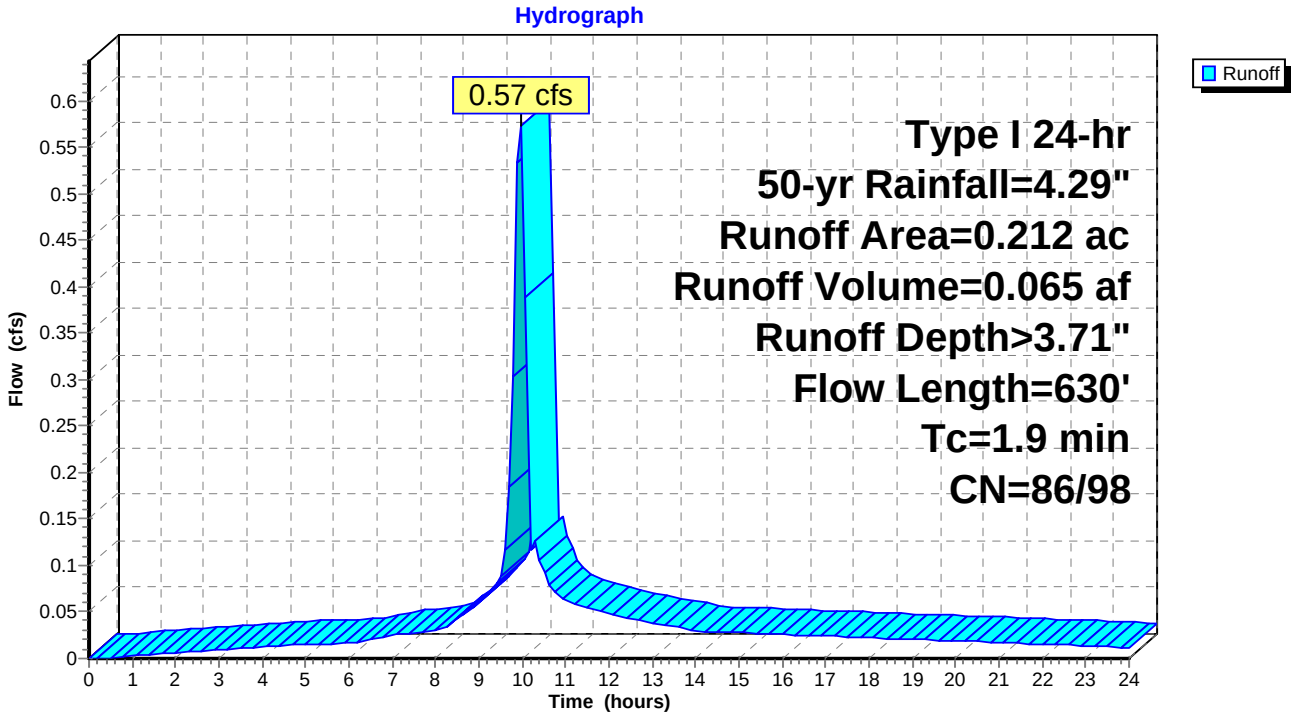
Runoff = 0.57 cfs @ 9.95 hrs, Volume= 0.065 af, Depth> 3.71"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
0.153	98	Paved roads w/curbs & sewers
0.059	86	Newly graded area, HSG B
0.212	95	Weighted Average
0.059		27.83% Pervious Area
0.153		72.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	16	0.0200	0.72		**Sheet Flow, CROWN TO GUTTER** Smooth surfaces n= 0.011 P2= 1.81"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	111	0.0758	5.59		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	65	0.1234	7.13		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	61	0.1332	7.41		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	101	0.1084	6.68		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	56	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	24	0.0100	7.73	13.66	**Pipe Channel, DI TO DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.9	630	Total			

Subcatchment 18S: Post Dev. 3



Summary for Subcatchment 19S: Post Dev. 4

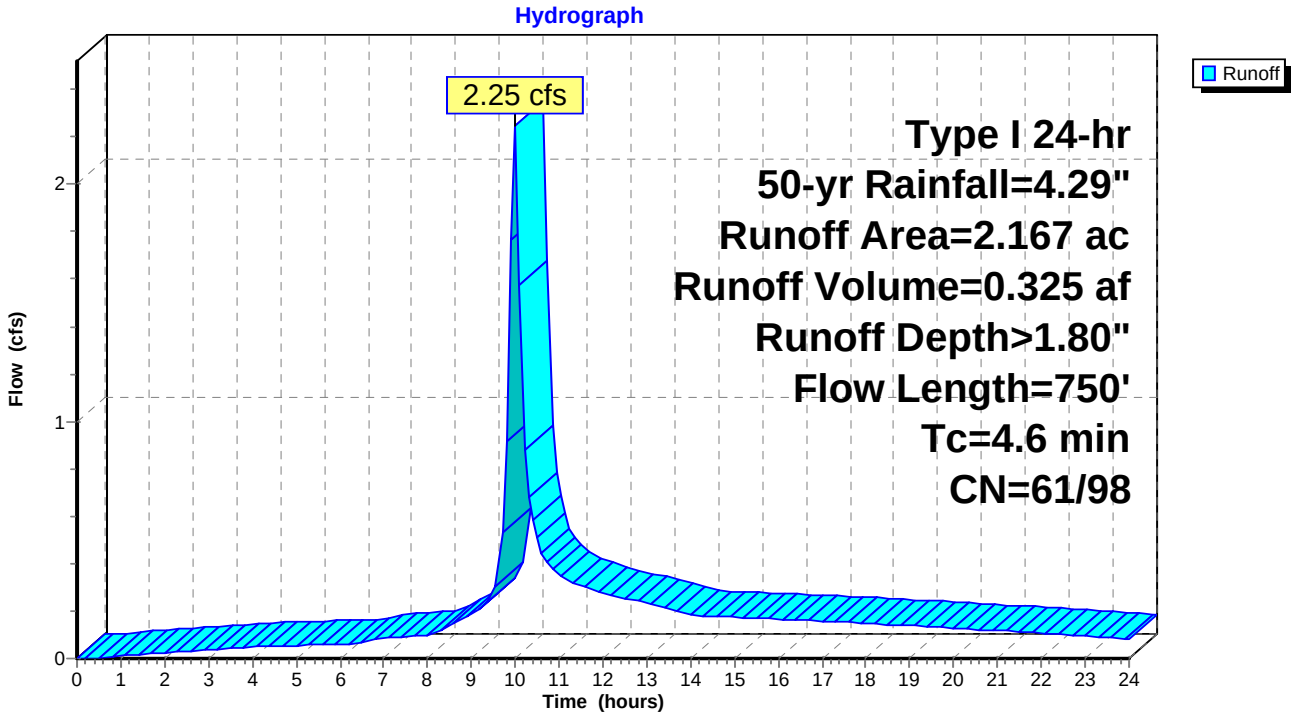
Runoff = 2.25 cfs @ 9.99 hrs, Volume= 0.325 af, Depth> 1.80"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
0.723	75	1/4 acre lots, 38% imp, HSG B
1.121	61	>75% Grass cover, Good, HSG B
0.305	98	Paved roads w/curbs & sewers
0.018	89	Paved roads w/open ditches, 50% imp, HSG B
2.167	71	Weighted Average
1.578		72.83% Pervious Area
0.589		27.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	28	0.5100	0.36		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
2.0	184	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY SWALE** Grassed Waterway Kv= 15.0 fps
0.8	290	0.0900	6.09		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	76	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
4.6	750	Total			

Subcatchment 19S: Post Dev. 4



Summary for Subcatchment 20S: Post Dev. C

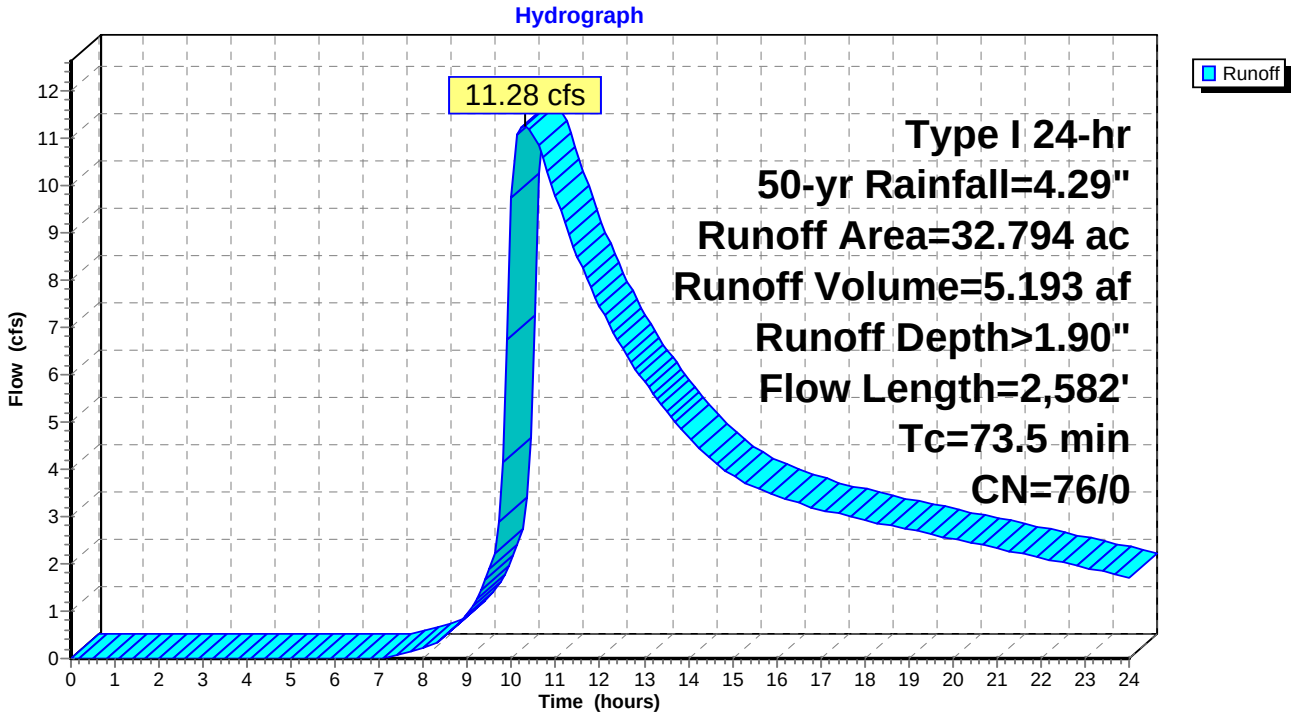
Runoff = 11.28 cfs @ 10.30 hrs, Volume= 5.193 af, Depth> 1.90"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
13.544	69	Pasture/grassland/range, Fair, HSG B
2.893	86	Newly graded area, HSG B
0.831	82	Dirt roads, HSG B
15.526	79	Pasture/grassland/range, Fair, HSG C
32.794	76	Weighted Average
32.794		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.8	300	0.0271	0.20		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
16.9	186	0.0271	0.18		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
8.8	442	0.0070	0.84		**Shallow Concentrated Flow, Flow at toe of path slope** Nearly Bare & Untilled Kv= 10.0 fps
2.1	303	0.0220	2.39		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
7.8	465	0.0200	0.99		**Shallow Concentrated Flow, Undeveloped flow to toe** Short Grass Pasture Kv= 7.0 fps
8.5	405	0.0028	0.79		**Shallow Concentrated Flow, Flow at toe of slope** Grassed Waterway Kv= 15.0 fps
0.7	49	0.0051	1.15		**Shallow Concentrated Flow, Flow at toe of slope** Unpaved Kv= 16.1 fps
3.2	393	0.0160	2.04		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
0.4	18	0.0020	0.72		**Shallow Concentrated Flow, Flow across path** Unpaved Kv= 16.1 fps
0.3	21	0.0391	1.38		**Shallow Concentrated Flow, Flow to creek** Short Grass Pasture Kv= 7.0 fps
73.5	2,582	Total			

Subcatchment 20S: Post Dev. C



Summary for Subcatchment 21S: Post Dev. E

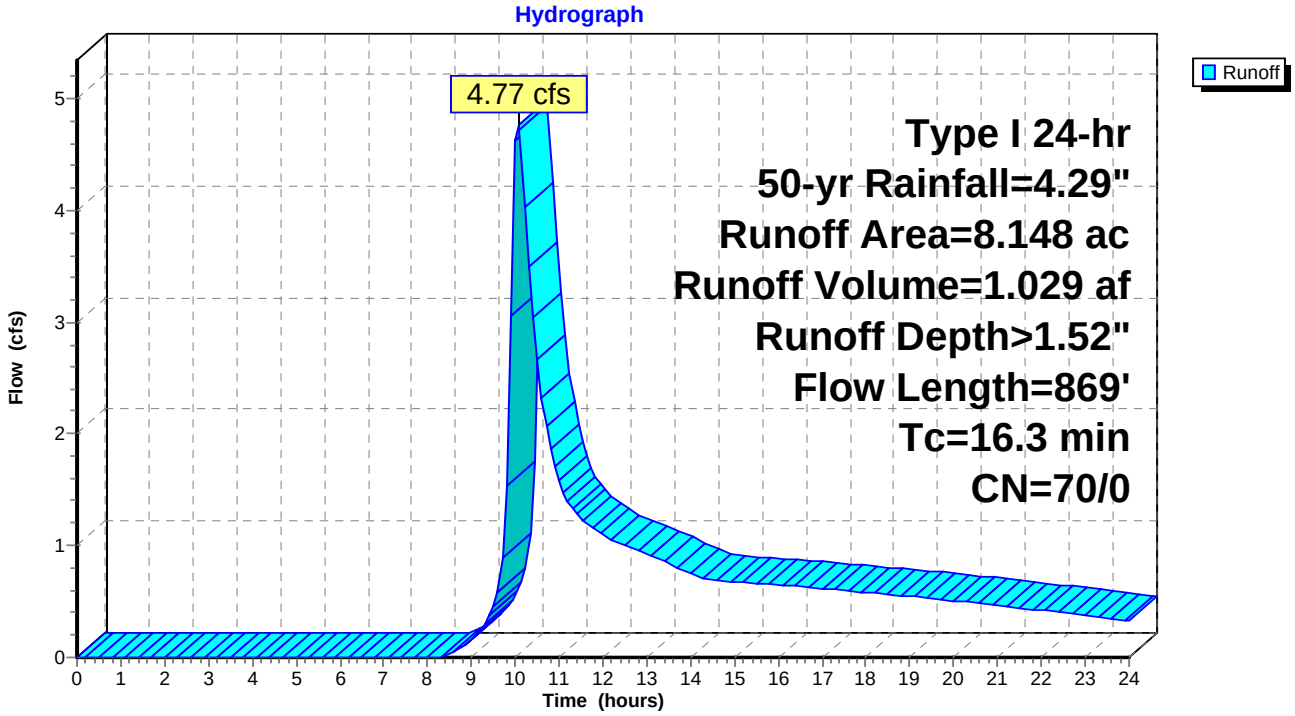
Runoff = 4.77 cfs @ 10.06 hrs, Volume= 1.029 af, Depth> 1.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
7.441	69	Pasture/grassland/range, Fair, HSG B
0.707	86	Newly graded area, HSG B
8.148	70	Weighted Average
8.148		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	18	0.5000	0.79		**Sheet Flow, Flow from graded area** Fallow n= 0.050 P2= 1.81"
9.0	189	0.1360	0.35		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
6.9	662	0.0520	1.60		**Shallow Concentrated Flow, Flow at boundary** Short Grass Pasture Kv= 7.0 fps
16.3	869	Total			

