Appendix A

Notice of Preparation May 27, 2016

Initial Study Environmental Checklist Form

Comments received during Notice of Preparation period

Planning Division
214 South C Street
Oxnard, CA. 93030
(805) 385-7858
(805) 385-7417 Fax

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT FOR THE AVALON HOMES SUBDIVISION

The Oxnard Planning Division will be the Lead Agency and will prepare an environmental impact report (EIR) for the proposed Avalon Homes Tentative Tract Map and Coastal Development Permit. We need to know the views of your agency as to the scope and content of the environmental information that 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 requirements or other approval for the project. You are receiving this notice in accordance with CEQA Guidelines and Section 3.6(c) of Oxnard City Council Resolution No. 9133.

The project description, location, and the potential environmental effects are discussed below.

The Notice of Preparation comment period begins on **May 27, 2016** and ends on **June 27, 2016**. Due to the time limits mandated by State Law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice. Please send your comments to Kathleen Mallory, MA, AICP, at the address above or by email (Kathleen.Mallory@oxnard.org), or call (805) 385-7858 for further information. Please include the name of a contact person in your agency.

Project Title: Avalon Homes Subdivision (Tract No 5888, PZ No. 16-400-02 (CDP), PZ No. 16-300-03 (TSM), EIR No. 2016-01)

Project Location: The project area includes 38.33 acres and is located within the City of Oxnard southeast of the corner of South Harbor Boulevard and West Fifth Street and just north of the existing Oxnard Dunes subdivision (Assessor Parcel Numbers 196-0-010-275, 225, and 235). The proposed Avalon Homes project area includes 8.75 acres proposed for residential development (including a private street and common areas) and 29.58 acres proposed for resource protection. The site is bounded by Catamaran Street, Dunes Street and South Harbor Boulevard on the south and west, and West Fifth Street on the north. To the east is the Edison Canal. Canal Street would be extended northward as a gated private street from the Oxnard Dunes subdivision and would form the northern boundary of the residential component of the project – separating it from the open space lots to the north.

Project Applicant: Oxnard Dunes, LLC, 1015 S. Harbor Bl., Oxnard, CA 93035. The contact is Mike Marlow, (805) 985-1557.

Project Description: The proposed subdivision would include a maximum of 65 residential dwelling units, consisting of 35 clustered single-family condominium units in the southeastern portion of the site on both sides of the private street (3.39 acres), and up to 30 duplex dwelling units along the southern side of the private street. The property will be subdivided into 17 residential lots and five lots intended for Resource Protection, drainage improvements, a community recreation area, and private street.

The area proposed for development is within the Coastal Zone, and is designated REX (Residential-Existing) in the City of Oxnard 2030 General Plan. This proposed development area is zoned R-2-C (Coastal Low-Density Multiple Family). Two of the proposed open space lots (Lots A and B; 27.67 acres and 1.91 acres, respectively) are designated RP (Resource Protection) in the General Plan, and are zoned RP (Coastal Resource Protection).

Clustered Single-Family Condominiums. The proposed 35 clustered single family residences would range in size from 1,500 to 2,800 square feet. This portion of the project would also include a community lot (Lot E, 0.19 acres) and a lot to be used for drainage mitigation (Lot C, 0.15 acres). The private street connection at the existing stub-out of Canal Street would be gated, and would be used for egress only—access into the project at this location would be for emergency vehicles only. This segment of the private street would have a 36-foot curb-to-curb width, with travel lanes of 10 feet and parking areas of 8 feet on both sides of the street. Five foot wide sidewalks would also be provided on both sides of the street. Street trees would be located along the adjacent lots, and would be maintained by a Homeowners Association.

A six foot high masonry wall would extend along the rear yards of the lot west of the private street, separating the project from the existing residences to the west along Catamaran Street. The minimum rear yard depth in this portion of the project would be 25 feet, and most of the proposed dwellings would have rear yards in excess of 30 feet.

Duplex Residential Lots. Up to 30 residences in duplex structures would be located on Lots 1 through 15 (total of 2.62 acres) along the south side of the private street through the project, extending from the northern end of the proposed condominium lots, westward to tie into Dunes Street at the northwest corner of the proposed development. Residences in this part of the project would be generally 3,000 square feet in area. The private street would continue the 10-foot wide travel lanes and 8-foot parking areas from the eastern portion of the project, and would have a 5-foot wide sidewalk on its south side adjacent to the new residences. The north side of the private street would have a split rail fence along the boundary of the open space to the north. Street trees and landscaping would be provided along both sides of the street, with maintenance by the Homeowners Association. A landscaped entry lot would be located at the southeast corner of Dunes Street and the private street of the project, which will also provide a bioswale for drainage control. This gated entry at this location would provide both ingress and egress for the project.

A six foot high masonry wall would extend along the rear yards of the proposed residences. The minimum rear yard depth separating the proposed structures from the wall and existing residences to the south would be just over 30 feet.

A project alternative, which will be considered in the EIR, includes designing all or part of these lots as detached single-family residences, which would reduce the number of dwellings in this part of the project from 30 to as low as 15.

Open Space. The project includes two open space lots (27.67 acres and 1.91 acres) located north of the proposed residential development.

Other Project Characteristics. Grading is expected to be balanced onsite. Grading and site development is planned to start in the summer of 2017 and should take approximately six months. After the completion of final residential designs, construction is expected to begin in the fall of 2017, and to last for approximately nine months. Based on this schedule, the project would be completed between the spring and fall of 2018.

The project would also include formation of a Homeowners Association, which would have responsibility for maintaining the landscaping in common areas

Topics Identified for Study in an EIR. The City has determined that an EIR will be prepared and will evaluate potentially significant impacts related to the following issues:

- *Aesthetics*
- *Air Quality*
- *Biological Resources*
- *Cultural* Resources
- *Geology/Soils*
- *Greenhouse Gas Emissions*
- *Hazards/Hazardous Materials*
- *Hydrology/Water Quality*
- *Land Use/Planning*
- *Noise/Vibration*
- *Transportation/Traffic*
- *Utilities/Service Systems*

Based on the City's preliminary evaluation of the project, impacts related to Agriculture and Forestry Resources, Mineral Resources, Population/Housing, Public Services, and Recreation are anticipated to be less than significant. Therefore, these topics will not be studied in detail in the EIR.

Scoping Meeting. The City of Oxnard, in its role as Lead Agency, will hold a public scoping meeting to provide an opportunity for the public and representatives of public agencies to address the scope of the EIR. The Scoping Meeting for the Environmental Impact Report for the project is scheduled for June 13, 2016, from 4:00 – 5:00 p.m. in the City of Oxnard Community Room, located at 300 West Third Street, First Floor (exterior doors at the southwest corner of Third Street & South B Street).

Kathleen M. Mallory for

Ashley Golden
Development Services Director

cc: Applicant
EIR Distribution List

CITY OF OXNARD

INITIAL STUDY ENVIRONMENTAL CHECKLIST FORM

1. PROJECT TITLE:

Avalon Homes Subdivision - Tract No 5888; Planning and Zoning (PZ) No. 16-400-02 (Coastal Development Permit); PZ No. 16-300-03 (Tentative Subdivision Map); and Environmental Impact Report No. 2016-01.

2. LEAD AGENCY NAME AND ADDRESS:

City of Oxnard
Development Services Department
Planning Division
214 South C Street
Oxnard, CA 93030

3. CONTACT PERSON AND PHONE NUMBER:

Kathleen Mallory, MA, AICP, LEED Green Associate, Project Planner
(805) 512-9800
Kathleen.Mallory@oxnard.org

4. PROJECT LOCATION:

The project is located at the Southeast corner of South Harbor Boulevard and West Fifth Street, north of existing Oxnard Dunes subdivision (APNs 196-0-010-275, 225, and 235). The project is located in the Oxnard Dunes Neighborhood in the Southwest Community of the City of Oxnard. Figure 1 provides the regional location and Figure 2 provides an aerial view of the property and surrounding vicinity.

5. PROJECT APPLICANT'S/SPONFSOR'S NAME AND ADDRESS:

Oxnard Dunes, LLC
Mike Marlow
1015 S. Harbor Bl.
Oxnard, CA 93035
Phone: (805) 985-1557

6. 2030 GENERAL PLAN DESIGNATION:

The project site has a General Plan land use designation of Coastal Zone REX (Residential-Existing), and Resource Protection (RP).

7. ZONING:

The project site is zoned Coastal Low-Density Multiple Family (R-2-C), and Coastal Resource Protection (RP).

8. PROJECT DESCRIPTION:

The Avalon Homes Subdivision (project) proposes the construction of a maximum of 65 residential dwelling units on 8.75 acres of a 38.33 acre property (Figure 3). The property would be subdivided into 17 residential lots and five lots intended for Resource Protection, drainage improvements, a community recreation area, and private street. Table 1 below identifies the proposed lots, their sizes, and proposed uses.

Table 1
Project Development Types and Acreage

Lot No.	Development Type	Units	Acres
1 through 15	Residential - Single Family or Duplex	15 single family, or maximum 30 if all duplex	2.62
16 and 17	Residential - Cluster Single Family	35	3.39
A	Resource Protection (No Development Proposed)	---	27.67
B	Resource Protection (No Development Proposed)	---	1.91
C	Drainage Basin	---	0.15
D	Entry / Vegetated Bio Swale	---	0.16
E	Private Community/Recreation Area	---	0.19
F	Private Street	---	2.24
Total		**Maximum 65**	**38.33**

The project site is within the Coastal Zone. The lots proposed for residential development are designated REX (Residential-Existing) in the City of Oxnard 2030 General Plan (City of Oxnard 2011: Figure 3-1) and Coastal Land Use Plan (City of Oxnard 2002: Map No. 18). This proposed development area is zoned R-2-C (Coastal Low-Density Multiple Family). The proposed open space lots (27.67 acres and 1.91 acres) are designated RP (Resource Protection) in the General Plan and Coastal Land Use Plan, and are zoned RP (Coastal Resource Protection).

The proposed residential development would occur in two components: a cluster development of single-family condominiums in the southeastern portion of the site, and a row of single family lots, some of which may be developed as duplexes, on the north. Thus, the number of dwellings within this component may range from 15 (all single family) to 30 (all duplexes). The proposed residential development areas are shown in Figure 4. These areas, along with other components of the proposed project are described in the following paragraphs.

Clustered Single-Family Condominiums. The proposed 35 clustered single family residences would be located on lots 16 and 17 (total 3.39 acres) in the southeast portion of the project site on both sides of the private street. Units would range in size from 1,500 to 2,800 square feet. This portion of the project would also include a community lot and a lot to be used for drainage mitigation (Lots E and C in Figure 3). The proposed private street connection at the existing

stub-out of Canal Street would be gated, and would be used for egress only—access into the project at this location would be for emergency vehicles only. This segment of the private street would have a 36-foot curb-to-curb width, with travel lanes of 10 feet and parking areas of 8 feet on both sides of the street. Five foot wide sidewalks would also be provided on both sides of the street. Street trees would be located along the adjacent lots, and would be maintained by a Homeowners Association.

A six foot high masonry wall would extend along the rear yards of the lot west of the private street (Lot 16), separating the project from the existing residences to the west along Catamaran Street. The minimum rear yard depth in this portion of the project would be 25 feet, and most of the proposed dwellings would have rear yards in excess of 30 feet.

Duplex Residential Lots. Up to 30 residences in single family or duplex structures would be located on Lots 1 through 15 (total of 2.62 acres) along the south side of the private street through the project, extending from the northern end of the proposed condominium lots, westward to tie into Dunes Street at the northwest corner of the proposed development. Residences in this portion of the project would generally range in size from 3,000 to 4,500 square feet. The private street would continue the 10-foot wide travel lanes and 8-foot parking areas from the eastern portion of the project, and would have a 5-foot wide sidewalk on its south side adjacent to the new residences. The north side of the private street would have a split rail fence along the boundary of the open space to the north. Street trees and landscaping would be provided along both sides of the street, with maintenance by the Homeowners Association. A landscaped entry lot would be located at the southeast corner of Dunes Street and the private street of the project, which would also provide a bioswale for drainage control (Lot D in Figure 3). This gated entry at this location would provide both ingress and egress for the project.

A six foot high masonry wall would extend along the rear yards of the proposed residences. The minimum rear yard depth separating the proposed structures from the wall and existing residences to the south would be just over 30 feet.

A project alternative, which will be considered in the EIR, includes designing all or part of these lots as detached single-family residences, which would reduce the number of dwellings in this part of the project from 30 to as low as 15.

Resource Protection Areas. The project includes two open space lots, where no development would occur. These are Lots A and B in Figure 3 (27.67 acres and 1.91 acres) located north of the proposed residential development.

Other Project Characteristics. Grading is expected to be balanced onsite. Grading and site development is planned to start in the summer of 2017 and should take approximately six months. After the completion of final residential designs, construction is expected to begin in the fall of 2017, and to last for approximately nine months. Based on this schedule, the project would be completed between the spring and fall of 2018.

The project would also include formation of a Homeowners Association, which would have responsibility for maintaining the landscaping in common areas.

Approval of the Coastal Development Permit (CDP) would allow the residential plotting of the future homes, with potentially three product types envisioned in two areas:

- 15 lots for either single family residences or duplex residences. The number of residences range from 15 to 30.
- 35 clustered single family condominium homes on two lots.

9. SURROUNDING LAND USES AND SETTING:

The project site is located east of South Harbor Boulevard between West Wooley Road and West 5th Street. Entrance to the project would be provided off of Dune Street to the west and Canal Street to the south. The project site is bordered by the following uses:

North: Undeveloped open space zoned for resource protection (RP), Coastal Visitor-Serving Commercial (CVC), and Single-Family Beach (RB1). The North Shore Subdivision planned on the RB1 property is presently in plan check.

East: Undeveloped open space zoned for Community Reserve (CR) with the existing Edison Canal oriented north to south and agricultural operations further to the east in the County.

South: Existing Single family residences in the Oxnard Dunes neighborhood on property zoned for Coastal Low-Density Multiple Family (R2C).

West: Existing Single family beach residences (RB1).

Adjacent land uses include the single family residences within the communities of Oxnard Shores and Oxnard Dunes to the west and south, respectively; undeveloped open space zoned for resource protection and Community Reserve to the north and east and the Edison Canal and agricultural operations to the east as well (see Figure 2 for project location). The project site is currently vacant and is situated on relatively flat and vegetated sand dunes with established low laying trees along the northern portion of the site.

10. REQUIRED ENTITLEMENTS:

The proposed development requires approval of a Tentative Subdivision Map for Tract No. 5888 (PZ No. 16-300-03) and a Coastal Development Permit (PZ 16-400-02).

11. CUMULATIVE PROJECTS:

The projects listed below are currently in development or are considered reasonably foreseeable development in the project vicinity.

Project/Case No.	**Description and Status**
Anacapa Townhomes PZ 13-420-02	70 Condominiums in 5 buildings on a 3.5 acre property located at 5001 West Wooley Street. Approved, not built.
5540 West 5th Street PZ 14-550-01	Modification of existing condition of approval to allow for the development of two mobile home sites located at 5540 West 5th Street. Currently under construction.

Project/Case No.	Description and Status
North Shore Subdivision PZ 05-300-04 and 08	183 single-family homes and 109 detached condominiums located at the northeast corner of West 5th Street and South Harbor Boulevard. Approved, not built.
Marina Condominiums Seabridge PZ 05-140-10	42 attached condominiums located at Tradewinds and Seabridge Drive. Approved, not built.
Channel Island Harbor Fisherman's Warf County of Ventura	Mixed use development that would replace existing commercial development on the 11.4 acre site with a mixed residential/commercial development with an estimated 200 rental apartments, and 25,000 square feet of commercial retail. Currently under environmental review
Channel Island Harbor Resort County of Ventura	Replacement of the existing 176 room Casa Sirena hotel with a new 205 room hotel, a 5,400 square foot restaurant, and 215 parking stalls. Currnetly under environmental review

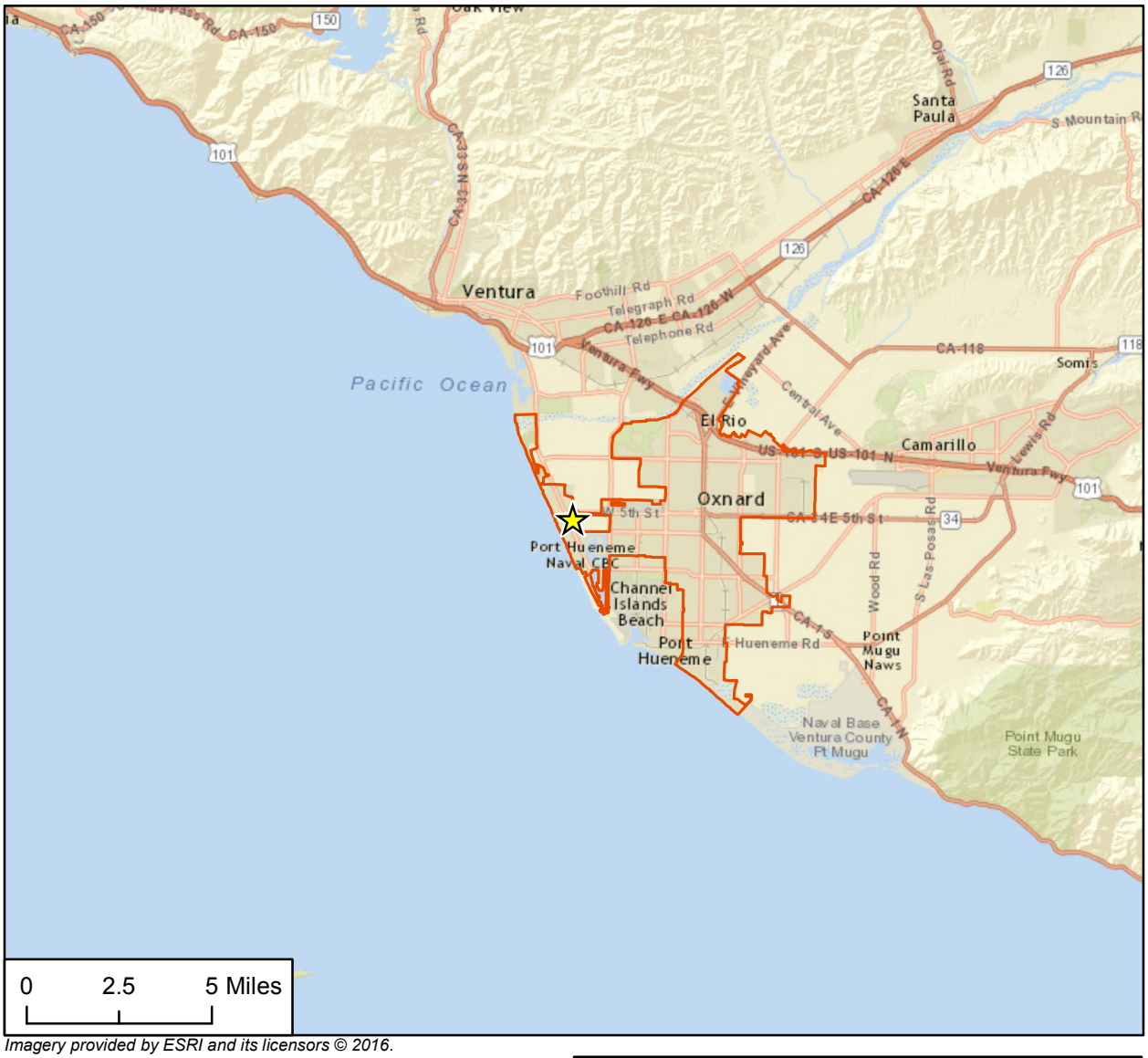
These developments, along with the proposed project, could result in cumulative impacts related to traffic or other impacts. Further, projected growth within the region may result in cumulative impacts to air quality and other regional scale environmental resources Cumulative impacts require further analysis in the Environmental Impact Report (EIR) to determine whether or not they would be cumulatively significant, and whether or not the project's contribution towards cumulative impacts would be considerable.

12. CITY OF OXNARD 2030 GENERAL PLAN AND COASTAL LAND USE PLAN:

The proposed project is generally consistent with the 2030 General Plan land use designations and zoning districts applied to the property. The northern portion of the project site extends into the Resource Protection land use designation, which includes Environmental Sensitive Habitat Areas (ESHA) associated with the Oxnard Dunes and riparian vegetation (see Figure 5, which shows Sensitive Habitat Areas from Map 7 in the Coastal Land Use Plan). The project includes these habitat areas in two lots (Lots A and B) intended for Resource Protection areas with no proposed development. The Coastal Land Use Plan also calls for a 100 foot buffer to be provided adjacent to all Resource Protection areas. This can be reduced to 50 feet only if the applicant can demonstrate that the large buffer is unnecessary to protect the resources of the habitat (Local Coastal Policy 6.d.). The proposed residential development is in an area designated REX – Existing Residential Development. The proposed design would provide some buffer adjacent to the Resource Protection areas through a narrow landscaped strip and the single-loaded private street proposed along the northern development boundary. More detailed analysis will be performed as part of the EIR to determine if there are any encroachments by the project into the Resource Protection land use category, and to identify any impacts and mitigation related to the project design. The EIR will discuss the issue, but the final determination of consistency with the Coastal Land Use Plan will be made by the decision-makers for the project.

13. OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED:

The City of Oxnard Local Coastal Program (LCP) was certified by the California Coastal Commission effective in 1985. As such, the authority to approve Coastal Development Permits for the project rests with the City of Oxnard, and the environmental effects of the coastal permit approvals will be considered in the EIR along with the proposed Tentative Tract Map. Approval by the City, however, is appealable to the California Coastal Commission.



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Oxnard City Limits

Project Location

N



Regional Location

Figure 1



Imagery provided by Google and its licensors © 2016.

Project Location

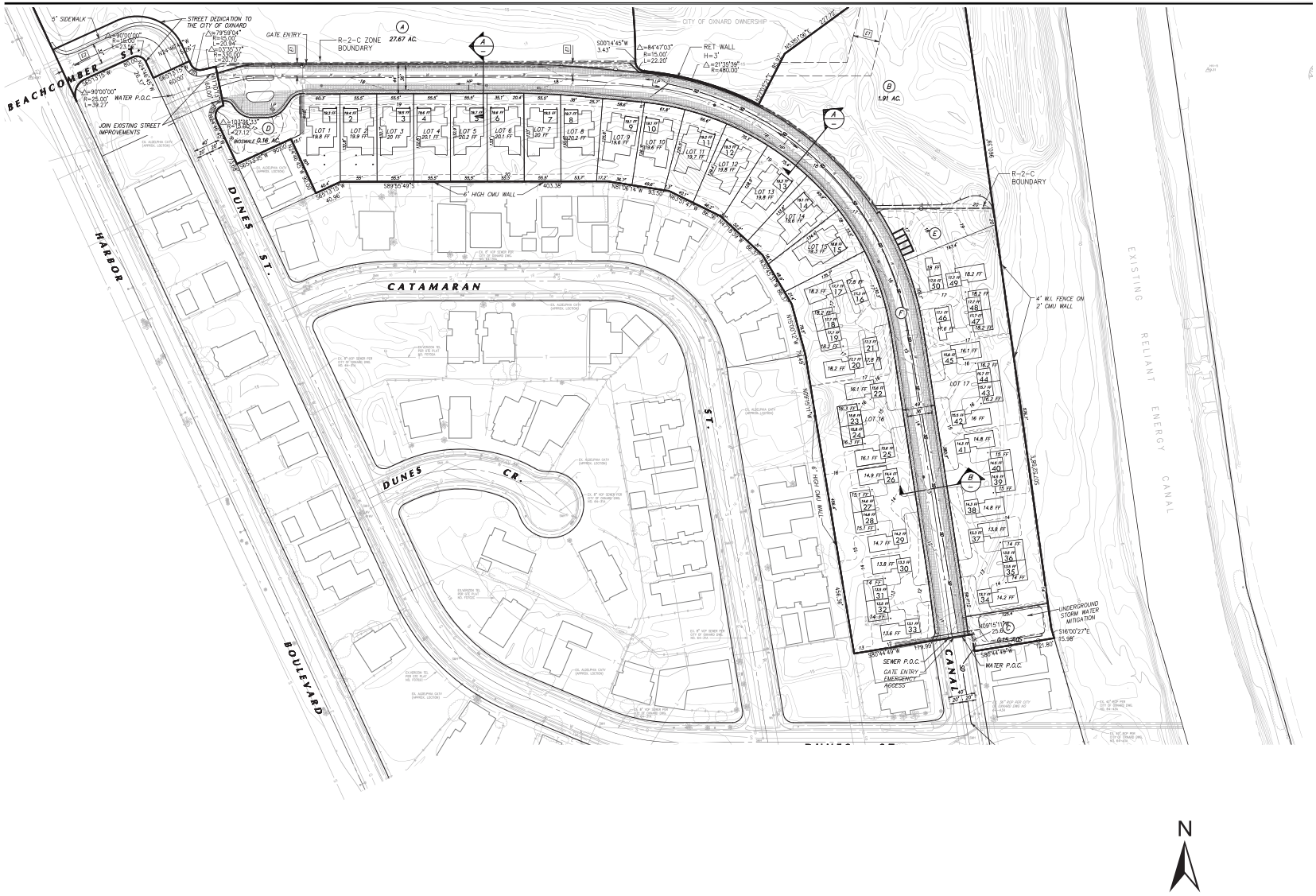
Figure 2



Source: Jensen Design& Survey, Inc. Oxnard Shores North Tentative Tract No. 5888, Feb 8, 2016

Overall Project Site Plan

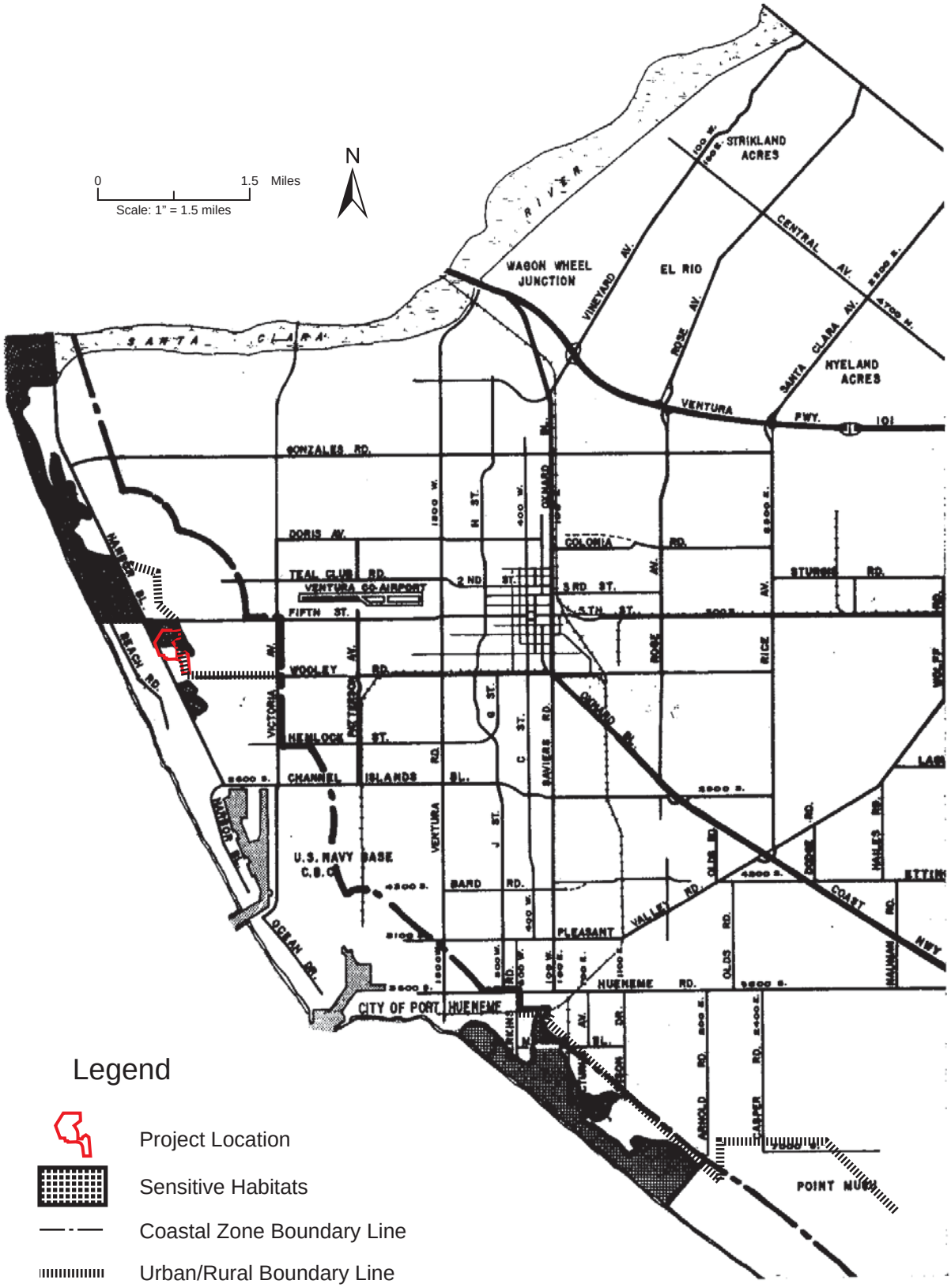
Figure 3



Source: Jensen Design & Survey, Inc.,Oxnard Shores North, Tentative Tract No. 5888, February 8, 2016.

Proposed Residential Development Site Plan

Figure 4



Sensitive Habitat Areas Within Coastal Zone

Source: Oxnard Coastal Land Use Plan, Maps 6 and 7

Figure 5

ENVIRONMENTAL FACTORS AFFECTED

The environmental factors checked below would be potentially affected by the Projects, involving at least one impact that is "Potentially Significant" or "Potentially Significant Unless Mitigation Incorporated" as indicated by the checklist on the following pages.

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

DETERMINATION:

On the basis of this initial evaluation:

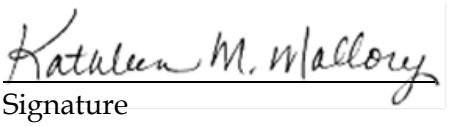
☐ I find that the proposed Projects COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed Projects could have a significant effect on the environment, there will not be a significant effect in this case because new construction is subject to uniformly applied development and design review standards and revisions (mitigations) in the Projects have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

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

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

☐ I find that although the proposed Projects could have a significant effect on the environment, because all potential significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Projects, nothing further is required.



Signature

May 27, 2016
Date

ENVIRONMENTAL CHECKLIST

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

a, c, d) The project is located in an existing residential area within the City of Oxnard. The entire site is currently undeveloped with existing single family residences immediately to the south and west. To the north of the project site is undeveloped land and to the east of the site is the Edison Canal with agricultural operations to the east of the canal. The site currently consists of relatively flat vegetated sand dunes with low laying tree vegetation along the northern portion of the site (see Figure 6, Site Photographs). Development of the project would potentially result in significant impacts to the existing visual character or quality of the site. Additionally, implementation of the project would potentially impact views of identified scenic resources from view location such as Harbor Boulevard. Development of the project site would also involve the addition of new sources of light and glare associated with single family residences and a residential street. **Therefore, impacts to scenic vistas, the existing visual character or quality of the site, and from new sources of light or glare would be potentially significant and require further analysis in an EIR.**

b) The nearest state scenic highway to the project site is State Route (SR) 1, which is currently an eligible state scenic highway, but is not officially designated within Ventura County (Caltrans, 2013). SR 1 is located approximately 3.5 miles to the east of the project site. Further, there is substantial existing residential and commercial development between the project site and SR 1. The project would require the removal of trees and vegetation along the norther portion of the project site. However, these scenic resources would not be visible from SR 1 or any other state scenic highway. Therefore, implementation of the project site would not substantially degrade any scenic resources within a state scenic highway. **Impacts related to scenic highways would be less than significant and further analysis of this issue in an EIR is not warranted.**

Figure 6. Site Photographs



Photograph 1: Looking southeast through the project site from Dunes Street at the northwest corner of the project site.



Photograph 2: Looking northwest through the project site from the terminus of Canal Street at the southeast corner of the project site.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
II. AGRICULTURE AND FOREST RESOURCES -- In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. -- Would the Projects:				
a) Convert Prime Farmland, Unique Farmland, Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

a, b, e) Review of the Farmland Mapping and Monitoring Program (FMMP) maps prepared by the California Department of Conservation confirmed that the project site is not designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance by the FMMP (California Department of Conservation, 2014) and would not convert any farmland to non-agricultural use. There is agricultural land located approximately 300 feet to the east of the project that is designated as Farmland of Statewide Importance and Prime Farmland. However, this farmland is separated from the project site by the Edison Canal. Further, the project is an extension of existing residential development. Therefore, the project would not represent a change in the existing environment that would lead to the conversion of any farmland to non-agricultural use.

The project site is not enrolled in a Williamson Act contract and is not zoned for agricultural production by Ventura County or the City of Oxnard. Therefore, the project would not conflict with any zoning for agricultural use or Williamson Act contracts. **No impacts to farmland or land zoned for agricultural use would occur, and no further analysis of this issue in an EIR is warranted.**

c, d) Neither the project site nor adjacent areas contain forest resources or are used for timber production (Ventura County, 2016). Therefore, the proposed project would not damage or result in the loss of forestry, and it would not conflict with any zoning designations designed to preserve timber resources. **No impacts to forestry or timber resources would occur, and no further analysis of this issue in an EIR is warranted.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
III. AIR QUALITY -- Would the Projects:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☒	☐	☐	☐
c) Result in a cumulatively considerable net	☒	☐	☐	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
III. AIR QUALITY -- Would the Projects:				
increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?				
d) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☒	☐	☐	☐

a-e) Implementation of the project would involve both short term construction-related emissions and long-term operational emissions associated with increases in average daily trips (ADT) and vehicle miles traveled (VMT). Existing single family residences immediately to the west and south of the project site would be susceptible sensitive receptors and would be potentially exposed to substantial pollutant concentrations as well as objectionable odors. Emissions from the project construction and operation would potentially conflict with or obstruct implementation of state and local air quality plans, and would potentially violate Ventura County Air Pollution Control District (VCAPCD) standards. Further, implementation of the project could potentially lead to a cumulatively considerable increase in of a criteria pollutant. **Impacts to air quality from implementation of the project would be potentially significant and will be studied further in an EIR.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES -- Would the Projects:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☒	☐	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the	☒	☐	☐	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
IV. <u>BIOLOGICAL RESOURCES</u> -- Would the Projects:				
California Department of Fish and Game or U.S. Fish and Wildlife Service?				
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☒	☐	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☒	☐	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☒	☐	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☒	☐	☐	☐

a-d) Implementation of the proposed project would involve the development adjacent to a sensitive habitat area as mapped by the City of Oxnard Coastal Land Use Plan (City of Oxnard 1982, Map 7; see Figure 5 of this Initial Study). The sensitive habitat is a portion of the Northern Dunes area. No development is proposed within the mapped sensitive habitat area, but the project would encroach into willow scrubland, which forms the southerly boundary of the dunes area. Additionally, the project is located approximately 150 feet from the Edison Canal and 2 miles south of the Santa Clara River Mouth. **Impacts to sensitive species and habitats would be potentially significant and require further analysis in an EIR.**

e) The project site is located on sand dunes and is part of the larger Northern Dunes Area identified in the Coastal Land Use Plan (City of Oxnard 2002: Map 3, Area 6). The project would include preservation of most of this area consistent with the Coastal Land Use Plan designation and zoning of RP (Resource Protection). Land that would be developed as a result of project implementation is designated REX (Existing Residential) and is zoned R-2-C for Coastal Low Density Residential. While generally consistent with the pattern of land use designation and zoning, the proposed development area would occur on vegetation associations that are considered sensitive resources (willow riparian and dune scrub). The Coastal Land Use Plan (in

Policy 6.d also states that a buffer of 100 feet in width shall be provided adjacent to all resource protection areas, and that the buffer may be reduced to a minimum of 50 feet only if it is demonstrated that a larger buffer is unnecessary to protect the resources of the habitat area. A 100 foot buffer has not been provided in all applicable locations. **Therefore, impacts associated with local policies or ordinances protecting biological resources would be potentially significant and require further analysis in an EIR.**

f) **Implementation of the proposed project would potentially conflict with an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other such plan. Impacts would be potentially significant and require further analysis in an EIR.**

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

a-d) Implementation of the project would involve grading and land disturbing activities within a currently undeveloped site. As such, impacts to any currently undiscovered archaeological resource, paleontological resources, or unique geologic feature would be potentially significant. Additionally, impacts to the disturbance of human remains would be potentially significant. **Therefore, impacts to cultural resources would be potentially significant and require further analysis in an EIR.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
VI. GEOLOGY AND SOILS – Would the Projects:				
a) Expose people or structures to potential				

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

a.i) thorugh a.iii) and c through d) The project site is located in a seismically active area along California's South Central Coast. As a result, hazards associated with seismic activity are considered to be potentially significant and require further analysis in an EIR. **Potential impacts of soil loss and erosion as well as seismic and soil related hazards would be potentially significant and would require further analysis in an EIR.**

a.iv) The project site is generally flat and there are no significant slopes in proximity to the project site. Therefore, implementation of the project would not expose people or structures to

adverse effects associated with landslides. **Impacts associated with landslides would be less than significant and no further analysis of this issue in an EIR is warranted.**

e) The residential units in the proposed project would be connected to the public sewer system provided by the City of Oxnard. No septic tanks or alternative wastewater disposal systems are proposed as part of the project. **Therefore no impact would occur, and no further analysis of this issue in an EIR is warranted.**

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

a, b) Implementation of the project would result in both short term construction-related Greenhouse Gas (GHG) emissions and long term operational GHG emissions. Long term emissions would be associated with an increase in the number of ADT and VMT, as well as natural gas combustion, electricity use, water demand, and solid waste generation. **Impacts associated with GHG emissions would be potentially significant and warrant further analysis in the EIR.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS - Would the Projects:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS - Would the Projects:				
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☒	☐	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?	☒	☐	☐	☐
f) For a project within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project area?	☒	☐	☐	☐
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

a, b) The proposed projects would involve the construction and operation of single-family residences and residential condominiums, as described in the *Project Description*. Potentially hazardous materials such as fuels, lubricants, and solvents would be used during construction on the proposed project site. The transport, use, and storage of hazardous materials during the construction of the projects would be conducted in accordance with all applicable state and federal laws, such as the Hazardous Materials Transportation Act, Resource Conservation and Recovery Act, the California Hazardous Material Management Act, and the California Code of Regulations, Title 22.

Operation of the residences would not involve the routine transport, use or disposal of hazardous substances, other than minor amounts typically used for routine residential

maintenance and housekeeping. Further, operation of the single family residences would not create a significant hazard to the public or the environment through the release of hazardous materials into the environment **Therefore, impacts from the proposed project would be less than significant and no further analysis in an EIR is warranted.**

c) Residences located immediately south and west of the project site are the nearest sensitive land uses. No schools are located within 0.25 mile of the project site. Large quantities of hazardous materials would not be used on-site and the residences would not emit toxic air contaminants. **Therefore, impacts associated with hazardous emissions in proximity to a school would be less than significant and not require further analysis in an EIR.**

d) The project site is currently undeveloped, however, there is potential for contaminated soils and groundwater to occur on site. **Therefore, impacts associated with contamination of the project site would be potentially significant and warrant further analysis in an EIR.**

e, f) The project is located within one mile of the Oxnard Airport and within the Airport Land Use Plan area (Ventura County Airport Land Use Commission, 2000). **Impacts associated with the project proximity to the Oxnard Airport would be potentially significant and warrant further analysis in an EIR.**

g) The proposed development is within a developed area already designed with roadways to accommodate access for emergency and other service vehicles. The proposed projects would not substantially change existing conditions with regard to transportation routes or evacuation plans. Construction activities may temporarily restrict vehicular traffic along Dune Street or Canal Street; thus, the contractor would be required to implement traffic control measures to facilitate the passage of people and vehicles through/around any required lane closures, in accordance with City policy and permitting requirements.

As shown on the site plan (Figure 4), the project would have two access points, one on Dune Street and one on Canal Street. As described in the Project Description, the Canal Street access would be egress only from the site but would allow access to emergency vehicles. The project would be required to comply with City's development standards related to site access. **Therefore, the projects potential to impact emergency response and evacuation routes would be less than significant and no further analysis in an EIR is warranted**.

h) The project site is located within the urban area of the City of Oxnard and is not located within a Very High Fire Hazard Severity Zone (VHFHSZ) as designated by the California Department of Forestry and Fire Protection (CalFire, 2010). The project site is adjacent to existing residential development and has adequate access. Additonally, the project plans would be subject to review and approval by the City of Oxnard Fire Chief to ensure adherence to all applicable fire codes and regulations under Chapter 14 of the City of Oxnard Code of Ordinances. Adjacent land uses include residences and undeveloped sand dune lands, which are not potentially dangerous fire hazards. **Therefore, impacts associated with wildland fires would be less than significant and further analysis in an EIR is not warranted.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY – Would the Projects:				
a) Violate any water quality standards or waste discharge requirements?	☒	☐	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering or the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☒	☐	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☒	☐	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☒	☐	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☒	☐	☐	☐
f) Otherwise substantially degrade water quality?	☒	☐	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☒	☐	☐	☐
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☒	☐	☐	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY – Would the Projects:				
i) Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	☒	☐	☐	☐
j) Inundation by seiche, tsunami, or mudflow?	☒	☐	☐	☐

a, c, d, e, f) Implementation of the project would add residences to a currently undeveloped site, which would increase impermeable surfaces within the project site and substantially change the drainage patterns of the site. **This would have potentially significant impacts to water quality, on- and off-site erosion and flooding, and stormwater drainage systems. Impacts would be potentially significant and warrant further analysis in an EIR.**

b) Implementation of the project would increase demands on local groundwater resources in the area, potentially creating significant impacts to depletion of groundwater resources and reduction in local aquifer levels. Additionally, implementation of the project would increase impermeable surfaces within the site, potentially impacting recharge of groundwater resources. **Impacts to groundwater resources would be potentially significant and warrant further analysis in an EIR.**

g-j) The project site is located approximately 2,400 feet from the coast and 150 feet from the Edison Canal. Additionally, the project is located approximately 2 miles from the Santa Clara River mouth. **Therefore, impacts associated with flooding, as well as inundation by tsunami would be potentially significant and require further analysis in the EIR.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
X. LAND USE AND PLANNING -- Would the proposal:				
a) Physically divide an established community?	☐	☐	☒	☐
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning	☒	☐	☐	☐

ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				
c) Conflict with an applicable habitat conservation plan or natural community conservation plan?	☒	☐	☐	☐

a) The project would be located on a vacant site adjacent to residential development and vacant land. The project does not include any structures or features that would physically divide the adjacent community. The project involves the construction of a single family or duplex residential development and residential clustered condominiums. The site does not separate complementary uses, nor is it used as a point of ingress/egress for the existing neighborhood. **Therefore, impacts associated with dividing the adjacent community would be less than significant and do not warrant further analysis in an EIR.**

b, c) The project site is composed of parcels currently zoned Coastal Low-Density Multiple Family (R-2-C), and Coastal Resource Protection (RP). The project is located in the Coastal Zone and is subject to policies in the City's Coastal Land Use Plan that are intended to protect coastal resources. Among others, local coastal policy 6.d includes the requirement for a buffer of 100 feet between development and sensitive resource areas, which may be reduced to 50 feet if it is demonstrated that a larger buffer is unnecessary to protect the sensitive resources present. A 100 foot buffer has not been provided in all applicable locations. This is primarily a biological issue, but consistency with applicable coastal policies is also a land use issue, which requires further analysis in the EIR. **Impacts to land use planning and habitat conservation plans or natural community plans would be potentially significant and warrant further analysis in a subsequent EIR.**

	Potentially Significant Impact	**Less than Significant with Mitigation Incorporated**	**Less than Significant Impact**	**No Impact**
XI. <u>MINERAL RESOURCES</u> -- Would the Projects:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☒

a-b) According to the 2030 General Plan, the City of Oxnard has mineral/sand/gravel deposits primarily along the Santa Clara River channel, along the Highway 101 corridor and along the eastern edge of the City extending west to Oxnard Boulevard. The project site is not located near any known mineral resource. The project would not create a unique demand on available mineral resources in the City, since the project site is not located in an area of importance for

mineral deposits. **Therefore, the project would have no impact on any known mineral resources and no further analysis is in an EIR is warranted.**

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

a-d) Implementation of the project would create temporary construction-related noise, and operational noise. Construction of the project would additionally generate temporary ground borne vibration. Further, an increase in VMT and ADT resulting from the project construction would also potentially increase ambient noise levels in the area. **Impacts associated with noise and vibration from the project would be potentially significant and require further analysis in the EIR.**

e, f) The project is located within one mile of the Oxnard Airport and within the Airport Land Use Plan area (Ventura County Airport Land Use Commission, 2000). **Therefore, impacts associated airport noise would also be potentially significant and warrant further analysis in an EIR.**

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

a) The City of Oxnard 2030 General Plan produced projections of population growth within the city by 2030. The General Plan estimates that the population of the City of Oxnard will grow to 285,521 by 2030 following market trends for housing development. The current estimated population of the City of Oxnard is 206,997 (Department of Finance 2016).

The project would involve the construction of a maximum of 65 new single family residences. According to data provided by the California Department of Finance (DOF), the current average number of persons per household in the City of Oxnard as of January 1, 2016 is 4.01 (DOF 2016). Based on this average, the project would add approximately 260 new residents for a total population of 207,257. Therefore, development of the project would not add population beyond that anticipated in 2030 General Plan growth forecasts. The addition of 260 new residents to the City would equal 0.33% of the total projected cumulative population growth through 2030. The level of population growth associated with the project was anticipated in City of Oxnard's long-term population forecasts and would not cumulatively exceed official regional population projections. **Therefore impacts from population growth would be less than significant and do not warrant further analysis in an EIR.**

b, c) The project site is currently undeveloped and would not displace any existing residences. Additionally, the project would add 65 new residences. **Therefore, no impacts to displacing people or housing would occur and no further analysis in an EIR is warranted.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
XIV. PUBLIC SERVICES				
a) Would the Projects result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
i) Fire protection?	☐	☐	☒	☐
ii) Police protection?	☐	☐	☒	☐
iii) Schools?	☐	☐	☒	☐
iv) Parks?	☐	☐	☒	☐
v) Other public facilities?	☐	☐	☒	☐

a.i) The Oxnard Fire Department (OFD) provides fire protection to the City of Oxnard. The National Fire Protection Association's (NFPA) recommended standard for fire department staffing is one firefighter per 1,000 residents. The current population of Oxnard is 206,997 (DOF, 2016). The population growth that would result from the proposed projects would represent a growth of 0.33 percent of the total growth projected by the City's General Plan, and would therefore not have a significant effect on these ratios. Further, there are seven fire stations in the City with an eighth fire station under construction. The basic unit is the engine company, which consists of a captain who supervises the crew, an engineer who is responsible for the safe operation of the equipment, and a firefighter who carries out the basic firefighting and medical tasks. In addition, the NFPA recommends that each fire station serve approximately 15,000 residents. Oxnard's seven fire stations serve approximately 30,000 residents per station. Furthermore, the Fire Department can access additional manpower and equipment through an automatic aid agreement with Ventura County and a mutual aid agreement with the City of Ventura and Point Mugu Naval Air Station. The projects would include uniformly applied development policies that require adequate fire hydrants, OFD site access, emergency signage, fire alarms, addressable smoke detectors, and other requirements of the Uniform Fire Code to minimize any potential impacts on Fire Services. The project would provide primary and secondary access for emergency vehicles. No new facilities would be required as a result of the projects. **The project would have a less than significant impact on fire protection services and no further analysis in an EIR is warranted.**

a.ii) The Oxnard Police Department (OPD) provides police protection in this area, which operates from the police station located at 251 South C Street. The station is located approximately 4.0 miles northeast of the project site. The City is divided into four Police Districts, each of which is further divided into smaller response beats. Each beat is patrolled 24 hours a day, seven days a week in three overlapping 12-hour shifts. The project site is located in Beat 21, which is part of District 2. In addition to its police stations, the OPD operates eight storefront police substations.

With a current population of 206,997 (DOF, 2016) and an estimated population growth of 260 residents resulting from the project, the project would represent 0.33 percent of the population growth projected in the City's General Plan. This would not result in an incremental increase in the police officer to population ratio. No new police facilities would be needed. **Impacts to police services would be less than significant and no further analysis in an EIR is warranted.**

a.iii) The project site is located within the Oxnard Elementary School District (OESD) and Oxnard Union High School District (OUHSD). Construction of the proposed project would accommodate an estimated 260 new residents to the area. The population would be expected to include school-aged children who would attend local schools. Students would attend McAuliffe or Marina West Elementary, Haydock Middle School, and Channel Islands High School.

To offset a project's potential impact on schools, Government Code 65995 (b) establishes the base amount of allowable developer fees a school district can collect from development projects located within its boundaries. The fees obtained by OESD and OUHSD are used to maintain the desired school capacity and the maintenance and/or development of new school facilities. The project proponents for any future residential developments would be required to pay the 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." **Therefore, with payment of mandatory school impact fees, impacts to schools would be less than significant and no further analysis in an EIR is warranted.**

a.iv) Impacts to parks are discussed in Section XV, *Recreation*. **Impacts to parks would be less than significant and no further analysis in an EIR is warranted.**

a.v) During the plan check and permitting process the Development Services Division will assess and determine the project impact fees that are required for this type of development. Development impact fees typically involve, but are not limited: Planned Traffic Circulation System Facilities Fees (Traffic Impact); Planned Water Facilities Fee; Planned Wastewater Facilities Fee; Planned Drainage Facilities Fee; and Growth Requirement Capital Fee. **Impacts to other public facilities would be less than significant and no further analysis in an EIR is warranted.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
XV. RECREATION --				
a) Would the Projects increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☒	☐

a, b) The City of Oxnard's estimated 2016 population is 206,997 (DOF, 2016). As identified in the City of Oxnard 2030 General Plan, there is approximately 759 acres of developed parks in existence or planned within the City of Oxnard (2030 General Plan page 1-21). Thus there are about 3.66 acres of park facilities per 1,000 residents, which exceeds the objective of 3.0 acres per 1,000 residents set forth in Policy ICS-23-1 in the 2030 General Plan. If regional parks, beaches, and other accessible open space are all considered, then the parkland available to City residents is higher. The proposed project would accommodate a population increase of approximately 260 residents, which would not substantially alter the park ratio or affect the City's ability to maintain and exceed its objectives for parkland. The City currently has sufficient parkland to serve the population and would continue to do so with development of the proposed project. The incremental increase in population would create an incremental increase in use of the existing parks. However, the existing parkland ratio would stay the same and no significant impacts would occur to existing parks.

Additionally, Lot E of the proposed project includes a private community/recreation area for the proposed residences that would be constructed as part of the project. This area would be a total of 0.19 acres in size and would not impact the overall parkland ratio within the City. The proposed community/recreation area would be maintained by a future Homeowners Association that would be formed as part of the proposed project. Grading and development of this park is within the area of disturbance and development to be addressed in the EIR.

Impacts to recreation would be less than significant and no further analysis in an EIR is warranted.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
XVI. <u>TRANSPORTATION / TRAFFIC</u> -- Would the Projects:				
a) Conflict with an applicable plan, ordinance or policy establishing a measure of effectiveness for the performance of the circulation system, taking into account all modes of transportation, including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?	☒	☐	☐	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☒	☐	☐	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☒	☐
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)?	☒	☐	☐	☐
e) Result in inadequate emergency access?	☒	☐	☐	☐
f) Conflict with adopted policies, plans, or programs regarding public transit, bikeways, or pedestrian facilities, or otherwise substantially decrease the performance or safety of such facilities?	☒	☐	☐	☐

a, b, d, e, f) The project would involve the construction of a maximum of 65 new single family residences, which would cause an increase in VMT and ADT in the area as well as increased use of other transportation methods. Additionally, the project involves the construction of a new residential street, which would provide emergency access to the new residences. **Impacts to transportation and traffic plans, policies, and programs would be potentially significant and require further analysis in the EIR. Impacts to roadway hazards and emergency access would additionally be potentially significant and warrant further analysis in an EIR**.

c) The project is located within one mile of the Oxnard Airport and within the Airport Land Use Plan area (Ventura County Airport Land Use Commission, 2000). However, the project involves the construction of a maximum of 65 new residences, which would be directly adjacent to existing single family residences. The new residences would be generally similar in height to the existing residences. Therefore, the proposed project would not result in a change in air traffic patterns from the Oxnard Airport. **Impacts to the flight paths of the Oxnard Airport would be less than significant and not warrant further analysis in an EIR.**

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

a, b, e) Implementation of the project would result in the development of currently vacant land that does not presently have existing utilities. The addition of up to 65 new residences and private residential street would require connection to the City of Oxnard's wastewater facilities.

Impacts to wastewater facilities would be potentially significant and warrant further analysis in an EIR.

c) The proposed project would substantially change the site drainage pattern of the currently undeveloped project site. **Therefore, impacts to storm water drainage facilities would be potentially significant and warrant further analysis in an EIR.**

d) The proposed project would construct up to 65 new residences on a currently undeveloped site. Therefore, implementation of the project would increase demand for water supplies. **Impacts to water supplies would be potentially significant and warrant further analysis in an EIR.**

f, g) Construction and operation of the proposed project would generate solid waste. **Impacts to landfill facilities and federal, state, and local statutes and regulations would be potentially significant and warrant further analysis in an EIR.**

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE —				
a) Do the Projects have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self- sustaining levels, eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☒	☐	☐	☐
b) Do the Projects have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Do the Projects have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☒	☐	☐	☐

a) Implementation of the proposed project would have the potential to significantly reduce the habitat of a wildlife population, eliminate a plant or animal community, reduce the number or

restrict the range of a rare or endangered plant or animal. Further, implementation of the project would potentially eliminate important example of California History or Prehistory. **Impacts to fish and wildlife habitats and cultural resources would be potentially significant and warrant further analysis in an EIR.**

b) Impacts of the proposed project in conjunction with other projects in the surrounding area within the City of Oxnard and the Channel Islands Harbor would be cumulatively considerable. **Cumulative impacts of the proposed project would be potentially considerable and warrant further analysis in an EIR.**

c) Environmental effects of the proposed project would potentially have environmental effects that cause substantial adverse effects on human beings. **Impacts to human beings would be potentially significant and warrant further analysis in an EIR.**

REFERENCES

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STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

Notice of Preparation

May 27, 2016

To: Reviewing Agencies

Re: Avalon Homes Subdivision
SCH# 2016051075

Attached for your review and comment is the Notice of Preparation (NOP) for the Avalon Homes Subdivision draft Environmental Impact Report (EIR).

Responsible agencies must transmit their comments on the scope and content of the NOP, focusing on specific information related to their own statutory responsibility, within 30 days of receipt of the NOP from the Lead Agency. This is a courtesy notice provided by the State Clearinghouse with a reminder for you to comment in a timely manner. We encourage other agencies to also respond to this notice and express their concerns early in the environmental review process.

Please direct your comments to:

Kathleen Mallory
City of Oxnard
214 South C Street
Oxnard, CA 93030

with a copy to the State Clearinghouse in the Office of Planning and Research. Please refer to the SCH number noted above in all correspondence concerning this project.

If you have any questions about the environmental document review process, please call the State Clearinghouse at (916) 445-0613.

Sincerely,

Scott Morgan
Director, State Clearinghouse

Attachments
cc: Lead Agency

Document Details Report
State Clearinghouse Data Base

SCH# 2016051075
Project Title Avalon Homes Subdivision
Lead Agency Oxnard, City of

Type NOP Notice of Preparation

Description The Avalon Homes Subdivision (project) proposes the construction of a maximum of 65 residential dwelling units on 8.75 acres of a 38.33 acre property. The property would be subdivided into 17 residential lots and two lots intended for Resource Protection (29.85 acres). Additional lots for a private street, drainage improvements, and community recreation area would be included within the residential development portion of the project.

Lead Agency Contact

Name Kathleen Mallory
Agency City of Oxnard
Phone 805-512-9800 **Fax**
email
Address 214 South C Street
City Oxnard **State** CA **Zip** 93030

Project Location

County Ventura
City Oxnard
Region
Cross Streets Dune Street, Canal Street
Lat / Long 39° 11' 37.3" N / 119° 14' 13.1" W
Parcel No. 196-0-010-275, 225, and 235
Township 1N **Range** 23W **Section** 12 **Base** SB

Proximity to:

Highways
Airports Oxnard Apt.
Railways
Waterways Pacific Ocean, Edison Canal
Schools McAuliffe Elem.
Land Use GP: Coastal REX (Residential Existing) and RP (Resource Protection / Zoning: R-2-C (Coastal Low Density Multiple Family, and RP

Project Issues Aesthetic/Visual; Air Quality; Archaeologic-Historic; Biological Resources; Drainage/Absorption; Coastal Zone; Flood Plain/Flooding; Geologic/Seismic; Noise; Sewer Capacity; Soil Erosion/Compaction/Grading; Solid Waste; Toxic/Hazardous; Traffic/Circulation; Vegetation; Water Quality; Water Supply; Wetland/Riparian; Landuse; Other Issues

Reviewing Agencies Resources Agency; California Coastal Commission; Department of Parks and Recreation; Department of Water Resources; Department of Fish and Wildlife, Region 5; Native American Heritage Commission; Caltrans, District 7; State Water Resources Control Board, Divison of Financial Assistance; Regional Water Quality Control Board, Region 4

Date Received 05/27/2016 **Start of Review** 05/27/2016 **End of Review** 06/27/2016

Note: Blanks in data fields result from insufficient information provided by lead agency.

Print Form

Appendix C

~~Notice of Completion &~~ Environmental Document Transmittal

2016051075

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: Avalon Homes Subdivision

Lead Agency: City of Oxnard, Development Services Department
Contact Person: Kathleen Mallory, MA, AICP
Mailing Address: 214 South C Street
Phone: (805) 512-9800
City: Oxnard, CA
Zip: 93030
County: Ventura

Project Location: County: Ventura
City/Nearest Community: Oxnard
Cross Streets: Dune Street, Canal Street
Zip Code: 93030
Longitude/Latitude (degrees, minutes and seconds): 39 ° 11 ′ 37.3 ″ N / 119 ° 14 ′ 13.1 ″ W Total Acres: 38.33
Assessor's Parcel No.: 196-0-010-275, 225, and 235
Section: 12 Twp.: 1N Range: 23W Base: SB
Within 2 Miles: State Hwy #: none
Waterways: Pacific Ocean (0.5 mi w), Edison Canal (150 ft e)
Airports: Oxnard Apt. (1.2 mi ne)
Railways: none
Schools: McAuliffe Elem. (1.3 mi s

Document Type:

CEQA: ☒ NOP ☐ Draft EIR
☐ Early Cons ☐ Supplement/Subsequent EIR
☐ Neg Dec (Prior SCH No.) ____
☐ Mit Neg Dec Other: Initial Study

NEPA: ☐ NOI ☐ EA ☐ Draft EIS ☐ FONSI

Other: ☐ Joint Document ☐ Final Document ☐ Other: ____

Governor's Office of Planning & Research
MAY 27 2016
STATE CLEARINGHOUSE

Local Action Type:

☐ General Plan Update ☐ Specific Plan ☐ Rezone ☐ Annexation
☐ General Plan Amendment ☐ Master Plan ☐ Prezone ☐ Redevelopment
☐ General Plan Element ☐ Planned Unit Development ☐ Use Permit ☒ Coastal Permit
☐ Community Plan ☐ Site Plan ☒ Land Division (Subdivision, etc.) ☐ Other: ____

Development Type:

☒ Residential: Units 65 max Acres 8.75
☐ Office: Sq.ft. ____ Acres ____ Employees ____
☐ Commercial: Sq.ft. ____ Acres ____ Employees ____
☐ Industrial: Sq.ft. ____ Acres ____ Employees ____
☐ Educational: ____
☐ Recreational: ____
☐ Water Facilities: Type ____ MGD ____
☐ Transportation: Type ____
☐ Mining: Mineral ____
☐ Power: Type ____ MW ____
☐ Waste Treatment: Type ____ MGD ____
☐ Hazardous Waste: Type ____
☒ Other: Resource protection (29.58 acres)

Project Issues Discussed in Document:

☒ Aesthetic/Visual ☐ Fiscal ☐ Recreation/Parks ☒ Vegetation
☐ Agricultural Land ☒ Flood Plain/Flooding ☐ Schools/Universities ☒ Water Quality
☒ Air Quality ☐ Forest Land/Fire Hazard ☐ Septic Systems ☒ Water Supply/Groundwater
☒ Archeological/Historical ☒ Geologic/Seismic ☒ Sewer Capacity ☒ Wetland/Riparian
☒ Biological Resources ☐ Minerals ☒ Soil Erosion/Compaction/Grading ☐ Growth Inducement
☒ Coastal Zone ☒ Noise ☒ Solid Waste ☒ Land Use
☒ Drainage/Absorption ☐ Population/Housing Balance ☒ Toxic/Hazardous ☐ Cumulative Effects
☐ Economic/Jobs ☐ Public Services/Facilities ☒ Traffic/Circulation ☒ Other: Greenhouse Gas

Present Land Use/Zoning/General Plan Designation:

GP: Coastal REX (Residential Existing) and RP (Resource Protection / Zoning: R-2-C (Coastal Low-Density Multiple Family, and RP

Project Description: *(please use a separate page if necessary)*

The Avalon Homes Subdivision (project) proposes the construction of a maximum of 65 residential dwelling units on 8.75 acres of a 38.33 acre property. The property would be subdivided into 17 residential lots and two lots intended for Resource Protection (29.58 acres). Additional lots for a private street, drainage improvements, and community recreation area would be included within the residential development portion of the project.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Revised 2010

NOP Distribution List

KD

County: Ventura **SCH#** 2016051075

Resources Agency

- [ ] **Resources Agency**
  Nadell Gayou
- [ ] **Dept. of Boating & Waterways**
  Denise Peterson
- [ ] **California Coastal Commission**
  Elizabeth A. Fuchs
- [ ] **Colorado River Board**
  Lisa Johansen
- [ ] **Dept. of Conservation**
  Elizabeth Carpenter
- [ ] **California Energy Commission**
  Eric Knight
- [ ] **Cal Fire**
  Dan Foster
- [ ] **Central Valley Flood Protection Board**
  James Herota
- [ ] **Office of Historic Preservation**
  Ron Parsons
- [ ] **Dept of Parks & Recreation**
  Environmental Stewardship Section
- [ ] **California Department of Resources, Recycling & Recovery**
  Sue O'Leary
- [ ] **S.F. Bay Conservation & Dev't. Comm.**
  Steve McAdam
- [ ] **Dept. of Water Resources**
  Resources Agency
  Nadell Gayou

Fish and Game

- [ ] **Depart. of Fish & Wildlife**
  Scott Flint
  Environmental Services Division
- [ ] **Fish & Wildlife Region 1**
  Curt Babcock
- [ ] **Fish & Wildlife Region 1E**
  Laurie Harnsberger
- [ ] **Fish & Wildlife Region 2**
  Jeff Drongesen
- [ ] **Fish & Wildlife Region 3**
  Craig Weightman
- [ ] **Fish & Wildlife Region 4**
  Julie Vance
- [ ] **Fish & Wildlife Region 5**
  Leslie Newton-Reed
  Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6**
  Tiffany Ellis
  Habitat Conservation Program
- [ ] **Fish & Wildlife Region 6 I/M**
  Heidi Calvert
  Inyo/Mono, Habitat Conservation Program
- [ ] **Dept. of Fish & Wildlife M**
  Becky Ota
  Marine Region

Other Departments

- [ ] **Food & Agriculture**
  Sandra Schubert
  Dept. of Food and Agriculture
- [ ] **Depart. of General Services**
  Public School Construction
- [ ] **Dept. of General Services**
  Cathy Buck/George Carollo
  Environmental Services Section
- [ ] **Delta Stewardship Council**
  Kevan Samsam
- [ ] **Housing & Comm. Dev.**
  CEQA Coordinator
  Housing Policy Division

Independent Commissions,Boards

- [ ] **Delta Protection Commission**
  Michael Machado
- [ ] **OES (Office of Emergency Services)**
  Monique Wilber
- [ ] **Native American Heritage Comm.**
  Debbie Treadway
- [ ] **Public Utilities Commission**
  Supervisor
- [ ] **Santa Monica Bay Restoration**
  Guangyu Wang
- [ ] **State Lands Commission**
  Jennifer Deleong
- [ ] **Tahoe Regional Planning Agency (TRPA)**
  Cherry Jacques

Cal State Transportation Agency CalSTA

- [ ] **Caltrans - Division of Aeronautics**
  Philip Crimmins
- [ ] **Caltrans – Planning HQ LD-IGR**
  Terri Pencovic
- [ ] **California Highway Patrol**
  Suzann Ikeuchi
  Office of Special Projects

Dept. of Transportation

- [ ] **Caltrans, District 1**
  Rex Jackman
- [ ] **Caltrans, District 2**
  Marcelino Gonzalez
- [ ] **Caltrans, District 3**
  Eric Federicks – South
  Susan Zanchi - North
- [ ] **Caltrans, District 4**
  Patricia Maurice
- [ ] **Caltrans, District 5**
  Larry Newland
- [ ] **Caltrans, District 6**
  Michael Navarro
- [ ] **Caltrans, District 7**
  Dianna Watson
- [ ] **Caltrans, District 8**
  Mark Roberts
- [ ] **Caltrans, District 9**
  Gayle Rosander
- [ ] **Caltrans, District 10**
  Tom Dumas
- [ ] **Caltrans, District 11**
  Jacob Armstrong
- [ ] **Caltrans, District 12**
  Maureen El Harake

Cal EPA

Air Resources Board

- [ ] Airport & Freight
  Cathi Slaminski
  - [ ] Transportation Projects
    Nesamani Kalandiyur
  - [ ] Industrial/Energy Projects
    Mike Tollstrup
- [ ] **State Water Resources Control Board**
  Regional Programs Unit
  Division of Financial Assistance
- [ ] **State Water Resources Control Board**
  Cindy Forbes – Asst Deputy
  Division of Drinking Water
- [ ] **State Water Resources Control Board**
  Div. Drinking Water #_____
- [ ] **State Water Resources Control Board**
  Student Intern, 401 Water Quality Certification Unit
  Division of Water Quality
- [ ] **State Water Resouces Control Board**
  Phil Crader
  Division of Water Rights
- [ ] **Dept. of Toxic Substances Control**
  CEQA Tracking Center
- [ ] **Department of Pesticide Regulation**
  CEQA Coordinator

Regional Water Quality Control Board (RWQCB)

- [ ] **RWQCB 1**
  Cathleen Hudson
  North Coast Region (1)
- [ ] **RWQCB 2**
  Environmental Document Coordinator
  San Francisco Bay Region (2)
- [ ] **RWQCB 3**
  Central Coast Region (3)
- [ ] **RWQCB 4**
  Teresa Rodgers
  Los Angeles Region (4)
- [ ] **RWQCB 5S**
  Central Valley Region (5)
  - [ ] **RWQCB 5F**
    Central Valley Region (5)
    Fresno Branch Office
  - [ ] **RWQCB 5R**
    Central Valley Region (5)
    Redding Branch Office
- [ ] **RWQCB 6**
  Lahontan Region (6)
  - [ ] **RWQCB 6V**
    Lahontan Region (6)
    Victorville Branch Office
- [ ] **RWQCB 7**
  Colorado River Basin Region (7)
- [ ] **RWQCB 8**
  Santa Ana Region (8)
- [ ] **RWQCB 9**
  San Diego Region (9)

- [ ] **Other** _____
  _____
  _____
- [ ] _____
  Conservancy

Last Updated 4/25/2016

1.

CITY OF OXNARD CALIFORNIA

Mallory, Kathleen <kathleen.mallory@oxnard.org>

Avalon

Tanya Hanson <tanhanson@aol.com> Mon, Jun 13, 2016 at 9:35 AM
To: Kathleen.Mallory@oxnard.org

Dear Ms. Mallory,
Oxnard has tons of blighted areas and infill possibilities that need work. Leave the beach areas alone, at least until the messiness gets cleaned up.

We are also in a drought that doesn't promise to be over any time soon. Many, including my family, ripped out our lawns in favor of xeriscaping... Yet you in charge want to divert our saved water to endless development.

Do your part, too.

Thank you,

TANYA HANSON
www.tanyahanson.com
www.petticoatsandpistols.com
OUTLAW HEART~June 2016
PICK ME~out now
WHEN HEARTS FLY~2017

2.

CITY OF OXNARD CALIFORNIA

Mallory, Kathleen <kathleen.mallory@oxnard.org>

Comments to Avalon Homes Project

1 message

Rachel Douglas <rayeatthebeach@aol.com> Sun, Jun 12, 2016 at 8:19 PM
To: Kathleen.Mallory@oxnard.org

Dear Ms Mallory,

Below are my concerns regarding the Avalon Homes Subdivision, located in the Dunes Area of Oxnard.

I own and rent a duplex at 909 & 911 Catamaran St., in the Dunes Area of Oxnard.

I have a number of concerns regarding the Avalon Homes Subdivision, scheduled to be built in the Dunes Area.

The existing Dunes residential area is small and quaint. Yet we currently have a problem with lack of enough street parking, and cars driving way too fast in this residential area. Kids live here. But there's nothing to slow the cars down, especially on Dunes St. & Catamaran St. . Also, at night and on weekends, there is not enough street parking for all the current housing that exists, let alone a new high density development .

My concern with the Avalon Homes Subdivision, is that this project will only ad to our parking and traffic problems.

I have two suggestions:

1) I suggest that the housing development be kept as small as possible. I feel that 15 single family housing units is much preferable to the 30 proposed as duplexes. We already have a traffic and parking problem in the Dunes Area, so the fewer number of Condominiums, Duplexes, or Single family homes, the better. Please keep this subdivision as small as possible.

2) The "egress only" exit proposed for Canal St. is totally unacceptable. The gated road on Canal St. must be for both directions, egress and ingress. Why? All of the nearby shopping (the Vons Shopping Center at Seabridge) is located off of Wooley Rd. All residences in the Dunes Area, and the proposed Avalon Homes Subdivision, will use Canal St. to get TO AND FROM Wooley Rd. and then on to this shopping center. If the Canal St. road is for "egress only" it forces ALL of the Avalon Subdivision ingress traffic to first drive thru the Dunes Area on every trip. (They will not use Harbor Blvd., to get to and from the shopping center. Fast moving Harbor Blvd. takes longer and is too difficult to make turns on!). Having only an "egress" on Canal St. will tremendously increase traffic thru the residential streets of Dunes St. & Catamaran St., and this traffic already drives too fast for a residential area! It only makes sense to have the Canal St. entrance as an "egress and ingress entry," in order to reduce the faster moving traffic on Dunes St & Catamaran St. Canal St. is much more convenient to use to get to and from the Von's shopping center. No one in the Dunes Area currently goes to and from the Von's Shopping Center by way of Harbor Blvd. Everyone uses the more convenient Canal St.

Please take my comments into consideration, and please call me if you have any questions.

Thank you,
Mrs. Raye M. Douglas

2027 Majorca Dr.
Oxnard, Ca. 93035
Cell # 805-407-5379
Email: RayeAtTheBeach@aol.com

Southern California Gas Company

A Sempra Energy utility®

James Chuang
Environmental Specialist

Southern California Gas Company
Sempra Energy utilities
GT17E2
555 Fifth Street
Los Angeles, Ca. 90013
Tel: 213-244-5817
Fax: 323 518 2324

06/10/2016

Kathleen Mallory, MA, AICP
Planning Division
City of Oxnard
214 South C Street
Oxnard, CA 93030

Re: **Avalon Homes Subdivision Project**

Dear Ms. Mallory:

Southern California Gas Company (SoCalGas) appreciates the opportunity to review and respond to the Notice of Preparation of a Draft Environmental Impact Report. SoCalGas understands that the proposed project would involve the construction of maximum of 65 residential units, including 35 clustered single-family condominium units and up to 30 duplex dwelling units. The property will be subdivided into 22 lots, with 17 for residential uses and five intended for resource protection, drainage improvements, a community recreation area, and a private street. We respectfully request that the following comments be incorporated in the subsequent Draft Environmental Impact Report (DEIR).

- SoCalGas has a five foot section of medium pressure distribution pipeline the southwest corner of the proposed project area within lot F. SoCalGas recommends that the project proponent call Underground Service Alert at 811 at least two business days prior to performing any excavation work for the proposed project. Underground Service Alert will coordinate with SoCalGas and other Utility owners in the area to mark the locations of buried utility-owned lines.

- Should it be determined that the proposed project may require SoCalGas to extend new natural gas service., SoCalGas respectfully requests that project proponent coordinate with us by calling (800) 427-2200 to follow-up on this matter.

- SoCalGas recommends that the DEIR include a discussion of activities associated with the extension of new natural gas service. At present, there is no mention of any existing facilities or new facilities that would have to be installed. This additional discussion should include:
  - The presence and condition of existing utility infrastructure on the project site, including right-of-ways and/or easements.
  - The number and description of any new natural gas facilities that will have to be constructed or installed, in order to provide natural gas service to the proposed project.

- Identification of any actions that would require permitting or acquisition of new right-of-way or easements for natural gas service to the project.

A discussion of these issues with appropriate diagrams, including specific environmental impact analyses related to these activities, if necessary, may help to reduce the time and cost associated with the extension of new natural gas service to the project.

Once again, we appreciate the opportunity to comment on the Notice of Preparation. If you have any questions, please feel free to contact me at (213) 244-5817 or wcchuang@semprautilities.com.

Sincerely,



James Chuang
Environmental Specialist
Southern California Gas Company

cc. Carli Ewert, SoCalGas

CITY OF OXNARD CALIFORNIA

Mallory, Kathleen <kathleen.mallory@oxnard.org>

Re: Avalon Homes Subdivision Concerns

1 message

Mallory, Kathleen <kathleen.mallory@oxnard.org> Tue, Jun 7, 2016 at 9:01 AM
To: Brandon Lincicum <brandonlincicum@gmail.com>, Abe Leider <aleider@rinconconsultants.com>, "kkaufman@rinconconsultants.com" <kkaufman@rinconconsultants.com>

Brandon -

Thank you for your comments. We will work with the EIR consultant to incorporate your comments into the EIR Analysis.

Best,
Kathleen

On Fri, Jun 3, 2016 at 2:13 PM, Brandon Lincicum <brandonlincicum@gmail.com> wrote:

Kathleen,

I am a resident of the Mandalay Shores Community, I live at 5200 Reef Way (the end house on Reef Way closest to Harbor St.).

My concerns with the upcoming subdivision are regarding the power lines, traffic and noise, and the location of the land allocated to resource protection.

Power Lines: One thing that I really appreciate about my neighborhood are the subterranean power lines. It really gives the neighborhood a nice feel and keeps the views intact. It is my hope that not only the Avalon subdivision will have subterranean power lines but that the Power Lines along the east side of Harbor will be buried as well. Those lines are constantly crackling and popping, not to mention they are unsightly. I think it would be a huge improvement to the neighborhood to have them buried and I'm sure everyone else would appreciate it as well.

Traffic and Noise: The addition residences will create more traffic and noise. I think this needs to be addressed in some manner. Whether that is planting more trees to create a "green sound screen" in the plantar along harbor or using the natural sound buffering of the dunes that are already in place. Also it would be nice to have a better bike path along harbor connecting us to the Ventura Harbor. I ride my bike with my 1 year old daughter and never feel safe on that narrow road with cars moving so fast, I can only imagine as the area become more densely populated.

Land Allocated to Resource Protection: I think it would be a good idea to have the natural sand dunes that line harbor right now stay there as the protected area. They provide a natural sound break, native vegetation, and are esthetically pleasing. Keeping the dune habitat native and separating it from farm land by the houses would protect it from insects, pesticides, nonnative seed is present, not to mention dirt born pathogens that may be released as the land is farmed. Hiding the subdivision behind some of those dunes would keep the neighborhood private and quiet as well. This section of dunes wouldn't be more than a few acres a small percentage of the 29.58 designated for resource protection.

Please give me a call or an email if you have any questions.

Thanks,

-Brandon

--
Kathleen Mallory
Project Planner

5.

Mallory, Kathleen <kathleen.mallory@oxnard.org>

New Homes

1 message

Liz Culver <lculver1948@icloud.com> Mon, Jun 13, 2016 at 12:53 PM
To: kathleen.mallory@oxnard.org

It was with great dismay that I read about the plans for the Dunes area as well as locations on Harbor Blvd, 5th St, and Wooley Rd. As a home owner at the California Light house community since 1998, I have seen traffic on the above roads increase tremendously. The new housing previously built in Oxnard along Victoria Blvd, has caused traffic that has become grid locked with cars. It is not unusual to sit through several red lights on 5th St and on Gonzalez (just to name a few). These areas are already highly congested and the proposed plan for 463 housing units will only make the problem get worse. New building on 5th St, Wooley, Harbor and Victoria Blvds will result in so much traffic, it will cause even more difficulty to navigate the area. It seems Oxnard cares more about money than it does the current citizens.

Sincerely,
Elizabeth Culver
1141 Mooring Walk
Oxnard CA 93030

6.

Mallory, Kathleen <kathleen.mallory@oxnard.org>

New Homes

1 message

Donna <rhopoulson@yahoo.com> Mon, Jun 13, 2016 at 9:46 AM
To: "Kathleen.Mallory@oxnard.org" <Kathleen.Mallory@oxnard.org>

Has anybody asked the question of where the water will come from?It will just make the shortage worse for those who already live here.The City fathers must be operating on a Hope and a prayer.That is no way to run a City.Let common sense prevail.
Peter Poulson
Sent from my iPad

CITY OF OXNARD CALIFORNIA

Mallory, Kathleen <kathleen.mallory@oxnard.org>

Re: Response to "New homes planned for Dunes area"

1 message

charminmillett@verizon.net <charminmillett@verizon.net> Mon, Jun 13, 2016 at 1:21 PM
To: Kathleen.Mallory@oxnard.org
Cc: letters@vcstar.com

-----Original Message-----
From: charminmillett <charminmillett@verizon.net>
To: Kathleen.Mallory <Kathleen.Mallory@oxnard.org>
Sent: Mon, Jun 13, 2016 1:15 pm
Subject: Response to "New homes planned for Dunes area"

How can you approve high density cheap tenement units built with particle board and brightly painted siding by the thousand all over every vacant spot in Oxnard?

Feigning water shortage and drought, you are obsoleting the existing infrastructure and
forcing existing tenants to pay for all of your ambition and projects, everyone of which has been associated with scandal and controversy.

Charles Millett

8

CITY OF OXNARD CALIFORNIA

Mallory, Kathleen <kathleen.mallory@oxnard.org>

RE: Planned new construction near Oxnard Shores

1 message

juliepjinc@aol.com <juliepjinc@aol.com> Mon, Jun 13, 2016 at 1:41 PM
To: kathleen.mallory@oxnard.org

Hello Kathleen,

I have lived in Oxnard since September of 1985 and have been a home owner near Oxnard Shores since early 1995 and I have watched this city grow from a population of less than 69,000 to what it is now ... 205,437 (as of 2014). I continue to be optimistic that Oxnard will employ people who are strong enough to start slowing our growth down and conserving our natural resources for the residents who already call Oxnard home.

The proposed developments near Harbor Blvd. and Wooley will only add to the already rapidly increasing traffic. Imagine if we have a natural disaster (tsunami, earthquake, fire, etc) that forces residents to evacuate in a hurry, they are a limited number of escape routes from Oxnard. Harbor Blvd. from Fifth Street to the Ventura Harbor needed to be expanded to two lanes in both directions decades ago. In a disaster, that roadway will look worse than the freeways did when people tried to evacuate New Orleans after Hurricane Katrina.

I still remember in the mid 1980's, the bridge near the power plant was closed for nine months for improvements. I told everyone who would listen back then that we needed to look forward and double the number of traffic lanes. No one listened.

Fifth Street is another two lane road that is in terrible disrepair now. Imagine how much it will degrade with construction traffic, large vehicles and then the increased traffic if the proposed homes get built.

We are in a major drought. My household has been ordered to reduce our water usage by 25%. We have done so for the past year. Please do not build more homes that will use water we don't have now for the current residents. If we have enough water to support all the new proposed homes, then I am going to return to my normal shower habits and stop taking cold ones. I am nearly done with my shower by the time the water warms up. I also only flush my toilet three times per day to save water. That is going to stop as well if you build new homes because that would be the equivalent of you telling me Oxnard has PLENTY OF WATER.

Oxnard desperately needs long sighted representatives who will work hard to maintain and IMPROVE the quality of life here. Building, building, building and using up our limited natural resources will not do that. If this developer is so determined to build something in Oxnard, have him rehabilitate Fisherman's Wharf at Channel Islands & Victoria.

I vote an EMPHATIC no to the proposed developments near Harbor Blvd. and Fifth Street and the ones near Wooley.

Julie Kaplan

DEPARTMENT OF TRANSPORTATION
DISTRICT 7-OFFICE OF TRANSPORTATION PLANNING
100 S. MAIN STREET, MS 16
LOS ANGELES, CA 90012
PHONE (213) 897-9140
FAX (213) 897-1337
www.dot.ca.gov

9.

Serious Drought.
Serious drought.
Help save water!

June 20, 2016

Ms. Kathleen Mallory
City of Oxnard
Development Services Department
214 South C Street
Oxnard, CA 93030
RE: Avalon Homes Subdivision

Vic. LA-101
SCH # 2016051075
IGR/CEQA No. 160603

Dear Ms. Mallory:

Thank you for including the California Department of Transportation (Caltrans) in the environmental review process for the above referenced project. The proposed project involves the construction of a maximum of 65 residential dwelling units on 8.75 acres of a 38.33 acre property. The project is located at the Southeast corner of South Harbor Boulevard and West Fifth Street in the City of Oxnard.

The proposed project site is located approximately five miles from the nearest state facility, which is the US-101 freeway. Caltrans does not expect project approval to result into a direct adverse impact to the existing State transportation facility.

Storm water run-off is a sensitive issue for Los Angeles County. Please be mindful that projects should be designed to discharge clean run-off water. Discharge of storm water run-off is not permitted onto State Highway facilities without a storm water management plan.

Please be reminded that transportation of heavy construction equipment, materials, or other special equipment which requires the use of oversized-transport vehicles on State highways, will require a Caltrans transportation permit. Caltrans recommends that large size truck trips be limited to off-peak commute hours.

If you have any questions, please feel free to contact Mr. Rick Holland the project coordinator at (213) 897-4230 and refer to IGR/CEQA No. 160603.

Sincerely,

DIANNA WATSON
IGR/CEQA Branch Chief

cc: Scott Morgan, State Clearinghouse

RESOURCE MANAGEMENT AGENCY

county of ventura

Planning Division
Kimberly L. Prillhart
Director

June 27, 2016

City of Oxnard
Planning Division
Attn: Kathleen Mallory, MA, AICP
214 South C Street
Oxnard, CA 93030

Email: kathleen.mallory@oxnard.org

Subject: Comments on the NOP of an EIR and Initial Study for the Avalon Homes Subdivision

Dear Ms. Mallory:

Thank you for the opportunity to review and comment on the subject document. Attached are the comments that we have received resulting from intra-county review of the subject document. Additional comments may have been sent directly to you by other County agencies.

Your proposed responses to these comments should be sent directly to the commenter, with a copy to Laura Hocking, Ventura County Planning Division, L#1740, 800 S. Victoria Avenue, Ventura, CA 93009.

If you have any questions regarding any of the comments, please contact the appropriate respondent. Overall questions may be directed to Laura Hocking at (805) 654-2443.

Sincerely,

TRICIA MAIER

Tricia Maier, Manager
Planning Programs Section

Attachments

County RMA Reference Number 16-016

Memorandum

County of Ventura • Resource Management Agency • Planning Division
800 S. Victoria Avenue, Ventura, CA 93009-1740 • (805) 654-2478 • ventura.org/rma/planning

DATE: June 27, 2016

TO: Kathleen Mallory, City of Oxnard

FROM: Whitney Wilkinson, Ventura County Planning Division

SUBJECT: Notice of Preparation of an Environmental Impact Report for the Avalon Homes Subdivision (RMA 16-016)

I have reviewed the Initial Study for the Avalon Homes Subdivision (RMA 16-016), and have the following comments that the City of Oxnard should consider with regard to the analysis of impacts to biological resources when preparing the Environmental Impact Report (EIR).

1. Climate Change

The Planning Division recommends a thorough analysis and full consideration of project alternatives in light of the future effects of climate change. The synergistic effects of sea level rise and storm surge will likely leave the proposed development vulnerable to flooding over the lifespan of these homes. The need to develop engineering solutions to these problems could result in significant indirect impacts to biological resources on and adjacent to the subject property. It is recommended that alternatives that minimize and avoid impacts to biological resources be fully evaluated when taking into account the likely effects of sea level rise and storm surge. In addition, the effects of climate change and sea level rise should be considered when considering project and cumulative impacts as they relate to the vulnerability and long term viability of these resources.

2. Indirect Impacts

The Planning Division recommends the project incorporate features and measures that avoid indirect impacts to the Resource Protection Areas. These indirect impacts should include, but not be limited to, increased human presence in and adjacent to sensitive plant and wildlife habitats and how to balance wildlife movement and seed dispersal with the prevention of degradation to sensitive habitats. Mitigation strategies should consider educational signage for property owners and visitors to raise awareness of these sensitive resources. Mitigation strategies considered should include preventing the loss of sand as substrate for sensitive vegetation communities and habitats in and adjacent to the project area. Indirect impacts associated with domesticated animals, specifically off-leash dogs should also be fully considered. Mitigation strategies should consider a designated fenced dog park to minimize these impacts. Indirect impacts associated with

night lighting should be fully analyzed, and project design should avoid lighting near sensitive habitats.

3. Invasive Plant Species

It is recommended that the environmental document fully evaluate the potential for the proposed project to facilitate the spread of invasive plants, and therefore, directly and indirectly impact special-status species and plant communities. Disturbance associated with grading and land clearing adjacent to sensitive vegetation communities may result in indirect impacts, not only to these habitats, but also to special-status plant and wildlife species that depend on them. Measures that avoid and minimize the spread of invasive plants should be analyzed and incorporated into the project. Such measures should include the prohibition on installation of landscaping with any species found on the California Invasive Plant Council's Invasive Plant Inventory. It should also include preservation of special status plants and only selective thinning of native vegetation in any fuel modification areas needed for defensible space around structures.

4. Conservation and Management of Resource Protection Areas

It is recommended that the undeveloped Resource Protection Areas of the project site be legally preserved in fee title, encumbered with a conservation easement, or a similar conservation agreement be reached that fully encumbers these lands and their resources in perpetuity. Furthermore, it is also recommended that the management of the undeveloped Resources Protection Areas be given to an agency or organization with the knowledge and expertise for stewarding sensitive biological resources to ensure any conclusions made regarding the viability of the remaining biological resources on the subject property in the environmental document are substantiated.

Thank you for the opportunity to comment on the Initial Study and Notice of Preparation. If you have questions regarding this submittal, please contact Whitney Wilkinson at 805-654-2462 or whitney.wilkinson@ventura.org.

VENTURA COUNTY
AIR POLLUTION CONTROL DISTRICT
Memorandum

TO: Laura Hocking, Planning DATE: June 23, 2016

FROM: Alicia Stratton

SUBJECT: Request for Review of Notice of Preparation for an Environmental Impact Report for the Avalon Homes Subdivision, City of Oxnard (Reference No. 15-016)

Air Pollution Control District staff has reviewed the subject notice of preparation (NOP) for an environmental impact report (EIR), which is a proposed subdivision for a maximum of 65 residential dwelling units, consisting of 35 clustered single-family condominium units and 30 duplex structures. The project location is 38 acres within the City of Oxnard at the southeast corner of South Harbor Blvd. and West Fifth Street just north of the existing Oxnard Dunes subdivision.

Section III of the NOP and initial study (Page 18) addresses air quality issues. We concur with this discussion that implementation of the project would involve both short term construction-related emissions and long term operational emissions associated with increases in vehicle trips. Existing single family residences immediately to the west and south of the project site would involve sensitive receptors and emissions from project construction and operation would potential conflict with implementation of state and local air quality plans.

District staff recommends the EIR evaluate all potential air quality impacts that may result from the project. Specifically, the air quality assessment should consider reactive organic compound, nitrogen oxide emissions and particulate emissions from all project-related motor vehicles and construction equipment.

A carbon monoxide screening analysis should be conducted for any project-impacted roadway intersection that are currently operating, or that are expected to operate at, Levels of Service D, E, or F, or at any project-impacted roadway intersection that may be a CO hotspot. If a potential hotspot is identified, the District recommends that a complete CALINE3 or CALINE4 carbon monoxide analysis be conducted for that intersection.

This project will involve a large amount of grading of soil. The California Air Resources Board (CARB) has identified diesel exhaust particulate matter as a Toxic Air Contaminant (TAC). Diesel exhaust includes hundreds of different gaseous and

particulate components, many of which are toxic. The earthmoving equipment has the potential to expose sensitive populations in the vicinity to elevated levels of diesel exhaust. We recommend that a screening health risk assessment be conducted for the project to assess the potential health risks on any nearby sensitive receptors. Mitigation measures should also be identified and discussed if the assessment indicates a significant risk. Additional information on TACs can be obtained from the District's website at http://www.vcapcd.org/air_toxics.htm. If you have any general questions regarding air toxics, please contact Terri Thomas of the APCD at (805) 645-1405 or by email at terri@vcapcd.org.

If the project is determined to have a significant impact on regional and/or local air quality, the EIR should include all feasible mitigation measures.

If you have any questions, please call me at (805) 645-1426.

County of Ventura
Public Works Agency
Transportation Department
MEMORANDUM

DATE: June 15, 2016

TO: RMA – Planning Division
Attention: Laura Hocking

FROM: Transportation Department AB.