Subcatchment 21S: Post Dev. E



Summary for Subcatchment 25S: Post Dev. A

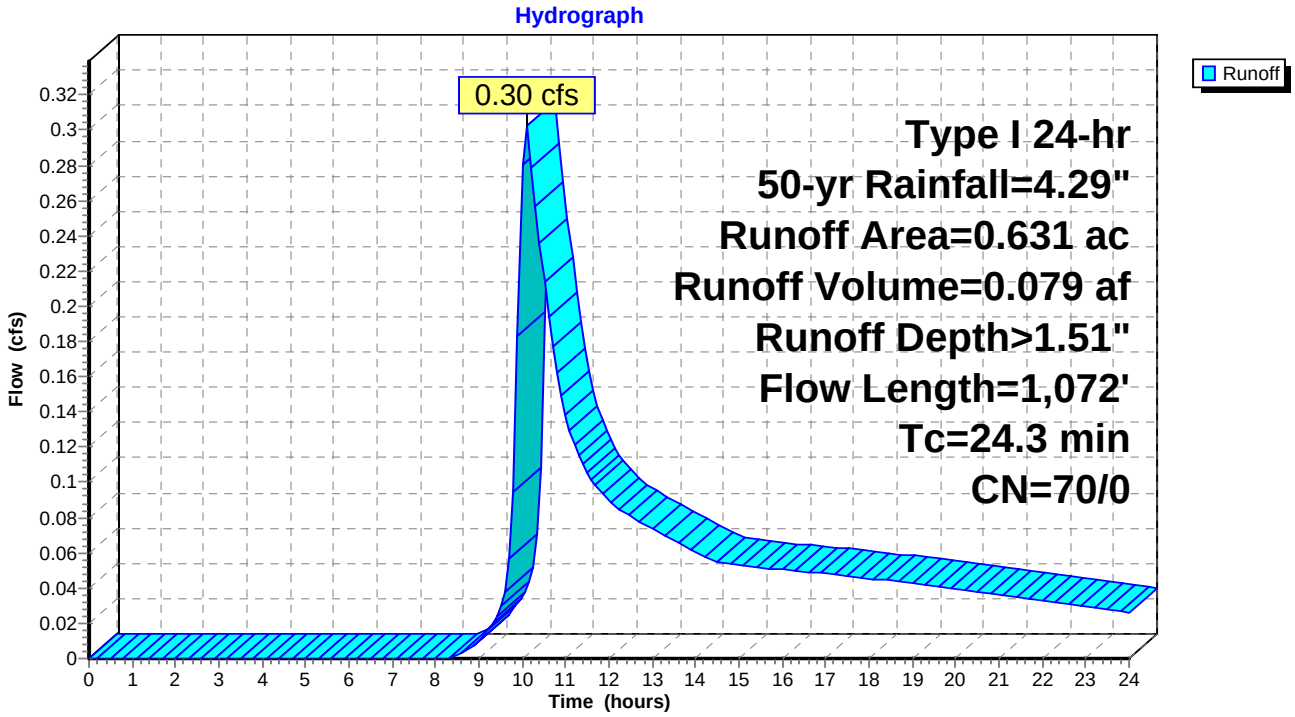
Runoff = 0.30 cfs @ 10.10 hrs, Volume= 0.079 af, Depth> 1.51"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
0.055	86	Newly graded area, HSG B
0.576	69	Pasture/grassland/range, Fair, HSG B
0.631	70	Weighted Average
0.631		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	39	0.0180	0.11		**Sheet Flow, Sheet flow to swale** Range n= 0.130 P2= 1.81"
11.6	789	0.0164	1.14	0.80	**Channel Flow, Concrete channel** Area= 0.7 sf Perim= 6.0' r= 0.12' n= 0.040 Earth, cobble bottom, clean sides
4.6	41	0.0350	0.15		**Sheet Flow, Flow from swale to undeveloped** Range n= 0.130 P2= 1.81"
0.9	26	0.8900	0.50		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
1.5	177	0.0750	1.92		**Shallow Concentrated Flow, Undeveloped shallow flow** Short Grass Pasture Kv= 7.0 fps
24.3	1,072	Total			

Subcatchment 25S: Post Dev. A



Summary for Subcatchment 27S: Post Dev. 10

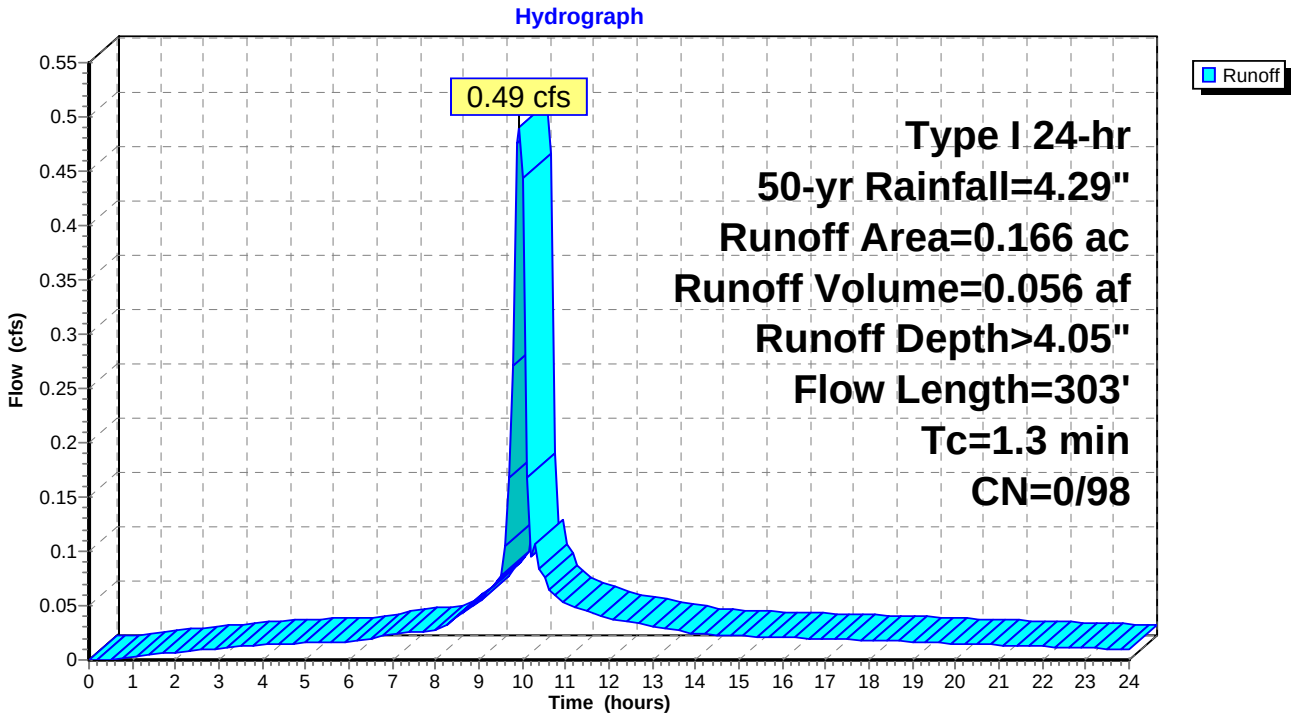
Runoff = 0.49 cfs @ 9.94 hrs, Volume= 0.056 af, Depth> 4.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
0.166	98	Paved roads w/curbs & sewers
0.166		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	12	0.0200	0.68		**Sheet Flow, Flow from Crown to Curb** Smooth surfaces n= 0.011 P2= 1.81"
0.4	133	0.0600	4.97		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.5	111	0.0367	3.89		**Shallow Concentrated Flow, Gutter Flow to DI** Paved Kv= 20.3 fps
0.1	47	0.0050	5.46	9.66	**Pipe Channel, SD Flow to Basin** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.3	303	Total			

Subcatchment 27S: Post Dev. 10



Summary for Subcatchment 28S: Post Dev. 11

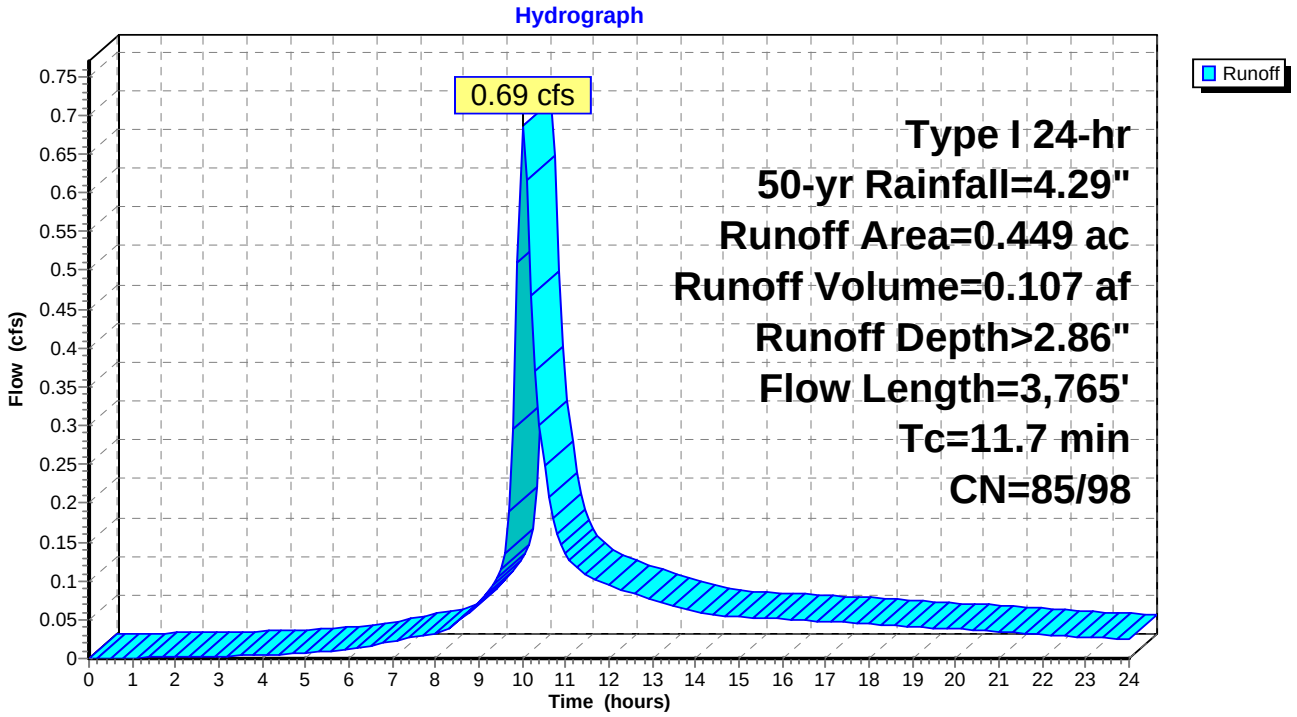
Runoff = 0.69 cfs @ 10.02 hrs, Volume= 0.107 af, Depth> 2.86"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
0.105	89	Paved roads w/open ditches, 50% imp, HSG B
0.344	86	Newly graded area, HSG B
0.449	87	Weighted Average
0.397		88.31% Pervious Area
0.052		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	22	0.2844	0.66		**Sheet Flow, Sheet flow to swale** Fallow n= 0.050 P2= 1.81"
3.2	760	0.0137	3.96	7.92	**Channel Flow, Flow in swale** Area= 2.0 sf Perim= 8.3' r= 0.24' n= 0.017 Concrete, unfinished
0.4	202	0.0120	8.47	14.96	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.7	320	0.0093	7.45	13.17	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD through MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD to Basin** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
11.7	3,765	Total			

Subcatchment 28S: Post Dev. 11



Summary for Subcatchment C1: Post Dev. 6

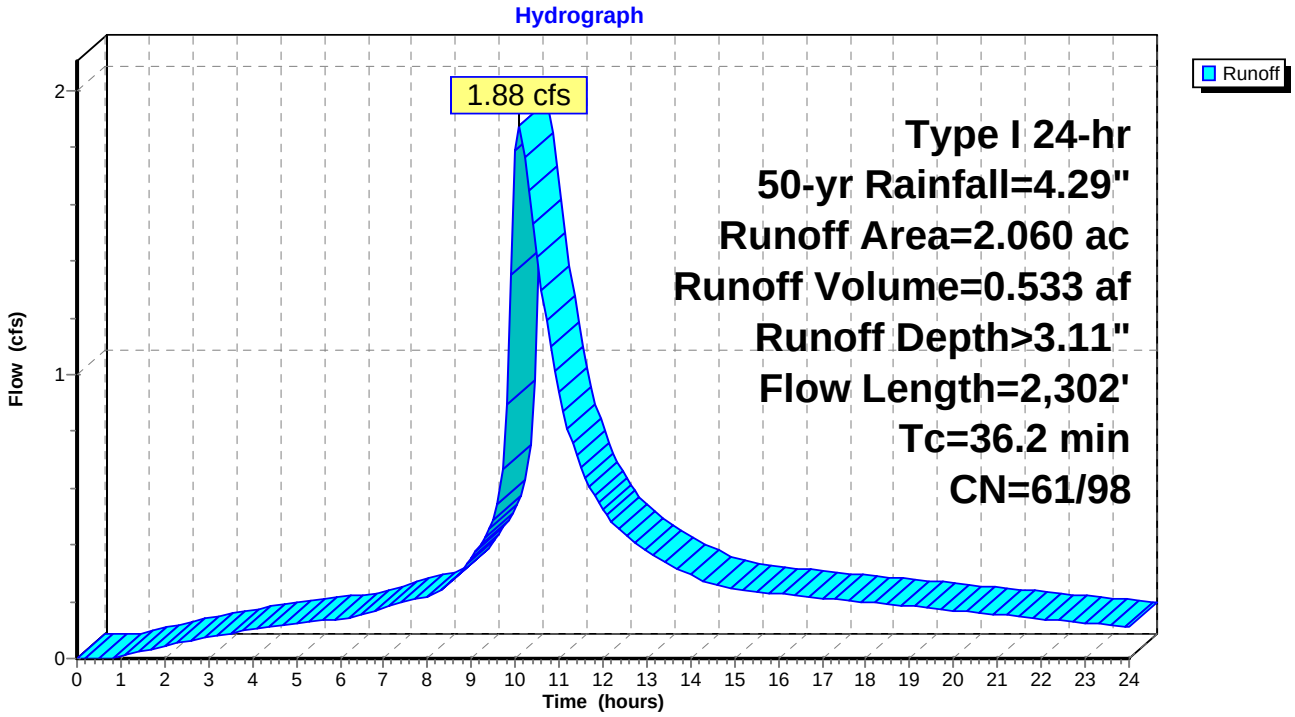
Runoff = 1.88 cfs @ 10.09 hrs, Volume= 0.533 af, Depth> 3.11"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
1.745	85	1/8 acre lots, 65% imp, HSG B
0.315	98	Paved roads w/curbs & sewers
2.060	87	Weighted Average
0.611		29.65% Pervious Area
1.449		70.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	180	0.0100	0.11		**Sheet Flow, Lot Flow** Grass: Short n= 0.150 P2= 1.81"
4.5	477	0.0075	1.76		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
36.2	2,302	Total			

Subcatchment C1: Post Dev. 6



Summary for Subcatchment C2: Post Dev. 5

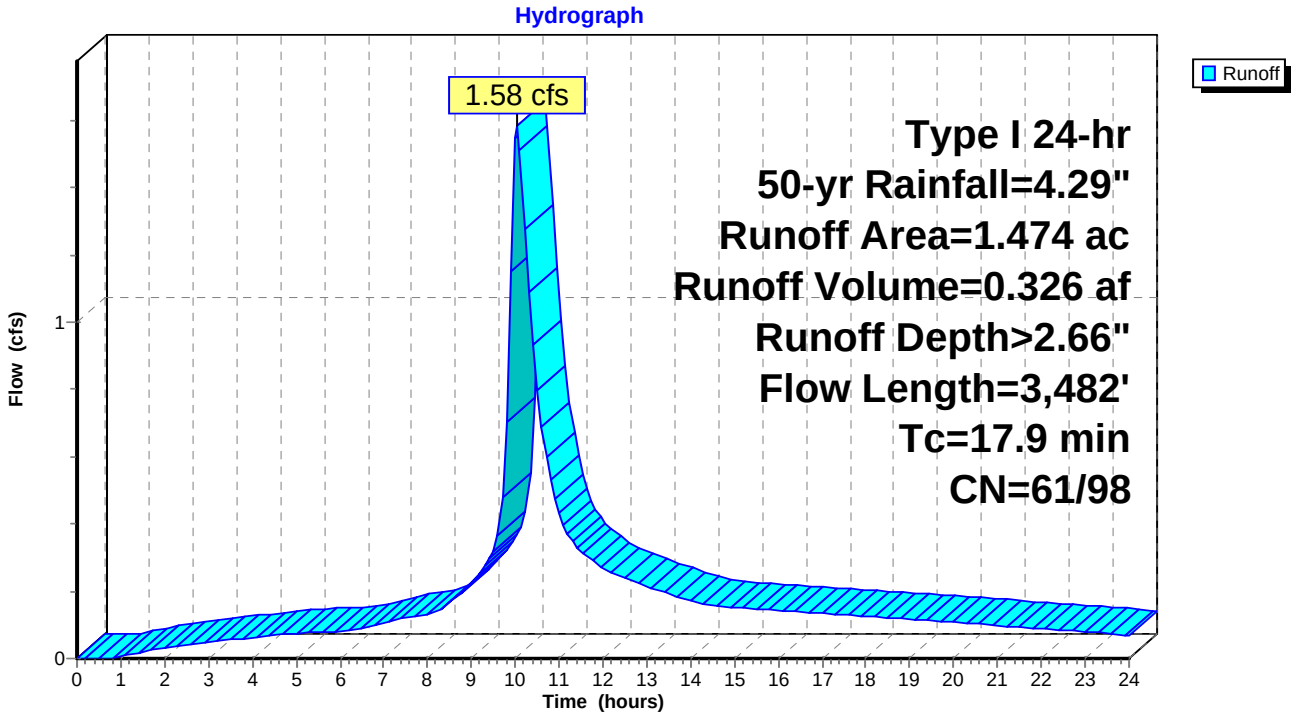
Runoff = 1.58 cfs @ 10.04 hrs, Volume= 0.326 af, Depth> 2.66"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
1.066	75	1/4 acre lots, 38% imp, HSG B
0.408	98	Paved roads w/curbs & sewers
1.474	81	Weighted Average
0.661		44.84% Pervious Area
0.813		55.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	169	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY GRASS SWALE** Grassed Waterway Kv= 15.0 fps
1.9	86	0.0100	0.76		**Sheet Flow, LOT SHEET FLOW/DRIVEWAY** Smooth surfaces n= 0.011 P2= 1.81"
0.3	38	0.0100	2.03		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.0	214	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.5	49	0.0073	1.73		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	28	0.0352	3.81		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.1	154	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	400	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.5	210	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.6	147	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.9	3,482	Total			