SUBJECT: **REVIEW OF DOCUMENT 16-016** Initial Study (IS)
Project: **Avalon Homes Subdivision**
Lead Agency: **City of Oxnard**
Initial Study for proposed construction of 65 residential units on 8.75 acres of 38.33-acre property in Oxnard Dunes Neighborhood located just east of Harbor Boulevard and south of Fifth Street in City of Oxnard (city).
APNs 196-0-010-225, 235, 275

Pursuant to your request, the Public Works Agency Transportation Department (PWATD) has reviewed the IS for the Avalon Homes Subdivision (Project).

This project is an Initial Study for the proposed construction of up to 65 residential dwelling units on 8.75 acres of a 38.33-acre undeveloped parcel in the Oxnard Dunes Neighborhood located just east of Harbor Boulevard, west of the Edison Canal, north of Wooley Road, and south of Fifth Street. According to the Determination, an Environment Impact Report (EIR) will be required, including approval of Tentative Tract Map No. 5888 and a Coastal Development Permit. The residential development would be constructed as two components of 15 single family condominiums or 30 duplexes and 35 clustered single family dwelling units ranging in size from 1,500 to 2,800 SF. Access to the private gated community would be via Canal Street (city) and Dunes Street (city). The nine-month construction phase would begin in the Fall 2017.

We offer the following comments:

1. The project would cause cumulative adverse traffic impacts to the County of Ventura Regional Road Network (RRN) that would be considered potentially significant. To address the cumulative adverse impacts of traffic on the RRN, the appropriate Traffic Impact Mitigation Fee (TIMF) should be paid to the County. The fee due to the County cannot be determined from the information provided in the IS. The Traffic Study for the EIR should determine the trip generation so that the TIMF may be computed.

2. LAFCO guidelines under Section 3.2.1 state that cities shall annex entire roadway sections and complete intersections adjacent to the territory proposed to be annexed. The EIR should require conditions for annexing County roadways adjacent to (or near) this development, namely: Fifth Street between Harbor Boulevard and Victoria Avenue. According to our records, Fifth Street is a

"county island" of roadway with an estimated 200-foot strip of land in the city's jurisdiction just south of the roadway.

3. Please send us the draft EIR when it becomes available for our review and comment.

Our review is limited to the impacts this project may have on the County's Regional Road Network.

T:\Planning\Land Development\Non_County\16-016 (OXN).doc

Ventura County
Watershed Protection District
Groundwater Resources

MEMORANDUM

DATE: June 23, 2016

TO: Laura Hocking, RMA/Planning Technician

FROM: Alma Quezada, P.G., Groundwater Specialist

SUBJECT: RMA Ref. #16-016, Avalon Homes Project, Initial Study

As requested, the Ventura County Watershed Protection District (VCWPD) – Groundwater Resources Division has reviewed the Initial Study for the Avalon Homes Project in accordance with the County of Ventura Initial Site Assessment Guidelines (ISAG) and provides the following comments:

PROJECT LOCATION

The proposed project is located within the service area of the City of Oxnard and overlies the Oxnard Plain Basin (Department of Water Resources [DWR] Basin No. 4-4.02), which was identified as a "high priority" basin by the California Statewide Elevation Monitoring Program (CASGEM) in June of 2014. The basin was also classified as a "critically overdrafted" basin by the Department of Water Resources in January 2016, which means that a Groundwater Sustainability Plan (GSP) with measurable objectives and measurable milestones must be developed and implemented by January 31, 2020 to ensure basin sustainability. The 38.33 acre site is presently vacant and does not have a physical address. It is known as Assessor's Parcel Numbers (APNs) 196-0-010-275, -225, and -235. The project site is located north of the existing Oxnard Dunes subdivision on the southeast corner of South Harbor Boulevard and West Fifth Street.

PROJECT DESCRIPTION

The proposed project site is undeveloped, vacant land. The County of Ventura has one record of a destroyed groundwater well associated with APN 196-0-010-27. According to County records, the well (SWN 01N23W01J01S) was destroyed on October 23, 1952. The Division of Oil, Gas and Geothermal Resources (DOGGR) has one record of a former oil well located east of APN 196-0-010-27 with a 'plugged' status.

The project proposes to construct a maximum of 65 residential dwelling units on 8.75 acres of the 38.33 acre site. A portion of the site (29.58 acres) would remain undeveloped and intended for Resource Protection. The 8.75 acres proposed for construction would be subdivided into 17 residential lots with a maximum of 65 residential units (35 cluster single family, and 15 single family or 30 if all duplex). The project also includes the addition of a private street. The project would occur in two

phases beginning with construction of the 35 cluster development of single family condominiums.

ENVIRONMENTAL IMPACT ANALYSIS

Item 2a. Groundwater Quantity

The project proposes to build up to 65 residential units that would increase demands of local groundwater resources in the area. It is not clear what the water demand for the project will be. The average U.S. household uses 360 gallons of water per day. This translates to 0.4 acre-feet per year (AFY) for the average U.S. home. If the minimum number of proposed residences is constructed (50 single family homes), the annual water demand based on average daily water consumption (360 gallons per day) equates to 20 AFY, but can be as high as 26 AFY if the maximum number (65 units) of residential units are constructed. The County considers any project which results in a net annual increase in groundwater extraction of 1.0 AFY or greater to have a significant impact.

Item 2b. Groundwater Quality

The proposed project will not involve the routine transport, use or disposal of hazardous substances, other than minor amounts used for routine residential housekeeping and maintenance, which will be conducted in accordance with all applicable state and federal laws. The project proposes to connect to the public sewer system provided by the City of Oxnard. Impacts to groundwater quality are considered to have no impact.

Item 2c. Surface Water Quantity

The proposed project does not rely on surface water supplies in a fully appropriated stream reach as designated by SWRCB or where unappropriated surface water is unavailable, and is considered to have no impact on surface water quantity.

Item 28b. Water Supply – Quantity

It is not clear if a permanent water supply will be available for the proposed project. The proposed project is located within the service area of the City of Oxnard. The City of Oxnard blends water from all available groundwater and imported surface water sources. Current water supply for the City of Oxnard is obtained from the following four sources:

1. Imported surface water from Calleguas Municipal Water District (CMWD),
2. Groundwater from United Water Conservation District (UWCD),
3. Groundwater from Oxnard's wells within the Fox Canyon Groundwater Management Agency's (FCGMA) jurisdiction, and
4. Recycled water from Oxnard's Advanced Water Purification Facility.

It is not known if agricultural pumping allocations are associated with the proposed project site. Groundwater pumping allocations are established by the FCGMA. Under FCGMA's Emergency Ordinance E, agricultural pumping allocations cannot be transferred during drought conditions. Additionally, the FCGMA allocation transfer systems are currently being reviewed, and will likely be modified through a Groundwater Sustainability Plan (GSP), as mandated by the 2014 Sustainable Groundwater Management Act (SGMA) of California. Groundwater allocation transfers to the City cannot be relied upon as a mitigation measure.

According to the Oxnard, California 2010 Urban Water Management Plan (UWMP [currently under revision]), the City of Oxnard has a Water Neutrality Policy that requires water demand offsets for all new development. Offsets can be achieved by the transfer of groundwater allocations, providing other water supplies, through efficiency programs, recycled water projects, or a combination of these options. The Water Neutrality Policy has generally been applied to all new development since 2008. Implementation of water conservation efforts must be successful and quantifiable to be relied upon as a permanent source of water for project implementation.

Projects that cannot verify a permanent source of water are considered potentially significant by the County of Ventura, however, the effect can be mitigated to a less than significant level if the project proponent can confirm a permanent water supply for the project by obtaining a valid Will Serve letter from the City of Oxnard.

STATE OF CALIFORNIA -- NATURAL RESOURCES AGENCY

EDMUND G. BROWN, JR., *Governor*

CALIFORNIA COASTAL COMMISSION
SOUTH CENTRAL COAST AREA
89 SOUTH CALIFORNIA ST., SUITE 200
VENTURA, CA 93001
(805) 585-1800

June 27, 2016

Kathleen Mallory
City of Oxnard
214 South C Street
Oxnard, CA 93030

RE: Notice of Preparation (NOP) for the Avalon Homes Subdivision Draft Environmental Impact Report (DEIR) SCH # 2016051075

Dear Ms. Mallory,

Commission staff has reviewed the Notice of Preparation for the Avalon Homes Subdivision Draft Environmental Impact Report dated May 27, 2016, and we appreciate the opportunity to provide comments for your consideration. The proposed project involves the construction of a maximum of 65 residential dwelling units on 8.75 acres of a 38.33 acre property. The property would be subdivided into 17 residential lots and two lots intended for Resource Protection (29.85 acres). Additional lots for a private street, drainage improvements, and community recreation area would be included within the residential development portion of the project. The Avalon Homes Subdivision project site is located within the City of Oxnard southeast of the corner of South Harbor Boulevard and West Fifth Street and just north of the existing Oxnard Dunes subdivision.

The project, as proposed, is located within the jurisdiction of the City of Oxnard Local Coastal Program (LCP). Due to the project's proposed siting, the project is also within the appealable jurisdiction of the California Coastal Commission. As such, the proposed project will require a coastal development permit from the City of Oxnard which would be appealable to the Coastal Commission.

The purpose of this letter is to identify potential coastal resource impacts that could result from the proposed project and provide preliminary comments that should be further evaluated in the Draft Environmental Impact Report. Policies of particular relevance to this project include Sections 30230, 30231, 30236, and 30240 of the Coastal Act and Policies 6-10 of the City's certified Land Use Plan that limit development in and around environmentally sensitive habitat areas, stream corridors, wetlands, and coastal waters. These policies not only limit the type of development that can be permitted within these resources, but also provide that development must be sited and designed to prevent impacts to these resources such that no less environmentally damaging, feasible alternatives exist for the project and measures to mitigate potential impacts are employed to the maximum degree possible.

The project site is situated within and adjacent to areas identified and mapped as an Environmental Sensitive Habitat Area (ESHA) by the LCP. As such, the project has the potential to result in significant adverse impacts to the sensitive habitats on and adjacent to the project site,

including but not limited to, dunes, wetlands, and habitat areas along Edison Canal. Section 30240 of the Coastal Act, which is incorporated as a policy of the Oxnard Land Use Plan requires that ESHA be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within those areas. In addition, Section 30240 requires that development in areas adjacent to ESHA shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas. Moreover, Land Use Plan Policy 6.d states that a buffer of 100 feet in width shall be provided adjacent to all resource protection areas, and that the buffer may be reduced to a minimum of 50 feet only if it is demonstrated that a larger buffer is unnecessary to protect the resources of the habitat area. The EIR should evaluate an alternative in which all new development is sited and designed to avoid areas designated ESHA, and provides the required 100 foot buffer from areas designated ESHA, as required by the Oxnard LCP.

Please feel free to contact me if you have concerns or questions regarding this correspondence. We look forward to continuing to work cooperatively with you and your staff on these important coastal issues.

Sincerely,

Denise Venegas

Denise Venegas
Coastal Program Analyst

16

CITY OF OXNARD CALIFORNIA

Mallory, Kathleen <kathleen.mallory@oxnard.org>

Avalon Homes Subdivision Tract 5888

1 message

Upham <twouphams@gmail.com> Mon, Jun 27, 2016 at 10:40 AM
To: Kathleen.Mallory@oxnard.org

Dear Kathleen Mallory, Please take under advisement as owner of two properties in Oxnard Dunes the following comments.
*We object to a gated private street on Canal Street. Our previous experience in this type of private street benefits only the project inhabitants and increases traffic flow to the surrounding neighborhood disproportionately .
*We agree with the suggestion of decreasing the number of Duplex
dwellings for the project which is more in keeping with the neighborhood environment. 30 to 15
*Decrease the number of "clustered" Condominiums
*We recommend close scrutiny of this project to ensure the present serenity and balance of our Dunes neighborhood .
Thank You

Christopher and Judith Upham Tr PZ 16-400-02, 16-300-03

Sent from my iPad

17.

CITY OF OXNARD CALIFORNIA

Mallory, Kathleen <kathleen.mallory@oxnard.org>

Requested Extended Comment Period Avalon Homes Subdivision

1 message

Jackson, Jamie@Wildlife <Jamie.Jackson@wildlife.ca.gov> Thu, Jun 23, 2016 at 2:08 PM
To: "Kathleen.Mallory@oxnard.org" <Kathleen.Mallory@oxnard.org>
Cc: "Found-Jackson, Christine@Wildlife" <Christine.Found-Jackson@wildlife.ca.gov>

Hello Kathleen,

The California Department of Fish and Wildlife (Department) would like to please request from the City of Oxnard (Lead Agency) an extended comment period on the Notice of Preparation (NOP- State Clearing House No. 2016051075) for the proposed Avalon Homes Subdivision (Project). The Department would like to request that comments be extended until July 7, 2016. The Department would like the opportunity to provide the Lead Agency with Project specific recommendations to avoid, reduce, and/or minimize Project-related impacts.

Providing the Department the extended time now would allow the Department to provide the Lead Agency with relevant specific measures to protect sensitive habitat and species immediately adjacent the proposed Project.

Allowing the Department the extra time requested, ultimately would result in saved time later. The Departments recommendations and concerns could be addressed now, in the NOP. The Department would not need to provide comprehensive comments on the draft Environmental Impact Report (dEIR), as the Lead Agency's dEIR, would have already considered the Departments recommended avoidance, reduction, and/or minimization recommendations in the NOP.

The Department would like to thank the Lead Agency for considering the request for extended comments, due July 7, 2016. If the Lead Agency has any questions, comments, or concerns please do not hesitate to contact the Department using the signature block information provided below. Again, Thank you. Have a great day. Jamie

Dr. Jamie Jackson, Ed.D.

Senior Environmental Scientist (Specialist)

PO Box 1179

Ventura, CA 93012

Office Hours: 7:00 am- 3:30 pm M-F

Office Phone: 805-382-6906

Email: jamie.jackson@wildlife.ca.gov

18.

CITY OF OXNARD CALIFORNIA

Mallory, Kathleen <kathleen.mallory@oxnard.org>

Dunes development

1 message

Patricia Kingsley <pkingsley2000@yahoo.com> Thu, Jun 16, 2016 at 4:12 PM
To: Kathleen.Mallory@oxnard.org

I read about the proposed development of 2 parcels in the Dunes area. As a resident of Mandalay Shores, I do have concerns. Currently Wooley Rd narrows as it approaches Harbor Blvd. This section is already a safety hazard for pedestrians and bikers. The 2 lane road has cars traveling at 45+ miles per hour. Bikers must share the narrow lane or try to negotiate among pedestrians on the narrow crumbling sidewalk. This is the main thoroughfare from Seabridge to the Shores area. With a 4 story condo going up in Seabridge and the proposed Dunes development, more population will only add stress to this already unsafe roadway. I would hope the city could negotiate with developers to improve this road as a condition to developing. The connection between these two beautiful areas should not be taxed with more cars, bikes, and pedestrians without adding lanes and improving the sidewalks. Thanks for your consideration, Patricia Kingsley

Sent from my iPad

Appendix B

Air Emissions Inventory from CalEEMod

- Avalon Homes Annual
- Avalon Homes Summer
- Avalon Homes Winter
- Greenhouse Gas Emissions Worksheet

Avalon Homes

Ventura County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	15.00	Dwelling Unit	2.62	67,500.00	46
Condo/Townhouse	18.00	Dwelling Unit	1.73	50,400.00	55
Condo/Townhouse	17.00	Dwelling Unit	1.66	47,600.00	52
Other Asphalt Surfaces	55.00	1000sqft	1.26	55,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	31
Climate Zone	8			**Operational Year**	2018
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Site plan: Lots 1-15 (2.62 acre), Lot 16 (1.73 acre), Lot 17 (1.66 acre)

Construction Phase - Construction schedule from Project Description

Grading - Project description

Vehicle Trips - Traffic study

Construction Off-road Equipment Mitigation -

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	115.00
tblConstructionPhase	NumDays	230.00	195.00
tblConstructionPhase	NumDays	20.00	120.00
tblConstructionPhase	PhaseEndDate	2/8/2019	8/24/2018
tblConstructionPhase	PhaseEndDate	9/21/2018	9/28/2018
tblConstructionPhase	PhaseStartDate	9/1/2018	3/19/2018
tblConstructionPhase	PhaseStartDate	12/2/2017	12/4/2017
tblConstructionPhase	PhaseStartDate	6/17/2017	6/19/2017
tblConstructionPhase	PhaseStartDate	8/25/2018	9/3/2018
tblGrading	AcresOfGrading	60.00	8.75
tblLandUse	LandUseSquareFeet	27,000.00	67,500.00
tblLandUse	LandUseSquareFeet	18,000.00	50,400.00
tblLandUse	LandUseSquareFeet	17,000.00	47,600.00
tblLandUse	LotAcreage	4.87	2.62
tblLandUse	LotAcreage	1.13	1.73
tblLandUse	LotAcreage	1.06	1.66
tblProjectCharacteristics	OperationalYear	2014	2018
tblVehicleTrips	WD_TR	6.59	9.52
tblVehicleTrips	WD_TR	9.57	9.52

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					
2017	0.2686	2.7002	1.9755	2.4200e-003	0.4695	0.1542	0.6237	0.2523	0.1422	0.3945	0.0000	221.0343	221.0343	0.0628	0.0000	222.3520
2018	1.7726	2.4414	2.1108	3.5300e-003	0.0523	0.1507	0.2030	0.0141	0.1420	0.1560	0.0000	302.4835	302.4835	0.0603	0.0000	303.7498
Total	**2.0412**	**5.1416**	**4.0863**	**5.9500e-003**	**0.5219**	**0.3049**	**0.8268**	**0.2664**	**0.2842**	**0.5505**	**0.0000**	**523.5177**	**523.5177**	**0.1231**	**0.0000**	**526.1019**

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					
2017	0.2686	2.7002	1.9755	2.4200e-003	0.2186	0.1542	0.3728	0.1155	0.1422	0.2577	0.0000	221.0340	221.0340	0.0628	0.0000	222.3518
2018	1.7726	2.4414	2.1108	3.5300e-003	0.0523	0.1507	0.2030	0.0141	0.1420	0.1560	0.0000	302.4832	302.4832	0.0603	0.0000	303.7496
Total	**2.0412**	**5.1415**	**4.0863**	**5.9500e-003**	**0.2709**	**0.3049**	**0.5758**	**0.1295**	**0.2842**	**0.4137**	**0.0000**	**523.5172**	**523.5172**	**0.1231**	**0.0000**	**526.1013**

	ROG	NOx	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**	**48.09**	**0.00**	**30.36**	**51.37**	**0.00**	**24.85**	**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	1.0206	4.3400e-003	0.3744	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6074	0.6074	6.0000e-004	0.0000	0.6201
Energy	5.3200e-003	0.0455	0.0194	2.9000e-004		3.6800e-003	3.6800e-003		3.6800e-003	3.6800e-003	0.0000	126.4244	126.4244	4.4000e-003	1.6700e-003	127.0336
Mobile	0.2417	0.6195	2.4801	6.3500e-003	0.4652	7.6200e-003	0.4729	0.1242	7.0200e-003	0.1312	0.0000	473.3655	473.3655	0.0181	0.0000	473.7462
Waste						0.0000	0.0000		0.0000	0.0000	7.0966	0.0000	7.0966	0.4194	0.0000	15.9039
Water						0.0000	0.0000		0.0000	0.0000	1.0335	18.6684	19.7019	0.1070	2.6800e-003	22.7811
Total	**1.2677**	**0.6693**	**2.8738**	**6.6600e-003**	**0.4652**	**0.0133**	**0.4786**	**0.1242**	**0.0127**	**0.1370**	**8.1301**	**619.0657**	**627.1958**	**0.5495**	**4.3500e-003**	**640.0850**

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	1.0206	4.3400e-003	0.3744	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6074	0.6074	6.0000e-004	0.0000	0.6201
Energy	4.2500e-003	0.0363	0.0155	2.3000e-004		2.9400e-003	2.9400e-003		2.9400e-003	2.9400e-003	0.0000	114.8841	114.8841	4.1500e-003	1.4600e-003	115.4251
Mobile	0.2417	0.6195	2.4801	6.3500e-003	0.4652	7.6200e-003	0.4729	0.1242	7.0200e-003	0.1312	0.0000	473.3655	473.3655	0.0181	0.0000	473.7462
Waste						0.0000	0.0000		0.0000	0.0000	7.0966	0.0000	7.0966	0.4194	0.0000	15.9039
Water						0.0000	0.0000		0.0000	0.0000	1.0335	18.6684	19.7019	0.1070	2.6800e-003	22.7795
Total	**1.2666**	**0.6602**	**2.8699**	**6.6000e-003**	**0.4652**	**0.0126**	**0.4778**	**0.1242**	**0.0120**	**0.1362**	**8.1301**	**607.5254**	**615.6555**	**0.5493**	**4.1400e-003**	**628.4747**

	ROG	NOx	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	**0.08**	**1.37**	**0.14**	**0.90**	**0.00**	**5.55**	**0.15**	**0.00**	**5.81**	**0.54**	**0.00**	**1.86**	**1.84**	**0.05**	**4.83**	**1.81**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/5/2017	6/16/2017	5	10	
2	Grading	Grading	6/19/2017	12/1/2017	5	120	
3	Building Construction	Building Construction	12/4/2017	8/31/2018	5	195	
4	Architectural Coating	Architectural Coating	3/19/2018	8/24/2018	5	115	
5	Paving	Paving	9/3/2018	9/28/2018	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8.75

Acres of Paving: 0

Residential Indoor: 335,138; Residential Outdoor: 111,713; Non-Residential Indoor: 82,500; Non-Residential Outdoor: 27,500 (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
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
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
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	54.00	14.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	11.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 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					
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	0.0242	0.2588	0.1970	2.0000e-004		0.0138	0.0138		0.0127	0.0127	0.0000	18.1577	18.1577	5.5600e-003	0.0000	18.2745
Total	**0.0242**	**0.2588**	**0.1970**	**2.0000e-004**	**0.0903**	**0.0138**	**0.1041**	**0.0497**	**0.0127**	**0.0623**	**0.0000**	**18.1577**	**18.1577**	**5.5600e-003**	**0.0000**	**18.2745**

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	2.9000e-004	3.4000e-004	3.4200e-003	1.0000e-005	7.3000e-004	1.0000e-005	7.3000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6161	0.6161	3.0000e-005	0.0000	0.6167
Total	**2.9000e-004**	**3.4000e-004**	**3.4200e-003**	**1.0000e-005**	**7.3000e-004**	**1.0000e-005**	**7.3000e-004**	**1.9000e-004**	**1.0000e-005**	**2.0000e-004**	**0.0000**	**0.6161**	**0.6161**	**3.0000e-005**	**0.0000**	**0.6167**

3.2 Site Preparation - 2017

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					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0242	0.2588	0.1970	2.0000e-004		0.0138	0.0138		0.0127	0.0127	0.0000	18.1577	18.1577	5.5600e-003	0.0000	18.2745
Total	**0.0242**	**0.2588**	**0.1970**	**2.0000e-004**	**0.0407**	**0.0138**	**0.0544**	**0.0223**	**0.0127**	**0.0350**	**0.0000**	**18.1577**	**18.1577**	**5.5600e-003**	**0.0000**	**18.2745**

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	2.9000e-004	3.4000e-004	3.4200e-003	1.0000e-005	7.3000e-004	1.0000e-005	7.3000e-004	1.9000e-004	1.0000e-005	2.0000e-004	0.0000	0.6161	0.6161	3.0000e-005	0.0000	0.6167
Total	**2.9000e-004**	**3.4000e-004**	**3.4200e-003**	**1.0000e-005**	**7.3000e-004**	**1.0000e-005**	**7.3000e-004**	**1.9000e-004**	**1.0000e-005**	**2.0000e-004**	**0.0000**	**0.6161**	**0.6161**	**3.0000e-005**	**0.0000**	**0.6167**

3.3 Grading - 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					
Fugitive Dust					0.3660	0.0000	0.3660	0.1991	0.0000	0.1991	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2073	2.1590	1.5229	1.7800e-003		0.1223	0.1223		0.1125	0.1125	0.0000	165.6701	165.6701	0.0508	0.0000	166.7361
Total	**0.2073**	**2.1590**	**1.5229**	**1.7800e-003**	**0.3660**	**0.1223**	**0.4883**	**0.1991**	**0.1125**	**0.3117**	**0.0000**	**165.6701**	**165.6701**	**0.0508**	**0.0000**	**166.7361**

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	2.8600e-003	3.4300e-003	0.0343	8.0000e-005	7.2600e-003	6.0000e-005	7.3100e-003	1.9300e-003	5.0000e-005	1.9800e-003	0.0000	6.1608	6.1608	3.0000e-004	0.0000	6.1671
Total	**2.8600e-003**	**3.4300e-003**	**0.0343**	**8.0000e-005**	**7.2600e-003**	**6.0000e-005**	**7.3100e-003**	**1.9300e-003**	**5.0000e-005**	**1.9800e-003**	**0.0000**	**6.1608**	**6.1608**	**3.0000e-004**	**0.0000**	**6.1671**

3.3 Grading - 2017

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					0.1647	0.0000	0.1647	0.0896	0.0000	0.0896	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2073	2.1589	1.5229	1.7800e-003		0.1223	0.1223		0.1125	0.1125	0.0000	165.6699	165.6699	0.0508	0.0000	166.7359
Total	**0.2073**	**2.1589**	**1.5229**	**1.7800e-003**	**0.1647**	**0.1223**	**0.2870**	**0.0896**	**0.1125**	**0.2021**	**0.0000**	**165.6699**	**165.6699**	**0.0508**	**0.0000**	**166.7359**

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	2.8600e-003	3.4300e-003	0.0343	8.0000e-005	7.2600e-003	6.0000e-005	7.3100e-003	1.9300e-003	5.0000e-005	1.9800e-003	0.0000	6.1608	6.1608	3.0000e-004	0.0000	6.1671
Total	**2.8600e-003**	**3.4300e-003**	**0.0343**	**8.0000e-005**	**7.2600e-003**	**6.0000e-005**	**7.3100e-003**	**1.9300e-003**	**5.0000e-005**	**1.9800e-003**	**0.0000**	**6.1608**	**6.1608**	**3.0000e-004**	**0.0000**	**6.1671**

3.4 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**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1600e-003	0.0126	0.0161	3.0000e-005	9.1000e-004	1.9000e-004	1.1000e-003	2.6000e-004	1.8000e-004	4.4000e-004	0.0000	2.7853	2.7853	2.0000e-005	0.0000	2.7857
Worker	1.7200e-003	2.0600e-003	0.0206	5.0000e-005	4.3500e-003	3.0000e-005	4.3900e-003	1.1600e-003	3.0000e-005	1.1900e-003	0.0000	3.6965	3.6965	1.8000e-004	0.0000	3.7003
Total	**2.8800e-003**	**0.0146**	**0.0367**	**8.0000e-005**	**5.2600e-003**	**2.2000e-004**	**5.4900e-003**	**1.4200e-003**	**2.1000e-004**	**1.6300e-003**	**0.0000**	**6.4817**	**6.4817**	**2.0000e-004**	**0.0000**	**6.4859**

3.4 Building Construction - 2017

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**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1600e-003	0.0126	0.0161	3.0000e-005	9.1000e-004	1.9000e-004	1.1000e-003	2.6000e-004	1.8000e-004	4.4000e-004	0.0000	2.7853	2.7853	2.0000e-005	0.0000	2.7857
Worker	1.7200e-003	2.0600e-003	0.0206	5.0000e-005	4.3500e-003	3.0000e-005	4.3900e-003	1.1600e-003	3.0000e-005	1.1900e-003	0.0000	3.6965	3.6965	1.8000e-004	0.0000	3.7003
Total	**2.8800e-003**	**0.0146**	**0.0367**	**8.0000e-005**	**5.2600e-003**	**2.2000e-004**	**5.4900e-003**	**1.4200e-003**	**2.1000e-004**	**1.6300e-003**	**0.0000**	**6.4817**	**6.4817**	**2.0000e-004**	**0.0000**	**6.4859**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2335	2.0353	1.5341	2.3500e-003		0.1308	0.1308		0.1229	0.1229	0.0000	207.1735	207.1735	0.0507	0.0000	208.2382
Total	**0.2335**	**2.0353**	**1.5341**	**2.3500e-003**		**0.1308**	**0.1308**		**0.1229**	**0.1229**	**0.0000**	**207.1735**	**207.1735**	**0.0507**	**0.0000**	**208.2382**

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	9.5000e-003	0.1000	0.1354	2.7000e-004	7.9400e-003	1.5800e-003	9.5100e-003	2.2600e-003	1.4500e-003	3.7100e-003	0.0000	23.9724	23.9724	1.5000e-004	0.0000	23.9756
Worker	0.0137	0.0164	0.1628	4.4000e-004	0.0381	2.8000e-004	0.0384	0.0101	2.6000e-004	0.0104	0.0000	31.1319	31.1319	1.4700e-003	0.0000	31.1628
Total	**0.0232**	**0.1164**	**0.2982**	**7.1000e-004**	**0.0460**	**1.8600e-003**	**0.0479**	**0.0124**	**1.7100e-003**	**0.0141**	**0.0000**	**55.1043**	**55.1043**	**1.6200e-003**	**0.0000**	**55.1384**

3.4 Building Construction - 2018

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	0.2335	2.0353	1.5341	2.3500e-003		0.1308	0.1308		0.1229	0.1229	0.0000	207.1732	207.1732	0.0507	0.0000	208.2379
Total	**0.2335**	**2.0353**	**1.5341**	**2.3500e-003**		**0.1308**	**0.1308**		**0.1229**	**0.1229**	**0.0000**	**207.1732**	**207.1732**	**0.0507**	**0.0000**	**208.2379**

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	9.5000e-003	0.1000	0.1354	2.7000e-004	7.9400e-003	1.5800e-003	9.5100e-003	2.2600e-003	1.4500e-003	3.7100e-003	0.0000	23.9724	23.9724	1.5000e-004	0.0000	23.9756
Worker	0.0137	0.0164	0.1628	4.4000e-004	0.0381	2.8000e-004	0.0384	0.0101	2.6000e-004	0.0104	0.0000	31.1319	31.1319	1.4700e-003	0.0000	31.1628
Total	**0.0232**	**0.1164**	**0.2982**	**7.1000e-004**	**0.0460**	**1.8600e-003**	**0.0479**	**0.0124**	**1.7100e-003**	**0.0141**	**0.0000**	**55.1043**	**55.1043**	**1.6200e-003**	**0.0000**	**55.1384**

3.5 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	1.4787					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0172	0.1153	0.1066	1.7000e-004		8.6600e-003	8.6600e-003		8.6600e-003	8.6600e-003	0.0000	14.6812	14.6812	1.4000e-003	0.0000	14.7105
Total	**1.4959**	**0.1153**	**0.1066**	**1.7000e-004**		**8.6600e-003**	**8.6600e-003**		**8.6600e-003**	**8.6600e-003**	**0.0000**	**14.6812**	**14.6812**	**1.4000e-003**	**0.0000**	**14.7105**

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	1.8300e-003	2.1900e-003	0.0218	6.0000e-005	5.1000e-003	4.0000e-005	5.1400e-003	1.3500e-003	4.0000e-005	1.3900e-003	0.0000	4.1674	4.1674	2.0000e-004	0.0000	4.1715
Total	**1.8300e-003**	**2.1900e-003**	**0.0218**	**6.0000e-005**	**5.1000e-003**	**4.0000e-005**	**5.1400e-003**	**1.3500e-003**	**4.0000e-005**	**1.3900e-003**	**0.0000**	**4.1674**	**4.1674**	**2.0000e-004**	**0.0000**	**4.1715**

3.5 Architectural Coating - 2018

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	1.4787					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0172	0.1153	0.1066	1.7000e-004		8.6600e-003	8.6600e-003		8.6600e-003	8.6600e-003	0.0000	14.6812	14.6812	1.4000e-003	0.0000	14.7105
Total	**1.4959**	**0.1153**	**0.1066**	**1.7000e-004**		**8.6600e-003**	**8.6600e-003**		**8.6600e-003**	**8.6600e-003**	**0.0000**	**14.6812**	**14.6812**	**1.4000e-003**	**0.0000**	**14.7105**

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	1.8300e-003	2.1900e-003	0.0218	6.0000e-005	5.1000e-003	4.0000e-005	5.1400e-003	1.3500e-003	4.0000e-005	1.3900e-003	0.0000	4.1674	4.1674	2.0000e-004	0.0000	4.1715
Total	**1.8300e-003**	**2.1900e-003**	**0.0218**	**6.0000e-005**	**5.1000e-003**	**4.0000e-005**	**5.1400e-003**	**1.3500e-003**	**4.0000e-005**	**1.3900e-003**	**0.0000**	**4.1674**	**4.1674**	**2.0000e-004**	**0.0000**	**4.1715**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0161	0.1716	0.1449	2.2000e-004		9.3900e-003	9.3900e-003		8.6400e-003	8.6400e-003	0.0000	20.3687	20.3687	6.3400e-003	0.0000	20.5019
Paving	1.6500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0178**	**0.1716**	**0.1449**	**2.2000e-004**		**9.3900e-003**	**9.3900e-003**		**8.6400e-003**	**8.6400e-003**	**0.0000**	**20.3687**	**20.3687**	**6.3400e-003**	**0.0000**	**20.5019**

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	4.3000e-004	5.2000e-004	5.1700e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9883	0.9883	5.0000e-005	0.0000	0.9893
Total	**4.3000e-004**	**5.2000e-004**	**5.1700e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**0.9883**	**0.9883**	**5.0000e-005**	**0.0000**	**0.9893**

3.6 Paving - 2018

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	0.0161	0.1716	0.1449	2.2000e-004		9.3900e-003	9.3900e-003		8.6400e-003	8.6400e-003	0.0000	20.3687	20.3687	6.3400e-003	0.0000	20.5019
Paving	1.6500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0178**	**0.1716**	**0.1449**	**2.2000e-004**		**9.3900e-003**	**9.3900e-003**		**8.6400e-003**	**8.6400e-003**	**0.0000**	**20.3687**	**20.3687**	**6.3400e-003**	**0.0000**	**20.5019**

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	4.3000e-004	5.2000e-004	5.1700e-003	1.0000e-005	1.2100e-003	1.0000e-005	1.2200e-003	3.2000e-004	1.0000e-005	3.3000e-004	0.0000	0.9883	0.9883	5.0000e-005	0.0000	0.9893
Total	**4.3000e-004**	**5.2000e-004**	**5.1700e-003**	**1.0000e-005**	**1.2100e-003**	**1.0000e-005**	**1.2200e-003**	**3.2000e-004**	**1.0000e-005**	**3.3000e-004**	**0.0000**	**0.9883**	**0.9883**	**5.0000e-005**	**0.0000**	**0.9893**

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					
Unmitigated	0.2417	0.6195	2.4801	6.3500e-003	0.4652	7.6200e-003	0.4729	0.1242	7.0200e-003	0.1312	0.0000	473.3655	473.3655	0.0181	0.0000	473.7462
Mitigated	0.2417	0.6195	2.4801	6.3500e-003	0.4652	7.6200e-003	0.4729	0.1242	7.0200e-003	0.1312	0.0000	473.3655	473.3655	0.0181	0.0000	473.7462

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	171.36	128.88	109.26	432,200	432,200
Condo/Townhouse	161.84	121.72	103.19	408,189	408,189
Single Family Housing	142.80	151.20	131.55	393,442	393,442
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	476.00	401.80	344.00	1,233,830	1,233,830

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	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Condo/Townhouse	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Single Family Housing	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.475011	0.063009	0.180574	0.158011	0.069740	0.010288	0.013503	0.017378	0.000770	0.000675	0.005608	0.000318	0.005113

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive 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					
NaturalGas Mitigated	4.2500e-003	0.0363	0.0155	2.3000e-004		2.9400e-003	2.9400e-003		2.9400e-003	2.9400e-003	0.0000	42.0503	42.0503	8.1000e-004	7.7000e-004	42.3062
NaturalGas Unmitigated	5.3200e-003	0.0455	0.0194	2.9000e-004		3.6800e-003	3.6800e-003		3.6800e-003	3.6800e-003	0.0000	52.6772	52.6772	1.0100e-003	9.7000e-004	52.9978
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	72.8338	72.8338	3.3500e-003	6.9000e-004	73.1189
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	73.7472	73.7472	3.3900e-003	7.0000e-004	74.0359

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					
Other Asphalt Surfaces	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	433253	2.3400e-003	0.0200	8.5000e-003	1.3000e-004		1.6100e-003	1.6100e-003		1.6100e-003	1.6100e-003	0.0000	23.1200	23.1200	4.4000e-004	4.2000e-004	23.2607
Condo/Townhouse	269028	1.4500e-003	0.0124	5.2800e-003	8.0000e-005		1.0000e-003	1.0000e-003		1.0000e-003	1.0000e-003	0.0000	14.3564	14.3564	2.8000e-004	2.6000e-004	14.4437
Condo/Townhouse	284853	1.5400e-003	0.0131	5.5900e-003	8.0000e-005		1.0600e-003	1.0600e-003		1.0600e-003	1.0600e-003	0.0000	15.2008	15.2008	2.9000e-004	2.8000e-004	15.2934
Total		**5.3300e-003**	**0.0455**	**0.0194**	**2.9000e-004**		**3.6700e-003**	**3.6700e-003**		**3.6700e-003**	**3.6700e-003**	**0.0000**	**52.6772**	**52.6772**	**1.0100e-003**	**9.6000e-004**	**52.9978**

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					
Other Asphalt Surfaces	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	346761	1.8700e-003	0.0160	6.8000e-003	1.0000e-004		1.2900e-003	1.2900e-003		1.2900e-003	1.2900e-003	0.0000	18.5045	18.5045	3.5000e-004	3.4000e-004	18.6171
Condo/Townhouse	214313	1.1600e-003	9.8800e-003	4.2000e-003	6.0000e-005		8.0000e-004	8.0000e-004		8.0000e-004	8.0000e-004	0.0000	11.4365	11.4365	2.2000e-004	2.1000e-004	11.5061
Condo/Townhouse	226919	1.2200e-003	0.0105	4.4500e-003	7.0000e-005		8.5000e-004	8.5000e-004		8.5000e-004	8.5000e-004	0.0000	12.1093	12.1093	2.3000e-004	2.2000e-004	12.1830
Total		**4.2500e-003**	**0.0363**	**0.0155**	**2.3000e-004**		**2.9400e-003**	**2.9400e-003**		**2.9400e-003**	**2.9400e-003**	**0.0000**	**42.0503**	**42.0503**	**8.0000e-004**	**7.7000e-004**	**42.3062**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	73518.7	21.0386	9.7000e-004	2.0000e-004	21.1210
Condo/Townhouse	77843.3	22.2762	1.0200e-003	2.1000e-004	22.3634
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	106345	30.4324	1.4000e-003	2.9000e-004	30.5515
Total		**73.7472**	**3.3900e-003**	**7.0000e-004**	**74.0359**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Condo/Townhouse	72680.6	20.7988	9.6000e-004	2.0000e-004	20.8802
Condo/Townhouse	76955.9	22.0222	1.0100e-003	2.1000e-004	22.1084
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	104879	30.0128	1.3800e-003	2.9000e-004	30.1303
Total		**72.8338**	**3.3500e-003**	**7.0000e-004**	**73.1189**

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					
Unmitigated	1.0206	4.3400e-003	0.3744	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6074	0.6074	6.0000e-004	0.0000	0.6201
Mitigated	1.0206	4.3400e-003	0.3744	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6074	0.6074	6.0000e-004	0.0000	0.6201

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	0.1479					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8612					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	0.0116	4.3400e-003	0.3744	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6074	0.6074	6.0000e-004	0.0000	0.6201
Total	**1.0206**	**4.3400e-003**	**0.3744**	**2.0000e-005**		**2.0400e-003**	**2.0400e-003**		**2.0400e-003**	**2.0400e-003**	**0.0000**	**0.6074**	**0.6074**	**6.0000e-004**	**0.0000**	**0.6201**

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	0.1479					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.8612					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	0.0116	4.3400e-003	0.3744	2.0000e-005		2.0400e-003	2.0400e-003		2.0400e-003	2.0400e-003	0.0000	0.6074	0.6074	6.0000e-004	0.0000	0.6201
Total	**1.0206**	**4.3400e-003**	**0.3744**	**2.0000e-005**		**2.0400e-003**	**2.0400e-003**		**2.0400e-003**	**2.0400e-003**	**0.0000**	**0.6074**	**0.6074**	**6.0000e-004**	**0.0000**	**0.6201**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Unmitigated	19.7019	0.1070	2.6800e-003	22.7811
Mitigated	19.7019	0.1070	2.6800e-003	22.7795

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	2.28039 / 1.43764	13.7913	0.0749	1.8800e-003	15.9468
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.97731 / 0.61613	5.9106	0.0321	8.1000e-004	6.8343
Total		**19.7019**	**0.1070**	**2.6900e-003**	**22.7811**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Condo/Townhouse	2.28039 / 1.43764	13.7913	0.0749	1.8800e-003	15.9456
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	0.97731 / 0.61613	5.9106	0.0321	8.0000e-004	6.8339
Total		**19.7019**	**0.1070**	**2.6800e-003**	**22.7795**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	7.0966	0.4194	0.0000	15.9039
Unmitigated	7.0966	0.4194	0.0000	15.9039

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	16.1	3.2682	0.1931	0.0000	7.3241
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	18.86	3.8284	0.2263	0.0000	8.5797
Total		**7.0966**	**0.4194**	**0.0000**	**15.9039**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Condo/Townhouse	16.1	3.2682	0.1931	0.0000	7.3241
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Single Family Housing	18.86	3.8284	0.2263	0.0000	8.5797
Total		**7.0966**	**0.4194**	**0.0000**	**15.9039**

9.0 Operational Offroad

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

10.0 Vegetation

Avalon Homes

Ventura County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	15.00	Dwelling Unit	2.62	67,500.00	46
Condo/Townhouse	18.00	Dwelling Unit	1.73	50,400.00	55
Condo/Townhouse	17.00	Dwelling Unit	1.66	47,600.00	52
Other Asphalt Surfaces	55.00	1000sqft	1.26	55,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	31
Climate Zone	8			**Operational Year**	2018
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Site plan: Lots 1-15 (2.62 acre), Lot 16 (1.73 acre), Lot 17 (1.66 acre)

Construction Phase - Construction schedule from Project Description

Grading - Project description

Vehicle Trips - Traffic study

Construction Off-road Equipment Mitigation -

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	115.00
tblConstructionPhase	NumDays	230.00	195.00
tblConstructionPhase	NumDays	20.00	120.00
tblConstructionPhase	PhaseEndDate	2/8/2019	8/24/2018
tblConstructionPhase	PhaseEndDate	9/21/2018	9/28/2018
tblConstructionPhase	PhaseStartDate	9/1/2018	3/19/2018
tblConstructionPhase	PhaseStartDate	12/2/2017	12/4/2017
tblConstructionPhase	PhaseStartDate	6/17/2017	6/19/2017
tblConstructionPhase	PhaseStartDate	8/25/2018	9/3/2018
tblGrading	AcresOfGrading	60.00	8.75
tblLandUse	LandUseSquareFeet	27,000.00	67,500.00
tblLandUse	LandUseSquareFeet	18,000.00	50,400.00
tblLandUse	LandUseSquareFeet	17,000.00	47,600.00
tblLandUse	LotAcreage	4.87	2.62
tblLandUse	LotAcreage	1.13	1.73
tblLandUse	LotAcreage	1.06	1.66
tblProjectCharacteristics	OperationalYear	2014	2018
tblVehicleTrips	WD_TR	6.59	9.52
tblVehicleTrips	WD_TR	9.57	9.52

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					
2017	4.8961	51.8140	40.0939	0.0409	18.2141	2.7553	20.9694	9.9699	2.5349	12.5048	0.0000	4,144.6209	4,144.6209	1.2332	0.0000	4,170.5184
2018	28.9750	26.5678	22.9306	0.0393	0.6261	1.6667	2.2928	0.1678	1.5754	1.7433	0.0000	3,686.3961	3,686.3961	0.7041	0.0000	3,701.1829
Total	**33.8711**	**78.3819**	**63.0244**	**0.0801**	**18.8402**	**4.4220**	**23.2622**	**10.1377**	**4.1103**	**14.2481**	**0.0000**	**7,831.0170**	**7,831.0170**	**1.9373**	**0.0000**	**7,871.7013**

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					
2017	4.8961	51.8140	40.0939	0.0409	8.2777	2.7553	11.0330	4.5080	2.5349	7.0429	0.0000	4,144.6209	4,144.6209	1.2332	0.0000	4,170.5184
2018	28.9750	26.5678	22.9306	0.0393	0.6261	1.6667	2.2928	0.1678	1.5754	1.7433	0.0000	3,686.3961	3,686.3961	0.7041	0.0000	3,701.1829
Total	**33.8711**	**78.3819**	**63.0244**	**0.0801**	**8.9038**	**4.4220**	**13.3258**	**4.6759**	**4.1103**	**8.7862**	**0.0000**	**7,831.0170**	**7,831.0170**	**1.9373**	**0.0000**	**7,871.7013**

	ROG	NOx	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**	**52.74**	**0.00**	**42.71**	**53.88**	**0.00**	**38.33**	**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	5.6576	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227	0.0000	7.4397	7.4397	7.3900e-003	0.0000	7.5949
Energy	0.0292	0.2492	0.1061	1.5900e-003		0.0202	0.0202		0.0202	0.0202		318.1736	318.1736	6.1000e-003	5.8300e-003	320.1099
Mobile	1.4367	3.4474	14.3091	0.0392	2.8246	0.0454	2.8700	0.7530	0.0418	0.7948		3,214.5180	3,214.5180	0.1192		3,217.0214
Total	**7.1234**	**3.7449**	**18.5750**	**0.0410**	**2.8246**	**0.0882**	**2.9128**	**0.7530**	**0.0847**	**0.8376**	**0.0000**	**3,540.1312**	**3,540.1312**	**0.1327**	**5.8300e-003**	**3,544.7263**

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	5.6576	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227	0.0000	7.4397	7.4397	7.3900e-003	0.0000	7.5949
Energy	0.0233	0.1990	0.0847	1.2700e-003		0.0161	0.0161		0.0161	0.0161		253.9863	253.9863	4.8700e-003	4.6600e-003	255.5321
Mobile	1.4367	3.4474	14.3091	0.0392	2.8246	0.0454	2.8700	0.7530	0.0418	0.7948		3,214.5180	3,214.5180	0.1192		3,217.0214
Total	**7.1175**	**3.6946**	**18.5536**	**0.0407**	**2.8246**	**0.0842**	**2.9088**	**0.7530**	**0.0806**	**0.8336**	**0.0000**	**3,475.9440**	**3,475.9440**	**0.1315**	**4.6600e-003**	**3,480.1484**

	ROG	NOx	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	**0.08**	**1.34**	**0.12**	**0.78**	**0.00**	**4.60**	**0.14**	**0.00**	**4.80**	**0.48**	**0.00**	**1.81**	**1.81**	**0.93**	**20.07**	**1.82**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/5/2017	6/16/2017	5	10	
2	Grading	Grading	6/19/2017	12/1/2017	5	120	
3	Building Construction	Building Construction	12/4/2017	8/31/2018	5	195	
4	Architectural Coating	Architectural Coating	3/19/2018	8/24/2018	5	115	
5	Paving	Paving	9/3/2018	9/28/2018	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8.75

Acres of Paving: 0

Residential Indoor: 335,138; Residential Outdoor: 111,713; Non-Residential Indoor: 82,500; Non-Residential Outdoor: 27,500 (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
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
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
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	54.00	14.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	11.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 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					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339		4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**		**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

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	0.0579	0.0606	0.6969	1.7600e-003	0.1479	1.1000e-003	0.1490	0.0392	1.0200e-003	0.0402		141.5350	141.5350	6.6800e-003		141.6752
Total	**0.0579**	**0.0606**	**0.6969**	**1.7600e-003**	**0.1479**	**1.1000e-003**	**0.1490**	**0.0392**	**1.0200e-003**	**0.0402**		**141.5350**	**141.5350**	**6.6800e-003**		**141.6752**

3.2 Site Preparation - 2017

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					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339	0.0000	4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**8.1298**	**2.7542**	**10.8840**	**4.4688**	**2.5339**	**7.0027**	**0.0000**	**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

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	0.0579	0.0606	0.6969	1.7600e-003	0.1479	1.1000e-003	0.1490	0.0392	1.0200e-003	0.0402		141.5350	141.5350	6.6800e-003		141.6752
Total	**0.0579**	**0.0606**	**0.6969**	**1.7600e-003**	**0.1479**	**1.1000e-003**	**0.1490**	**0.0392**	**1.0200e-003**	**0.0402**		**141.5350**	**141.5350**	**6.6800e-003**		**141.6752**

3.3 Grading - 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					
Fugitive Dust					6.0994	0.0000	6.0994	3.3186	0.0000	3.3186			0.0000			0.0000
Off-Road	3.4555	35.9825	25.3812	0.0297		2.0388	2.0388		1.8757	1.8757		3,043.6667	3,043.6667	0.9326		3,063.2507
Total	**3.4555**	**35.9825**	**25.3812**	**0.0297**	**6.0994**	**2.0388**	**8.1382**	**3.3186**	**1.8757**	**5.1943**		**3,043.6667**	**3,043.6667**	**0.9326**		**3,063.2507**

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	0.0483	0.0505	0.5807	1.4700e-003	0.1232	9.2000e-004	0.1241	0.0327	8.5000e-004	0.0335		117.9458	117.9458	5.5600e-003		118.0627
Total	**0.0483**	**0.0505**	**0.5807**	**1.4700e-003**	**0.1232**	**9.2000e-004**	**0.1241**	**0.0327**	**8.5000e-004**	**0.0335**		**117.9458**	**117.9458**	**5.5600e-003**		**118.0627**

3.3 Grading - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7447	0.0000	2.7447	1.4934	0.0000	1.4934			0.0000			0.0000
Off-Road	3.4555	35.9825	25.3812	0.0297		2.0388	2.0388		1.8757	1.8757	0.0000	3,043.6667	3,043.6667	0.9326		3,063.2507
Total	**3.4555**	**35.9825**	**25.3812**	**0.0297**	**2.7447**	**2.0388**	**4.7836**	**1.4934**	**1.8757**	**3.3691**	**0.0000**	**3,043.6667**	**3,043.6667**	**0.9326**		**3,063.2507**

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	0.0483	0.0505	0.5807	1.4700e-003	0.1232	9.2000e-004	0.1241	0.0327	8.5000e-004	0.0335		117.9458	117.9458	5.5600e-003		118.0627
Total	**0.0483**	**0.0505**	**0.5807**	**1.4700e-003**	**0.1232**	**9.2000e-004**	**0.1241**	**0.0327**	**8.5000e-004**	**0.0335**		**117.9458**	**117.9458**	**5.5600e-003**		**118.0627**

3.4 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**

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	0.1065	1.2135	1.3171	3.1200e-003	0.0921	0.0192	0.1113	0.0262	0.0177	0.0438		308.0835	308.0835	1.9300e-003		308.1241
Worker	0.1737	0.1817	2.0905	5.2800e-003	0.4436	3.3100e-003	0.4469	0.1177	3.0500e-003	0.1207		424.6050	424.6050	0.0200		425.0256
Total	**0.2801**	**1.3952**	**3.4076**	**8.4000e-003**	**0.5357**	**0.0225**	**0.5582**	**0.1438**	**0.0207**	**0.1646**		**732.6885**	**732.6885**	**0.0220**		**733.1497**

3.4 Building Construction - 2017

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**

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	0.1065	1.2135	1.3171	3.1200e-003	0.0921	0.0192	0.1113	0.0262	0.0177	0.0438		308.0835	308.0835	1.9300e-003		308.1241
Worker	0.1737	0.1817	2.0905	5.2800e-003	0.4436	3.3100e-003	0.4469	0.1177	3.0500e-003	0.1207		424.6050	424.6050	0.0200		425.0256
Total	**0.2801**	**1.3952**	**3.4076**	**8.4000e-003**	**0.5357**	**0.0225**	**0.5582**	**0.1438**	**0.0207**	**0.1646**		**732.6885**	**732.6885**	**0.0220**		**733.1497**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.9390	2,609.9390	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.9390**	**2,609.9390**	**0.6387**		**2,623.3517**

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	0.0999	1.1029	1.2569	3.1200e-003	0.0921	0.0179	0.1101	0.0262	0.0165	0.0427		303.0436	303.0436	1.9000e-003		303.0834
Worker	0.1586	0.1647	1.8998	5.2800e-003	0.4436	3.2400e-003	0.4468	0.1177	3.0000e-003	0.1207		408.7095	408.7095	0.0185		409.0989
Total	**0.2585**	**1.2677**	**3.1567**	**8.4000e-003**	**0.5357**	**0.0212**	**0.5569**	**0.1439**	**0.0195**	**0.1633**		**711.7530**	**711.7530**	**0.0204**		**712.1823**

3.4 Building Construction - 2018

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	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048	0.0000	2,609.9389	2,609.9389	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**	**0.0000**	**2,609.9389**	**2,609.9389**	**0.6387**		**2,623.3517**

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	0.0999	1.1029	1.2569	3.1200e-003	0.0921	0.0179	0.1101	0.0262	0.0165	0.0427		303.0436	303.0436	1.9000e-003		303.0834
Worker	0.1586	0.1647	1.8998	5.2800e-003	0.4436	3.2400e-003	0.4468	0.1177	3.0000e-003	0.1207		408.7095	408.7095	0.0185		409.0989
Total	**0.2585**	**1.2677**	**3.1567**	**8.4000e-003**	**0.5357**	**0.0212**	**0.5569**	**0.1439**	**0.0195**	**0.1633**		**711.7530**	**711.7530**	**0.0204**		**712.1823**

3.5 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	25.7169					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.0102
Total	**26.0155**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.0323	0.0336	0.3870	1.0800e-003	0.0904	6.6000e-004	0.0910	0.0240	6.1000e-004	0.0246		83.2556	83.2556	3.7800e-003		83.3350
Total	**0.0323**	**0.0336**	**0.3870**	**1.0800e-003**	**0.0904**	**6.6000e-004**	**0.0910**	**0.0240**	**6.1000e-004**	**0.0246**		**83.2556**	**83.2556**	**3.7800e-003**		**83.3350**

3.5 Architectural Coating - 2018

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	25.7169					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**26.0155**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.0323	0.0336	0.3870	1.0800e-003	0.0904	6.6000e-004	0.0910	0.0240	6.1000e-004	0.0246		83.2556	83.2556	3.7800e-003		83.3350
Total	**0.0323**	**0.0336**	**0.3870**	**1.0800e-003**	**0.0904**	**6.6000e-004**	**0.0910**	**0.0240**	**6.1000e-004**	**0.0246**		**83.2556**	**83.2556**	**3.7800e-003**		**83.3350**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6114	17.1628	14.4944	0.0223		0.9386	0.9386		0.8635	0.8635		2,245.2695	2,245.2695	0.6990		2,259.9481
Paving	0.1651					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7765**	**17.1628**	**14.4944**	**0.0223**		**0.9386**	**0.9386**		**0.8635**	**0.8635**		**2,245.2695**	**2,245.2695**	**0.6990**		**2,259.9481**

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	0.0441	0.0458	0.5277	1.4700e-003	0.1232	9.0000e-004	0.1241	0.0327	8.3000e-004	0.0335		113.5304	113.5304	5.1500e-003		113.6386
Total	**0.0441**	**0.0458**	**0.5277**	**1.4700e-003**	**0.1232**	**9.0000e-004**	**0.1241**	**0.0327**	**8.3000e-004**	**0.0335**		**113.5304**	**113.5304**	**5.1500e-003**		**113.6386**

3.6 Paving - 2018

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	1.6114	17.1628	14.4944	0.0223		0.9386	0.9386		0.8635	0.8635	0.0000	2,245.2695	2,245.2695	0.6990		2,259.9481
Paving	0.1651					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7765**	**17.1628**	**14.4944**	**0.0223**		**0.9386**	**0.9386**		**0.8635**	**0.8635**	**0.0000**	**2,245.2695**	**2,245.2695**	**0.6990**		**2,259.9481**

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	0.0441	0.0458	0.5277	1.4700e-003	0.1232	9.0000e-004	0.1241	0.0327	8.3000e-004	0.0335		113.5304	113.5304	5.1500e-003		113.6386
Total	**0.0441**	**0.0458**	**0.5277**	**1.4700e-003**	**0.1232**	**9.0000e-004**	**0.1241**	**0.0327**	**8.3000e-004**	**0.0335**		**113.5304**	**113.5304**	**5.1500e-003**		**113.6386**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.4367	3.4474	14.3091	0.0392	2.8246	0.0454	2.8700	0.7530	0.0418	0.7948		3,214.5180	3,214.5180	0.1192		3,217.0214
Unmitigated	1.4367	3.4474	14.3091	0.0392	2.8246	0.0454	2.8700	0.7530	0.0418	0.7948		3,214.5180	3,214.5180	0.1192		3,217.0214

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	171.36	128.88	109.26	432,200	432,200
Condo/Townhouse	161.84	121.72	103.19	408,189	408,189
Single Family Housing	142.80	151.20	131.55	393,442	393,442
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	476.00	401.80	344.00	1,233,830	1,233,830

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	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Condo/Townhouse	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Single Family Housing	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.475011	0.063009	0.180574	0.158011	0.069740	0.010288	0.013503	0.017378	0.000770	0.000675	0.005608	0.000318	0.005113

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive 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	0.0233	0.1990	0.0847	1.2700e-003		0.0161	0.0161		0.0161	0.0161		253.9863	253.9863	4.8700e-003	4.6600e-003	255.5321
NaturalGas Unmitigated	0.0292	0.2492	0.1061	1.5900e-003		0.0202	0.0202		0.0202	0.0202		318.1736	318.1736	6.1000e-003	5.8300e-003	320.1099

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					
Other Asphalt Surfaces	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	1186.99	0.0128	0.1094	0.0466	7.0000e-004		8.8400e-003	8.8400e-003		8.8400e-003	8.8400e-003		139.6463	139.6463	2.6800e-003	2.5600e-003	140.4961
Condo/Townhouse	737.063	7.9500e-003	0.0679	0.0289	4.3000e-004		5.4900e-003	5.4900e-003		5.4900e-003	5.4900e-003		86.7133	86.7133	1.6600e-003	1.5900e-003	87.2410
Condo/Townhouse	780.419	8.4200e-003	0.0719	0.0306	4.6000e-004		5.8100e-003	5.8100e-003		5.8100e-003	5.8100e-003		91.8140	91.8140	1.7600e-003	1.6800e-003	92.3728
Total		**0.0292**	**0.2492**	**0.1061**	**1.5900e-003**		**0.0201**	**0.0201**		**0.0201**	**0.0201**		**318.1736**	**318.1736**	**6.1000e-003**	**5.8300e-003**	**320.1099**

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					
Other Asphalt Surfaces	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	0.950029	0.0103	0.0876	0.0373	5.6000e-004		7.0800e-003	7.0800e-003		7.0800e-003	7.0800e-003		111.7681	111.7681	2.1400e-003	2.0500e-003	112.4483
Condo/Townhouse	0.587158	6.3300e-003	0.0541	0.0230	3.5000e-004		4.3700e-003	4.3700e-003		4.3700e-003	4.3700e-003		69.0774	69.0774	1.3200e-003	1.2700e-003	69.4978
Condo/Townhouse	0.621697	6.7000e-003	0.0573	0.0244	3.7000e-004		4.6300e-003	4.6300e-003		4.6300e-003	4.6300e-003		73.1408	73.1408	1.4000e-003	1.3400e-003	73.5859
Total		**0.0233**	**0.1990**	**0.0847**	**1.2800e-003**		**0.0161**	**0.0161**		**0.0161**	**0.0161**		**253.9863**	**253.9863**	**4.8600e-003**	**4.6600e-003**	**255.5320**

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	5.6576	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227	0.0000	7.4397	7.4397	7.3900e-003	0.0000	7.5949
Unmitigated	5.6576	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227	0.0000	7.4397	7.4397	7.3900e-003	0.0000	7.5949

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.8103					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.7187					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	0.1286	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227		7.4397	7.4397	7.3900e-003		7.5949
Total	**5.6576**	**0.0483**	**4.1599**	**2.2000e-004**		**0.0227**	**0.0227**		**0.0227**	**0.0227**	**0.0000**	**7.4397**	**7.4397**	**7.3900e-003**	**0.0000**	**7.5949**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.8103					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.7187					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	0.1286	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227		7.4397	7.4397	7.3900e-003		7.5949
Total	**5.6576**	**0.0483**	**4.1599**	**2.2000e-004**		**0.0227**	**0.0227**		**0.0227**	**0.0227**	**0.0000**	**7.4397**	**7.4397**	**7.3900e-003**	**0.0000**	**7.5949**

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

Avalon Homes

Ventura County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	15.00	Dwelling Unit	2.62	67,500.00	46
Condo/Townhouse	18.00	Dwelling Unit	1.73	50,400.00	55
Condo/Townhouse	17.00	Dwelling Unit	1.66	47,600.00	52
Other Asphalt Surfaces	55.00	1000sqft	1.26	55,000.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	31
Climate Zone	8			**Operational Year**	2018
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	630.89	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Site plan: Lots 1-15 (2.62 acre), Lot 16 (1.73 acre), Lot 17 (1.66 acre)

Construction Phase - Construction schedule from Project Description

Grading - Project description

Vehicle Trips - Traffic study

Construction Off-road Equipment Mitigation -

Energy Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	20.00	115.00
tblConstructionPhase	NumDays	230.00	195.00
tblConstructionPhase	NumDays	20.00	120.00
tblConstructionPhase	PhaseEndDate	2/8/2019	8/24/2018
tblConstructionPhase	PhaseEndDate	9/21/2018	9/28/2018
tblConstructionPhase	PhaseStartDate	9/1/2018	3/19/2018
tblConstructionPhase	PhaseStartDate	12/2/2017	12/4/2017
tblConstructionPhase	PhaseStartDate	6/17/2017	6/19/2017
tblConstructionPhase	PhaseStartDate	8/25/2018	9/3/2018
tblGrading	AcresOfGrading	60.00	8.75
tblLandUse	LandUseSquareFeet	27,000.00	67,500.00
tblLandUse	LandUseSquareFeet	18,000.00	50,400.00
tblLandUse	LandUseSquareFeet	17,000.00	47,600.00
tblLandUse	LotAcreage	4.87	2.62
tblLandUse	LotAcreage	1.13	1.73
tblLandUse	LotAcreage	1.06	1.66
tblProjectCharacteristics	OperationalYear	2014	2018
tblVehicleTrips	WD_TR	6.59	9.52
tblVehicleTrips	WD_TR	9.57	9.52

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					
2017	4.9004	51.8244	40.0966	0.0408	18.2141	2.7553	20.9694	9.9699	2.5349	12.5048	0.0000	4,137.8242	4,137.8242	1.2332	0.0000	4,163.7217
2018	29.0059	26.6330	23.4560	0.0389	0.6261	1.6669	2.2930	0.1678	1.5756	1.7435	0.0000	3,660.2664	3,660.2664	0.7041	0.0000	3,675.0532
Total	**33.9063**	**78.4574**	**63.5525**	**0.0797**	**18.8402**	**4.4222**	**23.2624**	**10.1377**	**4.1105**	**14.2483**	**0.0000**	**7,798.0906**	**7,798.0906**	**1.9373**	**0.0000**	**7,838.7749**

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					
2017	4.9004	51.8244	40.0966	0.0408	8.2777	2.7553	11.0330	4.5080	2.5349	7.0429	0.0000	4,137.8242	4,137.8242	1.2332	0.0000	4,163.7217
2018	29.0059	26.6330	23.4560	0.0389	0.6261	1.6669	2.2930	0.1678	1.5756	1.7435	0.0000	3,660.2664	3,660.2664	0.7041	0.0000	3,675.0532
Total	**33.9063**	**78.4574**	**63.5525**	**0.0797**	**8.9038**	**4.4222**	**13.3260**	**4.6759**	**4.1105**	**8.7864**	**0.0000**	**7,798.0906**	**7,798.0906**	**1.9373**	**0.0000**	**7,838.7749**

	ROG	NOx	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**	**52.74**	**0.00**	**42.71**	**53.88**	**0.00**	**38.33**	**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	5.6576	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227	0.0000	7.4397	7.4397	7.3900e-003	0.0000	7.5949
Energy	0.0292	0.2492	0.1061	1.5900e-003		0.0202	0.0202		0.0202	0.0202		318.1736	318.1736	6.1000e-003	5.8300e-003	320.1099
Mobile	1.5435	3.7273	15.5335	0.0377	2.8246	0.0456	2.8702	0.7530	0.0420	0.7950		3,093.3135	3,093.3135	0.1193		3,095.8186
Total	**7.2302**	**4.0248**	**19.7995**	**0.0395**	**2.8246**	**0.0885**	**2.9131**	**0.7530**	**0.0849**	**0.8378**	**0.0000**	**3,418.9267**	**3,418.9267**	**0.1328**	**5.8300e-003**	**3,423.5235**

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	5.6576	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227	0.0000	7.4397	7.4397	7.3900e-003	0.0000	7.5949
Energy	0.0233	0.1990	0.0847	1.2700e-003		0.0161	0.0161		0.0161	0.0161		253.9863	253.9863	4.8700e-003	4.6600e-003	255.5321
Mobile	1.5435	3.7273	15.5335	0.0377	2.8246	0.0456	2.8702	0.7530	0.0420	0.7950		3,093.3135	3,093.3135	0.1193		3,095.8186
Total	**7.2243**	**3.9745**	**19.7781**	**0.0391**	**2.8246**	**0.0844**	**2.9090**	**0.7530**	**0.0808**	**0.8338**	**0.0000**	**3,354.7395**	**3,354.7395**	**0.1316**	**4.6600e-003**	**3,358.9456**

	ROG	NOx	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	**0.08**	**1.25**	**0.11**	**0.81**	**0.00**	**4.59**	**0.14**	**0.00**	**4.78**	**0.48**	**0.00**	**1.88**	**1.88**	**0.93**	**20.07**	**1.89**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	6/5/2017	6/16/2017	5	10	
2	Grading	Grading	6/19/2017	12/1/2017	5	120	
3	Building Construction	Building Construction	12/4/2017	8/31/2018	5	195	
4	Architectural Coating	Architectural Coating	3/19/2018	8/24/2018	5	115	
5	Paving	Paving	9/3/2018	9/28/2018	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 8.75

Acres of Paving: 0

Residential Indoor: 335,138; Residential Outdoor: 111,713; Non-Residential Indoor: 82,500; Non-Residential Outdoor: 27,500 (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
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
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
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	54.00	14.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	11.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Clean Paved Roads

3.2 Site Preparation - 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					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339		4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**18.0663**	**2.7542**	**20.8205**	**9.9307**	**2.5339**	**12.4646**		**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

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	0.0622	0.0709	0.6995	1.6800e-003	0.1479	1.1000e-003	0.1490	0.0392	1.0200e-003	0.0402		134.7383	134.7383	6.6800e-003		134.8785
Total	**0.0622**	**0.0709**	**0.6995**	**1.6800e-003**	**0.1479**	**1.1000e-003**	**0.1490**	**0.0392**	**1.0200e-003**	**0.0402**		**134.7383**	**134.7383**	**6.6800e-003**		**134.8785**

3.2 Site Preparation - 2017

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					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.8382	51.7535	39.3970	0.0391		2.7542	2.7542		2.5339	2.5339	0.0000	4,003.0859	4,003.0859	1.2265		4,028.8432
Total	**4.8382**	**51.7535**	**39.3970**	**0.0391**	**8.1298**	**2.7542**	**10.8840**	**4.4688**	**2.5339**	**7.0027**	**0.0000**	**4,003.0859**	**4,003.0859**	**1.2265**		**4,028.8432**

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	0.0622	0.0709	0.6995	1.6800e-003	0.1479	1.1000e-003	0.1490	0.0392	1.0200e-003	0.0402		134.7383	134.7383	6.6800e-003		134.8785
Total	**0.0622**	**0.0709**	**0.6995**	**1.6800e-003**	**0.1479**	**1.1000e-003**	**0.1490**	**0.0392**	**1.0200e-003**	**0.0402**		**134.7383**	**134.7383**	**6.6800e-003**		**134.8785**

3.3 Grading - 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					
Fugitive Dust					6.0994	0.0000	6.0994	3.3186	0.0000	3.3186			0.0000			0.0000
Off-Road	3.4555	35.9825	25.3812	0.0297		2.0388	2.0388		1.8757	1.8757		3,043.6667	3,043.6667	0.9326		3,063.2507
Total	**3.4555**	**35.9825**	**25.3812**	**0.0297**	**6.0994**	**2.0388**	**8.1382**	**3.3186**	**1.8757**	**5.1943**		**3,043.6667**	**3,043.6667**	**0.9326**		**3,063.2507**

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	0.0518	0.0591	0.5829	1.4000e-003	0.1232	9.2000e-004	0.1241	0.0327	8.5000e-004	0.0335		112.2819	112.2819	5.5600e-003		112.3988
Total	**0.0518**	**0.0591**	**0.5829**	**1.4000e-003**	**0.1232**	**9.2000e-004**	**0.1241**	**0.0327**	**8.5000e-004**	**0.0335**		**112.2819**	**112.2819**	**5.5600e-003**		**112.3988**

3.3 Grading - 2017

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					2.7447	0.0000	2.7447	1.4934	0.0000	1.4934			0.0000			0.0000
Off-Road	3.4555	35.9825	25.3812	0.0297		2.0388	2.0388		1.8757	1.8757	0.0000	3,043.6667	3,043.6667	0.9326		3,063.2507
Total	**3.4555**	**35.9825**	**25.3812**	**0.0297**	**2.7447**	**2.0388**	**4.7836**	**1.4934**	**1.8757**	**3.3691**	**0.0000**	**3,043.6667**	**3,043.6667**	**0.9326**		**3,063.2507**

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	0.0518	0.0591	0.5829	1.4000e-003	0.1232	9.2000e-004	0.1241	0.0327	8.5000e-004	0.0335		112.2819	112.2819	5.5600e-003		112.3988
Total	**0.0518**	**0.0591**	**0.5829**	**1.4000e-003**	**0.1232**	**9.2000e-004**	**0.1241**	**0.0327**	**8.5000e-004**	**0.0335**		**112.2819**	**112.2819**	**5.5600e-003**		**112.3988**

3.4 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**

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	0.1258	1.2485	1.8560	3.1000e-003	0.0921	0.0194	0.1116	0.0262	0.0179	0.0441		305.5644	305.5644	2.0000e-003		305.6063
Worker	0.1866	0.2128	2.0986	5.0300e-003	0.4436	3.3100e-003	0.4469	0.1177	3.0500e-003	0.1207		404.2150	404.2150	0.0200		404.6356
Total	**0.3124**	**1.4612**	**3.9546**	**8.1300e-003**	**0.5357**	**0.0227**	**0.5585**	**0.1438**	**0.0209**	**0.1648**		**709.7794**	**709.7794**	**0.0220**		**710.2419**

3.4 Building Construction - 2017

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**

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	0.1258	1.2485	1.8560	3.1000e-003	0.0921	0.0194	0.1116	0.0262	0.0179	0.0441		305.5644	305.5644	2.0000e-003		305.6063
Worker	0.1866	0.2128	2.0986	5.0300e-003	0.4436	3.3100e-003	0.4469	0.1177	3.0500e-003	0.1207		404.2150	404.2150	0.0200		404.6356
Total	**0.3124**	**1.4612**	**3.9546**	**8.1300e-003**	**0.5357**	**0.0227**	**0.5585**	**0.1438**	**0.0209**	**0.1648**		**709.7794**	**709.7794**	**0.0220**		**710.2419**

3.4 Building Construction - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048		2,609.9390	2,609.9390	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**		**2,609.9390**	**2,609.9390**	**0.6387**		**2,623.3517**

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	0.1174	1.1341	1.7864	3.1000e-003	0.0921	0.0181	0.1103	0.0262	0.0167	0.0429		300.5610	300.5610	1.9700e-003		300.6023
Worker	0.1698	0.1930	1.8964	5.0300e-003	0.4436	3.2400e-003	0.4468	0.1177	3.0000e-003	0.1207		389.0641	389.0641	0.0185		389.4536
Total	**0.2871**	**1.3271**	**3.6828**	**8.1300e-003**	**0.5357**	**0.0214**	**0.5571**	**0.1439**	**0.0197**	**0.1635**		**689.6251**	**689.6251**	**0.0205**		**690.0558**

3.4 Building Construction - 2018

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	2.6687	23.2608	17.5327	0.0268		1.4943	1.4943		1.4048	1.4048	0.0000	2,609.9389	2,609.9389	0.6387		2,623.3517
Total	**2.6687**	**23.2608**	**17.5327**	**0.0268**		**1.4943**	**1.4943**		**1.4048**	**1.4048**	**0.0000**	**2,609.9389**	**2,609.9389**	**0.6387**		**2,623.3517**

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	0.1174	1.1341	1.7864	3.1000e-003	0.0921	0.0181	0.1103	0.0262	0.0167	0.0429		300.5610	300.5610	1.9700e-003		300.6023
Worker	0.1698	0.1930	1.8964	5.0300e-003	0.4436	3.2400e-003	0.4468	0.1177	3.0000e-003	0.1207		389.0641	389.0641	0.0185		389.4536
Total	**0.2871**	**1.3271**	**3.6828**	**8.1300e-003**	**0.5357**	**0.0214**	**0.5571**	**0.1439**	**0.0197**	**0.1635**		**689.6251**	**689.6251**	**0.0205**		**690.0558**

3.5 Architectural Coating - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	25.7169					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506		281.4485	281.4485	0.0267		282.0102
Total	**26.0155**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**		**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.0346	0.0393	0.3863	1.0200e-003	0.0904	6.6000e-004	0.0910	0.0240	6.1000e-004	0.0246		79.2538	79.2538	3.7800e-003		79.3331
Total	**0.0346**	**0.0393**	**0.3863**	**1.0200e-003**	**0.0904**	**6.6000e-004**	**0.0910**	**0.0240**	**6.1000e-004**	**0.0246**		**79.2538**	**79.2538**	**3.7800e-003**		**79.3331**

3.5 Architectural Coating - 2018

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	25.7169					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2986	2.0058	1.8542	2.9700e-003		0.1506	0.1506		0.1506	0.1506	0.0000	281.4485	281.4485	0.0267		282.0102
Total	**26.0155**	**2.0058**	**1.8542**	**2.9700e-003**		**0.1506**	**0.1506**		**0.1506**	**0.1506**	**0.0000**	**281.4485**	**281.4485**	**0.0267**		**282.0102**

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	0.0346	0.0393	0.3863	1.0200e-003	0.0904	6.6000e-004	0.0910	0.0240	6.1000e-004	0.0246		79.2538	79.2538	3.7800e-003		79.3331
Total	**0.0346**	**0.0393**	**0.3863**	**1.0200e-003**	**0.0904**	**6.6000e-004**	**0.0910**	**0.0240**	**6.1000e-004**	**0.0246**		**79.2538**	**79.2538**	**3.7800e-003**		**79.3331**

3.6 Paving - 2018

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.6114	17.1628	14.4944	0.0223		0.9386	0.9386		0.8635	0.8635		2,245.2695	2,245.2695	0.6990		2,259.9481
Paving	0.1651					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7765**	**17.1628**	**14.4944**	**0.0223**		**0.9386**	**0.9386**		**0.8635**	**0.8635**		**2,245.2695**	**2,245.2695**	**0.6990**		**2,259.9481**

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	0.0472	0.0536	0.5268	1.4000e-003	0.1232	9.0000e-004	0.1241	0.0327	8.3000e-004	0.0335		108.0734	108.0734	5.1500e-003		108.1816
Total	**0.0472**	**0.0536**	**0.5268**	**1.4000e-003**	**0.1232**	**9.0000e-004**	**0.1241**	**0.0327**	**8.3000e-004**	**0.0335**		**108.0734**	**108.0734**	**5.1500e-003**		**108.1816**

3.6 Paving - 2018

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	1.6114	17.1628	14.4944	0.0223		0.9386	0.9386		0.8635	0.8635	0.0000	2,245.2695	2,245.2695	0.6990		2,259.9481
Paving	0.1651					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.7765**	**17.1628**	**14.4944**	**0.0223**		**0.9386**	**0.9386**		**0.8635**	**0.8635**	**0.0000**	**2,245.2695**	**2,245.2695**	**0.6990**		**2,259.9481**

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	0.0472	0.0536	0.5268	1.4000e-003	0.1232	9.0000e-004	0.1241	0.0327	8.3000e-004	0.0335		108.0734	108.0734	5.1500e-003		108.1816
Total	**0.0472**	**0.0536**	**0.5268**	**1.4000e-003**	**0.1232**	**9.0000e-004**	**0.1241**	**0.0327**	**8.3000e-004**	**0.0335**		**108.0734**	**108.0734**	**5.1500e-003**		**108.1816**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.5435	3.7273	15.5335	0.0377	2.8246	0.0456	2.8702	0.7530	0.0420	0.7950		3,093.3135	3,093.3135	0.1193		3,095.8186
Unmitigated	1.5435	3.7273	15.5335	0.0377	2.8246	0.0456	2.8702	0.7530	0.0420	0.7950		3,093.3135	3,093.3135	0.1193		3,095.8186

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Condo/Townhouse	171.36	128.88	109.26	432,200	432,200
Condo/Townhouse	161.84	121.72	103.19	408,189	408,189
Single Family Housing	142.80	151.20	131.55	393,442	393,442
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	476.00	401.80	344.00	1,233,830	1,233,830

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	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Condo/Townhouse	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Single Family Housing	10.80	7.30	7.50	32.90	18.00	49.10	86	11	3
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.475011	0.063009	0.180574	0.158011	0.069740	0.010288	0.013503	0.017378	0.000770	0.000675	0.005608	0.000318	0.005113

5.0 Energy Detail

4.4 Fleet Mix

Historical Energy Use: N

5.1 Mitigation Measures Energy

Exceed Title 24

	ROG	NOx	CO	SO2	Fugitive 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	0.0233	0.1990	0.0847	1.2700e-003		0.0161	0.0161		0.0161	0.0161		253.9863	253.9863	4.8700e-003	4.6600e-003	255.5321
NaturalGas Unmitigated	0.0292	0.2492	0.1061	1.5900e-003		0.0202	0.0202		0.0202	0.0202		318.1736	318.1736	6.1000e-003	5.8300e-003	320.1099

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					
Other Asphalt Surfaces	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	1186.99	0.0128	0.1094	0.0466	7.0000e-004		8.8400e-003	8.8400e-003		8.8400e-003	8.8400e-003		139.6463	139.6463	2.6800e-003	2.5600e-003	140.4961
Condo/Townhouse	737.063	7.9500e-003	0.0679	0.0289	4.3000e-004		5.4900e-003	5.4900e-003		5.4900e-003	5.4900e-003		86.7133	86.7133	1.6600e-003	1.5900e-003	87.2410
Condo/Townhouse	780.419	8.4200e-003	0.0719	0.0306	4.6000e-004		5.8100e-003	5.8100e-003		5.8100e-003	5.8100e-003		91.8140	91.8140	1.7600e-003	1.6800e-003	92.3728
Total		**0.0292**	**0.2492**	**0.1061**	**1.5900e-003**		**0.0201**	**0.0201**		**0.0201**	**0.0201**		**318.1736**	**318.1736**	**6.1000e-003**	**5.8300e-003**	**320.1099**

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					
Other Asphalt Surfaces	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	0.950029	0.0103	0.0876	0.0373	5.6000e-004		7.0800e-003	7.0800e-003		7.0800e-003	7.0800e-003		111.7681	111.7681	2.1400e-003	2.0500e-003	112.4483
Condo/Townhouse	0.587158	6.3300e-003	0.0541	0.0230	3.5000e-004		4.3700e-003	4.3700e-003		4.3700e-003	4.3700e-003		69.0774	69.0774	1.3200e-003	1.2700e-003	69.4978
Condo/Townhouse	0.621697	6.7000e-003	0.0573	0.0244	3.7000e-004		4.6300e-003	4.6300e-003		4.6300e-003	4.6300e-003		73.1408	73.1408	1.4000e-003	1.3400e-003	73.5859
Total		**0.0233**	**0.1990**	**0.0847**	**1.2800e-003**		**0.0161**	**0.0161**		**0.0161**	**0.0161**		**253.9863**	**253.9863**	**4.8600e-003**	**4.6600e-003**	**255.5320**

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	5.6576	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227	0.0000	7.4397	7.4397	7.3900e-003	0.0000	7.5949
Unmitigated	5.6576	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227	0.0000	7.4397	7.4397	7.3900e-003	0.0000	7.5949

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.8103					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.7187					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	0.1286	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227		7.4397	7.4397	7.3900e-003		7.5949
Total	**5.6576**	**0.0483**	**4.1599**	**2.2000e-004**		**0.0227**	**0.0227**		**0.0227**	**0.0227**	**0.0000**	**7.4397**	**7.4397**	**7.3900e-003**	**0.0000**	**7.5949**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.8103					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.7187					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	0.1286	0.0483	4.1599	2.2000e-004		0.0227	0.0227		0.0227	0.0227		7.4397	7.4397	7.3900e-003		7.5949
Total	**5.6576**	**0.0483**	**4.1599**	**2.2000e-004**		**0.0227**	**0.0227**		**0.0227**	**0.0227**	**0.0000**	**7.4397**	**7.4397**	**7.3900e-003**	**0.0000**	**7.5949**

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 Avalon Homes Residential Project

From CalEEMod Annual Trip Summary Information Output:

Annual VMT: 1,233,830

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:	0.0869	metric tons N2O	**26.94**	metric tons CO2e
		Project Total:	***26.94 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 CalEEMod results

Appendix C

Cultural Resource Record Search Results

CHRIS Information Center Records Search Data Sheet

Project Name: Avalon Homes

Project Number: 15-02165 Date: 7/14/16

Information Center: SCCIC

Search Radius: Half Mile: X One Mile: _____ Other: _____

USGS Quadrangle: Oxnard

Public Land Survey System (PLSS): Township: 1N Range: 23W, 22W Section: 1, 12, 6, 7

County: Ventura

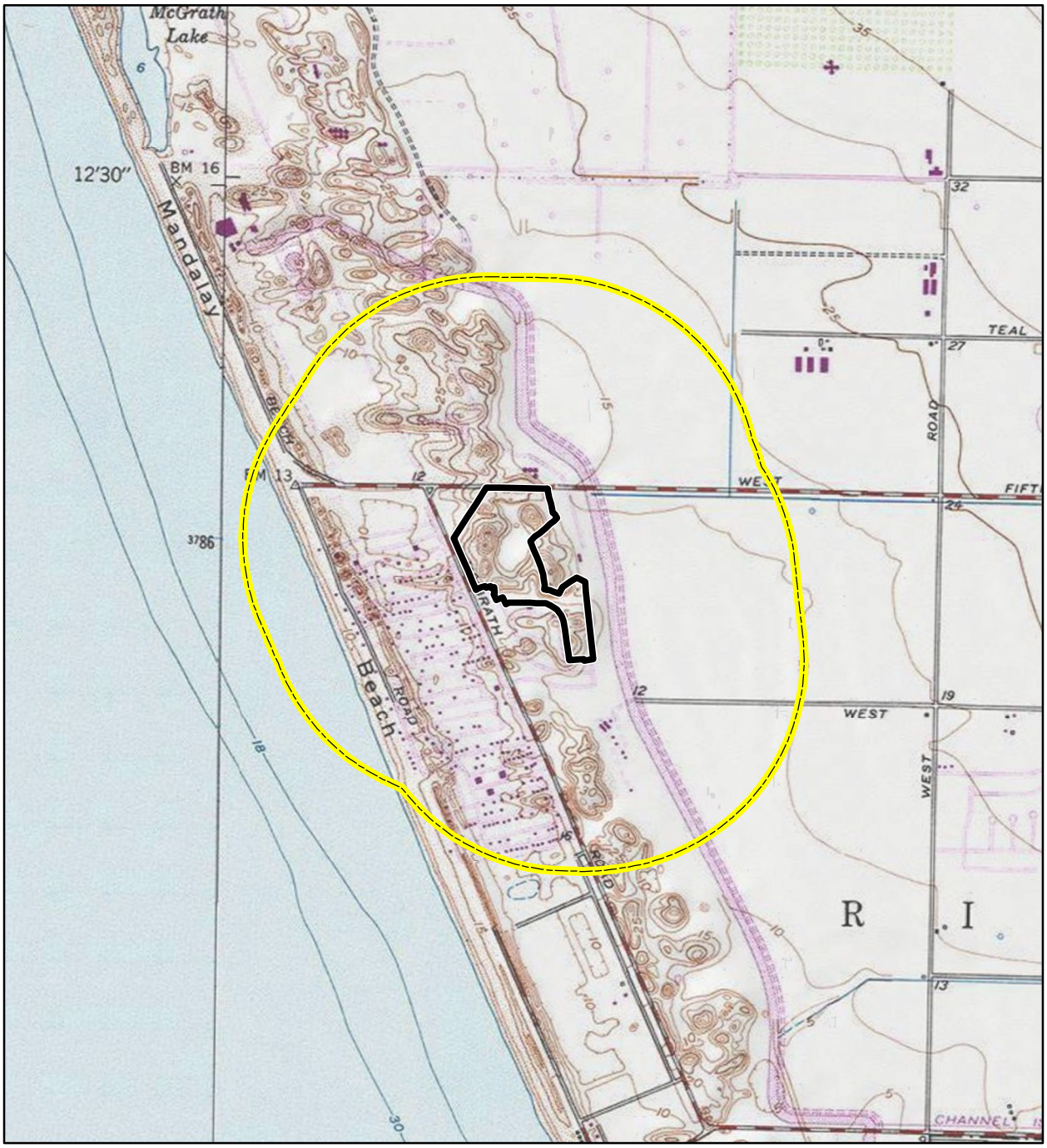
Previously Recorded Sites: 1234, 1667

Previous Studies: 398, 1660, 2463, 2432, 614, 1192, 236, 2014, 9, 2809, 385, 2978, 621

National Register of Historic Places:	Copies:	Y	N
California Register of Historical Resources:	Copies:	Y	N
California Points of Historical Interest:	Copies:	Y	N
California Historical Landmarks List:	Copies:	Y	N
Archaeological Determinations of Eligibility:	Copies:	Y	N
California Historical Resources Inventory:	Copies:	Y	N

Historic Maps: Hueneme, 1904

Notes: _____



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Oxnard Quadrangle. T01N, R23W, S01,12 & T01N, R22W, S06,07. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.

Project_Boundary
Half-Mile Buffer

N

0 1,000 2,000 Feet

0 250 500 Meters

1:24,000

Records Search Map

Resource List

Avalon Homes

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-56-000667	CA-VEN-000667	Resource Name - Oxnard 1	Site	Prehistoric	AP09 (Burials); AP11 (Hearths/pits); AP15 (Habitation debris)	1979 (Stephen Horne, Steven Craig); 1997 (DS Whitley, W&S Consultants)	VN-00236, VN-01660, VN-01705, VN-02013, VN-02014, VN-02809, VN-02901
P-56-001234	CA-VEN-001234H	Resource Name - Oxnard 14	Site	Protohistoric	AP16 (Other) - Juncus Collection Site	1979 (Stephen Horne, Steven Craig)	VN-00236, VN-02809, VN-02901

Report List

Avalon Homes

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
VN-00009		1973	Browne, Robert O.	Proposed Widening of Harbor Boulevard From West Fifth Street to Channel Island Boulevard.		
VN-00236		1980	Horne, Stephen	Final Report: Onshore Cultural Resources Assessment, Union Oil Company Platform Gina and Platform Gilda Project Federal Lease Ocs P-0202 and P-0216, Offshore Southern California	Dames & Moore/Stephen Horne	56-000553, 56-000662, 56-000663, 56-000664, 56-000665, 56-000666, 56-000667, 56-001234, 56-120002, 56-120003
VN-00385		1981	Wlodarski, Robert J.	Archaeological Monitoring Report: Union Oil Company Platform Gina and Platform Gilda Project, Ventura County, Ca	Historical, Environmental, Archaeological, Research, Team	
VN-00398		1981	Wlodarski, Robert J.	Archaeological Monitoring Report for the Proposed Location of an 8 Montalvo Pipeline, Along Harbor Boulevard, Ventura County, California	Historical, Environmental, Archaeological, Research, Team	
VN-00614		1982	Lopez, Robert	An Archaeological Reconnaissance of the Sixty-two Acres Involved in the Proposed Oxnard Beach Project, Oxnard	Robert Lopez, Archaeological Consultant	
VN-00621		1986	Lopez, Robert	An Archaeological Reconnaissance of Portions of the Area Proposed for Mandalay State Beach Regional Recreation Park, Oxnard, Ventura County	Robert Lopez, Archaeological Consultant	
VN-01192		1992	Wlodarski, Robert J.	A Phase I Archaeological Study for a 58 Acre Parcel (tract No. 4799) Mandalay Bay Project, Ventura County, California	Historical, Environmental, Archaeological, Research, Team	
VN-01660		1997	Simon, Joseph M.	Phase I Archaeological Survey and Cultural Resources Assesment for the North Shore at Mandalay Bay Study Area, Ventura County, California	W & S Consultants	56-000667
VN-02014		1998	Whitley, David S. and Joseph Simms	Phase Ii Test Excavation and Determining of Significance of a Portion of CA-VEN-667, Oxnard, Ventura County, California	W&S Consultants	56-000667
VN-02432		2005	Whitley, David S.	Phase I Archaeological Survey of the APN 191-0-0103-195 Study Area, Oxnard, Ventura County, California	W & S Consultants	
VN-02463		2004	Bartoy, Kevin M.	Cultural Resource Assessment, Cingular Wireless Facility No. Vy-527-02, City of Oxnard, Ventura County, California	Pacific Legacy, Inc.	

Report List

Avalon Homes

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
VN-02809		2010	Wlodarski, Robert	A Phase 1 Archaeological Study Lots 1-12, of Map 5063 Located Northeast of the Intersection of Reef Way and Harbor Boulevard City of Oxnard, County of Ventura, California	H.E.A.R.T	56-000667, 56-001234
VN-02978		2004	Sharpe, Jim and Durio, Lori	Groundwater Recovery Enhancement and Treatment (GREAT) Program, Cultural Resources Inventory Report	CH2MHill	56-000506, 56-000662, 56-000664, 56-000665, 56-000666, 56-000726, 56-000789, 56-000918, 56-100060, 56-152779, 56-152780, 56-152781, 56-152782, 56-152783, 56-152784

Appendix D

Cultural Resource Correspondence

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003
805 644 4455
FAX 644 4240

info@rinconconsultants.com
www.rinconconsultants.com

July 11, 2016

Native American Heritage Commission
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691

RE: Sacred Lands File Search and Native American Contact List Request for the Avalon Homes Project, City of Oxnard, Ventura County, California

Dear NAHC,

Rincon Consultants, Inc. (Rincon) has been retained to prepare a cultural resources study for the Avalon Homes Project (project) in the City of Oxnard, Ventura County, California. Rincon understands the project to propose the construction of 12 single family residential units and roughly 36 duplex units on an approximately 8.45-acre site located southeast of the Harbor Boulevard/Fifth Street intersection. The project involves the dedication of an adjacent 29.88-acre open space parcel in exchange for development on the project site due to the presence of environmentally sensitive habitat area. This project is subject to the California Environmental Quality Act (CEQA).

As part of this effort, Rincon will contact any Native American tribal organizations or individuals who may have knowledge of cultural resources within the project area. The project site is depicted on Township 1N, Range 23W, Sections 1 and 12, and Township 1N, Range 22W, Sections 6 and 7 of the U.S. Geological Survey *Oxnard, CA* 7.5-minute topographic quadrangle. The Records Search Map (attached) includes a 0.5-mile buffer.

Thank you for your assistance with Rincon's efforts to address any possible Native American concerns that may arise from the proposed project. If you have any questions or need additional information, please contact me by phone at 805 644 4455, or by email at mszromba@rinconconsultants.com.

Sincerely,

Meagan Szromba, M.A.
Cultural Resources Specialist

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003
805 644 4455
FAX 644 4240

info@rinconconsultants.com
www.rinconconsultants.com

Sacred Lands File & Native American Contacts List Request

Native American Heritage Commission
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is required for a Sacred Lands File Search

Project Title: Avalon Homes Project

County: Ventura

USGS Quadrangle Name: Oxnard

Township: 1N **Range:** 23W **Sections:** 1, 12

Township: 1N **Range:** 22W **Sections:** 6, 7

Contact Person: Meagan Szromba

Company/Firm/Agency: Rincon Consultants, Inc.

Street Address: 180 N Ashwood Ave

City: Ventura **Zip**: 93003

Phone: (805) 644 4455 **Fax**: (805) 644 4240

Email: mszromba@rinconconsultants.com

Project Description: The project proposes the construction of 12 single family residential units and roughly 36 duplex units on an approximately 8.45-acre site located southeast of the Harbor Boulevard/Fifth Street intersection. The project involves the dedication of an adjacent 29.88-acre open space parcel in exchange for development on the project site due to the presence of environmentally sensitive habitat area. This project is subject to the California Environmental Quality Act (CEQA).

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710
Fax (916) 373-5471

July 13, 2016

Meagan Szromba, M.A., Cultural Resource Specialist
Rincon Consultants, Inc.

Sent by Email: mszromba@rinconconsultants.com

RE: Proposed Avalon Homes Project, City of Oxnard; Oxnard USGS Quadrangle, Ventura County, California

Dear Ms. Szromba:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* was completed for the area of potential project effect (APE) referenced above with negative results. Please note that the absence of specific site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE.

I suggest you contact all of the listed Tribes. If they cannot supply information, they might recommend others with specific knowledge. The list should provide a starting place to locate areas of potential adverse impact within the APE. By contacting all those on the list, your organization will be better able to respond to claims of failure to consult. If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact via email: gayle.totton@nahc.ca.gov.

Sincerely,

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst

Native American Heritage Commission
Native American Contact List
Ventura County
7/12/2016

Barbareno/Ventureno Band of Mission Indians
Julie Lynn Tumamait-Stennslie, Chairperson
365 North Poli Ave — Chumash
Ojai, CA, 93023
Phone: (805)646-6214
jtumamait@hotmail.com

Coastal Band of the Chumash Nation
Mia Lopez, Chairperson
Phone: (805)324-0135 — Chumash
cbcn.nahc.sb@gmail.com

Northern Chumash Tribal Council
Fred Collins, Spokesperson
67 South Street — Chumash
San Luis Obispo, CA, 93401
fcollins@northernchumash.org

Santa Ynez Band of Mission Indians
Vincent Armenta, Chairperson
P.O. Box 517 — Chumash
Santa Ynez, CA, 93460
Phone: (805)688-7997
Fax: (805)686-9578
varmenta@santaynezchumash.org

yak tityu tityu - Northern Chumash Tribe
Mona Olivas Tucker, Chairperson
660 Camino Del Rey — Chumash
Arroyo Grande, CA, 93420
Phone: (805)489-1052
olivas.mona@gmail.com

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Avalon Homes Project, Ventura County.

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

805 644 4455
FAX 644 4240

info@rinconconsultants.com
www.rinconconsultants.com

July 13, 2016

Barbareno/Ventureno Band of Mission Indians
Julie Lynn Tumamait-Stennslie, Chairperson
365 North Poli Ave.
Ojai, CA, 93023

RE: **Cultural Resources Study for the Avalon Homes Project, City of Oxnard, Ventura County, California**

Dear Chairperson Julie Lynn Tumamait-Stennslie:

Rincon Consultants, Inc. (Rincon) has been retained to prepare a cultural resources study for the Avalon Homes Project (project) in the City of Oxnard, Ventura County, California. Rincon understands the project to propose the construction of 12 single family residential units and roughly 36 duplex units on an approximately 8.45-acre site located southeast of the Harbor Boulevard/Fifth Street intersection. The project involves the dedication of an adjacent 29.88-acre open space parcel in exchange for development on the project site due to the presence of environmentally sensitive habitat area. This project is subject to the California Environmental Quality Act (CEQA).

As part of the process of identifying cultural resources issues for this project, Rincon contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File (SLF) search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project site. The SLF search resulted in negative results; however, the NAHC recommended that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project. The project site is depicted on Township 1N, Range 23W, Sections 1 and 12, and Township 1N, Range 22W, Sections 6 and 7 of the U.S. Geological Survey *Oxnard, CA* 7.5-minute topographic quadrangle. The Records Search Map (attached) includes a 0.5-mile buffer.

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at mszromba@rinconconsultants.com, or at 805-644-4455. Thank you for your assistance.

Sincerely,

Meagan Szromba, M.A.
Cultural Resources Specialist

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

805 644 4455
FAX 644 4240

info@rinconconsultants.com
www.rinconconsultants.com

July 13, 2016

Coastal Band of the Chumash Nation
Mia Lopez, Chairperson

RE: **Cultural Resources Study for the Avalon Homes Project, City of Oxnard, Ventura County, California**

Dear Chairperson Mia Lopez:

Rincon Consultants, Inc. (Rincon) has been retained to prepare a cultural resources study for the Avalon Homes Project (project) in the City of Oxnard, Ventura County, California. Rincon understands the project to propose the construction of 12 single family residential units and roughly 36 duplex units on an approximately 8.45-acre site located southeast of the Harbor Boulevard/Fifth Street intersection. The project involves the dedication of an adjacent 29.88-acre open space parcel in exchange for development on the project site due to the presence of environmentally sensitive habitat area. This project is subject to the California Environmental Quality Act (CEQA).

As part of the process of identifying cultural resources issues for this project, Rincon contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File (SLF) search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project site. The SLF search resulted in negative results; however, the NAHC recommended that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project. The project site is depicted on Township 1N, Range 23W, Sections 1 and 12, and Township 1N, Range 22W, Sections 6 and 7 of the U.S. Geological Survey *Oxnard, CA* 7.5-minute topographic quadrangle. The Records Search Map (attached) includes a 0.5-mile buffer.

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at mszromba@rinconconsultants.com, or at 805-644-4455. Thank you for your assistance.

Sincerely,

Meagan Szromba, M.A.
Cultural Resources Specialist

Rincon Consultants, Inc.
180 North Ashwood Avenue
Ventura, California 93003

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July 13, 2016

Northern Chumash Tribal Council
Fred Collins, Spokesperson
67 South Street
San Luis Obispo, CA 93401

RE: **Cultural Resources Study for the Avalon Homes Project, City of Oxnard, Ventura County, California**

Dear Spokesperson Fred Collins:

Rincon Consultants, Inc. (Rincon) has been retained to prepare a cultural resources study for the Avalon Homes Project (project) in the City of Oxnard, Ventura County, California. Rincon understands the project to propose the construction of 12 single family residential units and roughly 36 duplex units on an approximately 8.45-acre site located southeast of the Harbor Boulevard/Fifth Street intersection. The project involves the dedication of an adjacent 29.88-acre open space parcel in exchange for development on the project site due to the presence of environmentally sensitive habitat area. This project is subject to the California Environmental Quality Act (CEQA).

As part of the process of identifying cultural resources issues for this project, Rincon contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File (SLF) search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project site. The SLF search resulted in negative results; however, the NAHC recommended that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project. The project site is depicted on Township 1N, Range 23W, Sections 1 and 12, and Township 1N, Range 22W, Sections 6 and 7 of the U.S. Geological Survey *Oxnard, CA* 7.5-minute topographic quadrangle. The Records Search Map (attached) includes a 0.5-mile buffer.

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Ventura, California 93003

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July 13, 2016

Santa Ynez Band of Mission Indians
Vincent Armenta, Chairperson
P.O. Box 517
Santa Ynez, CA, 93460

RE: **Cultural Resources Study for the Avalon Homes Project, City of Oxnard, Ventura County, California**

Dear Chairperson Vincent Armenta:

Rincon Consultants, Inc. (Rincon) has been retained to prepare a cultural resources study for the Avalon Homes Project (project) in the City of Oxnard, Ventura County, California. Rincon understands the project to propose the construction of 12 single family residential units and roughly 36 duplex units on an approximately 8.45-acre site located southeast of the Harbor Boulevard/Fifth Street intersection. The project involves the dedication of an adjacent 29.88-acre open space parcel in exchange for development on the project site due to the presence of environmentally sensitive habitat area. This project is subject to the California Environmental Quality Act (CEQA).

As part of the process of identifying cultural resources issues for this project, Rincon contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File (SLF) search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project site. The SLF search resulted in negative results; however, the NAHC recommended that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project. The project site is depicted on Township 1N, Range 23W, Sections 1 and 12, and Township 1N, Range 22W, Sections 6 and 7 of the U.S. Geological Survey *Oxnard, CA* 7.5-minute topographic quadrangle. The Records Search Map (attached) includes a 0.5-mile buffer.

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at mszromba@rinconconsultants.com, or at 805-644-4455. Thank you for your assistance.

Sincerely,

Meagan Szromba, M.A.
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July 13, 2016

yak tityu tityu – Northern Chumash Tribe
Mona Olivas Tucker, Chairperson
660 Camino Del Rey
Arroyo Grande, CA 93420

RE: **Cultural Resources Study for the Avalon Homes Project, City of Oxnard, Ventura County, California**

Dear Chairperson Mona Olivas Tucker:

Rincon Consultants, Inc. (Rincon) has been retained to prepare a cultural resources study for the Avalon Homes Project (project) in the City of Oxnard, Ventura County, California. Rincon understands the project to propose the construction of 12 single family residential units and roughly 36 duplex units on an approximately 8.45-acre site located southeast of the Harbor Boulevard/Fifth Street intersection. The project involves the dedication of an adjacent 29.88-acre open space parcel in exchange for development on the project site due to the presence of environmentally sensitive habitat area. This project is subject to the California Environmental Quality Act (CEQA).

As part of the process of identifying cultural resources issues for this project, Rincon contacted the Native American Heritage Commission (NAHC) and requested a Sacred Lands File (SLF) search and a list of Native American tribal organizations and individuals who may have knowledge of sensitive cultural resources in or near the project site. The SLF search resulted in negative results; however, the NAHC recommended that we consult with you directly regarding your knowledge of the presence of cultural resources that may be impacted by this project. The project site is depicted on Township 1N, Range 23W, Sections 1 and 12, and Township 1N, Range 22W, Sections 6 and 7 of the U.S. Geological Survey *Oxnard, CA* 7.5-minute topographic quadrangle. The Records Search Map (attached) includes a 0.5-mile buffer.

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at mszromba@rinconconsultants.com, or at 805-644-4455. Thank you for your assistance.

Sincerely,

Meagan Szromba, M.A.
Cultural Resources Specialist

Appendix E

Preliminary Soils Engineering Investigation

SubSurface Designs Inc.

12848 Foothill Boulevard • Sylmar, California 91342
(818) 898-1595 • (Fax) 898-4003

PRELIMINARY SOILS ENGINEERING INVESTIGATION

PROPOSED DEVELOPMENT OF 16 MULTI-FAMILY LOTS

CONSTRUCTION OF 48± RESIDENTIAL STRUCTURES

OXNARD SHORES NORTH

NORTHERN EXTENSION OF CANAL STREET

PARCELS 196001012 & 196001014

OXNARD, CALIFORNIA

FOR

OXNARD SHORES COMPANY, LLC

% MR. MIKE MARLOW

1015 S. HARBOR BOULEVARD

OXNARD, CALIFORNIA

PIN# 5462B

APRIL 28, 2011

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INTRODUCTION

This report presents the results of our Preliminary Soils Engineering Investigation performed at the northern extension of Canal Street in the City of Oxnard, California. The purpose of the investigation was to determine the subsurface conditions as they relate to the proposed construction of 48± residential structures. This investigation is limited to the area of the proposed development and does not warrant the remaining portions of the property.

SCOPE

This investigation is based upon:

- A topographic site plan by Jensen Design & Survey, Inc., a licensed land surveyor, that was utilized as our base map. This map appears to accurately reflect topographic conditions as observed at the subject property.
- The review of nine (9) exploratory borings. The materials encountered were logged by a representative of this office, and the explorations were backfilled with the excavated materials. However, backfill was not compacted and should be monitored for future settlement.
- Preparation of the enclosed Site Plan which locates the proposed development and our explorations (see APPENDIX I).
- Preparation of site exploration logs (see APPENDIX I).
- Laboratory testing and analysis of samples obtained within the excavations (see APPENDIX II).
- Calculations which may include, but are not limited to, bearing value, lateral pressure, active earth pressure, slope stability (see APPENDIX III).
- A search of earthquake, fault, and seismic parameters and conditions relevant to the subject site utilizing the EQSEARCH and EQFAULT computer programs (see APPENDIX IV).
- The review available maps and reports prepared by this office and others (see APPENDIX V).
- Preparation of this report.

The data that supports the following SUMMARY OF FINDINGS, CONCLUSIONS and RECOMMENDATIONS are contained within Appendices I through V.

The scope of our exploration is limited to the areas explored for the proposed development as delineated on the enclosed Site Plan. This report should not be considered as a comprehensive evaluation of the entire property. This report has not been prepared for use by other parties or for other purposes (or developments), and may not contain sufficient information for other than the intended use. If construction is delayed more than one year, this office should be contacted to perform an update and to verify the current site conditions.

LOCATION AND TOPOGRAPHY

The subject property is located in the City of Oxnard, California. The subject property is an undeveloped, irregular-shape parcel that extends from the northern terminus of Canal Street. See enclosed Vicinity Map for location of subject property (see APPENDIX I).

PROPOSED DEVELOPMENT

Final building plans have not been prepared and await the conclusions and recommendations of this investigation. However, it is our understanding that the proposed development will consist of constructing 48± residential structures. Grading will consist of the removal and recompaction of the near surface soil for support of the proposed structures. In addition, foundation excavations will be made for the support of the proposed structures. For reference, the locations of proposed structures are shown on the attached Site Plan, Plate A.

SUMMARY OF FINDINGS

Research

A representative from this office conducted research of available geotechnical engineering reports prepared for the subject property and adjacent properties at the City of Oxnard on April 11, 2011. In addition, research of available maps and publications prepared for the area was conducted. SubSurface Designs, Inc. has reviewed the referenced reports and has incorporated applicable information from these sources into this report.

It should be noted that other reports may have been prepared for the subject site in the past but were not found during records research, or were not submitted to the governing reviewing agency, and thus are not part of the public record.

Field Investigation

A field investigation of the site was conducted on March 14, 22 & 23, 2011. This included logging and sampling nine (9) drilled explorations that were excavated on the site. The explorations were excavated to a maximum depth of fifty-one feet (51') below an adjacent grade. For reference, excavations are located on the attached Site Plan, Plate A (see APPENDIX I).

The subsurface conditions encountered in these explorations were logged in detail by a representative of this office. Further, representative samples of the earth materials encountered were obtained.

Undisturbed samples were obtained within the test borings with a Modified California (M.C.) ring sampler (ASTM D 3550 with a shoe similar to ASTM D 1586), and with a Standard Penetration Test (SPT) sampler (ASTM D 1586). The M.C. sampler has a 3" outside diameter and a 2.37" inside diameter. The SPT sampler has a 2.00" outside diameter and a 1.37" inside diameter. The samples were obtained by driving the sampler with successive drops of the Kelly bar or 140 pound hammer dropping 30 inches in accordance with ASTM D 1586. The soil is retained in the brass rings of 2½" outside diameter and 1" in height.

Bulk samples were obtained for testing and analysis. All undisturbed and bulk samples were sent to the laboratory for examination, testing, and classification, using the Unified Classification system and group symbol.

Earth Materials

A thick sequence of alluvial deposits (Qa) underlie the entire property and surrounding areas.

The earth materials encountered on the subject property are briefly described below. For approximate depths and more detailed descriptions, refer to the enclosed Exploration Logs Figure E.1 through E.9 (see APPENDIX I).

Alluvium (Qa)

Site alluvium consists of a medium brown to dark brown silty sand to silty clay.

The earth fill materials, natural soil and alluvial deposits were visually classified in accordance with the Unified Soils Classification System.

Earth material profiles can only be obtained from individual explorations placed on the subject property. Care should be exercised when using these profiles to determine changes in depth or thickness of the earth materials between the explorations.

Site Drainage & Groundwater

Drainage within the site comprises essentially of sheet flow runoff of precipitation derived primarily within property boundaries.

Groundwater was encountered at a depth of nine to fourteen feet (9'-14') below the existing ground surface. However, historic high groundwater data is available within the Seismic Hazard Evaluation of the Oxnard Quadrangle, Open File Report 02-52, dated 2002, prepared by the State of California Division of Mines and Geology. Plate 1.2 of the aforementioned report illustrates that the depth to the historic high groundwater level is approximately five feet (5') below the ground surface in the area of the subject site.

It must be noted that fluctuations in the level of the groundwater may occur. The depth to groundwater, if encountered in the explorations, is only valid for the date of exploration. Changes may occur in this groundwater level due to climatic conditions and/or alterations in the existing groundwater recharge area (i.e. changes in landscaping irrigation rates, surface drainage and surface water infiltration conditions).

SEISMIC EVALUATION

General

The Southern California region is located within a tectonically active portion of the earth's crust which has produced both small and sizeable earthquakes throughout time. Faults are generally classified as active, potentially active, or inactive. A fault is considered "active" if it has produced seismic activity within the past 11,000 years. A "potentially active" fault is one where there has been seismic activity along the fault between 11,000 and 1,000,000 years. "Inactive" faults have not produced any seismic activity within the past 1,000,000 years. Active faults are considered to have a high probability of future seismic activity, potentially active faults are considered to have a low probability of future seismic activity, and inactive faults are considered to be no longer capable of producing seismic activity.

The potential exists throughout Southern California for strong ground motion similar to that which occurred during the 1994 Northridge Earthquake. Earthquakes with a magnitude of 5.0 and greater have occurred in Southern California throughout historic time. Strong ground shaking from a moderate to major earthquake can be expected during the lifetime of the structure. This may result in significant damage to the structure and hardscape. Since there are so many variables associated with ground movement during an intense earthquake, it is almost impossible to predict the impact of a seismic event to a particular site.

Earthquake Fault Zones

Following the 1971 Sylmar Earthquake, the State of California passed the Alquist-Priolo Special Studies Act in 1972. Active faults within the state were identified and zones were established which prohibited construction of most structures for human occupancy across a known active fault. The Alquist-Priolo Special Studies Act requires the State Geologist to delineate "special studies zones" along active faults, whereby development therein must include geologic investigation demonstrating the absence of a surface displacement threat prior to construction of habitable structures. "Special Studies Zones" have since been renamed "Earthquake Fault Zones".

The subject property is not located within the confines of an "Earthquake Fault Zone", and no zoned faults extend through the site or are in close proximity to the property. Although the site is not located within a State designated "Earthquake Fault Zone" it is located in an active seismic region where large numbers of earthquakes occur each year.

Seismic Hazard Zones

Following the 1989 Loma Prieta Earthquake, the State of California enacted the Seismic Hazard Mapping Act (SHMA) in 1990. As a result, the Department of Conservation prepared a set of maps designating areas within the state that may be susceptible to seismic slope instability and/or liquefaction during a strong seismic event. The seismic safety zones were published in a series of maps initially released in 1996.

The Seismic Hazards Mapping Act was prompted by damaging earthquakes in northern and southern California, and is intended to protect public safety from the effects of strong ground shaking, liquefaction, landslides, and other earthquake-related hazards. The Seismic Hazards Mapping Act requires that the State Geologist delineate the various "seismic hazards zones." The maps depicting the zones are released by the CGS. The fact that a site lies outside of a zone does not mean it is free of seismic or geologic hazards such as landslides, lateral spreading, liquefaction or rockfall. Southern California has not been completely mapped, although new maps are issued and existing maps are refined occasionally.

The Seismic Hazards Mapping Act requires a site investigation by a certified Engineering Geologist and/or Civil Engineer prior to development of a project within a hazard zone. The investigation is to include recommendations for a "minimum level of mitigation" that should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy. The Seismic Hazards Mapping Act does not require mitigation to a level of no ground failure and/or no structural damage.

Seismic Hazard Zone delineations are based on correlation of a combination factors, including: surf,ace distribution of soil deposits and bedrock, slope steepness, depth to groundwater, bedding orientation with respect to slopes, bedrock shear strength, and occunence of past seismic failure. Maps within the series are further designated as Reconnaissance, Preliminary or Official. Official Seismic Hazard Zone Maps are the culmination of mapping, analysis, review and comment of CGS, other State agencies, and the public following review and revision of the Preliminary Review Map. The Official Maps are the most rigorous and have the highest confidence level.

As defined, a "Liquefaction Hazard" area is an area where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693© would be required. As defined, an "Earthquake-Induced Landslide" area is an area where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693© would be required.

This office has reviewed the Seismic Hazards Map of the Oxnard Quadrangle prepared by the State of California Division of Mines and Geology. According to this map, the site is located within an area of study for earthquake-induced liquefaction. However, the site is not located within an area subject to earthquake-induced landsliding.

Recent Seismic Activity

The most recent largest earthquake within the specified search radius and time period is the Northridge Earthquake. The 6.7 magnitude Northridge Earthquake occurred on January 17, 1994 at 4:31 a.m., PST, and created strong ground shaking for approximately 10 seconds in the Los Angeles area resulting in wide spread, random damage. The earthquake occurred along a previously unrecognized south dipping thrust fault. The causative fault, as defined by a pattern of aftershocks, moved under an area roughly 19-miles across its front (approximately east-west in orientation) and 13 miles from front to back (approximately north-south in orientation). Although slip magnitude was approximately 9- to 10-feet, surface rupture along the causative fault did not occur as a result of the earthquake.) The epicenter of the Northridge Earthquake is located approximately forty miles east of the subject property. The earthquake produced an estimated repeatable high ground acceleration of 0.087g on the subject property.

The computer program EQSEARCH was used to determine all historical earthquakes with event magnitudes ranging from 4.5 to 9.0 on the Richter Scale within a 50 mile search radius of the subject property over the past 100 years. Data obtained from utilizing the EQSEARCH program may be found in APPENDIX IV.

Active Faults with Historic Surface Rupture

The 1857 Fort Tejon Earthquake (8.3±M) occurred along the San Andreas Fault Zone. The San Andreas Fault Zone is located approximately forty-six miles to the north and has a maximum probable event magnitude of 7.40. The 1933 Long Beach Earthquake (6.3M) occurred along the Newport-Inglewood Fault Zone. The 1971 San Fernando Earthquake (6.4M) occurred along the San Fernando Fault Zone. The San Fernando-Sierra Madre Fault Zone is located approximately forty-four miles to the northeast and has a maximum probable event magnitude of 6.30.

The program EQFAULT was used to estimate the proximity of various faults within a 50 mile radius, determine their maximum probable event magnitudes, and calculate the resulting ground accelerations on the subject property. Data obtained from utilizing the EQFAULT program may be found in APPENDIX IV.

Horizontal Ground Acceleration

Predicted maximum credible and probable event magnitudes, credible and repeatable high ground accelerations, and fault distances from the site have been estimated by using a method developed by Campbell & Bozorgnia (1994). Mean plus one standard deviation values have been determined for each known active fault zone within a 50 mile radius of the subject property. By definition, a mean plus one standard deviation" value has an 84 percent probability of non-exceedance. For additional information refer to the attached results obtained from EQFAULT, APPENDIX IV.

CBC Seismic Design Parameters

The majority of southern California, including all of Los Angeles and Ventura counties, is within a zone requiring structural design to resist earthquake loads. Section 1613A of the 2007 California Building Code (CBC) which is based on the 2006 International Building Code (IBC) requires mapped spectral response acceleration parameters. These parameters include 5-percent critical damping at 0.2 seconds ($\mathbf{S_s}$)and 1.0 seconds ($\mathbf{S_1}$). In addition, a Site Class and site coefficients ($\mathbf{F_a}$ and $\mathbf{F_v}$) must be assigned for use in structural design relative to strong ground shaking.

The mapped spectral acceleration parameters S_s and S_1 are determined utilizing Figures 1613.5(3) and 1613.5(4), and site coefficients F_a and F_v can be obtained from tables 1613A.5.3(1) and 1613A.5.3(2) of the CBC 2007. The spectral acceleration parameters and site coefficients can also be determined using the program "Earthquake Ground Motion Parameter Java Application" obtained from the U.S. Geological Survey website (http://earthquake.usgs.gov/research/hazmaps/design/index.php).

The following seismic coefficient values were obtained from use of the U.S. Geological Survey & Java Ground Motion Parameter Calculator. It is recommended that the project Structural Engineer independently verify the accuracy of all the parameters outlined in the following table, excluding Site Class, prior to use.

2007 California Building Code (Section 1613) - Site Coefficients & Data	
Site Latitude	34.1935°
Site Longitude	119.2365°
Site Class (average soil properties within the upper 100')	D
0.2 Second Spectral Response - $\mathbf{S_s}$	1.857
1.0 Second Spectral Response - $\mathbf{S_1}$	0.820
Site Coefficient - $\mathbf{F_a}$	1.0
Site Coefficient - $\mathbf{F_v}$	1.5
Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter	
$\mathbf{S_{MS}} = F_{a\ \text{Silty sand}}$ (0.2 Second Spectral Response)	1.857
$\mathbf{S_{M1}} = F_v S_1$ (1.0 Second Spectral Response)	1.230
Five Percent Damped Design Spectral Response Acceleration	

2007 California Building Code (Section 1613) - Site Coefficients & Data	
$S_{DS} = \frac{2}{3}S_{MS}$ (0.2 Second Spectral Response)	1.238
$S_{D1} = \frac{2}{3}S_{M1}$ (1.0 Second Spectral Response)	0.820

Conformance with the presented criteria for seismic structural design does not constitute any kind of warranty, guarantee, or assurance that significant damage, or ground failure, will not occur in the event of a maximum level earthquake. The primary goal of the code-required minimum seismic design is to protect life and limb, and catastrophic failure, and not avoid all damage, as such design may be economically prohibitive. The Project Structural Engineer and owner must decide if the level of risk associated with utilizing the minimum required code values is acceptable and, if not, assign appropriate seismic values above the minimum code values for use in the structural design.

SITE STABILITY

Liquefaction Potential

Liquefaction refers to the momentary loss of shear strength. The necessary components for liquefaction include: a shallow groundwater condition; relatively loose soils; fine grained sands and silty sands; and repeated cyclic loading. During an earthquake cyclic loading occurs, allowing pore pressures to increase as a result of individual soil grain particles realign themselves. The realignment of the soil particles allows the water to completely separate and surround the grains. As cyclic loading continues the shear resistance of the soil decreases until the pore pressures equal the confining pressures. The result of the increases in the pore pressure and the decrease in the shear resistance is termed "Liquefaction".

According to the Guidelines for Evaluating and Mitigating Seismic Hazards in California (SP 117A). There are two general levels of liquefaction hazards; large-scale displacement, and more localized failures including the loss of bearing strength, differential settlement and small-scale flows and lateral spreads. Areas with a potential for large-scale displacements will often require multiple methods of remediation to protect against liquefaction. Treating the site with soil improvement methods can often mitigate smaller scale ground deformations. These methods help reduce future settlements due to the static forces created by building loads and the dynamic forces from earthquake-imposed stress. With improvement, safe construction can be accomplished on marginal soils; i.e., loose sand, unconsolidated fill, collapsible soil, expandable clay and mine spoils.

SP 177A defines large-scale ground displacements as those that exceed 1-3 feet horizontally and 4-6 inches vertically. Only removal and densification of liquefiable soils, or permanently lowering the groundwater by dewatering, can fully eliminate liquefaction hazards.

Localized ground failures are smaller scale displacements that can often be mitigated by treating the site with soil improvement methods. There are several published articles with additional information on the success of specific soil improvement techniques (Hayden and Baez, 1994). Suitable mitigation alternatives may include one or more of the following:

- Excavation and removal or re-compaction of potentially liquefiable soils;
- Soil densification or other types of in-situ ground modifications;
- Deep foundations that have been designed to accommodate liquefaction effects; and,
- Reinforced shallow foundations and improved structural design to withstand predicted vertical and lateral ground displacements.

Three types of deformations cause most of the damage in small-scale failures; loss of bearing strength, differential settlement and soil spreads and flows.

Loss of bearing strength due to liquefaction can occur in saturated clean sand under strong earthquake loading conditions. This type of failure often occurs in natural deposits of clean sands that have interbedded lenses of finer-grained sediments at some depth below the ground surface. In addition, overburden pressure tends to increase density with depth. The fill deposits most susceptible to liquefaction and excessive settlement are thick accumulations of clean, cohesionless sand that are saturated and do not strengthen substantially with depth.

Differential settlement is a localized loss of support under the footprint or across the span of a building. It commonly occurs in interbedded sediments at alluvial sites. The variable lensing character of the material makes the extent and thickness of the liquefiable layers; and therefore, the amount of settlement, hard to predict.

Localized lateral spreads and small-scale flows are formed by the displacement of a surface layer in response to liquefaction of an underlying layer. This type of failure is dependent upon a gentle slope or a nearby free face or open area that will allow the displacement.

Treating the site with soil improvement methods can often mitigate smaller scale ground deformations. These methods help reduce future settlements due to the static forces created by building loads and the dynamic forces from earthquake-imposed stress.

It should be recognized that structural mitigation might not reduce the potential of the soils to liquefy during an earthquake. There will remain some risk that the structure could still suffer damage and may not be useable if liquefaction occurs. Utilities and lifeline services provided from outside the structure could still suffer disruption unless mitigation measures are employed that would account for the soil deformations that could occur between the structure and the supporting soils. Repair and remedial work should be anticipated after a liquefaction event if structural mitigation is used.

The intent of the State's Seismic Hazard Map Zoning program is to ensure that a minimum level of public safety and protection is met for projects in zones of required investigation. The acceptable level of risk by State standards is one that ensures life safety in most residential and commercial structures. For more details and information refer to California Geological Survey SP 177A.

During our explorations at the subject property, groundwater was encountered at a depth of nine to fourteen feet (9'-14') below the existing ground surface. However, historic high groundwater data is available within the Seismic Hazard Evaluation of the Oxnard Quadrangle, Open File Report 02-52, dated 2002, prepared by the State of California Division of Mines and Geology. Plate 1.2 of the aforementioned report illustrates that the depth to the historic high groundwater level is approximately five feet (5') below the ground surface in the area of the subject site.

A liquefaction analysis was performed for each of the explorations place on site utilizing LiquefyPro computer program prepared by Civiltech Corporation. Calculations, attached hereto, have been performed for the nine exploration placed on site by this office. The calculations show that there is a potential for earthquake induced liquefaction at the subject site. Generally, liquefaction at the subject property is predominately within soil layers in upper twenty five feet (25'). Some liquefaction potential has been calculated within soil layers below twenty five feet (25'), however, the largest amounts of settlement occur within the liquefiable layers in the upper twenty five feet (25'), please refer to the attached calculations. The calculations indicate settlement between approximately one and three inches (1"-3") may occur as a result of the design earthquake event. A potential differential settlement of one to two inches (1"-2") should be considered for design.

In order to help mitigate the effects of liquefaction related settlement, recommendations for support of the proposed structures include a mat foundation. Grading will also be necessary for development. As an alternative to a mat foundation system, ground modification could be performed. Recommendations for ground modification can be provided upon request.

Lateral Spread

Lateral spreading is an associated problem caused by liquefaction. Lateral spreading is typically associated in areas of gently sloping ground that undergo liquefaction. As a result, the ground surface moves in the direction of the slope. The effects of lateral spreading can be the elongation of, or cracks in the ground surface perpendicular to the direction of the slope. These cracks, if situated below or adjacent to structures, can result in settlement, lateral movement and damage to the structure. Based on the relatively level topography of the subject property, the potential for lateral spreading to occur is considered low.

Seismically Induced Settlement

As discussed above, calculations show that there is a potential for earthquake induced liquefaction at the subject site. The calculations indicate settlement between approximately one and three inches (1"-3") may occur as a result of the design earthquake event. A potential differential settlement of one to two inches (1"-2") should be considered for design.

Hydro-compression

Hydro-compression of soils is a phenomenon where loosely to medium dense and/or soft to firm soils "collapse" with moisture inundation. Infiltration of moisture into the subsurface may be attributed to various conditions or occurrences (i.e., either a rise in groundwater levels, excessive surface water percolating through the surficial sediments or by broken or leaking utility lines, etc.) and thus, must be considered when applicable. A review of the research materials, laboratory testing, field exploration and analysis contained herein suggests that the unsaturated soil has a potential for hydro-compression to occur. Recommendations contained herein are being provided to partially mitigate the potential for hydro-compression.

Expansive Soils

Expansive soils are considered to be one of the most costly natural hazards as related to light structures, slabs, retaining walls, paving etc. Expansive soils are influenced greatly by changes in moisture content and can lead to damage when the moisture content changes significantly over short durations of time (i.e. seasonal).

These changes can result from may factors including the initial moisture content of the soil, climate, groundwater, drainage conditions, irrigation and vegetation to name a few. Therefore, it is imperative that soils underlying the subject property are maintained at a consistent moisture content in order to reduce the potential damage caused by expansive soils. A watering schedule that allows the soil to become saturated, then dry out can result in foundation movement and distress. In addition, the recommendations outlined in the DRAINAGE AND MAINTENANCE section should be followed.

The near surface earth materials encountered in the explorations consist of silty sands, sandy silts and sands. The expansion potential of the underlying earth material is very low.

Tsunamis

Tsunamis are large waves or ocean surges caused by offshore earthquakes, large underwater landslides, and submarine volcanic eruptions which can travel for thousands of miles from the source. The potential for tsunami activity is typically discussed for all sites located below an elevation of thirty-five feet (35').

If a tsunami strikes and inundation occurs, the residence could be severely damaged or completely destroyed and thus there is an obvious hazard to life and limb should the tsunami strike while the residence is occupied. However, this is a known and accepted risk of beachfront or coastal living as there is no practical method of protecting a beachfront/coastal residential structure from a large tsunami. In the case of low-lying residential structures situated along an unprotected coastline, the protection of life and limb shall rely on the accuracy and efficiency of the government tsunami warning system and the actions of the occupants.

The potential for tsunami activity must be discussed for all sites located below an elevation of thirty-five feet (35'). Based upon the plan, the site is located at an elevation of approximately twelve to twenty-seven feet (12'-27') above mean sea-level. Due to the coastal location and elevation of the subject property, it is the opinion of this office that there is a threat of inundation of the site should a large tsunami develop and collide with this portion of the west coast. The costs incurred from such an event may be partially mitigated by appropriate insurance.

CONCLUSIONS

General

It is the professional opinion of this office that construction of the proposed residences is feasible provided that the recommendations contained herein are followed. In addition, all applicable elements of the governing agency Building Codes shall be followed.

Based upon our field observations, laboratory testing and analysis, the alluvium found at depth in the explorations should possess sufficient strength to support the proposed compacted fill pad and structures. The near surface soil deposits encountered in the explorations excavated on site are not considered suitable for foundation support as these materials may possess adverse deformational characteristics.

RECOMMENDATIONS

1. Grading for the proposed development shall include the removal and recompaction of the upper six feet (6') of the existing alluvium for support of the proposed foundation system. The grading shall extend outside of the footprint of the proposed structure ten feet (10'). A minimum of four feet (4') of compacted fill shall be maintained below the bottom of all foundations. A layer of bi-directional geogrid shall be placed within the bottom of the grading limits prior to the placement of compacted fill. Portions of the bottom excavation for the recommended removals are anticipated to require stabilization prior to the placement of compacted fill. In areas where excessive pumping is encountered, the geogrid shall be covered with one foot (1') of six inch (6") minus rock then covered with a geofrabric. The earth material outside of the grading limits for the proposed structure shall be removed and recompacted down two feet (2') for support in all areas to receive concrete slab, decking or paving.

Grading shall be carried fourth as described in the GRADING AND EARTHWORK section below. Based on the granular nature of the upper alluvium, each layer shall be compacted to 95 percent of the maximum density as determined by the latest version of ASTM D 1557

2. It is recommended that the proposed structures be supported by a mat foundation. A mat foundation is a thickened rigid slab that encompasses the entire building footprint, which spreads the load of the structure to a wider area. It should be noted that, the proposed mat foundation is not intended to mitigate the potential liquefaction hazard. The mat foundation is however intended to mitigate potential life and safety issues associated with resulting settlement that may be caused by liquefaction. In the case of settlement and/or differential settlement following a liquefaction event, the structure can be re-leveled by jacking or by other construction methods. Foundations should be designed as outlined in the FOUNDATIONS section below.

3. The site shall be maintained as outlined in the DRAINAGE AND MAINTENANCE section below.

It should be noted that, the recommendations contained within this report may be more restrictive than applicable building codes. All recommendations of this report which are in addition to or more restrictive than those outlined in a subsequent review letter, by your governing reviewing agency, shall be incorporated into the plans.

GRADING AND EARTHWORK

Proposed Grading

Grading for the proposed development shall include the removal and recompaction of the upper six feet (6') of the existing alluvium for support of the proposed foundation system. The grading shall extend outside of the footprint of the proposed structure ten feet (10'). A minimum of four feet (4') of compacted fill shall be maintained below the bottom of all foundations. A layer of bi-directional geogrid shall be placed within the bottom of the grading limits prior to the placement of compacted fill. Portions of the bottom excavation for the recommended removals are anticipated to require stabilization prior to the placement of compacted fill. In areas where excessive pumping is encountered, the geogrid shall be covered with one foot (1') of six inch (6") minus rock then covered with a geofrabric. The earth material outside of the grading limits for the proposed structure shall be removed and recompacted down two feet (2') for support in all areas to receive concrete slab, decking or paving.

Additionally, foundation excavations will be made. All grading shall be carried forth as outlined herein. Based on the granular nature of the upper alluvium, each layer shall be compacted to 95 percent of the maximum density as determined by the latest version of ASTM D 1557

Flatland

1. Prior to commencement of work, a pre-grading meeting shall be held. Participants at this meeting will consist of the contractor, the owner or his representative, and the soils engineer. The purpose of this meeting is to avoid misunderstanding of the recommendations set forth in this report that might cause delays in the project.

2. Prior to placement of fill, all vegetation, rubbish, and other deleterious material should be disposed of off site. The proposed structures should be staked out in the field by a surveyor. This staking should, as a minimum, include areas for overexcavation, toes of slopes, tops of cuts, setbacks, and easements. All staking shall be offset from the proposed grading area at least five feet (5').

   The proposed construction areas should be excavated down six feet (6') below existing grade, and a minimum of four feet (4') below all foundations.

3. The natural ground, which is determined to be satisfactory for the support of the filled ground, shall then be scarified to a depth of at least six inches (6") and moistened as required. The scarified ground should be compacted to at least 90 percent of the maximum laboratory density.

4. The fill soils shall consist of materials approved by the project Soils Engineer or his representative. These materials may be obtained from the excavation areas and any other approved sources, and by blending soils from one or more source. The material used shall be free from organic vegetable matter and other deleterious substances, and shall not contain rocks greater than eight inches (8") in diameter nor of a quantity sufficient to make compaction difficult.

5. The approved fill material shall be placed in approximately level layers six inches (6") thick, and moistened as required. Each layer shall be thoroughly mixed to attain uniformity of moisture in each layer.

   When the moisture content of the fill is below the optimum moisture content, as specified by the Soils Engineer, water shall be added and thoroughly mixed in until the moisture content is within three percent (3%) above the optimum moisture content.

   When the moisture content of the fill is more than three percent (3%) above the optimum moisture content, as specified by the Soils Engineer, the fill material shall be aerated by scarifying or shall be blended with additional materials and thoroughly mixed until the moisture content is within three percent (3%) above the optimum moisture content.

   Each layer shall be compacted to 90 percent of the maximum density as determined by the latest version of ASTM D 1557, using approved compaction equipment.

6. Review of the fill placement should be provided by the Soils Engineer or his representative during the progress of grading. In general, density tests will be made at intervals not exceeding two feet (2') of fill height or every 500 cubic yards of fill placed.

7. The materials can experience a shrinkage of ten to fifteen percent (10-15%).

8. During the inclement part of the year, or during periods when rain is threatening, all fill that has been spread and awaits compaction shall be compacted before stopping work for the day or before stopping because of inclement weather. These fills, once compacted, shall have the surfaces sloped to drain to one area where water may be removed.

   Work may start again, after the rainy period, once the site has been reviewed by the Soils Engineer and he has given his authorization to resume. Loose materials not compacted prior to the rain shall be removed and aerated so that the moisture content of these fills will be within three percent (3%) above the optimum moisture content.

   Surface materials previously compacted before the rain, shall be scarified, brought to the proper moisture content, and re-compacted prior to placing additional fill, if deemed necessary by the Soils Engineer.

9. Review of geotechnical data available for the local vicinity of the site indicates that septic tanks, seepage pits, or leach fields may be encountered during site grading. If encountered, these should be drained of effluent or drilled out if they have been backfilled. The cleaned-out area should be inspected by the soils engineer and governing inspector prior to backfill. The excavation may be filled with approved compacted fill, lean concrete, or gravel. Whichever backfill material is selected, at least five feet (5') of approved manmade fill, placed at 90 percent relative compaction should cap the excavation.

FOUNDATIONS

It is recommended that the proposed structures be supported by a mat foundation. A mat foundation is a thickened rigid slab that encompasses the entire building footprint, which spreads the load of the structure to a wider area. It should be noted that, the proposed mat foundation is not intended to mitigate the potential liquefaction hazard. The mat foundation is however intended to mitigate potential life and safety issues associated with resulting settlement that may be caused by liquefaction. In the case of settlement and/or differential settlement following a liquefaction event, the structure can be re-leveled by jacking or by other construction methods.

All earth materials derived from the excavations of foundations shall be removed from the site or placed as certified compacted fill. Fill temporarily stockpiled on site should be placed in a stable area, away from slopes, excavations and improvements. Earth materials shall not be cast over any descending slopes in an uncontrolled manner.

Mat Foundation

The thickness of the mat foundation and required reinforcement shall be specified by the Project Structural Engineer. A coefficient of subgrade modulus (K) of 150 lb/cubic inch may be utilized for the design. Perimeter foundations and interior pads shall be a minimum of 24 inches below grade and can utilize a soil bearing of 1500 pounds per square foot.

Lateral loads may be resisted by friction at the base of the foundations and by passive resistance within the certified fill (cef). A lateral bearing of 150 pounds per square foot shall be taken is passive pressure calculations. A coefficient of friction of 0.35 is recommended. The coefficient of friction shall be used between the base of the foundation and the recommended bearing material. When combining passive and friction for resistance of lateral loads, the passive component should be reduced by one-third.

Residential floor slab should be protected by a 10 mil vapor retarder/barrier placed beneath the slab. These types of retarders/barriers should be placed between two inches (2") of sand to prevent punctures in the vapor retarder/barrier and to aid in the cure of the concrete. It should be noted that this type of barrier will not preclude moisture damage to wood floors or vapor sensitive flooring. The commonly used 6-mil and 10-mil polyethylene plastic sheeting can produce less-than-satisfactory results due to its low puncture resistance, inconsistent vapor permeability, and variable product longevity. It is recommend that the retarder/barrier conform with ASTM E1745. These products should be installed in accordance with the manufacturer's recommendations. In particular, care should be utilized to seal sheet boundaries and seal around penetrations.

It should be noted that cracking of concrete floor slabs is very common during curing. The cracking occurs because concrete shrinks as it dries. It is important that additional water not be added to concrete at the site to make pumping easier as this will increase the magnitude of shrinkage.

Crack-control joints which are commonly used in exterior decking to control such cracking are normally not used in interior slabs. The reinforcement recommended is intended to reduce cracking, and its proper placement is critical to concrete slab performance. The minor shrinkage cracks which often form in interior slabs generally do not present a problem when carpeting, linoleum, or wood floor coverings are used. The slab cracks can, however, lead to surface cracks in brittle floor coverings such as stone or tile. A mortarbed or slip sheet is recommended between the slab and brittle floor covering to limit the potential for cracking.

SETTLEMENT

Settlement and differential settlement can result in cracks in the exterior and interior finishes, flooring, etc. Controlling drainage around the structure as outlined in the DRAINAGE AND MAINTENANCE section below can help to control settlement/differential settlement. Additionally, foundation excavations cleared of all loose material prior to the placement of steel, then prior to the placement of concrete is required and can significantly minimize future settlement and differential settlement.

Future settlement and/or differential settlement of the structure and secondary features due to long term deformation and natural occurrences are still possible. Any site drainage improvements, such as those outlined in the DRAINAGE AND MAINTENANCE section below, will result in a lower risk of future foundation problems.

Static settlement of the proposed single family residence will occur. Settlement of ½" to ¾" between walls, within 30 feet or less of each other and under similar loading conditions, are considered normal. Total settlement on the order of ¾" should be anticipated. Differential settlement is not expected to exceed ¾".

Seismic settlement due to liquefaction is also possible. The calculations indicate settlement between approximately one and three inches (1"-3") may occur as a result of the design earthquake event. A potential differential settlement of one to two inches (1"-2") should be considered for design.

EXCAVATION EROSION CONTROL

During inclement periods of the year, when rain is threatening (between October 1, and April 15) an erosion control plan shall be implemented and approved by the reviewing agency, to reduce the potential of site erosion. The following are several recommendations prepared by this office. The following recommendations are valid any time of the year that rain threatens an excavation.

Open Excavations

All open excavations shall be protected from inclement weather. This is required to keep the surface of the open excavation from becoming saturated during rainfall. Saturation of the excavation may result in a relaxation of the soils which may result in failures.

Hillside Excavations

All hillside excavations shall be covered during the rainy seasons. Stakes, ropes, and sandbags, along with plastic may be employed to help facilitate the coverage of the excavations. Coverage of the open excavations shall over-extend from the edges of the excavations in all directions.

The project Civil Engineer shall be consulted for the limits of coverage. If possible, slopes around the open excavations shall be trimmed to slope away from the open excavation, so water runoff will not drain into the excavation. Any trees or planters that might cause failure around the open excavations, due to the saturated hillside, shall be anchored safely. After the rain has ceased, the excavations shall be reviewed by the project soil engineer and geologist for safety prior to recommencement of work.

Open Trenches

No water shall be allowed to pond or saturate open trenches. All open trenches shall be covered with plastic and sandbags. Areas around trenches shall be sloped in such a way that water will not runoff into the trenches. After the rain has ceased, trenches shall be reviewed by project soil engineer for safety prior to recommencing work. All footing excavations must be reviewed by the project soil engineer again, prior to pouring concrete.

Open Pile/Caisson Excavations

All open excavations for piles or caissons shall be reviewed and poured prior to rainfall. We do not recommend any pile excavations being left open through any rain storms. However, if it is necessary to leave pile excavations open through any rain storms, all water and runoff must be prevented from entering these pile excavations.

Grading in Progress

During the inclement part of the year, or during periods when rain is threatening, all fill that has been spread and awaits compaction shall be compacted before stopping work for the day or before stopping because of inclement weather. These fills, once compacted, shall have the surfaces sloped to drain to one area where water may be removed.

Work may start again, after the rainy period, once the site has been reviewed by the project soils engineer. Loose materials not compacted prior to the rain shall be removed and aerated so that the moisture content of these fills will be within three percent (3%) above the optimum moisture content.

Surface materials previously compacted before the rain, shall be scarified, brought to the proper moisture content, and re-compacted prior to placing additional fill, if deemed necessary by the Soils Engineer.

Additionally, it is suggested that all stock-piled loose fill materials, not compacted prior to anticipated rainfall, shall be covered with plastic. This action will keep the loose fill from being saturated with water, and will allow the grading to resume when the rain stops. It is always easier and less time consuming to increase moisture content of the fill than to aerate the fill to achieve optimum moisture.

All of the above recommendations shall be considered as part of the erosion control plan for the subject property. However, these recommendations shall and will not supersede, nor limit any erosion control plans produced by the Project Civil Engineer.

EXCAVATIONS

Excavations ranging in vertical height up to six feet (6') will be required for the proposed development. Conventional excavation equipment may be used to make these excavations. Excavations should expose alluvium. The alluvium is suitable for vertical excavations up to four feet (4'). Excavations that exceed the stated height limits, and all loose surficial material, shall be trimmed back at a gradient of 1:1 (h:v). This should be verified by a representative of this office during construction so that modifications can be made if variations in the soil occur. The earth material exposed in the proposed cuts should be kept moist, but not saturated, to reduce the potential for raveling and sloughing that may occur during construction.

Excavations made as outlined herein will be safe for employees to perform work adjacent to the excavation which may include: foundation construction, wall construction, backdrain installation, finishing, and waterproofing. Prior to any work being performed adjacent to the excavation, other than performing the excavation with heavy equipment, excavations **must** be reviewed by a representative of this office in order to verify that the conditions encountered during grading are similar to those encountered during our initial investigation. If the conditions vary from those anticipated, additional recommendations may be required so that safe and stable excavations are made. Additional recommendations may include, but not be limited to, shoring, slot cutting or trimming of cuts to a safe inclination.

Construction excavations shall be made under the supervision of a qualified "competent person" along with periodic review performed by this office. A "competent person" as defined by California/OSHA, is one who is capable of identifying existing and predictable hazards that are unsanitary or dangerous to employees. The competent person has the authority to impose prompt corrective measures to eliminate these hazards.

All excavations should be stabilized within 15 days of initial excavation. If this time is exceeded, the project soils engineer must be notified, and modifications, such as shoring or slope trimming may be required. Water should not be allowed to pond on top of the excavation, nor to flow toward it. All excavations should be protected from inclement weather. The top of the excavations should be barricaded to ensure that no vehicular surcharge be allowed within five feet (5') of the top of cut.

All other construction methods shall meet the requirements of the Construction and General Industry Safety Orders, the Occupational Safety and Health Act, California OSHA in addition to other public agencies having jurisdiction.

CONCRETE DECKING

Concrete decking should be a minimum of four inches (4") thick, reinforced with minimum #3 reinforcing bars placed at eighteen inches (18") on center each way. The decking should be underlain by two inches (2") sand to aid in concrete curing. For crack control in concrete decking, the maximum control joint spacing should be eight feet (8'). A closer control joint spacing would provide greater crack control. Additional control joints at 90° corners, curves, angle points and where decking transitions to a narrower segment are recommended.

Decking that adjoins a lawn, planter or the top of a slope should be provided with an 8-inch-thick deepened edge. The deck reinforcement should be bent down into the thickened edge. Steel reinforcing bars (#3) should be provided at the top and bottom of the deepened edge. Although precautions can be taken, the recommendations are not intended to stop movement, settlement, differential settlement, or cracking. Recommendations provided are only to reduce movement, settlement and cracking as a result of expansion/contraction or consolidation of the supporting soil.

It should be noted that cracking of concrete decking is very common during curing. The cracking occurs because concrete shrinks as it dries. It is important that additional water not be added to concrete at the site to make pumping easier as this will increase the magnitude of shrinkage.

UTILITY TRENCHES

It is recommended that utility tenches are not planned or placed parallel to and below a 1½:1 plane projected down from the base of the outer edge of a conventional foundation. Footings should be deepened to satisfy the above recommendations. Clean sand should be placed around utility lines and properly jetted. Flooding and/or jetting of utility trenches does not create compact trench backfill and should be limited to backfilling around, and up to six inches (6") above, utility pipes. Backfill for the remaining portion of the trench above the pipes should be placed by mechanical compaction methods to a minimum of 90% of the maximum density, as determined by the latest version of ASTM D 1557. The upper twelve inches (12") of the certified fill shall be compacted to at least 95% of the maximum density in all areas where vehicle loading occurs. All compaction should be tested and certified by this office. Failure to properly backfill and compact utility trenches can result in water migrating through the trench which could lead to foundation settlement or slope instability. Utility penetrations through footings should be tightly sealed when raised-floor construction is utilized.

DRAINAGE AND MAINTENANCE

General

Maintenance of structures and slopes must be performed to minimize the chance of serious damage and/or instability to improvements. Most problems are associated with, or triggered by water. Therefore, a comprehensive drainage system should be designed and incorporated into the final plans. In addition, pad areas should be maintained and planted in a way that will allow this drainage system to function as intended. The following are drainage, maintenance and landscaping recommendations that should be implemented at minimum. Reductions in these recommendations will reduce their effectiveness and may lead to damage and/or instability to site improvements and adjacent properties. It is the responsibility of the property owner to ensure that the residence and site drainage devices are maintained in accordance with the following recommendations, including the requirements of applicable governing agency.

1. Pad Drainage

   (a) Positive pad drainage shall be incorporated into the final plans. All drainage from the roof and pad shall be directed so that water does not pond adjacent to the foundations or flow toward them. All drainage from the site shall be collected and directed via non-erosive devices to a location approved by the building official. **No alteration of this system shall be allowed.**

   (b) Planters placed adjacent to the structures shall be designed to drain away from the structure. Care should be taken to not saturate the soils (i.e. leaking irrigation lines or excessive landscape watering).

2. Slope Drainage

   No water shall be allowed to flow over any slopes. The drainage structures constructed to enhance slope stability shall be cleaned and/or maintained. This includes, but is not limited to, interceptor ditches, drainage terraces, downdrains, berms, debris fences, grates, and exits for subsurface devices.

3. Landscaping (Planting)

   It is recommended that a landscape architect be consulted regarding planting adjacent to the development and on any slopes. Plants surrounding the development shall be of a variety that requires a minimum of watering. Slope landscaping shall consist of plants with dense and deep root structures that require a minimum of watering. It will be the responsibility of the property owner to maintain the planting. Alterations of planting schemes shall be reviewed by the landscape architect.

4. Irrigation

   An adequate irrigation system will be required to sustain landscaping. Any leaks or defective sprinklers shall be repaired immediately. To mitigate erosion and saturation, automatic sprinkling systems shall be adjusted for rainy seasons. A landscape irrigation specialist should be consulted to determine the best times for landscape watering and the maximum amount of water usage.

5. Rodent Control

   The property owner must undertake and maintain a program which eliminates or controls burrowing animals. This must be an ongoing program in order to provide protection to the slope's stability. The uncontrolled burrowing by rodents has proven to be one of the major causes for surficial slope stability problems.

REVIEWS

Plan Review and Plan Notes

The final construction and/or grading plans shall be reviewed and approved by the consultants. This is required to determine if the recommendations of the report have been properly understood and carried forth in the design drawings.

The final plans should reflect the following:

1. The Soils Engineering Investigation by SubSurface Designs, Inc., as a part of the plans.

2. Plans must be reviewed and signed by the soils engineer.

3. All grading must be reviewed by the project soils engineer.

4. All foundations shall be reviewed by the project soils engineer.

5. All deep foundation excavation must be performed under the continuous review of the project soils engineer.

Reviews will be required to verify all work. A review will be performed to determine if the intent of the report has been adequately carried forth. This office should be notified at least **two working days** in advance of any reviews of this nature so that staff personnel may be made available.

Construction Review

It is required that all foundation excavations and grading be reviewed by this office. A review will be performed to determine if the intent of the report has been adequately carried forth. This office should be notified at least two working days in advance of any reviews of this nature so that staff personnel may be made available. The reviews will be billed at our current hourly rate.

LIMITATIONS

General

Subsurface conditions were determined on the basis of our field explorations and appear to be relatively uniform. Although, between exploratory excavations, subsurface earth materials may vary in type, strength, and many other properties. The recommendations presented herein are for soil conditions encountered in specific locations. Other soil conditions due to non-uniformity of the soil conditions or manmade alterations may be revealed during construction. At that time, further recommendations may be made if required.

Conclusions and recommendations presented herein are based on our experience and background. Therefore, the conclusions and recommendations are professional opinions and are not meant to indicate a control of nature. This report makes no other warranty, either expressed or implied, concerning the advice presented herein.

Conclusions on building site stability, settlement, slippage, and its affects on off-site property are based on our visual examination, the placement of explorations, laboratory testing of samples obtained during explorations, analysis of our data, and our experience. It is our opinion that our standard-of-care analysis provides an adequate assessment of the site conditions. Our examination does not, however, imply that the subject property is risk free.

This report may not be copied. If you wish additional copies, you may order them from this office. See your contract for charges.

Construction Notice

Construction can be difficult. Recommendations contained herein are based upon several windows (explorations) excavated at locations deemed suitable by your consultants. It is this corporation's aim to advise you through this report of the general site conditions, suitability for construction, and overall stability. It must be understood that the opinions are based upon testing, analysis, and interpretation thereof.

All properties are subject to risk, these risks can be mitigated but not be eliminated. Properties are subject to hazards including but not limited to, floods, mudslides, landslides, seepage, erosion, raveling of slopes, concentrated drainage, limited access, differential settlement, heaving and fire. The damage from these hazards may be reduced by the property owner by maintaining yards, slopes, walls, slough protection devices, drainage facilities, and by correcting any deficiencies found during occupancy of the property. It is not possible to eliminate all hazards.

Quantities for foundation concrete and steel may be estimated, based on the findings given in this report. However, you must be aware that depths and magnitudes will most likely vary between the excavated windows (explorations) given in the report.

If you have any questions concerning this report, please contact this office.

Respectfully submitted:
SUBSURFACE DESIGNS, INC.

Cameron Kennedy

Cameron Kennedy
Staff Geologist

Jon Mahn
Principal Engineer
RCE 60293

REGISTERED PROFESSIONAL ENGINEER JONATHAN EDWARD MAHN No. 60293 Exp. 06/30/12 CIVIL STATE OF CALIFORNIA

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CLK/JEM/MJT/mm: 5462.01S

dist: (6) Addressee
(1) file

APPENDIX I

SITE INFORMATION

Vicinity Map

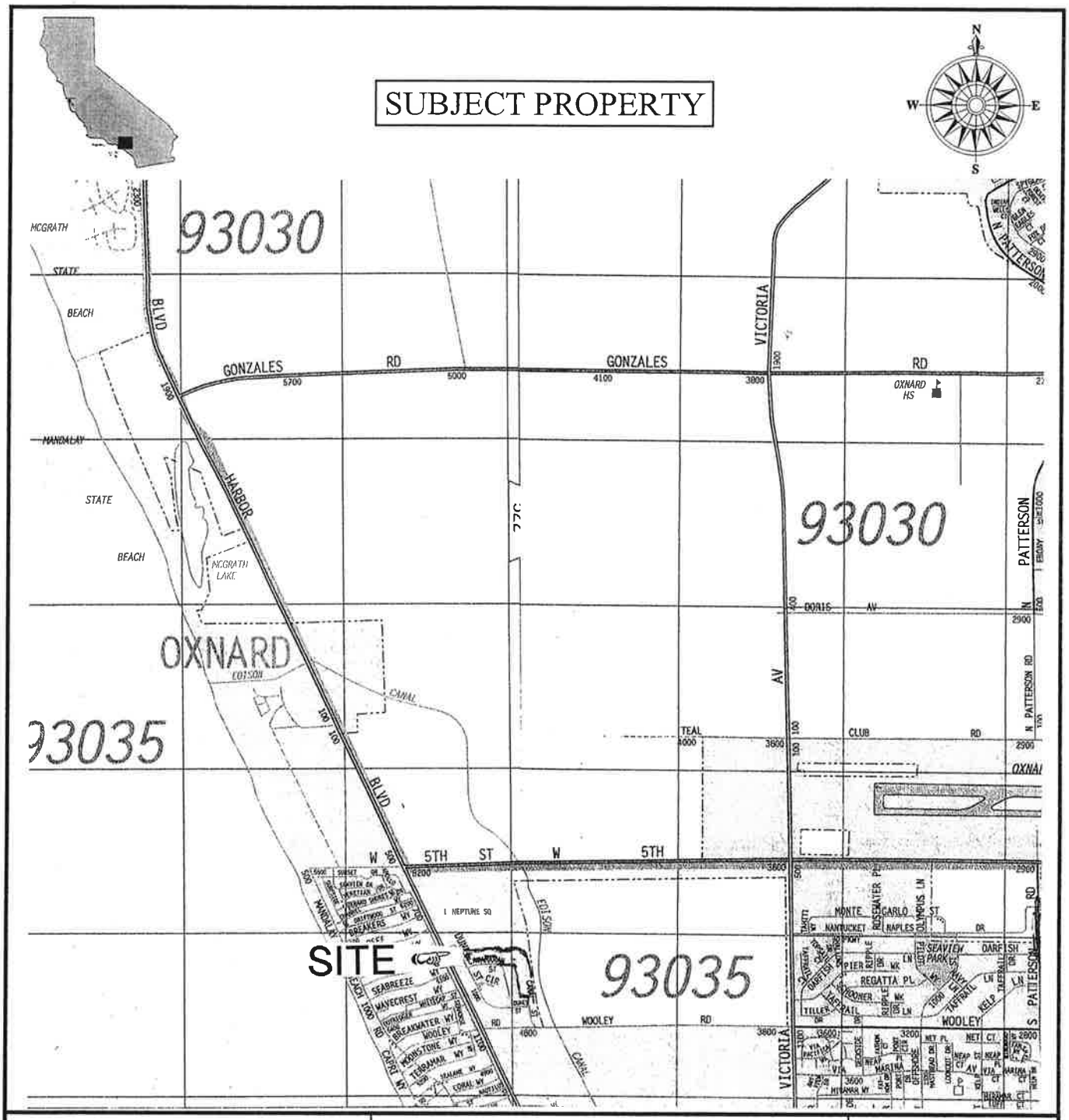
Seismic Hazard Map

Historic High Groundwater Map

Site Plan, Plate A (pocket attachments)

Exploration Logs, Figure E.1 through E.9

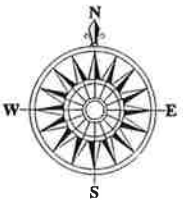
Exploration Logs (SubSurface Designs, Inc., 2008)

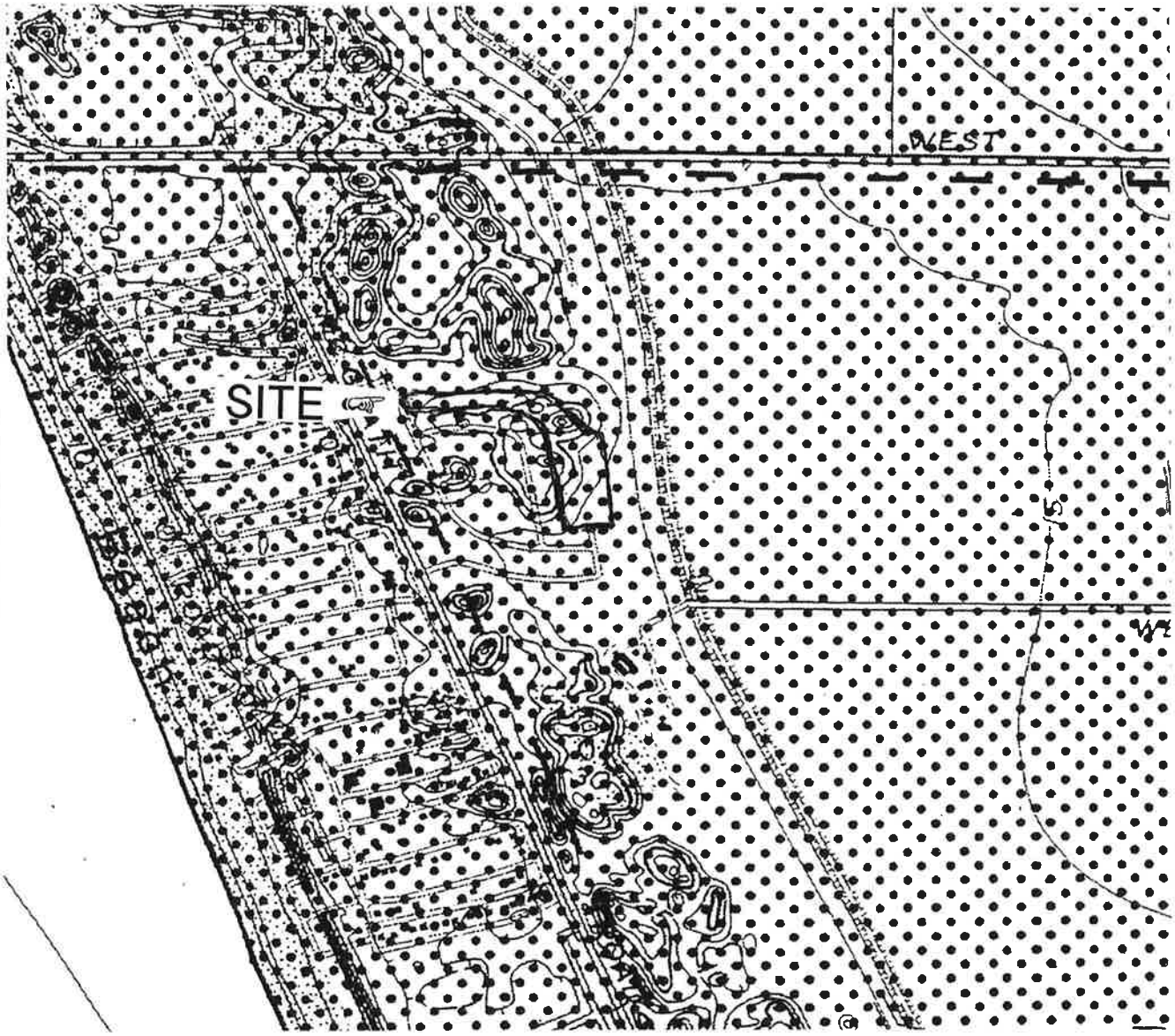


SubSurface Designs, Inc. Geotechnical Engineers Engineering Geologists	**Client**: Oxnard Shores Company, LLC	**PIN#** 5462B
	Subject: Vicinity Map **Ref**: Thomas Bros. Maps L. A. County, Page 521 & 522 **Scale**: 1" = 2400'	

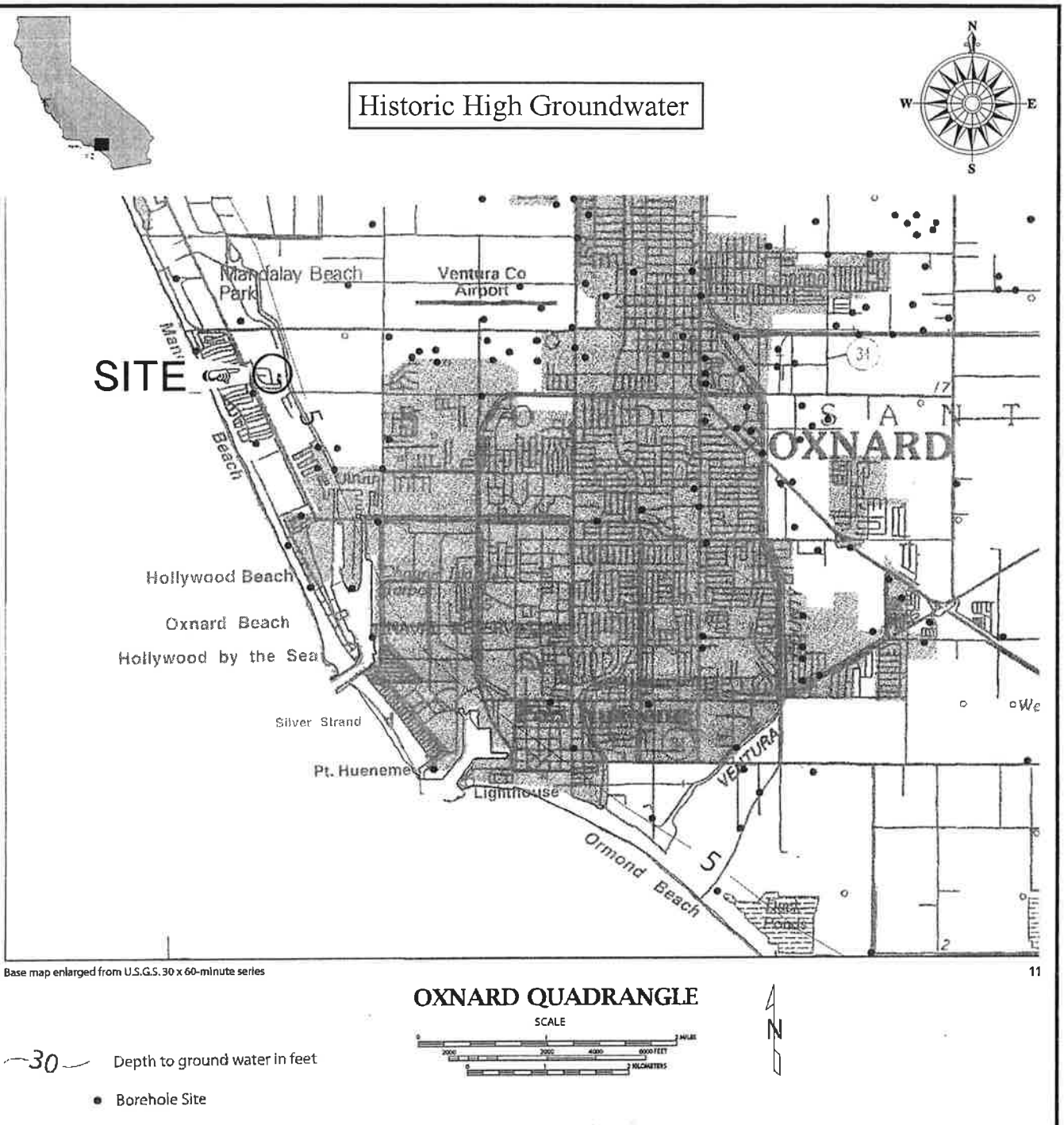


SEISMIC HAZARD MAP





SubSurface Designs, Inc. Geotechnical Engineers Engineering Geologists	**Client**: Oxnard Shores Company, LLC	**PIN#** 5462B
	Ref: Modified from the Seismic Hazard Zone Map of the Oxnard Quadrangle, prepared by the State of California Division of Mines and Geology, 2002. **Scale:** 1: = 1000'	



SubSurface Designs, Inc. Geotechnical Engineers Engineering Geologists	**Client**: Oxnard Shores Company, LLC	**PIN#** 5462B
	Ref: Historically Highest Groundwater Contours, From the Seismic Hazard Zone Report of the Oxnard Quadrangle, prepared by the State of California Division of Mines and Geology, 2002.	

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 01*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 14, 2011*	Top Elevation (ft.):
Date Completed: *March 14, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	30	2	96	2		**Alluvium (Qa)** Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	50	3	100	4		
	53	3				
	24	4		6		
	30	3	96	8		
				▽ 10		
	4	23		12		10.0' - Groundwater Silty Sand - dark brown, wet.
	10	26	101			Silty Fine Sand - dark brown, clay binder, wet.
	12	26	102	14		Silty Fine Sand - grayish brown, clay binder, wet.
	18	28		16		Clayey Silt - dark brown, wet.
				18		
	11	30		20		
				22		
				24		
	16	26		26		Silty Fine Sand - grayish brown, clay binder, wet.
				28		
	13	29		30		Clayey Silt - dark grayish brown, wet.
				32		
				34		
	75	40		36		Sandy Clay - grayish brown, wet.
				38		
	29	28		40		Clayey Silt - dark grayish brown, wet.
				42		
				44		
	35	32		46		Silty Clay - grayish brown, wet.
				48		
	50/6"	22		50		Clayey Fine Sand - grayish brown, wet.

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.1

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 02*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 14, 2011*	Top Elevation (ft.):
Date Completed: *March 14, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
				0		**Alluvium (Qa)**
	40	2	117	2		Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	50/6"	8	100	4		
	26	11		6		Silty Sand - medium brown, fine- to medium-grained, moist.
	13	23	101	8		Silty Fine Sand - dark brown, moist.
	6	25	104	10		9.0' - Groundwater
	3	27				Silty Fine Sand - medium brown, wet.
	19	30	98	12		Clayey Fine Sand - dark brown, wet.
	36	29	103	14		Silty Sand - medium brown, wet.
	26	23		16		Slightly Silty Sand - medium brown, fine- to coarse-grained, wet.
				18		
	16	29		20		Silty Fine Sand - medium brown, clay binder, wet.
				22		
				24		
	21	28		26		
				28		
	27	26		30		Silty Fine Sand - grayish brown, clay binder, wet.
				32		
				34		
	12	39		36		Clayey Silt - grayish brown, wet.
				38		
	43	27		40		Silty Fine Sand - grayish brown, clay binder, wet.
				42		
				44		
	45	32		46		Silty Fine Sand - grayish brown, wet.
				48		
	24	23		50		Silty Sand - grayish brown, fine- to medium-grained, wet.

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 03*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 14, 2011*	Top Elevation (ft.):
Date Completed: *March 14, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit Dry Wt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	31	6	99	2		**Alluvium (Qa)** Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	42	14	106	4		
	48	12		6		Silty Sand - medium brown, fine- to medium-grained, moist.
	27	17	112	8		Silty Fine Sand - dark brown, moist.
	11	23		▽ 10		10.0' - Groundwater
	17	19	101	12		Slightly Silty Sand - medium brown, fine- to coarse-grained, wet.
	15	20	109	14		Slightly Silty Sand - grayish-brown, fine- to medium-grained, wet.
	18	21		16		
				18		
	50/4"	108		20		Silty Sand - black, sulfer odor, clear crystals, wet.
				22		
				24		
	50/6"	26		26		Silty Sand - grayish brown, fine- to medium-grained, wet.
				28		
	30	26		30		Clayey Silt - grayish brown, wet.
				32		
				34		
	21	27		36		Silty Fine Sand - grayish-brown, clay binder, wet.
				38		
	40	22		40		
				42		
				44		
	37	27		46		Silty Fine Sand - grayish brown, wet.
				48		
	20	27		50		Silty Fine Sand - grayish brown, clay binder, wet.

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.3

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 04*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 22, 2011*	Top Elevation (ft.):
Date Completed: *March 22, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	28	3	99	2		**Alluvium (Qa)** Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	14	4	100	4		
	6	5		6		
	8	6	92	8		
	9	8		10		
	3	16	111	12		Silty Sand - dark brown, wet.
	14	23		▽ 14		14.0' - Groundwater
	11	24	105	16		Silty Fine Sand - medium brown, clay binder, wet. Silty Sand - medium brown, wet.
	16	25		18 20		Clayey Silt - medium brown, wet.
	15	27		22 24 26		Clayey Silt - grayish brown, wet.
	20	27		28 30		Silty Fine Sand - grayish brown, wet.
	25	29		32 34 36		Clayey Silt - grayish brown, wet.
	42	23		38 40		Silty Fine Sand - grayish brown, wet.
	24	23		42 44 46		Sandy Silt - grayish brown, wet.
	21	32		48 50		Silty Clay - grayish brown, wet.

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.4

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 05*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 22, 2011*	Top Elevation (ft.):
Date Completed: *March 22, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit Dry Wt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	24	4	99	2		**Alluvium (Qa)** Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	25	4	101	4		
	19	7		6		
	13	6	96	8		
	5	18		▽ 10		10.0' - Groundwater
	7	25	105	12		Silty Sand - medium to dark brown, wet. Clayey Sand - dark brown, wet.
	18	23		14 16		Silty Sand - medium brown, fine- to medium-grained, wet.
	21	26	99	18		Clayey Sand - dark brown, wet.
	17	28		20		Clayey Sand - medium brown, wet.
				22 24		
	10	27		26		Clayey Silt - grayish brown, wet.
				28		
	17	32		30		Silty Fine Sand - grayish brown, wet.
				32 34		
	33	34		36		
				38		
	40	42		40		Silty Clay - grayish brown, wet.
				42 44		
	25	26		46		Silty Fine Sand - grayish brown, wet.
				48		
	28	29		50		Clayey Fine Sand - grayish brown, wet.

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.5

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 06*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 22, 2011*	Top Elevation (ft.):
Date Completed: *March 22, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit Dry Wt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
				0		**Alluvium (Qa)**
	16	15	97	2		Silty Sand - medium brown to grayish brown, moist.
	--	4		4		
	13	6	95			Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	11	6		6		
	25	4	99	8		
	16	3		10		
	24	9	103	12		
	3	22		▽ 14		14.0' - Groundwater
	7	24	105	16		Clayey Sand - dark brown, wet.
				18		
	19	27		20		Clayey Sand - grayish brown, fine- to coarse-grained, wet.
				22		
				24		
	25	31		26		Sandy Clay - medium brown, wet.
				28		
	35	24		30		Clayey Silt - grayish brown, wet.
				32		
				34		
	19	37		36		Silty Clay - grayish brown, wet.
				38		
	25	34		40		Clayey Silt - grayish brown, wet.
				42		
				44		
	28	34		46		Silty Fine Sand - grayish brown, wet.
				48		
	20	54		50		Silty Clay - dark brown, wet.

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GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.6

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 07*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 23, 2011*	Top Elevation (ft.):
Date Completed: *March 23, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit Dry Wt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
				2		**Alluvium (Qa)**
	20	5	99			Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	20	5	101	4		
	12	7		6		
	12	20	99	8		
				▽		9.0' - Groundwater
	4	24		10		Clayey Sand - dark brown, wet.
	10	23	106	12		Clayey Silt - dark brown, wet.
	15	24		14		Silty Sand - medium brown, clay binder, wet.
	22	27	103	16		Clayey Sand - medium brown, wet.
				18		
	23	28		20		Silty Clay - dark brown, wet.
				22		
				24		
	25	28		26		Clayey Sand - grayish brown, wet.
				28		
				30		
	8	24		32		
				34		
	22	23		36		Slightly Silty Sand - grayish brown, fine- to coarse-grained, wet.
				38		
				40		
	18	30		42		Silty Clay - grayish brown, wet.
				44		
	28	23		46		Clayey Sand - grayish brown, wet.
				48		
				50		
	33	29				Clayey Silt - grayish brown, wet.

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.7

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 08*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 23, 2011*	Top Elevation (ft.):
Date Completed: *March 23, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	24	4	102	2		**Alluvium (Qa)** Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	19	4	98	4		
	13	7		6		
	20	5	101	8		
	11	22		10		
	16	22	104	▽ 12		
				14		13.0' - Groundwater
	13	24		16		Clayey Sand - medium brown, wet.
	23	23	110	18		Silty Sand - grayish brown, wet.
	15	28		20		Sandy Clay - grayish brown, wet.
				22		
				24		
	36	26		26		Clayey Fine Sand - grayish brown, wet.
				28		
	10	34		30		Clayey Silt - grayish brown, wet.
				32		
				34		
	34	18		36		Slightly Silty Sand - grayish brown, wet.
				38		
	13	26		40		Silty Clay - grayish brown, wet.
				42		
				44		
	24	23		46		Sandy Clay - grayish brown, wet.
				48		
	35	23		50		Clayey Sand - grayish brown, wet.

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.8

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores Company / Canal Street*	EXPLORATION NO: *AH 09*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462B*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *March 23, 2011*	Top Elevation (ft.):
Date Completed: *March 23, 2011*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
				0		**Alluvium (Qa)**
	26	5	108	2		Slightly Silty Sand - medium brown, fine- to medium-grained, moist.
	--	4	99	4		
	24	5		6		
	12	6		8		
	16	21	104	10		
	5	22		12		
	20	20	108	▽ 14		14.0' - Groundwater
	21	24		16		
	24	21	108	18		
	16	22		20		Clayey Sand - grayish brown, wet.
				22		
	17	24		24		Clayey Fine Sand - grayish brown, wet.
				26		
	18	25		28		Clayey Silt - grayish brown, wet.
				30		
	19	19		32		Clayey Sand - grayish brown, wet.
				34		
	19	19		36		Silty Sand - grayish brown, wet.
				38		
	23	23		40		Clayey Sand - grayish brown, wet.
				42		
	31	23		44		
				46		
				48		
				50		

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.9

Exploration Logs (SubSurface Designs, Inc., 2008)

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 01*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 9, 2008*	Top Elevation (ft.):
Date Completed: *October 9, 2008*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
				2		**Alluvium (Qa)**
	66	1	115			Slightly Silty Sand - medium brown, dry
	37	14	113	4		Silty Sand - medium to dark brown, moist
	29	19	113	6		
	12	30		8		Clayey Fine Sand - medium brown, very moist
	15	32		10		Clayey Silt - medium brown, very moist
	18	25		▽ 12		13.0' - Groundwater
				14		
	23	32	94	16		Sandy Clay - medium brown, fine grained
	16	29				
	19	29		18		
	17	24		20		
				22		
				24		
	16	24		26		
				28		
	36	27		30		
				32		
				34		
	18	28		36		Sandy Silt - grayish brown, clay binder
				38		
	30	25		40		Silty Sand - grayish brown, clay binder
				42		
				44		
	55	22		46		Sandy Silt - grayish brown, fine to medium grained, clay binder
				48		
	35	21		50		Sand - grayish brown, fine to coase grained, some gravel.

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.1

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 02*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 9, 2008*	Top Elevation (ft.):
Date Completed: *October 9, 2008*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit Dry Wt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	47	8	123	2		**Alluvium (Qa)** Silty Fine Sand - dark brown, slightly moist, clay binder
	27	10	122	4		
	16	19		6		
	9	15	100	8		
	8	28	99	10		
	19	28		12		Silty Sand - medium brown, clay binder, very moist
				14		
	17	30	96	16		15.0' - groundwater Clayey Fine Sand - medium brown
	10	26		18		
	9	25		20		Silty Fine Sand - grayish brown, very moist
				22		
				24		
	31	18		26		
				28		
	54	22		30		
				32		
				34		
	30	25		36		dark brown
				38		
	55	20		40		
				42		
				44		
	37	25		46		
				48		
	36	20		50		

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.2

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 03*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 9, 2008*	Top Elevation (ft.):
Date Completed: *October 9, 2008*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit Dry Wt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
				0		**Alluvium (Qa)**
	33	1	107	2		Sand - light brown, fine to medium grained, dry, moist and clayey with depth
	40	3 2	106	4		
	17	24	104	6		
	14	30		8		Clayey Silt - medium brown, very moist
	17	31		10		
	24	20	107	12		12.0' - groundwater
	4	25		14		Slightly Silty Sand - medium brown
	10	27		16		
	23	26		18		
	26	25		20		
				22		
				24		
	42	23		26		
				28		
				30		
	35	24		32		
				34		
	16	28		36		Slightly Sandy Silt - dark grayish brown
				38		
				40		
	21	25		42		
				44		
	20	35		46		Sandy Silt - dark grayish brown, clay binder
				48		
				50		
	80	24				Slightly Silty Sand - grayish brown

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure E.3

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 04*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 10, 2008*	Top Elevation (ft.):
Date Completed: *October 10, 2008*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit Dry Wt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	59	1	114	2		**Alluvium (Qa)** Silty Sand - medium brown, clay binder, slightly moist
	85	2	122	4		
	18	4		6		Slightly Silty Sand - medium brown, fine to medium grained, slightly moist
	86	11	122	8		
	13	22	105	10		
	14	21		12		Silty Fine Sand - medium brown, clay binder, very moist
▽	12	23		14		13.0' - groundwater
	25	17	113	16		Silty Fine Sand - grayish brown, clay binder, very moist
				18		
	13	25		20		Clayey Fine Sand - dark brown
				22		
				24		
	19	29		26		
				28		
	22	18		30		
				32		
				34		
	34	25		36		
				38		
	25	26		40		
				42		
				44		
	18	30		46		Clayey Silt - grayish brown
				48		
	23	21		50		Slightly Silty Sand - grayish brown, fine to medium grained

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Figure E.4

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 05*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 10, 2008*	Top Elevation (ft.):
Date Completed: *October 10, 2008*	Excavation Width: *8"*

Depth (ft.)	Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
0						**Alluvium (Qa)**
2						Slightly Silty Sand - medium brown, dry to moist
4		--	1			
		16				
6		16	2	99		
8		16	6			
10		20	19			10.0' - groundwater
12		19	21			Silty Fine Sand - grayish brown, clay binder
14		27	35	91		
16		15	26			
18		11	29			Silty Sand - grayish brown, fine to medium grained, clay binder
20		10	25			
22						
24						
26		40	27			Silty Fine Sand - grayish brown
28						
30		15	28			Clayey Silt - dark grayish brown
32						
34						
36		27	25			Silty Fine Sand - grayish brown
38						
40		28	28			
42						
44						
46		44	20			
48						
50						
		50/6"	18			Slightly Silty Sand - grayish brown, fine to medium grained

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Figure E.5

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 06*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 10, 2008*	Top Elevation (ft.):
Date Completed: *October 10, 2008*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	53	2	116	2		**Alluvium (Qa)** Silty Sand - dark brown, fine to medium grained, dry to slightly moist
	55	1	108	4		
	41	4		6		Slightly Silty Sand - medium brown, fine to medium grained, moist
	55	3	96	8		
	31	10	97	10		
	22	21		12		11.0' - groundwater
	37	19	107	14		
	17	25		16		Silty Sand - medium brown to grayish brown, fine to medium grained, clay binder
				18		
	7	32		20		Sandy Silt - dark grayish brown, fine grained, clay binder
				22		
				24		
	22	25		26		Silty Sand - grayish brown, clay binder
				28		
	20	27		30		
				32		
				34		
	14	28		36		
				38		
	22	25		40		
				42		
				44		
	20	25		46		
				48		
	50/6"	24		50		Slightly Silty Sand - grayish brown, fine to medium grained

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Figure E.6

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 07*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 13, 2008*	Top Elevation (ft.):
Date Completed: *October 13, 2008*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
				2		**Alluvium (Qa)**
	50/6"	2	111			Silty Sand - medium brown, dry
	88/10"	5	122	4		dark brown, slightly moist, sticky, petroleum odor
	30	9	113	6		
	21	16		8		Slightly Silty Sand - medium brown, fine to medium grained, very moist
	29	20		▽ 10		10.0' - groundwater
	38	18	111	12		
	16	29		14		
	10	29		16		Silty Sand - grayish brown, fine to medium grained, clay binder
	11	27		18		
	31	20		20		
				22		
				24		
	42	22		26		Sandy Silt - grayish brown, fine grained
				28		
	21	20		30		
				32		
				34		
	38	23		36		
				38		
	29	23		40		
				42		
				44		
	50	29		46		
				48		
				50		
	50/6"	22				Silty Sand - grayish brown, fine to medium grained

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Figure E.7

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 08*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 13, 2008*	Top Elevation (ft.):
Date Completed: *October 13, 2008*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
	34	2	113	2		**Alluvium (Qa)** Silty Sand - medium brown, dry
	34	1	104	4		Slightly Silty Sand - medium brown, fine to medium grained, moist
	18	2		6		
	27	2	102	8		
	32	18	105	10		9.0' - groundwater
	26	20		12		Silty Sand - grayish brown, fine to medium grained
	31	19		14		
	29	23	104	16		
				18		
	17	26		20		Sandy Silt - grayish brown, clay binder
				22		
				24		
	30	21		26		Sandy Silt - grayish brown, fine grained
				28		
	10	28		30		Sandy Silt - grayish brown, clay binder
				32		
				34		
	25	26		36		Sandy Silt - grayish brown, fine grained, clay binder
				38		
	31	23		40		
				42		
				44		
	35	21		46		
				48		
	55	25		50		Silty Sand - grayish brown, fine to medium grained, very moist

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Figure E.8

EXPLORATION LOG

PROJECT NAME: *Oxnard Shores/Harbor Bl. & Wooley Rd.*	EXPLORATION NO: *AH 09*	PAGE *1* OF *1*
PROJECT NUMBER: *PIN 5462*	EXPLORATION EQUIPMENT: *Hollow-Stem Auger*	
Comments: *See attached Site Plan for location.*		

Logged By: *CLK*	Total Depth: *51.0'*
Date Started: *October 13, 2008*	Top Elevation (ft.):
Date Completed: *October 13, 2008*	Excavation Width: *8"*

Sample Graphics	Blow Count (Per Foot)	Moisture Content (%)	Unit DryWt. (pcf)	Depth (ft.)	Lithologic Graphics	LITHOLOGIC DESCRIPTION
				2		**Alluvium (Qa)**
	50/6"	2	119			Silty Sand - medium brown, dry
	50/5"	4	100	4		Silty Sand - medium brown, fine to coarse grained, slightly moist
	54	2	95	6		Slightly Silty Sand - medium brown, fine to medium grained, wet
	18	17		▽ 8		8.0' - groundwater
	19	23		10		
	50/6"	18		12		
	78/9"	19	111	14		
	70	22		16		
	82/11"	20		18		Silty Sand - grayish brown, fine to medium grained
	50/6"	19		20		
				22		
				24		
	70	20		26		
				28		
	11	23		30		
				32		
				34		
	75	24		36		
				38		
	32	21		40		
				42		
				44		
	85/9"	22		46		
				48		
	50/6"	27		50		

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Figure E.9

APPENDIX II

LABORATORY TEST RESULTS

Laboratory Testing

Laboratory Recapitulation - Table I-1

Chemical Test Results - Table I-2

Shear Strength Diagram, Figure S.1 through S.5

Consolidation Diagram, Figure C.1 through C.19

Maximum Density, Figure M.1

Sieve Analysis, Figure SV.1 through SV.11

LABORATORY TEST RESULTS

Moisture and Density Tests

The moisture content and in-place dry density of all undisturbed samples obtained were determined. The test results are presented in the Laboratory Recapitulation - Table I.