Subcatchment C2: Post Dev. 5



Summary for Subcatchment C3: Post Dev. 8

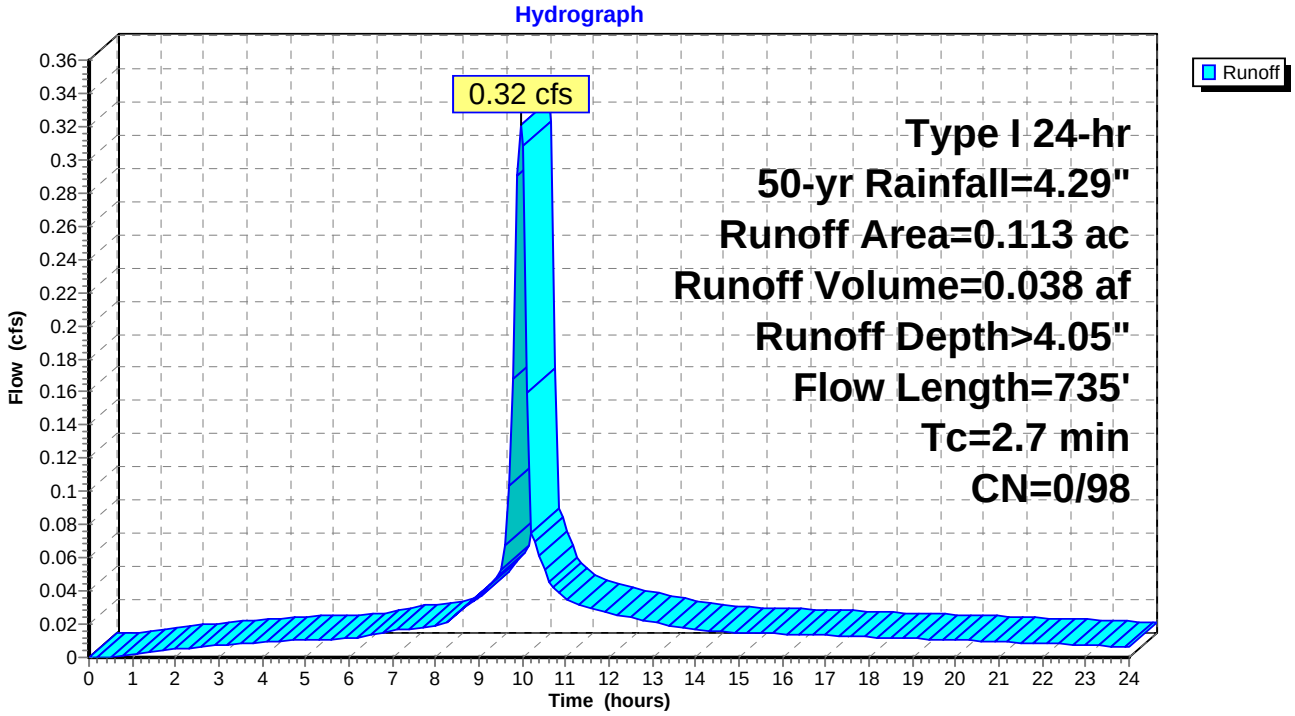
Runoff = 0.32 cfs @ 9.96 hrs, Volume= 0.038 af, Depth> 4.05"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 50-yr Rainfall=4.29"

Area (ac)	CN	Description
0.113	98	Paved roads w/curbs & sewers
0.113		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.0	31	0.1500	29.93	52.89	**Pipe Channel, SD FROM DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.8	629	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
2.7	735	Total			

Subcatchment C3: Post Dev. 8



Summary for Pond 11P: BASIN #1

Inflow Area = 31.018 ac, 52.38% Impervious, Inflow Depth > 2.72" for 50-yr event
Inflow = 30.07 cfs @ 10.05 hrs, Volume= 7.024 af
Outflow = 0.95 cfs @ 24.00 hrs, Volume= 0.434 af, Atten= 97%, Lag= 837.0 min
Primary = 0.95 cfs @ 24.00 hrs, Volume= 0.434 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Peak Elev= 565.24' @ 24.00 hrs Surf.Area= 1.358 ac Storage= 6.587 af

Plug-Flow detention time= 989.7 min calculated for 0.434 af (6% of inflow)
Center-of-Mass det. time= 491.9 min (1,242.8 - 751.0)

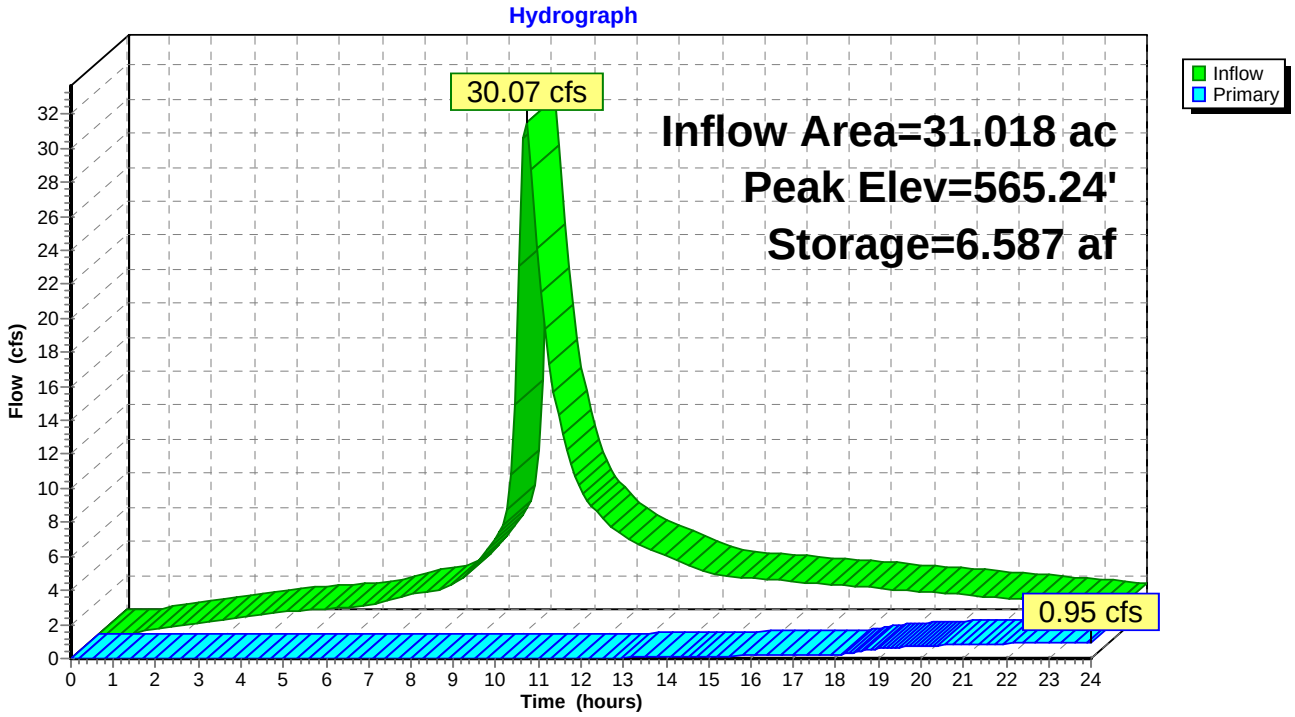
Volume	Invert	Avail.Storage	Storage Description
#1	559.00'	20.615 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
559.00	0.779	952.9	0.000	0.000	0.779
573.00	2.300	1,384.6	20.615	20.615	2.660

Device	Routing	Invert	Outlet Devices
#1	Primary	563.45'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	566.00'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	564.70'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	564.00'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	568.00'	**160.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=0.95 cfs @ 24.00 hrs HW=565.24' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.45 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Orifice Controls 0.70 cfs @ 3.55 fps)
- **4=Orifice/Grate** (Orifice Controls 0.12 cfs @ 5.37 fps)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: BASIN #1



Summary for Pond 15P: BASIN #2

Inflow Area = 2.545 ac, 35.67% Impervious, Inflow Depth > 2.11" for 50-yr event
Inflow = 3.27 cfs @ 9.98 hrs, Volume= 0.447 af
Outflow = 0.23 cfs @ 14.58 hrs, Volume= 0.162 af, Atten= 93%, Lag= 276.0 min
Primary = 0.23 cfs @ 14.58 hrs, Volume= 0.162 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 526.05' @ 14.58 hrs Surf.Area= 0.176 ac Storage= 0.290 af

Plug-Flow detention time= 576.5 min calculated for 0.162 af (36% of inflow)
Center-of-Mass det. time= 324.7 min (1,080.5 - 755.8)

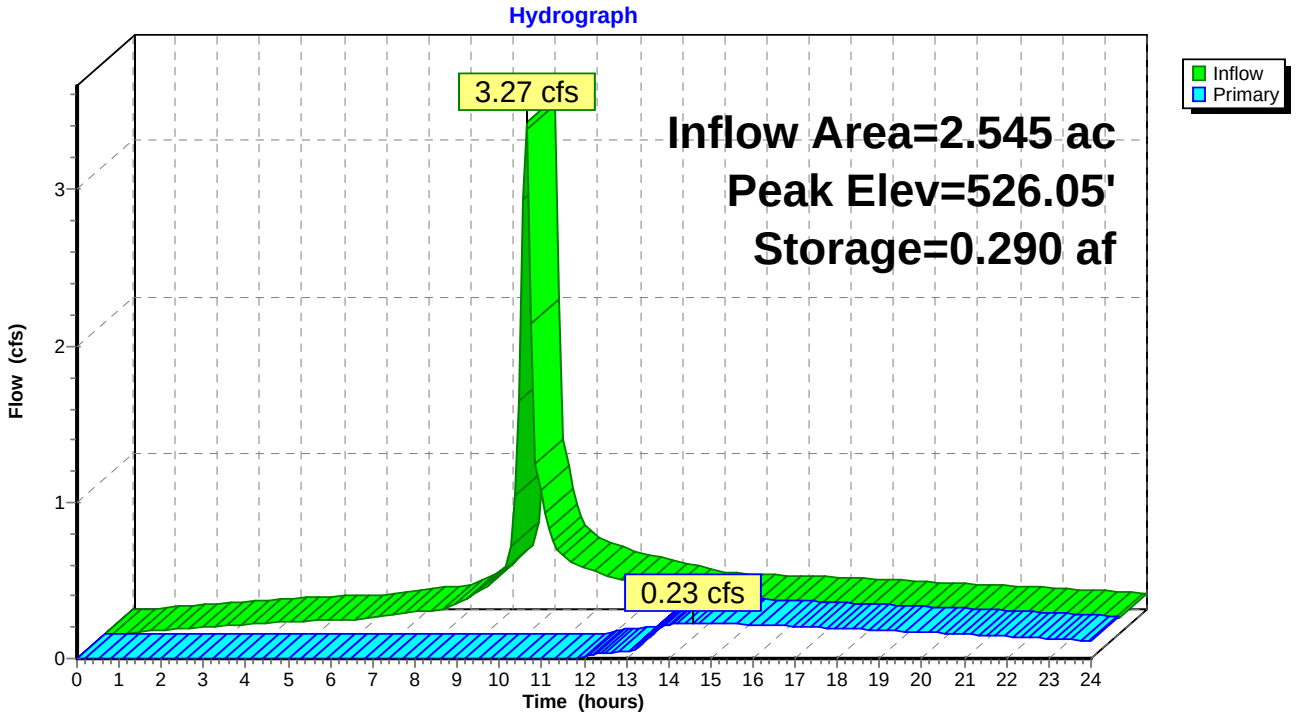
Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	0.474 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
524.00	0.109	314.9	0.000	0.000	0.109
527.00	0.213	427.1	0.474	0.474	0.263

Device	Routing	Invert	Outlet Devices
#1	Primary	525.80'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	527.00'	**40.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Primary	526.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.22 cfs @ 14.58 hrs HW=526.05' TW=103.00' (Fixed TW Elev= 103.00')
- **1=Orifice/Grate** (Orifice Controls 0.05 cfs @ 2.41 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Weir Controls 0.17 cfs @ 0.73 fps)

Pond 15P: BASIN #2

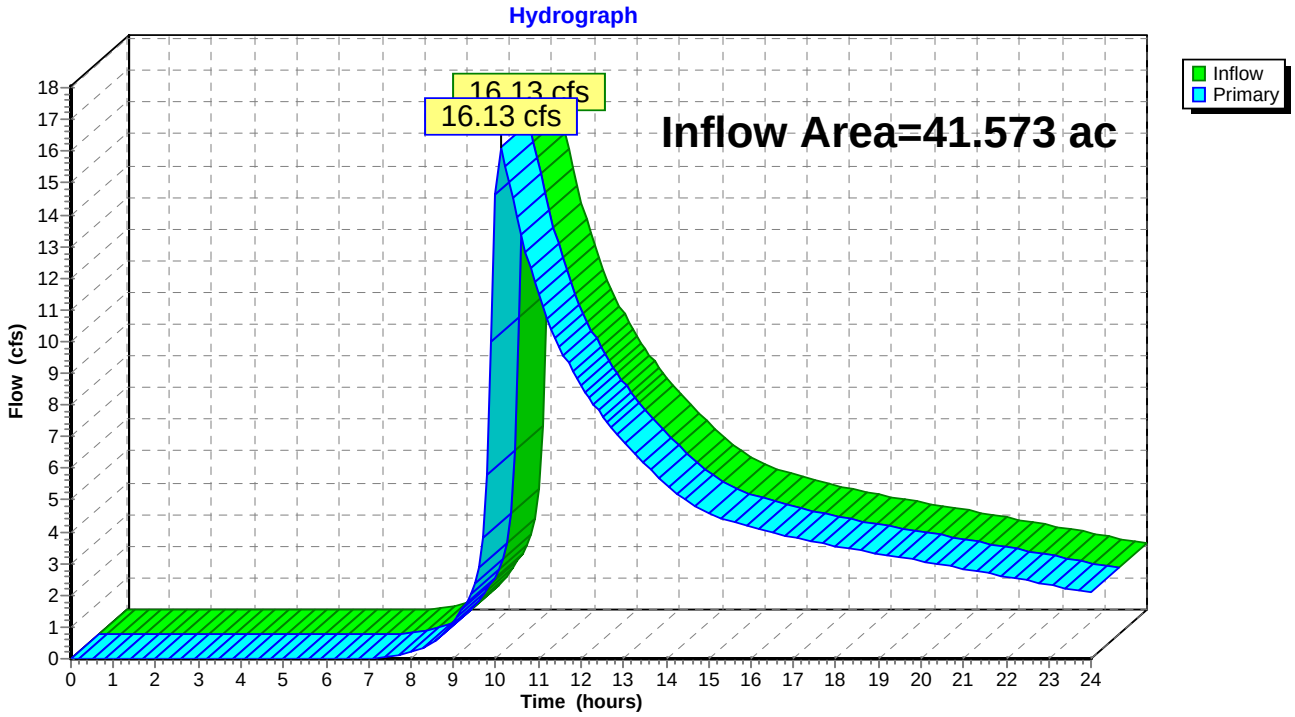


Summary for Pond 22P: Orcutt Creek

Inflow Area = 41.573 ac, 0.00% Impervious, Inflow Depth > 1.82" for 50-yr event
Inflow = 16.13 cfs @ 10.12 hrs, Volume= 6.302 af
Primary = 16.13 cfs @ 10.12 hrs, Volume= 6.302 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Pond 22P: Orcutt Creek



Time span=0.00-24.00 hrs, dt=0.10 hrs, 241 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment 3S: Post Dev. 9 Runoff Area=8.408 ac 36.54% Impervious Runoff Depth>2.95"
Flow Length=3,415' Tc=37.4 min CN=73/98 Runoff=7.13 cfs 2.064 af

Subcatchment 10S: Post Dev. 2 Runoff Area=8.670 ac 66.89% Impervious Runoff Depth>3.41"
Flow Length=3,525' Tc=24.8 min CN=61/98 Runoff=10.41 cfs 2.463 af

Subcatchment 16S: Post Dev. 7 Runoff Area=3.572 ac 37.83% Impervious Runoff Depth>2.46"
Flow Length=2,912' Tc=13.8 min CN=61/98 Runoff=3.85 cfs 0.733 af

Subcatchment 17S: Post Dev. 1 Runoff Area=6.272 ac 57.34% Impervious Runoff Depth>3.10"
Flow Length=3,832' Tc=17.2 min CN=61/98 Runoff=8.11 cfs 1.621 af

Subcatchment 18S: Post Dev. 3 Runoff Area=0.212 ac 72.17% Impervious Runoff Depth>4.17"
Flow Length=630' Tc=1.9 min CN=86/98 Runoff=0.64 cfs 0.074 af

Subcatchment 19S: Post Dev. 4 Runoff Area=2.167 ac 27.17% Impervious Runoff Depth>2.12"
Flow Length=750' Tc=4.6 min CN=61/98 Runoff=2.72 cfs 0.383 af

Subcatchment 20S: Post Dev. C Runoff Area=32.794 ac 0.00% Impervious Runoff Depth>2.27"
Flow Length=2,582' Tc=73.5 min CN=76/0 Runoff=13.83 cfs 6.194 af

Subcatchment 21S: Post Dev. E Runoff Area=8.148 ac 0.00% Impervious Runoff Depth>1.85"
Flow Length=869' Tc=16.3 min CN=70/0 Runoff=6.06 cfs 1.254 af

Subcatchment 25S: Post Dev. A Runoff Area=0.631 ac 0.00% Impervious Runoff Depth>1.84"
Flow Length=1,072' Tc=24.3 min CN=70/0 Runoff=0.39 cfs 0.097 af

Subcatchment 27S: Post Dev. 10 Runoff Area=0.166 ac 100.00% Impervious Runoff Depth>4.52"
Flow Length=303' Tc=1.3 min CN=0/98 Runoff=0.55 cfs 0.063 af

Subcatchment 28S: Post Dev. 11 Runoff Area=0.449 ac 11.69% Impervious Runoff Depth>3.30"
Flow Length=3,765' Tc=11.7 min CN=85/98 Runoff=0.79 cfs 0.123 af

Subcatchment C1: Post Dev. 6 Runoff Area=2.060 ac 70.35% Impervious Runoff Depth>3.51"
Flow Length=2,302' Tc=36.2 min CN=61/98 Runoff=2.12 cfs 0.603 af

Subcatchment C2: Post Dev. 5 Runoff Area=1.474 ac 55.16% Impervious Runoff Depth>3.03"
Flow Length=3,482' Tc=17.9 min CN=61/98 Runoff=1.82 cfs 0.372 af

Subcatchment C3: Post Dev. 8 Runoff Area=0.113 ac 100.00% Impervious Runoff Depth>4.52"
Flow Length=735' Tc=2.7 min CN=0/98 Runoff=0.36 cfs 0.043 af

Pond 11P: BASIN #1 Peak Elev=565.71' Storage=7.236 af Inflow=34.57 cfs 8.022 af
Outflow=1.25 cfs 0.784 af

Pond 15P: BASIN #2 Peak Elev=526.07' Storage=0.294 af Inflow=3.86 cfs 0.519 af
Outflow=0.37 cfs 0.233 af

Pond 22P: Orcutt Creek

Inflow=20.04 cfs 7.545 af
Primary=20.04 cfs 7.545 af

Total Runoff Area = 75.136 ac Runoff Volume = 16.086 af Average Runoff Depth = 2.57"
77.17% Pervious = 57.981 ac 22.83% Impervious = 17.155 ac

Summary for Subcatchment 3S: Post Dev. 9

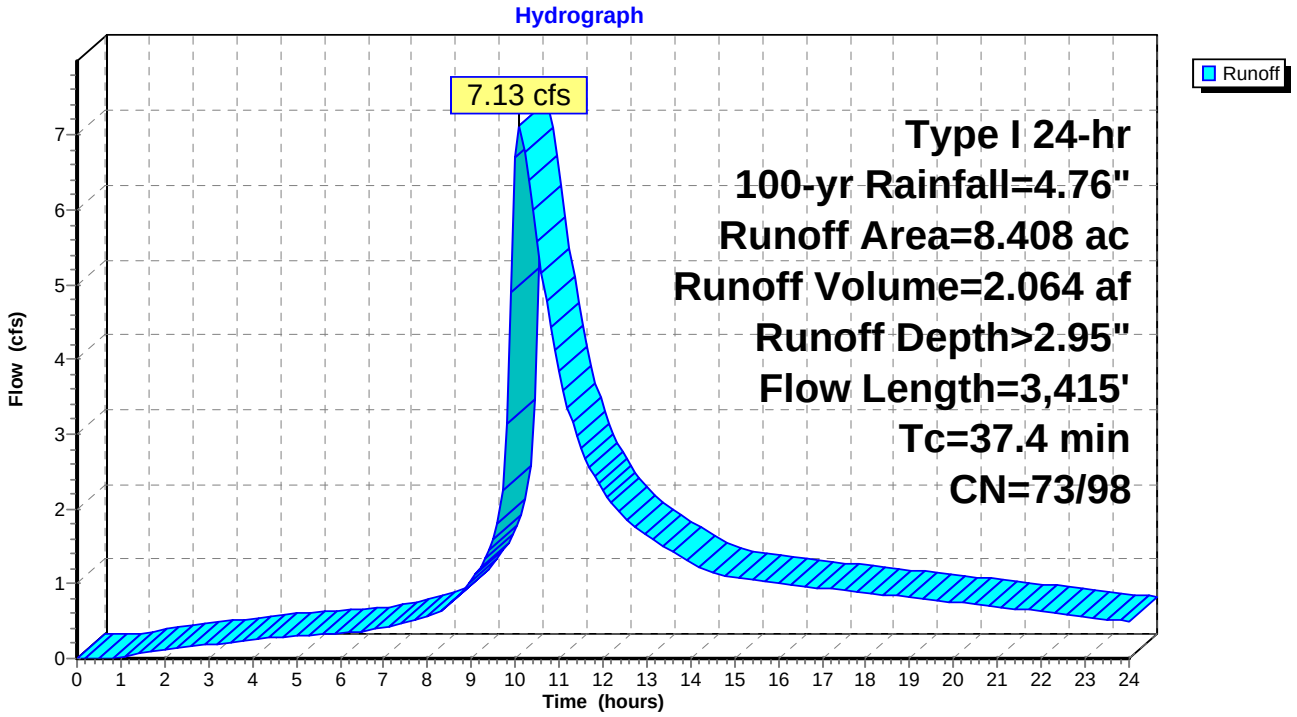
Runoff = 7.13 cfs @ 10.10 hrs, Volume= 2.064 af, Depth> 2.95"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
3.813	85	1/8 acre lots, 65% imp, HSG B
0.745	61	>75% Grass cover, Good, HSG B
0.558	98	Paved roads w/curbs & sewers
2.016	86	Newly graded area, HSG B
0.868	69	Pasture/grassland/range, Fair, HSG B
0.337	85	Gravel roads, HSG B
0.071	89	Paved roads w/open ditches, 50% imp, HSG B
8.408	82	Weighted Average
5.336		63.46% Pervious Area
3.072		36.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.1	22	0.0950	0.18		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
14.8	1,286	0.0093	1.45		**Shallow Concentrated Flow, NATURAL SWALE AT BOUNDARY** Grassed Waterway Kv= 15.0 fps
0.3	9	0.1720	0.45		**Sheet Flow, SHEET FLOW TO PATH** Fallow n= 0.050 P2= 1.81"
10.4	233	0.0210	0.37		**Sheet Flow, GRAVEL PATH** Fallow n= 0.050 P2= 1.81"
4.1	35	0.0444	0.14		**Sheet Flow, FLOW OFF PATH TO SWALE** Grass: Short n= 0.150 P2= 1.81"
0.8	104	0.0200	2.12		**Shallow Concentrated Flow, NATURAL SWALE TO GUTTER** Grassed Waterway Kv= 15.0 fps
0.7	81	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN #1** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
37.4	3,415	Total			

Subcatchment 3S: Post Dev. 9



Summary for Subcatchment 10S: Post Dev. 2

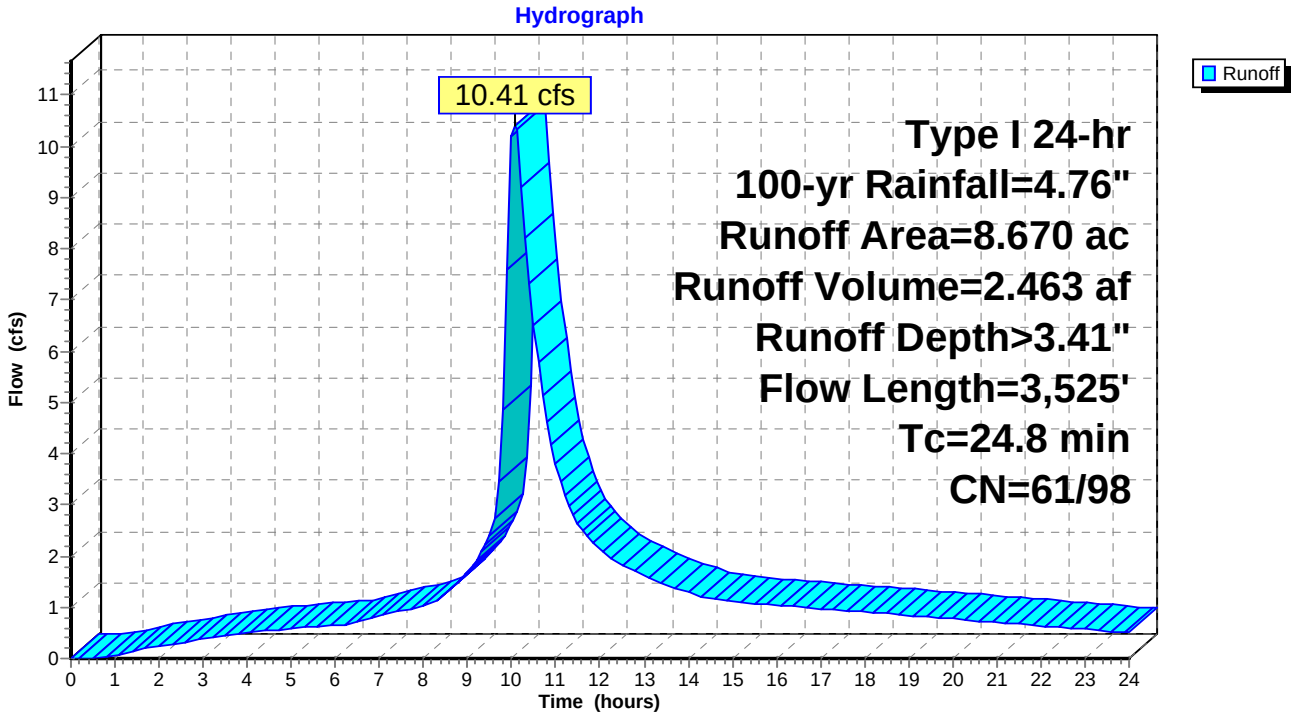
Runoff = 10.41 cfs @ 10.06 hrs, Volume= 2.463 af, Depth> 3.41"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
8.202	85	1/8 acre lots, 65% imp, HSG B
0.468	98	Paved roads w/curbs & sewers
8.670	86	Weighted Average
2.871		33.11% Pervious Area
5.799		66.89% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.4	69	0.0396	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
0.3	30	0.0100	1.50		**Shallow Concentrated Flow, FLOW TO DWY GUTTER** Grassed Waterway Kv= 15.0 fps
8.4	723	0.0050	1.44		**Shallow Concentrated Flow, DWY GUTTER FLOW** Paved Kv= 20.3 fps
0.0	23	0.2812	10.76		**Shallow Concentrated Flow, DWY GUTTER TO ROAD GUTTER** Paved Kv= 20.3 fps
1.9	219	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
24.8	3,525	Total			

Subcatchment 10S: Post Dev. 2



Summary for Subcatchment 16S: Post Dev. 7

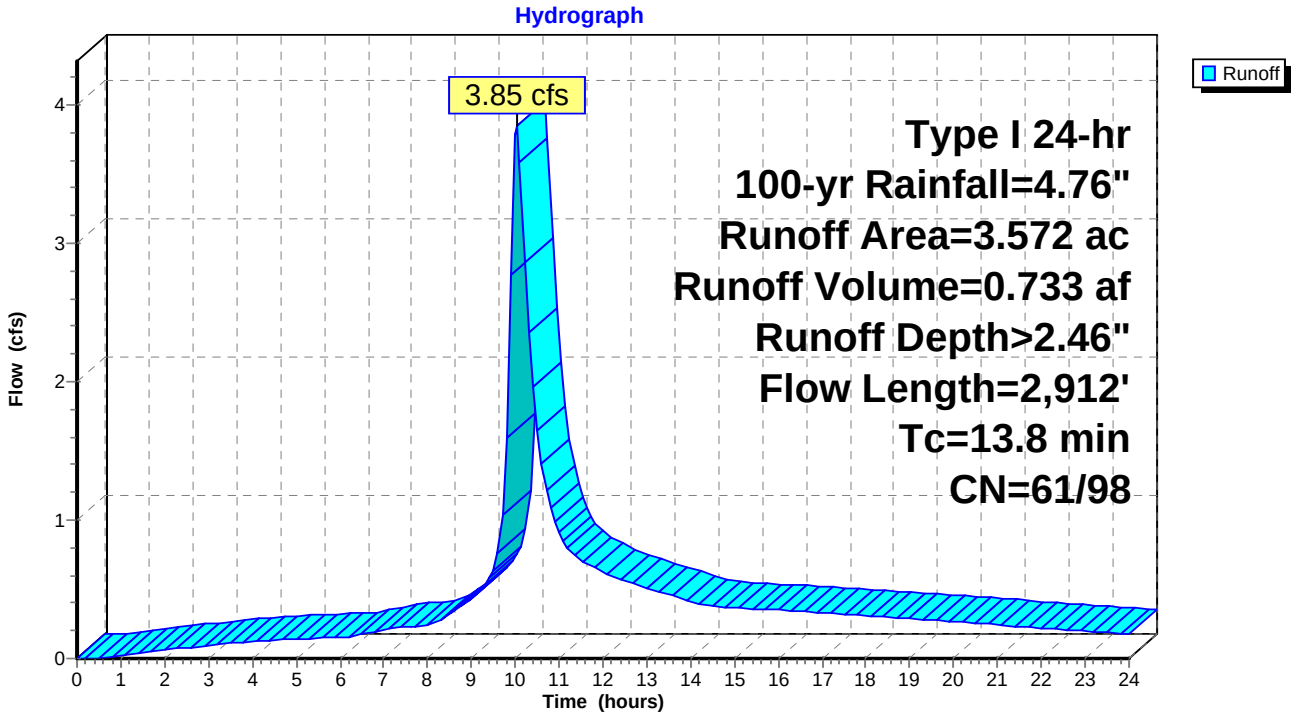
Runoff = 3.85 cfs @ 10.03 hrs, Volume= 0.733 af, Depth> 2.46"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
2.877	75	1/4 acre lots, 38% imp, HSG B
0.437	61	>75% Grass cover, Good, HSG B
0.258	98	Paved roads w/curbs & sewers
3.572	75	Weighted Average
2.221		62.17% Pervious Area
1.351		37.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.6	24	0.0675	0.16		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 1.81"
1.1	145	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	396	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.4	203	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	157	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
13.8	2,912	Total			