Shear Tests

Direct single-shear tests were performed on representative undisturbed samples to determine their strength characteristics. The desired normal load was applied to the specimen and allowed to come to equilibrium. The rate of deflection on the sample is approximately 0.01 inches per minute. Depending upon the sample location and future site condition, samples may be tested at field moisture. The results are plotted on the Shear Test Diagrams and in the Laboratory Recapitulation - Table I.

Consolidation

Consolidation tests were performed on undisturbed samples to predict the soils behavior under a specific load. Loads are applied in increasing load increments and the results are recorded. The samples are usually inundated at a designated load to determine the effect of water contacting the bearing soil. The results are plotted on the "Consolidation Pressure Curve," figures. The load at which the water is added is noted on the drawing.

Expansion Tests

Expansion tests are performed on representative samples to determine the expansive potential of compacted soils when inundated with water. The test was performed in accordance with the latest version of ASTM D 4829. The classification of potentially expansive soil is based on the following table.

Expansion Index	Potential Expansion
0-20	Very Low
20-50	Low
50-90	Medium
90-130	High
Above 130	Very High

Maximum Density

Maximum density tests are performed on representative samples to determine compactive characteristics and used to evaluate the present relative compaction of the in-place earth materials. The test was performed in accordance with the latest version of ASTM D 1557 (five layer).

Remolded Tests

Remolded samples are either prepared to in-situ densities for the desired material or in accordance with the maximum density tests described above. Remolded samples for shear, swell, and consolidation are prepared at densities corresponding to in-situ density, 90 or 95 percent of the maximum dry density, or as specified for project requirements.

Sulfate Tests

Selected samples were tested for their sulfate contents. Samples were obtained from the subsurface soils that will be in contact with the foundation of the proposed structure. The results are shown in the Laboratory Recapitulation - Table I.

RECOMMENDATIONS FOR NORMAL WEIGHT CONCRETE SUBJECT TO SULFATE ATTACK

Exposure	Water Soluble Sulfate (SO_4) in soil (%)	Sulfate (SO_4) in water (ppm)	Cement	Water Cement Ratio Maximum*
Mild	0.00-0.10	0-150	--	0.50
Moderate**	0.10-0.2	150-1500	Type II	0.50
Severe	0.20-2.00	1500-10,000	Type V	0.45
Very Severe	Over 2.00	Over 10,000	Type V + Pozzolan***	0.45

* A lower water-cement ratio may be necessary to prevent corrosion of embedded items.

** Seawater also falls in this category.

*** Use a pozzolan which has been determined by tests to improve sulfate resistance when used in concrete containing Type V cement.

LABORATORY RECAPITULATION

Table I-1

Location	Depth (ft)	Material Type	In Situ Dry Density. (P.C.F.)	In Situ Water (%)	Expansion Index	Percent Passing #200 Sieve	Cohesion (ksf)	Friction Angle (deg)
AH 01	1.0	Qa	96.4	2.2				
AH 01	2.0	Qa	Bulk	2.6	0	6.1	0.160	30.0
AH 01	3.0	Qa	100.0	3.5			0.115	30.5
AH 01	5.0	Qa	SPT	3.7				
AH 01	7.0	Qa	95.9	3.3				
AH 01	10.0	Qa	SPT	22.6				
AH 01	12.0	Qa	100.7	26.3		56.6		
AH 01	14.0	Qa	102.0	25.7				
AH 01	15.0	Qa	SPT	27.9		74.8		
AH 01	20.0	Qa	SPT	30.1				
AH 01	25.0	Qa	SPT	25.7		33.3		
AH 01	30.0	Qa	SPT	29.0		73.3		
AH 01	35.0	Qa	SPT	39.9		67.8		
AH 01	40.0	Qa	SPT	28.2				
AH 01	45.0	Qa	SPT	31.6		85.5		
AH 01	50.0	Qa	SPT	21.6				
AH 02	2.0	Qa	116.6	2.4		8.2	0.130	27.5
AH 02	4.0	Qa	100.2	8.0				
AH 02	5.0	Qa	SPT	10.6				
AH 02	7.0	Qa	101.4	22.9				

Table I-1

Location	Depth (ft)	Material Type	In Situ Dry Density. (P.C.F.)	In Situ Water (%)	Expansion Index	Percent Passing #200 Sieve	Cohesion (ksf)	Friction Angle (deg)
AH 02	9.0	Qa	103.9	24.9				
AH 02	10.0	Qa	SPT	27.1		48.1		
AH 02	12.0	Qa	98.3	29.6				
AH 02	14.0	Qa	103.2	28.7				
AH 02	15.0	Qa	SPT	22.6		32.2		
AH 02	20.0	Qa	SPT	29.0		73.7		
AH 02	25.0	Qa	SPT	27.6				
AH 02	30.0	Qa	SPT	25.7		73.8		
AH 02	35.0	Qa	SPT	39.3		88.1		
AH 02	40.0	Qa	SPT	27.1				
AH 02	45.0	Qa	SPT	31.9		41.4		
AH 02	50.0	Qa	SPT	22.6				
AH 03	1.0	Qa	99.3	6.0				
AH 03	3.0	Qa	105.9	13.5				
AH 03	5.0	Qa	SPT	12.2		24.8		
AH 03	7.0	Qa	111.9	17.3				
AH 03	10.0	Qa	SPT	23.1				
AH 03	12.0	Qa	101.3	19.0				
AH 03	14.0	Qa	109.1	20.2				
AH 03	15.0	Qa	SPT	20.6		19.4		
AH 03	20.0	Qa	SPT	107.7		89.0		

Table I-1

Location	Depth (ft)	Material Type	In Situ Dry Density. (P.C.F.)	In Situ Water (%)	Expansion Index	Percent Passing #200 Sieve	Cohesion (ksf)	Friction Angle (deg)
AH 03	25.0	Qa	SPT	26.3		21.3		
AH 03	30.0	Qa	SPT	26.3		69.8		
AH 03	35.0	Qa	SPT	27.1		74.0		
AH 03	40.0	Qa	SPT	22.4				
AH 03	45.0	Qa	SPT	26.8		57.7		
AH 03	50.0	Qa	SPT	27.1				
AH 04	2.0	Qa	98.9	2.9		2.7		
AH 04	4.0	Qa	99.9	4.4				
AH 04	6.0	Qa	SPT	5.5				
AH 04	8.0	Qa	92.1	5.7				
AH 04	10.0	Qa	SPT	7.6				
AH 04	12.0	Qa	111.2	16.0				
AH 04	14.0	Qa	SPT	23.4		47.4		
AH 04	16.0	Qa	105.1	24.2		41.8		
AH 04	20.0	Qa	SPT	24.9		67.3		
AH 04	25.0	Qa	SPT	26.5				
AH 04	30.0	Qa	SPT	27.1		34.5		
AH 04	35.0	Qa	SPT	29.0				
AH 04	40.0	Qa	SPT	23.4				
AH 04	45.0	Qa	SPT	23.4		72.0		
AH 04	50.0	Qa	SPT	31.9				

Table I-1

Location	Depth (ft)	Material Type	In Situ Dry Density. (P.C.F.)	In Situ Water (%)	Expansion Index	Percent Passing #200 Sieve	Cohesion (ksf)	Friction Angle (deg)
AH 05	1.0	Qa	99.4	3.7		1.7		
AH 05	3.0	Qa	100.7	4.4				
AH 05	5.0	Qa	SPT	6.8				
AH 05	7.0	Qa	95.7	5.9				
AH 05	10.0	Qa	SPT	17.6				
AH 05	12.0	Qa	105.4	24.7				
AH 05	15.0	Qa	SPT	22.9		36.6		
AH 05	17.0	Qa	99.3	26.0		74.0		
AH 05	20.0	Qa	SPT	27.6				
AH 05	25.0	Qa	SPT	26.8		72.2		
AH 05	30.0	Qa	SPT	31.6		55.6		
AH 05	35.0	Qa	SPT	33.6				
AH 05	40.0	Qa	SPT	41.6		77.2		
AH 05	45.0	Qa	SPT	26.3				
AH 05	50.0	Qa	SPT	29.3				
AH 06	2.0	Qa	96.6	14.6				
AH 06	3.0	Qa	Bulk	4.4		1.7		
AH 06	4.0	Qa	95.1	5.9				
AH 06	6.0	Qa	SPT	6.4				
AH 06	8.0	Qa	99.4	4.2				
AH 06	10.0	Qa	SPT	3.1				

Table I-1								
Location	Depth (ft)	Material Type	In Situ Dry Density. (P.C.F.)	In Situ Water (%)	Expansion Index	Percent Passing #200 Sieve	Cohesion (ksf)	Friction Angle (deg)
AH 06	12.0	Qa	102.6	9.4				
AH 06	14.0	Qa	SPT	21.6				
AH 06	16.0	Qa	104.6	24.4				
AH 06	20.0	Qa	SPT	27.4		77.8		
AH 06	25.0	Qa	SPT	31.3		74.1		
AH 06	30.0	Qa	SPT	24.2		62.2		
AH 06	35.0	Qa	SPT	37.0		67.8		
AH 06	40.0	Qa	SPT	33.6				
AH 06	45.0	Qa	SPT	33.9		43.3		
AH 06	50.0	Qa	SPT	54.0				
AH 07	2.0	Qa	98.9	4.7				
AH 07	4.0	Qa	101.4	4.6				
AH 07	6.0	Qa	SPT	7.0		3.3		
AH 07	8.0	Qa	99.5	19.9				
AH 07	10.0	Qa	SPT	23.9		36.1		
AH 07	12.0	Qa	106.2	23.4				
AH 07	14.0	Qa	SPT	23.9				
AH 07	16.0	Qa	103.3	26.5				
AH 07	20.0	Qa	SPT	28.2		79.4		
AH 07	25.0	Qa	SPT	27.9				
AH 07	30.0	Qa	SPT	23.9				

Table I-1

Location	Depth (ft)	Material Type	In Situ Dry Density. (P.C.F.)	In Situ Water (%)	Expansion Index	Percent Passing #200 Sieve	Cohesion (ksf)	Friction Angle (deg)
AH 07	35.0	Qa	SPT	22.9		27.3		
AH 07	40.0	Qa	SPT	30.4				
AH 07	45.0	Qa	SPT	23.4				
AH 07	50.0	Qa	SPT	29.0				
AH 08	1.0	Qa	101.9	4.0				
AH 08	3.0	Qa	98.5	4.4			0.250	29.0
AH 08	5.0	Qa	SPT	7.0		5.3		
AH 08	7.0	Qa	101.0	5.5				
AH 08	10.0	Qa	SPT	21.9				
AH 08	12.0	Qa	103.8	21.9				
AH 08	15.0	Qa	SPT	24.4		37.0		
AH 08	17.0	Qa	109.9	22.6				
AH 08	20.0	Qa	SPT	28.2		76.9		
AH 08	25.0	Qa	SPT	26.0		28.8		
AH 08	30.0	Qa	SPT	34.2		91.2		
AH 08	35.0	Qa	SPT	18.5				
AH 08	40.0	Qa	SPT	26.0		92.4		
AH 08	45.0	Qa	SPT	23.1				
AH 08	50.0	Qa	SPT	23.4				
AH 09	2.0	Qa	107.5	5.1				
AH 09	3.0	Qa	Bulk	4.2		2.8		

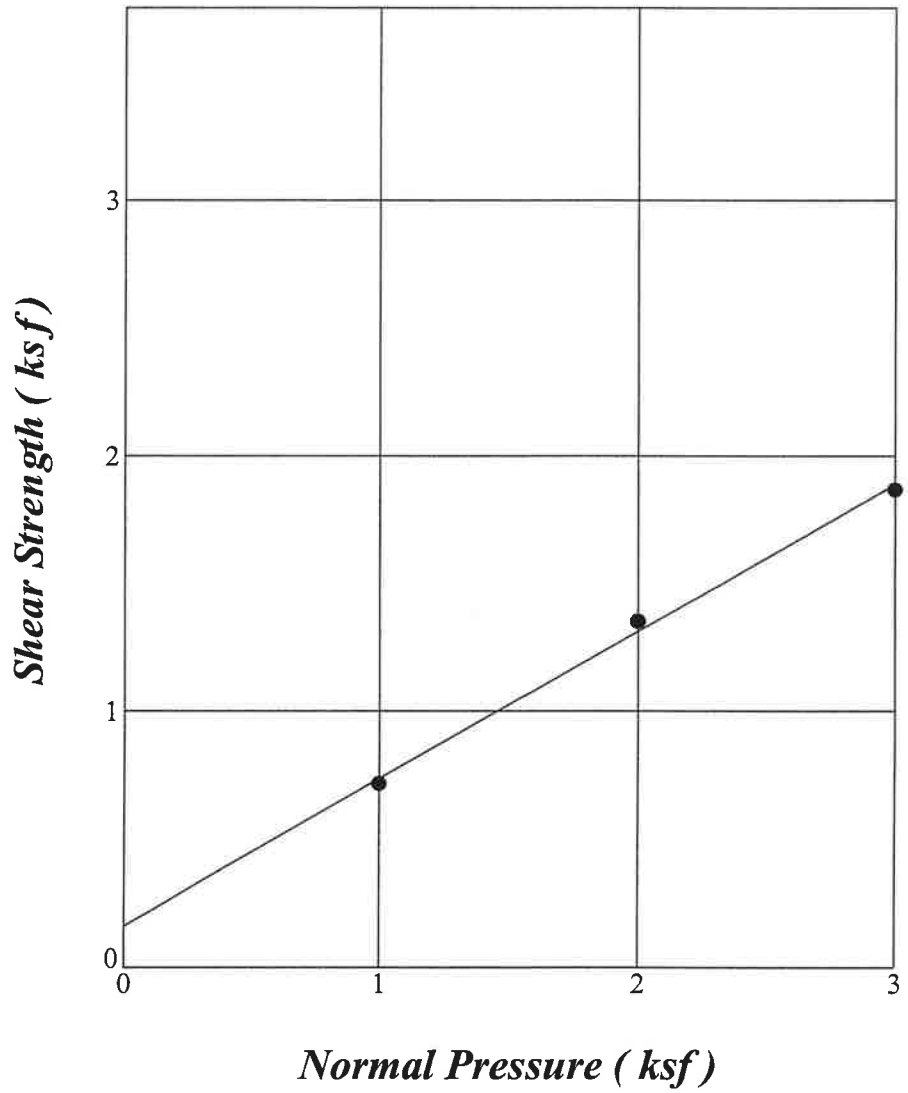
Table I-1								
Location	Depth (ft)	Material Type	In Situ Dry Density. (P.C.F.)	In Situ Water (%)	Expansion Index	Percent Passing #200 Sieve	Cohesion (ksf)	Friction Angle (deg)
AH 09	4.0	Qa	99.4	5.3			0.170	30.0
AH 09	6.0	Qa	SPT	6.4				
AH 09	8.0	Qa	104.1	20.9				
AH 09	10.0	Qa	SPT	21.6				
AH 09	12.0	Qa	108.1	20.4				
AH 09	14.0	Qa	SPT	24.2				
AH 09	16.0	Qa	108.0	21.4				
AH 09	20.0	Qa	SPT	21.9		47.3		
AH 09	25.0	Qa	SPT	24.4		61.2		
AH 09	30.0	Qa	SPT	24.7		75.8		
AH 09	35.0	Qa	SPT	19.4				
AH 09	40.0	Qa	SPT	19.0		13.2		
AH 09	45.0	Qa	SPT	23.4				
AH 09	50.0	Qa	SPT	23.4				

CHEMICAL TEST RESULTS

Table I-2					
Location	Depth (ft)	Sulfate (ppm)	Chloride (ppm)	pH	Resistivity (Ohms-cm)
AH 01	2.0	524	210	7.3	1100
AH 06	3.0	56	130	7.9	4200

SHEAR TEST DIAGRAM

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 01 @ 2.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*
TEST METHOD: *90% Remolded Ultimate Saturated Shear*	



MOISTURE CONTENT (%)		DENSITY (pcf)	RESULTS	
In Situ:	*2.6*		Phi (deg.):	*30.0*
Saturated:	*26.2*	Dry Density:	Cohesion (ksf):	*0.160*

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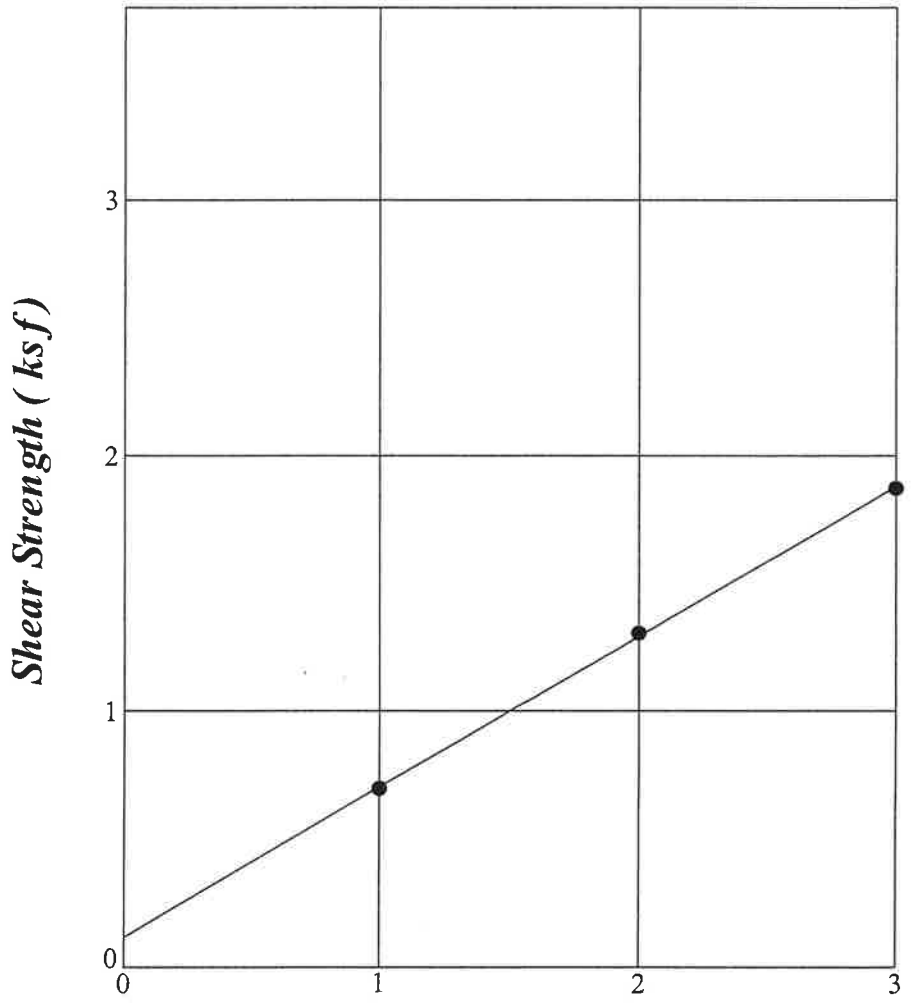
Figure S.1

SHEAR TEST DIAGRAM

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 01 @ 3.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*
TEST METHOD: *Ultimate Saturated Shear*	



MOISTURE CONTENT (%)		DENSITY (pcf)		RESULTS	
In Situ:	*3.5*			Phi (deg.):	*30.5*
Saturated:	*28.7*	Dry Density:	*100.0*	Cohesion (ksf):	*0.115*

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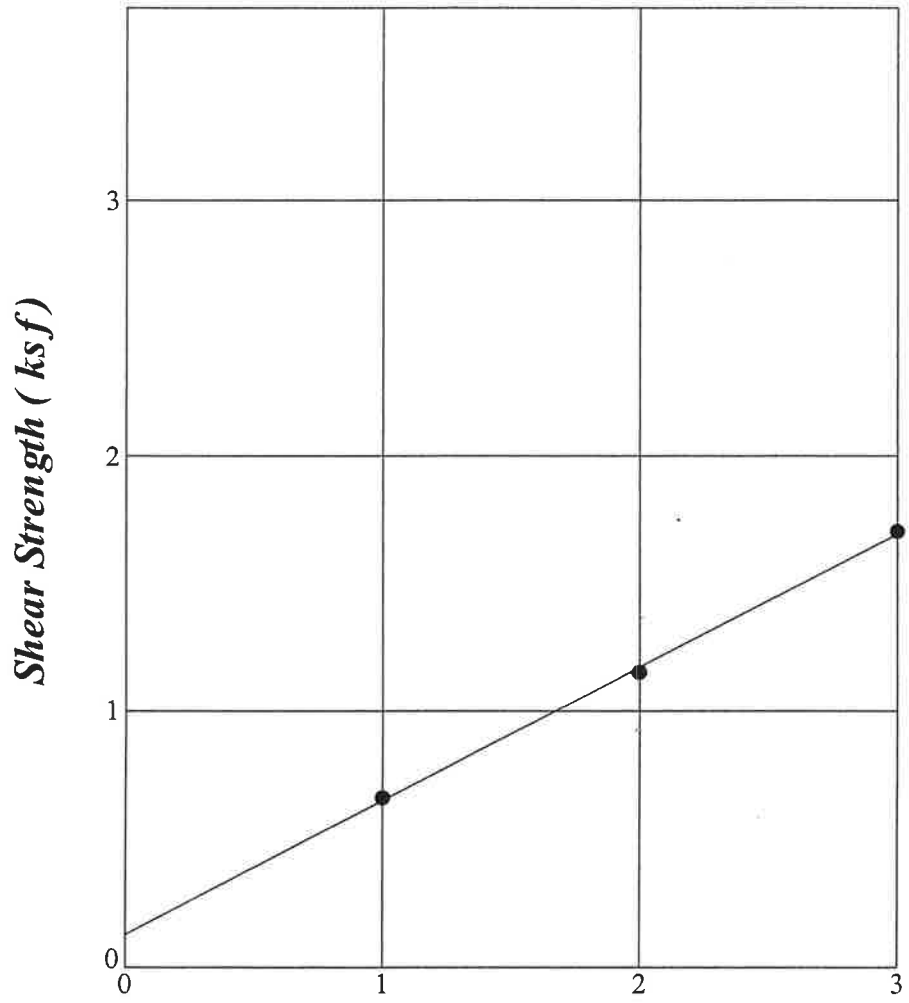
Figure S.2

SHEAR TEST DIAGRAM

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 02 @ 2.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*
TEST METHOD: *Ultimate Saturated Shear*	



MOISTURE CONTENT (%)		DENSITY (pcf)		RESULTS	
In Situ:	*2.4*			Phi (deg.):	*27.5*
Saturated:	*24.2*	Dry Density:	*116.6*	Cohesion (ksf):	*0.130*

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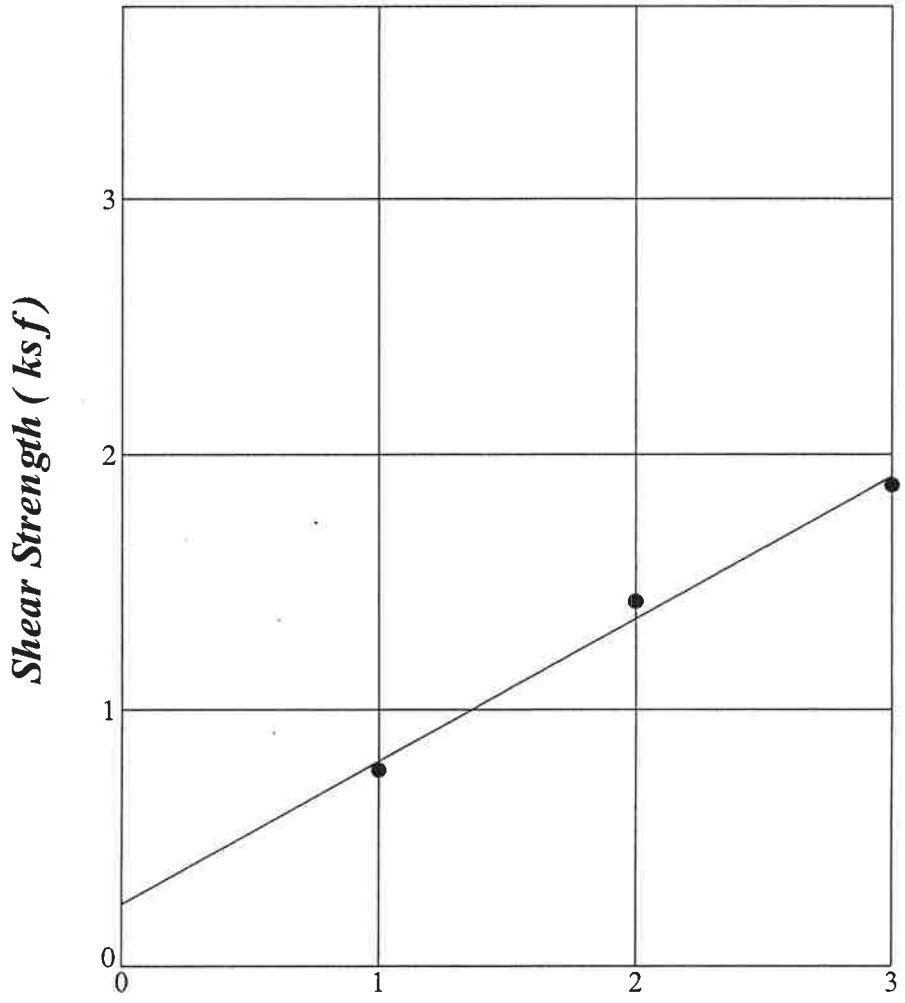
Figure S.3

SHEAR TEST DIAGRAM

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 08 @ 3.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*
TEST METHOD: *Ultimate Saturated Shear*	



MOISTURE CONTENT (%)		DENSITY (pcf)		RESULTS	
In Situ:	*4.4*			Phi (deg.):	*29.0*
Saturated:	*26.7*	Dry Density:	*98.5*	Cohesion (ksf):	*0.250*

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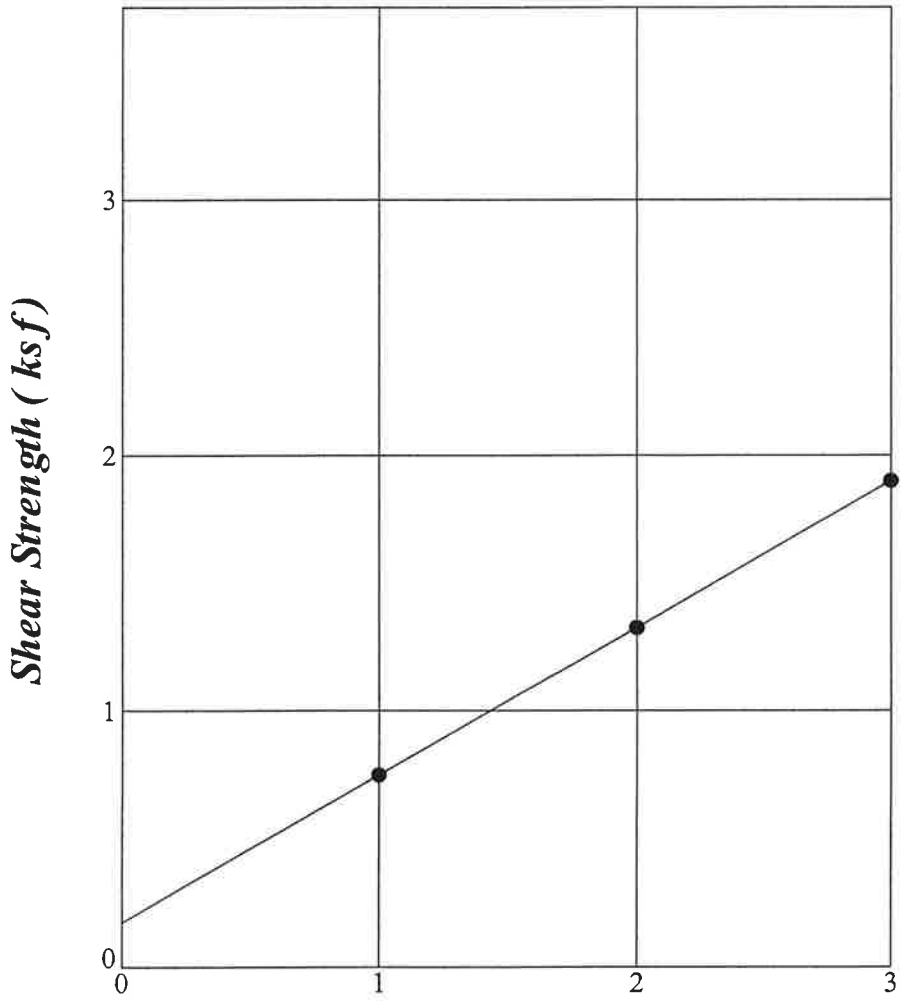
Figure S.4

SHEAR TEST DIAGRAM

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 09 @ 4.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*
TEST METHOD: *Ultimate Saturated Shear*	



MOISTURE CONTENT (%)		DENSITY (pcf)		RESULTS	
In Situ:	*5.3*			Phi (deg.):	*30.0*
Saturated:	*26.5*	Dry Density:	*99.4*	Cohesion (ksf):	*0.170*

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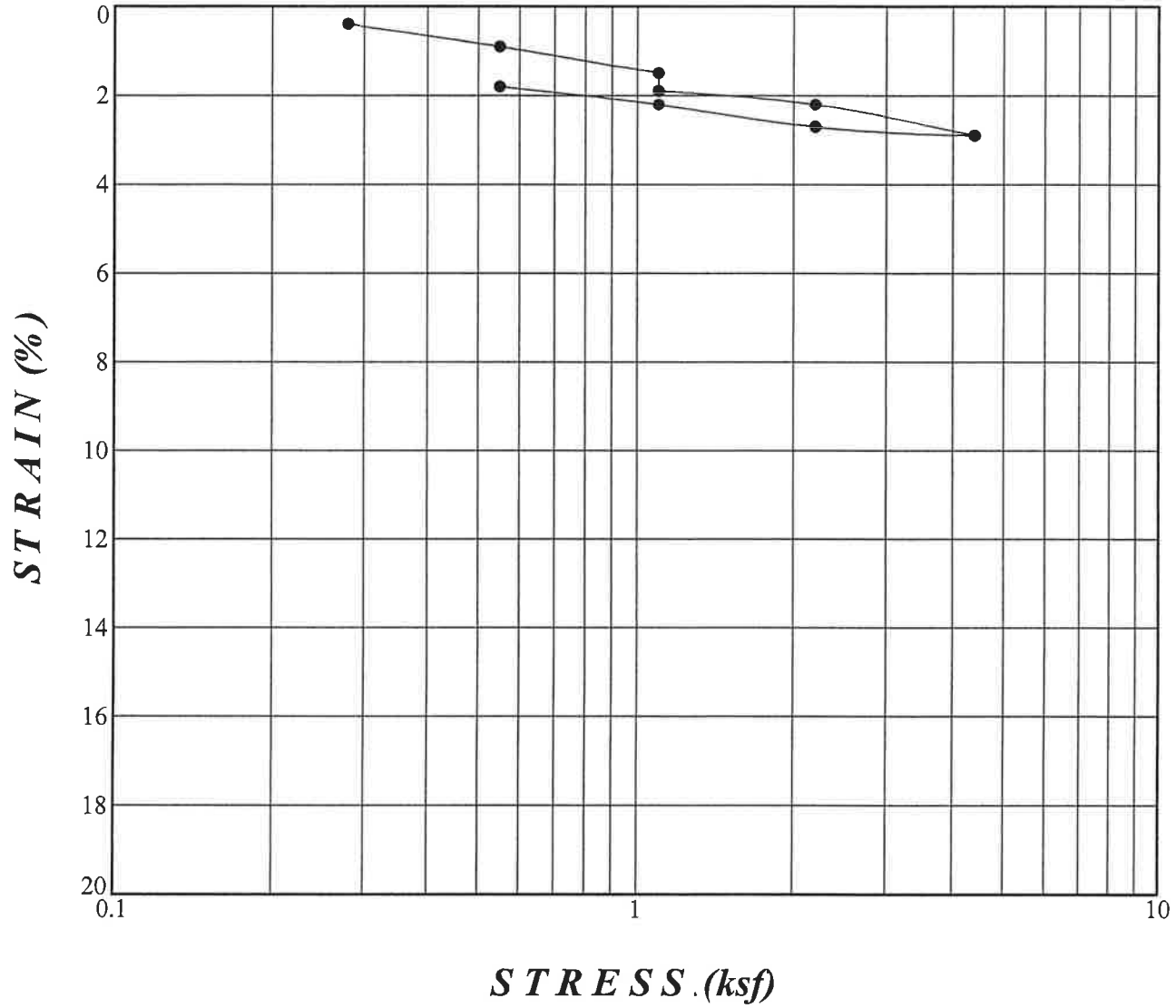
Figure S.5

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 01 @ 3.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*3.5*	Before Test:	*100.0*	Initial Void Ratio:	*0.9869*

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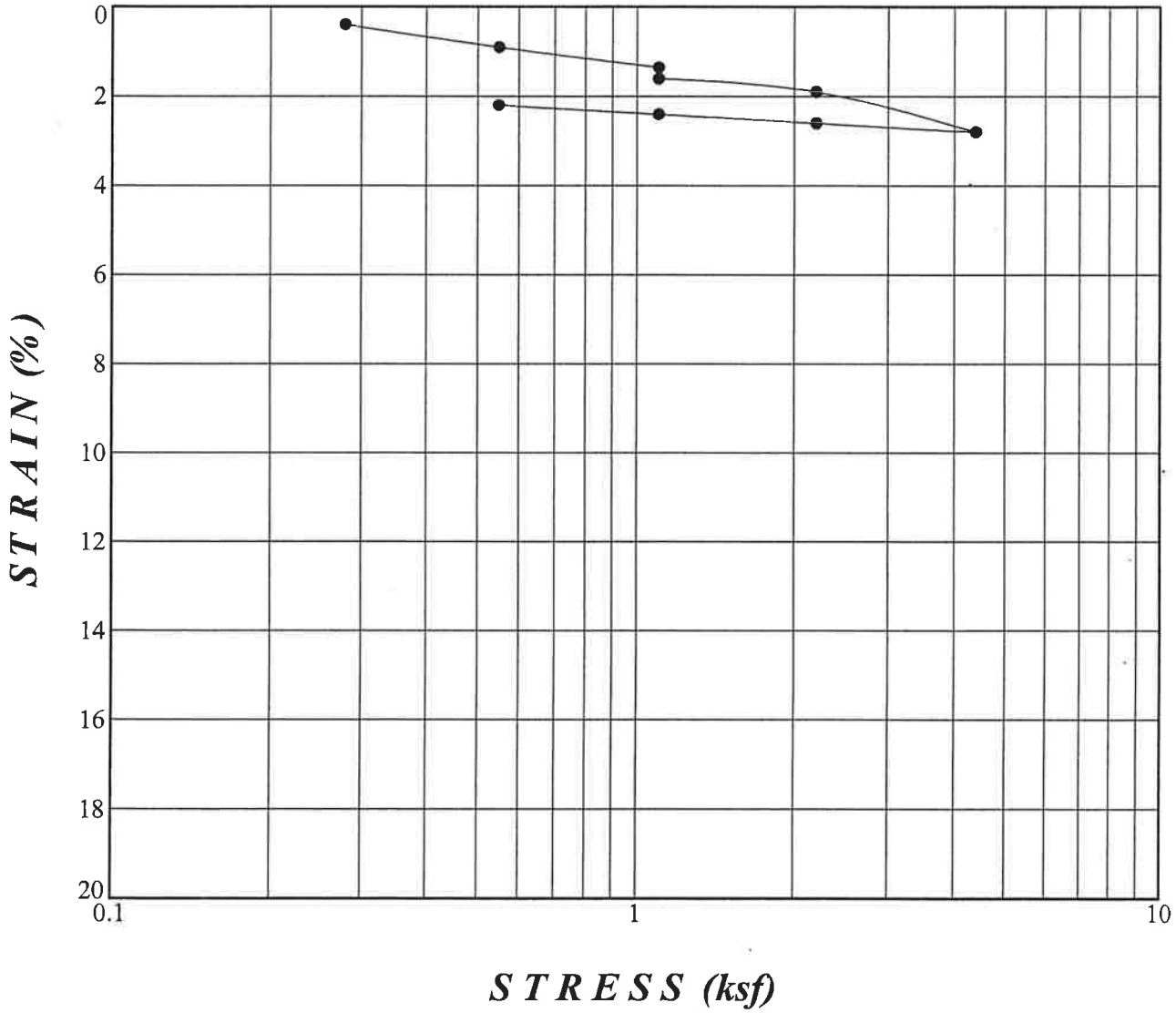
Figure C.1

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 01 @ 7.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*3.3*	Before Test:	*95.9*	Initial Void Ratio:	*1.1165*

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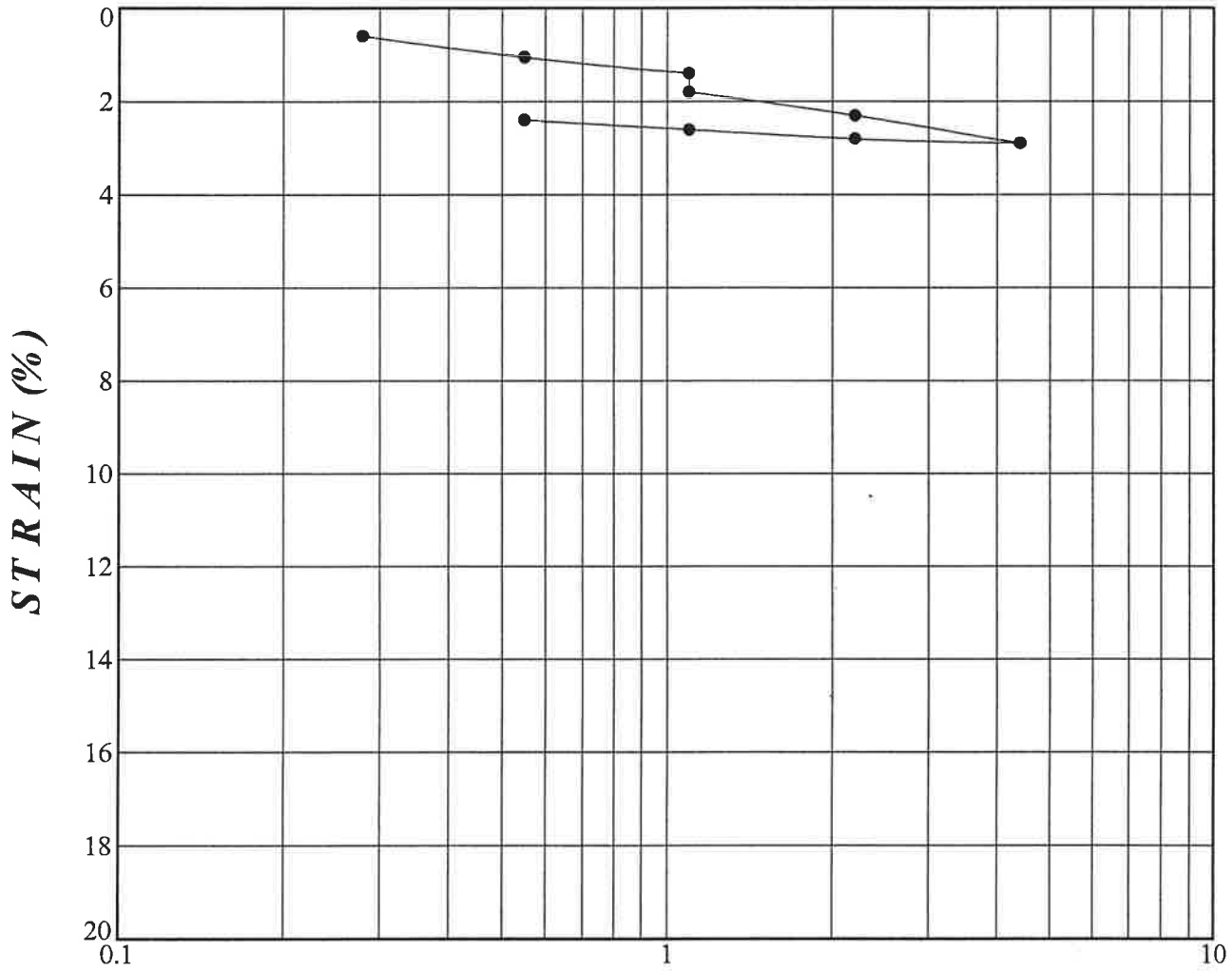
Figure C.2

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 02 @ 2.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*2.4*	Before Test:	*116.6*	Initial Void Ratio:	*0.5273*

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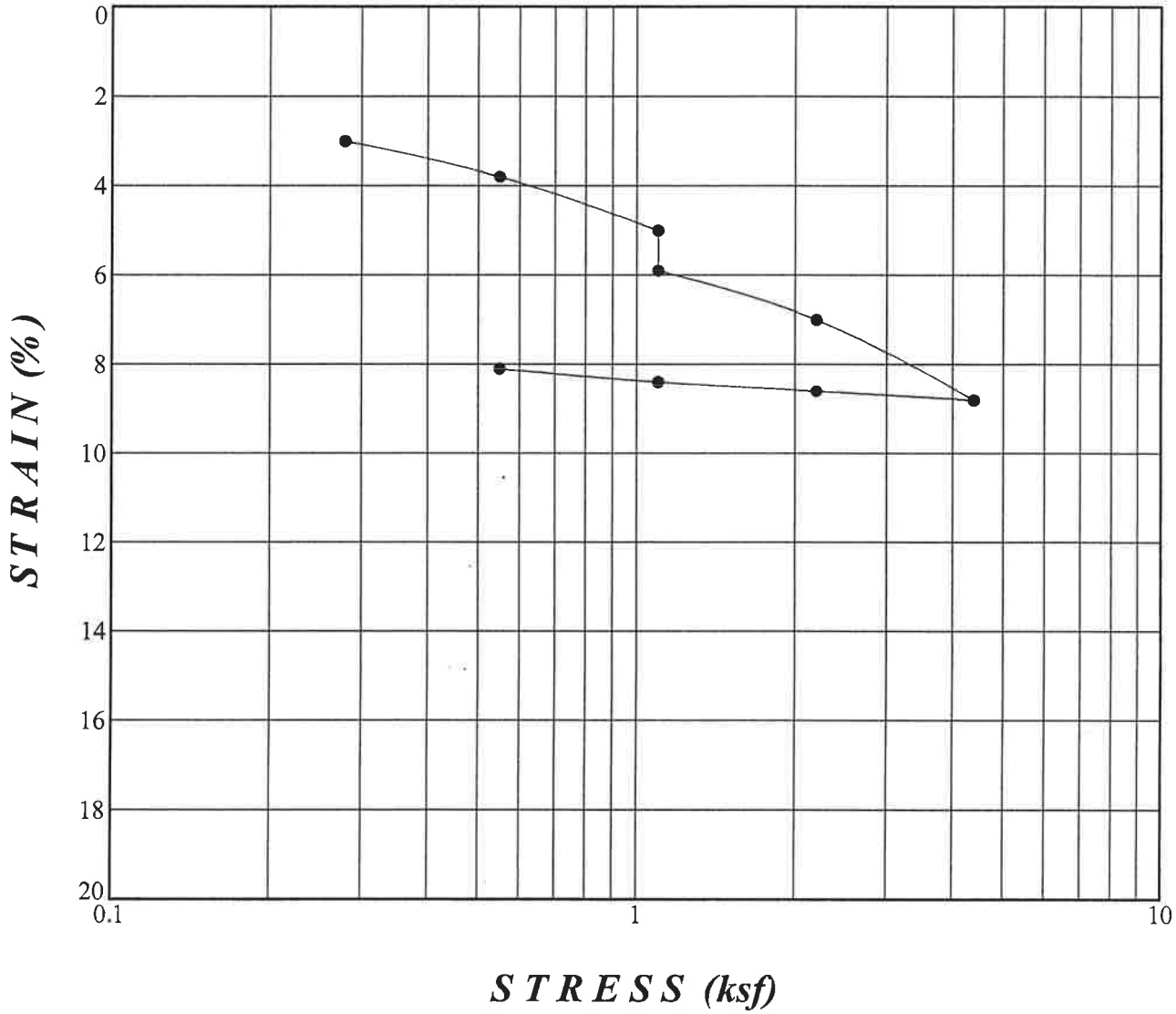
Figure C.3

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 02 @ 4.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*8.0*	Before Test:	*100.2*	Initial Void Ratio:	*0.6821*

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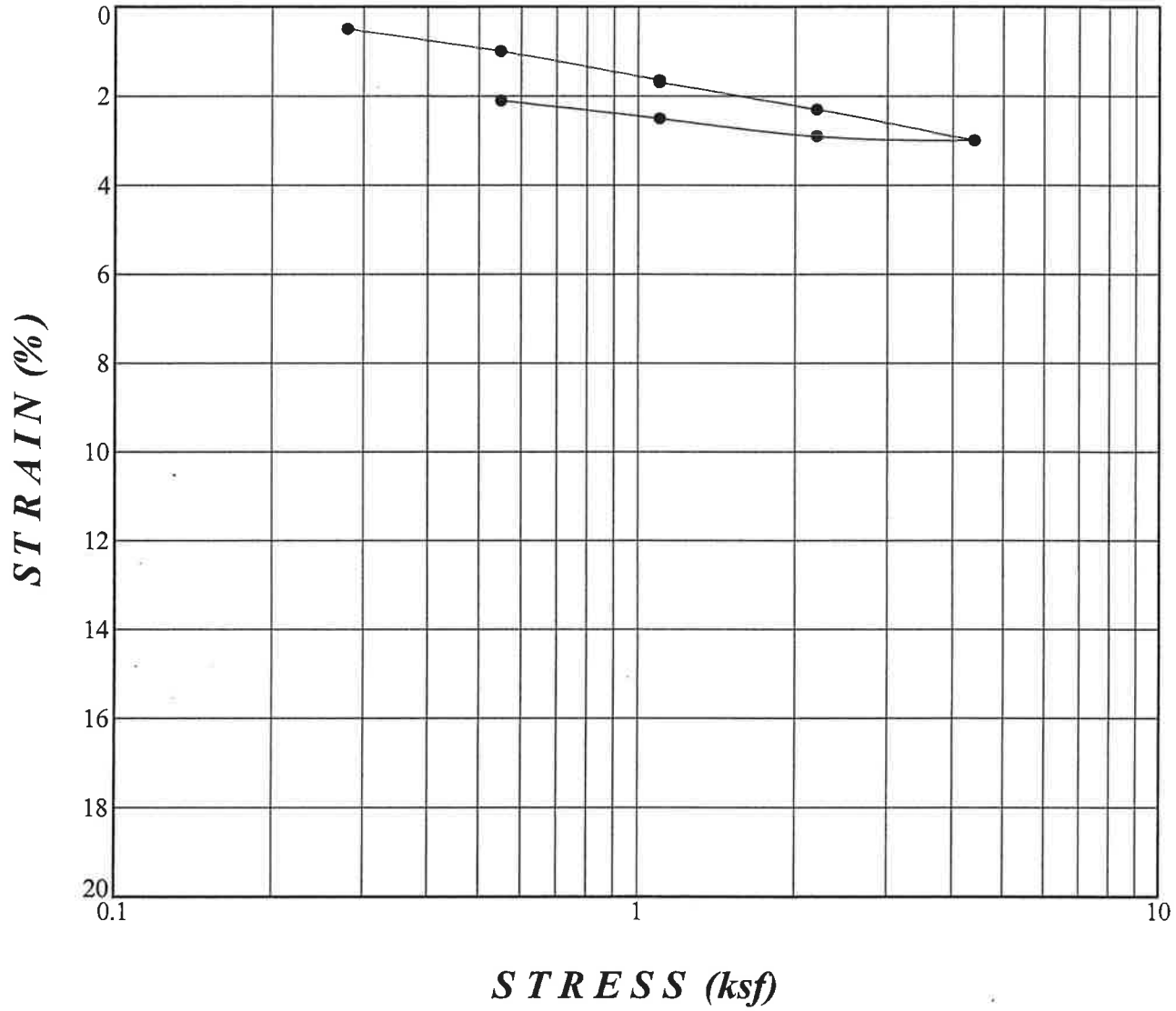
Figure C.4

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 02 @ 7.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*22.9*	Before Test:	*101.4*	Initial Void Ratio:	*0.8019*

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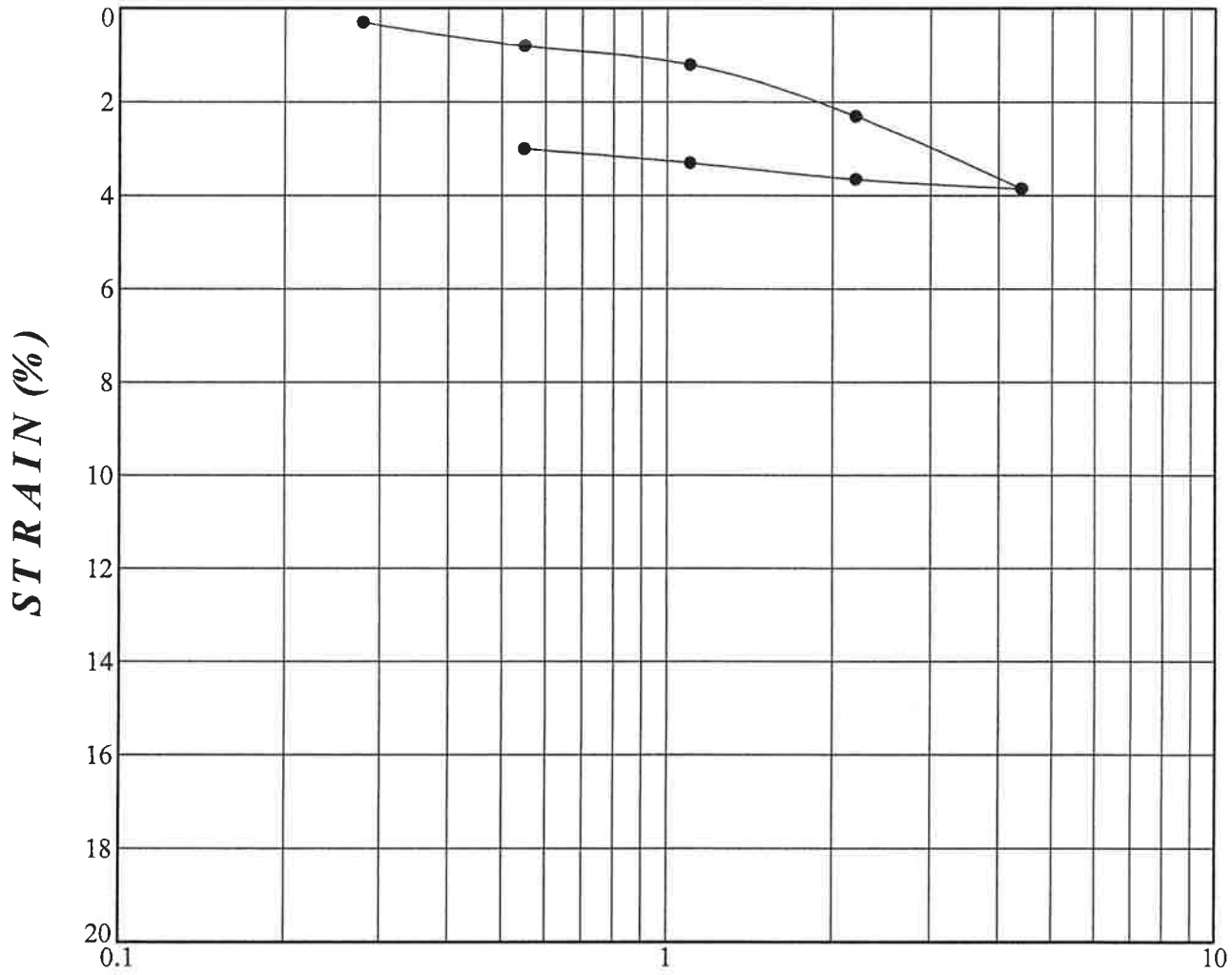
Figure C.5

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 03 @ 3.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*13.5*	Before Test:	*105.9*	Initial Void Ratio:	*0.6692*

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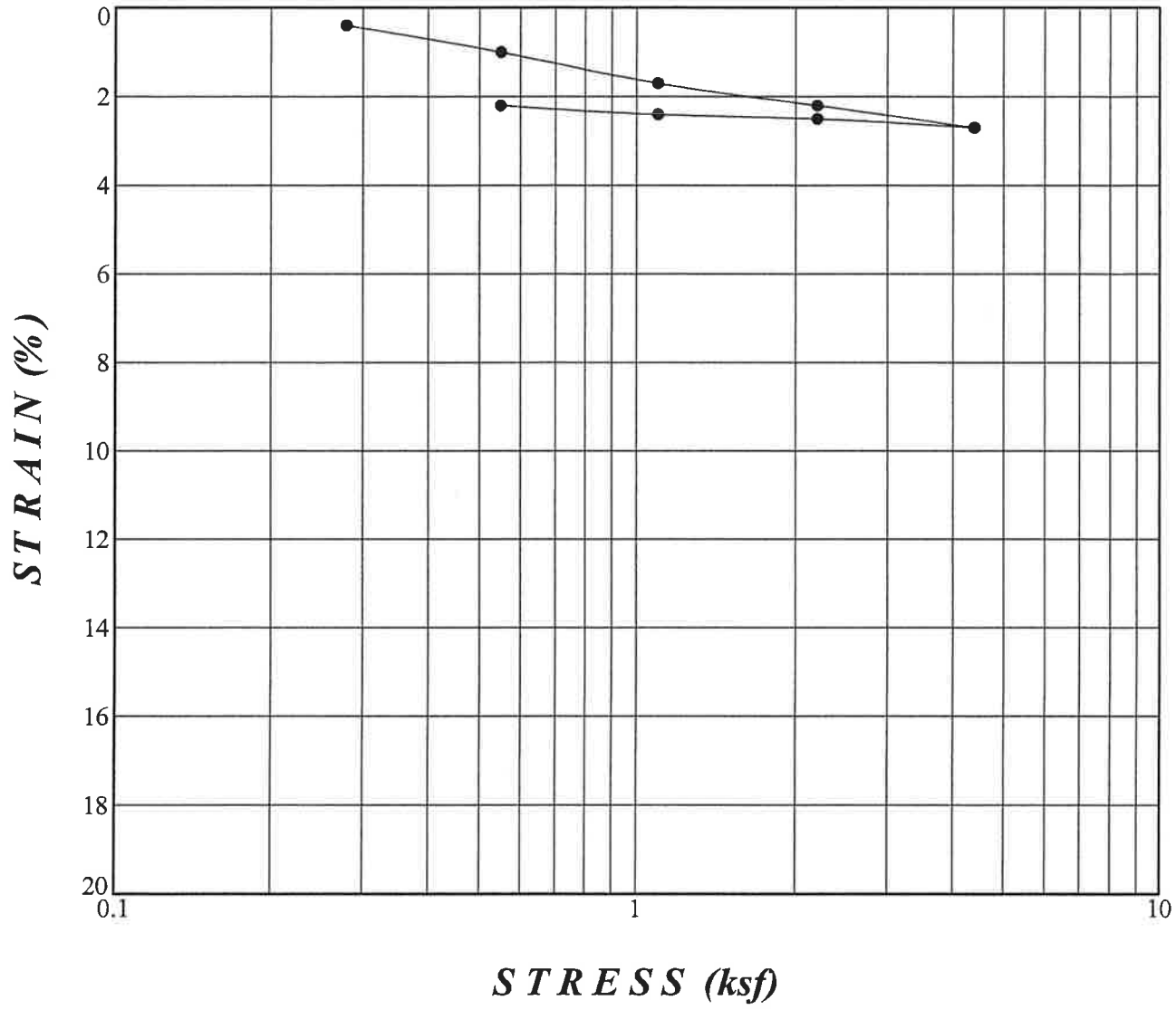
Figure C.6

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 03 @ 7.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*17.3*	Before Test:	*111.9*	Initial Void Ratio:	*0.4683*

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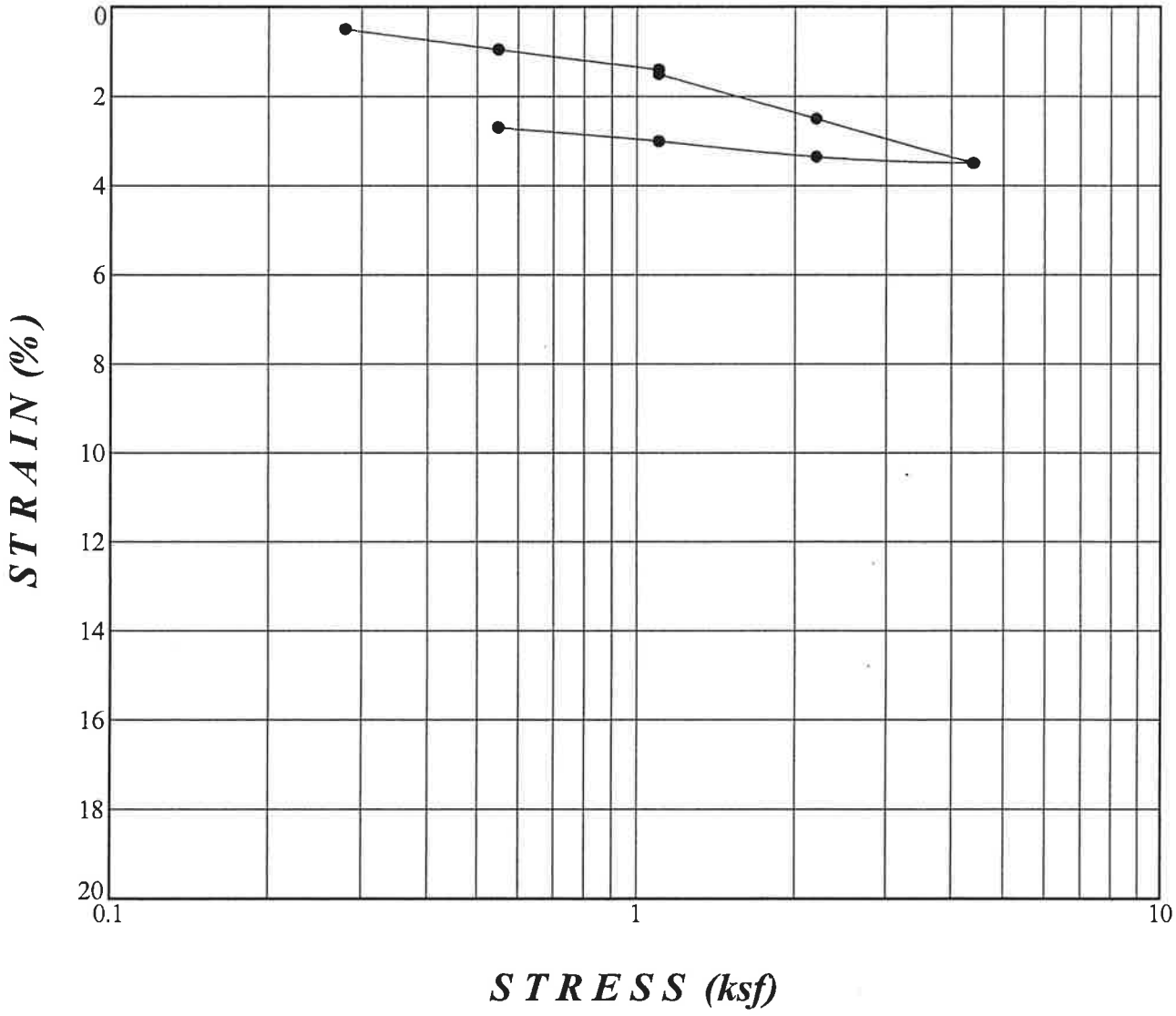
Figure C.7

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 04 @ 8.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*5.7*	Before Test:	*92.1*	Initial Void Ratio:	*1.0752*

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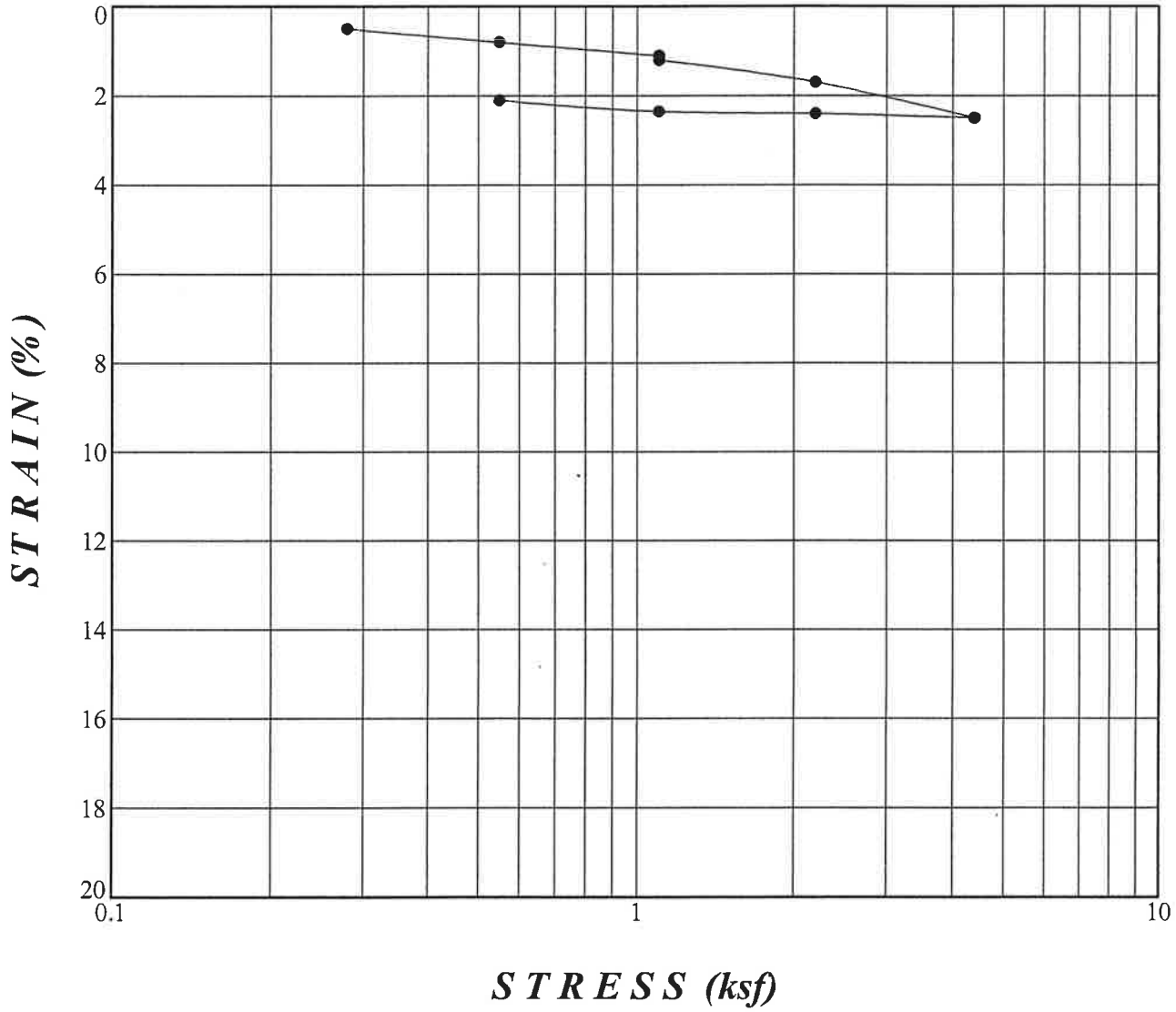
Figure C.8

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 05 @ 3.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*4.4*	Before Test:	*100.7*	Initial Void Ratio:	*0.9504*

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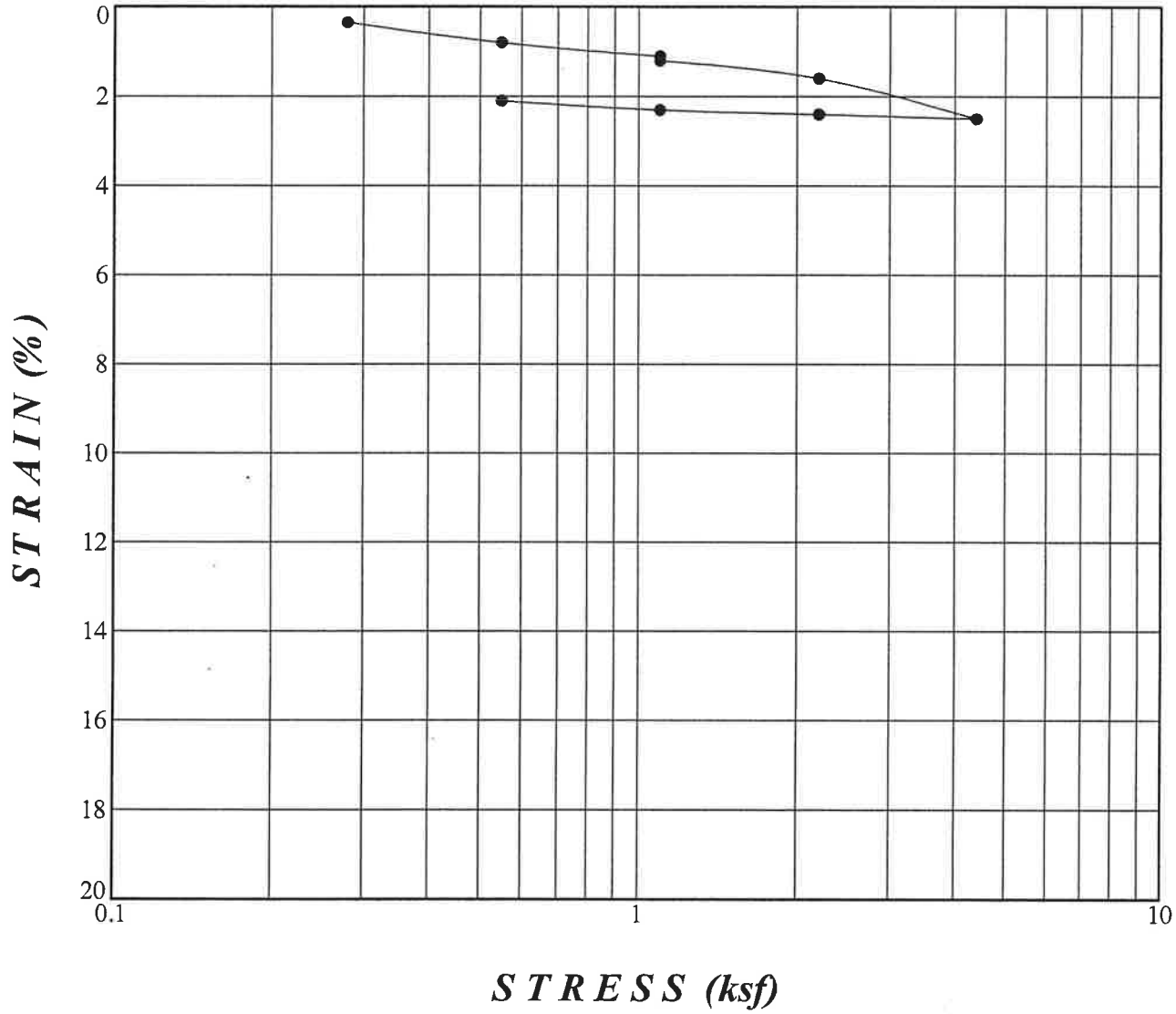
Figure C.9

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 05 @ 7.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*5.9*	Before Test:	*95.7*	Initial Void Ratio:	*0.9872*

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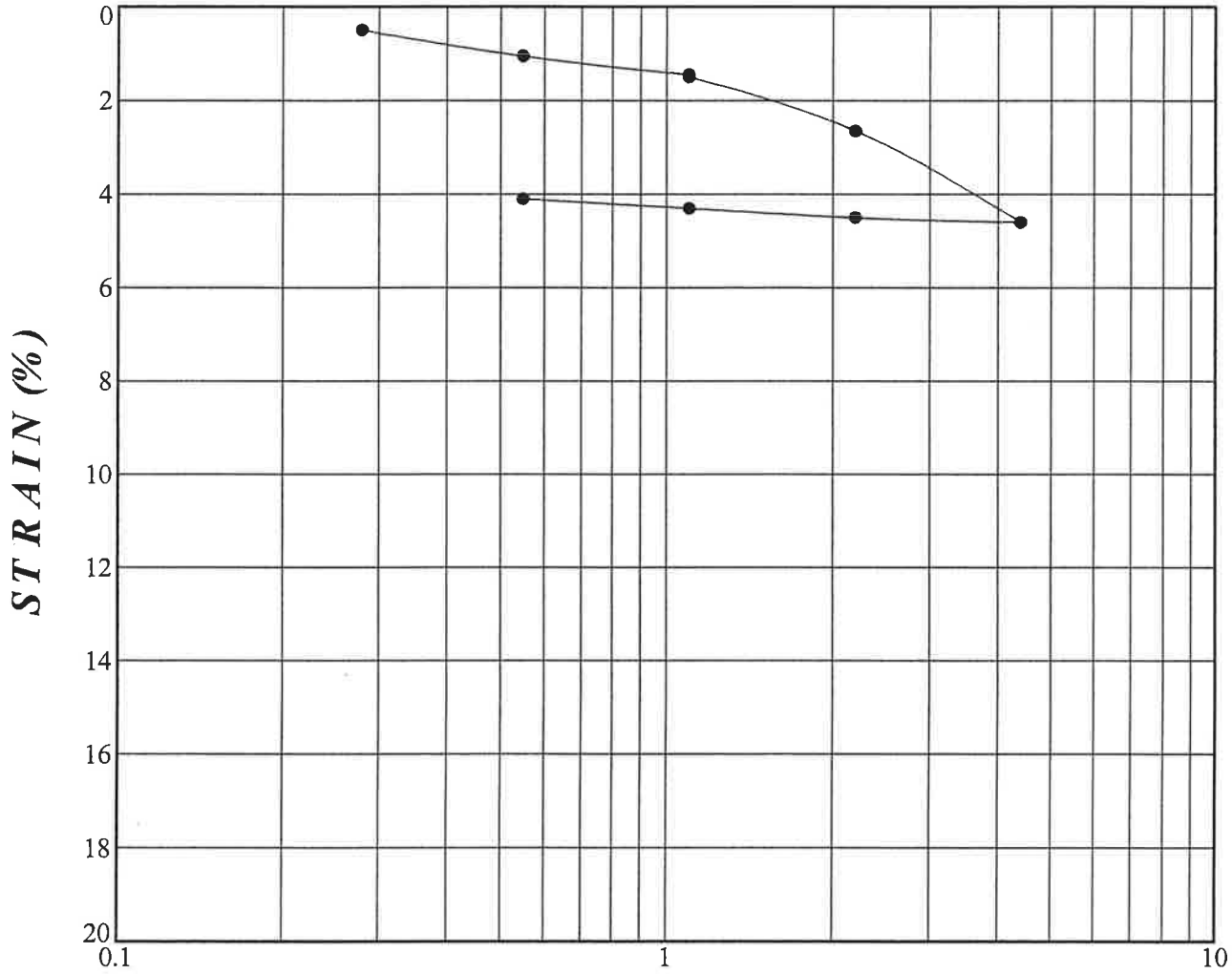
Figure C.10

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 06 @ 2.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*14.6*	Before Test:	*96.6*	Initial Void Ratio:	*0.7905*

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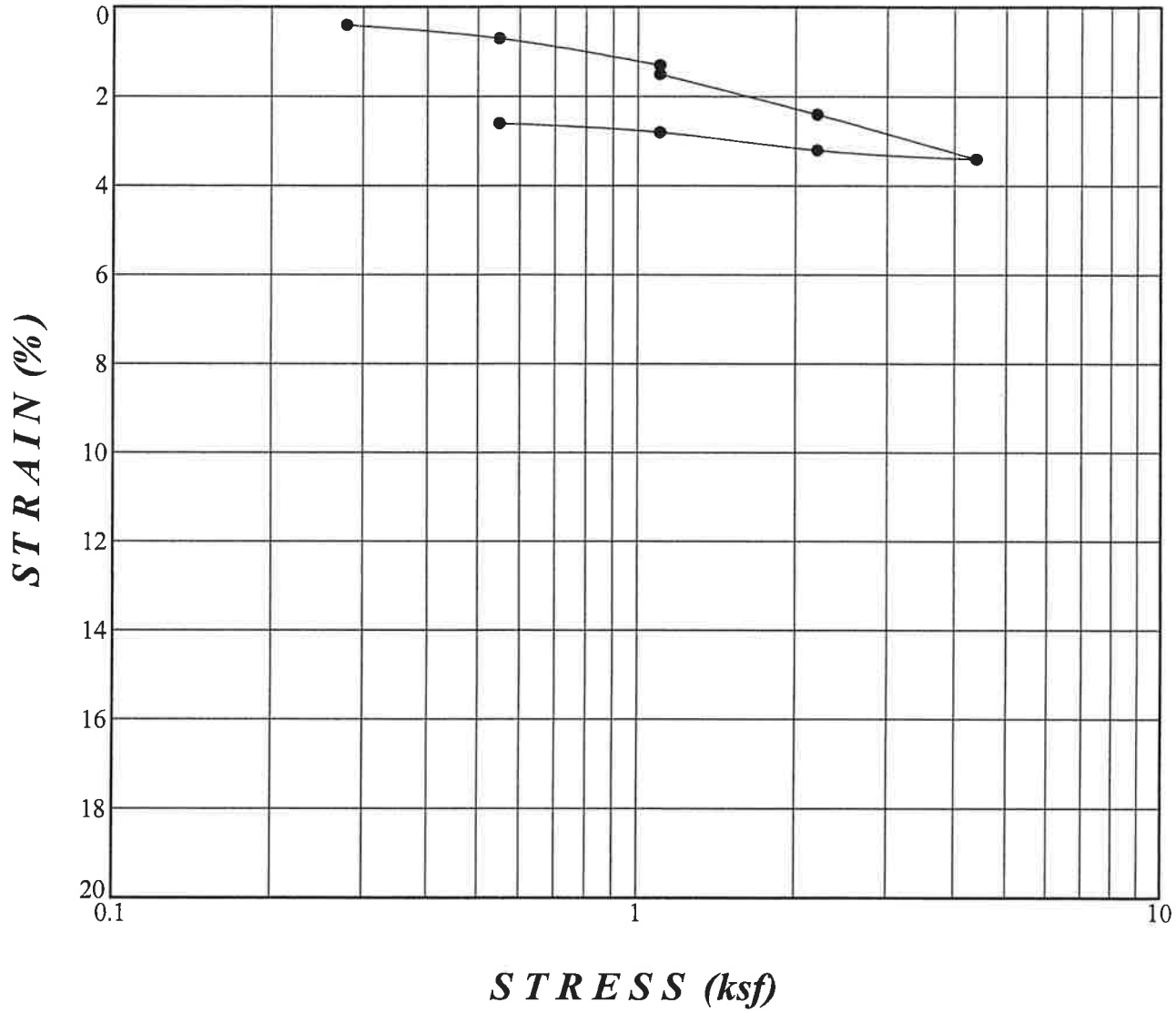
Figure C.11

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 06 @ 4.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*5.9*	Before Test:	*95.1*	Initial Void Ratio:	*0.9432*

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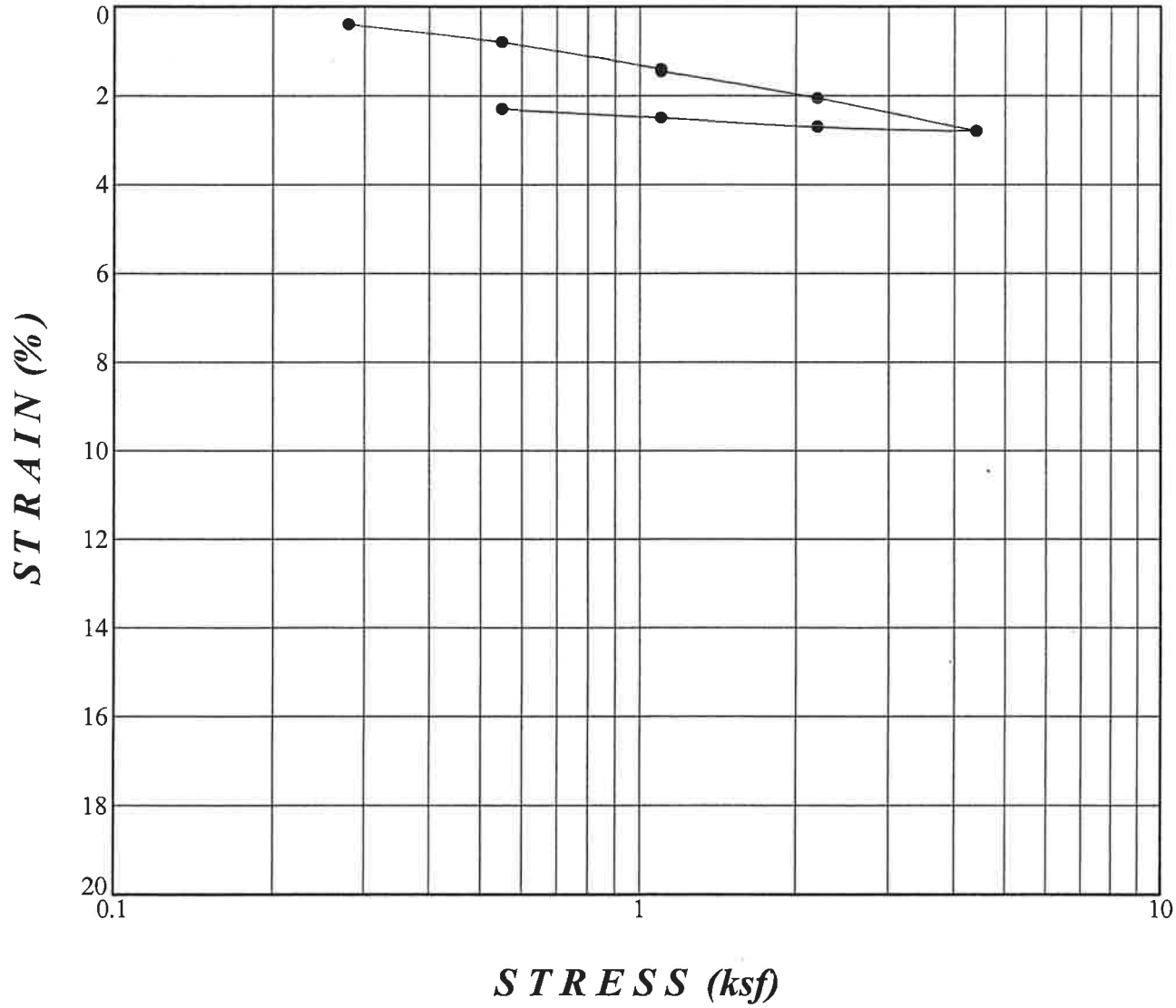
Figure C.12

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 06 @ 8.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*4.2*	Before Test:	*99.4*	Initial Void Ratio:	*0.9059*

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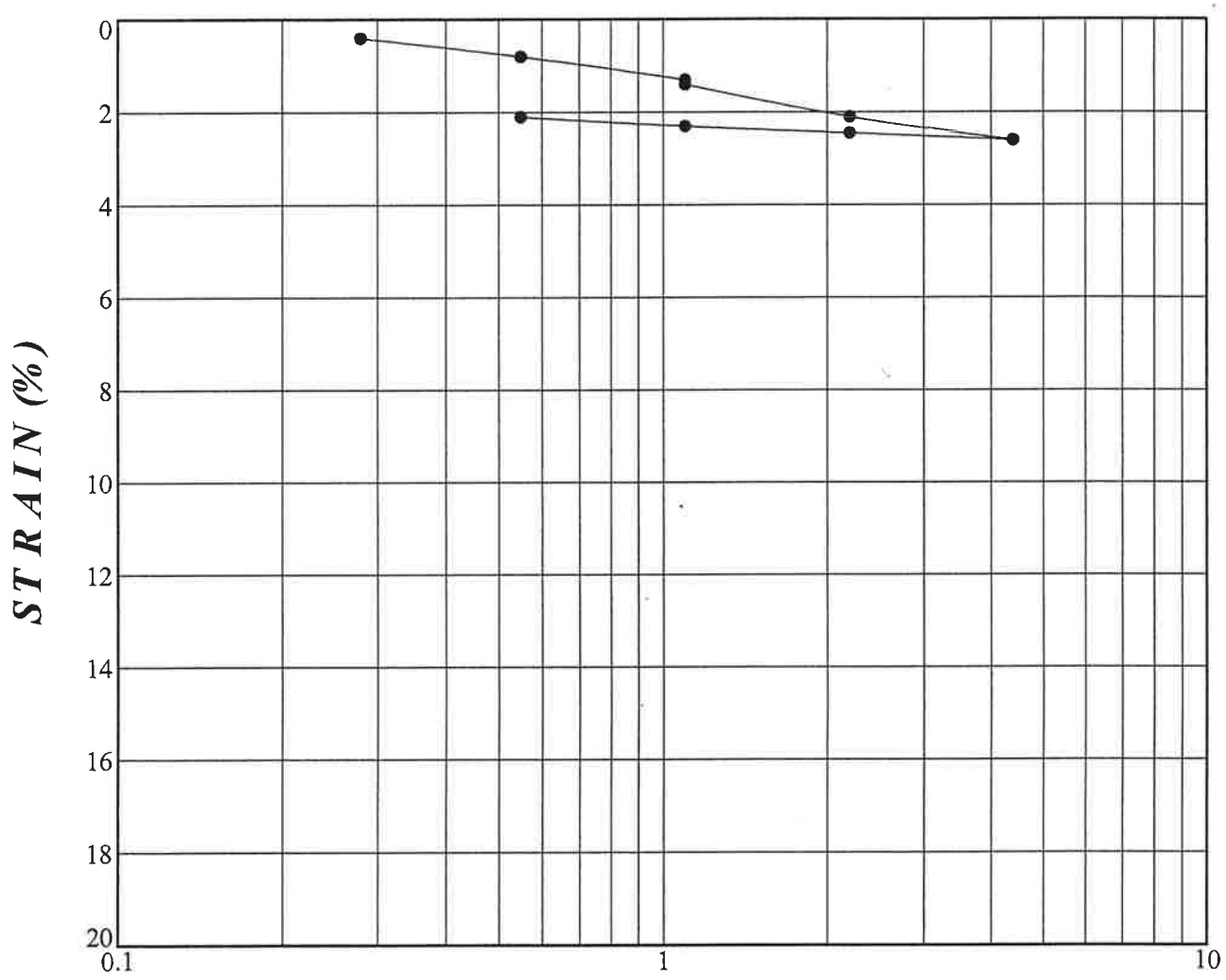
Figure C.13

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 07 @ 4.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*4.6*	Before Test:	*101.4*	Initial Void Ratio:	*0.9003*

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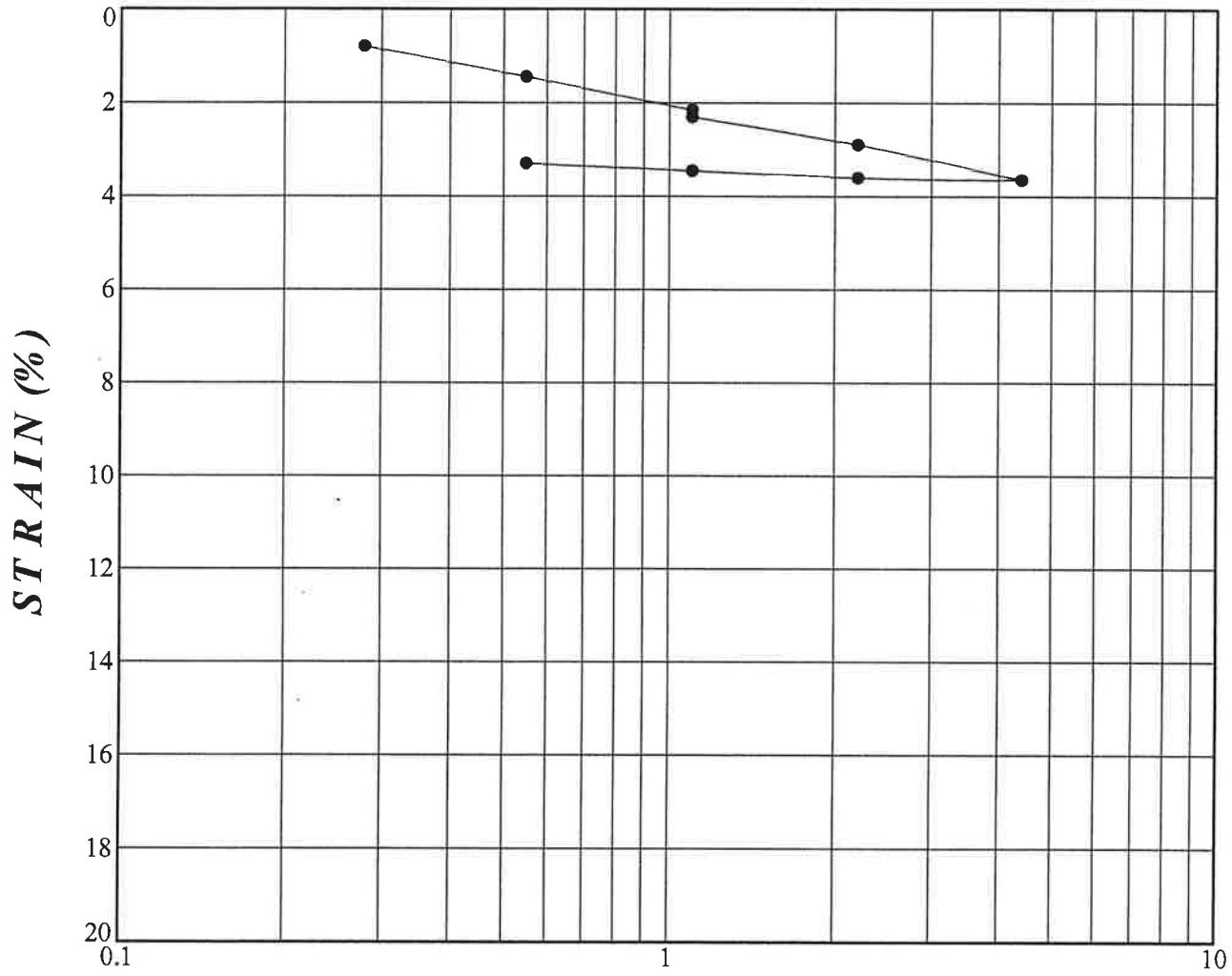
Figure C.14

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 08 @ 3.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*4.4*	Before Test:	*98.5*	Initial Void Ratio:	*0.9744*

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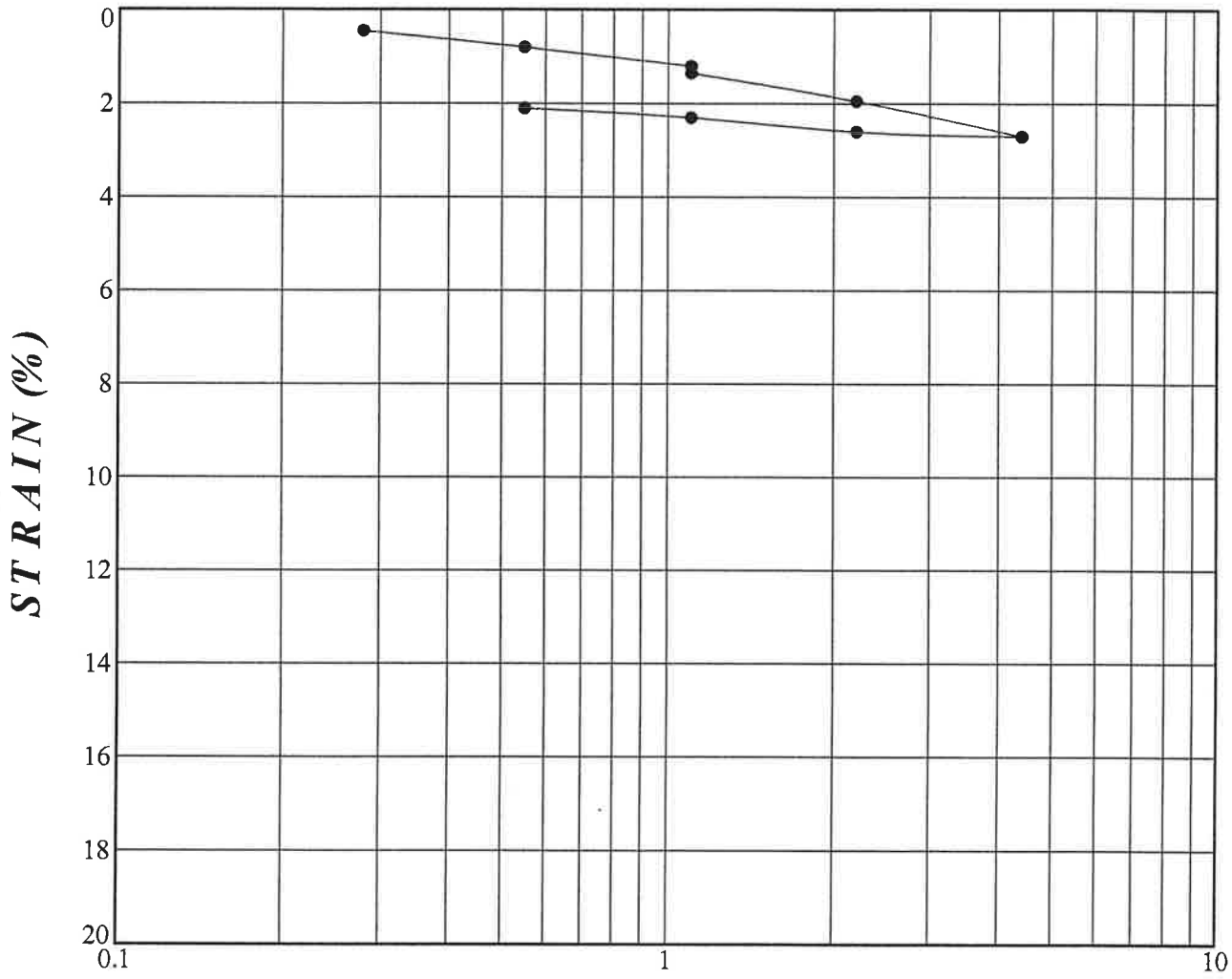
Figure C.15