Subcatchment 16S: Post Dev. 7



Summary for Subcatchment 17S: Post Dev. 1

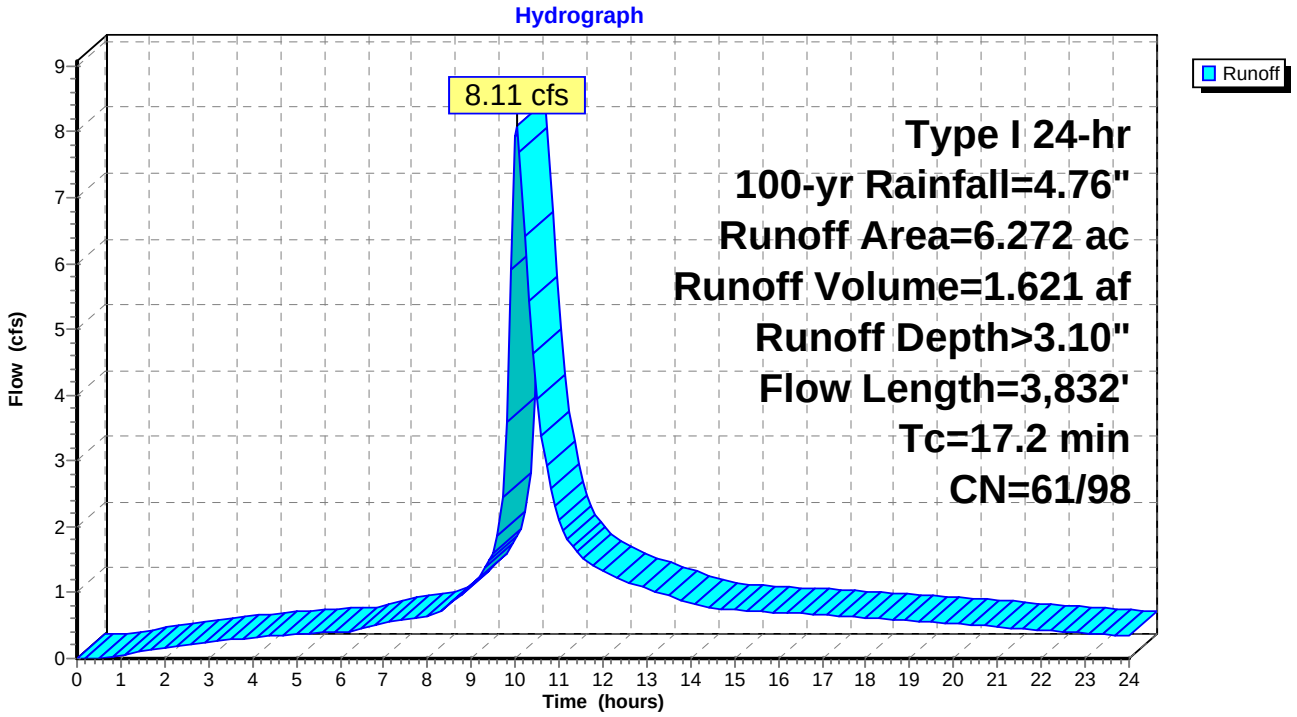
Runoff = 8.11 cfs @ 10.04 hrs, Volume= 1.621 af, Depth> 3.10"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
2.520	75	1/4 acre lots, 38% imp, HSG B
3.180	85	1/8 acre lots, 65% imp, HSG B
0.572	98	Paved roads w/curbs & sewers
6.272	82	Weighted Average
2.675		42.66% Pervious Area
3.597		57.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	11	0.2000	0.21		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
0.8	173	0.0300	3.52		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.7	121	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
3.4	503	0.0146	2.45		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
4.5	525	0.0092	1.95		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	38	0.0050	5.46	9.66	**Pipe Channel, DI# TO DI#2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD THROUGH MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.2	3,832	Total			

Subcatchment 17S: Post Dev. 1



Summary for Subcatchment 18S: Post Dev. 3

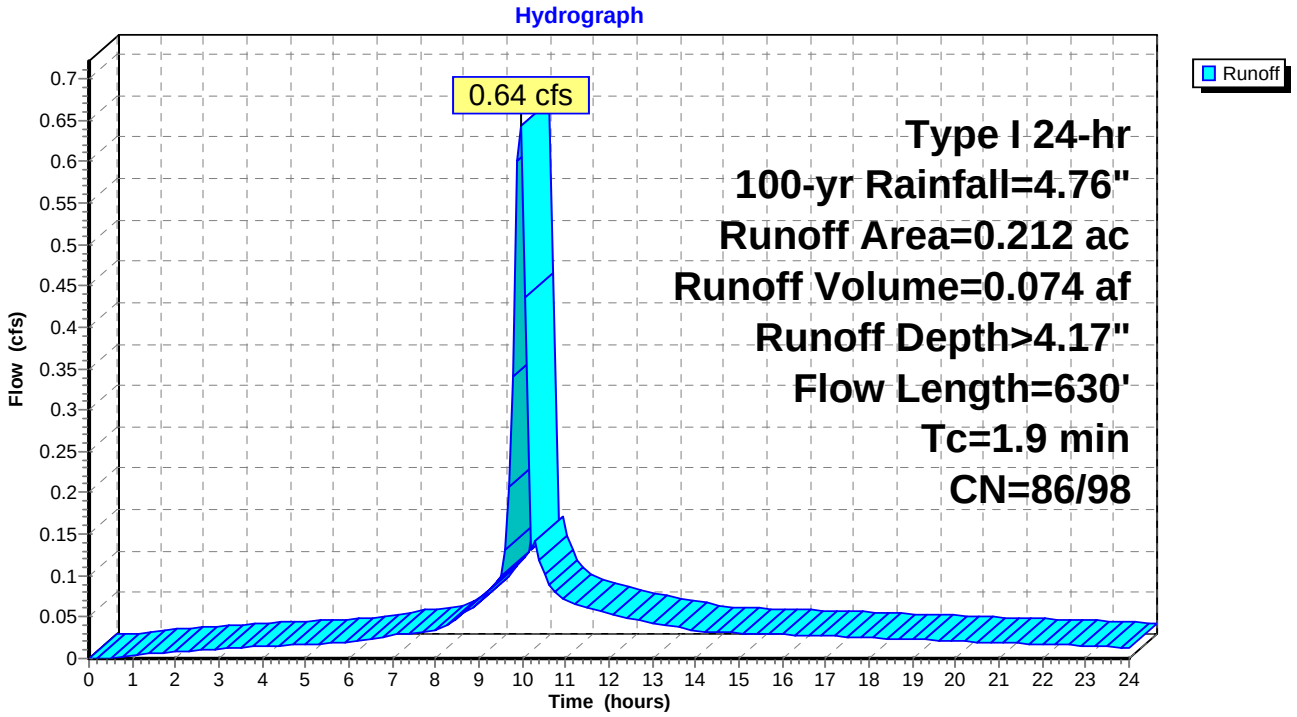
Runoff = 0.64 cfs @ 9.95 hrs, Volume= 0.074 af, Depth> 4.17"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
0.153	98	Paved roads w/curbs & sewers
0.059	86	Newly graded area, HSG B
0.212	95	Weighted Average
0.059		27.83% Pervious Area
0.153		72.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	16	0.0200	0.72		**Sheet Flow, CROWN TO GUTTER** Smooth surfaces n= 0.011 P2= 1.81"
0.1	24	0.0200	2.87		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	111	0.0758	5.59		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	65	0.1234	7.13		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	61	0.1332	7.41		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	101	0.1084	6.68		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.2	56	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.1	24	0.0100	7.73	13.66	**Pipe Channel, DI TO DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.9	630	Total			

Subcatchment 18S: Post Dev. 3



Summary for Subcatchment 19S: Post Dev. 4

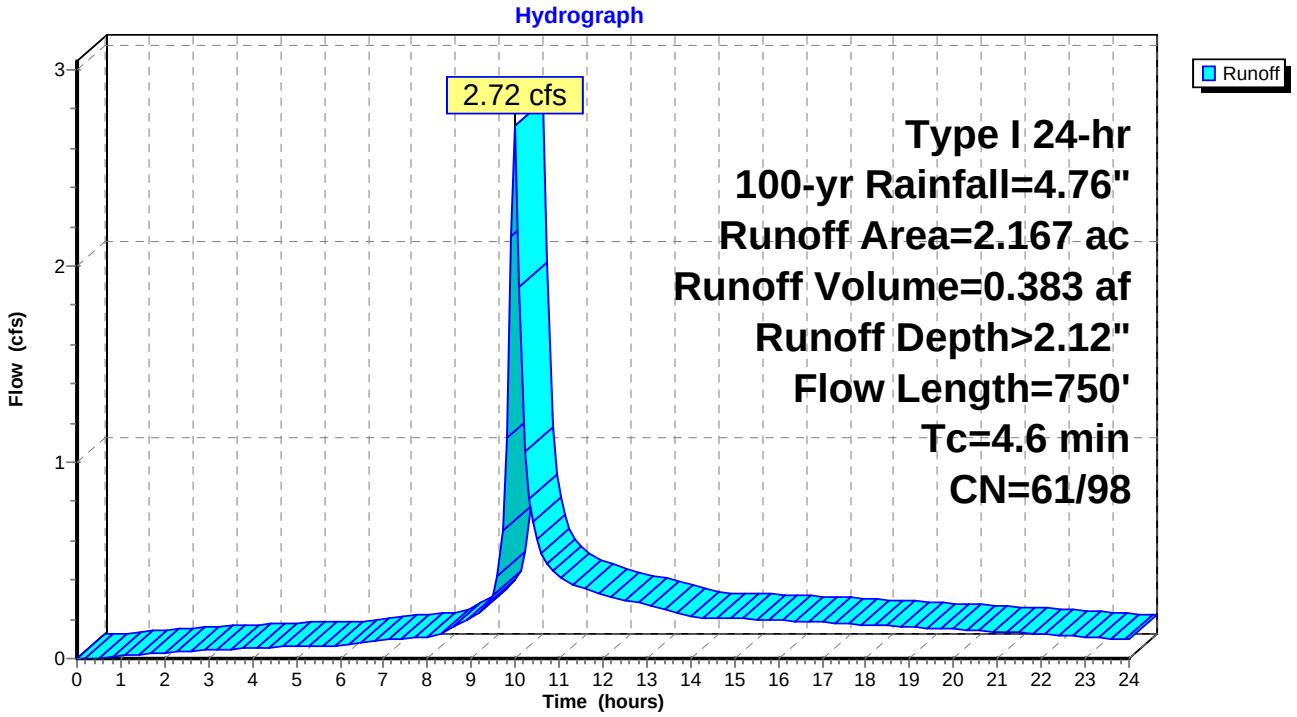
Runoff = 2.72 cfs @ 9.99 hrs, Volume= 0.383 af, Depth> 2.12"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
0.723	75	1/4 acre lots, 38% imp, HSG B
1.121	61	>75% Grass cover, Good, HSG B
0.305	98	Paved roads w/curbs & sewers
0.018	89	Paved roads w/open ditches, 50% imp, HSG B
2.167	71	Weighted Average
1.578		72.83% Pervious Area
0.589		27.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	28	0.5100	0.36		**Sheet Flow, SHEET FLOW** Grass: Short n= 0.150 P2= 1.81"
2.0	184	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY SWALE** Grassed Waterway Kv= 15.0 fps
0.8	290	0.0900	6.09		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.3	76	0.0600	4.97		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
0.2	172	0.0530	17.79	31.44	**Pipe Channel, SD TO BASIN #2** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
4.6	750	Total			

Subcatchment 19S: Post Dev. 4



Summary for Subcatchment 20S: Post Dev. C

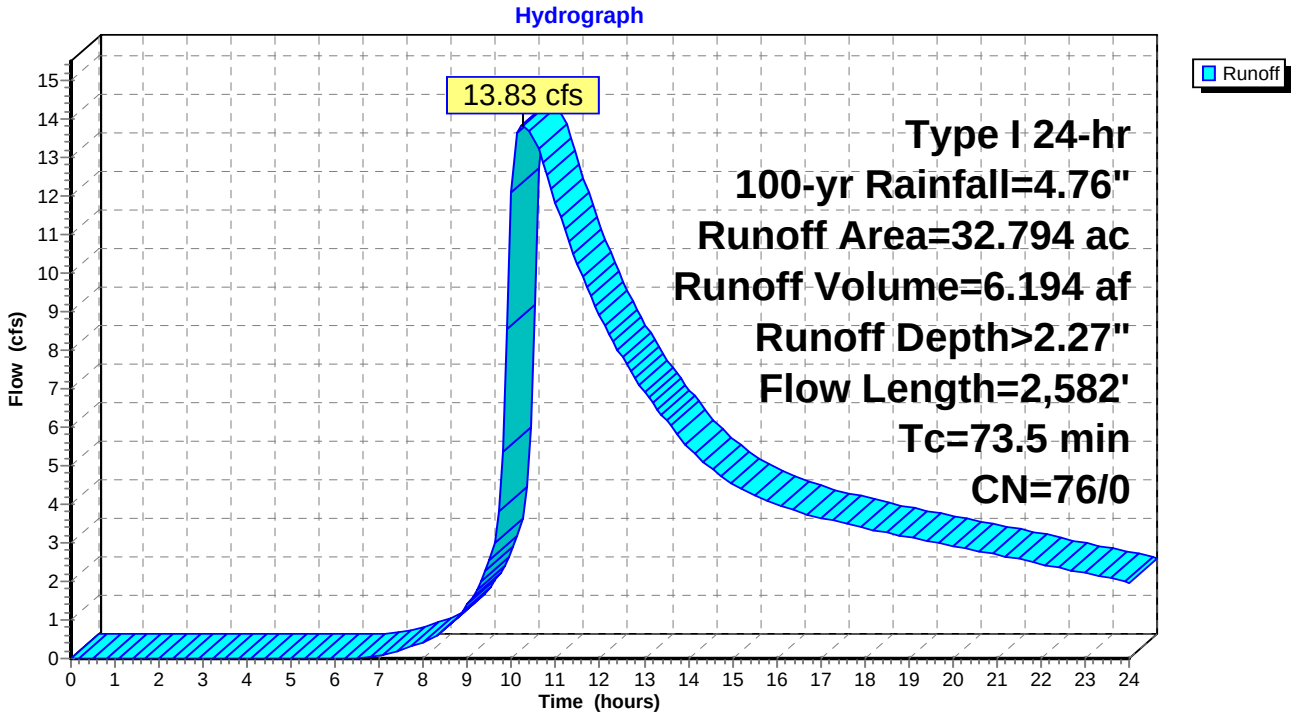
Runoff = 13.83 cfs @ 10.27 hrs, Volume= 6.194 af, Depth> 2.27"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
13.544	69	Pasture/grassland/range, Fair, HSG B
2.893	86	Newly graded area, HSG B
0.831	82	Dirt roads, HSG B
15.526	79	Pasture/grassland/range, Fair, HSG C
32.794	76	Weighted Average
32.794		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.8	300	0.0271	0.20		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
16.9	186	0.0271	0.18		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
8.8	442	0.0070	0.84		**Shallow Concentrated Flow, Flow at toe of path slope** Nearly Bare & Untilled Kv= 10.0 fps
2.1	303	0.0220	2.39		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
7.8	465	0.0200	0.99		**Shallow Concentrated Flow, Undeveloped flow to toe** Short Grass Pasture Kv= 7.0 fps
8.5	405	0.0028	0.79		**Shallow Concentrated Flow, Flow at toe of slope** Grassed Waterway Kv= 15.0 fps
0.7	49	0.0051	1.15		**Shallow Concentrated Flow, Flow at toe of slope** Unpaved Kv= 16.1 fps
3.2	393	0.0160	2.04		**Shallow Concentrated Flow, Path Flow** Unpaved Kv= 16.1 fps
0.4	18	0.0020	0.72		**Shallow Concentrated Flow, Flow across path** Unpaved Kv= 16.1 fps
0.3	21	0.0391	1.38		**Shallow Concentrated Flow, Flow to creek** Short Grass Pasture Kv= 7.0 fps
73.5	2,582	Total			

Subcatchment 20S: Post Dev. C



Summary for Subcatchment 21S: Post Dev. E

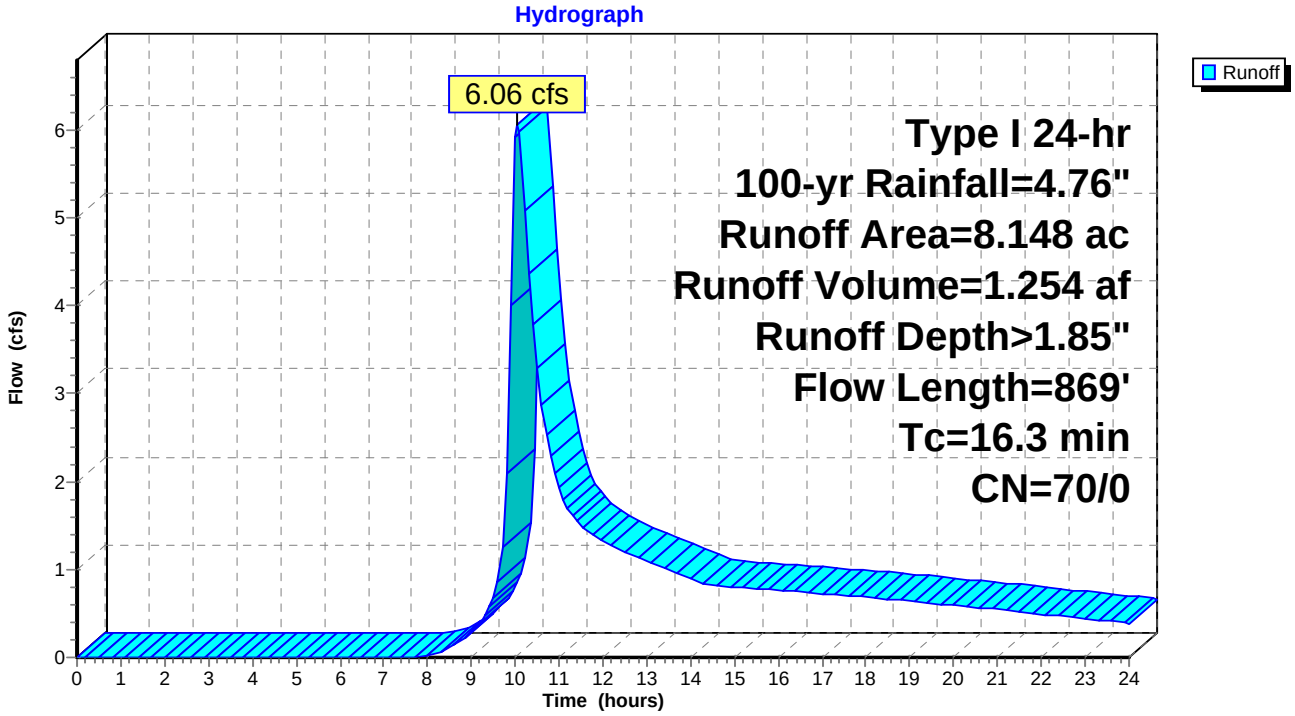
Runoff = 6.06 cfs @ 10.06 hrs, Volume= 1.254 af, Depth> 1.85"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
7.441	69	Pasture/grassland/range, Fair, HSG B
0.707	86	Newly graded area, HSG B
8.148	70	Weighted Average
8.148		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	18	0.5000	0.79		**Sheet Flow, Flow from graded area** Fallow n= 0.050 P2= 1.81"
9.0	189	0.1360	0.35		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
6.9	662	0.0520	1.60		**Shallow Concentrated Flow, Flow at boundary** Short Grass Pasture Kv= 7.0 fps
16.3	869	Total			

Subcatchment 21S: Post Dev. E



Summary for Subcatchment 25S: Post Dev. A

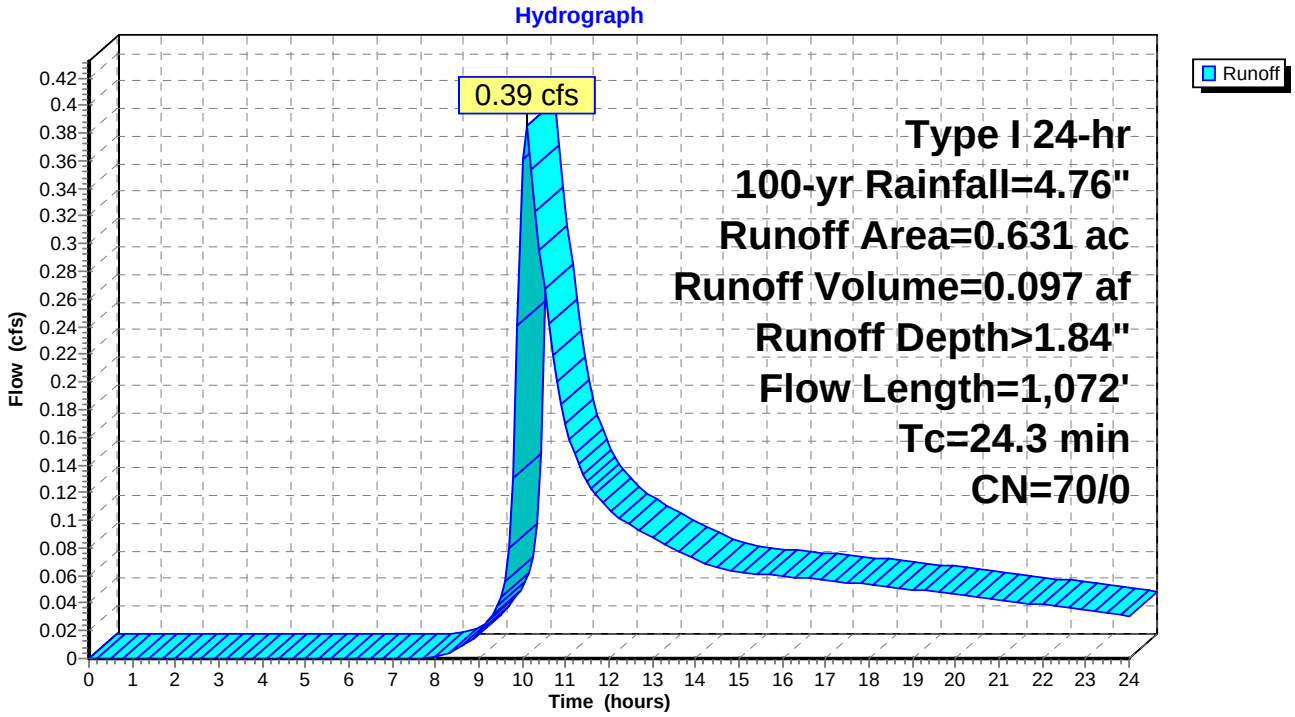
Runoff = 0.39 cfs @ 10.09 hrs, Volume= 0.097 af, Depth> 1.84"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
0.055	86	Newly graded area, HSG B
0.576	69	Pasture/grassland/range, Fair, HSG B
0.631	70	Weighted Average
0.631		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	39	0.0180	0.11		**Sheet Flow, Sheet flow to swale** Range n= 0.130 P2= 1.81"
11.6	789	0.0164	1.14	0.80	**Channel Flow, Concrete channel** Area= 0.7 sf Perim= 6.0' r= 0.12' n= 0.040 Earth, cobble bottom, clean sides
4.6	41	0.0350	0.15		**Sheet Flow, Flow from swale to undeveloped** Range n= 0.130 P2= 1.81"
0.9	26	0.8900	0.50		**Sheet Flow, Undeveloped sheet flow** Range n= 0.130 P2= 1.81"
1.5	177	0.0750	1.92		**Shallow Concentrated Flow, Undeveloped shallow flow** Short Grass Pasture Kv= 7.0 fps
24.3	1,072	Total			

Subcatchment 25S: Post Dev. A



Summary for Subcatchment 27S: Post Dev. 10

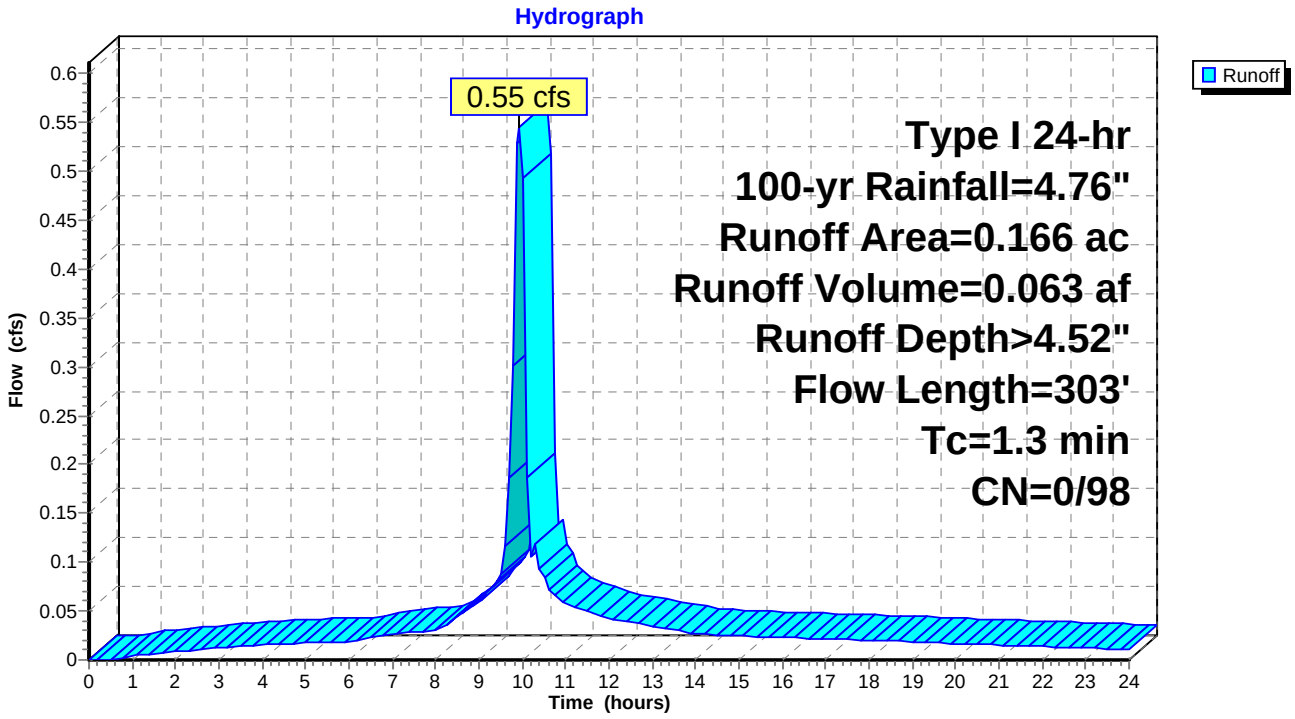
Runoff = 0.55 cfs @ 9.94 hrs, Volume= 0.063 af, Depth> 4.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
0.166	98	Paved roads w/curbs & sewers
0.166		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.3	12	0.0200	0.68		**Sheet Flow, Flow from Crown to Curb** Smooth surfaces n= 0.011 P2= 1.81"
0.4	133	0.0600	4.97		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.5	111	0.0367	3.89		**Shallow Concentrated Flow, Gutter Flow to DI** Paved Kv= 20.3 fps
0.1	47	0.0050	5.46	9.66	**Pipe Channel, SD Flow to Basin** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.3	303	Total			

Subcatchment 27S: Post Dev. 10



Summary for Subcatchment 28S: Post Dev. 11

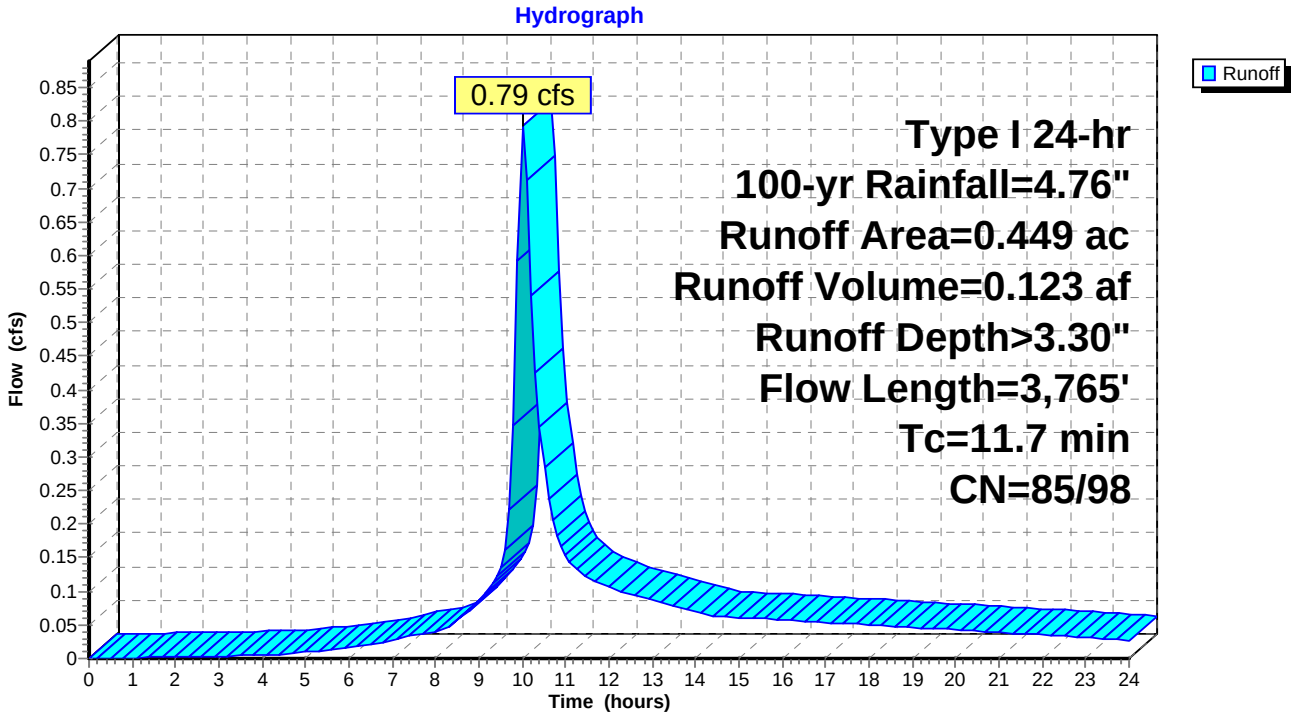
Runoff = 0.79 cfs @ 10.02 hrs, Volume= 0.123 af, Depth> 3.30"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
0.105	89	Paved roads w/open ditches, 50% imp, HSG B
0.344	86	Newly graded area, HSG B
0.449	87	Weighted Average
0.397		88.31% Pervious Area
0.052		11.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	22	0.2844	0.66		**Sheet Flow, Sheet flow to swale** Fallow n= 0.050 P2= 1.81"
3.2	760	0.0137	3.96	7.92	**Channel Flow, Flow in swale** Area= 2.0 sf Perim= 8.3' r= 0.24' n= 0.017 Concrete, unfinished
0.4	202	0.0120	8.47	14.96	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.7	320	0.0093	7.45	13.17	**Pipe Channel, SD flow** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.7	896	0.0050	5.46	9.66	**Pipe Channel, SD through MRO** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD to Basin** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010
11.7	3,765	Total			