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 08 @ 7.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*5.5*	Before Test:	*101.0*	Initial Void Ratio:	*0.9289*

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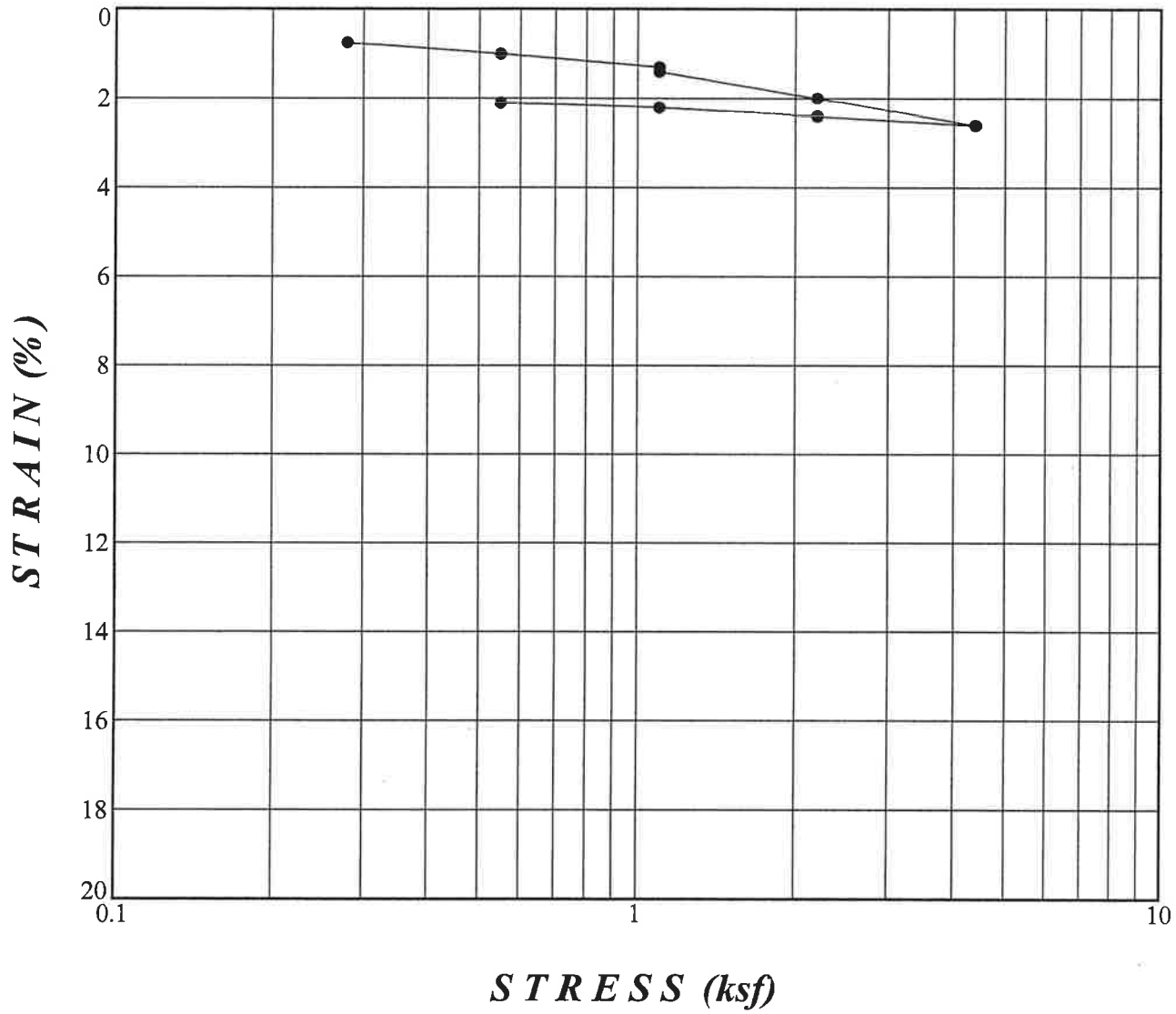
Figure C.16

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 09 @ 2.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*5.1*	Before Test:	*107.5*	Initial Void Ratio:	*0.7349*

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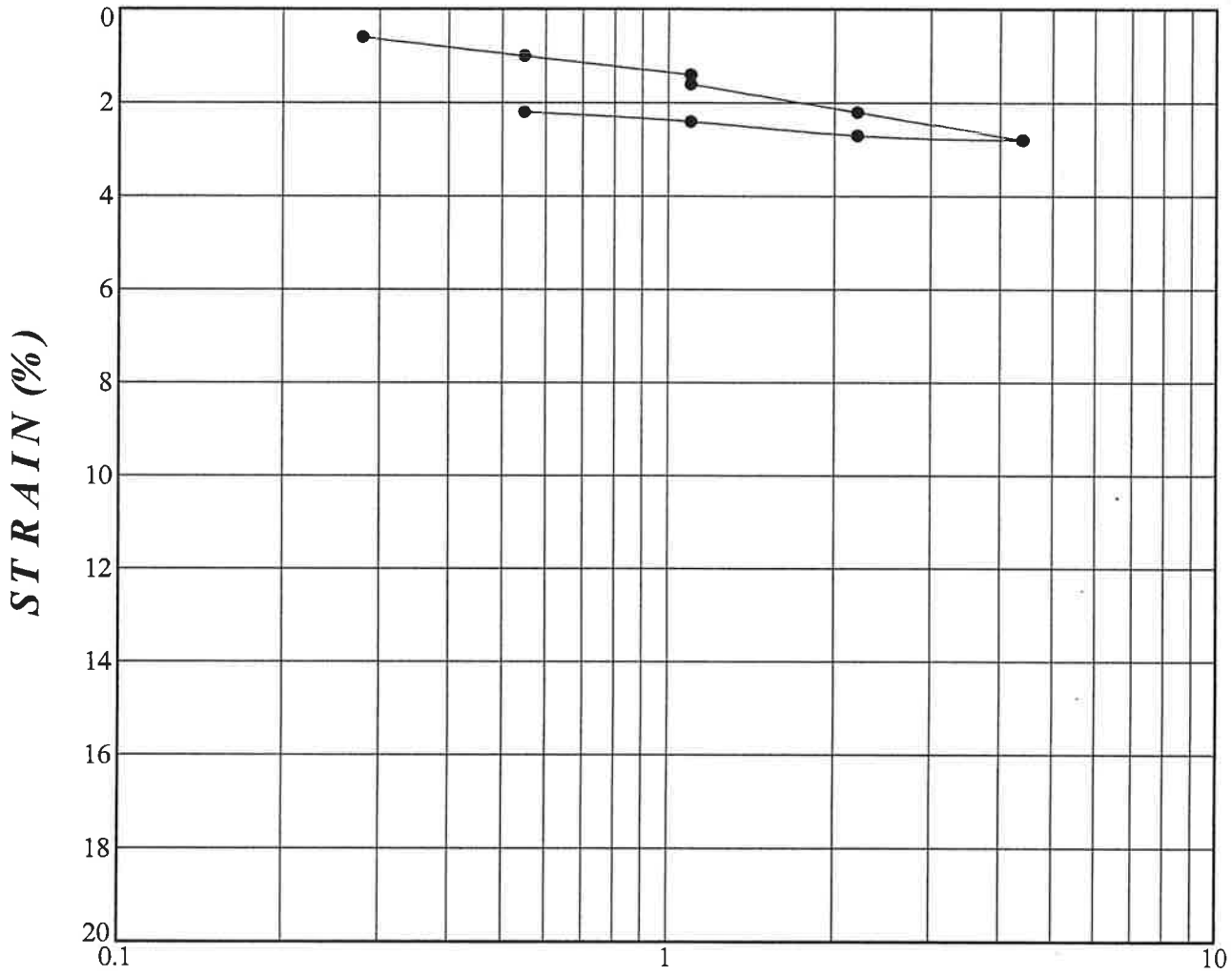
Figure C.17

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 09 @ 4.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*5.3*	Before Test:	*99.4*	Initial Void Ratio:	*0.9312*

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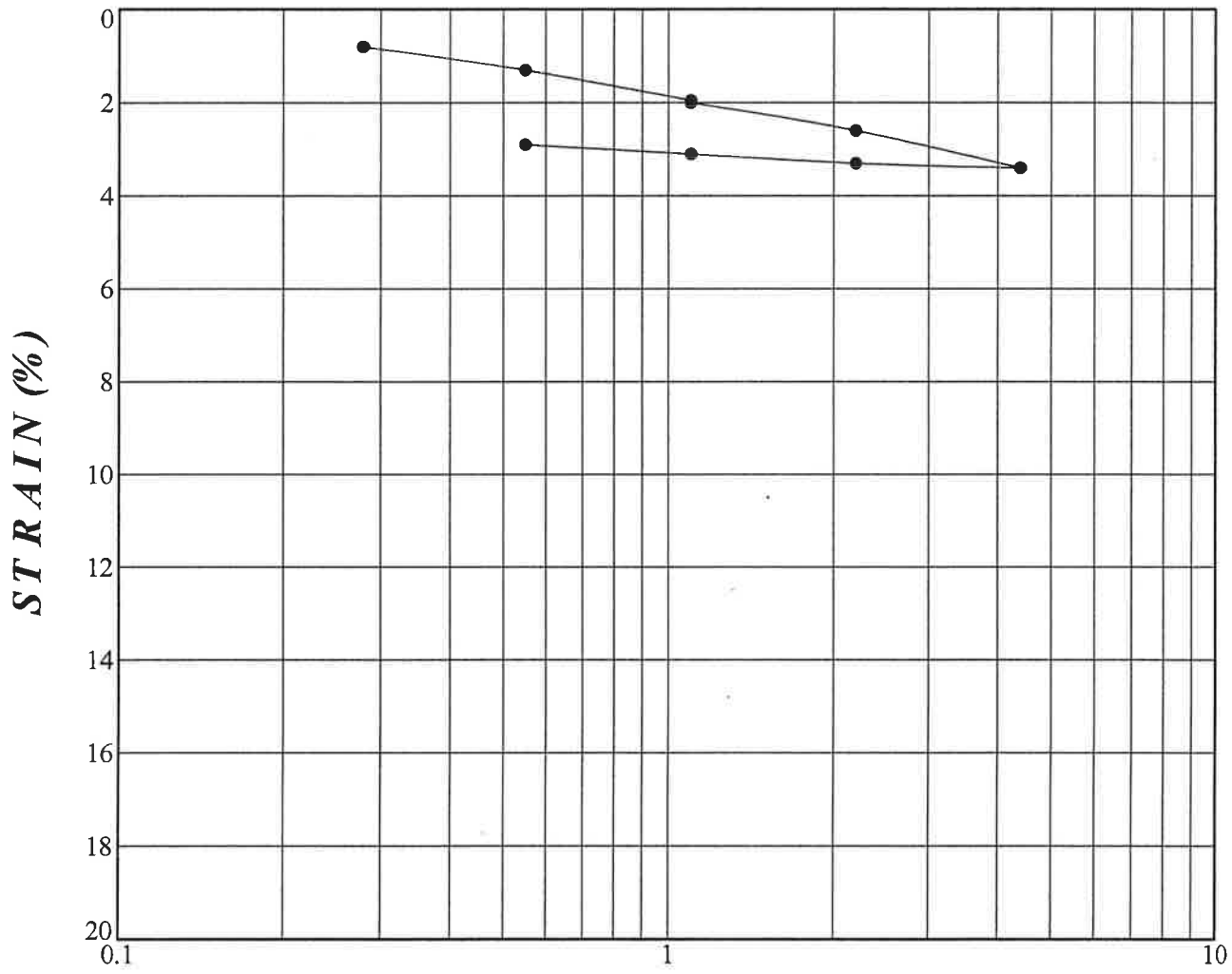
Figure C.18

CONSOLIDATION TEST

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 09 @ 8.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*

Load (psf) water added to test at: 1100



MOISTURE CONTENT (%)		DRY DENSITY (pcf)		RESULTS	
In Situ:	*20.9*	Before Test:	*104.1*	Initial Void Ratio:	*0.6516*

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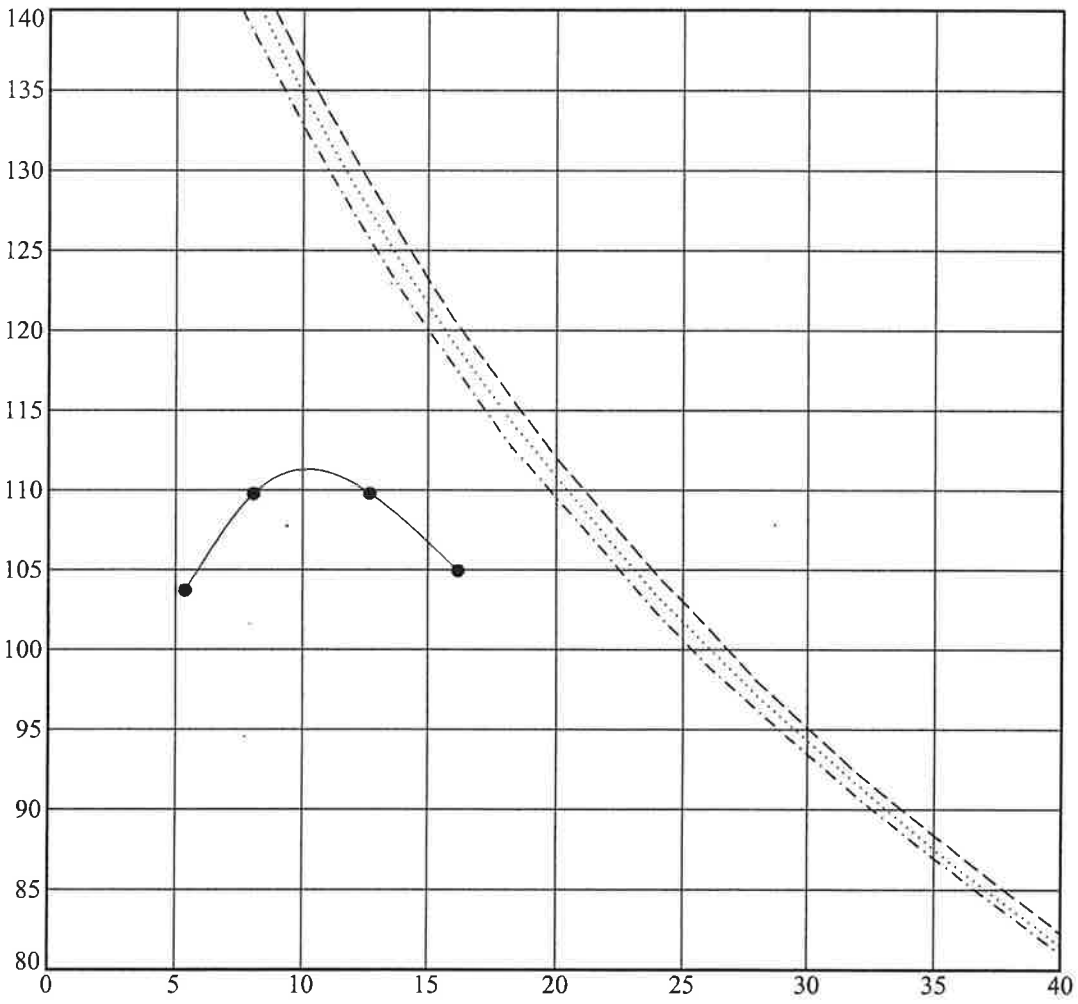
Figure C.19

MAXIMUM DENSITY CURVE

PROJECT NAME: *Oxnard Shores Company / Canal Street*	SAMPLE ID: *AH 01 @ 3.00'*
PROJECT NUMBER: *PIN 5462B*	MATERIAL DESCRIPTION: *Alluvium (Qa)*



Maximum Dry Density (pcf.) : *111.5*

Optimum Moisture Content (%) : *10.5*

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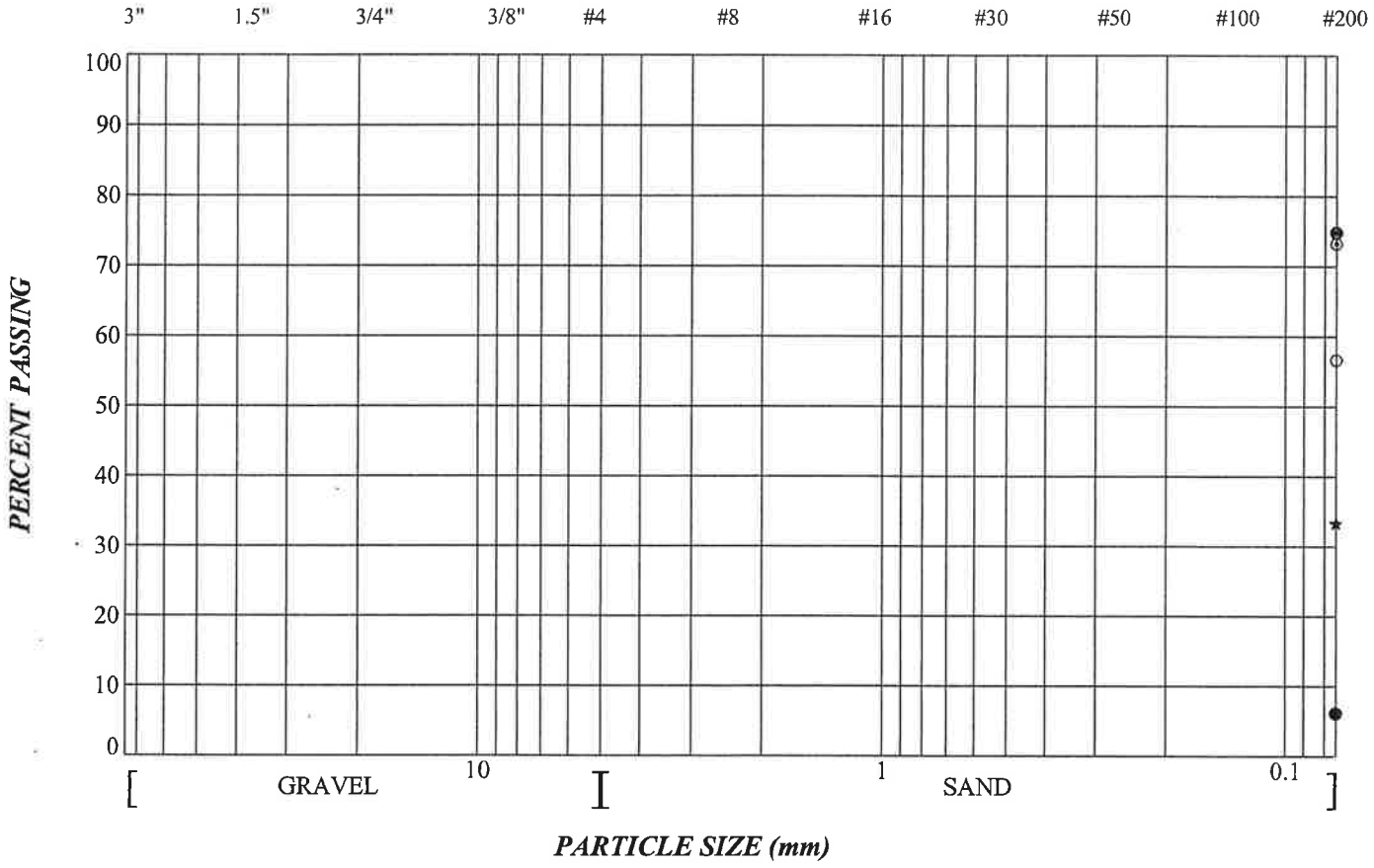
Figure M.1

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 01	2.0'	Alluvium (Qa)					
○	AH 01	12.0'	Alluvium (Qa)					
⊖	AH 01	15.0'	Alluvium (Qa)					
★	AH 01	25.0'	Alluvium (Qa)					
⊙	AH 01	30.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 01	2.0'	0.075						6.1	
○	AH 01	12.0'	0.075						56.6	
⊖	AH 01	15.0'	0.075						74.8	
★	AH 01	25.0'	0.075						33.3	
⊙	AH 01	30.0'	0.075						73.3	

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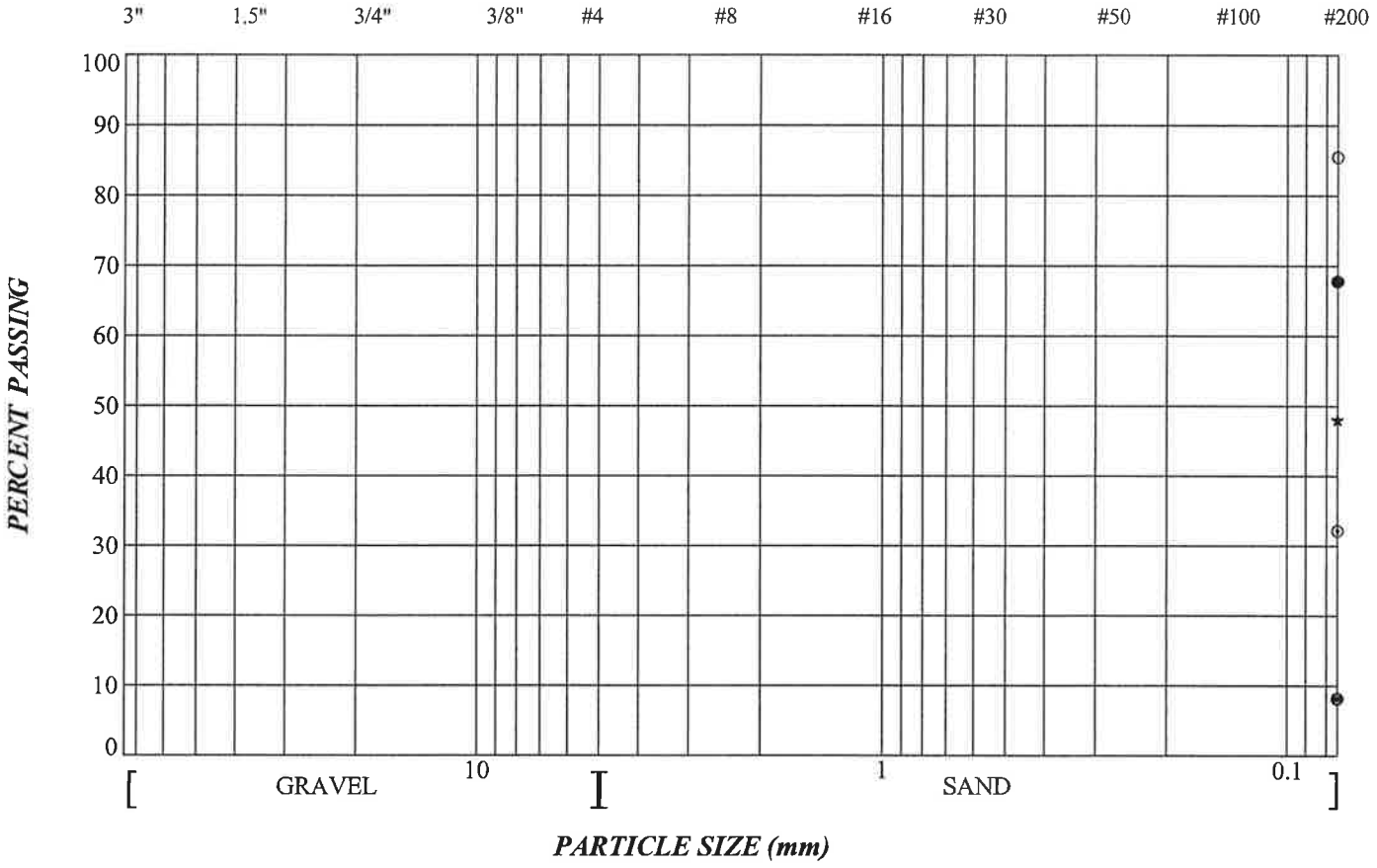
Figure SV.1

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 01	35.0'	Alluvium (Qa)					
○	AH 01	45.0'	Alluvium (Qa)					
⊖	AH 02	2.0'	Alluvium (Qa)					
★	AH 02	10.0'	Alluvium (Qa)					
⊙	AH 02	15.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 01	35.0'	0.075						67.8	
○	AH 01	45.0'	0.075						85.5	
⊖	AH 02	2.0'	0.075						8.2	
★	AH 02	10.0'	0.075						48.1	
⊙	AH 02	15.0'	0.075						32.2	

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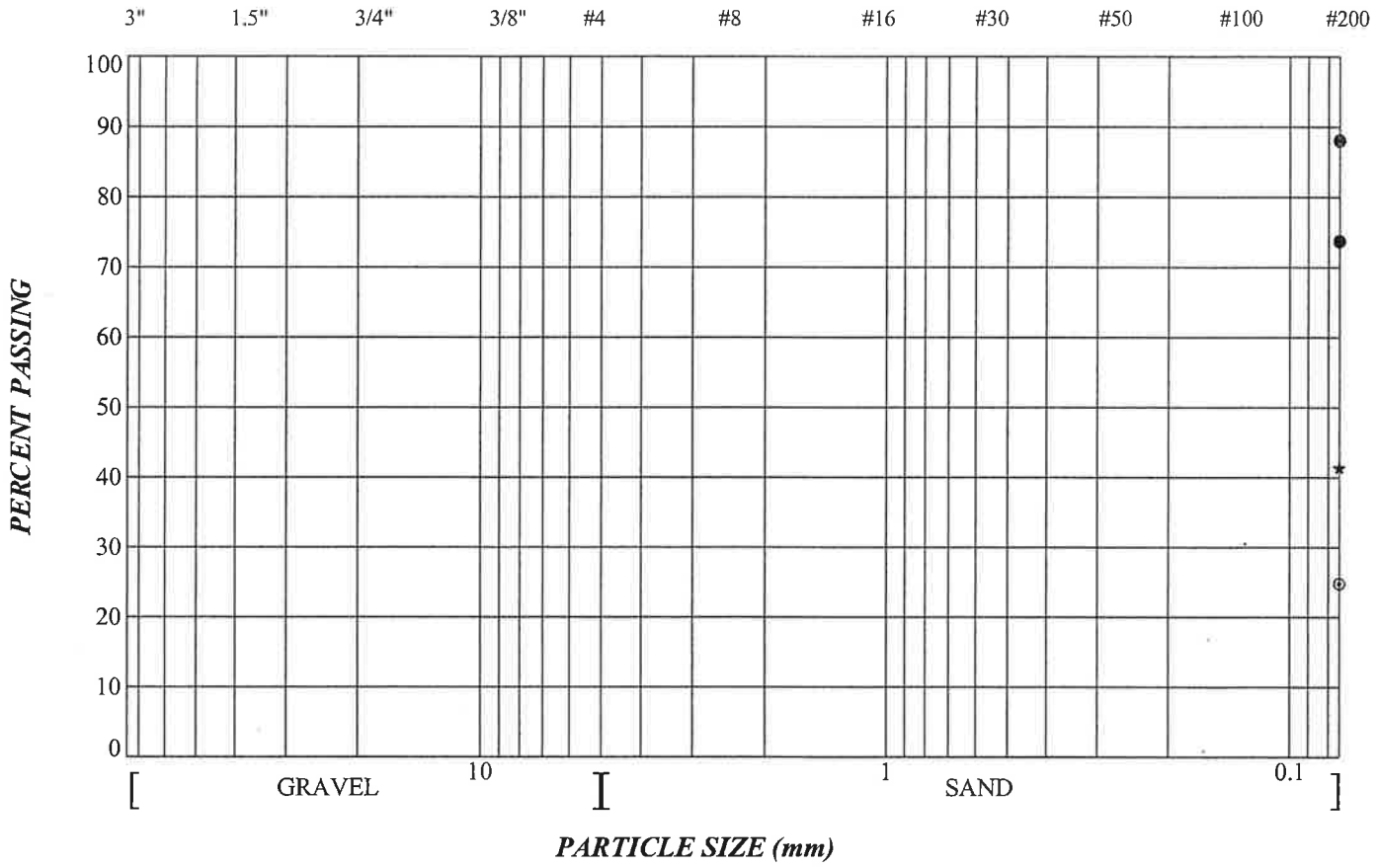
Figure SV.2

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 02	20.0'	Alluvium (Qa)					
○	AH 02	30.0'	Alluvium (Qa)					
⊖	AH 02	35.0'	Alluvium (Qa)					
★	AH 02	45.0'	Alluvium (Qa)					
⊙	AH 03	5.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 02	20.0'	0.075						73.7	
○	AH 02	30.0'	0.075						73.8	
⊖	AH 02	35.0'	0.075						88.1	
★	AH 02	45.0'	0.075						41.4	
⊙	AH 03	5.0'	0.075						24.8	

SubSurface Designs, Inc.

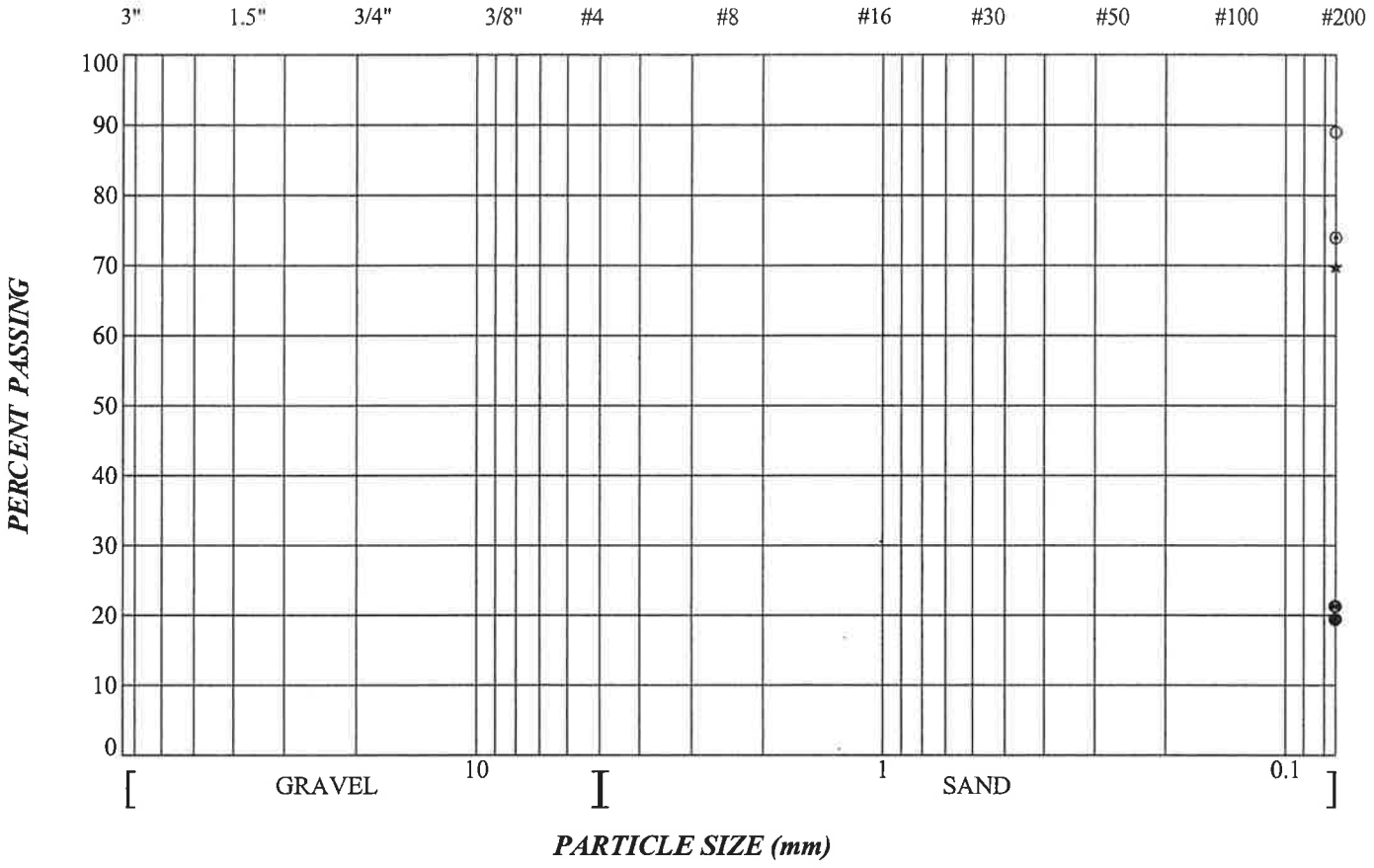
GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.3

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 03	15.0'	Alluvium (Qa)					
○	AH 03	20.0'	Alluvium (Qa)					
⊖	AH 03	25.0'	Alluvium (Qa)					
★	AH 03	30.0'	Alluvium (Qa)					
⊙	AH 03	35.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 03	15.0'	0.075						19.4	
○	AH 03	20.0'	0.075						89.0	
⊖	AH 03	25.0'	0.075						21.3	
★	AH 03	30.0'	0.075						69.8	
⊙	AH 03	35.0'	0.075						74.0	

SubSurface Designs, Inc.

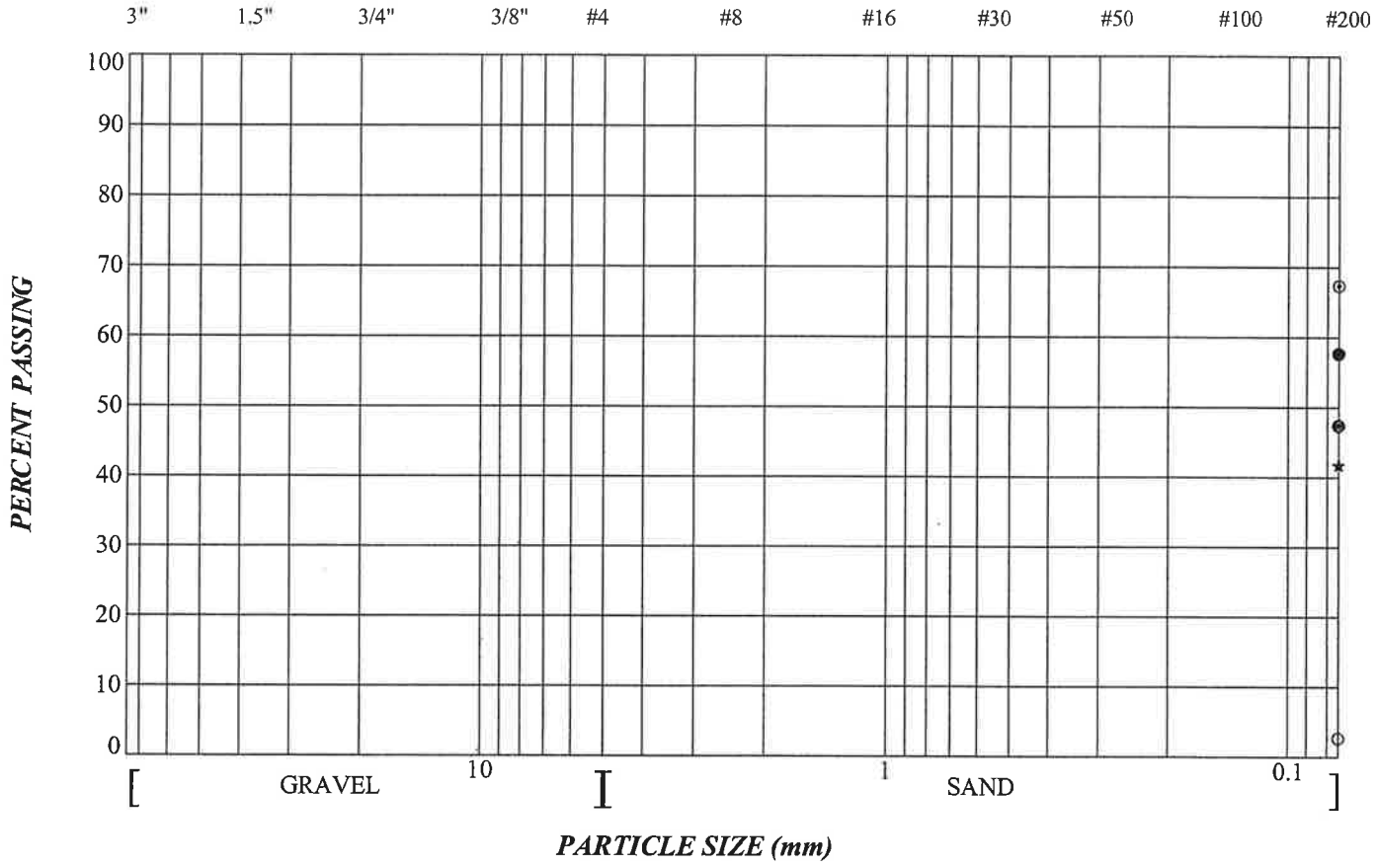
GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.4

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 03	45.0'	Alluvium (Qa)					
○	AH 04	2.0'	Alluvium (Qa)					
⊖	AH 04	14.0'	Alluvium (Qa)					
★	AH 04	16.0'	Alluvium (Qa)					
⊙	AH 04	20.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 03	45.0'	0.075						57.7	
○	AH 04	2.0'	0.075						2.7	
⊖	AH 04	14.0'	0.075						47.4	
★	AH 04	16.0'	0.075						41.8	
⊙	AH 04	20.0'	0.075						67.3	

SubSurface Designs, Inc.

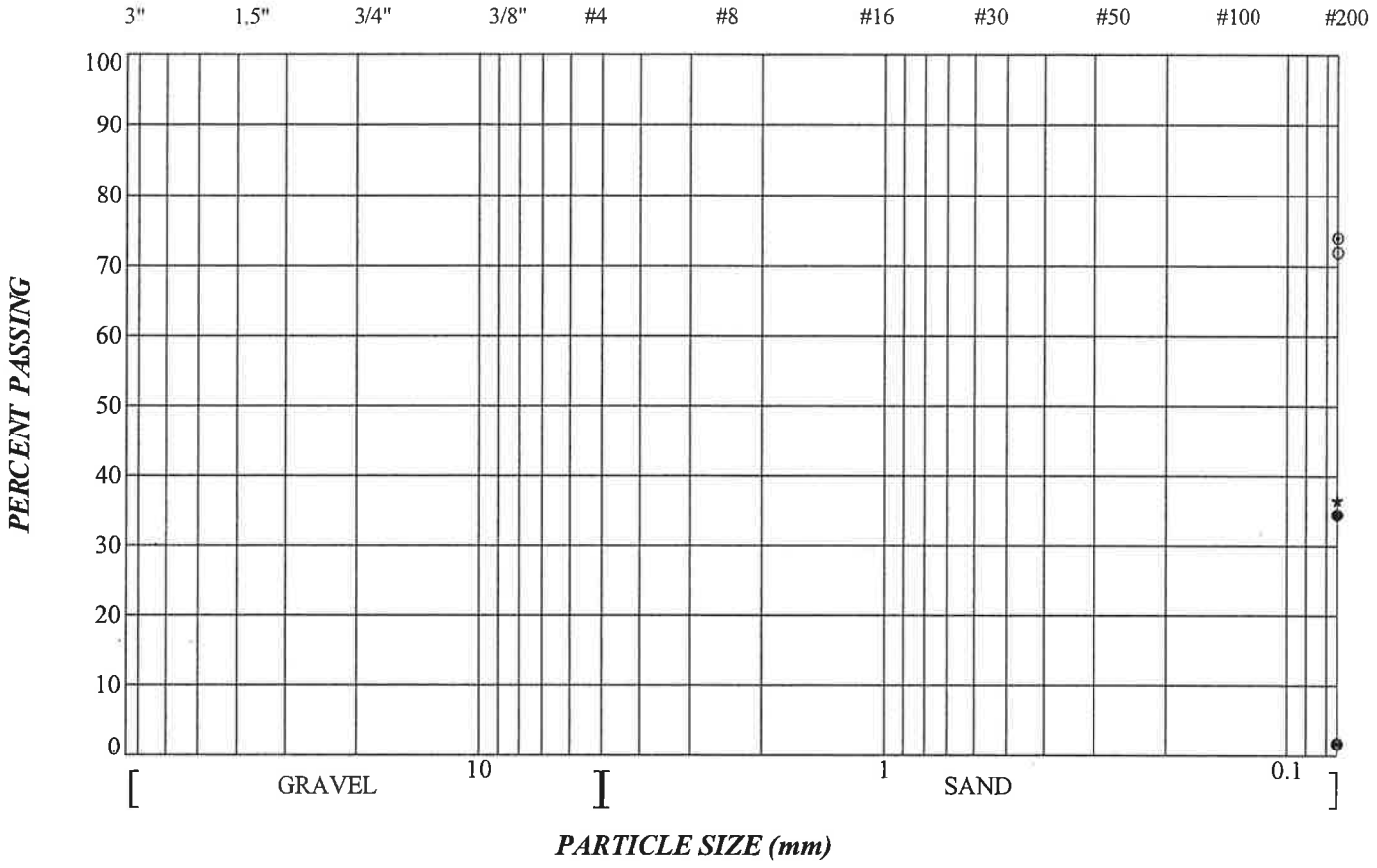
GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.5

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 04	30.0'	Alluvium (Qa)					
○	AH 04	45.0'	Alluvium (Qa)					
⊖	AH 05	1.0'	Alluvium (Qa)					
★	AH 05	15.0'	Alluvium (Qa)					
⊙	AH 05	17.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 04	30.0'	0.075						34.5	
○	AH 04	45.0'	0.075						72.0	
⊖	AH 05	1.0'	0.075						1.7	
★	AH 05	15.0'	0.075						36.6	
⊙	AH 05	17.0'	0.075						74.0	

SubSurface Designs, Inc.

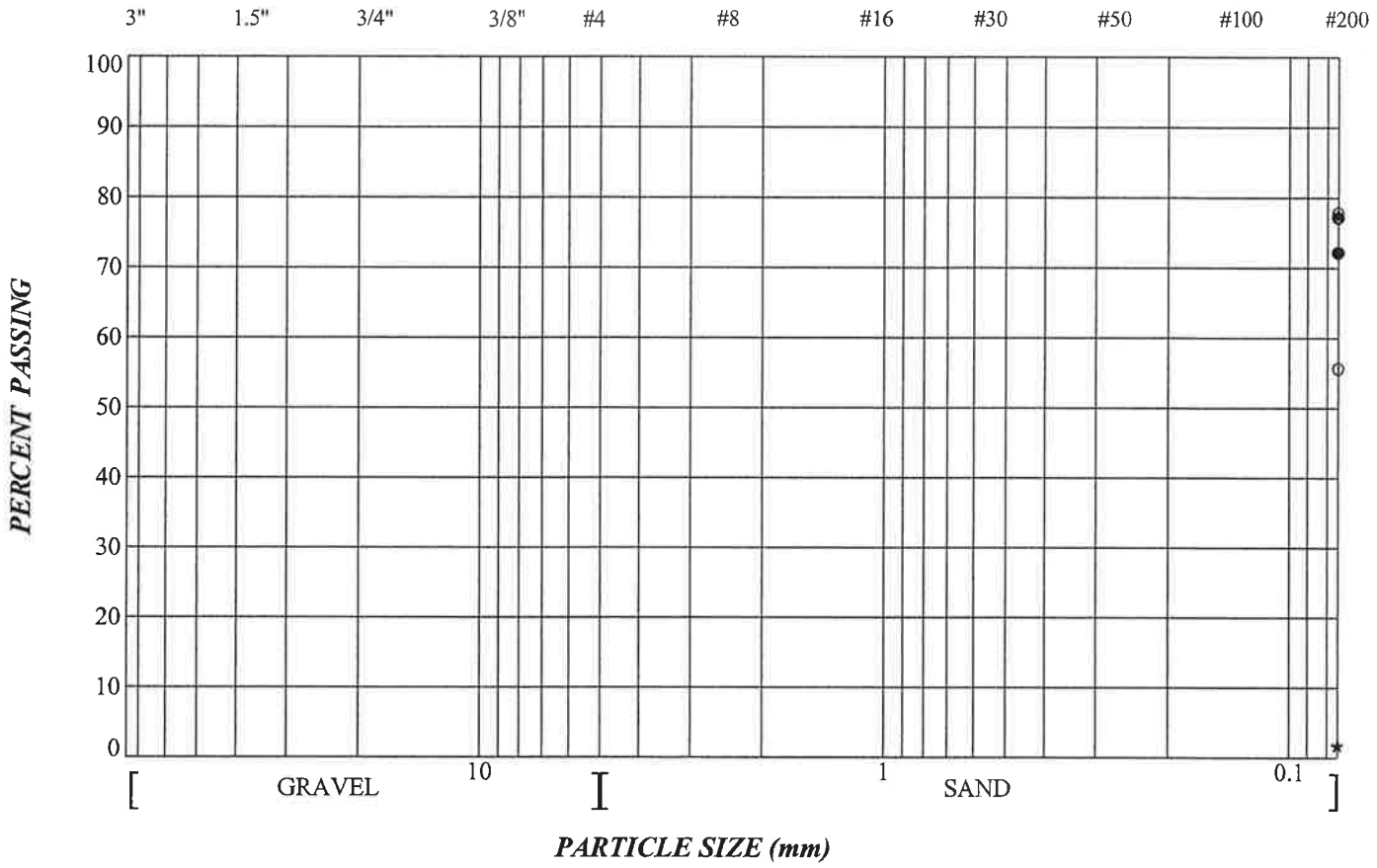
GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.6

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 05	25.0'	Alluvium (Qa)					
○	AH 05	30.0'	Alluvium (Qa)					
⊖	AH 05	40.0'	Alluvium (Qa)					
★	AH 06	3.0'	Alluvium (Qa)					
⊙	AH 06	20.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 05	25.0'	0.075						72.2	
○	AH 05	30.0'	0.075						55.6	
⊖	AH 05	40.0'	0.075						77.2	
★	AH 06	3.0'	0.075						1.7	
⊙	AH 06	20.0'	0.075						77.8	

SubSurface Designs, Inc.

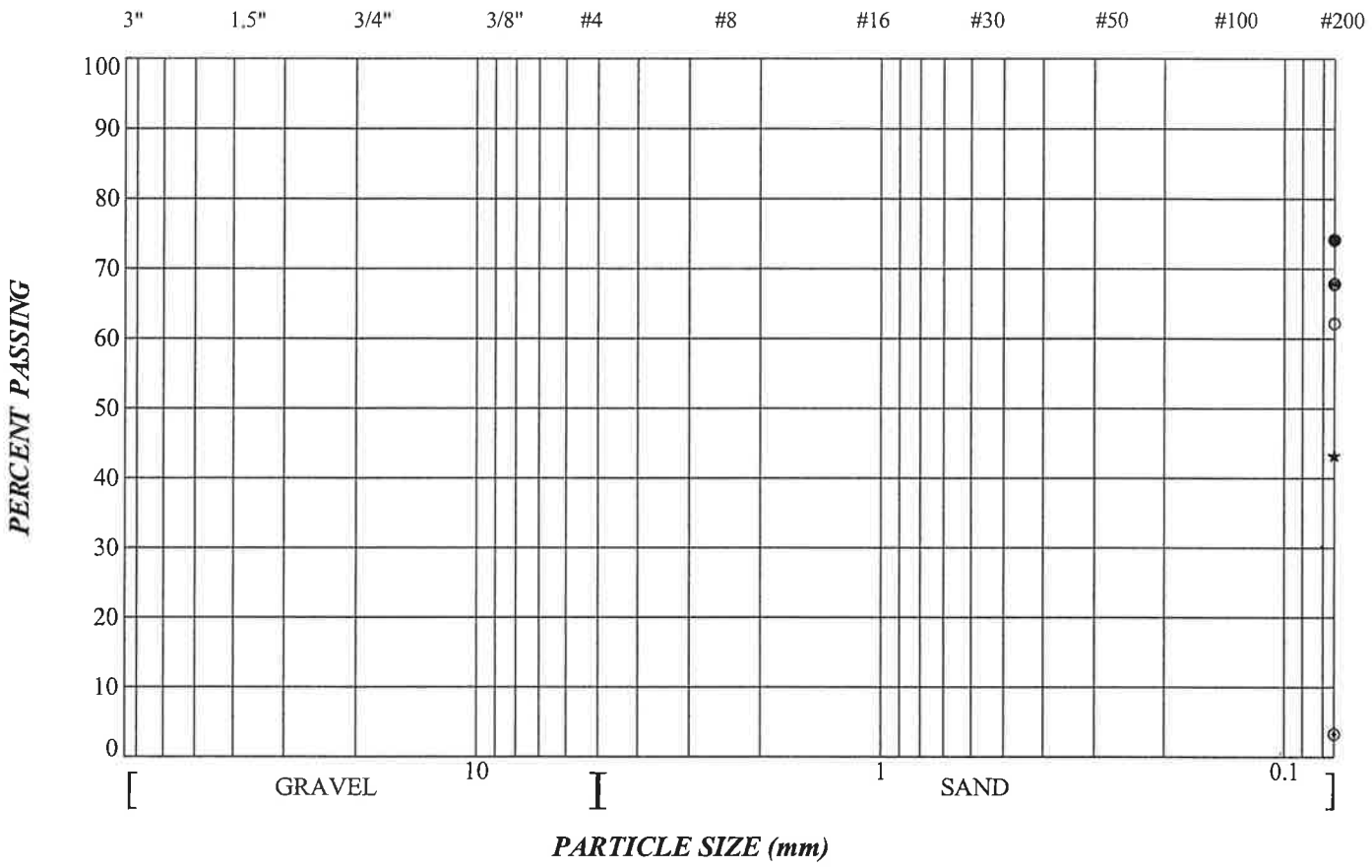
GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.7

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 06	25.0'	Alluvium (Qa)					
○	AH 06	30.0'	Alluvium (Qa)					
⊖	AH 06	35.0'	Alluvium (Qa)					
★	AH 06	45.0'	Alluvium (Qa)					
⊙	AH 07	6.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 06	25.0'	0.075						74.1	
○	AH 06	30.0'	0.075						62.2	
⊖	AH 06	35.0'	0.075						67.8	
★	AH 06	45.0'	0.075						43.3	
⊙	AH 07	6.0'	0.075						3.3	

SubSurface Designs, Inc.

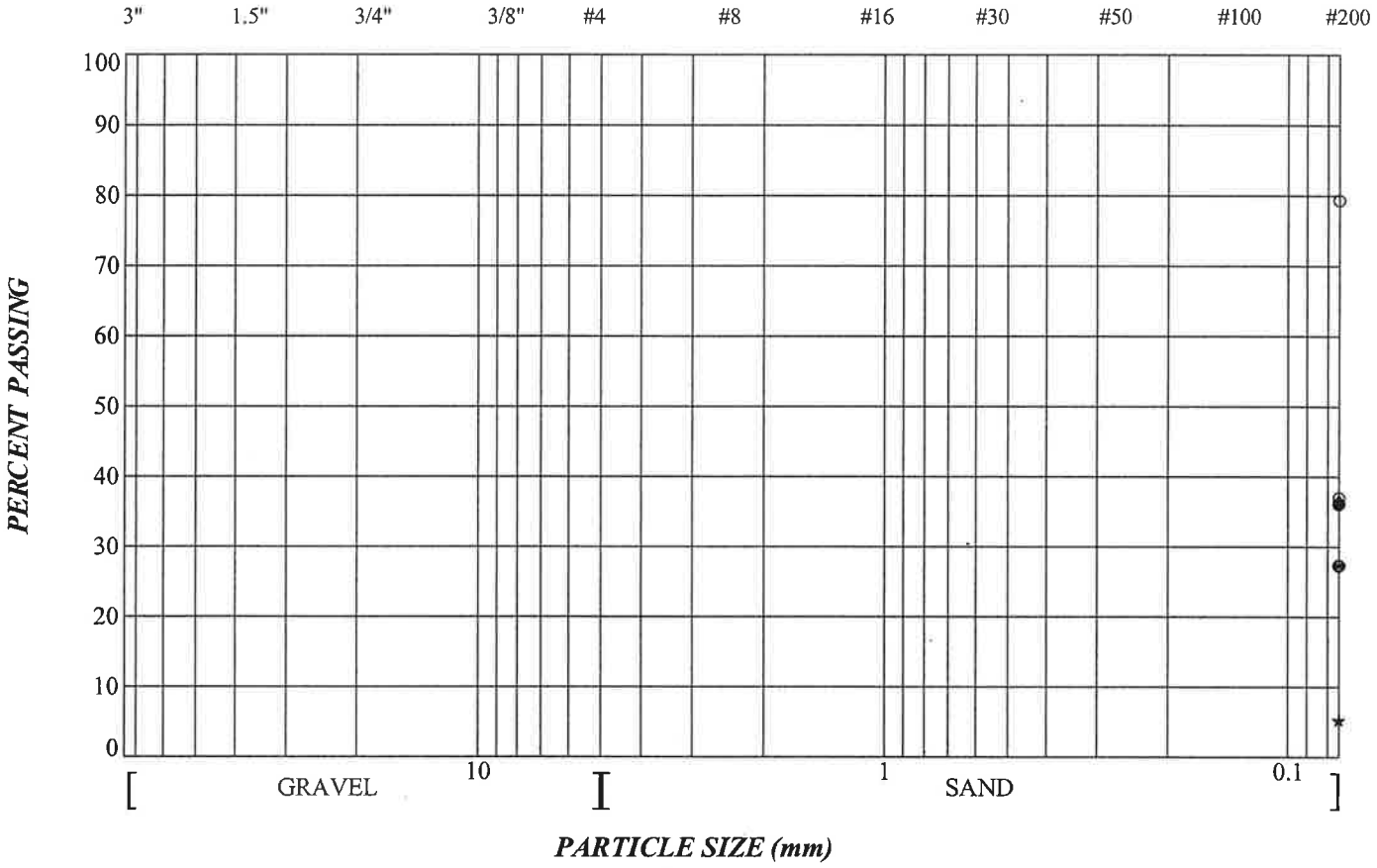
GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.8

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 07	10.0'	Alluvium (Qa)					
○	AH 07	20.0'	Alluvium (Qa)					
⊖	AH 07	35.0'	Alluvium (Qa)					
★	AH 08	5.0'	Alluvium (Qa)					
⊙	AH 08	15.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 07	10.0'	0.075						36.1	
○	AH 07	20.0'	0.075						79.4	
⊖	AH 07	35.0'	0.075						27.3	
★	AH 08	5.0'	0.075						5.3	
⊙	AH 08	15.0'	0.075						37.0	

SubSurface Designs, Inc.

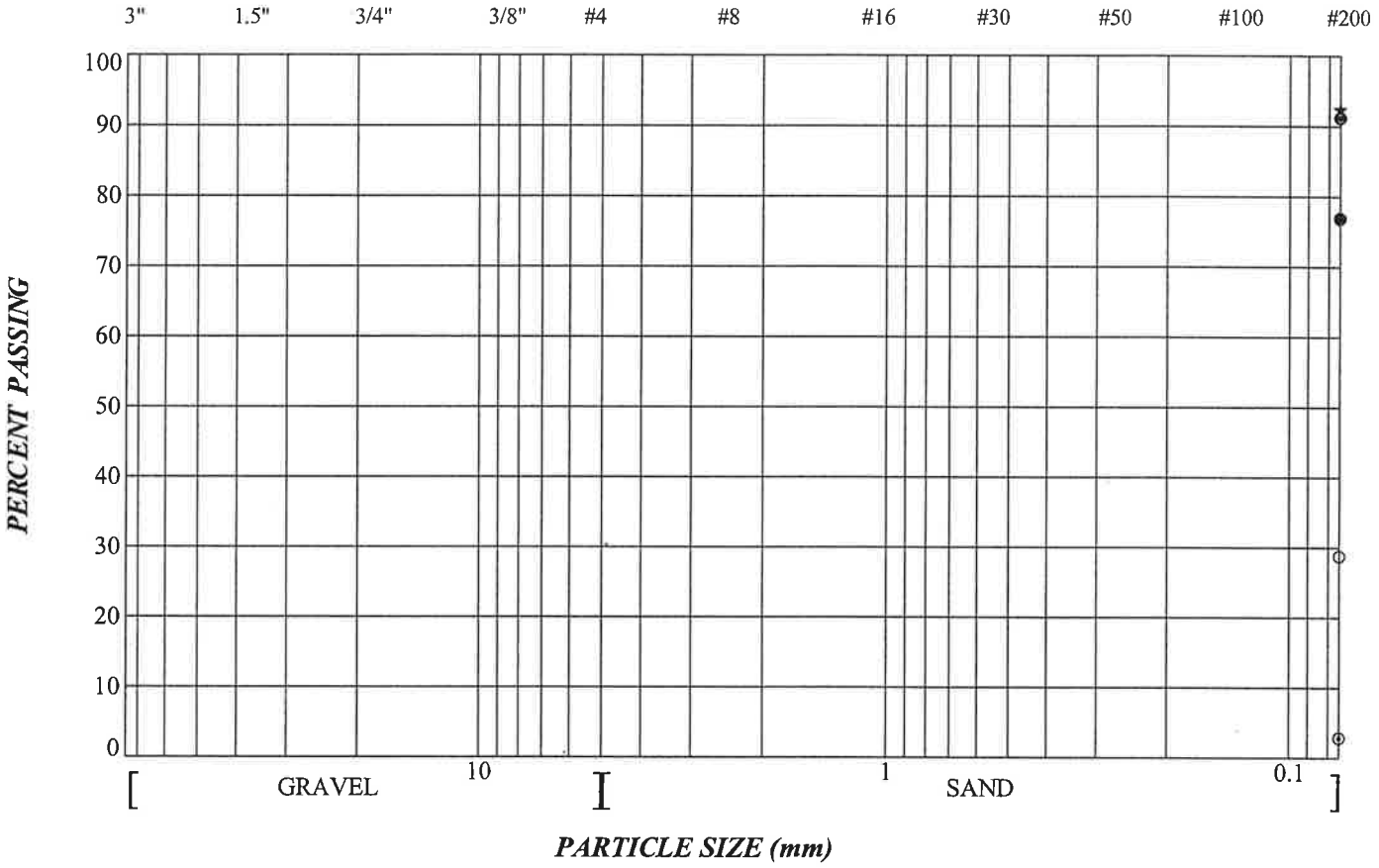
GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.9

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 08	20.0'	Alluvium (Qa)					
○	AH 08	25.0'	Alluvium (Qa)					
⊖	AH 08	30.0'	Alluvium (Qa)					
★	AH 08	40.0'	Alluvium (Qa)					
⊙	AH 09	3.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 08	20.0'	0.075						76.9	
○	AH 08	25.0'	0.075						28.8	
⊖	AH 08	30.0'	0.075						91.2	
★	AH 08	40.0'	0.075						92.4	
⊙	AH 09	3.0'	0.075						2.8	

SubSurface Designs, Inc.

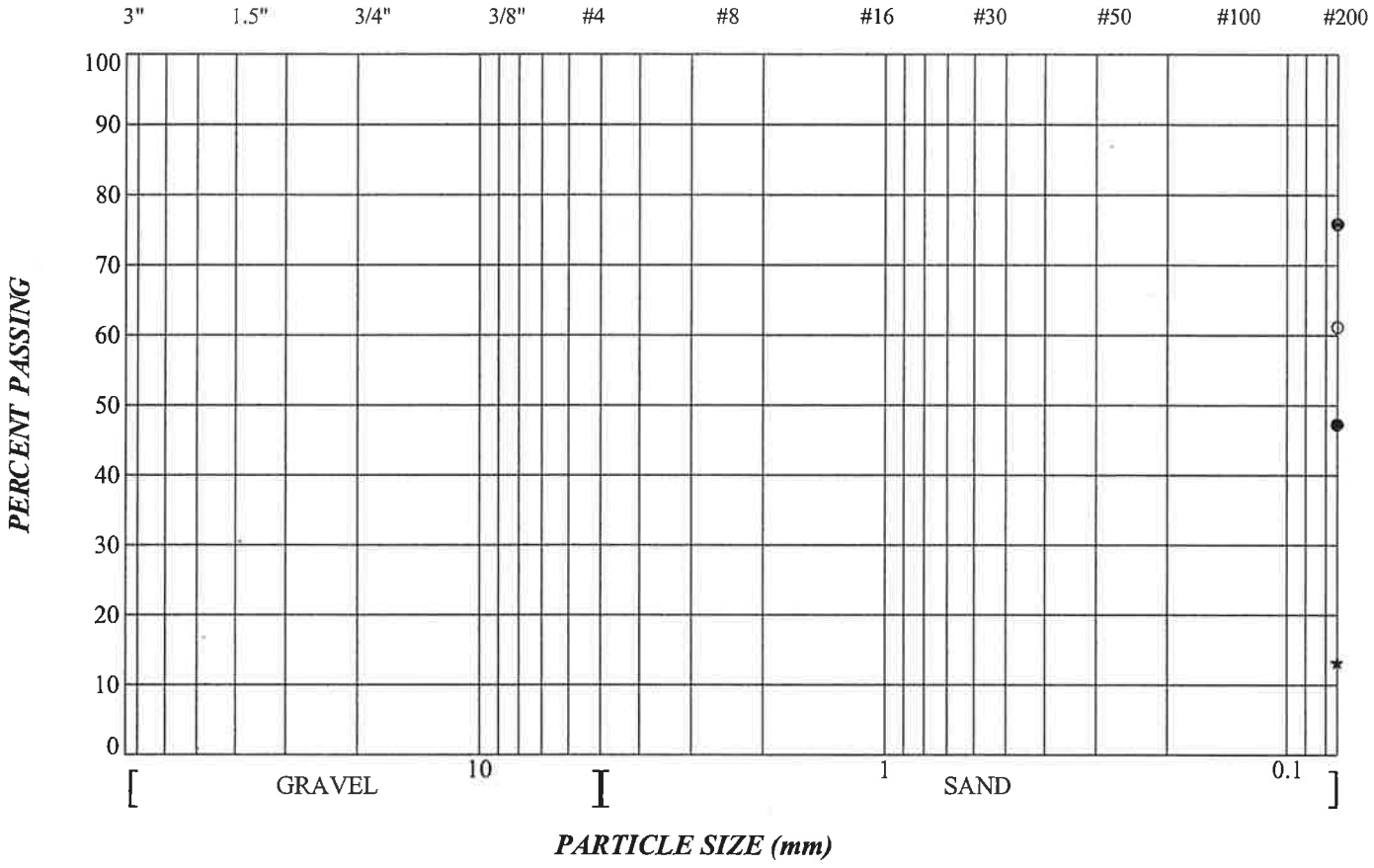
GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.10

SIEVE ANALYSIS

PROJECT NAME: *Oxnard Shores Company / Canal Street*

PROJECT NUMBER: *PIN 5462B*



Sample Identification			Material Description	LL	PL	PI	Cc	Cu
●	AH 09	20.0'	Alluvium (Qa)					
○	AH 09	25.0'	Alluvium (Qa)					
⊖	AH 09	30.0'	Alluvium (Qa)					
★	AH 09	40.0'	Alluvium (Qa)					

Sample Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	AH 09	20.0'	0.075						47.3	
○	AH 09	25.0'	0.075						61.2	
⊖	AH 09	30.0'	0.075						75.8	
★	AH 09	40.0'	0.075						13.2	

SubSurface Designs, Inc.

GEOTECHNICAL ENGINEERS & ENGINEERING GEOLOGISTS

Figure SV.11

APPENDIX III

CALCULATIONS

Bearing Value

Temporary Stability Calculation

Liquefaction Analysis

SubSurface Designs Inc.

BEARING CAPACITY ANALYSIS

JN: **5462B** CONSULT: **0**
CLIENT: **Oxnard Shores**

CALCULATION SHEET # **1**

CALCULATE THE ULTIMATE AND ALLOWABLE BEARING CAPACITIES OF THE BEARING MATERIAL LISTED BELOW USING HANSEN'S METHOD. (REFERENCE: J. BOWLES, *FOUNDATION ANALYSIS AND DESIGN*, 1988, p. 188-194).

CALCULATION PARAMETERS

EARTH MATERIAL:	COMPACTED FILL	EMBEDMENT DEPTH:	1 feet
SHEAR DIAGRAM:	S.1	FOOTING LENGTH:	100 feet
COHESION:	160 psf	FOOTING WIDTH:	1 feet
PHI ANGLE:	30 degrees	SLOPE ANGLE:	0 degrees
DENSITY:	100 pcf	FOOTING INCLINATION:	0 degrees
SAFETY FACTOR:	3		
FOOTING TYPE:	S Strip		

CALCULATED RESULTS

HANSEN'S SHAPE, DEPTH, AND INCLINATION FACTORS

Nq =	18.40	Dq =	1.29	Sy =	1.00
Nc =	30.14	Gc =	1.00	Dy =	1.00
Ny =	15.07	Bc =	1.00	Iy =	1.00
Sc =	1.01	Iq =	1.00	Gy =	1.00
Sq =	1.01	Ic =	1.00	Gq =	1.00
Dc =	1.40	Bq =	1.00	By =	1.00

CALCULATED ULTIMATE BEARING CAPACITY (Qult)	9,928.0 pounds
ALLOWABLE BEARING CAPACITY (Qa = Qult / fs)	3,309.3 pounds
PERCENT INCREASE FOR EMBEDMENT DEPTH	27.3%

CONCLUSIONS:

THE RECOMMENDED DESIGN BEARING PRESSURE IS 1500 POUNDS PER SQUARE FOOT.

SubSurface Designs Inc.

BEARING CAPACITY ANALYSIS

JN: **5462B** CONSULT: **0**
CLIENT: **Oxnard Shores**

CALCULATION SHEET # **1**

CALCULATE THE ULTIMATE AND ALLOWABLE BEARING CAPACITIES OF THE BEARING MATERIAL LISTED BELOW USING HANSEN'S METHOD. (REFERENCE: J. BOWLES, *FOUNDATION ANALYSIS AND DESIGN*, 1988, p. 188-194).

CALCULATION PARAMETERS

EARTH MATERIAL:	COMPACTED FILL	EMBEDMENT DEPTH:	1 feet
SHEAR DIAGRAM:	S.1	PAD LENGTH:	2 feet
COHESION:	160 psf	PAD WIDTH:	2 feet
PHI ANGLE:	30 degrees	SLOPE ANGLE:	0 degrees
DENSITY:	100 pcf	PAD INCLINATION:	0 degrees
SAFETY FACTOR:	3		
FOOTING TYPE:	P Pad		

CALCULATED RESULTS

HANSEN'S SHAPE, DEPTH, AND INCLINATION FACTORS

Nq =	18.40	Dq =	1.14	Sy =	0.60
Nc =	30.14	Gc =	1.00	Dy =	1.00
Ny =	15.07	Bc =	1.00	Iy =	1.00
Sc =	1.61	Iq =	1.00	Gy =	1.00
Sq =	1.58	Ic =	1.00	Gq =	1.00
Dc =	1.20	Bq =	1.00	By =	1.00

CALCULATED ULTIMATE BEARING CAPACITY (Qult)	13,545.5 pounds
ALLOWABLE BEARING CAPACITY (Qa = Qult / fs)	4,515.2 pounds
PERCENT INCREASE FOR EMBEDMENT DEPTH	42.2%

CONCLUSIONS:

THE RECOMMENDED DESIGN BEARING PRESSURE IS 1500 POUNDS PER SQUARE FOOT.

SubSurface Designs Inc.

TEMPORARY EXCAVATION HEIGHT

JN: **5462B** CONSULT: **0**
CLIENT: **Oxnard Shores**

CALCULATION SHEET #

CALCULATE THE HEIGHT TO WHICH TEMPORARY EXCAVATIONS ARE STABLE (NEGATIVE THRUST). THE EXCAVATION HEIGHT AND BACKSLOPE AND SURCHARGE CONDITIONS ARE LISTED BELOW. ASSUME THE EARTH MATERIAL IS SATURATED WITH NO EXCESS HYDROSTATIC PRESSURE.

CALCULATION PARAMETERS

EARTH MATERIAL:	Alluvium	WALL HEIGHT:	4 feet
SHEAR DIAGRAM:	0	BACKSLOPE ANGLE:	0 degrees
COHESION:	130 psf	SURCHARGE:	0 pounds
PHI ANGLE:	27.5 degrees	SURCHARGE TYPE:	U Uniform
DENSITY:	125 pcf	INITIAL FAILURE ANGLE:	30 degrees
SAFETY FACTOR:	1	FINAL FAILURE ANGLE:	90 degrees
WALL FRICTION:	0 degrees	INITIAL TENSION CRACK:	1 feet
CD (C/FS):	130.0 psf	FINAL TENSION CRACK:	4 feet
PHID = ATAN(TAN(PHI)/FS) =	27.5 degrees		

CALCULATED RESULTS

CRITICAL FAILURE ANGLE	54 degrees
AREA OF TRIAL FAILURE WEDGE	3.3 square feet
TOTAL EXTERNAL SURCHARGE	0.0 pounds
WEIGHT OF TRIAL FAILURE WEDGE	414.0 pounds
NUMBER OF TRIAL WEDGES ANALYZED	244 trials
LENGTH OF FAILURE PLANE	1.7 feet
DEPTH OF TENSION CRACK	2.6 feet
HORIZONTAL DISTANCE TO UPSLOPE TENSION CRACK	1.0 feet
CALCULATED HORIZONTAL THRUST	**-12.8 pounds**
CALCULATED EQUIVALENT FLUID PRESSURE	**-1.6 pcf**
MAXIMUM HEIGHT OF TEMPORARY EXCAVATION	**4.0 feet**

CONCLUSIONS:

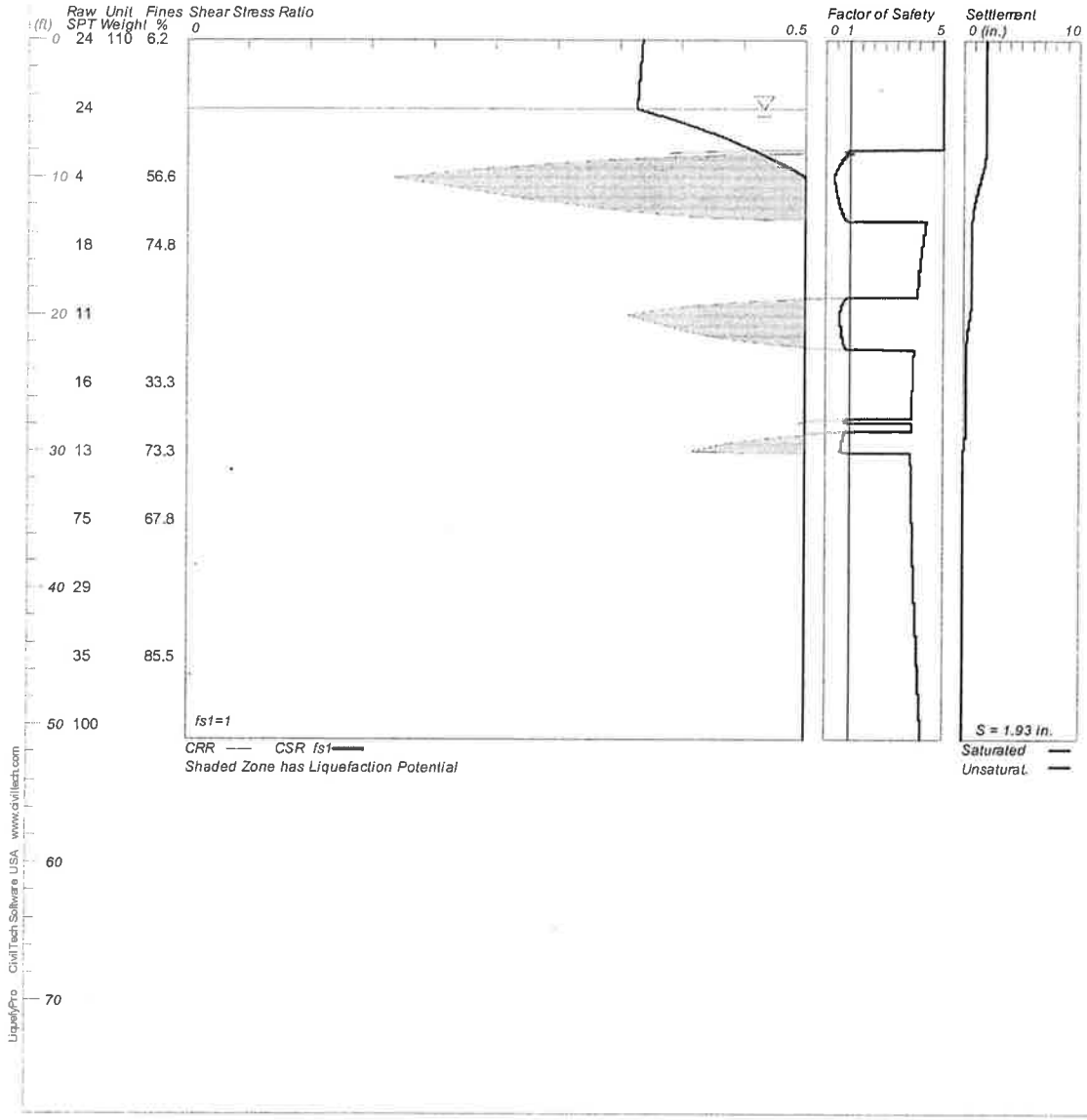
THE CALCULATION INDICATES THAT THE TEMPORARY EXCAVATIONS UP TO 4 FEET HIGH IN ALLUVIUM WITH A 1:1 BACKSLOPE HAVE A NEGATIVE THRUST AND ARE TEMPORARILY STABLE.

LIQUEFACTION ANALYSIS

Oxnard Shores

Hole No.=AH 01 Water Depth=5 ft

Magnitude=7.04
Acceleration=0.566g



SubSurface Designs, Inc. 5462B Plate A-1

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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Font: Courier New, Regular, Size 8 is recommended for this report.

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Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 01.liq

Title: Oxnard Shores

Subtitle: 5462B

Input Data:

Surface Elev.=

Hole No.=AH 01

Depth of Hole=51.00 ft

Water Table during Earthquake= 5.00 ft

Water Table during In-Situ Testing= 10.00 ft

Max. Acceleration=0.57 g

Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	24.00	110.00	6.20
5.00	24.00	110.00	6.20
10.00	4.00	110.00	56.60
15.00	18.00	110.00	74.80
20.00	11.00	110.00	74.80
25.00	16.00	110.00	33.30
30.00	13.00	110.00	73.30
35.00	75.00	110.00	67.80
40.00	29.00	110.00	67.80
45.00	35.00	110.00	85.50
50.00	100.00	110.00	85.50

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	24.00	1.50	0.75	0.000	1.70	45.90	6.20	0.29	46.19	2.00
0.50	24.00	1.50	0.75	0.028	1.70	45.90	6.20	0.29	46.19	2.00
1.00	24.00	1.50	0.75	0.055	1.70	45.90	6.20	0.29	46.19	2.00
1.50	24.00	1.50	0.75	0.083	1.70	45.90	6.20	0.29	46.19	2.00
2.00	24.00	1.50	0.75	0.110	1.70	45.90	6.20	0.29	46.19	2.00
2.50	24.00	1.50	0.75	0.138	1.70	45.90	6.20	0.29	46.19	2.00
3.00	24.00	1.50	0.75	0.165	1.70	45.90	6.20	0.29	46.19	2.00
3.50	24.00	1.50	0.75	0.193	1.70	45.90	6.20	0.29	46.19	2.00
4.00	24.00	1.50	0.75	0.220	1.70	45.90	6.20	0.29	46.19	2.00
4.50	24.00	1.50	0.75	0.248	1.70	45.90	6.20	0.29	46.19	2.00
5.00	24.00	1.50	0.75	0.275	1.70	45.90	6.20	0.29	46.19	2.00
5.50	22.00	1.50	0.75	0.303	1.70	42.07	11.24	2.46	44.53	2.00
6.00	20.00	1.50	0.75	0.330	1.70	38.25	16.28	4.97	43.22	2.00

6.50	18.00	1.50	0.75	0.358	1.67	33.87	21.32	6.82	40.69	2.00
7.00	16.00	1.50	0.75	0.385	1.61	29.01	26.36	8.06	37.07	2.00
7.50	14.00	1.50	0.75	0.413	1.56	24.52	31.40	8.86	33.39	2.00
8.00	12.00	1.50	0.75	0.440	1.51	20.35	36.44	9.07	29.42	0.40
8.50	10.00	1.50	0.85	0.468	1.46	18.65	41.48	8.73	27.38	0.33
9.00	8.00	1.50	0.85	0.495	1.42	14.50	46.52	7.90	22.40	0.25
9.50	6.00	1.50	0.85	0.523	1.38	10.58	51.56	7.12	17.70	0.19
10.00	4.00	1.50	0.85	0.550	1.35	6.88	56.60	6.38	13.25	0.14
10.50	5.40	1.50	0.85	0.562	1.33	9.18	58.42	6.84	16.02	0.17
11.00	6.80	1.50	0.85	0.574	1.32	11.45	60.24	7.29	18.73	0.20
11.50	8.20	1.50	0.85	0.586	1.31	13.66	62.06	7.73	21.39	0.23
12.00	9.60	1.50	0.85	0.598	1.29	15.83	63.88	8.17	24.00	0.27
12.50	11.00	1.50	0.85	0.610	1.28	17.96	65.70	8.59	26.56	0.31
13.00	12.40	1.50	0.85	0.621	1.27	20.06	67.52	9.01	29.07	0.38
13.50	13.80	1.50	0.85	0.633	1.26	22.11	69.34	9.42	31.53	2.00
14.00	15.20	1.50	0.85	0.645	1.24	24.13	71.16	9.83	33.95	2.00
14.50	16.60	1.50	0.85	0.657	1.23	26.11	72.98	10.22	36.33	2.00
15.00	18.00	1.50	0.95	0.669	1.22	31.36	74.80	11.27	42.63	2.00
15.50	17.30	1.50	0.95	0.681	1.21	29.88	74.80	10.98	40.85	2.00
16.00	16.60	1.50	0.95	0.693	1.20	28.42	74.80	10.68	39.10	2.00
16.50	15.90	1.50	0.95	0.705	1.19	26.99	74.80	10.40	37.39	2.00
17.00	15.20	1.50	0.95	0.717	1.18	25.59	74.80	10.12	35.70	2.00
17.50	14.50	1.50	0.95	0.729	1.17	24.21	74.80	9.84	34.05	2.00
18.00	13.80	1.50	0.95	0.740	1.16	22.85	74.80	9.57	32.42	2.00
18.50	13.10	1.50	0.95	0.752	1.15	21.52	74.80	9.30	30.83	2.00
19.00	12.40	1.50	0.95	0.764	1.14	20.21	74.80	9.04	29.26	0.39
19.50	11.70	1.50	0.95	0.776	1.14	18.93	74.80	8.79	27.71	0.34
20.00	11.00	1.50	0.95	0.788	1.13	17.66	74.80	8.53	26.19	0.30
20.50	11.50	1.50	0.95	0.800	1.12	18.32	70.65	8.66	26.99	0.32
21.00	12.00	1.50	0.95	0.812	1.11	18.98	66.50	8.80	27.77	0.34
21.50	12.50	1.50	0.95	0.824	1.10	19.63	62.35	8.93	28.55	0.36
22.00	13.00	1.50	0.95	0.836	1.09	20.27	58.20	9.05	29.32	0.39
22.50	13.50	1.50	0.95	0.848	1.09	20.90	54.05	9.18	30.08	0.48
23.00	14.00	1.50	0.95	0.859	1.08	21.52	49.90	9.30	30.82	2.00
23.50	14.50	1.50	0.95	0.871	1.07	22.14	45.75	9.43	31.56	2.00
24.00	15.00	1.50	0.95	0.883	1.06	22.74	41.60	9.55	32.29	2.00
24.50	15.50	1.50	0.95	0.895	1.06	23.35	37.45	9.67	33.01	2.00
25.00	16.00	1.50	0.95	0.907	1.05	23.94	33.30	9.26	33.20	2.00
25.50	15.70	1.50	0.95	0.919	1.04	23.34	37.30	9.67	33.01	2.00
26.00	15.40	1.50	0.95	0.931	1.04	22.75	41.30	9.55	32.30	2.00
26.50	15.10	1.50	0.95	0.943	1.03	22.16	45.30	9.43	31.59	2.00
27.00	14.80	1.50	0.95	0.955	1.02	21.59	49.30	9.32	30.90	2.00
27.50	14.50	1.50	0.95	0.967	1.02	21.02	53.30	9.20	30.22	2.00
28.00	14.20	1.50	1.00	0.978	1.01	21.53	57.30	9.31	30.84	2.00
28.50	13.90	1.50	1.00	0.990	1.00	20.95	61.30	9.19	30.14	2.00
29.00	13.60	1.50	1.00	1.002	1.00	20.38	65.30	9.08	29.45	0.40
29.50	13.30	1.50	1.00	1.014	0.99	19.81	69.30	8.96	28.77	0.37
30.00	13.00	1.50	1.00	1.026	0.99	19.25	73.30	8.85	28.10	0.35
30.50	19.20	1.50	1.00	1.038	0.98	28.27	72.75	10.65	38.92	2.00
31.00	25.40	1.50	1.00	1.050	0.98	37.18	72.20	12.44	49.62	2.00
31.50	31.60	1.50	1.00	1.062	0.97	46.00	71.65	14.20	60.20	2.00
32.00	37.80	1.50	1.00	1.074	0.97	54.72	71.10	15.94	70.66	2.00
32.50	44.00	1.50	1.00	1.086	0.96	63.34	70.55	17.67	81.01	2.00
33.00	50.20	1.50	1.00	1.097	0.95	71.88	70.00	19.38	91.25	2.00
33.50	56.40	1.50	1.00	1.109	0.95	80.32	69.45	21.06	101.38	2.00
34.00	62.60	1.50	1.00	1.121	0.94	88.68	68.90	22.74	111.41	2.00
34.50	68.80	1.50	1.00	1.133	0.94	96.95	68.35	24.39	121.33	2.00
35.00	75.00	1.50	1.00	1.145	0.93	105.13	67.80	26.03	131.16	2.00
35.50	70.40	1.50	1.00	1.157	0.93	98.18	67.80	24.64	122.82	2.00
36.00	65.80	1.50	1.00	1.169	0.92	91.30	67.80	23.26	114.56	2.00
36.50	61.20	1.50	1.00	1.181	0.92	84.49	67.80	21.90	106.38	2.00

37.00	56.60	1.50	1.00	1.193	0.92	77.75	67.80	20.55	98.30	2.00
37.50	52.00	1.50	1.00	1.205	0.91	71.07	67.80	19.21	90.29	2.00
38.00	47.40	1.50	1.00	1.216	0.91	64.47	67.80	17.89	82.36	2.00
38.50	42.80	1.50	1.00	1.228	0.90	57.93	67.80	16.59	74.52	2.00
39.00	38.20	1.50	1.00	1.240	0.90	51.46	67.80	15.29	66.75	2.00
39.50	33.60	1.50	1.00	1.252	0.89	45.05	67.80	14.01	59.05	2.00
40.00	29.00	1.50	1.00	1.264	0.89	38.70	67.80	12.74	51.43	2.00
40.50	29.60	1.50	1.00	1.276	0.89	39.31	69.57	12.86	52.17	2.00
41.00	30.20	1.50	1.00	1.288	0.88	39.92	71.34	12.98	52.90	2.00
41.50	30.80	1.50	1.00	1.300	0.88	40.52	73.11	13.10	53.63	2.00
42.00	31.40	1.50	1.00	1.312	0.87	41.13	74.88	13.23	54.35	2.00
42.50	32.00	1.50	1.00	1.323	0.87	41.72	76.65	13.34	55.07	2.00
43.00	32.60	1.50	1.00	1.335	0.87	42.32	78.42	13.46	55.78	2.00
43.50	33.20	1.50	1.00	1.347	0.86	42.90	80.19	13.58	56.48	2.00
44.00	33.80	1.50	1.00	1.359	0.86	43.49	81.96	13.70	57.18	2.00
44.50	34.40	1.50	1.00	1.371	0.85	44.07	83.73	13.81	57.88	2.00
45.00	35.00	1.50	1.00	1.383	0.85	44.64	85.50	13.93	58.57	2.00
45.50	41.49	1.50	1.00	1.395	0.85	52.70	85.50	15.54	68.24	2.00
46.00	47.99	1.50	1.00	1.407	0.84	60.70	85.50	17.14	77.84	2.00
46.50	54.49	1.50	1.00	1.419	0.84	68.63	85.50	18.73	87.35	2.00
47.00	60.99	1.50	1.00	1.431	0.84	76.49	85.50	20.30	96.79	2.00
47.50	67.49	1.50	1.00	1.442	0.83	84.29	85.50	21.86	106.15	2.00
48.00	73.99	1.50	1.00	1.454	0.83	92.03	85.50	23.41	115.44	2.00
48.50	80.49	1.50	1.00	1.466	0.83	99.71	85.50	24.94	124.65	2.00
49.00	86.99	1.50	1.00	1.478	0.82	107.33	85.50	26.47	133.79	2.00
49.50	93.49	1.50	1.00	1.490	0.82	114.89	85.50	27.98	142.86	2.00
50.00	99.99	1.50	1.00	1.502	0.82	122.39	85.50	29.48	151.86	2.00
50.50	100.00	1.50	1.00	1.514	0.81	121.91	85.50	29.38	151.29	2.00
51.00	100.00	1.50	1.00	1.526	0.81	121.44	85.50	29.29	150.72	2.00

CRR is based on water table at 10.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.00	1.00	2.00	1.18	2.35	0.37	5.00
0.50	0.02	2.00	1.00	2.00	1.18	2.35	0.37	5.00
1.00	0.04	2.00	1.00	2.00	1.18	2.35	0.37	5.00
1.50	0.05	2.00	1.00	2.00	1.18	2.35	0.37	5.00
2.00	0.07	2.00	1.00	2.00	1.18	2.35	0.37	5.00
2.50	0.09	2.00	1.00	2.00	1.18	2.35	0.37	5.00
3.00	0.11	2.00	1.00	2.00	1.18	2.35	0.37	5.00
3.50	0.13	2.00	1.00	2.00	1.18	2.35	0.36	5.00
4.00	0.14	2.00	1.00	2.00	1.18	2.35	0.36	5.00
4.50	0.16	2.00	1.00	2.00	1.18	2.35	0.36	5.00
5.00	0.18	2.00	1.00	2.00	1.18	2.35	0.36	5.00
5.50	0.20	2.00	1.00	2.00	1.18	2.35	0.38	5.00
6.00	0.21	2.00	1.00	2.00	1.18	2.35	0.40	5.00
6.50	0.23	2.00	1.00	2.00	1.18	2.35	0.42	5.00
7.00	0.25	2.00	1.00	2.00	1.18	2.35	0.43	5.00
7.50	0.27	2.00	1.00	2.00	1.18	2.35	0.45	5.00
8.00	0.29	0.40	1.00	0.40	1.18	0.46	0.46	1.01
8.50	0.30	0.33	1.00	0.33	1.18	0.39	0.47	0.82 *
9.00	0.32	0.25	1.00	0.25	1.18	0.29	0.48	0.60 *
9.50	0.34	0.19	1.00	0.19	1.18	0.22	0.49	0.46 *
10.00	0.36	0.14	1.00	0.14	1.18	0.17	0.50	0.34 *
10.50	0.37	0.17	1.00	0.17	1.18	0.20	0.51	0.40 *
11.00	0.37	0.20	1.00	0.20	1.18	0.24	0.52	0.46 *
11.50	0.38	0.23	1.00	0.23	1.18	0.27	0.53	0.52 *
12.00	0.39	0.27	1.00	0.27	1.18	0.31	0.53	0.59 *