Subcatchment 28S: Post Dev. 11



Summary for Subcatchment C1: Post Dev. 6

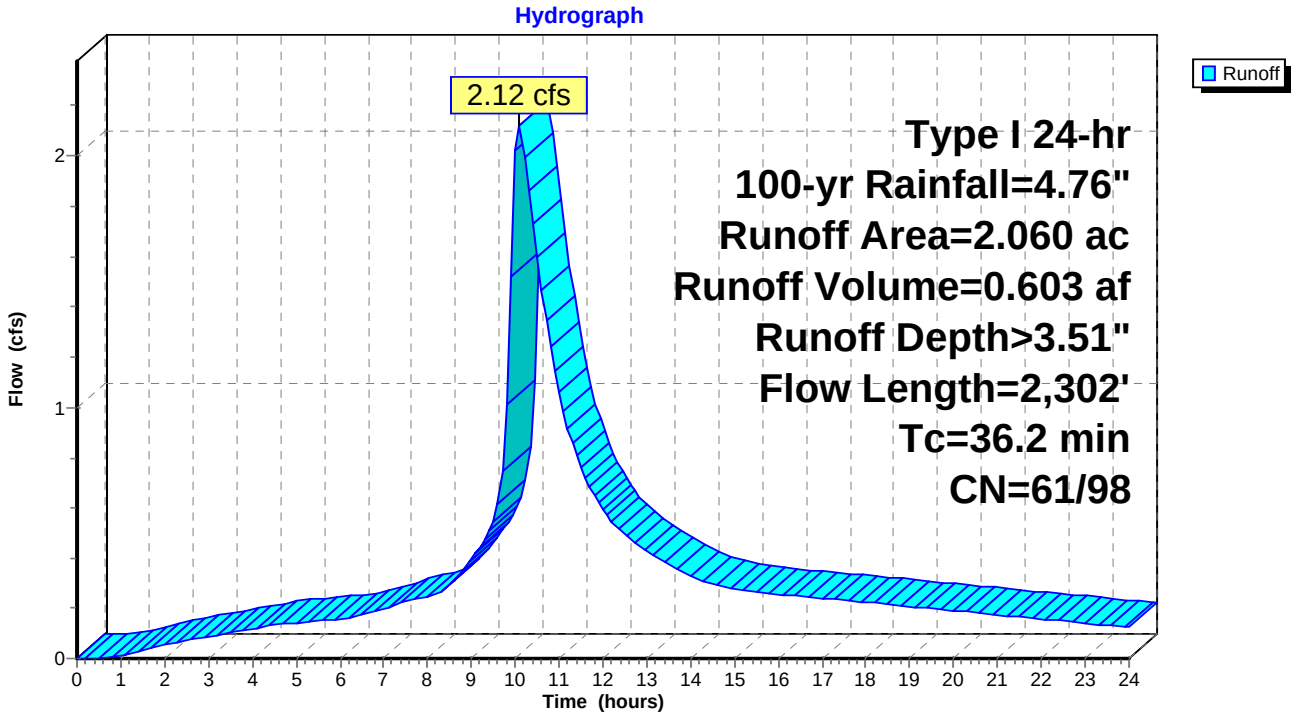
Runoff = 2.12 cfs @ 10.09 hrs, Volume= 0.603 af, Depth> 3.51"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
1.745	85	1/8 acre lots, 65% imp, HSG B
0.315	98	Paved roads w/curbs & sewers
2.060	87	Weighted Average
0.611		29.65% Pervious Area
1.449		70.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
27.5	180	0.0100	0.11		**Sheet Flow, Lot Flow** Grass: Short n= 0.150 P2= 1.81"
4.5	477	0.0075	1.76		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.1	80	0.1000	24.44	43.18	**Pipe Channel, DI TO DROP MH** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
2.2	876	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
36.2	2,302	Total			

Subcatchment C1: Post Dev. 6



Summary for Subcatchment C2: Post Dev. 5

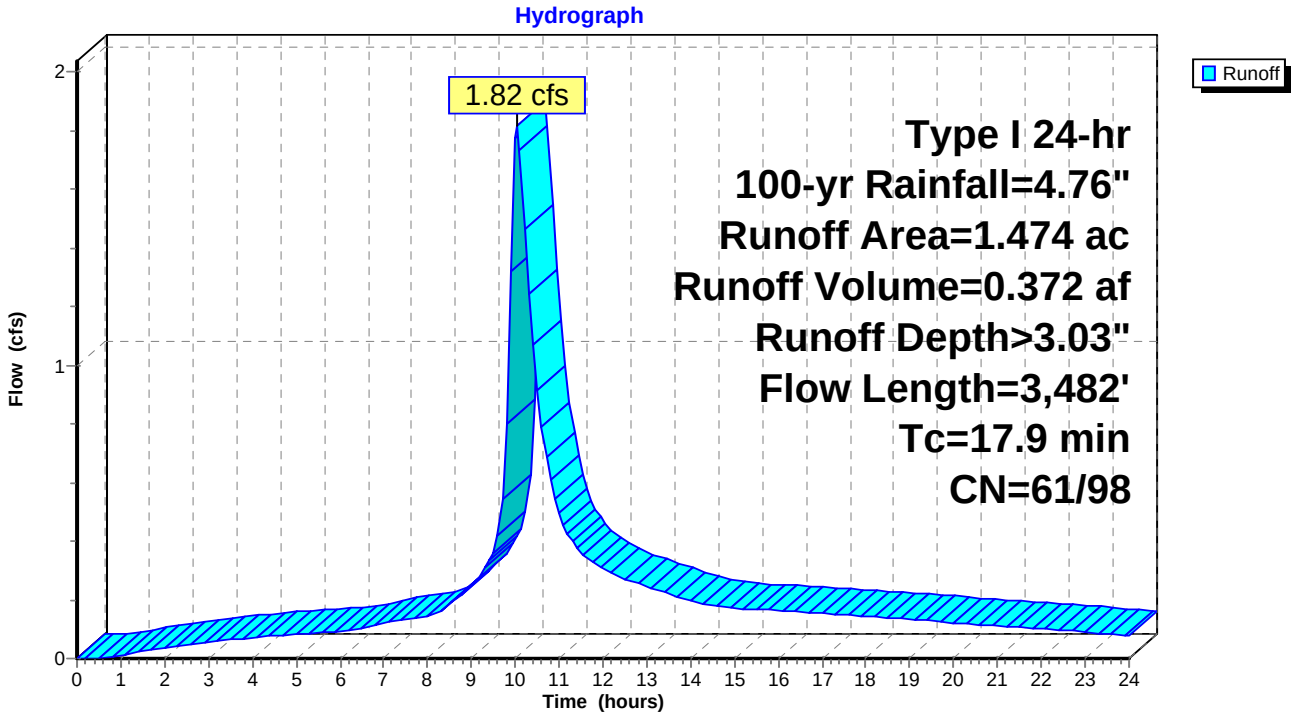
Runoff = 1.82 cfs @ 10.04 hrs, Volume= 0.372 af, Depth> 3.03"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
1.066	75	1/4 acre lots, 38% imp, HSG B
0.408	98	Paved roads w/curbs & sewers
1.474	81	Weighted Average
0.661		44.84% Pervious Area
0.813		55.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.9	169	0.0100	1.50		**Shallow Concentrated Flow, PROPERTY GRASS SWALE** Grassed Waterway Kv= 15.0 fps
1.9	86	0.0100	0.76		**Sheet Flow, LOT SHEET FLOW/DRIVEWAY** Smooth surfaces n= 0.011 P2= 1.81"
0.3	38	0.0100	2.03		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.0	214	0.0080	1.82		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.5	49	0.0073	1.73		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.1	28	0.0352	3.81		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.1	154	0.0123	2.25		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
2.3	400	0.0197	2.85		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
1.5	210	0.0135	2.36		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.6	147	0.0367	3.89		**Shallow Concentrated Flow, GUTTER FLOW TO DI** Paved Kv= 20.3 fps
2.9	952	0.0050	5.46	9.66	**Pipe Channel, ROAD "F" SD** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
0.9	346	0.0050	6.62	20.80	**Pipe Channel, ROAD "A" SD** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
1.9	689	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
17.9	3,482	Total			

Subcatchment C2: Post Dev. 5



Summary for Subcatchment C3: Post Dev. 8

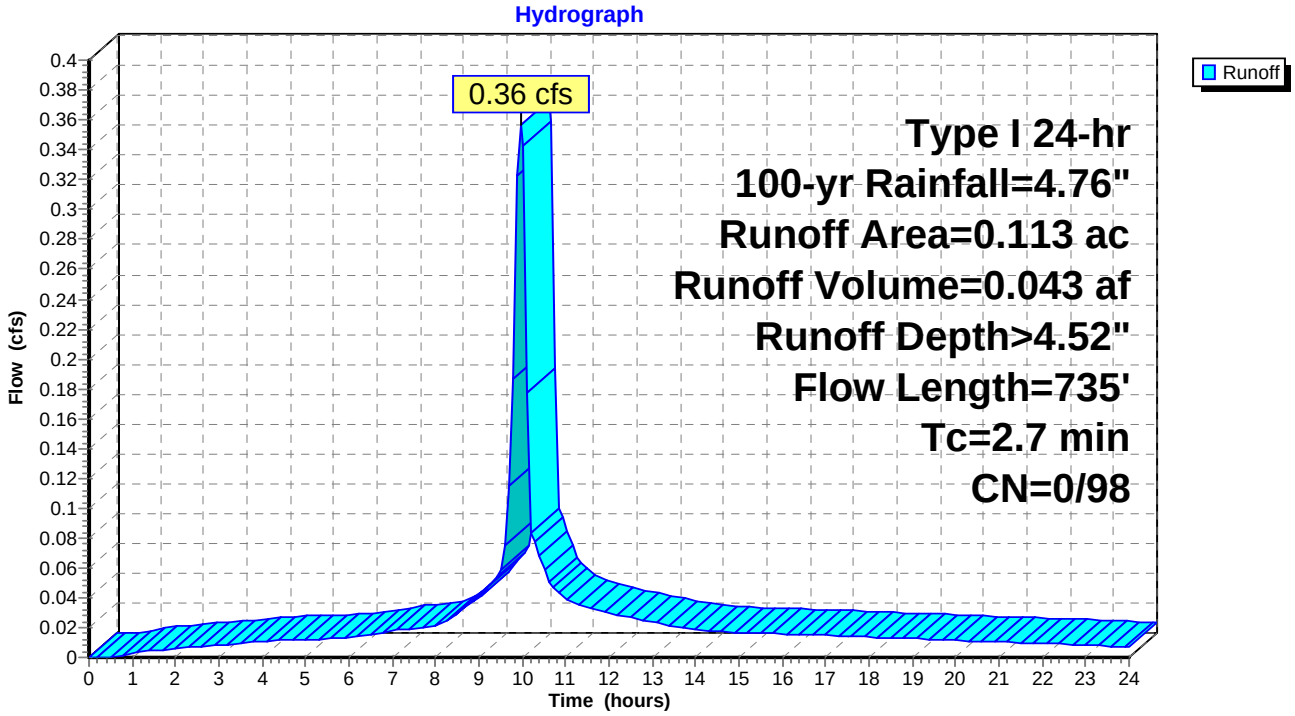
Runoff = 0.36 cfs @ 9.96 hrs, Volume= 0.043 af, Depth> 4.52"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Type I 24-hr 100-yr Rainfall=4.76"

Area (ac)	CN	Description
0.113	98	Paved roads w/curbs & sewers
0.113		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	75	0.0050	1.44		**Shallow Concentrated Flow, GUTTER FLOW** Paved Kv= 20.3 fps
0.0	31	0.1500	29.93	52.89	**Pipe Channel, SD FROM DI** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.010 PVC, smooth interior
1.8	629	0.0040	5.92	18.60	**Pipe Channel, SD TO BASIN** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.010 PVC, smooth interior
2.7	735	Total			

Subcatchment C3: Post Dev. 8



Summary for Pond 11P: BASIN #1

Inflow Area = 31.018 ac, 52.38% Impervious, Inflow Depth > 3.10" for 100-yr event
Inflow = 34.57 cfs @ 10.05 hrs, Volume= 8.022 af
Outflow = 1.25 cfs @ 24.00 hrs, Volume= 0.784 af, Atten= 96%, Lag= 837.0 min
Primary = 1.25 cfs @ 24.00 hrs, Volume= 0.784 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs
Peak Elev= 565.71' @ 24.00 hrs Surf.Area= 1.408 ac Storage= 7.236 af

Plug-Flow detention time= 876.2 min calculated for 0.781 af (10% of inflow)
Center-of-Mass det. time= 437.7 min (1,187.6 - 749.9)

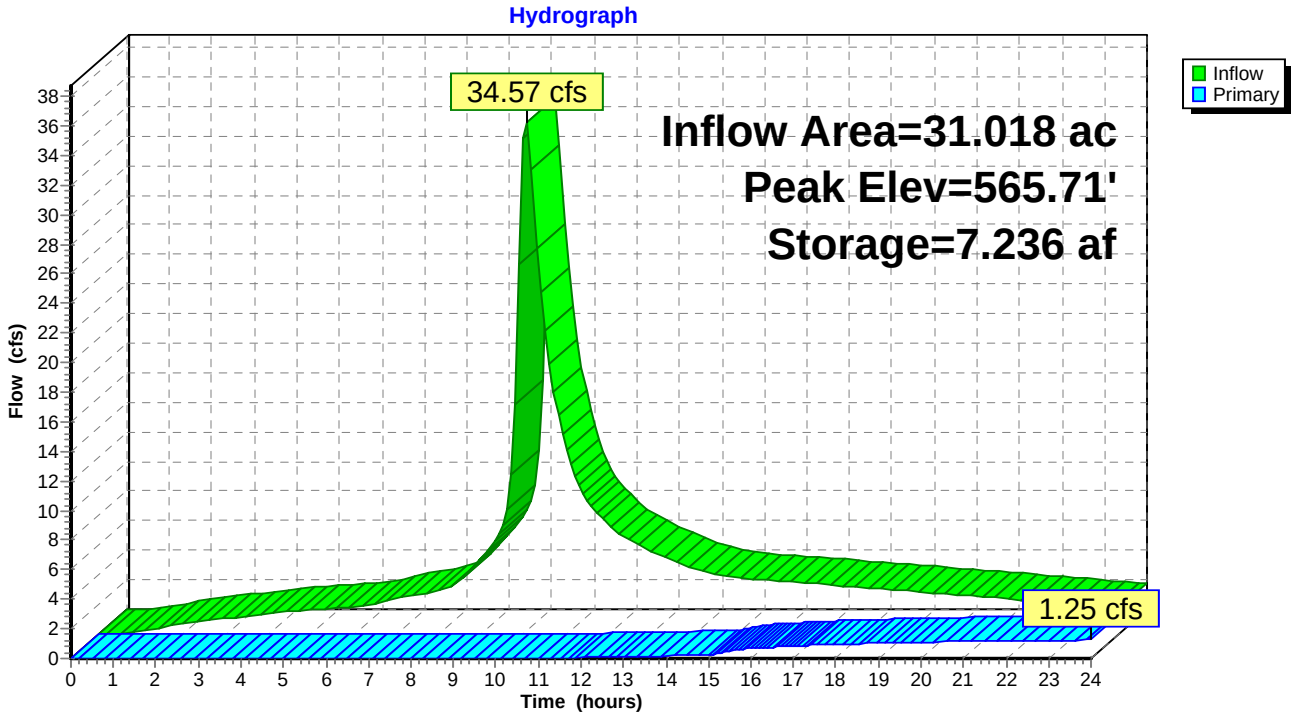
Volume	Invert	Avail.Storage	Storage Description
#1	559.00'	20.615 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
559.00	0.779	952.9	0.000	0.000	0.779
573.00	2.300	1,384.6	20.615	20.615	2.660

Device	Routing	Invert	Outlet Devices
#1	Primary	563.45'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	566.00'	**8.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Primary	564.70'	**6.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	564.00'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Primary	568.00'	**160.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32

Primary OutFlow Max=1.25 cfs @ 24.00 hrs HW=565.71' (Free Discharge)
- **1=Orifice/Grate** (Orifice Controls 0.16 cfs @ 7.24 fps)
- **2=Orifice/Grate** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Orifice Controls 0.95 cfs @ 4.84 fps)
- **4=Orifice/Grate** (Orifice Controls 0.14 cfs @ 6.30 fps)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 11P: BASIN #1



Summary for Pond 15P: BASIN #2

Inflow Area = 2.545 ac, 35.67% Impervious, Inflow Depth > 2.45" for 100-yr event
Inflow = 3.86 cfs @ 9.98 hrs, Volume= 0.519 af
Outflow = 0.37 cfs @ 12.80 hrs, Volume= 0.233 af, Atten= 91%, Lag= 169.3 min
Primary = 0.37 cfs @ 12.80 hrs, Volume= 0.233 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs / 2
Peak Elev= 526.07' @ 12.80 hrs Surf.Area= 0.177 ac Storage= 0.294 af

Plug-Flow detention time= 490.4 min calculated for 0.233 af (45% of inflow)
Center-of-Mass det. time= 261.8 min (1,017.2 - 755.4)