12.50	0.40	0.31	1.00	0.31	1.18	0.36	0.54	0.67 *
13.00	0.40	0.38	1.00	0.38	1.18	0.44	0.55	0.81 *
13.50	0.41	2.00	1.00	2.00	1.18	2.35	0.55	4.24
14.00	0.42	2.00	1.00	2.00	1.18	2.35	0.56	4.20
14.50	0.43	2.00	1.00	2.00	1.18	2.35	0.57	4.16
15.00	0.43	2.00	1.00	2.00	1.18	2.35	0.57	4.12
15.50	0.44	2.00	1.00	2.00	1.18	2.35	0.58	4.08
16.00	0.45	2.00	1.00	2.00	1.18	2.35	0.58	4.05
16.50	0.46	2.00	1.00	2.00	1.18	2.35	0.59	4.02
17.00	0.47	2.00	1.00	2.00	1.18	2.35	0.59	3.99
17.50	0.47	2.00	1.00	2.00	1.18	2.35	0.59	3.96
18.00	0.48	2.00	1.00	2.00	1.18	2.35	0.60	3.94
18.50	0.49	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.50	0.39	1.00	0.39	1.18	0.45	0.60	0.75 *
19.50	0.50	0.34	1.00	0.34	1.18	0.39	0.61	0.65 *
20.00	0.51	0.30	1.00	0.30	1.18	0.36	0.61	0.58 *
20.50	0.52	0.32	1.00	0.32	1.18	0.38	0.61	0.61 *
21.00	0.53	0.34	1.00	0.34	1.18	0.40	0.62	0.64 *
21.50	0.54	0.36	1.00	0.36	1.18	0.42	0.62	0.68 *
22.00	0.54	0.39	1.00	0.39	1.18	0.46	0.62	0.74 *
22.50	0.55	0.48	1.00	0.48	1.18	0.56	0.62	0.90 *
23.00	0.56	2.00	1.00	2.00	1.18	2.35	0.63	3.75
23.50	0.57	2.00	1.00	2.00	1.18	2.35	0.63	3.74
24.00	0.57	2.00	1.00	2.00	1.18	2.35	0.63	3.73
24.50	0.58	2.00	1.00	2.00	1.18	2.35	0.63	3.72
25.00	0.59	2.00	1.00	2.00	1.18	2.35	0.63	3.71
25.50	0.60	2.00	1.00	2.00	1.18	2.35	0.64	3.70
26.00	0.61	2.00	1.00	2.00	1.18	2.35	0.64	3.69
26.50	0.61	2.00	1.00	2.00	1.18	2.35	0.64	3.68
27.00	0.62	2.00	1.00	2.00	1.18	2.35	0.64	3.67
27.50	0.63	2.00	1.00	2.00	1.18	2.35	0.64	3.66
28.00	0.64	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.64	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.00	0.65	0.40	1.00	0.40	1.18	0.47	0.65	0.72 *
29.50	0.66	0.37	1.00	0.37	1.18	0.43	0.65	0.66 *
30.00	0.67	0.35	1.00	0.35	1.18	0.41	0.65	0.63 *
30.50	0.67	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.00	0.68	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.50	0.69	2.00	1.00	2.00	1.18	2.35	0.65	3.64
32.00	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.65
32.50	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.72	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.73	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.74	2.00	1.00	2.00	1.18	2.35	0.64	3.68
35.00	0.74	2.00	1.00	2.00	1.18	2.35	0.64	3.69
35.50	0.75	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.76	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.77	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.78	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.78	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.79	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.80	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.81	2.00	1.00	2.00	1.18	2.35	0.62	3.77
39.50	0.81	2.00	1.00	2.00	1.18	2.35	0.62	3.78
40.00	0.82	2.00	1.00	2.00	1.18	2.35	0.62	3.79
40.50	0.83	2.00	1.00	2.00	1.18	2.35	0.62	3.80
41.00	0.84	2.00	1.00	2.00	1.18	2.35	0.62	3.82
41.50	0.84	2.00	1.00	2.00	1.18	2.35	0.61	3.83
42.00	0.85	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.86	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.87	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.88	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.88	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.89	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.90	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.91	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	0.91	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	0.92	2.00	1.00	2.00	1.18	2.35	0.59	3.97
47.00	0.93	2.00	1.00	2.00	1.18	2.35	0.59	3.98
47.50	0.94	2.00	1.00	2.00	1.18	2.35	0.59	4.00
48.00	0.95	2.00	1.00	2.00	1.18	2.35	0.59	4.01
48.50	0.95	2.00	1.00	2.00	1.18	2.35	0.58	4.03
49.00	0.96	2.00	1.00	2.00	1.18	2.35	0.58	4.04
49.50	0.97	2.00	1.00	2.00	1.18	2.35	0.58	4.06
50.00	0.98	2.00	1.00	2.00	1.18	2.35	0.58	4.08
50.50	0.98	2.00	1.00	2.00	1.18	2.35	0.57	4.09
51.00	0.99	2.00	1.00	2.00	1.18	2.35	0.57	4.11

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, ` CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	46.19	6.20	0.00	46.19
0.50	-	-	-	46.19	6.20	0.00	46.19
1.00	-	-	-	46.19	6.20	0.00	46.19
1.50	-	-	-	46.19	6.20	0.00	46.19
2.00	-	-	-	46.19	6.20	0.00	46.19
2.50	-	-	-	46.19	6.20	0.00	46.19
3.00	-	-	-	46.19	6.20	0.00	46.19
3.50	-	-	-	46.19	6.20	0.00	46.19
4.00	-	-	-	46.19	6.20	0.00	46.19
4.50	-	-	-	46.19	6.20	0.00	46.19
5.00	-	-	-	46.19	6.20	0.00	46.19
5.50	-	-	-	44.53	11.24	0.00	44.53
6.00	-	-	-	43.22	16.28	0.00	43.22
6.50	-	-	-	40.69	21.32	0.00	40.69
7.00	-	-	-	37.07	26.36	0.00	37.07
7.50	-	-	-	33.39	31.40	0.00	33.39
8.00	-	-	-	29.42	36.44	0.00	29.42
8.50	-	-	-	27.38	41.48	0.00	27.38
9.00	-	-	-	22.40	46.52	0.00	22.40
9.50	-	-	-	17.70	51.56	0.00	17.70
10.00	-	-	-	13.25	56.60	0.00	13.25
10.50	-	-	-	16.02	58.42	0.00	16.02
11.00	-	-	-	18.73	60.24	0.00	18.73
11.50	-	-	-	21.39	62.06	0.00	21.39
12.00	-	-	-	24.00	63.88	0.00	24.00
12.50	-	-	-	26.56	65.70	0.00	26.56
13.00	-	-	-	29.07	67.52	0.00	29.07
13.50	-	-	-	31.53	69.34	0.00	31.53
14.00	-	-	-	33.95	71.16	0.00	33.95
14.50	-	-	-	36.33	72.98	0.00	36.33
15.00	-	-	-	42.63	74.80	0.00	42.63
15.50	-	-	-	40.85	74.80	0.00	40.85
16.00	-	-	-	39.10	74.80	0.00	39.10

16.50	-	-	-	37.39	74.80	0.00	37.39
17.00	-	-	-	35.70	74.80	0.00	35.70
17.50	-	-	-	34.05	74.80	0.00	34.05
18.00	-	-	-	32.42	74.80	0.00	32.42
18.50	-	-	-	30.83	74.80	0.00	30.83
19.00	-	-	-	29.26	74.80	0.00	29.26
19.50	-	-	-	27.71	74.80	0.00	27.71
20.00	-	-	-	26.19	74.80	0.00	26.19
20.50	-	-	-	26.99	70.65	0.00	26.99
21.00	-	-	-	27.77	66.50	0.00	27.77
21.50	-	-	-	28.55	62.35	0.00	28.55
22.00	-	-	-	29.32	58.20	0.00	29.32
22.50	-	-	-	30.08	54.05	0.00	30.08
23.00	-	-	-	30.82	49.90	0.00	30.82
23.50	-	-	-	31.56	45.75	0.00	31.56
24.00	-	-	-	32.29	41.60	0.00	32.29
24.50	-	-	-	33.01	37.45	0.00	33.01
25.00	-	-	-	33.20	33.30	0.00	33.20
25.50	-	-	-	33.01	37.30	0.00	33.01
26.00	-	-	-	32.30	41.30	0.00	32.30
26.50	-	-	-	31.59	45.30	0.00	31.59
27.00	-	-	-	30.90	49.30	0.00	30.90
27.50	-	-	-	30.22	53.30	0.00	30.22
28.00	-	-	-	30.84	57.30	0.00	30.84
28.50	-	-	-	30.14	61.30	0.00	30.14
29.00	-	-	-	29.45	65.30	0.00	29.45
29.50	-	-	-	28.77	69.30	0.00	28.77
30.00	-	-	-	28.10	73.30	0.00	28.10
30.50	-	-	-	38.92	72.75	0.00	38.92
31.00	-	-	-	49.62	72.20	0.00	49.62
31.50	-	-	-	60.20	71.65	0.00	60.20
32.00	-	-	-	70.66	71.10	0.00	70.66
32.50	-	-	-	81.01	70.55	0.00	81.01
33.00	-	-	-	91.25	70.00	0.00	91.25
33.50	-	-	-	100.00	69.45	0.00	100.00
34.00	-	-	-	100.00	68.90	0.00	100.00
34.50	-	-	-	100.00	68.35	0.00	100.00
35.00	-	-	-	100.00	67.80	0.00	100.00
35.50	-	-	-	100.00	67.80	0.00	100.00
36.00	-	-	-	100.00	67.80	0.00	100.00
36.50	-	-	-	100.00	67.80	0.00	100.00
37.00	-	-	-	98.30	67.80	0.00	98.30
37.50	-	-	-	90.29	67.80	0.00	90.29
38.00	-	-	-	82.36	67.80	0.00	82.36
38.50	-	-	-	74.52	67.80	0.00	74.52
39.00	-	-	-	66.75	67.80	0.00	66.75
39.50	-	-	-	59.05	67.80	0.00	59.05
40.00	-	-	-	51.43	67.80	0.00	51.43
40.50	-	-	-	52.17	69.57	0.00	52.17
41.00	-	-	-	52.90	71.34	0.00	52.90
41.50	-	-	-	53.63	73.11	0.00	53.63
42.00	-	-	-	54.35	74.88	0.00	54.35
42.50	-	-	-	55.07	76.65	0.00	55.07
43.00	-	-	-	55.78	78.42	0.00	55.78
43.50	-	-	-	56.48	80.19	0.00	56.48
44.00	-	-	-	57.18	81.96	0.00	57.18
44.50	-	-	-	57.88	83.73	0.00	57.88
45.00	-	-	-	58.57	85.50	0.00	58.57
45.50	-	-	-	68.24	85.50	0.00	68.24
46.00	-	-	-	77.84	85.50	0.00	77.84
46.50	-	-	-	87.35	85.50	0.00	87.35

47.00	-	-	-	96.79	85.50	0.00	96.79
47.50	-	-	-	100.00	85.50	0.00	100.00
48.00	-	-	-	100.00	85.50	0.00	100.00
48.50	-	-	-	100.00	85.50	0.00	100.00
49.00	-	-	-	100.00	85.50	0.00	100.00
49.50	-	-	-	100.00	85.50	0.00	100.00
50.00	-	-	-	100.00	85.50	0.00	100.00
50.50	-	-	-	100.00	85.50	0.00	100.00
51.00	-	-	-	100.00	85.50	0.00	100.00

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.11	85.50	100.00	100.00	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.09	85.50	100.00	100.00	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.08	85.50	100.00	100.00	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.06	85.50	100.00	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.04	85.50	100.00	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.03	85.50	100.00	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.01	85.50	100.00	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.00	85.50	100.00	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	3.98	85.50	96.79	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.97	85.50	87.35	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	85.50	77.84	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	85.50	68.24	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	85.50	58.57	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	83.73	57.88	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	81.96	57.18	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	80.19	56.48	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	78.42	55.78	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	76.65	55.07	100.00	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	74.88	54.35	100.00	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	3.83	73.11	53.63	100.00	0.000	0.0E0	0.000	0.000
41.00	0.62	1.00	0.62	3.82	71.34	52.90	100.00	0.000	0.0E0	0.000	0.000
40.50	0.62	1.00	0.62	3.80	69.57	52.17	100.00	0.000	0.0E0	0.000	0.000
40.00	0.62	1.00	0.62	3.79	67.80	51.43	100.00	0.000	0.0E0	0.000	0.000
39.50	0.62	1.00	0.62	3.78	67.80	59.05	100.00	0.000	0.0E0	0.000	0.000
39.00	0.62	1.00	0.62	3.77	67.80	66.75	100.00	0.000	0.0E0	0.000	0.000
38.50	0.63	1.00	0.63	3.76	67.80	74.52	100.00	0.000	0.0E0	0.000	0.000
38.00	0.63	1.00	0.63	3.75	67.80	82.36	100.00	0.000	0.0E0	0.000	0.000
37.50	0.63	1.00	0.63	3.74	67.80	90.29	100.00	0.000	0.0E0	0.000	0.000
37.00	0.63	1.00	0.63	3.73	67.80	98.30	100.00	0.000	0.0E0	0.000	0.000
36.50	0.63	1.00	0.63	3.72	67.80	100.00	100.00	0.000	0.0E0	0.000	0.000
36.00	0.63	1.00	0.63	3.71	67.80	100.00	100.00	0.000	0.0E0	0.000	0.000
35.50	0.64	1.00	0.64	3.70	67.80	100.00	100.00	0.000	0.0E0	0.000	0.000
35.00	0.64	1.00	0.64	3.69	67.80	100.00	100.00	0.000	0.0E0	0.000	0.000
34.50	0.64	1.00	0.64	3.68	68.35	100.00	100.00	0.000	0.0E0	0.000	0.000
34.00	0.64	1.00	0.64	3.68	68.90	100.00	100.00	0.000	0.0E0	0.000	0.000
33.50	0.64	1.00	0.64	3.67	69.45	100.00	100.00	0.000	0.0E0	0.000	0.000
33.00	0.64	1.00	0.64	3.66	70.00	91.25	100.00	0.000	0.0E0	0.000	0.000
32.50	0.64	1.00	0.64	3.65	70.55	81.01	100.00	0.000	0.0E0	0.000	0.000
32.00	0.64	1.00	0.64	3.65	71.10	70.66	100.00	0.000	0.0E0	0.000	0.000
31.50	0.65	1.00	0.65	3.64	71.65	60.20	100.00	0.000	0.0E0	0.000	0.000
31.00	0.65	1.00	0.65	3.63	72.20	49.62	100.00	0.000	0.0E0	0.000	0.000
30.50	0.65	1.00	0.65	3.63	72.75	38.92	100.00	0.000	0.0E0	0.000	0.000

30.00	0.65	1.00	0.65	0.63	73.30	28.10	85.92	1.288	7.7E-3	0.014	0.014
29.50	0.65	1.00	0.65	0.66	69.30	28.77	87.35	1.142	6.9E-3	0.073	0.087
29.00	0.65	1.00	0.65	0.72	65.30	29.45	88.84	0.965	5.8E-3	0.063	0.150
28.50	0.65	1.00	0.65	3.64	61.30	30.14	90.38	0.000	0.0E0	0.044	0.194
28.00	0.64	1.00	0.64	3.65	57.30	30.84	91.99	0.000	0.0E0	0.000	0.194
27.50	0.64	1.00	0.64	3.66	53.30	30.22	90.56	0.000	0.0E0	0.027	0.221
27.00	0.64	1.00	0.64	3.67	49.30	30.90	92.13	0.000	0.0E0	0.000	0.221
26.50	0.64	1.00	0.64	3.68	45.30	31.59	93.78	0.000	0.0E0	0.000	0.221
26.00	0.64	1.00	0.64	3.69	41.30	32.30	95.49	0.000	0.0E0	0.000	0.221
25.50	0.64	1.00	0.64	3.70	37.30	33.01	97.29	0.000	0.0E0	0.000	0.221
25.00	0.63	1.00	0.63	3.71	33.30	33.20	97.78	0.000	0.0E0	0.000	0.221
24.50	0.63	1.00	0.63	3.72	37.45	33.01	97.31	0.000	0.0E0	0.000	0.221
24.00	0.63	1.00	0.63	3.73	41.60	32.29	95.49	0.000	0.0E0	0.000	0.221
23.50	0.63	1.00	0.63	3.74	45.75	31.56	93.70	0.000	0.0E0	0.000	0.221
23.00	0.63	1.00	0.63	3.75	49.90	30.82	91.95	0.000	0.0E0	0.000	0.221
22.50	0.62	1.00	0.62	0.90	54.05	30.08	90.23	0.614	3.7E-3	0.004	0.225
22.00	0.62	1.00	0.62	0.74	58.20	29.32	88.54	0.950	5.7E-3	0.050	0.274
21.50	0.62	1.00	0.62	0.68	62.35	28.55	86.88	1.135	6.8E-3	0.063	0.338
21.00	0.62	1.00	0.62	0.64	66.50	27.77	85.24	1.291	7.7E-3	0.073	0.411
20.50	0.61	1.00	0.61	0.61	70.65	26.99	83.63	1.441	8.6E-3	0.082	0.493
20.00	0.61	1.00	0.61	0.58	74.80	26.19	82.03	1.570	9.4E-3	0.091	0.584
19.50	0.61	1.00	0.61	0.65	74.80	27.71	85.11	1.285	7.7E-3	0.085	0.669
19.00	0.60	1.00	0.60	0.75	74.80	29.26	88.40	0.926	5.6E-3	0.066	0.735
18.50	0.60	1.00	0.60	3.91	74.80	30.83	91.95	0.000	0.0E0	0.023	0.758
18.00	0.60	1.00	0.60	3.94	74.80	32.42	95.81	0.000	0.0E0	0.000	0.758
17.50	0.59	1.00	0.59	3.96	74.80	34.05	100.00	0.000	0.0E0	0.000	0.758
17.00	0.59	1.00	0.59	3.99	74.80	35.70	100.00	0.000	0.0E0	0.000	0.758
16.50	0.59	1.00	0.59	4.02	74.80	37.39	100.00	0.000	0.0E0	0.000	0.758
16.00	0.58	1.00	0.58	4.05	74.80	39.10	100.00	0.000	0.0E0	0.000	0.758
15.50	0.58	1.00	0.58	4.08	74.80	40.85	100.00	0.000	0.0E0	0.000	0.758
15.00	0.57	1.00	0.57	4.12	74.80	42.63	100.00	0.000	0.0E0	0.000	0.758
14.50	0.57	1.00	0.57	4.16	72.98	36.33	100.00	0.000	0.0E0	0.000	0.758
14.00	0.56	1.00	0.56	4.20	71.16	33.95	99.76	0.000	0.0E0	0.000	0.758
13.50	0.55	1.00	0.55	4.24	69.34	31.53	93.63	0.000	0.0E0	0.000	0.758
13.00	0.55	1.00	0.55	0.81	67.52	29.07	87.99	0.831	5.0E-3	0.020	0.778
12.50	0.54	1.00	0.54	0.67	65.70	26.56	82.76	1.354	8.1E-3	0.068	0.846
12.00	0.53	1.00	0.53	0.59	63.88	24.00	77.83	1.789	1.1E-2	0.096	0.942
11.50	0.53	1.00	0.53	0.52	62.06	21.39	73.05	2.054	1.2E-2	0.116	1.059
11.00	0.52	1.00	0.52	0.46	60.24	18.73	68.25	2.302	1.4E-2	0.131	1.190
10.50	0.51	1.00	0.51	0.40	58.42	16.02	63.24	2.607	1.6E-2	0.148	1.338
10.00	0.50	1.00	0.50	0.34	56.60	13.25	57.77	2.964	1.8E-2	0.168	1.505
9.50	0.49	1.00	0.49	0.46	51.56	17.70	66.37	2.417	1.5E-2	0.159	1.664
9.00	0.48	1.00	0.48	0.60	46.52	22.40	74.87	1.939	1.2E-2	0.129	1.793
8.50	0.47	1.00	0.47	0.82	41.48	27.38	84.42	0.950	5.7E-3	0.085	1.879
8.00	0.46	1.00	0.46	1.01	36.44	29.42	88.77	0.460	2.8E-3	0.039	1.918
7.50	0.45	1.00	0.45	5.00	31.40	33.39	98.27	0.000	0.0E0	0.002	1.920
7.00	0.43	1.00	0.43	5.00	26.36	37.07	100.00	0.000	0.0E0	0.000	1.920
6.50	0.42	1.00	0.42	5.00	21.32	40.69	100.00	0.000	0.0E0	0.000	1.920
6.00	0.40	1.00	0.40	5.00	16.28	43.22	100.00	0.000	0.0E0	0.000	1.920
5.50	0.38	1.00	0.38	5.00	11.24	44.53	100.00	0.000	0.0E0	0.000	1.920
5.00	0.36	1.00	0.36	5.00	6.20	46.19	100.00	0.000	0.0E0	0.000	1.920

Settlement of Saturated Sands=1.920 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	46.19	0.36	674.16	1.5E-4	0.0258	0.0082	0.94	0.0077	9.20E-5	0.000	0.000
4.50	0.25	0.16	46.19	0.36	642.78	1.4E-4	0.0243	0.0077	0.94	0.0072	8.67E-5	0.001	0.001
4.00	0.22	0.14	46.19	0.36	606.03	1.3E-4	0.0245	0.0078	0.94	0.0073	8.75E-5	0.001	0.002
3.50	0.19	0.13	46.19	0.36	566.89	1.2E-4	0.0230	0.0073	0.94	0.0068	8.19E-5	0.001	0.003
3.00	0.17	0.11	46.19	0.37	524.84	1.1E-4	0.0244	0.0077	0.94	0.0073	8.71E-5	0.001	0.003
2.50	0.14	0.09	46.19	0.37	479.11	1.0E-4	0.0215	0.0068	0.94	0.0064	7.67E-5	0.001	0.004
2.00	0.11	0.07	46.19	0.37	428.53	9.4E-5	0.0181	0.0057	0.94	0.0054	6.44E-5	0.001	0.005
1.50	0.08	0.05	46.19	0.37	371.13	8.2E-5	0.0144	0.0046	0.94	0.0043	5.13E-5	0.001	0.006
1.00	0.06	0.04	46.19	0.37	303.03	6.7E-5	0.0108	0.0034	0.94	0.0032	3.84E-5	0.000	0.006
0.50	0.03	0.02	46.19	0.37	214.30	4.7E-5	0.0063	0.0020	0.94	0.0019	2.25E-5	0.000	0.006
0.00	0.00	0.00	46.19	0.37	4.09	9.0E-7	0.0010	0.0003	0.94	0.0003	3.62E-6	0.000	0.006

Settlement of Unsaturated Sands=0.006 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=1.926 in.
Differential Settlement=0.963 to 1.271 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) =	1 tsf (ton/ft2)
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022. SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

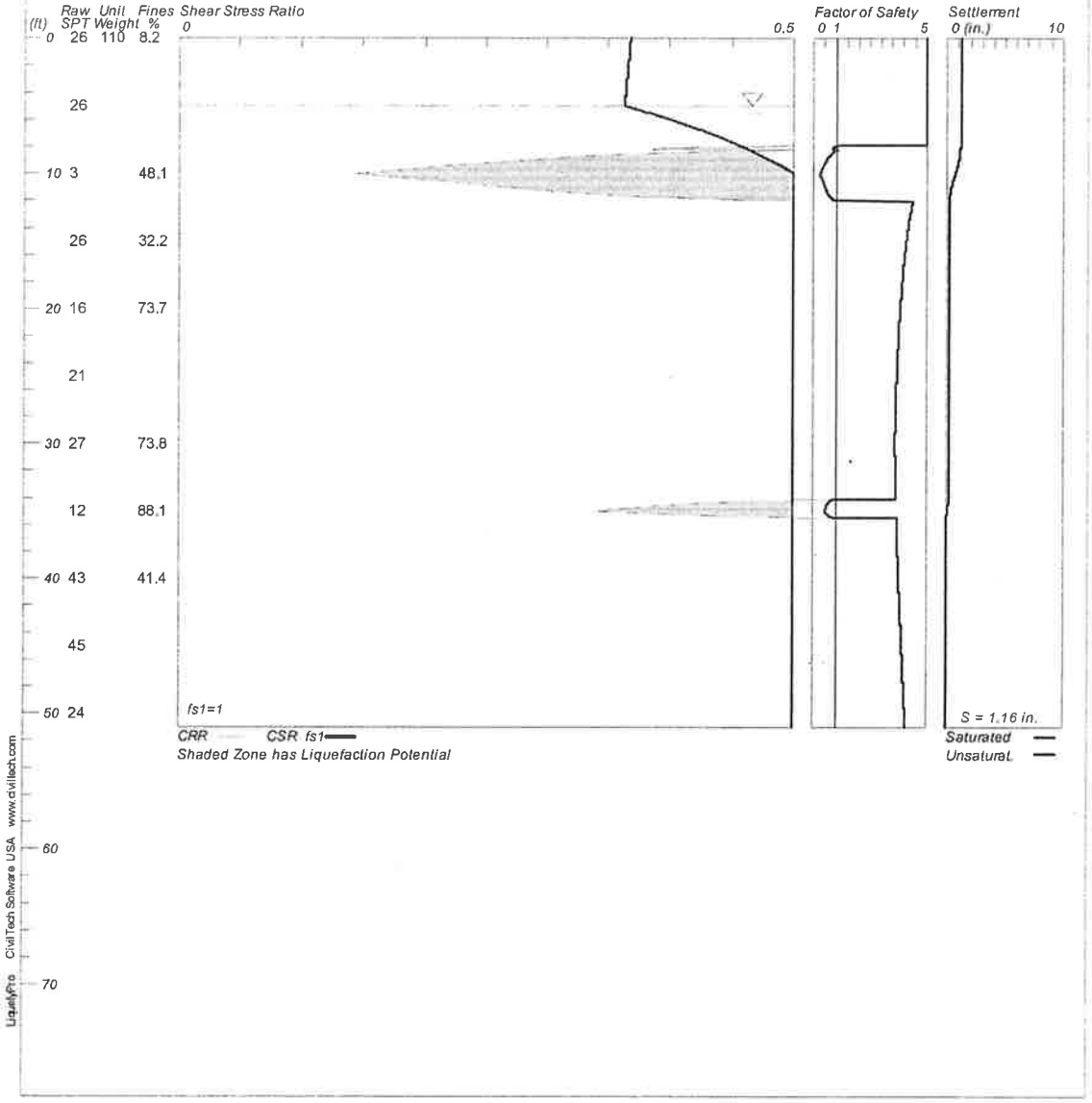
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

LIQUEFACTION ANALYSIS

Oxnard Shores

Hole No.=AH 02 Water Depth=5 ft

Magnitude=7.04
Acceleration=0.566g



SubSurface Designs, Inc. 5462B Plate A-1

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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 02.liq
Title: Oxnard Shores
Subtitle: 5462B

Input Data:

Surface Elev.=
Hole No.=AH 02
Depth of Hole=51.00 ft
Water Table during Earthquake= 5.00 ft
Water Table during In-Situ Testing= 9.00 ft
Max. Acceleration=0.57 g
Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	26.00	110.00	8.20
5.00	26.00	110.00	8.20
10.00	3.00	110.00	48.10
15.00	26.00	110.00	32.20
20.00	16.00	110.00	73.70
25.00	21.00	110.00	73.70
30.00	27.00	110.00	73.80
35.00	12.00	110.00	88.10
40.00	43.00	110.00	41.40
45.00	45.00	110.00	41.40
50.00	24.00	110.00	41.40

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	26.00	1.50	0.75	0.000	1.70	49.73	8.20	1.01	50.74	2.00
0.50	26.00	1.50	0.75	0.028	1.70	49.73	8.20	1.01	50.74	2.00
1.00	26.00	1.50	0.75	0.055	1.70	49.73	8.20	1.01	50.74	2.00
1.50	26.00	1.50	0.75	0.083	1.70	49.73	8.20	1.01	50.74	2.00
2.00	26.00	1.50	0.75	0.110	1.70	49.73	8.20	1.01	50.74	2.00
2.50	26.00	1.50	0.75	0.138	1.70	49.73	8.20	1.01	50.74	2.00
3.00	26.00	1.50	0.75	0.165	1.70	49.73	8.20	1.01	50.74	2.00
3.50	26.00	1.50	0.75	0.193	1.70	49.73	8.20	1.01	50.74	2.00
4.00	26.00	1.50	0.75	0.220	1.70	49.73	8.20	1.01	50.74	2.00
4.50	26.00	1.50	0.75	0.248	1.70	49.73	8.20	1.01	50.74	2.00
5.00	26.00	1.50	0.75	0.275	1.70	49.72	8.20	1.01	50.74	2.00
5.50	23.70	1.50	0.75	0.303	1.70	45.33	12.19	3.09	48.42	2.00
6.00	21.40	1.50	0.75	0.330	1.70	40.93	16.18	5.07	45.99	2.00

6.50	19.10	1.50	0.75	0.358	1.67	35.94	20.17	6.54	42.48	2.00
7.00	16.80	1.50	0.75	0.385	1.61	30.46	24.16	7.51	37.97	2.00
7.50	14.50	1.50	0.75	0.413	1.56	25.40	28.15	8.11	33.51	2.00
8.00	12.20	1.50	0.75	0.440	1.51	20.69	32.14	8.40	29.09	0.38
8.50	9.90	1.50	0.85	0.468	1.46	18.46	36.13	8.69	27.15	0.32
9.00	7.60	1.50	0.85	0.495	1.42	13.77	40.12	7.75	21.53	0.23
9.50	5.30	1.50	0.85	0.507	1.40	9.49	44.11	6.90	16.39	0.18
10.00	3.00	1.50	0.85	0.519	1.39	5.31	48.10	6.06	11.37	0.12
10.50	5.30	1.50	0.85	0.531	1.37	9.28	46.51	6.86	16.13	0.17
11.00	7.60	1.50	0.85	0.543	1.36	13.15	44.92	7.63	20.79	0.23
11.50	9.90	1.50	0.85	0.555	1.34	16.95	43.33	8.39	25.34	0.29
12.00	12.20	1.50	0.85	0.566	1.33	20.67	41.74	9.13	29.80	0.43
12.50	14.50	1.50	0.85	0.578	1.31	24.31	40.15	9.86	34.17	2.00
13.00	16.80	1.50	0.85	0.590	1.30	27.88	38.56	10.58	38.46	2.00
13.50	19.10	1.50	0.85	0.602	1.29	31.38	36.97	11.28	42.66	2.00
14.00	21.40	1.50	0.85	0.614	1.28	34.82	35.38	11.96	46.78	2.00
14.50	23.70	1.50	0.85	0.626	1.26	38.19	33.79	12.04	50.24	2.00
15.00	26.00	1.50	0.95	0.638	1.25	46.39	32.20	12.85	59.24	2.00
15.50	25.00	1.50	0.95	0.650	1.24	44.20	36.35	13.84	58.04	2.00
16.00	24.00	1.50	0.95	0.662	1.23	42.05	40.50	13.41	55.46	2.00
16.50	23.00	1.50	0.95	0.674	1.22	39.94	44.65	12.99	52.92	2.00
17.00	22.00	1.50	0.95	0.685	1.21	37.87	48.80	12.57	50.44	2.00
17.50	21.00	1.50	0.95	0.697	1.20	35.84	52.95	12.17	48.00	2.00
18.00	20.00	1.50	0.95	0.709	1.19	33.84	57.10	11.77	45.61	2.00
18.50	19.00	1.50	0.95	0.721	1.18	31.88	61.25	11.38	43.26	2.00
19.00	18.00	1.50	0.95	0.733	1.17	29.96	65.40	10.99	40.95	2.00
19.50	17.00	1.50	0.95	0.745	1.16	28.07	69.55	10.61	38.68	2.00
20.00	16.00	1.50	0.95	0.757	1.15	26.21	73.70	10.24	36.45	2.00
20.50	16.50	1.50	0.95	0.769	1.14	26.82	73.70	10.36	37.18	2.00
21.00	17.00	1.50	0.95	0.781	1.13	27.42	73.70	10.48	37.90	2.00
21.50	17.50	1.50	0.95	0.793	1.12	28.01	73.70	10.60	38.61	2.00
22.00	18.00	1.50	0.95	0.804	1.11	28.60	73.70	10.72	39.32	2.00
22.50	18.50	1.50	0.95	0.816	1.11	29.18	73.70	10.84	40.01	2.00
23.00	19.00	1.50	0.95	0.828	1.10	29.75	73.70	10.95	40.70	2.00
23.50	19.50	1.50	0.95	0.840	1.09	30.32	73.70	11.06	41.38	2.00
24.00	20.00	1.50	0.95	0.852	1.08	30.88	73.70	11.18	42.05	2.00
24.50	20.50	1.50	0.95	0.864	1.08	31.43	73.70	11.29	42.71	2.00
25.00	21.00	1.50	0.95	0.876	1.07	31.98	73.70	11.40	43.37	2.00
25.50	21.60	1.50	0.95	0.888	1.06	32.67	73.71	11.53	44.20	2.00
26.00	22.20	1.50	0.95	0.900	1.05	33.35	73.72	11.67	45.02	2.00
26.50	22.80	1.50	0.95	0.912	1.05	34.03	73.73	11.81	45.84	2.00
27.00	23.40	1.50	0.95	0.923	1.04	34.70	73.74	11.94	46.64	2.00
27.50	24.00	1.50	0.95	0.935	1.03	35.36	73.75	12.07	47.44	2.00
28.00	24.60	1.50	1.00	0.947	1.03	37.91	73.76	12.58	50.50	2.00
28.50	25.20	1.50	1.00	0.959	1.02	38.60	73.77	12.72	51.32	2.00
29.00	25.80	1.50	1.00	0.971	1.01	39.27	73.78	12.85	52.13	2.00
29.50	26.40	1.50	1.00	0.983	1.01	39.94	73.79	12.99	52.93	2.00
30.00	27.00	1.50	1.00	0.995	1.00	40.61	73.80	13.12	53.73	2.00
30.50	25.50	1.50	1.00	1.007	1.00	38.12	75.23	12.62	50.75	2.00
31.00	24.00	1.50	1.00	1.019	0.99	35.67	76.66	12.13	47.80	2.00
31.50	22.50	1.50	1.00	1.031	0.99	33.25	78.09	11.65	44.90	2.00
32.00	21.00	1.50	1.00	1.042	0.98	30.85	79.52	11.17	42.02	2.00
32.50	19.50	1.50	1.00	1.054	0.97	28.49	80.95	10.70	39.19	2.00
33.00	18.00	1.50	1.00	1.066	0.97	26.15	82.38	10.23	36.38	2.00
33.50	16.50	1.50	1.00	1.078	0.96	23.84	83.81	9.77	33.61	2.00
34.00	15.00	1.50	1.00	1.090	0.96	21.55	85.24	9.31	30.86	2.00
34.50	13.50	1.50	1.00	1.102	0.95	19.29	86.67	8.86	28.15	0.35
35.00	12.00	1.50	1.00	1.114	0.95	17.06	88.10	8.41	25.47	0.29
35.50	15.10	1.50	1.00	1.126	0.94	21.35	83.43	9.27	30.61	2.00
36.00	18.20	1.50	1.00	1.138	0.94	25.59	78.76	10.12	35.71	2.00
36.50	21.30	1.50	1.00	1.150	0.93	29.80	74.09	10.96	40.76	2.00

37.00	24.40	1.50	1.00	1.161	0.93	33.96	69.42	11.79	45.75	2.00
37.50	27.50	1.50	1.00	1.173	0.92	38.08	64.75	12.62	50.70	2.00
38.00	30.60	1.50	1.00	1.185	0.92	42.16	60.08	13.43	55.59	2.00
38.50	33.70	1.50	1.00	1.197	0.91	46.20	55.41	14.24	60.44	2.00
39.00	36.80	1.50	1.00	1.209	0.91	50.20	50.74	15.04	65.24	2.00
39.50	39.90	1.50	1.00	1.221	0.91	54.16	46.07	15.83	70.00	2.00
40.00	43.00	1.50	1.00	1.233	0.90	58.09	41.40	16.62	74.71	2.00
40.50	43.20	1.50	1.00	1.245	0.90	58.08	41.40	16.62	74.70	2.00
41.00	43.40	1.50	1.00	1.257	0.89	58.07	41.40	16.61	74.69	2.00
41.50	43.60	1.50	1.00	1.269	0.89	58.07	41.40	16.61	74.68	2.00
42.00	43.80	1.50	1.00	1.280	0.88	58.06	41.40	16.61	74.67	2.00
42.50	44.00	1.50	1.00	1.292	0.88	58.06	41.40	16.61	74.67	2.00
43.00	44.20	1.50	1.00	1.304	0.88	58.06	41.40	16.61	74.67	2.00
43.50	44.40	1.50	1.00	1.316	0.87	58.05	41.40	16.61	74.66	2.00
44.00	44.60	1.50	1.00	1.328	0.87	58.05	41.40	16.61	74.66	2.00
44.50	44.80	1.50	1.00	1.340	0.86	58.05	41.40	16.61	74.66	2.00
45.00	45.00	1.50	1.00	1.352	0.86	58.06	41.40	16.61	74.67	2.00
45.50	42.90	1.50	1.00	1.364	0.86	55.11	41.40	16.02	71.13	2.00
46.00	40.80	1.50	1.00	1.376	0.85	52.18	41.40	15.44	67.62	2.00
46.50	38.70	1.50	1.00	1.387	0.85	49.28	41.40	14.86	64.14	2.00
47.00	36.60	1.50	1.00	1.399	0.85	46.41	41.40	14.28	60.69	2.00
47.50	34.50	1.50	1.00	1.411	0.84	43.56	41.40	13.71	57.28	2.00
48.00	32.40	1.50	1.00	1.423	0.84	40.74	41.40	13.15	53.89	2.00
48.50	30.30	1.50	1.00	1.435	0.83	37.94	41.40	12.59	50.53	2.00
49.00	28.20	1.50	1.00	1.447	0.83	35.17	41.40	12.03	47.20	2.00
49.50	26.10	1.50	1.00	1.459	0.83	32.42	41.40	11.48	43.90	2.00
50.00	24.00	1.50	1.00	1.471	0.82	29.69	41.40	10.94	40.62	2.00
50.50	24.00	1.50	1.00	1.483	0.82	29.56	41.40	10.91	40.48	2.00
51.00	24.00	1.50	1.00	1.495	0.82	29.45	41.40	10.89	40.34	2.00

CRR is based on water table at 9.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.00	1.00	2.00	1.18	2.35	0.37	5.00
0.50	0.02	2.00	1.00	2.00	1.18	2.35	0.37	5.00
1.00	0.04	2.00	1.00	2.00	1.18	2.35	0.37	5.00
1.50	0.05	2.00	1.00	2.00	1.18	2.35	0.37	5.00
2.00	0.07	2.00	1.00	2.00	1.18	2.35	0.37	5.00
2.50	0.09	2.00	1.00	2.00	1.18	2.35	0.37	5.00
3.00	0.11	2.00	1.00	2.00	1.18	2.35	0.37	5.00
3.50	0.13	2.00	1.00	2.00	1.18	2.35	0.36	5.00
4.00	0.14	2.00	1.00	2.00	1.18	2.35	0.36	5.00
4.50	0.16	2.00	1.00	2.00	1.18	2.35	0.36	5.00
5.00	0.18	2.00	1.00	2.00	1.18	2.35	0.36	5.00
5.50	0.20	2.00	1.00	2.00	1.18	2.35	0.38	5.00
6.00	0.21	2.00	1.00	2.00	1.18	2.35	0.40	5.00
6.50	0.23	2.00	1.00	2.00	1.18	2.35	0.42	5.00
7.00	0.25	2.00	1.00	2.00	1.18	2.35	0.43	5.00
7.50	0.27	2.00	1.00	2.00	1.18	2.35	0.45	5.00
8.00	0.29	0.38	1.00	0.38	1.18	0.45	0.46	0.97 *
8.50	0.30	0.32	1.00	0.32	1.18	0.38	0.47	0.81 *
9.00	0.32	0.23	1.00	0.23	1.18	0.28	0.48	0.57 *
9.50	0.33	0.18	1.00	0.18	1.18	0.21	0.49	0.42 *
10.00	0.34	0.12	1.00	0.12	1.18	0.14	0.50	0.29 *
10.50	0.34	0.17	1.00	0.17	1.18	0.20	0.51	0.40 *
11.00	0.35	0.23	1.00	0.23	1.18	0.26	0.52	0.51 *
11.50	0.36	0.29	1.00	0.29	1.18	0.34	0.53	0.64 *
12.00	0.37	0.43	1.00	0.43	1.18	0.50	0.53	0.94 *

12.50	0.38	2.00	1.00	2.00	1.18	2.35	0.54	4.34
13.00	0.38	2.00	1.00	2.00	1.18	2.35	0.55	4.29
13.50	0.39	2.00	1.00	2.00	1.18	2.35	0.55	4.24
14.00	0.40	2.00	1.00	2.00	1.18	2.35	0.56	4.20
14.50	0.41	2.00	1.00	2.00	1.18	2.35	0.57	4.16
15.00	0.41	2.00	1.00	2.00	1.18	2.35	0.57	4.12
15.50	0.42	2.00	1.00	2.00	1.18	2.35	0.58	4.08
16.00	0.43	2.00	1.00	2.00	1.18	2.35	0.58	4.05
16.50	0.44	2.00	1.00	2.00	1.18	2.35	0.59	4.02
17.00	0.45	2.00	1.00	2.00	1.18	2.35	0.59	3.99
17.50	0.45	2.00	1.00	2.00	1.18	2.35	0.59	3.96
18.00	0.46	2.00	1.00	2.00	1.18	2.35	0.60	3.94
18.50	0.47	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.48	2.00	1.00	2.00	1.18	2.35	0.60	3.89
19.50	0.48	2.00	1.00	2.00	1.18	2.35	0.61	3.87
20.00	0.49	2.00	1.00	2.00	1.18	2.35	0.61	3.85
20.50	0.50	2.00	1.00	2.00	1.18	2.35	0.61	3.83
21.00	0.51	2.00	1.00	2.00	1.18	2.35	0.62	3.82
21.50	0.52	2.00	1.00	2.00	1.18	2.35	0.62	3.80
22.00	0.52	2.00	1.00	2.00	1.18	2.35	0.62	3.78
22.50	0.53	2.00	1.00	2.00	1.18	2.35	0.62	3.77
23.00	0.54	2.00	1.00	2.00	1.18	2.35	0.63	3.75
23.50	0.55	2.00	1.00	2.00	1.18	2.35	0.63	3.74
24.00	0.55	2.00	1.00	2.00	1.18	2.35	0.63	3.73
24.50	0.56	2.00	1.00	2.00	1.18	2.35	0.63	3.72
25.00	0.57	2.00	1.00	2.00	1.18	2.35	0.63	3.71
25.50	0.58	2.00	1.00	2.00	1.18	2.35	0.64	3.70
26.00	0.58	2.00	1.00	2.00	1.18	2.35	0.64	3.69
26.50	0.59	2.00	1.00	2.00	1.18	2.35	0.64	3.68
27.00	0.60	2.00	1.00	2.00	1.18	2.35	0.64	3.67
27.50	0.61	2.00	1.00	2.00	1.18	2.35	0.64	3.66
28.00	0.62	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.62	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.00	0.63	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.50	0.64	2.00	1.00	2.00	1.18	2.35	0.65	3.63
30.00	0.65	2.00	1.00	2.00	1.18	2.35	0.65	3.62
30.50	0.65	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.00	0.66	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.50	0.67	2.00	1.00	2.00	1.18	2.35	0.65	3.64
32.00	0.68	2.00	1.00	2.00	1.18	2.35	0.64	3.65
32.50	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.72	0.35	1.00	0.35	1.18	0.41	0.64	0.64 *
35.00	0.72	0.29	1.00	0.29	1.18	0.34	0.64	0.54 *
35.50	0.73	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.74	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.75	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.75	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.76	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.77	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.78	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.79	2.00	1.00	2.00	1.18	2.35	0.62	3.77
39.50	0.79	2.00	1.00	2.00	1.18	2.35	0.62	3.78
40.00	0.80	2.00	1.00	2.00	1.18	2.35	0.62	3.79
40.50	0.81	2.00	1.00	2.00	1.18	2.35	0.62	3.80
41.00	0.82	2.00	1.00	2.00	1.18	2.35	0.62	3.82
41.50	0.82	2.00	1.00	2.00	1.18	2.35	0.61	3.83
42.00	0.83	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.84	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.85	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.86	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.86	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.87	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.88	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.89	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	0.89	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	0.90	2.00	1.00	2.00	1.18	2.35	0.59	3.97
47.00	0.91	2.00	1.00	2.00	1.18	2.35	0.59	3.98
47.50	0.92	2.00	1.00	2.00	1.18	2.35	0.59	4.00
48.00	0.93	2.00	1.00	2.00	1.18	2.35	0.59	4.01
48.50	0.93	2.00	1.00	2.00	1.18	2.35	0.58	4.03
49.00	0.94	2.00	1.00	2.00	1.18	2.35	0.58	4.04
49.50	0.95	2.00	1.00	2.00	1.18	2.35	0.58	4.06
50.00	0.96	2.00	1.00	2.00	1.18	2.35	0.58	4.08
50.50	0.96	2.00	1.00	2.00	1.18	2.35	0.57	4.09
51.00	0.97	2.00	1.00	2.00	1.18	2.35	0.57	4.11

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	50.74	8.20	0.00	50.74
0.50	-	-	-	50.74	8.20	0.00	50.74
1.00	-	-	-	50.74	8.20	0.00	50.74
1.50	-	-	-	50.74	8.20	0.00	50.74
2.00	-	-	-	50.74	8.20	0.00	50.74
2.50	-	-	-	50.74	8.20	0.00	50.74
3.00	-	-	-	50.74	8.20	0.00	50.74
3.50	-	-	-	50.74	8.20	0.00	50.74
4.00	-	-	-	50.74	8.20	0.00	50.74
4.50	-	-	-	50.74	8.20	0.00	50.74
5.00	-	-	-	50.74	8.20	0.00	50.74
5.50	-	-	-	48.42	12.19	0.00	48.42
6.00	-	-	-	45.99	16.18	0.00	45.99
6.50	-	-	-	42.48	20.17	0.00	42.48
7.00	-	-	-	37.97	24.16	0.00	37.97
7.50	-	-	-	33.51	28.15	0.00	33.51
8.00	-	-	-	29.09	32.14	0.00	29.09
8.50	-	-	-	27.15	36.13	0.00	27.15
9.00	-	-	-	21.53	40.12	0.00	21.53
9.50	-	-	-	16.39	44.11	0.00	16.39
10.00	-	-	-	11.37	48.10	0.00	11.37
10.50	-	-	-	16.13	46.51	0.00	16.13
11.00	-	-	-	20.79	44.92	0.00	20.79
11.50	-	-	-	25.34	43.33	0.00	25.34
12.00	-	-	-	29.80	41.74	0.00	29.80
12.50	-	-	-	34.17	40.15	0.00	34.17
13.00	-	-	-	38.46	38.56	0.00	38.46
13.50	-	-	-	42.66	36.97	0.00	42.66
14.00	-	-	-	46.78	35.38	0.00	46.78
14.50	-	-	-	50.24	33.79	0.00	50.24
15.00	-	-	-	59.24	32.20	0.00	59.24
15.50	-	-	-	58.04	36.35	0.00	58.04
16.00	-	-	-	55.46	40.50	0.00	55.46

16.50	-	-	-	52.92	44.65	0.00	52.92
17.00	-	-	-	50.44	48.80	0.00	50.44
17.50	-	-	-	48.00	52.95	0.00	48.00
18.00	-	-	-	45.61	57.10	0.00	45.61
18.50	-	-	-	43.26	61.25	0.00	43.26
19.00	-	-	-	40.95	65.40	0.00	40.95
19.50	-	-	-	38.68	69.55	0.00	38.68
20.00	-	-	-	36.45	73.70	0.00	36.45
20.50	-	-	-	37.18	73.70	0.00	37.18
21.00	-	-	-	37.90	73.70	0.00	37.90
21.50	-	-	-	38.61	73.70	0.00	38.61
22.00	-	-	-	39.32	73.70	0.00	39.32
22.50	-	-	-	40.01	73.70	0.00	40.01
23.00	-	-	-	40.70	73.70	0.00	40.70
23.50	-	-	-	41.38	73.70	0.00	41.38
24.00	-	-	-	42.05	73.70	0.00	42.05
24.50	-	-	-	42.71	73.70	0.00	42.71
25.00	-	-	-	43.37	73.70	0.00	43.37
25.50	-	-	-	44.20	73.71	0.00	44.20
26.00	-	-	-	45.02	73.72	0.00	45.02
26.50	-	-	-	45.84	73.73	0.00	45.84
27.00	-	-	-	46.64	73.74	0.00	46.64
27.50	-	-	-	47.44	73.75	0.00	47.44
28.00	-	-	-	50.50	73.76	0.00	50.50
28.50	-	-	-	51.32	73.77	0.00	51.32
29.00	-	-	-	52.13	73.78	0.00	52.13
29.50	-	-	-	52.93	73.79	0.00	52.93
30.00	-	-	-	53.73	73.80	0.00	53.73
30.50	-	-	-	50.75	75.23	0.00	50.75
31.00	-	-	-	47.80	76.66	0.00	47.80
31.50	-	-	-	44.90	78.09	0.00	44.90
32.00	-	-	-	42.02	79.52	0.00	42.02
32.50	-	-	-	39.19	80.95	0.00	39.19
33.00	-	-	-	36.38	82.38	0.00	36.38
33.50	-	-	-	33.61	83.81	0.00	33.61
34.00	-	-	-	30.86	85.24	0.00	30.86
34.50	-	-	-	28.15	86.67	0.00	28.15
35.00	-	-	-	25.47	88.10	0.00	25.47
35.50	-	-	-	30.61	83.43	0.00	30.61
36.00	-	-	-	35.71	78.76	0.00	35.71
36.50	-	-	-	40.76	74.09	0.00	40.76
37.00	-	-	-	45.75	69.42	0.00	45.75
37.50	-	-	-	50.70	64.75	0.00	50.70
38.00	-	-	-	55.59	60.08	0.00	55.59
38.50	-	-	-	60.44	55.41	0.00	60.44
39.00	-	-	-	65.24	50.74	0.00	65.24
39.50	-	-	-	70.00	46.07	0.00	70.00
40.00	-	-	-	74.71	41.40	0.00	74.71
40.50	-	-	-	74.70	41.40	0.00	74.70
41.00	-	-	-	74.69	41.40	0.00	74.69
41.50	-	-	-	74.68	41.40	0.00	74.68
42.00	-	-	-	74.67	41.40	0.00	74.67
42.50	-	-	-	74.67	41.40	0.00	74.67
43.00	-	-	-	74.67	41.40	0.00	74.67
43.50	-	-	-	74.66	41.40	0.00	74.66
44.00	-	-	-	74.66	41.40	0.00	74.66
44.50	-	-	-	74.66	41.40	0.00	74.66
45.00	-	-	-	74.67	41.40	0.00	74.67
45.50	-	-	-	71.13	41.40	0.00	71.13
46.00	-	-	-	67.62	41.40	0.00	67.62
46.50	-	-	-	64.14	41.40	0.00	64.14

47.00	-	-	-	60.69	41.40	0.00	60.69
47.50	-	-	-	57.28	41.40	0.00	57.28
48.00	-	-	-	53.89	41.40	0.00	53.89
48.50	-	-	-	50.53	41.40	0.00	50.53
49.00	-	-	-	47.20	41.40	0.00	47.20
49.50	-	-	-	43.90	41.40	0.00	43.90
50.00	-	-	-	40.62	41.40	0.00	40.62
50.50	-	-	-	40.48	41.40	0.00	40.48
51.00	-	-	-	40.34	41.40	0.00	40.34

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.11	41.40	40.35	100.00	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.09	41.40	40.48	100.00	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.08	41.40	40.62	100.00	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.06	41.40	43.90	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.04	41.40	47.20	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.03	41.40	50.53	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.01	41.40	53.89	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.00	41.40	57.28	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	3.98	41.40	60.69	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.97	41.40	64.14	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	41.40	67.62	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	41.40	71.13	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	41.40	74.67	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	41.40	74.66	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	41.40	74.66	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	41.40	74.66	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	41.40	74.67	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	41.40	74.67	100.00	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	41.40	74.67	100.00	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	3.83	41.40	74.68	100.00	0.000	0.0E0	0.000	0.000
41.00	0.62	1.00	0.62	3.82	41.40	74.69	100.00	0.000	0.0E0	0.000	0.000
40.50	0.62	1.00	0.62	3.80	41.40	74.70	100.00	0.000	0.0E0	0.000	0.000
40.00	0.62	1.00	0.62	3.79	41.40	74.71	100.00	0.000	0.0E0	0.000	0.000
39.50	0.62	1.00	0.62	3.78	46.07	70.00	100.00	0.000	0.0E0	0.000	0.000
39.00	0.62	1.00	0.62	3.77	50.74	65.24	100.00	0.000	0.0E0	0.000	0.000
38.50	0.63	1.00	0.63	3.76	55.41	60.44	100.00	0.000	0.0E0	0.000	0.000
38.00	0.63	1.00	0.63	3.75	60.08	55.59	100.00	0.000	0.0E0	0.000	0.000
37.50	0.63	1.00	0.63	3.74	64.75	50.70	100.00	0.000	0.0E0	0.000	0.000
37.00	0.63	1.00	0.63	3.73	69.42	45.75	100.00	0.000	0.0E0	0.000	0.000
36.50	0.63	1.00	0.63	3.72	74.09	40.76	100.00	0.000	0.0E0	0.000	0.000
36.00	0.63	1.00	0.63	3.71	78.76	35.71	100.00	0.000	0.0E0	0.000	0.000
35.50	0.64	1.00	0.64	3.70	83.43	30.61	91.46	0.000	0.0E0	0.000	0.000
35.00	0.64	1.00	0.64	0.54	88.10	25.47	80.62	1.687	1.0E-2	0.076	0.076
34.50	0.64	1.00	0.64	0.64	86.67	28.15	86.03	1.257	7.5E-3	0.088	0.165
34.00	0.64	1.00	0.64	3.68	85.24	30.86	92.04	0.000	0.0E0	0.041	0.206
33.50	0.64	1.00	0.64	3.67	83.81	33.61	98.84	0.000	0.0E0	0.000	0.206
33.00	0.64	1.00	0.64	3.66	82.38	36.38	100.00	0.000	0.0E0	0.000	0.206
32.50	0.64	1.00	0.64	3.65	80.95	39.19	100.00	0.000	0.0E0	0.000	0.206
32.00	0.64	1.00	0.64	3.65	79.52	42.02	100.00	0.000	0.0E0	0.000	0.206
31.50	0.65	1.00	0.65	3.64	78.09	44.90	100.00	0.000	0.0E0	0.000	0.206
31.00	0.65	1.00	0.65	3.63	76.66	47.80	100.00	0.000	0.0E0	0.000	0.206
30.50	0.65	1.00	0.65	3.63	75.23	50.75	100.00	0.000	0.0E0	0.000	0.206

30.00	0.65	1.00	0.65	3.62	73.80	53.73	100.00	0.000	0.0E0	0.000	0.206
29.50	0.65	1.00	0.65	3.63	73.79	52.93	100.00	0.000	0.0E0	0.000	0.206
29.00	0.65	1.00	0.65	3.64	73.78	52.13	100.00	0.000	0.0E0	0.000	0.206
28.50	0.65	1.00	0.65	3.64	73.77	51.32	100.00	0.000	0.0E0	0.000	0.206
28.00	0.64	1.00	0.64	3.65	73.76	50.50	100.00	0.000	0.0E0	0.000	0.206
27.50	0.64	1.00	0.64	3.66	73.75	47.44	100.00	0.000	0.0E0	0.000	0.206
27.00	0.64	1.00	0.64	3.67	73.74	46.64	100.00	0.000	0.0E0	0.000	0.206
26.50	0.64	1.00	0.64	3.68	73.73	45.84	100.00	0.000	0.0E0	0.000	0.206
26.00	0.64	1.00	0.64	3.69	73.72	45.02	100.00	0.000	0.0E0	0.000	0.206
25.50	0.64	1.00	0.64	3.70	73.71	44.20	100.00	0.000	0.0E0	0.000	0.206
25.00	0.63	1.00	0.63	3.71	73.70	43.37	100.00	0.000	0.0E0	0.000	0.206
24.50	0.63	1.00	0.63	3.72	73.70	42.71	100.00	0.000	0.0E0	0.000	0.206
24.00	0.63	1.00	0.63	3.73	73.70	42.05	100.00	0.000	0.0E0	0.000	0.206
23.50	0.63	1.00	0.63	3.74	73.70	41.38	100.00	0.000	0.0E0	0.000	0.206
23.00	0.63	1.00	0.63	3.75	73.70	40.70	100.00	0.000	0.0E0	0.000	0.206
22.50	0.62	1.00	0.62	3.77	73.70	40.01	100.00	0.000	0.0E0	0.000	0.206
22.00	0.62	1.00	0.62	3.78	73.70	39.32	100.00	0.000	0.0E0	0.000	0.206
21.50	0.62	1.00	0.62	3.80	73.70	38.61	100.00	0.000	0.0E0	0.000	0.206
21.00	0.62	1.00	0.62	3.82	73.70	37.90	100.00	0.000	0.0E0	0.000	0.206
20.50	0.61	1.00	0.61	3.83	73.70	37.18	100.00	0.000	0.0E0	0.000	0.206
20.00	0.61	1.00	0.61	3.85	73.70	36.45	100.00	0.000	0.0E0	0.000	0.206
19.50	0.61	1.00	0.61	3.87	69.55	38.68	100.00	0.000	0.0E0	0.000	0.206
19.00	0.60	1.00	0.60	3.89	65.40	40.95	100.00	0.000	0.0E0	0.000	0.206
18.50	0.60	1.00	0.60	3.91	61.25	43.26	100.00	0.000	0.0E0	0.000	0.206
18.00	0.60	1.00	0.60	3.94	57.10	45.61	100.00	0.000	0.0E0	0.000	0.206
17.50	0.59	1.00	0.59	3.96	52.95	48.00	100.00	0.000	0.0E0	0.000	0.206
17.00	0.59	1.00	0.59	3.99	48.80	50.44	100.00	0.000	0.0E0	0.000	0.206
16.50	0.59	1.00	0.59	4.02	44.65	52.92	100.00	0.000	0.0E0	0.000	0.206
16.00	0.58	1.00	0.58	4.05	40.50	55.46	100.00	0.000	0.0E0	0.000	0.206
15.50	0.58	1.00	0.58	4.08	36.35	58.04	100.00	0.000	0.0E0	0.000	0.206
15.00	0.57	1.00	0.57	4.12	32.20	59.24	100.00	0.000	0.0E0	0.000	0.206
14.50	0.57	1.00	0.57	4.16	33.79	50.24	100.00	0.000	0.0E0	0.000	0.206
14.00	0.56	1.00	0.56	4.20	35.38	46.78	100.00	0.000	0.0E0	0.000	0.206
13.50	0.55	1.00	0.55	4.24	36.97	42.66	100.00	0.000	0.0E0	0.000	0.206
13.00	0.55	1.00	0.55	4.29	38.56	38.46	100.00	0.000	0.0E0	0.000	0.206
12.50	0.54	1.00	0.54	4.34	40.15	34.17	100.00	0.000	0.0E0	0.000	0.206
12.00	0.53	1.00	0.53	0.94	41.74	29.80	89.61	0.573	3.4E-3	0.003	0.209
11.50	0.53	1.00	0.53	0.64	43.33	25.34	80.37	1.545	9.3E-3	0.069	0.278
11.00	0.52	1.00	0.52	0.51	44.92	20.79	71.95	2.106	1.3E-2	0.114	0.392
10.50	0.51	1.00	0.51	0.40	46.51	16.13	63.45	2.594	1.6E-2	0.142	0.534
10.00	0.50	1.00	0.50	0.29	48.10	11.37	53.72	3.253	2.0E-2	0.176	0.710
9.50	0.49	1.00	0.49	0.42	44.11	16.39	63.94	2.565	1.5E-2	0.171	0.881
9.00	0.48	1.00	0.48	0.57	40.12	21.53	73.29	2.029	1.2E-2	0.136	1.016
8.50	0.47	1.00	0.47	0.81	36.13	27.15	83.96	0.993	6.0E-3	0.091	1.108
8.00	0.46	1.00	0.46	0.97	32.14	29.09	88.04	0.549	3.3E-3	0.042	1.149
7.50	0.45	1.00	0.45	5.00	28.15	33.51	98.59	0.000	0.0E0	0.004	1.153
7.00	0.43	1.00	0.43	5.00	24.16	37.97	100.00	0.000	0.0E0	0.000	1.153
6.50	0.42	1.00	0.42	5.00	20.17	42.48	100.00	0.000	0.0E0	0.000	1.153
6.00	0.40	1.00	0.40	5.00	16.18	45.99	100.00	0.000	0.0E0	0.000	1.153
5.50	0.38	1.00	0.38	5.00	12.19	48.42	100.00	0.000	0.0E0	0.000	1.153
5.00	0.36	1.00	0.36	5.00	8.20	50.74	100.00	0.000	0.0E0	0.000	1.153

Settlement of Saturated Sands=1.153 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	50.74	0.36	695.58	1.4E-4	0.0248	0.0078	0.94	0.0074	8.84E-5	0.000	0.000
4.50	0.25	0.16	50.74	0.36	663.21	1.4E-4	0.0233	0.0074	0.94	0.0069	8.33E-5	0.001	0.001
4.00	0.22	0.14	50.74	0.36	625.28	1.3E-4	0.0237	0.0075	0.94	0.0071	8.46E-5	0.001	0.002
3.50	0.19	0.13	50.74	0.36	584.90	1.2E-4	0.0258	0.0082	0.94	0.0077	9.20E-5	0.001	0.003
3.00	0.17	0.11	50.74	0.37	541.51	1.1E-4	0.0234	0.0074	0.94	0.0070	8.35E-5	0.001	0.003
2.50	0.14	0.09	50.74	0.37	494.33	1.0E-4	0.0205	0.0065	0.94	0.0061	7.31E-5	0.001	0.004
2.00	0.11	0.07	50.74	0.37	442.15	9.1E-5	0.0172	0.0054	0.94	0.0051	6.13E-5	0.001	0.005
1.50	0.08	0.05	50.74	0.37	382.92	7.9E-5	0.0137	0.0043	0.94	0.0041	4.90E-5	0.001	0.005
1.00	0.06	0.04	50.74	0.37	312.66	6.5E-5	0.0103	0.0033	0.94	0.0031	3.67E-5	0.000	0.006
0.50	0.03	0.02	50.74	0.37	221.10	4.6E-5	0.0060	0.0019	0.94	0.0018	2.13E-5	0.000	0.006
0.00	0.00	0.00	50.74	0.37	4.22	8.7E-7	0.0010	0.0003	0.94	0.0003	3.62E-6	0.000	0.006

Settlement of Unsaturated Sands=0.006 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=1.160 in.
Differential Settlement=0.580 to 0.765 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) =	1 tsf (ton/ft2)
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022. SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

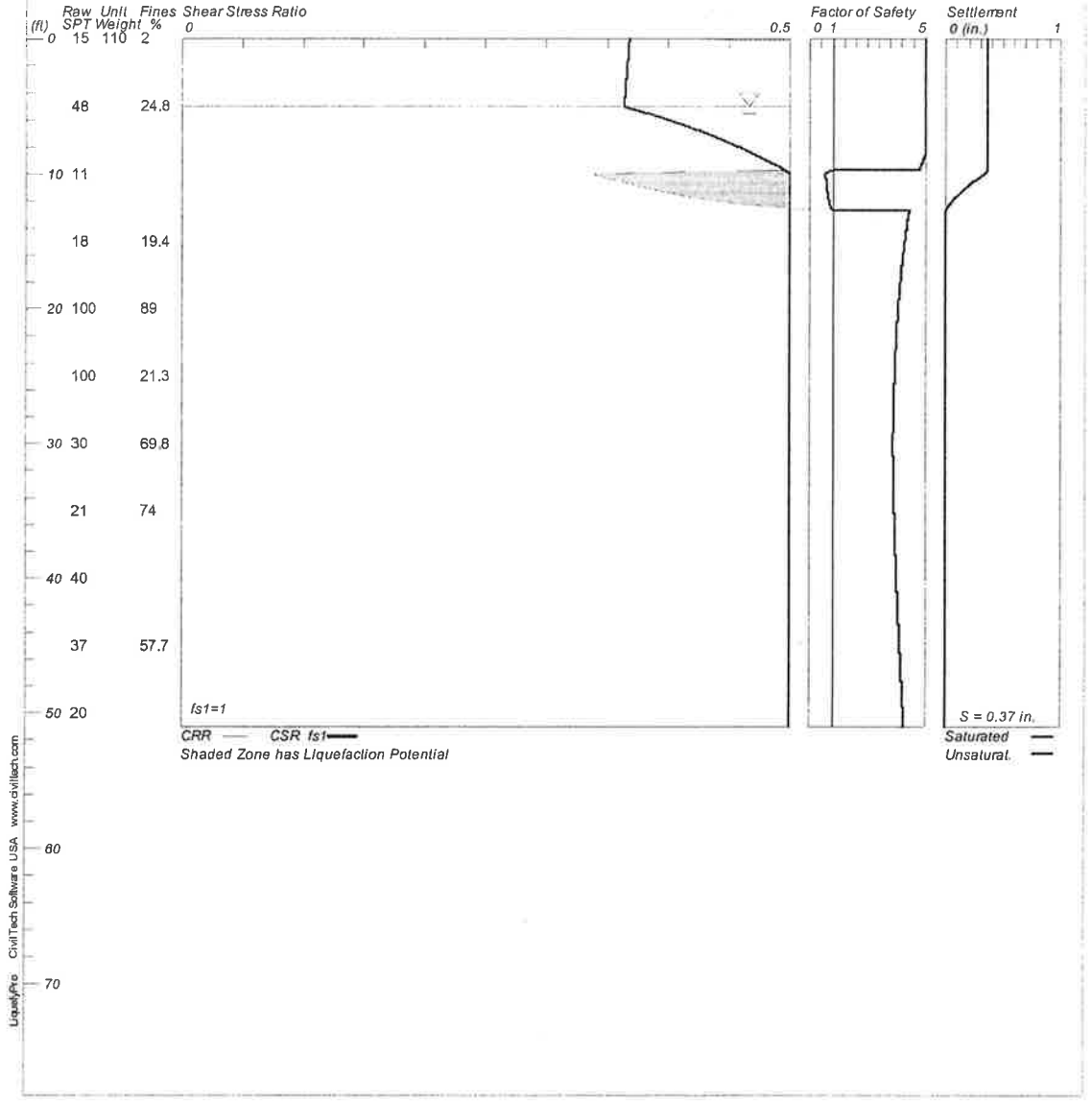
2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

LIQUEFACTION ANALYSIS

Oxnard Shores

Hole No.=AH 03 Water Depth=5 ft ***Magnitude=7.04***
Acceleration=0.566g



SubSurface Designs, Inc. 5462B Plate A-1

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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 03.liq
Title: Oxnard Shores
Subtitle: 5462B

Input Data:

Surface Elev.=
Hole No.=AH 03
Depth of Hole=51.00 ft
Water Table during Earthquake= 5.00 ft
Water Table during In-Situ Testing= 10.00 ft
Max. Acceleration=0.57 g
Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	15.00	110.00	2.00
5.00	48.00	110.00	24.80
10.00	11.00	110.00	24.80
15.00	18.00	110.00	19.40
20.00	100.00	110.00	89.00
25.00	100.00	110.00	21.30
30.00	30.00	110.00	69.80
35.00	21.00	110.00	74.00
40.00	40.00	110.00	74.00
45.00	37.00	110.00	57.70
50.00	20.00	110.00	57.70

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	15.00	1.50	0.75	0.000	1.70	28.69	2.00	0.00	28.69	0.36
0.50	18.30	1.50	0.75	0.028	1.70	35.00	4.28	0.00	35.00	2.00
1.00	21.60	1.50	0.75	0.055	1.70	41.31	6.56	0.35	41.66	2.00
1.50	24.90	1.50	0.75	0.083	1.70	47.62	8.84	1.29	48.91	2.00
2.00	28.20	1.50	0.75	0.110	1.70	53.93	11.12	2.71	56.64	2.00
2.50	31.50	1.50	0.75	0.138	1.70	60.24	13.40	4.37	64.61	2.00
3.00	34.80	1.50	0.75	0.165	1.70	66.55	15.68	6.15	72.71	2.00
3.50	38.10	1.50	0.75	0.193	1.70	72.87	17.96	8.04	80.91	2.00
4.00	41.40	1.50	0.75	0.220	1.70	79.18	20.24	10.07	89.25	2.00
4.50	44.70	1.50	0.75	0.248	1.70	85.49	22.52	12.28	97.77	2.00
5.00	48.00	1.50	0.75	0.275	1.70	91.80	24.80	14.69	106.49	2.00
5.50	44.30	1.50	0.75	0.303	1.70	84.72	24.80	13.88	98.61	2.00
6.00	40.60	1.50	0.75	0.330	1.70	77.65	24.80	13.08	90.73	2.00

6.50	36.90	1.50	0.75	0.358	1.67	69.43	24.80	12.15	81.58	2.00
7.00	33.20	1.50	0.75	0.385	1.61	60.19	24.80	11.10	71.29	2.00
7.50	29.50	1.50	0.75	0.413	1.56	51.67	24.80	10.13	61.80	2.00
8.00	25.80	1.50	0.75	0.440	1.51	43.76	24.80	9.23	52.99	2.00
8.50	22.10	1.50	0.85	0.468	1.46	41.21	24.80	8.95	50.16	2.00
9.00	18.40	1.50	0.85	0.495	1.42	33.34	24.80	8.05	41.40	2.00
9.50	14.70	1.50	0.85	0.523	1.38	25.93	24.80	7.21	33.14	2.00
10.00	11.00	1.50	0.85	0.550	1.35	18.91	24.80	6.41	25.33	0.29
10.50	11.70	1.50	0.85	0.562	1.33	19.90	24.26	6.39	26.29	0.31
11.00	12.40	1.50	0.85	0.574	1.32	20.87	23.72	6.35	27.22	0.32
11.50	13.10	1.50	0.85	0.586	1.31	21.82	23.18	6.30	28.12	0.35
12.00	13.80	1.50	0.85	0.598	1.29	22.76	22.64	6.24	29.00	0.37
12.50	14.50	1.50	0.85	0.610	1.28	23.68	22.10	6.16	29.84	0.43
13.00	15.20	1.50	0.85	0.621	1.27	24.58	21.56	6.08	30.66	2.00
13.50	15.90	1.50	0.85	0.633	1.26	25.47	21.02	5.98	31.46	2.00
14.00	16.60	1.50	0.85	0.645	1.24	26.35	20.48	5.87	32.22	2.00
14.50	17.30	1.50	0.85	0.657	1.23	27.21	19.94	5.76	32.97	2.00
15.00	18.00	1.50	0.95	0.669	1.22	31.36	19.40	5.87	37.24	2.00
15.50	26.20	1.50	0.95	0.681	1.21	45.25	26.36	10.09	55.34	2.00
16.00	34.40	1.50	0.95	0.693	1.20	58.89	33.32	15.64	74.53	2.00
16.50	42.60	1.50	0.95	0.705	1.19	72.31	40.28	19.46	91.78	2.00
17.00	50.80	1.50	0.95	0.717	1.18	85.51	47.24	22.10	107.62	2.00
17.50	59.00	1.50	0.95	0.729	1.17	98.50	54.20	24.70	123.20	2.00
18.00	67.20	1.50	0.95	0.740	1.16	111.29	61.16	27.26	138.55	2.00
18.50	75.40	1.50	0.95	0.752	1.15	123.88	68.12	29.78	153.65	2.00
19.00	83.60	1.50	0.95	0.764	1.14	136.27	75.08	32.25	168.53	2.00
19.50	91.80	1.50	0.95	0.776	1.14	148.49	82.04	34.70	183.19	2.00
20.00	100.00	1.50	0.95	0.788	1.13	160.53	89.00	37.11	197.63	2.00
20.50	100.00	1.50	0.95	0.800	1.12	159.33	82.23	36.87	196.19	2.00
21.00	100.00	1.50	0.95	0.812	1.11	158.16	75.46	36.63	194.79	2.00
21.50	100.00	1.50	0.95	0.824	1.10	157.01	68.69	36.40	193.41	2.00
22.00	100.00	1.50	0.95	0.836	1.09	155.89	61.92	36.18	192.07	2.00
22.50	100.00	1.50	0.95	0.848	1.09	154.79	55.15	35.96	190.75	2.00
23.00	100.00	1.50	0.95	0.859	1.08	153.71	48.38	35.74	189.46	2.00
23.50	100.00	1.50	0.95	0.871	1.07	152.66	41.61	35.53	188.19	2.00
24.00	100.00	1.50	0.95	0.883	1.06	151.63	34.84	34.64	186.27	2.00
24.50	100.00	1.50	0.95	0.895	1.06	150.62	28.07	25.46	176.08	2.00
25.00	100.00	1.50	0.95	0.907	1.05	149.63	21.30	17.04	166.66	2.00
25.50	93.00	1.50	0.95	0.919	1.04	138.25	26.15	21.51	159.76	2.00
26.00	86.00	1.50	0.95	0.931	1.04	127.03	31.00	25.42	152.45	2.00
26.50	79.00	1.50	0.95	0.943	1.03	115.95	35.85	28.19	144.14	2.00
27.00	72.00	1.50	0.95	0.955	1.02	105.01	40.70	26.00	131.02	2.00
27.50	65.00	1.50	0.95	0.967	1.02	94.22	45.55	23.84	118.06	2.00
28.00	58.00	1.50	1.00	0.978	1.01	87.96	50.40	22.59	110.55	2.00
28.50	51.00	1.50	1.00	0.990	1.00	76.88	55.25	20.38	97.25	2.00
29.00	44.00	1.50	1.00	1.002	1.00	65.93	60.10	18.19	84.12	2.00
29.50	37.00	1.50	1.00	1.014	0.99	55.12	64.95	16.02	71.14	2.00
30.00	30.00	1.50	1.00	1.026	0.99	44.43	69.80	13.89	58.32	2.00
30.50	29.10	1.50	1.00	1.038	0.98	42.85	70.22	13.57	56.42	2.00
31.00	28.20	1.50	1.00	1.050	0.98	41.28	70.64	13.26	54.54	2.00
31.50	27.30	1.50	1.00	1.062	0.97	39.74	71.06	12.95	52.69	2.00
32.00	26.40	1.50	1.00	1.074	0.97	38.22	71.48	12.64	50.86	2.00
32.50	25.50	1.50	1.00	1.086	0.96	36.71	71.90	12.34	49.06	2.00
33.00	24.60	1.50	1.00	1.097	0.95	35.22	72.32	12.04	47.27	2.00
33.50	23.70	1.50	1.00	1.109	0.95	33.75	72.74	11.75	45.50	2.00
34.00	22.80	1.50	1.00	1.121	0.94	32.30	73.16	11.46	43.76	2.00
34.50	21.90	1.50	1.00	1.133	0.94	30.86	73.58	11.17	42.03	2.00
35.00	21.00	1.50	1.00	1.145	0.93	29.44	74.00	10.89	40.33	2.00
35.50	22.90	1.50	1.00	1.157	0.93	31.93	74.00	11.39	43.32	2.00
36.00	24.80	1.50	1.00	1.169	0.92	34.41	74.00	11.88	46.29	2.00
36.50	26.70	1.50	1.00	1.181	0.92	36.86	74.00	12.37	49.23	2.00

37.00	28.60	1.50	1.00	1.193	0.92	39.28	74.00	12.86	52.14	2.00
37.50	30.50	1.50	1.00	1.205	0.91	41.68	74.00	13.34	55.02	2.00
38.00	32.40	1.50	1.00	1.216	0.91	44.06	74.00	13.81	57.88	2.00
38.50	34.30	1.50	1.00	1.228	0.90	46.42	74.00	14.28	60.71	2.00
39.00	36.20	1.50	1.00	1.240	0.90	48.76	74.00	14.75	63.51	2.00
39.50	38.10	1.50	1.00	1.252	0.89	51.07	74.00	15.21	66.29	2.00
40.00	40.00	1.50	1.00	1.264	0.89	53.37	74.00	15.67	69.04	2.00
40.50	39.70	1.50	1.00	1.276	0.89	52.72	72.37	15.54	68.26	2.00
41.00	39.40	1.50	1.00	1.288	0.88	52.08	70.74	15.42	67.50	2.00
41.50	39.10	1.50	1.00	1.300	0.88	51.45	69.11	15.29	66.73	2.00
42.00	38.80	1.50	1.00	1.312	0.87	50.82	67.48	15.16	65.98	2.00
42.50	38.50	1.50	1.00	1.323	0.87	50.20	65.85	15.04	65.24	2.00
43.00	38.20	1.50	1.00	1.335	0.87	49.59	64.22	14.92	64.50	2.00
43.50	37.90	1.50	1.00	1.347	0.86	48.98	62.59	14.80	63.77	2.00
44.00	37.60	1.50	1.00	1.359	0.86	48.38	60.96	14.68	63.05	2.00
44.50	37.30	1.50	1.00	1.371	0.85	47.78	59.33	14.56	62.34	2.00
45.00	37.00	1.50	1.00	1.383	0.85	47.19	57.70	14.44	61.63	2.00
45.50	35.30	1.50	1.00	1.395	0.85	44.83	57.70	13.97	58.80	2.00
46.00	33.60	1.50	1.00	1.407	0.84	42.49	57.70	13.50	55.99	2.00
46.50	31.90	1.50	1.00	1.419	0.84	40.18	57.70	13.04	53.21	2.00
47.00	30.20	1.50	1.00	1.431	0.84	37.88	57.70	12.58	50.45	2.00
47.50	28.50	1.50	1.00	1.442	0.83	35.60	57.70	12.12	47.72	2.00
48.00	26.80	1.50	1.00	1.454	0.83	33.34	57.70	11.67	45.00	2.00
48.50	25.10	1.50	1.00	1.466	0.83	31.09	57.70	11.22	42.31	2.00
49.00	23.40	1.50	1.00	1.478	0.82	28.87	57.70	10.77	39.65	2.00
49.50	21.70	1.50	1.00	1.490	0.82	26.67	57.70	10.33	37.00	2.00
50.00	20.00	1.50	1.00	1.502	0.82	24.48	57.70	9.90	34.38	2.00
50.50	20.00	1.50	1.00	1.514	0.81	24.38	57.70	9.88	34.26	2.00
51.00	20.00	1.50	1.00	1.526	0.81	24.29	57.70	9.86	34.14	2.00

CRR is based on water table at 10.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	0.36	1.00	0.36	1.18	0.43	0.37	5.00
0.50	0.02	2.00	1.00	2.00	1.18	2.35	0.37	5.00
1.00	0.04	2.00	1.00	2.00	1.18	2.35	0.37	5.00
1.50	0.05	2.00	1.00	2.00	1.18	2.35	0.37	5.00
2.00	0.07	2.00	1.00	2.00	1.18	2.35	0.37	5.00
2.50	0.09	2.00	1.00	2.00	1.18	2.35	0.37	5.00
3.00	0.11	2.00	1.00	2.00	1.18	2.35	0.37	5.00
3.50	0.13	2.00	1.00	2.00	1.18	2.35	0.36	5.00
4.00	0.14	2.00	1.00	2.00	1.18	2.35	0.36	5.00
4.50	0.16	2.00	1.00	2.00	1.18	2.35	0.36	5.00
5.00	0.18	2.00	1.00	2.00	1.18	2.35	0.36	5.00
5.50	0.20	2.00	1.00	2.00	1.18	2.35	0.38	5.00
6.00	0.21	2.00	1.00	2.00	1.18	2.35	0.40	5.00
6.50	0.23	2.00	1.00	2.00	1.18	2.35	0.42	5.00
7.00	0.25	2.00	1.00	2.00	1.18	2.35	0.43	5.00
7.50	0.27	2.00	1.00	2.00	1.18	2.35	0.45	5.00
8.00	0.29	2.00	1.00	2.00	1.18	2.35	0.46	5.00
8.50	0.30	2.00	1.00	2.00	1.18	2.35	0.47	5.00
9.00	0.32	2.00	1.00	2.00	1.18	2.35	0.48	4.88
9.50	0.34	2.00	1.00	2.00	1.18	2.35	0.49	4.78
10.00	0.36	0.29	1.00	0.29	1.18	0.34	0.50	0.67 *
10.50	0.37	0.31	1.00	0.31	1.18	0.36	0.51	0.70 *
11.00	0.37	0.32	1.00	0.32	1.18	0.38	0.52	0.73 *
11.50	0.38	0.35	1.00	0.35	1.18	0.41	0.53	0.77 *
12.00	0.39	0.37	1.00	0.37	1.18	0.44	0.53	0.82 *

12.50	0.40	0.43	1.00	0.43	1.18	0.51	0.54	0.94 *
13.00	0.40	2.00	1.00	2.00	1.18	2.35	0.55	4.29
13.50	0.41	2.00	1.00	2.00	1.18	2.35	0.55	4.24
14.00	0.42	2.00	1.00	2.00	1.18	2.35	0.56	4.20
14.50	0.43	2.00	1.00	2.00	1.18	2.35	0.57	4.16
15.00	0.43	2.00	1.00	2.00	1.18	2.35	0.57	4.12
15.50	0.44	2.00	1.00	2.00	1.18	2.35	0.58	4.08
16.00	0.45	2.00	1.00	2.00	1.18	2.35	0.58	4.05
16.50	0.46	2.00	1.00	2.00	1.18	2.35	0.59	4.02
17.00	0.47	2.00	1.00	2.00	1.18	2.35	0.59	3.99
17.50	0.47	2.00	1.00	2.00	1.18	2.35	0.59	3.96
18.00	0.48	2.00	1.00	2.00	1.18	2.35	0.60	3.94
18.50	0.49	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.50	2.00	1.00	2.00	1.18	2.35	0.60	3.89
19.50	0.50	2.00	1.00	2.00	1.18	2.35	0.61	3.87
20.00	0.51	2.00	1.00	2.00	1.18	2.35	0.61	3.85
20.50	0.52	2.00	1.00	2.00	1.18	2.35	0.61	3.83
21.00	0.53	2.00	1.00	2.00	1.18	2.35	0.62	3.82
21.50	0.54	2.00	1.00	2.00	1.18	2.35	0.62	3.80
22.00	0.54	2.00	1.00	2.00	1.18	2.35	0.62	3.78
22.50	0.55	2.00	1.00	2.00	1.18	2.35	0.62	3.77
23.00	0.56	2.00	1.00	2.00	1.18	2.35	0.63	3.75
23.50	0.57	2.00	1.00	2.00	1.18	2.35	0.63	3.74
24.00	0.57	2.00	1.00	2.00	1.18	2.35	0.63	3.73
24.50	0.58	2.00	1.00	2.00	1.18	2.35	0.63	3.72
25.00	0.59	2.00	1.00	2.00	1.18	2.35	0.63	3.71
25.50	0.60	2.00	1.00	2.00	1.18	2.35	0.64	3.70
26.00	0.61	2.00	1.00	2.00	1.18	2.35	0.64	3.69
26.50	0.61	2.00	1.00	2.00	1.18	2.35	0.64	3.68
27.00	0.62	2.00	1.00	2.00	1.18	2.35	0.64	3.67
27.50	0.63	2.00	1.00	2.00	1.18	2.35	0.64	3.66
28.00	0.64	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.64	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.00	0.65	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.50	0.66	2.00	1.00	2.00	1.18	2.35	0.65	3.63
30.00	0.67	2.00	1.00	2.00	1.18	2.35	0.65	3.62
30.50	0.67	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.00	0.68	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.50	0.69	2.00	1.00	2.00	1.18	2.35	0.65	3.64
32.00	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.65
32.50	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.72	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.73	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.74	2.00	1.00	2.00	1.18	2.35	0.64	3.68
35.00	0.74	2.00	1.00	2.00	1.18	2.35	0.64	3.69
35.50	0.75	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.76	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.77	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.78	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.78	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.79	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.80	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.81	2.00	1.00	2.00	1.18	2.35	0.62	3.77
39.50	0.81	2.00	1.00	2.00	1.18	2.35	0.62	3.78
40.00	0.82	2.00	1.00	2.00	1.18	2.35	0.62	3.79
40.50	0.83	2.00	1.00	2.00	1.18	2.35	0.62	3.80
41.00	0.84	2.00	1.00	2.00	1.18	2.35	0.62	3.82
41.50	0.84	2.00	1.00	2.00	1.18	2.35	0.61	3.83
42.00	0.85	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.86	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.87	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.88	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.88	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.89	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.90	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.91	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	0.91	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	0.92	2.00	1.00	2.00	1.18	2.35	0.59	3.97
47.00	0.93	2.00	1.00	2.00	1.18	2.35	0.59	3.98
47.50	0.94	2.00	1.00	2.00	1.18	2.35	0.59	4.00
48.00	0.95	2.00	1.00	2.00	1.18	2.35	0.59	4.01
48.50	0.95	2.00	1.00	2.00	1.18	2.35	0.58	4.03
49.00	0.96	2.00	1.00	2.00	1.18	2.35	0.58	4.04
49.50	0.97	2.00	1.00	2.00	1.18	2.35	0.58	4.06
50.00	0.98	2.00	1.00	2.00	1.18	2.35	0.58	4.08
50.50	0.98	2.00	1.00	2.00	1.18	2.35	0.57	4.09
51.00	0.99	2.00	1.00	2.00	1.18	2.35	0.57	4.11

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	28.69	2.00	0.00	28.69
0.50	-	-	-	35.00	4.28	0.00	35.00
1.00	-	-	-	41.66	6.56	0.00	41.66
1.50	-	-	-	48.91	8.84	0.00	48.91
2.00	-	-	-	56.64	11.12	0.00	56.64
2.50	-	-	-	64.61	13.40	0.00	64.61
3.00	-	-	-	72.71	15.68	0.00	72.71
3.50	-	-	-	80.91	17.96	0.00	80.91
4.00	-	-	-	89.25	20.24	0.00	89.25
4.50	-	-	-	97.77	22.52	0.00	97.77
5.00	-	-	-	100.00	24.80	0.00	100.00
5.50	-	-	-	98.61	24.80	0.00	98.61
6.00	-	-	-	90.73	24.80	0.00	90.73
6.50	-	-	-	81.58	24.80	0.00	81.58
7.00	-	-	-	71.29	24.80	0.00	71.29
7.50	-	-	-	61.80	24.80	0.00	61.80
8.00	-	-	-	52.99	24.80	0.00	52.99
8.50	-	-	-	50.16	24.80	0.00	50.16
9.00	-	-	-	41.40	24.80	0.00	41.40
9.50	-	-	-	33.14	24.80	0.00	33.14
10.00	-	-	-	25.33	24.80	0.00	25.33
10.50	-	-	-	26.29	24.26	0.00	26.29
11.00	-	-	-	27.22	23.72	0.00	27.22
11.50	-	-	-	28.12	23.18	0.00	28.12
12.00	-	-	-	29.00	22.64	0.00	29.00
12.50	-	-	-	29.84	22.10	0.00	29.84
13.00	-	-	-	30.66	21.56	0.00	30.66
13.50	-	-	-	31.46	21.02	0.00	31.46
14.00	-	-	-	32.22	20.48	0.00	32.22
14.50	-	-	-	32.97	19.94	0.00	32.97
15.00	-	-	-	37.24	19.40	0.00	37.24
15.50	-	-	-	55.34	26.36	0.00	55.34
16.00	-	-	-	74.53	33.32	0.00	74.53

16.50	-	-	-	91.78	40.28	0.00	91.78
17.00	-	-	-	100.00	47.24	0.00	100.00
17.50	-	-	-	100.00	54.20	0.00	100.00
18.00	-	-	-	100.00	61.16	0.00	100.00
18.50	-	-	-	100.00	68.12	0.00	100.00
19.00	-	-	-	100.00	75.08	0.00	100.00
19.50	-	-	-	100.00	82.04	0.00	100.00
20.00	-	-	-	100.00	89.00	0.00	100.00
20.50	-	-	-	100.00	82.23	0.00	100.00
21.00	-	-	-	100.00	75.46	0.00	100.00
21.50	-	-	-	100.00	68.69	0.00	100.00
22.00	-	-	-	100.00	61.92	0.00	100.00
22.50	-	-	-	100.00	55.15	0.00	100.00
23.00	-	-	-	100.00	48.38	0.00	100.00
23.50	-	-	-	100.00	41.61	0.00	100.00
24.00	-	-	-	100.00	34.84	0.00	100.00
24.50	-	-	-	100.00	28.07	0.00	100.00
25.00	-	-	-	100.00	21.30	0.00	100.00
25.50	-	-	-	100.00	26.15	0.00	100.00
26.00	-	-	-	100.00	31.00	0.00	100.00
26.50	-	-	-	100.00	35.85	0.00	100.00
27.00	-	-	-	100.00	40.70	0.00	100.00
27.50	-	-	-	100.00	45.55	0.00	100.00
28.00	-	-	-	100.00	50.40	0.00	100.00
28.50	-	-	-	97.25	55.25	0.00	97.25
29.00	-	-	-	84.12	60.10	0.00	84.12
29.50	-	-	-	71.14	64.95	0.00	71.14
30.00	-	-	-	58.32	69.80	0.00	58.32
30.50	-	-	-	56.42	70.22	0.00	56.42
31.00	-	-	-	54.54	70.64	0.00	54.54
31.50	-	-	-	52.69	71.06	0.00	52.69
32.00	-	-	-	50.86	71.48	0.00	50.86
32.50	-	-	-	49.06	71.90	0.00	49.06
33.00	-	-	-	47.27	72.32	0.00	47.27
33.50	-	-	-	45.50	72.74	0.00	45.50
34.00	-	-	-	43.76	73.16	0.00	43.76
34.50	-	-	-	42.03	73.58	0.00	42.03
35.00	-	-	-	40.33	74.00	0.00	40.33
35.50	-	-	-	43.32	74.00	0.00	43.32
36.00	-	-	-	46.29	74.00	0.00	46.29
36.50	-	-	-	49.23	74.00	0.00	49.23
37.00	-	-	-	52.14	74.00	0.00	52.14
37.50	-	-	-	55.02	74.00	0.00	55.02
38.00	-	-	-	57.88	74.00	0.00	57.88
38.50	-	-	-	60.71	74.00	0.00	60.71
39.00	-	-	-	63.51	74.00	0.00	63.51
39.50	-	-	-	66.29	74.00	0.00	66.29
40.00	-	-	-	69.04	74.00	0.00	69.04
40.50	-	-	-	68.26	72.37	0.00	68.26
41.00	-	-	-	67.50	70.74	0.00	67.50
41.50	-	-	-	66.73	69.11	0.00	66.73
42.00	-	-	-	65.98	67.48	0.00	65.98
42.50	-	-	-	65.24	65.85	0.00	65.24
43.00	-	-	-	64.50	64.22	0.00	64.50
43.50	-	-	-	63.77	62.59	0.00	63.77
44.00	-	-	-	63.05	60.96	0.00	63.05
44.50	-	-	-	62.34	59.33	0.00	62.34
45.00	-	-	-	61.63	57.70	0.00	61.63
45.50	-	-	-	58.80	57.70	0.00	58.80
46.00	-	-	-	55.99	57.70	0.00	55.99
46.50	-	-	-	53.21	57.70	0.00	53.21

47.00	-	-	-	50.45	57.70	0.00	50.45
47.50	-	-	-	47.72	57.70	0.00	47.72
48.00	-	-	-	45.00	57.70	0.00	45.00
48.50	-	-	-	42.31	57.70	0.00	42.31
49.00	-	-	-	39.65	57.70	0.00	39.65
49.50	-	-	-	37.00	57.70	0.00	37.00
50.00	-	-	-	34.38	57.70	0.00	34.38
50.50	-	-	-	34.26	57.70	0.00	34.26
51.00	-	-	-	34.14	57.70	0.00	34.14

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.11	57.70	34.16	100.00	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.09	57.70	34.26	100.00	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.08	57.70	34.38	100.00	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.06	57.70	37.00	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.04	57.70	39.65	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.03	57.70	42.31	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.01	57.70	45.00	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.00	57.70	47.72	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	3.98	57.70	50.45	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.97	57.70	53.21	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	57.70	55.99	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	57.70	58.80	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	57.70	61.63	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	59.33	62.34	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	60.96	63.05	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	62.59	63.77	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	64.22	64.50	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	65.85	65.24	100.00	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	67.48	65.98	100.00	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	3.83	69.11	66.73	100.00	0.000	0.0E0	0.000	0.000
41.00	0.62	1.00	0.62	3.82	70.74	67.50	100.00	0.000	0.0E0	0.000	0.000
40.50	0.62	1.00	0.62	3.80	72.37	68.26	100.00	0.000	0.0E0	0.000	0.000
40.00	0.62	1.00	0.62	3.79	74.00	69.04	100.00	0.000	0.0E0	0.000	0.000
39.50	0.62	1.00	0.62	3.78	74.00	66.29	100.00	0.000	0.0E0	0.000	0.000
39.00	0.62	1.00	0.62	3.77	74.00	63.51	100.00	0.000	0.0E0	0.000	0.000
38.50	0.63	1.00	0.63	3.76	74.00	60.71	100.00	0.000	0.0E0	0.000	0.000
38.00	0.63	1.00	0.63	3.75	74.00	57.88	100.00	0.000	0.0E0	0.000	0.000
37.50	0.63	1.00	0.63	3.74	74.00	55.02	100.00	0.000	0.0E0	0.000	0.000
37.00	0.63	1.00	0.63	3.73	74.00	52.14	100.00	0.000	0.0E0	0.000	0.000
36.50	0.63	1.00	0.63	3.72	74.00	49.23	100.00	0.000	0.0E0	0.000	0.000
36.00	0.63	1.00	0.63	3.71	74.00	46.29	100.00	0.000	0.0E0	0.000	0.000
35.50	0.64	1.00	0.64	3.70	74.00	43.32	100.00	0.000	0.0E0	0.000	0.000
35.00	0.64	1.00	0.64	3.69	74.00	40.33	100.00	0.000	0.0E0	0.000	0.000
34.50	0.64	1.00	0.64	3.68	73.58	42.03	100.00	0.000	0.0E0	0.000	0.000
34.00	0.64	1.00	0.64	3.68	73.16	43.76	100.00	0.000	0.0E0	0.000	0.000
33.50	0.64	1.00	0.64	3.67	72.74	45.50	100.00	0.000	0.0E0	0.000	0.000
33.00	0.64	1.00	0.64	3.66	72.32	47.27	100.00	0.000	0.0E0	0.000	0.000
32.50	0.64	1.00	0.64	3.65	71.90	49.06	100.00	0.000	0.0E0	0.000	0.000
32.00	0.64	1.00	0.64	3.65	71.48	50.86	100.00	0.000	0.0E0	0.000	0.000
31.50	0.65	1.00	0.65	3.64	71.06	52.69	100.00	0.000	0.0E0	0.000	0.000
31.00	0.65	1.00	0.65	3.63	70.64	54.54	100.00	0.000	0.0E0	0.000	0.000
30.50	0.65	1.00	0.65	3.63	70.22	56.42	100.00	0.000	0.0E0	0.000	0.000

30.00	0.65	1.00	0.65	3.62	69.80	58.32	100.00	0.000	0.0E0	0.000	0.000
29.50	0.65	1.00	0.65	3.63	64.95	71.14	100.00	0.000	0.0E0	0.000	0.000
29.00	0.65	1.00	0.65	3.64	60.10	84.12	100.00	0.000	0.0E0	0.000	0.000
28.50	0.65	1.00	0.65	3.64	55.25	97.25	100.00	0.000	0.0E0	0.000	0.000
28.00	0.64	1.00	0.64	3.65	50.40	100.00	100.00	0.000	0.0E0	0.000	0.000
27.50	0.64	1.00	0.64	3.66	45.55	100.00	100.00	0.000	0.0E0	0.000	0.000
27.00	0.64	1.00	0.64	3.67	40.70	100.00	100.00	0.000	0.0E0	0.000	0.000
26.50	0.64	1.00	0.64	3.68	35.85	100.00	100.00	0.000	0.0E0	0.000	0.000
26.00	0.64	1.00	0.64	3.69	31.00	100.00	100.00	0.000	0.0E0	0.000	0.000
25.50	0.64	1.00	0.64	3.70	26.15	100.00	100.00	0.000	0.0E0	0.000	0.000
25.00	0.63	1.00	0.63	3.71	21.30	100.00	100.00	0.000	0.0E0	0.000	0.000
24.50	0.63	1.00	0.63	3.72	28.07	100.00	100.00	0.000	0.0E0	0.000	0.000
24.00	0.63	1.00	0.63	3.73	34.84	100.00	100.00	0.000	0.0E0	0.000	0.000
23.50	0.63	1.00	0.63	3.74	41.61	100.00	100.00	0.000	0.0E0	0.000	0.000
23.00	0.63	1.00	0.63	3.75	48.38	100.00	100.00	0.000	0.0E0	0.000	0.000
22.50	0.62	1.00	0.62	3.77	55.15	100.00	100.00	0.000	0.0E0	0.000	0.000
22.00	0.62	1.00	0.62	3.78	61.92	100.00	100.00	0.000	0.0E0	0.000	0.000
21.50	0.62	1.00	0.62	3.80	68.69	100.00	100.00	0.000	0.0E0	0.000	0.000
21.00	0.62	1.00	0.62	3.82	75.46	100.00	100.00	0.000	0.0E0	0.000	0.000
20.50	0.61	1.00	0.61	3.83	82.23	100.00	100.00	0.000	0.0E0	0.000	0.000
20.00	0.61	1.00	0.61	3.85	89.00	100.00	100.00	0.000	0.0E0	0.000	0.000
19.50	0.61	1.00	0.61	3.87	82.04	100.00	100.00	0.000	0.0E0	0.000	0.000
19.00	0.60	1.00	0.60	3.89	75.08	100.00	100.00	0.000	0.0E0	0.000	0.000
18.50	0.60	1.00	0.60	3.91	68.12	100.00	100.00	0.000	0.0E0	0.000	0.000
18.00	0.60	1.00	0.60	3.94	61.16	100.00	100.00	0.000	0.0E0	0.000	0.000
17.50	0.59	1.00	0.59	3.96	54.20	100.00	100.00	0.000	0.0E0	0.000	0.000
17.00	0.59	1.00	0.59	3.99	47.24	100.00	100.00	0.000	0.0E0	0.000	0.000
16.50	0.59	1.00	0.59	4.02	40.28	91.78	100.00	0.000	0.0E0	0.000	0.000
16.00	0.58	1.00	0.58	4.05	33.32	74.53	100.00	0.000	0.0E0	0.000	0.000
15.50	0.58	1.00	0.58	4.08	26.36	55.34	100.00	0.000	0.0E0	0.000	0.000
15.00	0.57	1.00	0.57	4.12	19.40	37.24	100.00	0.000	0.0E0	0.000	0.000
14.50	0.57	1.00	0.57	4.16	19.94	32.97	97.18	0.000	0.0E0	0.000	0.000
14.00	0.56	1.00	0.56	4.20	20.48	32.22	95.31	0.000	0.0E0	0.000	0.000
13.50	0.55	1.00	0.55	4.24	21.02	31.46	93.44	0.000	0.0E0	0.000	0.000
13.00	0.55	1.00	0.55	4.29	21.56	30.66	91.57	0.000	0.0E0	0.000	0.000
12.50	0.54	1.00	0.54	0.94	22.10	29.84	89.70	0.573	3.4E-3	0.012	0.012
12.00	0.53	1.00	0.53	0.82	22.64	29.00	87.84	0.814	4.9E-3	0.044	0.055
11.50	0.53	1.00	0.53	0.77	23.18	28.12	85.97	0.987	5.9E-3	0.055	0.110
11.00	0.52	1.00	0.52	0.73	23.72	27.22	84.10	1.154	6.9E-3	0.065	0.174
10.50	0.51	1.00	0.51	0.70	24.26	26.29	82.23	1.316	7.9E-3	0.075	0.249
10.00	0.50	1.00	0.50	0.67	24.80	25.33	80.34	1.471	8.8E-3	0.084	0.333
9.50	0.49	1.00	0.49	4.78	24.80	33.14	97.63	0.000	0.0E0	0.032	0.365
9.00	0.48	1.00	0.48	4.88	24.80	41.40	100.00	0.000	0.0E0	0.000	0.365
8.50	0.47	1.00	0.47	5.00	24.80	50.16	100.00	0.000	0.0E0	0.000	0.365
8.00	0.46	1.00	0.46	5.00	24.80	52.99	100.00	0.000	0.0E0	0.000	0.365
7.50	0.45	1.00	0.45	5.00	24.80	61.80	100.00	0.000	0.0E0	0.000	0.365
7.00	0.43	1.00	0.43	5.00	24.80	71.29	100.00	0.000	0.0E0	0.000	0.365
6.50	0.42	1.00	0.42	5.00	24.80	81.58	100.00	0.000	0.0E0	0.000	0.365
6.00	0.40	1.00	0.40	5.00	24.80	90.73	100.00	0.000	0.0E0	0.000	0.365
5.50	0.38	1.00	0.38	5.00	24.80	98.61	100.00	0.000	0.0E0	0.000	0.365
5.00	0.36	1.00	0.36	5.00	24.80	100.00	100.00	0.000	0.0E0	0.000	0.365

Settlement of Saturated Sands=0.365 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	100.00	0.36	871.89	1.1E-4	0.0187	0.0059	0.94	0.0056	6.66E-5	0.000	0.000
4.50	0.25	0.16	97.77	0.36	825.09	1.1E-4	0.0178	0.0056	0.94	0.0053	6.35E-5	0.001	0.001
4.00	0.22	0.14	89.25	0.36	754.65	1.1E-4	0.0219	0.0069	0.94	0.0065	7.81E-5	0.001	0.001
3.50	0.19	0.13	80.91	0.36	683.22	1.0E-4	0.0208	0.0066	0.94	0.0062	7.43E-5	0.001	0.002
3.00	0.17	0.11	72.71	0.37	610.42	9.9E-5	0.0196	0.0062	0.94	0.0058	6.98E-5	0.001	0.003
2.50	0.14	0.09	64.61	0.37	535.77	9.4E-5	0.0180	0.0057	0.94	0.0054	6.43E-5	0.001	0.003
2.00	0.11	0.07	56.64	0.37	458.66	8.8E-5	0.0162	0.0051	0.94	0.0048	5.78E-5	0.001	0.004
1.50	0.08	0.05	48.91	0.37	378.26	8.0E-5	0.0140	0.0044	0.94	0.0042	4.99E-5	0.001	0.005
1.00	0.06	0.04	41.66	0.37	292.79	6.9E-5	0.0113	0.0036	0.94	0.0034	4.02E-5	0.000	0.005
0.50	0.03	0.02	35.00	0.37	195.38	5.2E-5	0.0074	0.0032	0.94	0.0030	3.62E-5	0.000	0.005
0.00	0.00	0.00	28.69	0.37	3.49	1.1E-6	0.0010	0.0006	0.94	0.0006	6.97E-6	0.000	0.006

Settlement of Unsaturated Sands=0.006 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=0.371 in.
Differential Settlement=0.186 to 0.245 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) =	1 tsf (ton/ft2)
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

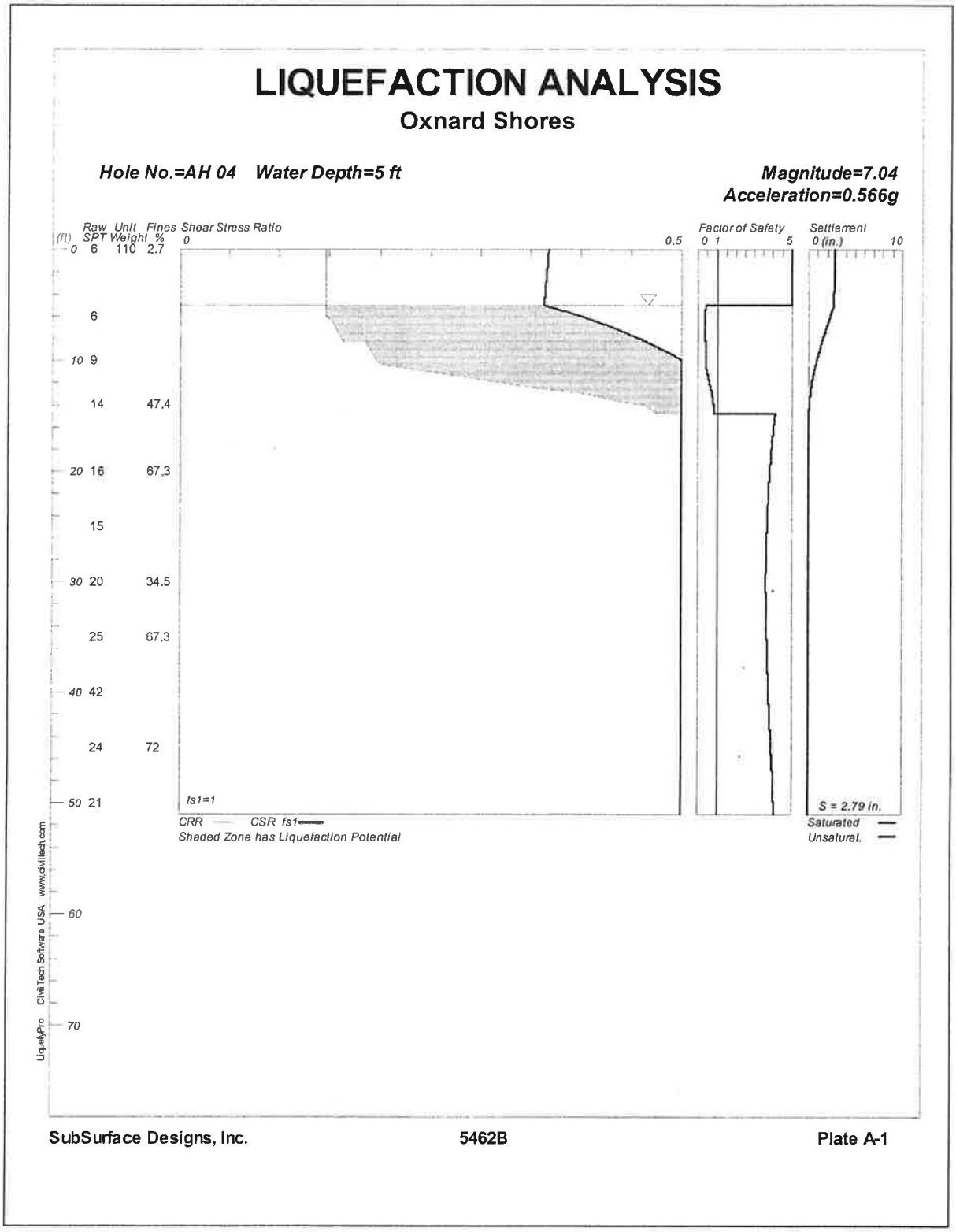
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022. SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.


LIQUEFACTION ANALYSIS
Oxnard Shores
Hole No.=AH 04 Water Depth=5 ft
Magnitude=7.04
Acceleration=0.566g
(ft)
Raw SPT
Unit Weight
Fines %
Shear Stress Ratio
Factor of Safety
Settlement
0 (in.)
10
0 6 110 2.7
6
10 9
14 47.4
20 16 67.3
15
30 20 34.5
25 67.3
40 42
24 72
50 21
60
70
fs1=1
CRR CSR fs1
Shaded Zone has Liquefaction Potential
S = 2.79 in.
Saturated
Unsaturat.
LiquefyPro CivilTech Software USA www.civiltech.com
SubSurface Designs, Inc.
5462B
Plate A-1

****

LIQUEFACTION ANALYSIS CALCULATION DETAILS

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****

Font: Courier New, Regular, Size 8 is recommended for this report.

Licensed to , SubSurface Designs, Inc. 5/3/2011 4:49:31 PM

Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 04.liq

Title: Oxnard Shores

Subtitle: 5462B

Input Data:

Surface Elev.=

Hole No.=AH 04

Depth of Hole=51.00 ft

Water Table during Earthquake= 5.00 ft

Water Table during In-Situ Testing= 14.00 ft

Max. Acceleration=0.57 g

Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	6.00	110.00	2.70
6.00	6.00	110.00	2.70
10.00	9.00	110.00	2.70
14.00	14.00	110.00	47.40
20.00	16.00	110.00	67.30
25.00	15.00	110.00	67.30
30.00	20.00	110.00	34.50
35.00	25.00	110.00	67.30
40.00	42.00	110.00	67.30
45.00	24.00	110.00	72.00
50.00	21.00	110.00	72.00

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	6.00	1.50	0.75	0.000	1.70	11.48	2.70	0.00	11.48	0.12
0.50	6.00	1.50	0.75	0.028	1.70	11.48	2.70	0.00	11.48	0.12
1.00	6.00	1.50	0.75	0.055	1.70	11.48	2.70	0.00	11.48	0.12
1.50	6.00	1.50	0.75	0.083	1.70	11.48	2.70	0.00	11.48	0.12
2.00	6.00	1.50	0.75	0.110	1.70	11.48	2.70	0.00	11.48	0.12
2.50	6.00	1.50	0.75	0.138	1.70	11.48	2.70	0.00	11.48	0.12
3.00	6.00	1.50	0.75	0.165	1.70	11.48	2.70	0.00	11.48	0.12
3.50	6.00	1.50	0.75	0.193	1.70	11.48	2.70	0.00	11.48	0.12
4.00	6.00	1.50	0.75	0.220	1.70	11.48	2.70	0.00	11.48	0.12
4.50	6.00	1.50	0.75	0.248	1.70	11.48	2.70	0.00	11.48	0.12
5.00	6.00	1.50	0.75	0.275	1.70	11.48	2.70	0.00	11.48	0.12
5.50	6.00	1.50	0.75	0.303	1.70	11.48	2.70	0.00	11.48	0.12
6.00	6.00	1.50	0.75	0.330	1.70	11.48	2.70	0.00	11.48	0.12

6.50	6.38	1.50	0.75	0.358	1.67	11.99	2.70	0.00	11.99	0.13
7.00	6.75	1.50	0.75	0.385	1.61	12.24	2.70	0.00	12.24	0.13
7.50	7.13	1.50	0.75	0.413	1.56	12.48	2.70	0.00	12.48	0.14
8.00	7.50	1.50	0.75	0.440	1.51	12.72	2.70	0.00	12.72	0.14
8.50	7.88	1.50	0.85	0.468	1.46	14.68	2.70	0.00	14.68	0.16
9.00	8.25	1.50	0.85	0.495	1.42	14.95	2.70	0.00	14.95	0.16
9.50	8.63	1.50	0.85	0.523	1.38	15.21	2.70	0.00	15.21	0.16
10.00	9.00	1.50	0.85	0.550	1.35	15.47	2.70	0.00	15.47	0.17
10.50	9.63	1.50	0.85	0.578	1.32	16.15	8.29	0.59	16.74	0.18
11.00	10.25	1.50	0.85	0.605	1.29	16.80	13.88	2.87	19.67	0.21
11.50	10.88	1.50	0.85	0.633	1.26	17.43	19.46	4.84	22.28	0.24
12.00	11.50	1.50	0.85	0.660	1.23	18.05	25.05	6.38	24.42	0.27
12.50	12.13	1.50	0.85	0.688	1.21	18.64	30.64	7.72	26.37	0.31
13.00	12.75	1.50	0.85	0.715	1.18	19.22	36.23	8.84	28.07	0.34
13.50	13.38	1.50	0.85	0.743	1.16	19.79	41.81	8.96	28.75	0.37
14.00	14.00	1.50	0.85	0.770	1.14	20.34	47.40	9.07	29.41	0.39
14.50	14.17	1.50	0.85	0.782	1.13	20.43	49.06	9.09	29.51	0.40
15.00	14.33	1.50	0.95	0.794	1.12	22.92	50.72	9.58	32.51	2.00
15.50	14.50	1.50	0.95	0.806	1.11	23.02	52.38	9.60	32.62	2.00
16.00	14.67	1.50	0.95	0.818	1.11	23.11	54.03	9.62	32.74	2.00
16.50	14.83	1.50	0.95	0.830	1.10	23.21	55.69	9.64	32.85	2.00
17.00	15.00	1.50	0.95	0.841	1.09	23.30	57.35	9.66	32.96	2.00
17.50	15.17	1.50	0.95	0.853	1.08	23.40	59.01	9.68	33.08	2.00
18.00	15.33	1.50	0.95	0.865	1.08	23.49	60.67	9.70	33.19	2.00
18.50	15.50	1.50	0.95	0.877	1.07	23.58	62.33	9.72	33.30	2.00
19.00	15.67	1.50	0.95	0.889	1.06	23.68	63.98	9.74	33.41	2.00
19.50	15.83	1.50	0.95	0.901	1.05	23.77	65.64	9.75	33.53	2.00
20.00	16.00	1.50	0.95	0.913	1.05	23.86	67.30	9.77	33.64	2.00
20.50	15.90	1.50	0.95	0.925	1.04	23.56	67.30	9.71	33.27	2.00
21.00	15.80	1.50	0.95	0.937	1.03	23.26	67.30	9.65	32.92	2.00
21.50	15.70	1.50	0.95	0.949	1.03	22.97	67.30	9.59	32.57	2.00
22.00	15.60	1.50	0.95	0.960	1.02	22.68	67.30	9.54	32.22	2.00
22.50	15.50	1.50	0.95	0.972	1.01	22.40	67.30	9.48	31.88	2.00
23.00	15.40	1.50	0.95	0.984	1.01	22.12	67.30	9.42	31.54	2.00
23.50	15.30	1.50	0.95	0.996	1.00	21.85	67.30	9.37	31.21	2.00
24.00	15.20	1.50	0.95	1.008	1.00	21.57	67.30	9.31	30.89	2.00
24.50	15.10	1.50	0.95	1.020	0.99	21.31	67.30	9.26	30.57	2.00
25.00	15.00	1.50	0.95	1.032	0.98	21.04	67.30	9.21	30.25	2.00
25.50	15.50	1.50	0.95	1.044	0.98	21.62	64.02	9.32	30.94	2.00
26.00	16.00	1.50	0.95	1.056	0.97	22.19	60.74	9.44	31.63	2.00
26.50	16.50	1.50	0.95	1.068	0.97	22.76	57.46	9.55	32.31	2.00
27.00	17.00	1.50	0.95	1.079	0.96	23.32	54.18	9.66	32.98	2.00
27.50	17.50	1.50	0.95	1.091	0.96	23.87	50.90	9.77	33.65	2.00
28.00	18.00	1.50	1.00	1.103	0.95	25.71	47.62	10.14	35.85	2.00
28.50	18.50	1.50	1.00	1.115	0.95	26.28	44.34	10.26	36.53	2.00
29.00	19.00	1.50	1.00	1.127	0.94	26.85	41.06	10.37	37.22	2.00
29.50	19.50	1.50	1.00	1.139	0.94	27.41	37.78	10.48	37.89	2.00
30.00	20.00	1.50	1.00	1.151	0.93	27.97	34.50	10.34	38.31	2.00
30.50	20.50	1.50	1.00	1.163	0.93	28.52	37.78	10.70	39.22	2.00
31.00	21.00	1.50	1.00	1.175	0.92	29.06	41.06	10.81	39.88	2.00
31.50	21.50	1.50	1.00	1.187	0.92	29.61	44.34	10.92	40.53	2.00
32.00	22.00	1.50	1.00	1.198	0.91	30.14	47.62	11.03	41.17	2.00
32.50	22.50	1.50	1.00	1.210	0.91	30.68	50.90	11.14	41.81	2.00
33.00	23.00	1.50	1.00	1.222	0.90	31.21	54.18	11.24	42.45	2.00
33.50	23.50	1.50	1.00	1.234	0.90	31.73	57.46	11.35	43.08	2.00
34.00	24.00	1.50	1.00	1.246	0.90	32.25	60.74	11.45	43.70	2.00
34.50	24.50	1.50	1.00	1.258	0.89	32.77	64.02	11.55	44.32	2.00
35.00	25.00	1.50	1.00	1.270	0.89	33.28	67.30	11.66	44.93	2.00
35.50	26.70	1.50	1.00	1.282	0.88	35.37	67.30	12.07	47.45	2.00
36.00	28.40	1.50	1.00	1.294	0.88	37.45	67.30	12.49	49.94	2.00
36.50	30.10	1.50	1.00	1.305	0.88	39.51	67.30	12.90	52.42	2.00

37.00	31.80	1.50	1.00	1.317	0.87	41.56	67.30	13.31	54.87	2.00
37.50	33.50	1.50	1.00	1.329	0.87	43.58	67.30	13.72	57.30	2.00
38.00	35.20	1.50	1.00	1.341	0.86	45.59	67.30	14.12	59.71	2.00
38.50	36.90	1.50	1.00	1.353	0.86	47.58	67.30	14.52	62.10	2.00
39.00	38.60	1.50	1.00	1.365	0.86	49.56	67.30	14.91	64.47	2.00
39.50	40.30	1.50	1.00	1.377	0.85	51.52	67.30	15.30	66.82	2.00
40.00	42.00	1.50	1.00	1.389	0.85	53.46	67.30	15.69	69.15	2.00
40.50	40.20	1.50	1.00	1.401	0.84	50.95	67.77	15.19	66.14	2.00
41.00	38.40	1.50	1.00	1.413	0.84	48.46	68.24	14.69	63.16	2.00
41.50	36.60	1.50	1.00	1.424	0.84	46.00	68.71	14.20	60.20	2.00
42.00	34.80	1.50	1.00	1.436	0.83	43.56	69.18	13.71	57.27	2.00
42.50	33.00	1.50	1.00	1.448	0.83	41.13	69.65	13.23	54.36	2.00
43.00	31.20	1.50	1.00	1.460	0.83	38.73	70.12	12.75	51.48	2.00
43.50	29.40	1.50	1.00	1.472	0.82	36.35	70.59	12.27	48.62	2.00
44.00	27.60	1.50	1.00	1.484	0.82	33.99	71.06	11.80	45.78	2.00
44.50	25.80	1.50	1.00	1.496	0.82	31.64	71.53	11.33	42.97	2.00
45.00	24.00	1.50	1.00	1.508	0.81	29.32	72.00	10.86	40.18	2.00
45.50	23.70	1.50	1.00	1.520	0.81	28.84	72.00	10.77	39.61	2.00
46.00	23.40	1.50	1.00	1.532	0.81	28.36	72.00	10.67	39.03	2.00
46.50	23.10	1.50	1.00	1.543	0.80	27.89	72.00	10.58	38.47	2.00
47.00	22.80	1.50	1.00	1.555	0.80	27.42	72.00	10.48	37.91	2.00
47.50	22.50	1.50	1.00	1.567	0.80	26.96	72.00	10.39	37.35	2.00
48.00	22.20	1.50	1.00	1.579	0.80	26.50	72.00	10.30	36.80	2.00
48.50	21.90	1.50	1.00	1.591	0.79	26.04	72.00	10.21	36.25	2.00
49.00	21.60	1.50	1.00	1.603	0.79	25.59	72.00	10.12	35.71	2.00
49.50	21.30	1.50	1.00	1.615	0.79	25.14	72.00	10.03	35.17	2.00
50.00	21.00	1.50	1.00	1.627	0.78	24.70	72.00	9.94	34.64	2.00
50.50	21.00	1.50	1.00	1.639	0.78	24.61	72.00	9.92	34.53	2.00
51.00	21.00	1.50	1.00	1.651	0.78	24.52	72.00	9.90	34.42	2.00

CRR is based on water table at 14.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	0.12	1.00	0.12	1.18	0.15	0.37	5.00
0.50	0.02	0.12	1.00	0.12	1.18	0.15	0.37	5.00
1.00	0.04	0.12	1.00	0.12	1.18	0.15	0.37	5.00
1.50	0.05	0.12	1.00	0.12	1.18	0.15	0.37	5.00
2.00	0.07	0.12	1.00	0.12	1.18	0.15	0.37	5.00
2.50	0.09	0.12	1.00	0.12	1.18	0.15	0.37	5.00
3.00	0.11	0.12	1.00	0.12	1.18	0.15	0.37	5.00
3.50	0.13	0.12	1.00	0.12	1.18	0.15	0.36	5.00
4.00	0.14	0.12	1.00	0.12	1.18	0.15	0.36	5.00
4.50	0.16	0.12	1.00	0.12	1.18	0.15	0.36	5.00
5.00	0.18	0.12	1.00	0.12	1.18	0.15	0.36	0.40 *
5.50	0.20	0.12	1.00	0.12	1.18	0.15	0.38	0.38 *
6.00	0.21	0.12	1.00	0.12	1.18	0.15	0.40	0.36 *
6.50	0.23	0.13	1.00	0.13	1.18	0.15	0.42	0.37 *
7.00	0.25	0.13	1.00	0.13	1.18	0.16	0.43	0.36 *
7.50	0.27	0.14	1.00	0.14	1.18	0.16	0.45	0.36 *
8.00	0.29	0.14	1.00	0.14	1.18	0.16	0.46	0.35 *
8.50	0.30	0.16	1.00	0.16	1.18	0.19	0.47	0.40 *
9.00	0.32	0.16	1.00	0.16	1.18	0.19	0.48	0.39 *
9.50	0.34	0.16	1.00	0.16	1.18	0.19	0.49	0.39 *
10.00	0.36	0.17	1.00	0.17	1.18	0.20	0.50	0.39 *
10.50	0.38	0.18	1.00	0.18	1.18	0.21	0.51	0.42 *
11.00	0.39	0.21	1.00	0.21	1.18	0.25	0.52	0.48 *
11.50	0.41	0.24	1.00	0.24	1.18	0.29	0.53	0.54 *
12.00	0.43	0.27	1.00	0.27	1.18	0.32	0.53	0.60 *

12.50	0.45	0.31	1.00	0.31	1.18	0.36	0.54	0.67 *
13.00	0.46	0.34	1.00	0.34	1.18	0.41	0.55	0.74 *
13.50	0.48	0.37	1.00	0.37	1.18	0.43	0.55	0.77 *
14.00	0.50	0.39	1.00	0.39	1.18	0.46	0.56	0.83 *
14.50	0.51	0.40	1.00	0.40	1.18	0.47	0.57	0.83 *
15.00	0.52	2.00	1.00	2.00	1.18	2.35	0.57	4.12
15.50	0.52	2.00	1.00	2.00	1.18	2.35	0.58	4.08
16.00	0.53	2.00	1.00	2.00	1.18	2.35	0.58	4.05
16.50	0.54	2.00	1.00	2.00	1.18	2.35	0.59	4.02
17.00	0.55	2.00	1.00	2.00	1.18	2.35	0.59	3.99
17.50	0.55	2.00	1.00	2.00	1.18	2.35	0.59	3.96
18.00	0.56	2.00	1.00	2.00	1.18	2.35	0.60	3.94
18.50	0.57	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.58	2.00	1.00	2.00	1.18	2.35	0.60	3.89
19.50	0.59	2.00	1.00	2.00	1.18	2.35	0.61	3.87
20.00	0.59	2.00	1.00	2.00	1.18	2.35	0.61	3.85
20.50	0.60	2.00	1.00	2.00	1.18	2.35	0.61	3.83
21.00	0.61	2.00	1.00	2.00	1.18	2.35	0.62	3.82
21.50	0.62	2.00	1.00	2.00	1.18	2.35	0.62	3.80
22.00	0.62	2.00	1.00	2.00	1.18	2.35	0.62	3.78
22.50	0.63	2.00	1.00	2.00	1.18	2.35	0.62	3.77
23.00	0.64	2.00	1.00	2.00	1.18	2.35	0.63	3.75
23.50	0.65	2.00	1.00	2.00	1.18	2.35	0.63	3.74
24.00	0.66	2.00	1.00	2.00	1.18	2.35	0.63	3.73
24.50	0.66	2.00	1.00	2.00	1.18	2.35	0.63	3.72
25.00	0.67	2.00	1.00	2.00	1.18	2.35	0.63	3.71
25.50	0.68	2.00	1.00	2.00	1.18	2.35	0.64	3.70
26.00	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.69
26.50	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.68
27.00	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.67
27.50	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.66
28.00	0.72	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.72	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.00	0.73	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.50	0.74	2.00	1.00	2.00	1.18	2.35	0.65	3.63
30.00	0.75	2.00	1.00	2.00	1.18	2.35	0.65	3.62
30.50	0.76	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.00	0.76	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.50	0.77	2.00	1.00	2.00	1.18	2.35	0.65	3.64
32.00	0.78	2.00	1.00	2.00	1.18	2.35	0.64	3.65
32.50	0.79	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.79	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.80	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.81	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.82	2.00	1.00	2.00	1.18	2.35	0.64	3.68
35.00	0.83	2.00	1.00	2.00	1.18	2.35	0.64	3.69
35.50	0.83	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.84	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.85	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.86	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.86	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.87	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.88	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.89	2.00	1.00	2.00	1.18	2.35	0.62	3.77
39.50	0.89	2.00	1.00	2.00	1.18	2.35	0.62	3.78
40.00	0.90	2.00	1.00	2.00	1.18	2.35	0.62	3.79
40.50	0.91	2.00	1.00	2.00	1.18	2.35	0.62	3.80
41.00	0.92	2.00	1.00	2.00	1.18	2.35	0.62	3.82
41.50	0.93	2.00	1.00	2.00	1.18	2.35	0.61	3.83
42.00	0.93	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.94	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.95	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.96	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.96	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.97	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.98	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.99	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	1.00	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	1.00	2.00	1.01	2.01	1.18	2.36	0.59	3.99
47.00	1.01	2.00	1.00	2.01	1.18	2.36	0.59	4.00
47.50	1.02	2.00	1.00	2.01	1.18	2.36	0.59	4.01
48.00	1.03	2.00	1.00	2.00	1.18	2.36	0.59	4.02
48.50	1.03	2.00	1.00	2.00	1.18	2.35	0.58	4.03
49.00	1.04	2.00	1.00	2.00	1.18	2.35	0.58	4.04
49.50	1.05	2.00	1.00	2.00	1.18	2.35	0.58	4.05
50.00	1.06	2.00	1.00	1.99	1.18	2.34	0.58	4.07
50.50	1.07	2.00	1.00	1.99	1.18	2.34	0.57	4.08
51.00	1.07	2.00	0.99	1.99	1.18	2.34	0.57	4.09

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	11.48	2.70	0.00	11.48
0.50	-	-	-	11.48	2.70	0.00	11.48
1.00	-	-	-	11.48	2.70	0.00	11.48
1.50	-	-	-	11.48	2.70	0.00	11.48
2.00	-	-	-	11.48	2.70	0.00	11.48
2.50	-	-	-	11.48	2.70	0.00	11.48
3.00	-	-	-	11.48	2.70	0.00	11.48
3.50	-	-	-	11.48	2.70	0.00	11.48
4.00	-	-	-	11.48	2.70	0.00	11.48
4.50	-	-	-	11.48	2.70	0.00	11.48
5.00	-	-	-	11.48	2.70	0.00	11.48
5.50	-	-	-	11.48	2.70	0.00	11.48
6.00	-	-	-	11.48	2.70	0.00	11.48
6.50	-	-	-	11.99	2.70	0.00	11.99
7.00	-	-	-	12.24	2.70	0.00	12.24
7.50	-	-	-	12.48	2.70	0.00	12.48
8.00	-	-	-	12.72	2.70	0.00	12.72
8.50	-	-	-	14.68	2.70	0.00	14.68
9.00	-	-	-	14.95	2.70	0.00	14.95
9.50	-	-	-	15.21	2.70	0.00	15.21
10.00	-	-	-	15.47	2.70	0.00	15.47
10.50	-	-	-	16.74	8.29	0.00	16.74
11.00	-	-	-	19.67	13.88	0.00	19.67
11.50	-	-	-	22.28	19.46	0.00	22.28
12.00	-	-	-	24.42	25.05	0.00	24.42
12.50	-	-	-	26.37	30.64	0.00	26.37
13.00	-	-	-	28.07	36.23	0.00	28.07
13.50	-	-	-	28.75	41.81	0.00	28.75
14.00	-	-	-	29.41	47.40	0.00	29.41
14.50	-	-	-	29.51	49.06	0.00	29.51
15.00	-	-	-	32.51	50.72	0.00	32.51
15.50	-	-	-	32.62	52.38	0.00	32.62
16.00	-	-	-	32.74	54.03	0.00	32.74

16.50	-	-	-	32.85	55.69	0.00	32.85
17.00	-	-	-	32.96	57.35	0.00	32.96
17.50	-	-	-	33.08	59.01	0.00	33.08
18.00	-	-	-	33.19	60.67	0.00	33.19
18.50	-	-	-	33.30	62.33	0.00	33.30
19.00	-	-	-	33.41	63.98	0.00	33.41
19.50	-	-	-	33.53	65.64	0.00	33.53
20.00	-	-	-	33.64	67.30	0.00	33.64
20.50	-	-	-	33.27	67.30	0.00	33.27
21.00	-	-	-	32.92	67.30	0.00	32.92
21.50	-	-	-	32.57	67.30	0.00	32.57
22.00	-	-	-	32.22	67.30	0.00	32.22
22.50	-	-	-	31.88	67.30	0.00	31.88
23.00	-	-	-	31.54	67.30	0.00	31.54
23.50	-	-	-	31.21	67.30	0.00	31.21
24.00	-	-	-	30.89	67.30	0.00	30.89
24.50	-	-	-	30.57	67.30	0.00	30.57
25.00	-	-	-	30.25	67.30	0.00	30.25
25.50	-	-	-	30.94	64.02	0.00	30.94
26.00	-	-	-	31.63	60.74	0.00	31.63
26.50	-	-	-	32.31	57.46	0.00	32.31
27.00	-	-	-	32.98	54.18	0.00	32.98
27.50	-	-	-	33.65	50.90	0.00	33.65
28.00	-	-	-	35.85	47.62	0.00	35.85
28.50	-	-	-	36.53	44.34	0.00	36.53
29.00	-	-	-	37.22	41.06	0.00	37.22
29.50	-	-	-	37.89	37.78	0.00	37.89
30.00	-	-	-	38.31	34.50	0.00	38.31
30.50	-	-	-	39.22	37.78	0.00	39.22
31.00	-	-	-	39.88	41.06	0.00	39.88
31.50	-	-	-	40.53	44.34	0.00	40.53
32.00	-	-	-	41.17	47.62	0.00	41.17
32.50	-	-	-	41.81	50.90	0.00	41.81
33.00	-	-	-	42.45	54.18	0.00	42.45
33.50	-	-	-	43.08	57.46	0.00	43.08
34.00	-	-	-	43.70	60.74	0.00	43.70
34.50	-	-	-	44.32	64.02	0.00	44.32
35.00	-	-	-	44.93	67.30	0.00	44.93
35.50	-	-	-	47.45	67.30	0.00	47.45
36.00	-	-	-	49.94	67.30	0.00	49.94
36.50	-	-	-	52.42	67.30	0.00	52.42
37.00	-	-	-	54.87	67.30	0.00	54.87
37.50	-	-	-	57.30	67.30	0.00	57.30
38.00	-	-	-	59.71	67.30	0.00	59.71
38.50	-	-	-	62.10	67.30	0.00	62.10
39.00	-	-	-	64.47	67.30	0.00	64.47
39.50	-	-	-	66.82	67.30	0.00	66.82
40.00	-	-	-	69.15	67.30	0.00	69.15
40.50	-	-	-	66.14	67.77	0.00	66.14
41.00	-	-	-	63.16	68.24	0.00	63.16
41.50	-	-	-	60.20	68.71	0.00	60.20
42.00	-	-	-	57.27	69.18	0.00	57.27
42.50	-	-	-	54.36	69.65	0.00	54.36
43.00	-	-	-	51.48	70.12	0.00	51.48
43.50	-	-	-	48.62	70.59	0.00	48.62
44.00	-	-	-	45.78	71.06	0.00	45.78
44.50	-	-	-	42.97	71.53	0.00	42.97
45.00	-	-	-	40.18	72.00	0.00	40.18
45.50	-	-	-	39.61	72.00	0.00	39.61
46.00	-	-	-	39.03	72.00	0.00	39.03
46.50	-	-	-	38.47	72.00	0.00	38.47

47.00	-	-	-	37.91	72.00	0.00	37.91
47.50	-	-	-	37.35	72.00	0.00	37.35
48.00	-	-	-	36.80	72.00	0.00	36.80
48.50	-	-	-	36.25	72.00	0.00	36.25
49.00	-	-	-	35.71	72.00	0.00	35.71
49.50	-	-	-	35.17	72.00	0.00	35.17
50.00	-	-	-	34.64	72.00	0.00	34.64
50.50	-	-	-	34.53	72.00	0.00	34.53
51.00	-	-	-	34.42	72.00	0.00	34.42

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.09	72.00	34.43	100.00	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.08	72.00	34.53	100.00	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.07	72.00	34.64	100.00	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.05	72.00	35.17	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.04	72.00	35.71	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.03	72.00	36.25	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.02	72.00	36.80	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.01	72.00	37.35	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	4.00	72.00	37.91	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.99	72.00	38.47	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	72.00	39.03	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	72.00	39.61	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	72.00	40.18	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	71.53	42.97	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	71.06	45.78	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	70.59	48.62	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	70.12	51.48	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	69.65	54.36	100.00	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	69.18	57.27	100.00	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	3.83	68.71	60.20	100.00	0.000	0.0E0	0.000	0.000
41.00	0.62	1.00	0.62	3.82	68.24	63.16	100.00	0.000	0.0E0	0.000	0.000
40.50	0.62	1.00	0.62	3.80	67.77	66.14	100.00	0.000	0.0E0	0.000	0.000
40.00	0.62	1.00	0.62	3.79	67.30	69.15	100.00	0.000	0.0E0	0.000	0.000
39.50	0.62	1.00	0.62	3.78	67.30	66.82	100.00	0.000	0.0E0	0.000	0.000
39.00	0.62	1.00	0.62	3.77	67.30	64.47	100.00	0.000	0.0E0	0.000	0.000
38.50	0.63	1.00	0.63	3.76	67.30	62.10	100.00	0.000	0.0E0	0.000	0.000
38.00	0.63	1.00	0.63	3.75	67.30	59.71	100.00	0.000	0.0E0	0.000	0.000
37.50	0.63	1.00	0.63	3.74	67.30	57.30	100.00	0.000	0.0E0	0.000	0.000
37.00	0.63	1.00	0.63	3.73	67.30	54.87	100.00	0.000	0.0E0	0.000	0.000
36.50	0.63	1.00	0.63	3.72	67.30	52.42	100.00	0.000	0.0E0	0.000	0.000
36.00	0.63	1.00	0.63	3.71	67.30	49.94	100.00	0.000	0.0E0	0.000	0.000
35.50	0.64	1.00	0.64	3.70	67.30	47.45	100.00	0.000	0.0E0	0.000	0.000
35.00	0.64	1.00	0.64	3.69	67.30	44.93	100.00	0.000	0.0E0	0.000	0.000
34.50	0.64	1.00	0.64	3.68	64.02	44.32	100.00	0.000	0.0E0	0.000	0.000
34.00	0.64	1.00	0.64	3.68	60.74	43.70	100.00	0.000	0.0E0	0.000	0.000
33.50	0.64	1.00	0.64	3.67	57.46	43.08	100.00	0.000	0.0E0	0.000	0.000
33.00	0.64	1.00	0.64	3.66	54.18	42.45	100.00	0.000	0.0E0	0.000	0.000
32.50	0.64	1.00	0.64	3.65	50.90	41.81	100.00	0.000	0.0E0	0.000	0.000
32.00	0.64	1.00	0.64	3.65	47.62	41.17	100.00	0.000	0.0E0	0.000	0.000
31.50	0.65	1.00	0.65	3.64	44.34	40.53	100.00	0.000	0.0E0	0.000	0.000
31.00	0.65	1.00	0.65	3.63	41.06	39.88	100.00	0.000	0.0E0	0.000	0.000
30.50	0.65	1.00	0.65	3.63	37.78	39.22	100.00	0.000	0.0E0	0.000	0.000

30.00	0.65	1.00	0.65	3.62	34.50	38.31	100.00	0.000	0.0E0	0.000	0.000
29.50	0.65	1.00	0.65	3.63	37.78	37.89	100.00	0.000	0.0E0	0.000	0.000
29.00	0.65	1.00	0.65	3.64	41.06	37.22	100.00	0.000	0.0E0	0.000	0.000
28.50	0.65	1.00	0.65	3.64	44.34	36.53	100.00	0.000	0.0E0	0.000	0.000
28.00	0.64	1.00	0.64	3.65	47.62	35.85	100.00	0.000	0.0E0	0.000	0.000
27.50	0.64	1.00	0.64	3.66	50.90	33.65	98.95	0.000	0.0E0	0.000	0.000
27.00	0.64	1.00	0.64	3.67	54.18	32.98	97.22	0.000	0.0E0	0.000	0.000
26.50	0.64	1.00	0.64	3.68	57.46	32.31	95.52	0.000	0.0E0	0.000	0.000
26.00	0.64	1.00	0.64	3.69	60.74	31.63	93.86	0.000	0.0E0	0.000	0.000
25.50	0.64	1.00	0.64	3.70	64.02	30.94	92.23	0.000	0.0E0	0.000	0.000
25.00	0.63	1.00	0.63	3.71	67.30	30.25	90.63	0.000	0.0E0	0.000	0.000
24.50	0.63	1.00	0.63	3.72	67.30	30.57	91.35	0.000	0.0E0	0.000	0.000
24.00	0.63	1.00	0.63	3.73	67.30	30.89	92.10	0.000	0.0E0	0.000	0.000
23.50	0.63	1.00	0.63	3.74	67.30	31.21	92.87	0.000	0.0E0	0.000	0.000
23.00	0.63	1.00	0.63	3.75	67.30	31.54	93.66	0.000	0.0E0	0.000	0.000
22.50	0.62	1.00	0.62	3.77	67.30	31.88	94.47	0.000	0.0E0	0.000	0.000
22.00	0.62	1.00	0.62	3.78	67.30	32.22	95.31	0.000	0.0E0	0.000	0.000
21.50	0.62	1.00	0.62	3.80	67.30	32.57	96.17	0.000	0.0E0	0.000	0.000
21.00	0.62	1.00	0.62	3.82	67.30	32.92	97.06	0.000	0.0E0	0.000	0.000
20.50	0.61	1.00	0.61	3.83	67.30	33.27	97.98	0.000	0.0E0	0.000	0.000
20.00	0.61	1.00	0.61	3.85	67.30	33.64	98.93	0.000	0.0E0	0.000	0.000
19.50	0.61	1.00	0.61	3.87	65.64	33.53	98.63	0.000	0.0E0	0.000	0.000
19.00	0.60	1.00	0.60	3.89	63.98	33.41	98.34	0.000	0.0E0	0.000	0.000
18.50	0.60	1.00	0.60	3.91	62.33	33.30	98.05	0.000	0.0E0	0.000	0.000
18.00	0.60	1.00	0.60	3.94	60.67	33.19	97.76	0.000	0.0E0	0.000	0.000
17.50	0.59	1.00	0.59	3.96	59.01	33.08	97.47	0.000	0.0E0	0.000	0.000
17.00	0.59	1.00	0.59	3.99	57.35	32.96	97.18	0.000	0.0E0	0.000	0.000
16.50	0.59	1.00	0.59	4.02	55.69	32.85	96.89	0.000	0.0E0	0.000	0.000
16.00	0.58	1.00	0.58	4.05	54.03	32.74	96.60	0.000	0.0E0	0.000	0.000
15.50	0.58	1.00	0.58	4.08	52.38	32.62	96.31	0.000	0.0E0	0.000	0.000
15.00	0.57	1.00	0.57	4.12	50.72	32.51	96.03	0.000	0.0E0	0.000	0.000
14.50	0.57	1.00	0.57	0.83	49.06	29.51	88.97	0.760	4.6E-3	0.027	0.027
14.00	0.56	1.00	0.56	0.83	47.40	29.41	88.74	0.775	4.7E-3	0.046	0.073
13.50	0.55	1.00	0.55	0.77	41.81	28.75	87.30	0.926	5.6E-3	0.052	0.125
13.00	0.55	1.00	0.55	0.74	36.23	28.07	85.86	1.063	6.4E-3	0.060	0.185
12.50	0.54	1.00	0.54	0.67	30.64	26.37	82.38	1.390	8.3E-3	0.074	0.259
12.00	0.53	1.00	0.53	0.60	25.05	24.42	78.62	1.736	1.0E-2	0.095	0.354
11.50	0.53	1.00	0.53	0.54	19.46	22.28	74.65	1.971	1.2E-2	0.112	0.466
11.00	0.52	1.00	0.52	0.48	13.88	19.67	69.94	2.199	1.3E-2	0.126	0.591
10.50	0.51	1.00	0.51	0.42	8.29	16.74	64.59	2.525	1.5E-2	0.143	0.734
10.00	0.50	1.00	0.50	0.39	2.70	15.47	62.19	2.671	1.6E-2	0.157	0.892
9.50	0.49	1.00	0.49	0.39	2.70	15.21	61.69	2.701	1.6E-2	0.161	1.053
9.00	0.48	1.00	0.48	0.39	2.70	14.95	61.18	2.732	1.6E-2	0.163	1.216
8.50	0.47	1.00	0.47	0.40	2.70	14.68	60.66	2.764	1.7E-2	0.165	1.381
8.00	0.46	1.00	0.46	0.35	2.70	12.72	56.65	3.043	1.8E-2	0.174	1.555
7.50	0.45	1.00	0.45	0.36	2.70	12.48	56.14	3.080	1.8E-2	0.184	1.739
7.00	0.43	1.00	0.43	0.36	2.70	12.24	55.62	3.117	1.9E-2	0.186	1.925
6.50	0.42	1.00	0.42	0.37	2.70	11.99	55.10	3.155	1.9E-2	0.188	2.113
6.00	0.40	1.00	0.40	0.36	2.70	11.48	53.95	3.236	1.9E-2	0.191	2.305
5.50	0.38	1.00	0.38	0.38	2.70	11.48	53.95	3.236	1.9E-2	0.194	2.499
5.00	0.36	1.00	0.36	0.40	2.70	11.48	53.95	3.236	1.9E-2	0.194	2.693

Settlement of Saturated Sands=2.693 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	11.48	0.36	424.00	2.3E-4	0.0557	0.1116	0.94	0.1049	1.26E-3	0.001	0.001
4.50	0.25	0.16	11.48	0.36	404.26	2.2E-4	0.0481	0.0964	0.94	0.0906	1.09E-3	0.010	0.012
4.00	0.22	0.14	11.48	0.36	381.15	2.1E-4	0.1316	0.2635	0.94	0.2477	2.97E-3	0.020	0.031
3.50	0.19	0.13	11.48	0.36	356.53	2.0E-4	0.0713	0.1427	0.94	0.1342	1.61E-3	0.021	0.052
3.00	0.17	0.11	11.48	0.37	330.08	1.8E-4	0.0442	0.0885	0.94	0.0832	9.98E-4	0.011	0.064
2.50	0.14	0.09	11.48	0.37	301.33	1.7E-4	0.0359	0.0719	0.94	0.0676	8.11E-4	0.009	0.073
2.00	0.11	0.07	11.48	0.37	269.52	1.5E-4	0.0291	0.0584	0.94	0.0549	6.58E-4	0.007	0.080
1.50	0.08	0.05	11.48	0.37	233.41	1.3E-4	0.0240	0.0480	0.94	0.0451	5.42E-4	0.006	0.086
1.00	0.06	0.04	11.48	0.37	190.59	1.1E-4	0.0218	0.0437	0.94	0.0410	4.93E-4	0.005	0.091
0.50	0.03	0.02	11.48	0.37	134.78	7.5E-5	0.0127	0.0255	0.94	0.0239	2.87E-4	0.004	0.095
0.00	0.00	0.00	11.48	0.37	2.57	1.4E-6	0.0010	0.0020	0.94	0.0019	2.30E-5	0.002	0.096

Settlement of Unsaturated Sands=0.096 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=2.790 in.
Differential Settlement=1.395 to 1.841 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) =	1 tsf (ton/ft2)
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022. SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

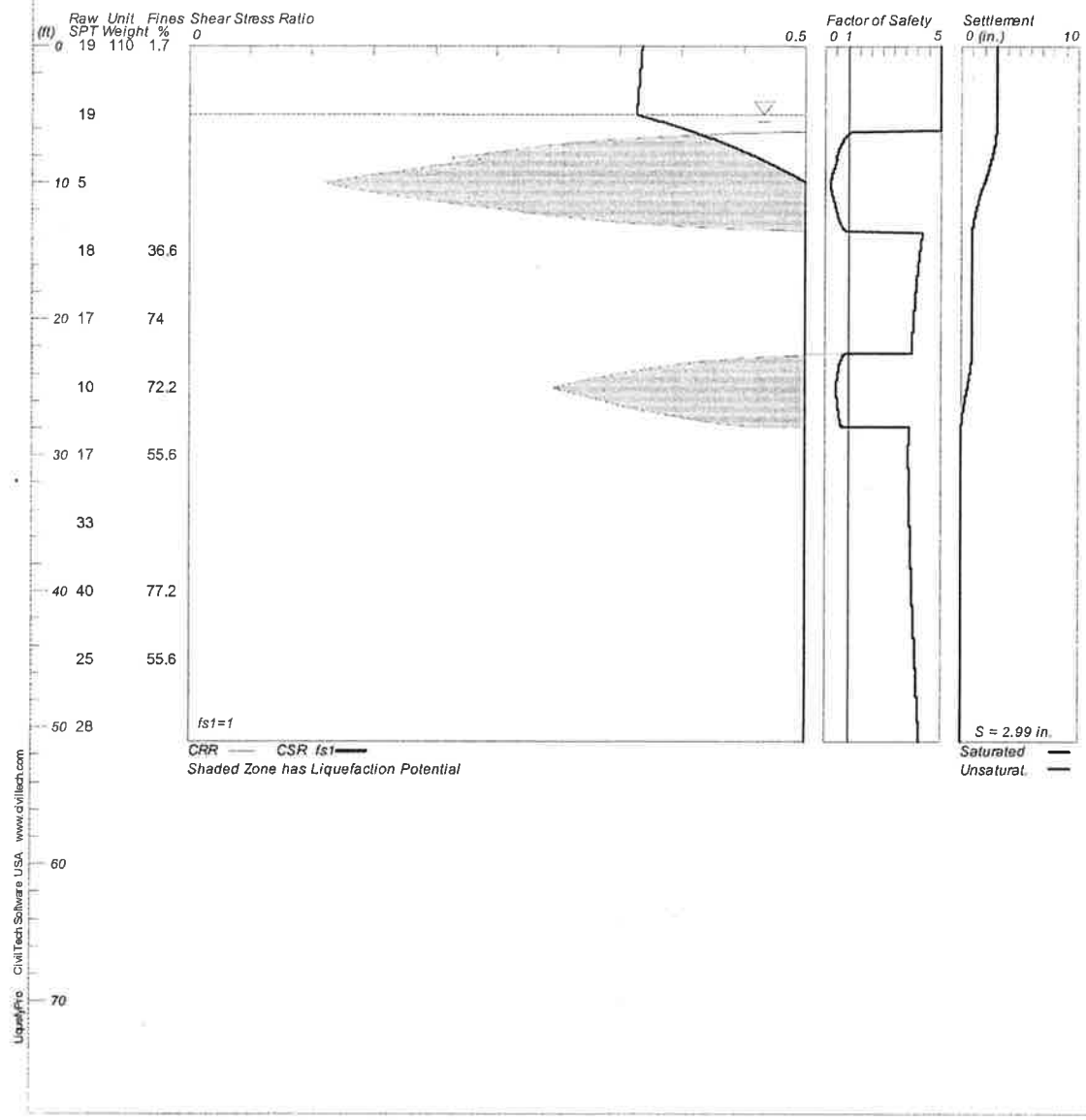
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

LIQUEFACTION ANALYSIS

Oxnard Shores

Hole No.=AH 05 Water Depth=5 ft

Magnitude=7.04
Acceleration=0.566g



SubSurface Designs, Inc. 5462B Plate A-1

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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Font: Courier New, Regular, Size 8 is recommended for this report.

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Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 05.liq

Title: Oxnard Shores

Subtitle: 5462B

Input Data:

Surface Elev.=

Hole No.=AH 05

Depth of Hole=51.00 ft

Water Table during Earthquake= 5.00 ft

Water Table during In-Situ Testing= 10.00 ft

Max. Acceleration=0.57 g

Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	19.00	110.00	1.70
5.00	19.00	110.00	1.70
10.00	5.00	110.00	1.70
15.00	18.00	110.00	36.60
20.00	17.00	110.00	74.00
25.00	10.00	110.00	72.20
30.00	17.00	110.00	55.60
35.00	33.00	110.00	55.60
40.00	40.00	110.00	77.20
45.00	25.00	110.00	55.60
50.00	28.00	110.00	55.60

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	19.00	1.50	0.75	0.000	1.70	36.34	1.70	0.00	36.34	2.00
0.50	19.00	1.50	0.75	0.028	1.70	36.34	1.70	0.00	36.34	2.00
1.00	19.00	1.50	0.75	0.055	1.70	36.34	1.70	0.00	36.34	2.00
1.50	19.00	1.50	0.75	0.083	1.70	36.34	1.70	0.00	36.34	2.00
2.00	19.00	1.50	0.75	0.110	1.70	36.34	1.70	0.00	36.34	2.00
2.50	19.00	1.50	0.75	0.138	1.70	36.34	1.70	0.00	36.34	2.00
3.00	19.00	1.50	0.75	0.165	1.70	36.34	1.70	0.00	36.34	2.00
3.50	19.00	1.50	0.75	0.193	1.70	36.34	1.70	0.00	36.34	2.00
4.00	19.00	1.50	0.75	0.220	1.70	36.34	1.70	0.00	36.34	2.00
4.50	19.00	1.50	0.75	0.248	1.70	36.34	1.70	0.00	36.34	2.00
5.00	19.00	1.50	0.75	0.275	1.70	36.34	1.70	0.00	36.34	2.00
5.50	17.60	1.50	0.75	0.303	1.70	33.66	1.70	0.00	33.66	2.00
6.00	16.20	1.50	0.75	0.330	1.70	30.98	1.70	0.00	30.98	2.00

6.50	14.80	1.50	0.75	0.358	1.67	27.85	1.70	0.00	27.85	0.34
7.00	13.40	1.50	0.75	0.385	1.61	24.30	1.70	0.00	24.30	0.27
7.50	12.00	1.50	0.75	0.413	1.56	21.02	1.70	0.00	21.02	0.23
8.00	10.60	1.50	0.75	0.440	1.51	17.98	1.70	0.00	17.98	0.19
8.50	9.20	1.50	0.85	0.468	1.46	17.16	1.70	0.00	17.16	0.19
9.00	7.80	1.50	0.85	0.495	1.42	14.13	1.70	0.00	14.13	0.15
9.50	6.40	1.50	0.85	0.523	1.38	11.29	1.70	0.00	11.29	0.12
10.00	5.00	1.50	0.85	0.550	1.35	8.60	1.70	0.00	8.60	0.09
10.50	6.30	1.50	0.85	0.562	1.33	10.72	5.19	0.02	10.74	0.12
11.00	7.60	1.50	0.85	0.574	1.32	12.79	8.68	0.67	13.46	0.15
11.50	8.90	1.50	0.85	0.586	1.31	14.83	12.17	2.09	16.92	0.18
12.00	10.20	1.50	0.85	0.598	1.29	16.82	15.66	3.55	20.38	0.22
12.50	11.50	1.50	0.85	0.610	1.28	18.78	19.15	4.85	23.63	0.26
13.00	12.80	1.50	0.85	0.621	1.27	20.70	22.64	6.04	26.74	0.31
13.50	14.10	1.50	0.85	0.633	1.26	22.59	26.13	7.19	29.78	0.42
14.00	15.40	1.50	0.85	0.645	1.24	24.44	29.62	8.38	32.82	2.00
14.50	16.70	1.50	0.85	0.657	1.23	26.27	33.11	9.63	35.90	2.00
15.00	18.00	1.50	0.95	0.669	1.22	31.36	36.60	11.27	42.63	2.00
15.50	17.90	1.50	0.95	0.681	1.21	30.91	40.34	11.18	42.09	2.00
16.00	17.80	1.50	0.95	0.693	1.20	30.47	44.08	11.09	41.57	2.00
16.50	17.70	1.50	0.95	0.705	1.19	30.05	47.82	11.01	41.05	2.00
17.00	17.60	1.50	0.95	0.717	1.18	29.63	51.56	10.93	40.55	2.00
17.50	17.50	1.50	0.95	0.729	1.17	29.22	55.30	10.84	40.06	2.00
18.00	17.40	1.50	0.95	0.740	1.16	28.82	59.04	10.76	39.58	2.00
18.50	17.30	1.50	0.95	0.752	1.15	28.42	62.78	10.68	39.11	2.00
19.00	17.20	1.50	0.95	0.764	1.14	28.04	66.52	10.61	38.64	2.00
19.50	17.10	1.50	0.95	0.776	1.14	27.66	70.26	10.53	38.19	2.00
20.00	17.00	1.50	0.95	0.788	1.13	27.29	74.00	10.46	37.75	2.00
20.50	16.30	1.50	0.95	0.800	1.12	25.97	73.82	10.19	36.16	2.00
21.00	15.60	1.50	0.95	0.812	1.11	24.67	73.64	9.93	34.61	2.00
21.50	14.90	1.50	0.95	0.824	1.10	23.39	73.46	9.68	33.07	2.00
22.00	14.20	1.50	0.95	0.836	1.09	22.14	73.28	9.43	31.56	2.00
22.50	13.50	1.50	0.95	0.848	1.09	20.90	73.10	9.18	30.08	0.48
23.00	12.80	1.50	0.95	0.859	1.08	19.68	72.92	8.94	28.61	0.36
23.50	12.10	1.50	0.95	0.871	1.07	18.47	72.74	8.69	27.17	0.32
24.00	11.40	1.50	0.95	0.883	1.06	17.29	72.56	8.46	25.74	0.30
24.50	10.70	1.50	0.95	0.895	1.06	16.12	72.38	8.22	24.34	0.27
25.00	10.00	1.50	0.95	0.907	1.05	14.96	72.20	7.99	22.96	0.25
25.50	10.70	1.50	0.95	0.919	1.04	15.91	70.54	8.18	24.09	0.27
26.00	11.40	1.50	0.95	0.931	1.04	16.84	68.88	8.37	25.21	0.29
26.50	12.10	1.50	0.95	0.943	1.03	17.76	67.22	8.55	26.31	0.31
27.00	12.80	1.50	0.95	0.955	1.02	18.67	65.56	8.73	27.40	0.33
27.50	13.50	1.50	0.95	0.967	1.02	19.57	63.90	8.91	28.48	0.36
28.00	14.20	1.50	1.00	0.978	1.01	21.53	62.24	9.31	30.84	2.00
28.50	14.90	1.50	1.00	0.990	1.00	22.46	60.58	9.49	31.95	2.00
29.00	15.60	1.50	1.00	1.002	1.00	23.37	58.92	9.67	33.05	2.00
29.50	16.30	1.50	1.00	1.014	0.99	24.28	57.26	9.86	34.13	2.00
30.00	17.00	1.50	1.00	1.026	0.99	25.17	55.60	10.03	35.21	2.00
30.50	18.60	1.50	1.00	1.038	0.98	27.38	55.60	10.48	37.86	2.00
31.00	20.20	1.50	1.00	1.050	0.98	29.57	55.60	10.91	40.49	2.00
31.50	21.80	1.50	1.00	1.062	0.97	31.73	55.60	11.35	43.08	2.00
32.00	23.40	1.50	1.00	1.074	0.97	33.87	55.60	11.77	45.65	2.00
32.50	25.00	1.50	1.00	1.086	0.96	35.99	55.60	12.20	48.19	2.00
33.00	26.60	1.50	1.00	1.097	0.95	38.09	55.60	12.62	50.70	2.00
33.50	28.20	1.50	1.00	1.109	0.95	40.16	55.60	13.03	53.19	2.00
34.00	29.80	1.50	1.00	1.121	0.94	42.21	55.60	13.44	55.66	2.00
34.50	31.40	1.50	1.00	1.133	0.94	44.25	55.60	13.85	58.10	2.00
35.00	33.00	1.50	1.00	1.145	0.93	46.26	55.60	14.25	60.51	2.00
35.50	33.70	1.50	1.00	1.157	0.93	47.00	57.76	14.40	61.40	2.00
36.00	34.40	1.50	1.00	1.169	0.92	47.73	59.92	14.55	62.27	2.00
36.50	35.10	1.50	1.00	1.181	0.92	48.45	62.08	14.69	63.14	2.00

37.00	35.80	1.50	1.00	1.193	0.92	49.17	64.24	14.83	64.01	2.00
37.50	36.50	1.50	1.00	1.205	0.91	49.89	66.40	14.98	64.86	2.00
38.00	37.20	1.50	1.00	1.216	0.91	50.59	68.56	15.12	65.71	2.00
38.50	37.90	1.50	1.00	1.228	0.90	51.29	70.72	15.26	66.55	2.00
39.00	38.60	1.50	1.00	1.240	0.90	51.99	72.88	15.40	67.39	2.00
39.50	39.30	1.50	1.00	1.252	0.89	52.68	75.04	15.54	68.22	2.00
40.00	40.00	1.50	1.00	1.264	0.89	53.37	77.20	15.67	69.04	2.00
40.50	38.50	1.50	1.00	1.276	0.89	51.13	75.04	15.23	66.35	2.00
41.00	37.00	1.50	1.00	1.288	0.88	48.91	72.88	14.78	63.69	2.00
41.50	35.50	1.50	1.00	1.300	0.88	46.71	70.72	14.34	61.05	2.00
42.00	34.00	1.50	1.00	1.312	0.87	44.53	68.56	13.91	58.44	2.00
42.50	32.50	1.50	1.00	1.323	0.87	42.38	66.40	13.48	55.85	2.00
43.00	31.00	1.50	1.00	1.335	0.87	40.24	64.24	13.05	53.29	2.00
43.50	29.50	1.50	1.00	1.347	0.86	38.12	62.08	12.62	50.75	2.00
44.00	28.00	1.50	1.00	1.359	0.86	36.03	59.92	12.21	48.23	2.00
44.50	26.50	1.50	1.00	1.371	0.85	33.95	57.76	11.79	45.74	2.00
45.00	25.00	1.50	1.00	1.383	0.85	31.89	55.60	11.38	43.27	2.00
45.50	25.30	1.50	1.00	1.395	0.85	32.13	55.60	11.43	43.56	2.00
46.00	25.60	1.50	1.00	1.407	0.84	32.38	55.60	11.48	43.85	2.00
46.50	25.90	1.50	1.00	1.419	0.84	32.62	55.60	11.52	44.14	2.00
47.00	26.20	1.50	1.00	1.431	0.84	32.86	55.60	11.57	44.43	2.00
47.50	26.50	1.50	1.00	1.442	0.83	33.10	55.60	11.62	44.72	2.00
48.00	26.80	1.50	1.00	1.454	0.83	33.33	55.60	11.67	45.00	2.00
48.50	27.10	1.50	1.00	1.466	0.83	33.57	55.60	11.71	45.28	2.00
49.00	27.40	1.50	1.00	1.478	0.82	33.80	55.60	11.76	45.57	2.00
49.50	27.70	1.50	1.00	1.490	0.82	34.04	55.60	11.81	45.85	2.00
50.00	28.00	1.50	1.00	1.502	0.82	34.27	55.60	11.85	46.12	2.00
50.50	28.00	1.50	1.00	1.514	0.81	34.14	55.60	11.83	45.96	2.00
51.00	28.00	1.50	1.00	1.526	0.81	34.00	55.60	11.80	45.80	2.00

CRR is based on water table at 10.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	2.00	1.00	2.00	1.18	2.35	0.37	5.00
0.50	0.02	2.00	1.00	2.00	1.18	2.35	0.37	5.00
1.00	0.04	2.00	1.00	2.00	1.18	2.35	0.37	5.00
1.50	0.05	2.00	1.00	2.00	1.18	2.35	0.37	5.00
2.00	0.07	2.00	1.00	2.00	1.18	2.35	0.37	5.00
2.50	0.09	2.00	1.00	2.00	1.18	2.35	0.37	5.00
3.00	0.11	2.00	1.00	2.00	1.18	2.35	0.37	5.00
3.50	0.13	2.00	1.00	2.00	1.18	2.35	0.36	5.00
4.00	0.14	2.00	1.00	2.00	1.18	2.35	0.36	5.00
4.50	0.16	2.00	1.00	2.00	1.18	2.35	0.36	5.00
5.00	0.18	2.00	1.00	2.00	1.18	2.35	0.36	5.00
5.50	0.20	2.00	1.00	2.00	1.18	2.35	0.38	5.00
6.00	0.21	2.00	1.00	2.00	1.18	2.35	0.40	5.00
6.50	0.23	0.34	1.00	0.34	1.18	0.40	0.42	0.96 *
7.00	0.25	0.27	1.00	0.27	1.18	0.32	0.43	0.74 *
7.50	0.27	0.23	1.00	0.23	1.18	0.27	0.45	0.60 *
8.00	0.29	0.19	1.00	0.19	1.18	0.23	0.46	0.50 *
8.50	0.30	0.19	1.00	0.19	1.18	0.22	0.47	0.46 *
9.00	0.32	0.15	1.00	0.15	1.18	0.18	0.48	0.37 *
9.50	0.34	0.12	1.00	0.12	1.18	0.14	0.49	0.29 *
10.00	0.36	0.09	1.00	0.09	1.18	0.11	0.50	0.22 *
10.50	0.37	0.12	1.00	0.12	1.18	0.14	0.51	0.27 *
11.00	0.37	0.15	1.00	0.15	1.18	0.17	0.52	0.33 *
11.50	0.38	0.18	1.00	0.18	1.18	0.21	0.53	0.41 *
12.00	0.39	0.22	1.00	0.22	1.18	0.26	0.53	0.49 *

12.50	0.40	0.26	1.00	0.26	1.18	0.31	0.54	0.57 *
13.00	0.40	0.31	1.00	0.31	1.18	0.37	0.55	0.67 *
13.50	0.41	0.42	1.00	0.42	1.18	0.50	0.55	0.90 *
14.00	0.42	2.00	1.00	2.00	1.18	2.35	0.56	4.20
14.50	0.43	2.00	1.00	2.00	1.18	2.35	0.57	4.16
15.00	0.43	2.00	1.00	2.00	1.18	2.35	0.57	4.12
15.50	0.44	2.00	1.00	2.00	1.18	2.35	0.58	4.08
16.00	0.45	2.00	1.00	2.00	1.18	2.35	0.58	4.05
16.50	0.46	2.00	1.00	2.00	1.18	2.35	0.59	4.02
17.00	0.47	2.00	1.00	2.00	1.18	2.35	0.59	3.99
17.50	0.47	2.00	1.00	2.00	1.18	2.35	0.59	3.96
18.00	0.48	2.00	1.00	2.00	1.18	2.35	0.60	3.94
18.50	0.49	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.50	2.00	1.00	2.00	1.18	2.35	0.60	3.89
19.50	0.50	2.00	1.00	2.00	1.18	2.35	0.61	3.87
20.00	0.51	2.00	1.00	2.00	1.18	2.35	0.61	3.85
20.50	0.52	2.00	1.00	2.00	1.18	2.35	0.61	3.83
21.00	0.53	2.00	1.00	2.00	1.18	2.35	0.62	3.82
21.50	0.54	2.00	1.00	2.00	1.18	2.35	0.62	3.80
22.00	0.54	2.00	1.00	2.00	1.18	2.35	0.62	3.78
22.50	0.55	0.48	1.00	0.48	1.18	0.56	0.62	0.90 *
23.00	0.56	0.36	1.00	0.36	1.18	0.42	0.63	0.68 *
23.50	0.57	0.32	1.00	0.32	1.18	0.38	0.63	0.60 *
24.00	0.57	0.30	1.00	0.30	1.18	0.35	0.63	0.55 *
24.50	0.58	0.27	1.00	0.27	1.18	0.32	0.63	0.51 *
25.00	0.59	0.25	1.00	0.25	1.18	0.30	0.63	0.47 *
25.50	0.60	0.27	1.00	0.27	1.18	0.32	0.64	0.50 *
26.00	0.61	0.29	1.00	0.29	1.18	0.34	0.64	0.53 *
26.50	0.61	0.31	1.00	0.31	1.18	0.36	0.64	0.56 *
27.00	0.62	0.33	1.00	0.33	1.18	0.39	0.64	0.60 *
27.50	0.63	0.36	1.00	0.36	1.18	0.42	0.64	0.65 *
28.00	0.64	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.64	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.00	0.65	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.50	0.66	2.00	1.00	2.00	1.18	2.35	0.65	3.63
30.00	0.67	2.00	1.00	2.00	1.18	2.35	0.65	3.62
30.50	0.67	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.00	0.68	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.50	0.69	2.00	1.00	2.00	1.18	2.35	0.65	3.64
32.00	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.65
32.50	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.72	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.73	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.74	2.00	1.00	2.00	1.18	2.35	0.64	3.68
35.00	0.74	2.00	1.00	2.00	1.18	2.35	0.64	3.69
35.50	0.75	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.76	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.77	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.78	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.78	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.79	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.80	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.81	2.00	1.00	2.00	1.18	2.35	0.62	3.77
39.50	0.81	2.00	1.00	2.00	1.18	2.35	0.62	3.78
40.00	0.82	2.00	1.00	2.00	1.18	2.35	0.62	3.79
40.50	0.83	2.00	1.00	2.00	1.18	2.35	0.62	3.80
41.00	0.84	2.00	1.00	2.00	1.18	2.35	0.62	3.82
41.50	0.84	2.00	1.00	2.00	1.18	2.35	0.61	3.83
42.00	0.85	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.86	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.87	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.88	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.88	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.89	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.90	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.91	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	0.91	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	0.92	2.00	1.00	2.00	1.18	2.35	0.59	3.97
47.00	0.93	2.00	1.00	2.00	1.18	2.35	0.59	3.98
47.50	0.94	2.00	1.00	2.00	1.18	2.35	0.59	4.00
48.00	0.95	2.00	1.00	2.00	1.18	2.35	0.59	4.01
48.50	0.95	2.00	1.00	2.00	1.18	2.35	0.58	4.03
49.00	0.96	2.00	1.00	2.00	1.18	2.35	0.58	4.04
49.50	0.97	2.00	1.00	2.00	1.18	2.35	0.58	4.06
50.00	0.98	2.00	1.00	2.00	1.18	2.35	0.58	4.08
50.50	0.98	2.00	1.00	2.00	1.18	2.35	0.57	4.09
51.00	0.99	2.00	1.00	2.00	1.18	2.35	0.57	4.11

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	36.34	1.70	0.00	36.34
0.50	-	-	-	36.34	1.70	0.00	36.34
1.00	-	-	-	36.34	1.70	0.00	36.34
1.50	-	-	-	36.34	1.70	0.00	36.34
2.00	-	-	-	36.34	1.70	0.00	36.34
2.50	-	-	-	36.34	1.70	0.00	36.34
3.00	-	-	-	36.34	1.70	0.00	36.34
3.50	-	-	-	36.34	1.70	0.00	36.34
4.00	-	-	-	36.34	1.70	0.00	36.34
4.50	-	-	-	36.34	1.70	0.00	36.34
5.00	-	-	-	36.34	1.70	0.00	36.34
5.50	-	-	-	33.66	1.70	0.00	33.66
6.00	-	-	-	30.98	1.70	0.00	30.98
6.50	-	-	-	27.85	1.70	0.00	27.85
7.00	-	-	-	24.30	1.70	0.00	24.30
7.50	-	-	-	21.02	1.70	0.00	21.02
8.00	-	-	-	17.98	1.70	0.00	17.98
8.50	-	-	-	17.16	1.70	0.00	17.16
9.00	-	-	-	14.13	1.70	0.00	14.13
9.50	-	-	-	11.29	1.70	0.00	11.29
10.00	-	-	-	8.60	1.70	0.00	8.60
10.50	-	-	-	10.74	5.19	0.00	10.74
11.00	-	-	-	13.46	8.68	0.00	13.46
11.50	-	-	-	16.92	12.17	0.00	16.92
12.00	-	-	-	20.38	15.66	0.00	20.38
12.50	-	-	-	23.63	19.15	0.00	23.63
13.00	-	-	-	26.74	22.64	0.00	26.74
13.50	-	-	-	29.78	26.13	0.00	29.78
14.00	-	-	-	32.82	29.62	0.00	32.82
14.50	-	-	-	35.90	33.11	0.00	35.90
15.00	-	-	-	42.63	36.60	0.00	42.63
15.50	-	-	-	42.09	40.34	0.00	42.09
16.00	-	-	-	41.57	44.08	0.00	41.57

16.50	-	-	-	41.05	47.82	0.00	41.05
17.00	-	-	-	40.55	51.56	0.00	40.55
17.50	-	-	-	40.06	55.30	0.00	40.06
18.00	-	-	-	39.58	59.04	0.00	39.58
18.50	-	-	-	39.11	62.78	0.00	39.11
19.00	-	-	-	38.64	66.52	0.00	38.64
19.50	-	-	-	38.19	70.26	0.00	38.19
20.00	-	-	-	37.75	74.00	0.00	37.75
20.50	-	-	-	36.16	73.82	0.00	36.16
21.00	-	-	-	34.61	73.64	0.00	34.61
21.50	-	-	-	33.07	73.46	0.00	33.07
22.00	-	-	-	31.56	73.28	0.00	31.56
22.50	-	-	-	30.08	73.10	0.00	30.08
23.00	-	-	-	28.61	72.92	0.00	28.61
23.50	-	-	-	27.17	72.74	0.00	27.17
24.00	-	-	-	25.74	72.56	0.00	25.74
24.50	-	-	-	24.34	72.38	0.00	24.34
25.00	-	-	-	22.96	72.20	0.00	22.96
25.50	-	-	-	24.09	70.54	0.00	24.09
26.00	-	-	-	25.21	68.88	0.00	25.21
26.50	-	-	-	26.31	67.22	0.00	26.31
27.00	-	-	-	27.40	65.56	0.00	27.40
27.50	-	-	-	28.48	63.90	0.00	28.48
28.00	-	-	-	30.84	62.24	0.00	30.84
28.50	-	-	-	31.95	60.58	0.00	31.95
29.00	-	-	-	33.05	58.92	0.00	33.05
29.50	-	-	-	34.13	57.26	0.00	34.13
30.00	-	-	-	35.21	55.60	0.00	35.21
30.50	-	-	-	37.86	55.60	0.00	37.86
31.00	-	-	-	40.49	55.60	0.00	40.49
31.50	-	-	-	43.08	55.60	0.00	43.08
32.00	-	-	-	45.65	55.60	0.00	45.65
32.50	-	-	-	48.19	55.60	0.00	48.19
33.00	-	-	-	50.70	55.60	0.00	50.70
33.50	-	-	-	53.19	55.60	0.00	53.19
34.00	-	-	-	55.66	55.60	0.00	55.66
34.50	-	-	-	58.10	55.60	0.00	58.10
35.00	-	-	-	60.51	55.60	0.00	60.51
35.50	-	-	-	61.40	57.76	0.00	61.40
36.00	-	-	-	62.27	59.92	0.00	62.27
36.50	-	-	-	63.14	62.08	0.00	63.14
37.00	-	-	-	64.01	64.24	0.00	64.01
37.50	-	-	-	64.86	66.40	0.00	64.86
38.00	-	-	-	65.71	68.56	0.00	65.71
38.50	-	-	-	66.55	70.72	0.00	66.55
39.00	-	-	-	67.39	72.88	0.00	67.39
39.50	-	-	-	68.22	75.04	0.00	68.22
40.00	-	-	-	69.04	77.20	0.00	69.04
40.50	-	-	-	66.35	75.04	0.00	66.35
41.00	-	-	-	63.69	72.88	0.00	63.69
41.50	-	-	-	61.05	70.72	0.00	61.05
42.00	-	-	-	58.44	68.56	0.00	58.44
42.50	-	-	-	55.85	66.40	0.00	55.85
43.00	-	-	-	53.29	64.24	0.00	53.29
43.50	-	-	-	50.75	62.08	0.00	50.75
44.00	-	-	-	48.23	59.92	0.00	48.23
44.50	-	-	-	45.74	57.76	0.00	45.74
45.00	-	-	-	43.27	55.60	0.00	43.27
45.50	-	-	-	43.56	55.60	0.00	43.56
46.00	-	-	-	43.85	55.60	0.00	43.85
46.50	-	-	-	44.14	55.60	0.00	44.14

47.00	-	-	-	44.43	55.60	0.00	44.43
47.50	-	-	-	44.72	55.60	0.00	44.72
48.00	-	-	-	45.00	55.60	0.00	45.00
48.50	-	-	-	45.28	55.60	0.00	45.28
49.00	-	-	-	45.57	55.60	0.00	45.57
49.50	-	-	-	45.85	55.60	0.00	45.85
50.00	-	-	-	46.12	55.60	0.00	46.12
50.50	-	-	-	45.96	55.60	0.00	45.96
51.00	-	-	-	45.80	55.60	0.00	45.80

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.11	55.60	45.82	100.00	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.09	55.60	45.96	100.00	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.08	55.60	46.12	100.00	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.06	55.60	45.85	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.04	55.60	45.57	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.03	55.60	45.28	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.01	55.60	45.00	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.00	55.60	44.72	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	3.98	55.60	44.43	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.97	55.60	44.14	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	55.60	43.85	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	55.60	43.56	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	55.60	43.27	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	57.76	45.74	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	59.92	48.23	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	62.08	50.75	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	64.24	53.29	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	66.40	55.85	100.00	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	68.56	58.44	100.00	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	3.83	70.72	61.05	100.00	0.000	0.0E0	0.000	0.000
41.00	0.62	1.00	0.62	3.82	72.88	63.69	100.00	0.000	0.0E0	0.000	0.000
40.50	0.62	1.00	0.62	3.80	75.04	66.35	100.00	0.000	0.0E0	0.000	0.000
40.00	0.62	1.00	0.62	3.79	77.20	69.04	100.00	0.000	0.0E0	0.000	0.000
39.50	0.62	1.00	0.62	3.78	75.04	68.22	100.00	0.000	0.0E0	0.000	0.000
39.00	0.62	1.00	0.62	3.77	72.88	67.39	100.00	0.000	0.0E0	0.000	0.000
38.50	0.63	1.00	0.63	3.76	70.72	66.55	100.00	0.000	0.0E0	0.000	0.000
38.00	0.63	1.00	0.63	3.75	68.56	65.71	100.00	0.000	0.0E0	0.000	0.000
37.50	0.63	1.00	0.63	3.74	66.40	64.86	100.00	0.000	0.0E0	0.000	0.000
37.00	0.63	1.00	0.63	3.73	64.24	64.01	100.00	0.000	0.0E0	0.000	0.000
36.50	0.63	1.00	0.63	3.72	62.08	63.14	100.00	0.000	0.0E0	0.000	0.000
36.00	0.63	1.00	0.63	3.71	59.92	62.27	100.00	0.000	0.0E0	0.000	0.000
35.50	0.64	1.00	0.64	3.70	57.76	61.40	100.00	0.000	0.0E0	0.000	0.000
35.00	0.64	1.00	0.64	3.69	55.60	60.51	100.00	0.000	0.0E0	0.000	0.000
34.50	0.64	1.00	0.64	3.68	55.60	58.10	100.00	0.000	0.0E0	0.000	0.000
34.00	0.64	1.00	0.64	3.68	55.60	55.66	100.00	0.000	0.0E0	0.000	0.000
33.50	0.64	1.00	0.64	3.67	55.60	53.19	100.00	0.000	0.0E0	0.000	0.000
33.00	0.64	1.00	0.64	3.66	55.60	50.70	100.00	0.000	0.0E0	0.000	0.000
32.50	0.64	1.00	0.64	3.65	55.60	48.19	100.00	0.000	0.0E0	0.000	0.000
32.00	0.64	1.00	0.64	3.65	55.60	45.65	100.00	0.000	0.0E0	0.000	0.000
31.50	0.65	1.00	0.65	3.64	55.60	43.08	100.00	0.000	0.0E0	0.000	0.000
31.00	0.65	1.00	0.65	3.63	55.60	40.49	100.00	0.000	0.0E0	0.000	0.000
30.50	0.65	1.00	0.65	3.63	55.60	37.86	100.00	0.000	0.0E0	0.000	0.000

30.00	0.65	1.00	0.65	3.62	55.60	35.21	100.00	0.000	0.0E0	0.000	0.000
29.50	0.65	1.00	0.65	3.63	57.26	34.13	100.00	0.000	0.0E0	0.000	0.000
29.00	0.65	1.00	0.65	3.64	58.92	33.05	97.39	0.000	0.0E0	0.000	0.000
28.50	0.65	1.00	0.65	3.64	60.58	31.95	94.64	0.000	0.0E0	0.000	0.000
28.00	0.64	1.00	0.64	3.65	62.24	30.84	91.99	0.000	0.0E0	0.000	0.000
27.50	0.64	1.00	0.64	0.65	63.90	28.48	86.73	1.196	7.2E-3	0.053	0.053
27.00	0.64	1.00	0.64	0.60	65.56	27.40	84.47	1.414	8.5E-3	0.079	0.132
26.50	0.64	1.00	0.64	0.56	67.22	26.31	82.27	1.580	9.5E-3	0.091	0.223
26.00	0.64	1.00	0.64	0.53	68.88	25.21	80.11	1.719	1.0E-2	0.100	0.322
25.50	0.64	1.00	0.64	0.50	70.54	24.09	77.99	1.836	1.1E-2	0.107	0.430
25.00	0.63	1.00	0.63	0.47	72.20	22.96	75.89	1.931	1.2E-2	0.113	0.543
24.50	0.63	1.00	0.63	0.51	72.38	24.34	78.46	1.811	1.1E-2	0.112	0.655
24.00	0.63	1.00	0.63	0.55	72.56	25.74	81.15	1.648	9.9E-3	0.103	0.758
23.50	0.63	1.00	0.63	0.60	72.74	27.17	83.99	1.436	8.6E-3	0.092	0.851
23.00	0.63	1.00	0.63	0.68	72.92	28.61	87.00	1.136	6.8E-3	0.076	0.927
22.50	0.62	1.00	0.62	0.90	73.10	30.08	90.23	0.614	3.7E-3	0.054	0.981
22.00	0.62	1.00	0.62	3.78	73.28	31.56	93.70	0.000	0.0E0	0.000	0.981
21.50	0.62	1.00	0.62	3.80	73.46	33.07	97.46	0.000	0.0E0	0.000	0.981
21.00	0.62	1.00	0.62	3.82	73.64	34.61	100.00	0.000	0.0E0	0.000	0.981
20.50	0.61	1.00	0.61	3.83	73.82	36.16	100.00	0.000	0.0E0	0.000	0.981
20.00	0.61	1.00	0.61	3.85	74.00	37.75	100.00	0.000	0.0E0	0.000	0.981
19.50	0.61	1.00	0.61	3.87	70.26	38.19	100.00	0.000	0.0E0	0.000	0.981
19.00	0.60	1.00	0.60	3.89	66.52	38.64	100.00	0.000	0.0E0	0.000	0.981
18.50	0.60	1.00	0.60	3.91	62.78	39.11	100.00	0.000	0.0E0	0.000	0.981
18.00	0.60	1.00	0.60	3.94	59.04	39.58	100.00	0.000	0.0E0	0.000	0.981
17.50	0.59	1.00	0.59	3.96	55.30	40.06	100.00	0.000	0.0E0	0.000	0.981
17.00	0.59	1.00	0.59	3.99	51.56	40.55	100.00	0.000	0.0E0	0.000	0.981
16.50	0.59	1.00	0.59	4.02	47.82	41.05	100.00	0.000	0.0E0	0.000	0.981
16.00	0.58	1.00	0.58	4.05	44.08	41.57	100.00	0.000	0.0E0	0.000	0.981
15.50	0.58	1.00	0.58	4.08	40.34	42.09	100.00	0.000	0.0E0	0.000	0.981
15.00	0.57	1.00	0.57	4.12	36.60	42.63	100.00	0.000	0.0E0	0.000	0.981
14.50	0.57	1.00	0.57	4.16	33.11	35.90	100.00	0.000	0.0E0	0.000	0.981
14.00	0.56	1.00	0.56	4.20	29.62	32.82	96.81	0.000	0.0E0	0.000	0.981
13.50	0.55	1.00	0.55	0.90	26.13	29.78	89.57	0.646	3.9E-3	0.006	0.988
13.00	0.55	1.00	0.55	0.67	22.64	26.74	83.12	1.336	8.0E-3	0.063	1.051
12.50	0.54	1.00	0.54	0.57	19.15	23.63	77.14	1.836	1.1E-2	0.098	1.149
12.00	0.53	1.00	0.53	0.49	15.66	20.38	71.21	2.141	1.3E-2	0.121	1.270
11.50	0.53	1.00	0.53	0.41	12.17	16.92	64.93	2.504	1.5E-2	0.140	1.409
11.00	0.52	1.00	0.52	0.33	8.68	13.46	58.19	2.933	1.8E-2	0.164	1.573
10.50	0.51	1.00	0.51	0.27	5.19	10.74	52.28	3.356	2.0E-2	0.190	1.764
10.00	0.50	1.00	0.50	0.22	1.70	8.60	47.05	3.815	2.3E-2	0.215	1.979
9.50	0.49	1.00	0.49	0.29	1.70	11.29	53.53	3.266	2.0E-2	0.209	2.188
9.00	0.48	1.00	0.48	0.37	1.70	14.13	59.57	2.835	1.7E-2	0.182	2.370
8.50	0.47	1.00	0.47	0.46	1.70	17.16	65.37	2.478	1.5E-2	0.158	2.528
8.00	0.46	1.00	0.46	0.50	1.70	17.98	66.88	2.386	1.4E-2	0.145	2.673
7.50	0.45	1.00	0.45	0.60	1.70	21.02	72.37	2.069	1.2E-2	0.133	2.805
7.00	0.43	1.00	0.43	0.74	1.70	24.30	78.38	1.435	8.6E-3	0.106	2.911
6.50	0.42	1.00	0.42	0.96	1.70	27.85	85.39	0.640	3.8E-3	0.059	2.970
6.00	0.40	1.00	0.40	5.00	1.70	30.98	92.32	0.000	0.0E0	0.014	2.984
5.50	0.38	1.00	0.38	5.00	1.70	33.66	98.99	0.000	0.0E0	0.000	2.984
5.00	0.36	1.00	0.36	5.00	1.70	36.34	100.00	0.000	0.0E0	0.000	2.984

Settlement of Saturated Sands=2.984 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	36.34	0.36	622.39	1.6E-4	0.0286	0.0115	0.94	0.0108	1.30E-4	0.000	0.000
4.50	0.25	0.16	36.34	0.36	593.43	1.5E-4	0.0269	0.0108	0.94	0.0102	1.22E-4	0.001	0.001
4.00	0.22	0.14	36.34	0.36	559.49	1.4E-4	0.0273	0.0110	0.94	0.0103	1.24E-4	0.001	0.002
3.50	0.19	0.13	36.34	0.36	523.36	1.3E-4	0.0250	0.0101	0.94	0.0094	1.13E-4	0.001	0.004
3.00	0.17	0.11	36.34	0.37	484.53	1.2E-4	0.0230	0.0093	0.94	0.0087	1.05E-4	0.001	0.005
2.50	0.14	0.09	36.34	0.37	442.32	1.1E-4	0.0241	0.0097	0.94	0.0091	1.09E-4	0.001	0.006
2.00	0.11	0.07	36.34	0.37	395.63	1.0E-4	0.0205	0.0083	0.94	0.0078	9.32E-5	0.001	0.007
1.50	0.08	0.05	36.34	0.37	342.63	8.8E-5	0.0163	0.0066	0.94	0.0062	7.41E-5	0.001	0.008
1.00	0.06	0.04	36.34	0.37	279.76	7.2E-5	0.0120	0.0048	0.94	0.0046	5.46E-5	0.001	0.008
0.50	0.03	0.02	36.34	0.37	197.84	5.1E-5	0.0072	0.0029	0.94	0.0027	3.28E-5	0.000	0.009
0.00	0.00	0.00	36.34	0.37	3.77	9.8E-7	0.0010	0.0004	0.94	0.0004	4.61E-6	0.000	0.009

Settlement of Unsaturated Sands=0.009 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=2.993 in.
Differential Settlement=1.497 to 1.975 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) =	1 tsf (ton/ft2)
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

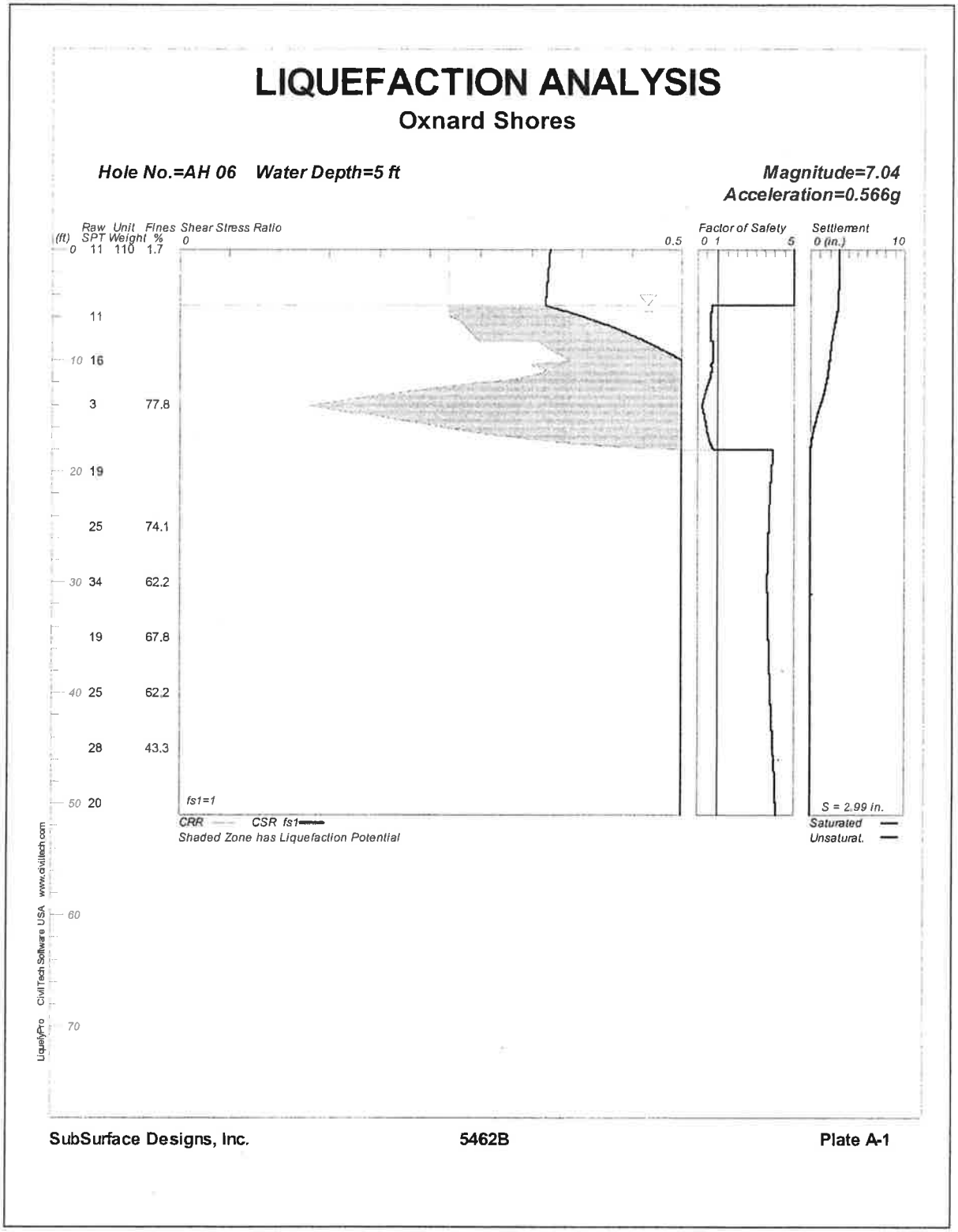
(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022. SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.