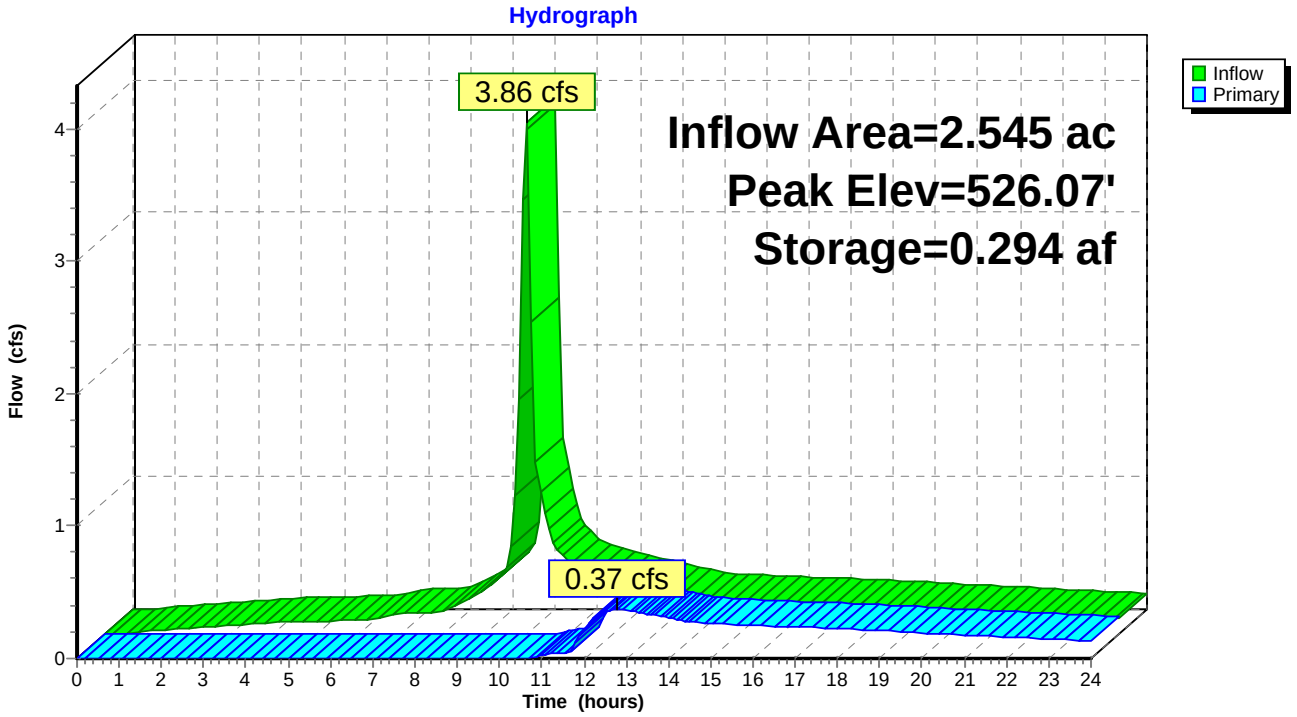
Volume	Invert	Avail.Storage	Storage Description
#1	524.00'	0.474 af	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (acres)	Perim. (feet)	Inc.Store (acre-feet)	Cum.Store (acre-feet)	Wet.Area (acres)
524.00	0.109	314.9	0.000	0.000	0.109
527.00	0.213	427.1	0.474	0.474	0.263

Device	Routing	Invert	Outlet Devices
#1	Primary	525.80'	**2.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#2	Primary	527.00'	**40.0' long x 2.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 Coef. (English) 2.54 2.61 2.61 2.60 2.66 2.70 2.77 2.89 2.88 2.85 3.07 3.20 3.32
#3	Primary	526.00'	**18.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.36 cfs @ 12.80 hrs HW=526.07' TW=103.00' (Fixed TW Elev= 103.00')
- **1=Orifice/Grate** (Orifice Controls 0.05 cfs @ 2.52 fps)
- **2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)
- **3=Orifice/Grate** (Weir Controls 0.31 cfs @ 0.89 fps)

Pond 15P: BASIN #2

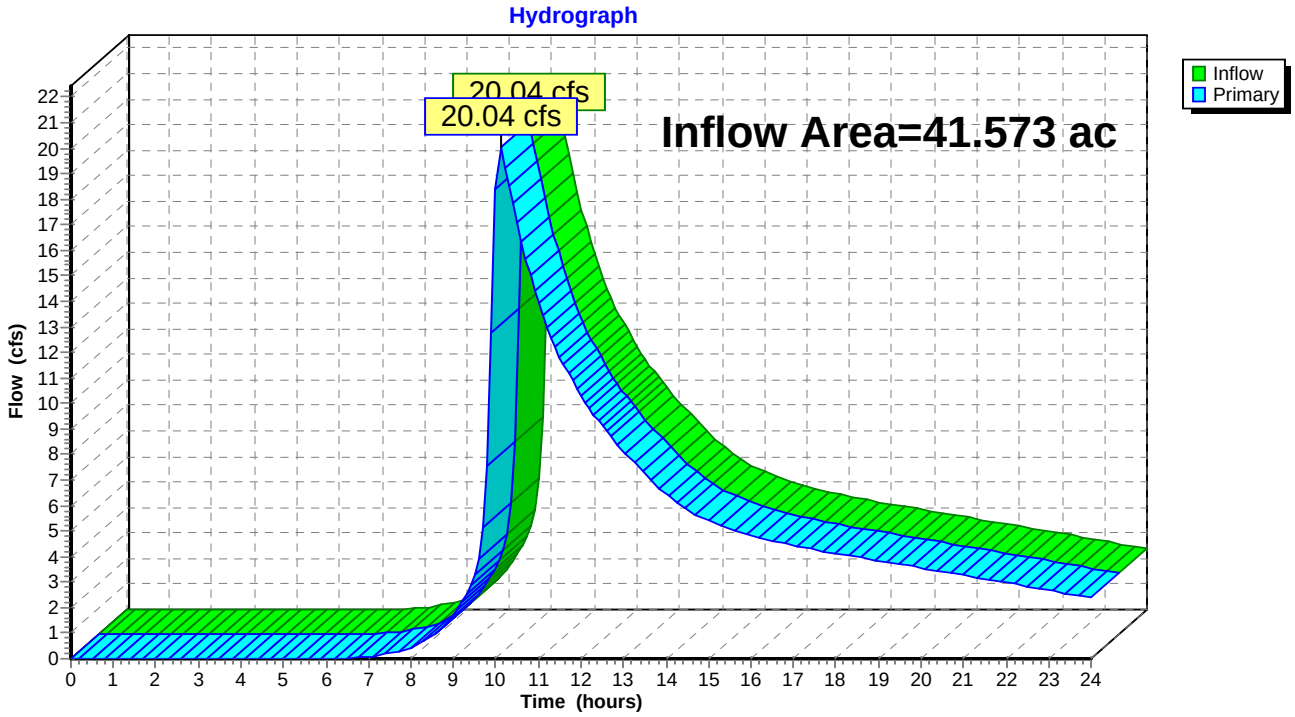


Summary for Pond 22P: Orcutt Creek

Inflow Area = 41.573 ac, 0.00% Impervious, Inflow Depth > 2.18" for 100-yr event
Inflow = 20.04 cfs @ 10.12 hrs, Volume= 7.545 af
Primary = 20.04 cfs @ 10.12 hrs, Volume= 7.545 af, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.10 hrs

Pond 22P: Orcutt Creek



Appendix D

*Calculations based on the Central Coast Regional Water Quality Control Board equations for calculating retention volume from the 95th percentile rainfall data

*Rainfall data records received from the Santa Barbara County Flood Control District for rain gauge #158 in Orcutt, CA; the 95th percentile storm event produces 1.52 inches of rainfall per hour within a 24 hour period

Retention Basin #1

Tributary Area - A A = 31.018 ac

Impervious Area - i i = 0.524

Runoff Coefficient - C

$$C = 0.858*i^3 - 0.78*i^2 + 0.04$$

C = 0.355

Retention Volume - V

V = 1.52-in * C * A

V = 1.3948 ac-ft

Retention Basin #2

Tributary Area - A A = 2.545 ac

Impervious Area - i i = 0.357

Runoff Coefficient - C

$$C = 0.858*i^3 - 0.78*i^2 + 0.04$$

C = 0.252

Retention Volume - V

V = 1.52-in * C * A

V = 0.081 ac-ft

Storage Volume - Basin #1: *Basin #1 bottom at elevation 559.00 ft*

A1b Area, *basin bottom* = 0.779 ac

A1t Area, *basin top* = 1.201 ac

Average Area-End Method

A1T = (A1b + A1T) / 2 = 0.990 ac

Elevation of lowest orirfice = 563.45 ft
Retention volume/water depth, d = 4.450 ft

Storage Volume, V1 = d * A1T = 4.406 ac-ft

4.45 ft > 1.395 ft

Storage Volume - Basin #2: *Basin #2 bottom at elevation 524.00 ft*

A2b Area, *basin bottom* = 0.109 ac

A2t Area, *basin top* = 0.168 ac

Average Area-End Method

A2T = (A2b + A2T) / 2 = 0.139 ac

Elevation of lowest orirfice = 525.80 ft
Retention volume/water depth, d = 1.800 ft

Storage Volume, V2 = d * A1T = 0.250 ac-ft

0.250 ac- ft > 0.081 ac- ft

Retention Basin Percolation Rates

Date November 13, 201
W.O. No. 16527.12
Sheet ____ of ____
By JTZ Ck. By ____

Santa Barbara • Camarillo • Santa Maria • Lancaster

*The Volume from the 95th% Storm must percolate with-in 48-hrs
Volume = Basin Bottom Area Height (from bottom to lowest orifice)

Basin #1 (side slopes 1'v : 4' h)

Area (gross cross-section) , A

A = 33945.34 ft² (*basin bottom*)

Hydraulic Gradient, i

i = ΔH/ΔL ΔH = 3.5 ΔL = 3.5 i = 1

*K values taken from NRCS Custom Soils Report (Appendix A)

Hydraulic Conductivity, K

bottom of basin is 3.5' above existing grade. The most conservative K value was used for that 3.5' of fill.

	K (µm/s)	K (ft/s)	Depth (ft)	K*D
	0.00000042	1.37795E-06	3.50	4.82E-06
	0.000042	0.000137795	2.17	0.000299
	0.00000042	1.37795E-06	1.00	1.38E-06
	0.000014	4.59318E-05	1.00	4.59E-05
	0.000042	0.000137795	0.83	0.000115
total	0.00009884	0.000324278	8.50	0.000465

K (ave) = 5.48E-05 ft/s

Percolation rate, Q

Q = K*i*A = 1.86 ft³/s

Volume of Basin #1

V = 4.41 ac-ft = 191919.7 ft³

Time of Percolation, t

t = V/Q = 28.7 hrs OK

Penfield & Smith

Retention Basin Percolation Rates

Date November 13, 201

W.O. No. 16527.12

Sheet ____ of ____

By JTZ Ck. By ____

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Basin #2 (side slopes 1'v : 4' h)

Area (gross cross-section)

A = 4740 ft² (*basin bottom*)

*K values taken from NRCS Custom Soils Report (Appendix A)

Hydraulic Conductivity, K

bottom of basin is 2.8' below existing ground. 5'-2.8' = 2.2'. K value for the last 2.2' was used.

	K (µm/s)	K (ft/s)	Depth (ft)	K*D
	0.000042	0.000137795	0.83	0.000115
	0.000014	4.59318E-05	1.67	7.66E-05
	0.000014	4.59318E-05	2.50	0.000115
total	0.00007	0.000229659	5.00	0.00

K (ave) = 4.59E-05 ft/s

Hydraulic Gradient, i

i = ΔH/ΔL ΔH = 1 ΔL = 1 i = 1

Percolation rate, Q

Q = K*i*A = 0.22 ft³/s

Volume of Basin #1

V = 0.25 ac-ft = 10890 ft³

Time of Percolation, t

t = V/Q = 13.9 hrs OK

Appendix K

Response to Comments Appendices

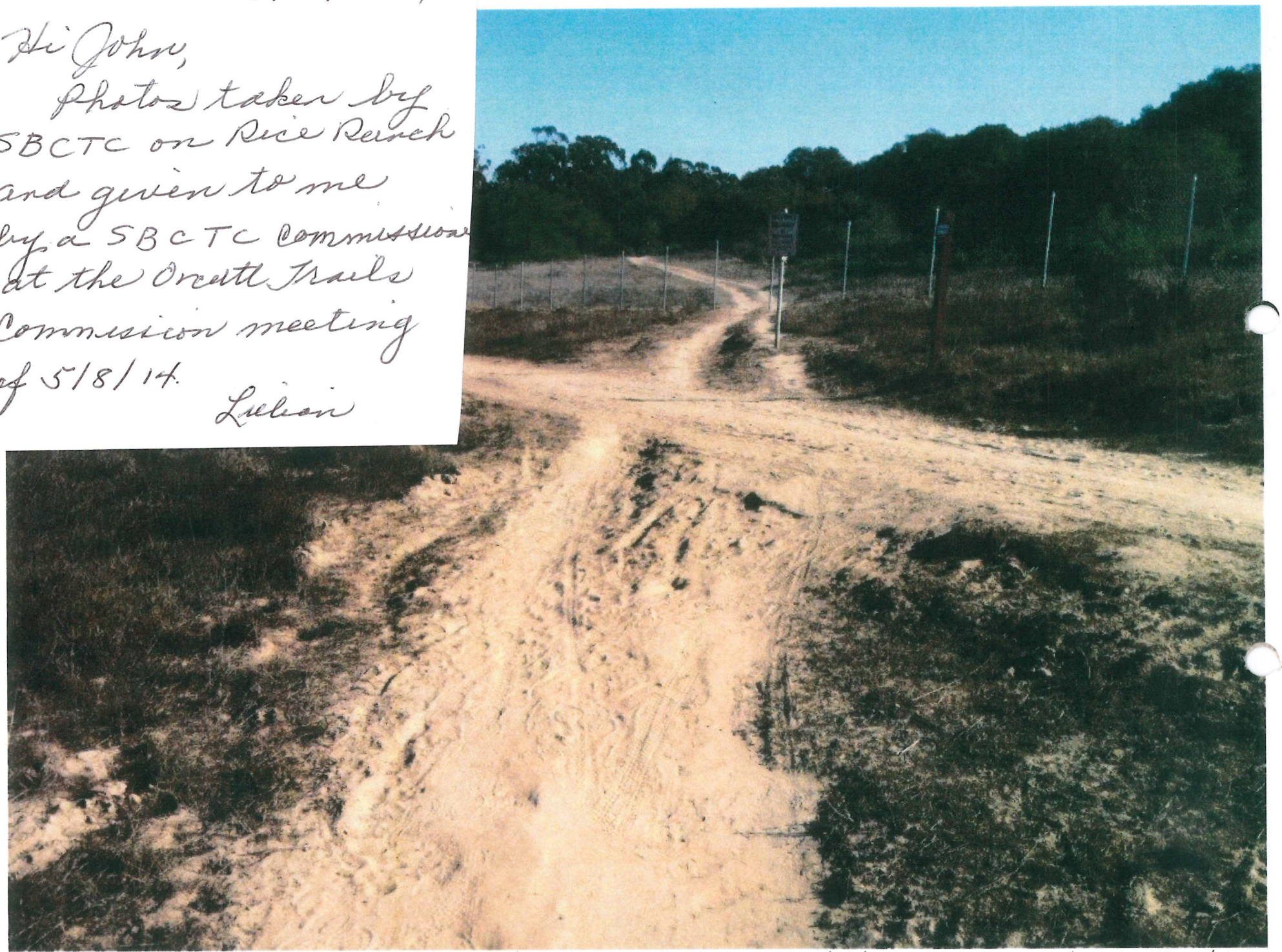


5/30/2014

Hi John,

Photos taken by SBCTC on Rice Ranch and given to me by a SBCTC Commissioner at the Orcutt Trails Commission meeting of 5/18/14.

Lucian



12/12/13 Santa Barbara County ~~Park~~ Trails Commission photo, Rice Ranch phase 1 trails



12/12/13 Santa Barbara County ~~Park~~ Commission photo, Rice Ranch phase 1 trails over Diuaroan trails



iver diagram 12/12/13) S.B. Co. Park commission photo, Rice Ranch Phase I trails



(cover 12/12/13 Diagram) Santa Barbara County ~~Park~~ trails Commission photo. Rice Ranch phase I trails