LIQUEFACTION ANALYSIS
Oxnard Shores
Hole No.=AH 06 Water Depth=5 ft
Magnitude=7.04
Acceleration=0.566g
Raw SPT
Unit Weight
Fines %
Shear Stress Ratio
Factor of Safety
Settlement
(ft)
0 11 110 1.7
11
10 16
3 77.8
20 19
25 74.1
30 34 62.2
19 67.8
40 25 62.2
28 43.3
50 20
60
70
0
0.5
0 1 5
0 (in.) 10
fs1=1
S = 2.99 in.
CRR CSR fs1
Shaded Zone has Liquefaction Potential
Saturated
Unsatural.
LiquefyPro CivilTech Software USA www.civiltech.com
SubSurface Designs, Inc.
5462B
Plate A-1

****

LIQUEFACTION ANALYSIS CALCULATION DETAILS
Copyright by CivilTech Software
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****

Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , SubSurface Designs, Inc. 5/3/2011 4:51:29 PM

Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 06.liq
Title: Oxnard Shores
Subtitle: 5462B

Input Data:

Surface Elev.=
Hole No.=AH 06
Depth of Hole=51.00 ft
Water Table during Earthquake= 5.00 ft
Water Table during In-Situ Testing= 14.00 ft
Max. Acceleration=0.57 g
Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR), User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	11.00	110.00	1.70
6.00	11.00	110.00	1.70
10.00	16.00	110.00	1.70
14.00	3.00	110.00	77.80
20.00	19.00	110.00	77.80
25.00	25.00	110.00	74.10
30.00	34.00	110.00	62.20
35.00	19.00	110.00	67.80
40.00	25.00	110.00	62.20
45.00	28.00	110.00	43.30
50.00	20.00	110.00	43.30

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	11.00	1.50	0.75	0.000	1.70	21.04	1.70	0.00	21.04	0.23
0.50	11.00	1.50	0.75	0.028	1.70	21.04	1.70	0.00	21.04	0.23
1.00	11.00	1.50	0.75	0.055	1.70	21.04	1.70	0.00	21.04	0.23
1.50	11.00	1.50	0.75	0.083	1.70	21.04	1.70	0.00	21.04	0.23
2.00	11.00	1.50	0.75	0.110	1.70	21.04	1.70	0.00	21.04	0.23
2.50	11.00	1.50	0.75	0.138	1.70	21.04	1.70	0.00	21.04	0.23
3.00	11.00	1.50	0.75	0.165	1.70	21.04	1.70	0.00	21.04	0.23
3.50	11.00	1.50	0.75	0.193	1.70	21.04	1.70	0.00	21.04	0.23
4.00	11.00	1.50	0.75	0.220	1.70	21.04	1.70	0.00	21.04	0.23
4.50	11.00	1.50	0.75	0.248	1.70	21.04	1.70	0.00	21.04	0.23
5.00	11.00	1.50	0.75	0.275	1.70	21.04	1.70	0.00	21.04	0.23
5.50	11.00	1.50	0.75	0.303	1.70	21.04	1.70	0.00	21.04	0.23
6.00	11.00	1.50	0.75	0.330	1.70	21.04	1.70	0.00	21.04	0.23

6.50	11.63	1.50	0.75	0.358	1.67	21.87	1.70	0.00	21.87	0.24
7.00	12.25	1.50	0.75	0.385	1.61	22.21	1.70	0.00	22.21	0.24
7.50	12.88	1.50	0.75	0.413	1.56	22.55	1.70	0.00	22.55	0.25
8.00	13.50	1.50	0.75	0.440	1.51	22.90	1.70	0.00	22.90	0.25
8.50	14.13	1.50	0.85	0.468	1.46	26.34	1.70	0.00	26.34	0.31
9.00	14.75	1.50	0.85	0.495	1.42	26.73	1.70	0.00	26.73	0.31
9.50	15.38	1.50	0.85	0.523	1.38	27.12	1.70	0.00	27.12	0.32
10.00	16.00	1.50	0.85	0.550	1.35	27.51	1.70	0.00	27.51	0.33
10.50	14.37	1.50	0.85	0.578	1.32	24.12	11.21	1.95	26.06	0.30
11.00	12.75	1.50	0.85	0.605	1.29	20.90	20.73	5.50	26.40	0.31
11.50	11.12	1.50	0.85	0.633	1.26	17.84	30.24	7.51	25.34	0.29
12.00	9.50	1.50	0.85	0.660	1.23	14.91	39.75	7.98	22.89	0.25
12.50	7.87	1.50	0.85	0.688	1.21	12.11	49.26	7.42	19.53	0.21
13.00	6.25	1.50	0.85	0.715	1.18	9.42	58.78	6.88	16.31	0.18
13.50	4.62	1.50	0.85	0.743	1.16	6.84	68.29	6.37	13.21	0.14
14.00	3.00	1.50	0.85	0.770	1.14	4.36	77.80	5.87	10.23	0.11
14.50	4.33	1.50	0.85	0.782	1.13	6.25	77.80	6.25	12.50	0.14
15.00	5.67	1.50	0.95	0.794	1.12	9.06	77.80	6.81	15.88	0.17
15.50	7.00	1.50	0.95	0.806	1.11	11.11	77.80	7.22	18.34	0.20
16.00	8.33	1.50	0.95	0.818	1.11	13.13	77.80	7.63	20.76	0.23
16.50	9.67	1.50	0.95	0.830	1.10	15.12	77.80	8.02	23.15	0.26
17.00	11.00	1.50	0.95	0.841	1.09	17.09	77.80	8.42	25.51	0.29
17.50	12.33	1.50	0.95	0.853	1.08	19.03	77.80	8.81	27.83	0.34
18.00	13.67	1.50	0.95	0.865	1.08	20.94	77.80	9.19	30.12	0.50
18.50	15.00	1.50	0.95	0.877	1.07	22.82	77.80	9.56	32.39	2.00
19.00	16.33	1.50	0.95	0.889	1.06	24.69	77.80	9.94	34.62	2.00
19.50	17.67	1.50	0.95	0.901	1.05	26.52	77.80	10.30	36.83	2.00
20.00	19.00	1.50	0.95	0.913	1.05	28.34	77.80	10.67	39.01	2.00
20.50	19.60	1.50	0.95	0.925	1.04	29.04	77.43	10.81	39.85	2.00
21.00	20.20	1.50	0.95	0.937	1.03	29.74	77.06	10.95	40.69	2.00
21.50	20.80	1.50	0.95	0.949	1.03	30.43	76.69	11.09	41.52	2.00
22.00	21.40	1.50	0.95	0.960	1.02	31.12	76.32	11.22	42.34	2.00
22.50	22.00	1.50	0.95	0.972	1.01	31.79	75.95	11.36	43.15	2.00
23.00	22.60	1.50	0.95	0.984	1.01	32.46	75.58	11.49	43.95	2.00
23.50	23.20	1.50	0.95	0.996	1.00	33.12	75.21	11.62	44.75	2.00
24.00	23.80	1.50	0.95	1.008	1.00	33.78	74.84	11.76	45.54	2.00
24.50	24.40	1.50	0.95	1.020	0.99	34.43	74.47	11.89	46.31	2.00
25.00	25.00	1.50	0.95	1.032	0.98	35.07	74.10	12.01	47.09	2.00
25.50	25.90	1.50	0.95	1.044	0.98	36.13	72.91	12.23	48.35	2.00
26.00	26.80	1.50	0.95	1.056	0.97	37.17	71.72	12.43	49.60	2.00
26.50	27.70	1.50	0.95	1.068	0.97	38.20	70.53	12.64	50.84	2.00
27.00	28.60	1.50	0.95	1.079	0.96	39.23	69.34	12.85	52.07	2.00
27.50	29.50	1.50	0.95	1.091	0.96	40.24	68.15	13.05	53.29	2.00
28.00	30.40	1.50	1.00	1.103	0.95	43.41	66.96	13.68	57.10	2.00
28.50	31.30	1.50	1.00	1.115	0.95	44.46	65.77	13.89	58.35	2.00
29.00	32.20	1.50	1.00	1.127	0.94	45.50	64.58	14.10	59.60	2.00
29.50	33.10	1.50	1.00	1.139	0.94	46.52	63.39	14.30	60.83	2.00
30.00	34.00	1.50	1.00	1.151	0.93	47.54	62.20	14.51	62.05	2.00
30.50	32.50	1.50	1.00	1.163	0.93	45.21	62.76	14.04	59.25	2.00
31.00	31.00	1.50	1.00	1.175	0.92	42.91	63.32	13.58	56.49	2.00
31.50	29.50	1.50	1.00	1.187	0.92	40.62	63.88	13.12	53.75	2.00
32.00	28.00	1.50	1.00	1.198	0.91	38.37	64.44	12.67	51.04	2.00
32.50	26.50	1.50	1.00	1.210	0.91	36.13	65.00	12.23	48.36	2.00
33.00	25.00	1.50	1.00	1.222	0.90	33.92	65.56	11.78	45.71	2.00
33.50	23.50	1.50	1.00	1.234	0.90	31.73	66.12	11.35	43.08	2.00
34.00	22.00	1.50	1.00	1.246	0.90	29.56	66.68	10.91	40.48	2.00
34.50	20.50	1.50	1.00	1.258	0.89	27.42	67.24	10.48	37.90	2.00
35.00	19.00	1.50	1.00	1.270	0.89	25.29	67.80	10.06	35.35	2.00
35.50	19.60	1.50	1.00	1.282	0.88	25.97	67.24	10.19	36.16	2.00
36.00	20.20	1.50	1.00	1.294	0.88	26.64	66.68	10.33	36.97	2.00
36.50	20.80	1.50	1.00	1.305	0.88	27.31	66.12	10.46	37.77	2.00

37.00	21.40	1.50	1.00	1.317	0.87	27.97	65.56	10.59	38.56	2.00
37.50	22.00	1.50	1.00	1.329	0.87	28.62	65.00	10.72	39.35	2.00
38.00	22.60	1.50	1.00	1.341	0.86	29.27	64.44	10.85	40.13	2.00
38.50	23.20	1.50	1.00	1.353	0.86	29.92	63.88	10.98	40.90	2.00
39.00	23.80	1.50	1.00	1.365	0.86	30.56	63.32	11.11	41.67	2.00
39.50	24.40	1.50	1.00	1.377	0.85	31.19	62.76	11.24	42.43	2.00
40.00	25.00	1.50	1.00	1.389	0.85	31.82	62.20	11.36	43.18	2.00
40.50	25.30	1.50	1.00	1.401	0.84	32.07	60.31	11.41	43.48	2.00
41.00	25.60	1.50	1.00	1.413	0.84	32.31	58.42	11.46	43.77	2.00
41.50	25.90	1.50	1.00	1.424	0.84	32.55	56.53	11.51	44.06	2.00
42.00	26.20	1.50	1.00	1.436	0.83	32.79	54.64	11.56	44.35	2.00
42.50	26.50	1.50	1.00	1.448	0.83	33.03	52.75	11.61	44.64	2.00
43.00	26.80	1.50	1.00	1.460	0.83	33.27	50.86	11.65	44.92	2.00
43.50	27.10	1.50	1.00	1.472	0.82	33.50	48.97	11.70	45.20	2.00
44.00	27.40	1.50	1.00	1.484	0.82	33.74	47.08	11.75	45.49	2.00
44.50	27.70	1.50	1.00	1.496	0.82	33.97	45.19	11.79	45.77	2.00
45.00	28.00	1.50	1.00	1.508	0.81	34.20	43.30	11.84	46.04	2.00
45.50	27.20	1.50	1.00	1.520	0.81	33.10	43.30	11.62	44.72	2.00
46.00	26.40	1.50	1.00	1.532	0.81	32.00	43.30	11.40	43.40	2.00
46.50	25.60	1.50	1.00	1.543	0.80	30.91	43.30	11.18	42.09	2.00
47.00	24.80	1.50	1.00	1.555	0.80	29.83	43.30	10.97	40.79	2.00
47.50	24.00	1.50	1.00	1.567	0.80	28.76	43.30	10.75	39.51	2.00
48.00	23.20	1.50	1.00	1.579	0.80	27.69	43.30	10.54	38.23	2.00
48.50	22.40	1.50	1.00	1.591	0.79	26.64	43.30	10.33	36.97	2.00
49.00	21.60	1.50	1.00	1.603	0.79	25.59	43.30	10.12	35.71	2.00
49.50	20.80	1.50	1.00	1.615	0.79	24.55	43.30	9.91	34.46	2.00
50.00	20.00	1.50	1.00	1.627	0.78	23.52	43.30	9.70	33.23	2.00
50.50	20.00	1.50	1.00	1.639	0.78	23.44	43.30	9.69	33.12	2.00
51.00	20.00	1.50	1.00	1.651	0.78	23.35	43.30	9.67	33.02	2.00

CRR is based on water table at 14.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	0.23	1.00	0.23	1.18	0.27	0.37	5.00
0.50	0.02	0.23	1.00	0.23	1.18	0.27	0.37	5.00
1.00	0.04	0.23	1.00	0.23	1.18	0.27	0.37	5.00
1.50	0.05	0.23	1.00	0.23	1.18	0.27	0.37	5.00
2.00	0.07	0.23	1.00	0.23	1.18	0.27	0.37	5.00
2.50	0.09	0.23	1.00	0.23	1.18	0.27	0.37	5.00
3.00	0.11	0.23	1.00	0.23	1.18	0.27	0.37	5.00
3.50	0.13	0.23	1.00	0.23	1.18	0.27	0.36	5.00
4.00	0.14	0.23	1.00	0.23	1.18	0.27	0.36	5.00
4.50	0.16	0.23	1.00	0.23	1.18	0.27	0.36	5.00
5.00	0.18	0.23	1.00	0.23	1.18	0.27	0.36	0.74 *
5.50	0.20	0.23	1.00	0.23	1.18	0.27	0.38	0.70 *
6.00	0.21	0.23	1.00	0.23	1.18	0.27	0.40	0.67 *
6.50	0.23	0.24	1.00	0.24	1.18	0.28	0.42	0.67 *
7.00	0.25	0.24	1.00	0.24	1.18	0.29	0.43	0.66 *
7.50	0.27	0.25	1.00	0.25	1.18	0.29	0.45	0.65 *
8.00	0.29	0.25	1.00	0.25	1.18	0.30	0.46	0.65 *
8.50	0.30	0.31	1.00	0.31	1.18	0.36	0.47	0.76 *
9.00	0.32	0.31	1.00	0.31	1.18	0.37	0.48	0.77 *
9.50	0.34	0.32	1.00	0.32	1.18	0.38	0.49	0.77 *
10.00	0.36	0.33	1.00	0.33	1.18	0.39	0.50	0.78 *
10.50	0.38	0.30	1.00	0.30	1.18	0.35	0.51	0.69 *
11.00	0.39	0.31	1.00	0.31	1.18	0.36	0.52	0.70 *
11.50	0.41	0.29	1.00	0.29	1.18	0.34	0.53	0.64 *
12.00	0.43	0.25	1.00	0.25	1.18	0.30	0.53	0.55 *

12.50	0.45	0.21	1.00	0.21	1.18	0.25	0.54	0.46 *
13.00	0.46	0.18	1.00	0.18	1.18	0.21	0.55	0.38 *
13.50	0.48	0.14	1.00	0.14	1.18	0.17	0.55	0.30 *
14.00	0.50	0.11	1.00	0.11	1.18	0.13	0.56	0.23 *
14.50	0.51	0.14	1.00	0.14	1.18	0.16	0.57	0.28 *
15.00	0.52	0.17	1.00	0.17	1.18	0.20	0.57	0.35 *
15.50	0.52	0.20	1.00	0.20	1.18	0.23	0.58	0.40 *
16.00	0.53	0.23	1.00	0.23	1.18	0.26	0.58	0.46 *
16.50	0.54	0.26	1.00	0.26	1.18	0.30	0.59	0.51 *
17.00	0.55	0.29	1.00	0.29	1.18	0.34	0.59	0.58 *
17.50	0.55	0.34	1.00	0.34	1.18	0.40	0.59	0.67 *
18.00	0.56	0.50	1.00	0.50	1.18	0.59	0.60	0.98 *
18.50	0.57	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.58	2.00	1.00	2.00	1.18	2.35	0.60	3.89
19.50	0.59	2.00	1.00	2.00	1.18	2.35	0.61	3.87
20.00	0.59	2.00	1.00	2.00	1.18	2.35	0.61	3.85
20.50	0.60	2.00	1.00	2.00	1.18	2.35	0.61	3.83
21.00	0.61	2.00	1.00	2.00	1.18	2.35	0.62	3.82
21.50	0.62	2.00	1.00	2.00	1.18	2.35	0.62	3.80
22.00	0.62	2.00	1.00	2.00	1.18	2.35	0.62	3.78
22.50	0.63	2.00	1.00	2.00	1.18	2.35	0.62	3.77
23.00	0.64	2.00	1.00	2.00	1.18	2.35	0.63	3.75
23.50	0.65	2.00	1.00	2.00	1.18	2.35	0.63	3.74
24.00	0.66	2.00	1.00	2.00	1.18	2.35	0.63	3.73
24.50	0.66	2.00	1.00	2.00	1.18	2.35	0.63	3.72
25.00	0.67	2.00	1.00	2.00	1.18	2.35	0.63	3.71
25.50	0.68	2.00	1.00	2.00	1.18	2.35	0.64	3.70
26.00	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.69
26.50	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.68
27.00	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.67
27.50	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.66
28.00	0.72	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.72	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.00	0.73	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.50	0.74	2.00	1.00	2.00	1.18	2.35	0.65	3.63
30.00	0.75	2.00	1.00	2.00	1.18	2.35	0.65	3.62
30.50	0.76	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.00	0.76	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.50	0.77	2.00	1.00	2.00	1.18	2.35	0.65	3.64
32.00	0.78	2.00	1.00	2.00	1.18	2.35	0.64	3.65
32.50	0.79	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.79	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.80	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.81	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.82	2.00	1.00	2.00	1.18	2.35	0.64	3.68
35.00	0.83	2.00	1.00	2.00	1.18	2.35	0.64	3.69
35.50	0.83	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.84	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.85	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.86	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.86	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.87	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.88	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.89	2.00	1.00	2.00	1.18	2.35	0.62	3.77
39.50	0.89	2.00	1.00	2.00	1.18	2.35	0.62	3.78
40.00	0.90	2.00	1.00	2.00	1.18	2.35	0.62	3.79
40.50	0.91	2.00	1.00	2.00	1.18	2.35	0.62	3.80
41.00	0.92	2.00	1.00	2.00	1.18	2.35	0.62	3.82
41.50	0.93	2.00	1.00	2.00	1.18	2.35	0.61	3.83
42.00	0.93	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.94	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.95	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.96	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.96	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.97	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.98	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.99	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	1.00	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	1.00	2.00	1.01	2.01	1.18	2.36	0.59	3.99
47.00	1.01	2.00	1.00	2.01	1.18	2.36	0.59	4.00
47.50	1.02	2.00	1.00	2.01	1.18	2.36	0.59	4.01
48.00	1.03	2.00	1.00	2.00	1.18	2.36	0.59	4.02
48.50	1.03	2.00	1.00	2.00	1.18	2.35	0.58	4.03
49.00	1.04	2.00	1.00	2.00	1.18	2.35	0.58	4.04
49.50	1.05	2.00	1.00	2.00	1.18	2.35	0.58	4.05
50.00	1.06	2.00	1.00	1.99	1.18	2.34	0.58	4.07
50.50	1.07	2.00	1.00	1.99	1.18	2.34	0.57	4.08
51.00	1.07	2.00	0.99	1.99	1.18	2.34	0.57	4.09

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	21.04	1.70	0.00	21.04
0.50	-	-	-	21.04	1.70	0.00	21.04
1.00	-	-	-	21.04	1.70	0.00	21.04
1.50	-	-	-	21.04	1.70	0.00	21.04
2.00	-	-	-	21.04	1.70	0.00	21.04
2.50	-	-	-	21.04	1.70	0.00	21.04
3.00	-	-	-	21.04	1.70	0.00	21.04
3.50	-	-	-	21.04	1.70	0.00	21.04
4.00	-	-	-	21.04	1.70	0.00	21.04
4.50	-	-	-	21.04	1.70	0.00	21.04
5.00	-	-	-	21.04	1.70	0.00	21.04
5.50	-	-	-	21.04	1.70	0.00	21.04
6.00	-	-	-	21.04	1.70	0.00	21.04
6.50	-	-	-	21.87	1.70	0.00	21.87
7.00	-	-	-	22.21	1.70	0.00	22.21
7.50	-	-	-	22.55	1.70	0.00	22.55
8.00	-	-	-	22.90	1.70	0.00	22.90
8.50	-	-	-	26.34	1.70	0.00	26.34
9.00	-	-	-	26.73	1.70	0.00	26.73
9.50	-	-	-	27.12	1.70	0.00	27.12
10.00	-	-	-	27.51	1.70	0.00	27.51
10.50	-	-	-	26.06	11.21	0.00	26.06
11.00	-	-	-	26.40	20.73	0.00	26.40
11.50	-	-	-	25.34	30.24	0.00	25.34
12.00	-	-	-	22.89	39.75	0.00	22.89
12.50	-	-	-	19.53	49.26	0.00	19.53
13.00	-	-	-	16.31	58.78	0.00	16.31
13.50	-	-	-	13.21	68.29	0.00	13.21
14.00	-	-	-	10.23	77.80	0.00	10.23
14.50	-	-	-	12.50	77.80	0.00	12.50
15.00	-	-	-	15.88	77.80	0.00	15.88
15.50	-	-	-	18.34	77.80	0.00	18.34
16.00	-	-	-	20.76	77.80	0.00	20.76

16.50	-	-	-	23.15	77.80	0.00	23.15
17.00	-	-	-	25.51	77.80	0.00	25.51
17.50	-	-	-	27.83	77.80	0.00	27.83
18.00	-	-	-	30.12	77.80	0.00	30.12
18.50	-	-	-	32.39	77.80	0.00	32.39
19.00	-	-	-	34.62	77.80	0.00	34.62
19.50	-	-	-	36.83	77.80	0.00	36.83
20.00	-	-	-	39.01	77.80	0.00	39.01
20.50	-	-	-	39.85	77.43	0.00	39.85
21.00	-	-	-	40.69	77.06	0.00	40.69
21.50	-	-	-	41.52	76.69	0.00	41.52
22.00	-	-	-	42.34	76.32	0.00	42.34
22.50	-	-	-	43.15	75.95	0.00	43.15
23.00	-	-	-	43.95	75.58	0.00	43.95
23.50	-	-	-	44.75	75.21	0.00	44.75
24.00	-	-	-	45.54	74.84	0.00	45.54
24.50	-	-	-	46.31	74.47	0.00	46.31
25.00	-	-	-	47.09	74.10	0.00	47.09
25.50	-	-	-	48.35	72.91	0.00	48.35
26.00	-	-	-	49.60	71.72	0.00	49.60
26.50	-	-	-	50.84	70.53	0.00	50.84
27.00	-	-	-	52.07	69.34	0.00	52.07
27.50	-	-	-	53.29	68.15	0.00	53.29
28.00	-	-	-	57.10	66.96	0.00	57.10
28.50	-	-	-	58.35	65.77	0.00	58.35
29.00	-	-	-	59.60	64.58	0.00	59.60
29.50	-	-	-	60.83	63.39	0.00	60.83
30.00	-	-	-	62.05	62.20	0.00	62.05
30.50	-	-	-	59.25	62.76	0.00	59.25
31.00	-	-	-	56.49	63.32	0.00	56.49
31.50	-	-	-	53.75	63.88	0.00	53.75
32.00	-	-	-	51.04	64.44	0.00	51.04
32.50	-	-	-	48.36	65.00	0.00	48.36
33.00	-	-	-	45.71	65.56	0.00	45.71
33.50	-	-	-	43.08	66.12	0.00	43.08
34.00	-	-	-	40.48	66.68	0.00	40.48
34.50	-	-	-	37.90	67.24	0.00	37.90
35.00	-	-	-	35.35	67.80	0.00	35.35
35.50	-	-	-	36.16	67.24	0.00	36.16
36.00	-	-	-	36.97	66.68	0.00	36.97
36.50	-	-	-	37.77	66.12	0.00	37.77
37.00	-	-	-	38.56	65.56	0.00	38.56
37.50	-	-	-	39.35	65.00	0.00	39.35
38.00	-	-	-	40.13	64.44	0.00	40.13
38.50	-	-	-	40.90	63.88	0.00	40.90
39.00	-	-	-	41.67	63.32	0.00	41.67
39.50	-	-	-	42.43	62.76	0.00	42.43
40.00	-	-	-	43.18	62.20	0.00	43.18
40.50	-	-	-	43.48	60.31	0.00	43.48
41.00	-	-	-	43.77	58.42	0.00	43.77
41.50	-	-	-	44.06	56.53	0.00	44.06
42.00	-	-	-	44.35	54.64	0.00	44.35
42.50	-	-	-	44.64	52.75	0.00	44.64
43.00	-	-	-	44.92	50.86	0.00	44.92
43.50	-	-	-	45.20	48.97	0.00	45.20
44.00	-	-	-	45.49	47.08	0.00	45.49
44.50	-	-	-	45.77	45.19	0.00	45.77
45.00	-	-	-	46.04	43.30	0.00	46.04
45.50	-	-	-	44.72	43.30	0.00	44.72
46.00	-	-	-	43.40	43.30	0.00	43.40
46.50	-	-	-	42.09	43.30	0.00	42.09

47.00	-	-	-	40.79	43.30	0.00	40.79
47.50	-	-	-	39.51	43.30	0.00	39.51
48.00	-	-	-	38.23	43.30	0.00	38.23
48.50	-	-	-	36.97	43.30	0.00	36.97
49.00	-	-	-	35.71	43.30	0.00	35.71
49.50	-	-	-	34.46	43.30	0.00	34.46
50.00	-	-	-	33.23	43.30	0.00	33.23
50.50	-	-	-	33.12	43.30	0.00	33.12
51.00	-	-	-	33.02	43.30	0.00	33.02

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.09	43.30	33.03	97.35	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.08	43.30	33.12	97.59	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.07	43.30	33.23	97.85	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.05	43.30	34.46	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.04	43.30	35.71	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.03	43.30	36.97	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.02	43.30	38.23	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.01	43.30	39.51	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	4.00	43.30	40.79	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.99	43.30	42.09	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	43.30	43.40	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	43.30	44.72	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	43.30	46.04	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	45.19	45.77	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	47.08	45.49	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	48.97	45.20	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	50.86	44.92	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	52.75	44.64	100.00	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	54.64	44.35	100.00	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	3.83	56.53	44.06	100.00	0.000	0.0E0	0.000	0.000
41.00	0.62	1.00	0.62	3.82	58.42	43.77	100.00	0.000	0.0E0	0.000	0.000
40.50	0.62	1.00	0.62	3.80	60.31	43.48	100.00	0.000	0.0E0	0.000	0.000
40.00	0.62	1.00	0.62	3.79	62.20	43.18	100.00	0.000	0.0E0	0.000	0.000
39.50	0.62	1.00	0.62	3.78	62.76	42.43	100.00	0.000	0.0E0	0.000	0.000
39.00	0.62	1.00	0.62	3.77	63.32	41.67	100.00	0.000	0.0E0	0.000	0.000
38.50	0.63	1.00	0.63	3.76	63.88	40.90	100.00	0.000	0.0E0	0.000	0.000
38.00	0.63	1.00	0.63	3.75	64.44	40.13	100.00	0.000	0.0E0	0.000	0.000
37.50	0.63	1.00	0.63	3.74	65.00	39.35	100.00	0.000	0.0E0	0.000	0.000
37.00	0.63	1.00	0.63	3.73	65.56	38.56	100.00	0.000	0.0E0	0.000	0.000
36.50	0.63	1.00	0.63	3.72	66.12	37.77	100.00	0.000	0.0E0	0.000	0.000
36.00	0.63	1.00	0.63	3.71	66.68	36.97	100.00	0.000	0.0E0	0.000	0.000
35.50	0.64	1.00	0.64	3.70	67.24	36.16	100.00	0.000	0.0E0	0.000	0.000
35.00	0.64	1.00	0.64	3.69	67.80	35.35	100.00	0.000	0.0E0	0.000	0.000
34.50	0.64	1.00	0.64	3.68	67.24	37.90	100.00	0.000	0.0E0	0.000	0.000
34.00	0.64	1.00	0.64	3.68	66.68	40.48	100.00	0.000	0.0E0	0.000	0.000
33.50	0.64	1.00	0.64	3.67	66.12	43.08	100.00	0.000	0.0E0	0.000	0.000
33.00	0.64	1.00	0.64	3.66	65.56	45.71	100.00	0.000	0.0E0	0.000	0.000
32.50	0.64	1.00	0.64	3.65	65.00	48.36	100.00	0.000	0.0E0	0.000	0.000
32.00	0.64	1.00	0.64	3.65	64.44	51.04	100.00	0.000	0.0E0	0.000	0.000
31.50	0.65	1.00	0.65	3.64	63.88	53.75	100.00	0.000	0.0E0	0.000	0.000
31.00	0.65	1.00	0.65	3.63	63.32	56.49	100.00	0.000	0.0E0	0.000	0.000
30.50	0.65	1.00	0.65	3.63	62.76	59.25	100.00	0.000	0.0E0	0.000	0.000

30.00	0.65	1.00	0.65	3.62	62.20	62.05	100.00	0.000	0.0E0	0.000	0.000
29.50	0.65	1.00	0.65	3.63	63.39	60.83	100.00	0.000	0.0E0	0.000	0.000
29.00	0.65	1.00	0.65	3.64	64.58	59.60	100.00	0.000	0.0E0	0.000	0.000
28.50	0.65	1.00	0.65	3.64	65.77	58.35	100.00	0.000	0.0E0	0.000	0.000
28.00	0.64	1.00	0.64	3.65	66.96	57.10	100.00	0.000	0.0E0	0.000	0.000
27.50	0.64	1.00	0.64	3.66	68.15	53.29	100.00	0.000	0.0E0	0.000	0.000
27.00	0.64	1.00	0.64	3.67	69.34	52.07	100.00	0.000	0.0E0	0.000	0.000
26.50	0.64	1.00	0.64	3.68	70.53	50.84	100.00	0.000	0.0E0	0.000	0.000
26.00	0.64	1.00	0.64	3.69	71.72	49.60	100.00	0.000	0.0E0	0.000	0.000
25.50	0.64	1.00	0.64	3.70	72.91	48.35	100.00	0.000	0.0E0	0.000	0.000
25.00	0.63	1.00	0.63	3.71	74.10	47.09	100.00	0.000	0.0E0	0.000	0.000
24.50	0.63	1.00	0.63	3.72	74.47	46.31	100.00	0.000	0.0E0	0.000	0.000
24.00	0.63	1.00	0.63	3.73	74.84	45.54	100.00	0.000	0.0E0	0.000	0.000
23.50	0.63	1.00	0.63	3.74	75.21	44.75	100.00	0.000	0.0E0	0.000	0.000
23.00	0.63	1.00	0.63	3.75	75.58	43.95	100.00	0.000	0.0E0	0.000	0.000
22.50	0.62	1.00	0.62	3.77	75.95	43.15	100.00	0.000	0.0E0	0.000	0.000
22.00	0.62	1.00	0.62	3.78	76.32	42.34	100.00	0.000	0.0E0	0.000	0.000
21.50	0.62	1.00	0.62	3.80	76.69	41.52	100.00	0.000	0.0E0	0.000	0.000
21.00	0.62	1.00	0.62	3.82	77.06	40.69	100.00	0.000	0.0E0	0.000	0.000
20.50	0.61	1.00	0.61	3.83	77.43	39.85	100.00	0.000	0.0E0	0.000	0.000
20.00	0.61	1.00	0.61	3.85	77.80	39.01	100.00	0.000	0.0E0	0.000	0.000
19.50	0.61	1.00	0.61	3.87	77.80	36.83	100.00	0.000	0.0E0	0.000	0.000
19.00	0.60	1.00	0.60	3.89	77.80	34.62	100.00	0.000	0.0E0	0.000	0.000
18.50	0.60	1.00	0.60	3.91	77.80	32.39	95.72	0.000	0.0E0	0.000	0.000
18.00	0.60	1.00	0.60	0.98	77.80	30.12	90.34	0.470	2.8E-3	0.003	0.003
17.50	0.59	1.00	0.59	0.67	77.80	27.83	85.36	1.230	7.4E-3	0.059	0.062
17.00	0.59	1.00	0.59	0.58	77.80	25.51	80.69	1.645	9.9E-3	0.088	0.150
16.50	0.59	1.00	0.59	0.51	77.80	23.15	76.25	1.908	1.1E-2	0.108	0.258
16.00	0.58	1.00	0.58	0.46	77.80	20.76	71.91	2.110	1.3E-2	0.121	0.379
15.50	0.58	1.00	0.58	0.40	77.80	18.34	67.53	2.346	1.4E-2	0.134	0.513
15.00	0.57	1.00	0.57	0.35	77.80	15.88	62.97	2.624	1.6E-2	0.150	0.663
14.50	0.57	1.00	0.57	0.28	77.80	12.50	56.18	3.077	1.8E-2	0.172	0.836
14.00	0.56	1.00	0.56	0.23	77.80	10.23	51.09	3.441	2.1E-2	0.196	1.032
13.50	0.55	1.00	0.55	0.30	68.29	13.21	57.68	2.970	1.8E-2	0.191	1.223
13.00	0.55	1.00	0.55	0.38	58.78	16.31	63.78	2.574	1.5E-2	0.165	1.387
12.50	0.54	1.00	0.54	0.46	49.26	19.53	69.69	2.214	1.3E-2	0.143	1.530
12.00	0.53	1.00	0.53	0.55	39.75	22.89	75.77	1.912	1.1E-2	0.123	1.653
11.50	0.53	1.00	0.53	0.64	30.24	25.34	80.38	1.544	9.3E-3	0.102	1.755
11.00	0.52	1.00	0.52	0.70	20.73	26.40	82.44	1.321	7.9E-3	0.084	1.840
10.50	0.51	1.00	0.51	0.69	11.21	26.06	81.78	1.359	8.2E-3	0.079	1.918
10.00	0.50	1.00	0.50	0.78	1.70	27.51	84.69	1.035	6.2E-3	0.077	1.995
9.50	0.49	1.00	0.49	0.77	1.70	27.12	83.89	1.081	6.5E-3	0.064	2.059
9.00	0.48	1.00	0.48	0.77	1.70	26.73	83.11	1.122	6.7E-3	0.066	2.125
8.50	0.47	1.00	0.47	0.76	1.70	26.34	82.33	1.158	6.9E-3	0.069	2.193
8.00	0.46	1.00	0.46	0.65	1.70	22.90	75.78	1.817	1.1E-2	0.089	2.283
7.50	0.45	1.00	0.45	0.65	1.70	22.55	75.15	1.846	1.1E-2	0.110	2.393
7.00	0.43	1.00	0.43	0.66	1.70	22.21	74.53	1.873	1.1E-2	0.112	2.505
6.50	0.42	1.00	0.42	0.67	1.70	21.87	73.92	1.898	1.1E-2	0.113	2.618
6.00	0.40	1.00	0.40	0.67	1.70	21.04	72.41	2.000	1.2E-2	0.116	2.734
5.50	0.38	1.00	0.38	0.70	1.70	21.04	72.41	1.968	1.2E-2	0.119	2.853
5.00	0.36	1.00	0.36	0.74	1.70	21.04	72.41	1.847	1.1E-2	0.114	2.967

Settlement of Saturated Sands=2.967 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	21.04	0.36	518.82	1.9E-4	0.0371	0.0342	0.94	0.0321	3.85E-4	0.000	0.000
4.50	0.25	0.16	21.04	0.36	494.68	1.8E-4	0.0346	0.0319	0.94	0.0300	3.60E-4	0.003	0.004
4.00	0.22	0.14	21.04	0.36	466.39	1.7E-4	0.0383	0.0353	0.94	0.0332	3.98E-4	0.004	0.007
3.50	0.19	0.13	21.04	0.36	436.27	1.6E-4	0.0334	0.0308	0.94	0.0289	3.47E-4	0.004	0.011
3.00	0.17	0.11	21.04	0.37	403.91	1.5E-4	0.0291	0.0268	0.94	0.0252	3.02E-4	0.003	0.014
2.50	0.14	0.09	21.04	0.37	368.72	1.4E-4	0.0255	0.0235	0.94	0.0221	2.65E-4	0.003	0.017
2.00	0.11	0.07	21.04	0.37	329.80	1.2E-4	0.0227	0.0209	0.94	0.0196	2.36E-4	0.002	0.020
1.50	0.08	0.05	21.04	0.37	285.62	1.1E-4	0.0218	0.0201	0.94	0.0189	2.27E-4	0.002	0.022
1.00	0.06	0.04	21.04	0.37	233.21	8.7E-5	0.0158	0.0146	0.94	0.0137	1.65E-4	0.002	0.024
0.50	0.03	0.02	21.04	0.37	164.92	6.1E-5	0.0096	0.0088	0.94	0.0083	9.96E-5	0.001	0.025
0.00	0.00	0.00	21.04	0.37	3.14	1.2E-6	0.0010	0.0009	0.94	0.0009	1.06E-5	0.001	0.026

Settlement of Unsaturated Sands=0.026 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=2.993 in.
Differential Settlement=1.497 to 1.975 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)	
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth
International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

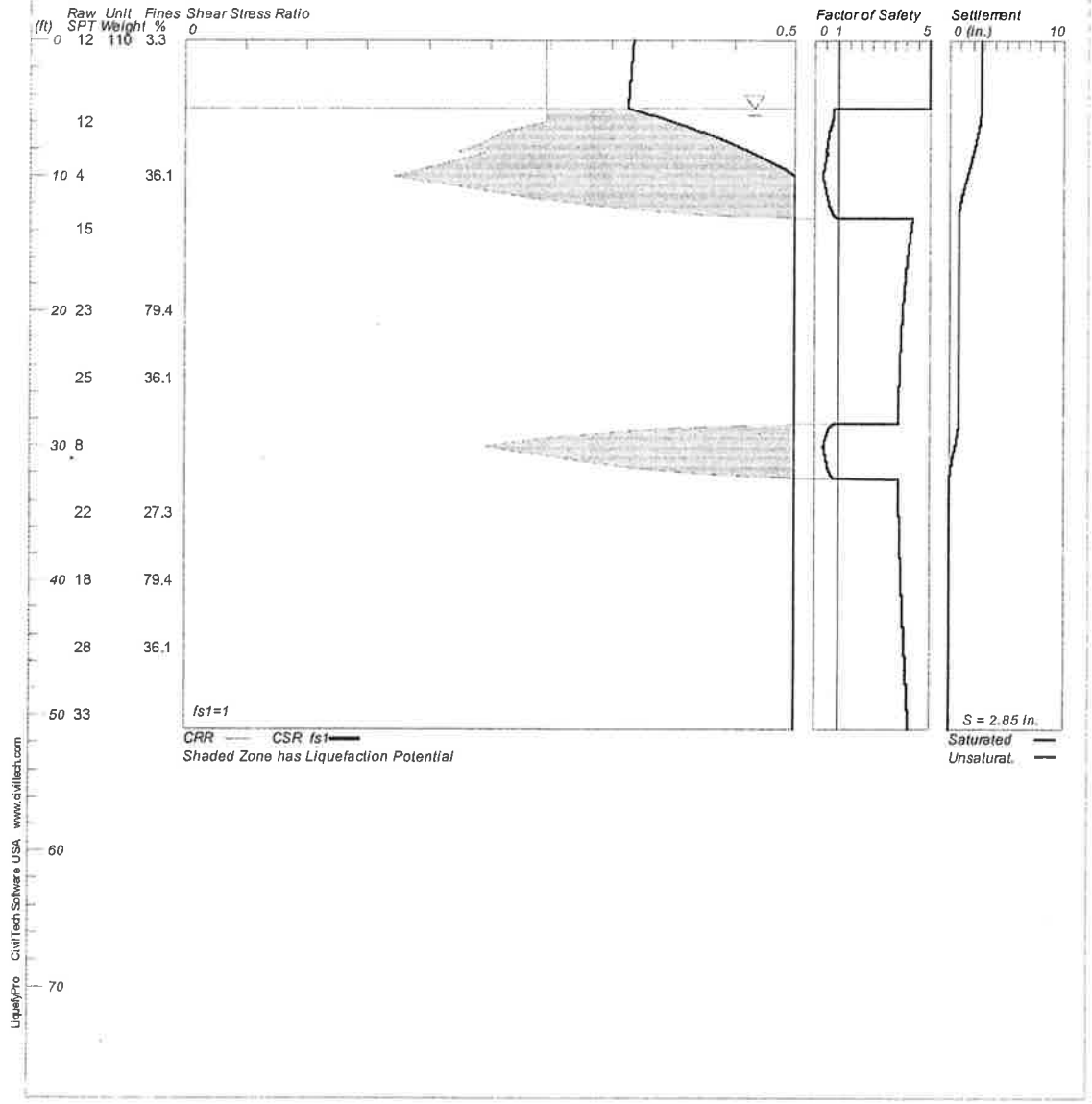
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center,
Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

LIQUEFACTION ANALYSIS

Oxnard Shores

Hole No.=AH 07 Water Depth=5 ft

Magnitude=7.04
Acceleration=0.566g



SubSurface Designs, Inc. **5462B** **Plate A-1**

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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Font: Courier New, Regular, Size 8 is recommended for this report.

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Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 07.liq

Title: Oxnard Shores

Subtitle: 5462B

Input Data:

Surface Elev.=

Hole No.=AH 07

Depth of Hole=51.00 ft

Water Table during Earthquake= 5.00 ft

Water Table during In-Situ Testing= 9.00 ft

Max. Acceleration=0.57 g

Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	12.00	110.00	3.30
6.00	12.00	110.00	3.30
10.00	4.00	110.00	36.10
14.00	15.00	110.00	36.10
20.00	23.00	110.00	79.40
25.00	25.00	110.00	36.10
30.00	8.00	110.00	36.10
35.00	22.00	110.00	27.30
40.00	18.00	110.00	79.40
45.00	28.00	110.00	36.10
50.00	33.00	110.00	36.10

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	12.00	1.50	0.75	0.000	1.70	22.95	3.30	0.00	22.95	0.25
0.50	12.00	1.50	0.75	0.028	1.70	22.95	3.30	0.00	22.95	0.25
1.00	12.00	1.50	0.75	0.055	1.70	22.95	3.30	0.00	22.95	0.25
1.50	12.00	1.50	0.75	0.083	1.70	22.95	3.30	0.00	22.95	0.25
2.00	12.00	1.50	0.75	0.110	1.70	22.95	3.30	0.00	22.95	0.25
2.50	12.00	1.50	0.75	0.138	1.70	22.95	3.30	0.00	22.95	0.25
3.00	12.00	1.50	0.75	0.165	1.70	22.95	3.30	0.00	22.95	0.25
3.50	12.00	1.50	0.75	0.193	1.70	22.95	3.30	0.00	22.95	0.25
4.00	12.00	1.50	0.75	0.220	1.70	22.95	3.30	0.00	22.95	0.25
4.50	12.00	1.50	0.75	0.248	1.70	22.95	3.30	0.00	22.95	0.25
5.00	12.00	1.50	0.75	0.275	1.70	22.95	3.30	0.00	22.95	0.25
5.50	12.00	1.50	0.75	0.303	1.70	22.95	3.30	0.00	22.95	0.25
6.00	12.00	1.50	0.75	0.330	1.70	22.95	3.30	0.00	22.95	0.25

6.50	11.00	1.50	0.75	0.358	1.67	20.70	7.40	0.39	21.09	0.23
7.00	10.00	1.50	0.75	0.385	1.61	18.13	11.50	1.91	20.04	0.22
7.50	9.00	1.50	0.75	0.413	1.56	15.76	15.60	3.48	19.24	0.21
8.00	8.00	1.50	0.75	0.440	1.51	13.57	19.70	4.61	18.18	0.20
8.50	7.00	1.50	0.85	0.468	1.46	13.05	23.80	5.54	18.59	0.20
9.00	6.00	1.50	0.85	0.495	1.42	10.87	27.90	6.05	16.92	0.18
9.50	5.00	1.50	0.85	0.507	1.40	8.95	32.00	6.36	15.31	0.17
10.00	4.00	1.50	0.85	0.519	1.39	7.08	36.10	6.42	13.50	0.15
10.50	5.38	1.50	0.85	0.531	1.37	9.41	36.10	6.88	16.29	0.18
11.00	6.75	1.50	0.85	0.543	1.36	11.68	36.10	7.34	19.02	0.21
11.50	8.13	1.50	0.85	0.555	1.34	13.91	36.10	7.78	21.69	0.24
12.00	9.50	1.50	0.85	0.566	1.33	16.09	36.10	8.22	24.31	0.27
12.50	10.88	1.50	0.85	0.578	1.31	18.23	36.10	8.65	26.88	0.32
13.00	12.25	1.50	0.85	0.590	1.30	20.33	36.10	9.07	29.40	0.39
13.50	13.63	1.50	0.85	0.602	1.29	22.39	36.10	9.48	31.87	2.00
14.00	15.00	1.50	0.85	0.614	1.28	24.41	36.10	9.88	34.29	2.00
14.50	15.67	1.50	0.85	0.626	1.26	25.25	39.71	10.05	35.30	2.00
15.00	16.33	1.50	0.95	0.638	1.25	29.14	43.32	10.83	39.97	2.00
15.50	17.00	1.50	0.95	0.650	1.24	30.05	46.93	11.01	41.07	2.00
16.00	17.67	1.50	0.95	0.662	1.23	30.95	50.53	11.19	42.14	2.00
16.50	18.33	1.50	0.95	0.674	1.22	31.83	54.14	11.37	43.20	2.00
17.00	19.00	1.50	0.95	0.685	1.21	32.70	57.75	11.54	44.24	2.00
17.50	19.67	1.50	0.95	0.697	1.20	33.56	61.36	11.71	45.27	2.00
18.00	20.33	1.50	0.95	0.709	1.19	34.41	64.97	11.88	46.29	2.00
18.50	21.00	1.50	0.95	0.721	1.18	35.24	68.58	12.05	47.29	2.00
19.00	21.67	1.50	0.95	0.733	1.17	36.06	72.18	12.21	48.27	2.00
19.50	22.33	1.50	0.95	0.745	1.16	36.87	75.79	12.37	49.25	2.00
20.00	23.00	1.50	0.95	0.757	1.15	37.67	79.40	12.53	50.21	2.00
20.50	23.20	1.50	0.95	0.769	1.14	37.71	75.07	12.54	50.25	2.00
21.00	23.40	1.50	0.95	0.781	1.13	37.74	70.74	12.55	50.29	2.00
21.50	23.60	1.50	0.95	0.793	1.12	37.78	66.41	12.56	50.33	2.00
22.00	23.80	1.50	0.95	0.804	1.11	37.81	62.08	12.56	50.38	2.00
22.50	24.00	1.50	0.95	0.816	1.11	37.85	57.75	12.57	50.42	2.00
23.00	24.20	1.50	0.95	0.828	1.10	37.89	53.42	12.58	50.47	2.00
23.50	24.40	1.50	0.95	0.840	1.09	37.93	49.09	12.59	50.52	2.00
24.00	24.60	1.50	0.95	0.852	1.08	37.98	44.76	12.60	50.57	2.00
24.50	24.80	1.50	0.95	0.864	1.08	38.02	40.43	12.60	50.63	2.00
25.00	25.00	1.50	0.95	0.876	1.07	38.07	36.10	12.61	50.68	2.00
25.50	23.30	1.50	0.95	0.888	1.06	35.24	36.10	12.05	47.29	2.00
26.00	21.60	1.50	0.95	0.900	1.05	32.45	36.10	11.49	43.94	2.00
26.50	19.90	1.50	0.95	0.912	1.05	29.70	36.10	10.94	40.64	2.00
27.00	18.20	1.50	0.95	0.923	1.04	26.99	36.10	10.40	37.39	2.00
27.50	16.50	1.50	0.95	0.935	1.03	24.31	36.10	9.86	34.18	2.00
28.00	14.80	1.50	1.00	0.947	1.03	22.81	36.10	9.56	32.37	2.00
28.50	13.10	1.50	1.00	0.959	1.02	20.07	36.10	9.01	29.08	0.38
29.00	11.40	1.50	1.00	0.971	1.01	17.35	36.10	8.47	25.83	0.30
29.50	9.70	1.50	1.00	0.983	1.01	14.68	36.10	7.94	22.61	0.25
30.00	8.00	1.50	1.00	0.995	1.00	12.03	36.10	7.41	19.44	0.21
30.50	9.40	1.50	1.00	1.007	1.00	14.05	35.22	7.81	21.86	0.24
31.00	10.80	1.50	1.00	1.019	0.99	16.05	34.34	8.02	24.07	0.27
31.50	12.20	1.50	1.00	1.031	0.99	18.03	33.46	8.21	26.24	0.30
32.00	13.60	1.50	1.00	1.042	0.98	19.98	32.58	8.38	28.36	0.35
32.50	15.00	1.50	1.00	1.054	0.97	21.91	31.70	8.50	30.41	2.00
33.00	16.40	1.50	1.00	1.066	0.97	23.82	30.82	8.60	32.42	2.00
33.50	17.80	1.50	1.00	1.078	0.96	25.71	29.94	8.66	34.37	2.00
34.00	19.20	1.50	1.00	1.090	0.96	27.58	29.06	8.69	36.27	2.00
34.50	20.60	1.50	1.00	1.102	0.95	29.44	28.18	8.68	38.12	2.00
35.00	22.00	1.50	1.00	1.114	0.95	31.27	27.30	8.65	39.92	2.00
35.50	21.60	1.50	1.00	1.126	0.94	30.54	32.51	10.21	40.75	2.00
36.00	21.20	1.50	1.00	1.138	0.94	29.82	37.72	10.96	40.78	2.00
36.50	20.80	1.50	1.00	1.150	0.93	29.10	42.93	10.82	39.92	2.00

37.00	20.40	1.50	1.00	1.161	0.93	28.39	48.14	10.68	39.07	2.00
37.50	20.00	1.50	1.00	1.173	0.92	27.70	53.35	10.54	38.24	2.00
38.00	19.60	1.50	1.00	1.185	0.92	27.01	58.56	10.40	37.41	2.00
38.50	19.20	1.50	1.00	1.197	0.91	26.32	63.77	10.26	36.59	2.00
39.00	18.80	1.50	1.00	1.209	0.91	25.65	68.98	10.13	35.78	2.00
39.50	18.40	1.50	1.00	1.221	0.91	24.98	74.19	10.00	34.97	2.00
40.00	18.00	1.50	1.00	1.233	0.90	24.32	79.40	9.86	34.18	2.00
40.50	19.00	1.50	1.00	1.245	0.90	25.54	75.07	10.11	35.65	2.00
41.00	20.00	1.50	1.00	1.257	0.89	26.76	70.74	10.35	37.11	2.00
41.50	21.00	1.50	1.00	1.269	0.89	27.97	66.41	10.59	38.56	2.00
42.00	22.00	1.50	1.00	1.280	0.88	29.16	62.08	10.83	40.00	2.00
42.50	23.00	1.50	1.00	1.292	0.88	30.35	57.75	11.07	41.42	2.00
43.00	24.00	1.50	1.00	1.304	0.88	31.52	53.42	11.30	42.83	2.00
43.50	25.00	1.50	1.00	1.316	0.87	32.69	49.09	11.54	44.22	2.00
44.00	26.00	1.50	1.00	1.328	0.87	33.84	44.76	11.77	45.61	2.00
44.50	27.00	1.50	1.00	1.340	0.86	34.99	40.43	12.00	46.98	2.00
45.00	28.00	1.50	1.00	1.352	0.86	36.12	36.10	12.22	48.35	2.00
45.50	28.50	1.50	1.00	1.364	0.86	36.61	36.10	12.32	48.93	2.00
46.00	29.00	1.50	1.00	1.376	0.85	37.09	36.10	12.42	49.51	2.00
46.50	29.50	1.50	1.00	1.387	0.85	37.57	36.10	12.51	50.08	2.00
47.00	30.00	1.50	1.00	1.399	0.85	38.04	36.10	12.61	50.65	2.00
47.50	30.50	1.50	1.00	1.411	0.84	38.51	36.10	12.70	51.21	2.00
48.00	31.00	1.50	1.00	1.423	0.84	38.98	36.10	12.80	51.77	2.00
48.50	31.50	1.50	1.00	1.435	0.83	39.44	36.10	12.89	52.33	2.00
49.00	32.00	1.50	1.00	1.447	0.83	39.90	36.10	12.98	52.88	2.00
49.50	32.50	1.50	1.00	1.459	0.83	40.36	36.10	13.07	53.43	2.00
50.00	33.00	1.50	1.00	1.471	0.82	40.82	36.10	13.16	53.98	2.00
50.50	33.00	1.50	1.00	1.483	0.82	40.65	36.10	13.13	53.78	2.00
51.00	33.00	1.50	1.00	1.495	0.82	40.49	36.10	13.10	53.59	2.00

CRR is based on water table at 9.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	0.25	1.00	0.25	1.18	0.30	0.37	5.00
0.50	0.02	0.25	1.00	0.25	1.18	0.30	0.37	5.00
1.00	0.04	0.25	1.00	0.25	1.18	0.30	0.37	5.00
1.50	0.05	0.25	1.00	0.25	1.18	0.30	0.37	5.00
2.00	0.07	0.25	1.00	0.25	1.18	0.30	0.37	5.00
2.50	0.09	0.25	1.00	0.25	1.18	0.30	0.37	5.00
3.00	0.11	0.25	1.00	0.25	1.18	0.30	0.37	5.00
3.50	0.13	0.25	1.00	0.25	1.18	0.30	0.36	5.00
4.00	0.14	0.25	1.00	0.25	1.18	0.30	0.36	5.00
4.50	0.16	0.25	1.00	0.25	1.18	0.30	0.36	5.00
5.00	0.18	0.25	1.00	0.25	1.18	0.30	0.36	0.82 *
5.50	0.20	0.25	1.00	0.25	1.18	0.30	0.38	0.77 *
6.00	0.21	0.25	1.00	0.25	1.18	0.30	0.40	0.74 *
6.50	0.23	0.23	1.00	0.23	1.18	0.27	0.42	0.65 *
7.00	0.25	0.22	1.00	0.22	1.18	0.25	0.43	0.59 *
7.50	0.27	0.21	1.00	0.21	1.18	0.24	0.45	0.55 *
8.00	0.29	0.20	1.00	0.20	1.18	0.23	0.46	0.50 *
8.50	0.30	0.20	1.00	0.20	1.18	0.24	0.47	0.50 *
9.00	0.32	0.18	1.00	0.18	1.18	0.21	0.48	0.45 *
9.50	0.33	0.17	1.00	0.17	1.18	0.19	0.49	0.40 *
10.00	0.34	0.15	1.00	0.15	1.18	0.17	0.50	0.34 *
10.50	0.34	0.18	1.00	0.18	1.18	0.21	0.51	0.40 *
11.00	0.35	0.21	1.00	0.21	1.18	0.24	0.52	0.46 *
11.50	0.36	0.24	1.00	0.24	1.18	0.28	0.53	0.53 *
12.00	0.37	0.27	1.00	0.27	1.18	0.32	0.53	0.60 *

12.50	0.38	0.32	1.00	0.32	1.18	0.37	0.54	0.69 *
13.00	0.38	0.39	1.00	0.39	1.18	0.46	0.55	0.84 *
13.50	0.39	2.00	1.00	2.00	1.18	2.35	0.55	4.24
14.00	0.40	2.00	1.00	2.00	1.18	2.35	0.56	4.20
14.50	0.41	2.00	1.00	2.00	1.18	2.35	0.57	4.16
15.00	0.41	2.00	1.00	2.00	1.18	2.35	0.57	4.12
15.50	0.42	2.00	1.00	2.00	1.18	2.35	0.58	4.08
16.00	0.43	2.00	1.00	2.00	1.18	2.35	0.58	4.05
16.50	0.44	2.00	1.00	2.00	1.18	2.35	0.59	4.02
17.00	0.45	2.00	1.00	2.00	1.18	2.35	0.59	3.99
17.50	0.45	2.00	1.00	2.00	1.18	2.35	0.59	3.96
18.00	0.46	2.00	1.00	2.00	1.18	2.35	0.60	3.94
18.50	0.47	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.48	2.00	1.00	2.00	1.18	2.35	0.60	3.89
19.50	0.48	2.00	1.00	2.00	1.18	2.35	0.61	3.87
20.00	0.49	2.00	1.00	2.00	1.18	2.35	0.61	3.85
20.50	0.50	2.00	1.00	2.00	1.18	2.35	0.61	3.83
21.00	0.51	2.00	1.00	2.00	1.18	2.35	0.62	3.82
21.50	0.52	2.00	1.00	2.00	1.18	2.35	0.62	3.80
22.00	0.52	2.00	1.00	2.00	1.18	2.35	0.62	3.78
22.50	0.53	2.00	1.00	2.00	1.18	2.35	0.62	3.77
23.00	0.54	2.00	1.00	2.00	1.18	2.35	0.63	3.75
23.50	0.55	2.00	1.00	2.00	1.18	2.35	0.63	3.74
24.00	0.55	2.00	1.00	2.00	1.18	2.35	0.63	3.73
24.50	0.56	2.00	1.00	2.00	1.18	2.35	0.63	3.72
25.00	0.57	2.00	1.00	2.00	1.18	2.35	0.63	3.71
25.50	0.58	2.00	1.00	2.00	1.18	2.35	0.64	3.70
26.00	0.58	2.00	1.00	2.00	1.18	2.35	0.64	3.69
26.50	0.59	2.00	1.00	2.00	1.18	2.35	0.64	3.68
27.00	0.60	2.00	1.00	2.00	1.18	2.35	0.64	3.67
27.50	0.61	2.00	1.00	2.00	1.18	2.35	0.64	3.66
28.00	0.62	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.62	0.38	1.00	0.38	1.18	0.44	0.65	0.69 *
29.00	0.63	0.30	1.00	0.30	1.18	0.35	0.65	0.54 *
29.50	0.64	0.25	1.00	0.25	1.18	0.29	0.65	0.45 *
30.00	0.65	0.21	1.00	0.21	1.18	0.25	0.65	0.38 *
30.50	0.65	0.24	1.00	0.24	1.18	0.28	0.65	0.43 *
31.00	0.66	0.27	1.00	0.27	1.18	0.32	0.65	0.49 *
31.50	0.67	0.30	1.00	0.30	1.18	0.36	0.65	0.55 *
32.00	0.68	0.35	1.00	0.35	1.18	0.41	0.64	0.64 *
32.50	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.72	2.00	1.00	2.00	1.18	2.35	0.64	3.68
35.00	0.72	2.00	1.00	2.00	1.18	2.35	0.64	3.69
35.50	0.73	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.74	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.75	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.75	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.76	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.77	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.78	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.79	2.00	1.00	2.00	1.18	2.35	0.62	3.77
39.50	0.79	2.00	1.00	2.00	1.18	2.35	0.62	3.78
40.00	0.80	2.00	1.00	2.00	1.18	2.35	0.62	3.79
40.50	0.81	2.00	1.00	2.00	1.18	2.35	0.62	3.80
41.00	0.82	2.00	1.00	2.00	1.18	2.35	0.62	3.82
41.50	0.82	2.00	1.00	2.00	1.18	2.35	0.61	3.83
42.00	0.83	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.84	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.85	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.86	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.86	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.87	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.88	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.89	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	0.89	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	0.90	2.00	1.00	2.00	1.18	2.35	0.59	3.97
47.00	0.91	2.00	1.00	2.00	1.18	2.35	0.59	3.98
47.50	0.92	2.00	1.00	2.00	1.18	2.35	0.59	4.00
48.00	0.93	2.00	1.00	2.00	1.18	2.35	0.59	4.01
48.50	0.93	2.00	1.00	2.00	1.18	2.35	0.58	4.03
49.00	0.94	2.00	1.00	2.00	1.18	2.35	0.58	4.04
49.50	0.95	2.00	1.00	2.00	1.18	2.35	0.58	4.06
50.00	0.96	2.00	1.00	2.00	1.18	2.35	0.58	4.08
50.50	0.96	2.00	1.00	2.00	1.18	2.35	0.57	4.09
51.00	0.97	2.00	1.00	2.00	1.18	2.35	0.57	4.11

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	22.95	3.30	0.00	22.95
0.50	-	-	-	22.95	3.30	0.00	22.95
1.00	-	-	-	22.95	3.30	0.00	22.95
1.50	-	-	-	22.95	3.30	0.00	22.95
2.00	-	-	-	22.95	3.30	0.00	22.95
2.50	-	-	-	22.95	3.30	0.00	22.95
3.00	-	-	-	22.95	3.30	0.00	22.95
3.50	-	-	-	22.95	3.30	0.00	22.95
4.00	-	-	-	22.95	3.30	0.00	22.95
4.50	-	-	-	22.95	3.30	0.00	22.95
5.00	-	-	-	22.95	3.30	0.00	22.95
5.50	-	-	-	22.95	3.30	0.00	22.95
6.00	-	-	-	22.95	3.30	0.00	22.95
6.50	-	-	-	21.09	7.40	0.00	21.09
7.00	-	-	-	20.04	11.50	0.00	20.04
7.50	-	-	-	19.24	15.60	0.00	19.24
8.00	-	-	-	18.18	19.70	0.00	18.18
8.50	-	-	-	18.59	23.80	0.00	18.59
9.00	-	-	-	16.92	27.90	0.00	16.92
9.50	-	-	-	15.31	32.00	0.00	15.31
10.00	-	-	-	13.50	36.10	0.00	13.50
10.50	-	-	-	16.29	36.10	0.00	16.29
11.00	-	-	-	19.02	36.10	0.00	19.02
11.50	-	-	-	21.69	36.10	0.00	21.69
12.00	-	-	-	24.31	36.10	0.00	24.31
12.50	-	-	-	26.88	36.10	0.00	26.88
13.00	-	-	-	29.40	36.10	0.00	29.40
13.50	-	-	-	31.87	36.10	0.00	31.87
14.00	-	-	-	34.29	36.10	0.00	34.29
14.50	-	-	-	35.30	39.71	0.00	35.30
15.00	-	-	-	39.97	43.32	0.00	39.97
15.50	-	-	-	41.07	46.93	0.00	41.07
16.00	-	-	-	42.14	50.53	0.00	42.14

16.50	-	-	-	43.20	54.14	0.00	43.20
17.00	-	-	-	44.24	57.75	0.00	44.24
17.50	-	-	-	45.27	61.36	0.00	45.27
18.00	-	-	-	46.29	64.97	0.00	46.29
18.50	-	-	-	47.29	68.58	0.00	47.29
19.00	-	-	-	48.27	72.18	0.00	48.27
19.50	-	-	-	49.25	75.79	0.00	49.25
20.00	-	-	-	50.21	79.40	0.00	50.21
20.50	-	-	-	50.25	75.07	0.00	50.25
21.00	-	-	-	50.29	70.74	0.00	50.29
21.50	-	-	-	50.33	66.41	0.00	50.33
22.00	-	-	-	50.38	62.08	0.00	50.38
22.50	-	-	-	50.42	57.75	0.00	50.42
23.00	-	-	-	50.47	53.42	0.00	50.47
23.50	-	-	-	50.52	49.09	0.00	50.52
24.00	-	-	-	50.57	44.76	0.00	50.57
24.50	-	-	-	50.63	40.43	0.00	50.63
25.00	-	-	-	50.68	36.10	0.00	50.68
25.50	-	-	-	47.29	36.10	0.00	47.29
26.00	-	-	-	43.94	36.10	0.00	43.94
26.50	-	-	-	40.64	36.10	0.00	40.64
27.00	-	-	-	37.39	36.10	0.00	37.39
27.50	-	-	-	34.18	36.10	0.00	34.18
28.00	-	-	-	32.37	36.10	0.00	32.37
28.50	-	-	-	29.08	36.10	0.00	29.08
29.00	-	-	-	25.83	36.10	0.00	25.83
29.50	-	-	-	22.61	36.10	0.00	22.61
30.00	-	-	-	19.44	36.10	0.00	19.44
30.50	-	-	-	21.86	35.22	0.00	21.86
31.00	-	-	-	24.07	34.34	0.00	24.07
31.50	-	-	-	26.24	33.46	0.00	26.24
32.00	-	-	-	28.36	32.58	0.00	28.36
32.50	-	-	-	30.41	31.70	0.00	30.41
33.00	-	-	-	32.42	30.82	0.00	32.42
33.50	-	-	-	34.37	29.94	0.00	34.37
34.00	-	-	-	36.27	29.06	0.00	36.27
34.50	-	-	-	38.12	28.18	0.00	38.12
35.00	-	-	-	39.92	27.30	0.00	39.92
35.50	-	-	-	40.75	32.51	0.00	40.75
36.00	-	-	-	40.78	37.72	0.00	40.78
36.50	-	-	-	39.92	42.93	0.00	39.92
37.00	-	-	-	39.07	48.14	0.00	39.07
37.50	-	-	-	38.24	53.35	0.00	38.24
38.00	-	-	-	37.41	58.56	0.00	37.41
38.50	-	-	-	36.59	63.77	0.00	36.59
39.00	-	-	-	35.78	68.98	0.00	35.78
39.50	-	-	-	34.97	74.19	0.00	34.97
40.00	-	-	-	34.18	79.40	0.00	34.18
40.50	-	-	-	35.65	75.07	0.00	35.65
41.00	-	-	-	37.11	70.74	0.00	37.11
41.50	-	-	-	38.56	66.41	0.00	38.56
42.00	-	-	-	40.00	62.08	0.00	40.00
42.50	-	-	-	41.42	57.75	0.00	41.42
43.00	-	-	-	42.83	53.42	0.00	42.83
43.50	-	-	-	44.22	49.09	0.00	44.22
44.00	-	-	-	45.61	44.76	0.00	45.61
44.50	-	-	-	46.98	40.43	0.00	46.98
45.00	-	-	-	48.35	36.10	0.00	48.35
45.50	-	-	-	48.93	36.10	0.00	48.93
46.00	-	-	-	49.51	36.10	0.00	49.51
46.50	-	-	-	50.08	36.10	0.00	50.08

47.00	-	-	-	50.65	36.10	0.00	50.65
47.50	-	-	-	51.21	36.10	0.00	51.21
48.00	-	-	-	51.77	36.10	0.00	51.77
48.50	-	-	-	52.33	36.10	0.00	52.33
49.00	-	-	-	52.88	36.10	0.00	52.88
49.50	-	-	-	53.43	36.10	0.00	53.43
50.00	-	-	-	53.98	36.10	0.00	53.98
50.50	-	-	-	53.78	36.10	0.00	53.78
51.00	-	-	-	53.59	36.10	0.00	53.59

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.11	36.10	53.61	100.00	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.09	36.10	53.78	100.00	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.08	36.10	53.98	100.00	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.06	36.10	53.43	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.04	36.10	52.88	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.03	36.10	52.33	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.01	36.10	51.77	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.00	36.10	51.21	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	3.98	36.10	50.65	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.97	36.10	50.08	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	36.10	49.51	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	36.10	48.93	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	36.10	48.35	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	40.43	46.98	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	44.76	45.61	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	49.09	44.22	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	53.42	42.83	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	57.75	41.42	100.00	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	62.08	40.00	100.00	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	3.83	66.41	38.56	100.00	0.000	0.0E0	0.000	0.000
41.00	0.62	1.00	0.62	3.82	70.74	37.11	100.00	0.000	0.0E0	0.000	0.000
40.50	0.62	1.00	0.62	3.80	75.07	35.65	100.00	0.000	0.0E0	0.000	0.000
40.00	0.62	1.00	0.62	3.79	79.40	34.18	100.00	0.000	0.0E0	0.000	0.000
39.50	0.62	1.00	0.62	3.78	74.19	34.97	100.00	0.000	0.0E0	0.000	0.000
39.00	0.62	1.00	0.62	3.77	68.98	35.78	100.00	0.000	0.0E0	0.000	0.000
38.50	0.63	1.00	0.63	3.76	63.77	36.59	100.00	0.000	0.0E0	0.000	0.000
38.00	0.63	1.00	0.63	3.75	58.56	37.41	100.00	0.000	0.0E0	0.000	0.000
37.50	0.63	1.00	0.63	3.74	53.35	38.24	100.00	0.000	0.0E0	0.000	0.000
37.00	0.63	1.00	0.63	3.73	48.14	39.07	100.00	0.000	0.0E0	0.000	0.000
36.50	0.63	1.00	0.63	3.72	42.93	39.92	100.00	0.000	0.0E0	0.000	0.000
36.00	0.63	1.00	0.63	3.71	37.72	40.78	100.00	0.000	0.0E0	0.000	0.000
35.50	0.64	1.00	0.64	3.70	32.51	40.75	100.00	0.000	0.0E0	0.000	0.000
35.00	0.64	1.00	0.64	3.69	27.30	39.92	100.00	0.000	0.0E0	0.000	0.000
34.50	0.64	1.00	0.64	3.68	28.18	38.12	100.00	0.000	0.0E0	0.000	0.000
34.00	0.64	1.00	0.64	3.68	29.06	36.27	100.00	0.000	0.0E0	0.000	0.000
33.50	0.64	1.00	0.64	3.67	29.94	34.37	100.00	0.000	0.0E0	0.000	0.000
33.00	0.64	1.00	0.64	3.66	30.82	32.42	95.80	0.000	0.0E0	0.000	0.000
32.50	0.64	1.00	0.64	3.65	31.70	30.41	91.00	0.000	0.0E0	0.000	0.000
32.00	0.64	1.00	0.64	0.64	32.58	28.36	86.46	1.227	7.4E-3	0.055	0.055
31.50	0.65	1.00	0.65	0.55	33.46	26.24	82.13	1.595	9.6E-3	0.087	0.141
31.00	0.65	1.00	0.65	0.49	34.34	24.07	77.95	1.838	1.1E-2	0.104	0.245
30.50	0.65	1.00	0.65	0.43	35.22	21.86	73.90	2.020	1.2E-2	0.116	0.362

30.00	0.65	1.00	0.65	0.38	36.10	19.44	69.53	2.225	1.3E-2	0.128	0.490
29.50	0.65	1.00	0.65	0.45	36.10	22.61	75.26	1.959	1.2E-2	0.125	0.614
29.00	0.65	1.00	0.65	0.54	36.10	25.83	81.31	1.650	9.9E-3	0.108	0.722
28.50	0.65	1.00	0.65	0.69	36.10	29.08	88.01	1.067	6.4E-3	0.082	0.804
28.00	0.64	1.00	0.64	3.65	36.10	32.37	95.69	0.000	0.0E0	0.015	0.819
27.50	0.64	1.00	0.64	3.66	36.10	34.18	100.00	0.000	0.0E0	0.000	0.819
27.00	0.64	1.00	0.64	3.67	36.10	37.39	100.00	0.000	0.0E0	0.000	0.819
26.50	0.64	1.00	0.64	3.68	36.10	40.64	100.00	0.000	0.0E0	0.000	0.819
26.00	0.64	1.00	0.64	3.69	36.10	43.94	100.00	0.000	0.0E0	0.000	0.819
25.50	0.64	1.00	0.64	3.70	36.10	47.29	100.00	0.000	0.0E0	0.000	0.819
25.00	0.63	1.00	0.63	3.71	36.10	50.68	100.00	0.000	0.0E0	0.000	0.819
24.50	0.63	1.00	0.63	3.72	40.43	50.63	100.00	0.000	0.0E0	0.000	0.819
24.00	0.63	1.00	0.63	3.73	44.76	50.57	100.00	0.000	0.0E0	0.000	0.819
23.50	0.63	1.00	0.63	3.74	49.09	50.52	100.00	0.000	0.0E0	0.000	0.819
23.00	0.63	1.00	0.63	3.75	53.42	50.47	100.00	0.000	0.0E0	0.000	0.819
22.50	0.62	1.00	0.62	3.77	57.75	50.42	100.00	0.000	0.0E0	0.000	0.819
22.00	0.62	1.00	0.62	3.78	62.08	50.38	100.00	0.000	0.0E0	0.000	0.819
21.50	0.62	1.00	0.62	3.80	66.41	50.33	100.00	0.000	0.0E0	0.000	0.819
21.00	0.62	1.00	0.62	3.82	70.74	50.29	100.00	0.000	0.0E0	0.000	0.819
20.50	0.61	1.00	0.61	3.83	75.07	50.25	100.00	0.000	0.0E0	0.000	0.819
20.00	0.61	1.00	0.61	3.85	79.40	50.21	100.00	0.000	0.0E0	0.000	0.819
19.50	0.61	1.00	0.61	3.87	75.79	49.25	100.00	0.000	0.0E0	0.000	0.819
19.00	0.60	1.00	0.60	3.89	72.18	48.27	100.00	0.000	0.0E0	0.000	0.819
18.50	0.60	1.00	0.60	3.91	68.58	47.29	100.00	0.000	0.0E0	0.000	0.819
18.00	0.60	1.00	0.60	3.94	64.97	46.29	100.00	0.000	0.0E0	0.000	0.819
17.50	0.59	1.00	0.59	3.96	61.36	45.27	100.00	0.000	0.0E0	0.000	0.819
17.00	0.59	1.00	0.59	3.99	57.75	44.24	100.00	0.000	0.0E0	0.000	0.819
16.50	0.59	1.00	0.59	4.02	54.14	43.20	100.00	0.000	0.0E0	0.000	0.819
16.00	0.58	1.00	0.58	4.05	50.53	42.14	100.00	0.000	0.0E0	0.000	0.819
15.50	0.58	1.00	0.58	4.08	46.93	41.07	100.00	0.000	0.0E0	0.000	0.819
15.00	0.57	1.00	0.57	4.12	43.32	39.97	100.00	0.000	0.0E0	0.000	0.819
14.50	0.57	1.00	0.57	4.16	39.71	35.30	100.00	0.000	0.0E0	0.000	0.819
14.00	0.56	1.00	0.56	4.20	36.10	34.29	100.00	0.000	0.0E0	0.000	0.819
13.50	0.55	1.00	0.55	4.24	36.10	31.87	94.43	0.000	0.0E0	0.000	0.819
13.00	0.55	1.00	0.55	0.84	36.10	29.40	88.71	0.752	4.5E-3	0.012	0.831
12.50	0.54	1.00	0.54	0.69	36.10	26.88	83.41	1.291	7.7E-3	0.064	0.895
12.00	0.53	1.00	0.53	0.60	36.10	24.31	78.41	1.752	1.1E-2	0.093	0.987
11.50	0.53	1.00	0.53	0.53	36.10	21.69	73.59	2.027	1.2E-2	0.114	1.102
11.00	0.52	1.00	0.52	0.46	36.10	19.02	68.77	2.271	1.4E-2	0.129	1.231
10.50	0.51	1.00	0.51	0.40	36.10	16.29	63.75	2.576	1.5E-2	0.146	1.378
10.00	0.50	1.00	0.50	0.34	36.10	13.50	58.27	2.928	1.8E-2	0.166	1.543
9.50	0.49	1.00	0.49	0.40	32.00	15.31	61.89	2.690	1.6E-2	0.167	1.710
9.00	0.48	1.00	0.48	0.45	27.90	16.92	64.93	2.504	1.5E-2	0.155	1.865
8.50	0.47	1.00	0.47	0.50	23.80	18.59	68.00	2.317	1.4E-2	0.144	2.009
8.00	0.46	1.00	0.46	0.50	19.70	18.18	67.25	2.363	1.4E-2	0.140	2.149
7.50	0.45	1.00	0.45	0.55	15.60	19.24	69.17	2.246	1.3E-2	0.138	2.287
7.00	0.43	1.00	0.43	0.59	11.50	20.04	70.61	2.164	1.3E-2	0.132	2.419
6.50	0.42	1.00	0.42	0.65	7.40	21.09	72.50	2.019	1.2E-2	0.126	2.545
6.00	0.40	1.00	0.40	0.74	3.30	22.95	75.88	1.602	9.6E-3	0.109	2.654
5.50	0.38	1.00	0.38	0.77	3.30	22.95	75.88	1.500	9.0E-3	0.093	2.747
5.00	0.36	1.00	0.36	0.82	3.30	22.95	75.88	1.369	8.2E-3	0.086	2.832

Settlement of Saturated Sands=2.832 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	22.95	0.36	534.08	1.9E-4	0.0355	0.0292	0.94	0.0275	3.30E-4	0.000	0.000
4.50	0.25	0.16	22.95	0.36	509.22	1.8E-4	0.0332	0.0273	0.94	0.0257	3.08E-4	0.003	0.003
4.00	0.22	0.14	22.95	0.36	480.10	1.7E-4	0.0360	0.0296	0.94	0.0278	3.34E-4	0.003	0.006
3.50	0.19	0.13	22.95	0.36	449.10	1.6E-4	0.0316	0.0260	0.94	0.0244	2.93E-4	0.003	0.009
3.00	0.17	0.11	22.95	0.37	415.78	1.4E-4	0.0278	0.0229	0.94	0.0215	2.58E-4	0.003	0.012
2.50	0.14	0.09	22.95	0.37	379.56	1.3E-4	0.0246	0.0202	0.94	0.0190	2.28E-4	0.002	0.015
2.00	0.11	0.07	22.95	0.37	339.49	1.2E-4	0.0254	0.0209	0.94	0.0197	2.36E-4	0.002	0.017
1.50	0.08	0.05	22.95	0.37	294.01	1.0E-4	0.0209	0.0172	0.94	0.0161	1.94E-4	0.002	0.019
1.00	0.06	0.04	22.95	0.37	240.07	8.4E-5	0.0151	0.0124	0.94	0.0117	1.40E-4	0.002	0.021
0.50	0.03	0.02	22.95	0.37	169.77	6.0E-5	0.0092	0.0076	0.94	0.0071	8.53E-5	0.001	0.022
0.00	0.00	0.00	22.95	0.37	3.24	1.1E-6	0.0010	0.0008	0.94	0.0008	9.44E-6	0.000	0.022

Settlement of Unsaturated Sands=0.022 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=2.855 in.
Differential Settlement=1.427 to 1.884 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)

SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022. SP117, Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

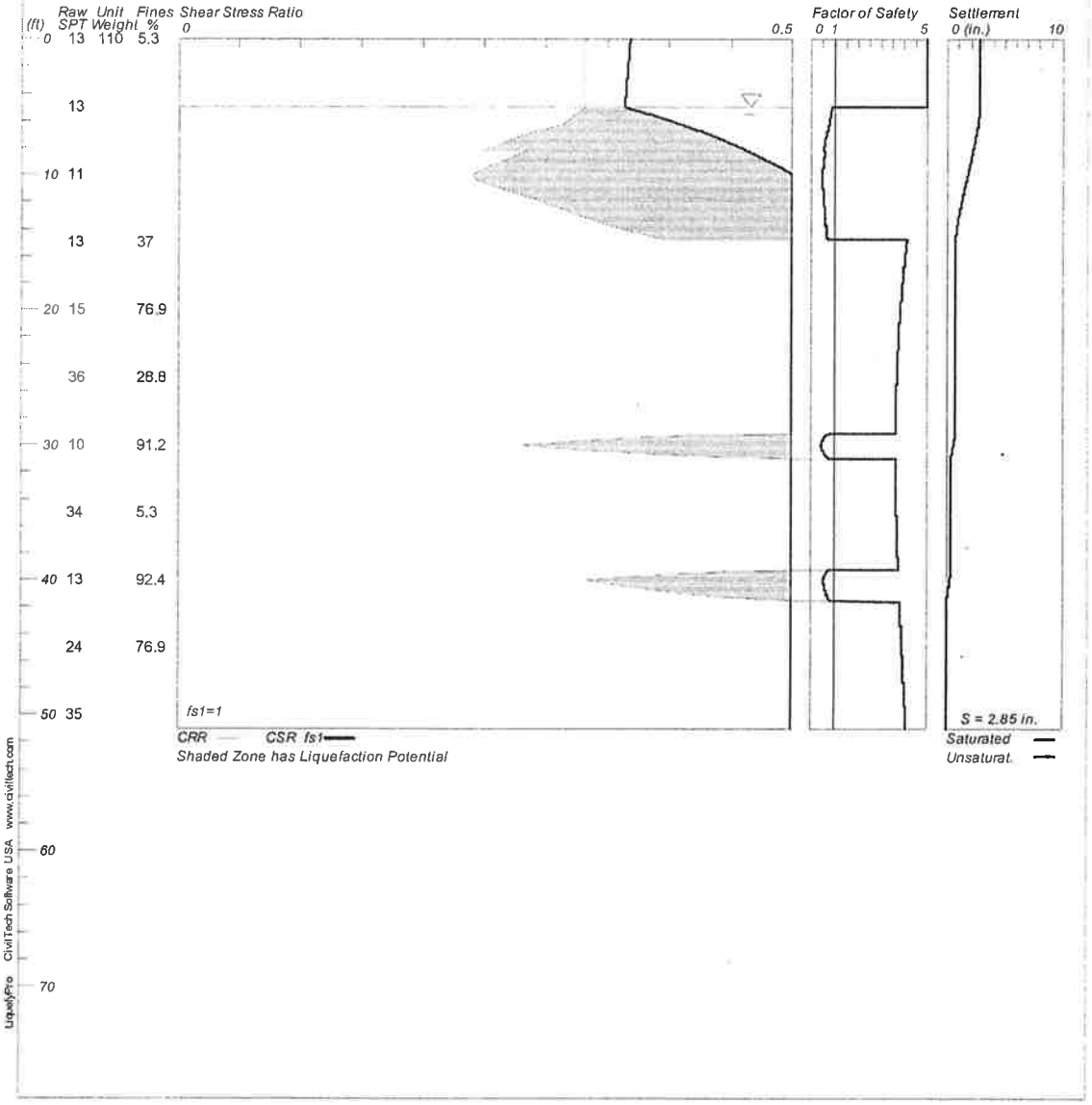
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

LIQUEFACTION ANALYSIS

Oxnard Shores

Hole No.=AH 08 Water Depth=5 ft

Magnitude=7.04
Acceleration=0.566g



SubSurface Designs, Inc. 5462B Plate A-1

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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 08.liq

Title: Oxnard Shores

Subtitle: 5462B

Input Data:

Surface Elev.=

Hole No.=AH 08

Depth of Hole=51.00 ft

Water Table during Earthquake= 5.00 ft

Water Table during In-Situ Testing= 13.00 ft

Max. Acceleration=0.57 g

Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	13.00	110.00	5.30
5.00	13.00	110.00	5.30
10.00	11.00	110.00	5.30
15.00	13.00	110.00	37.00
20.00	15.00	110.00	76.90
25.00	36.00	110.00	28.80
30.00	10.00	110.00	91.20
35.00	34.00	110.00	5.30
40.00	13.00	110.00	92.40
45.00	24.00	110.00	76.90
50.00	35.00	110.00	76.90

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	13.00	1.50	0.75	0.000	1.70	24.86	5.30	0.06	24.92	0.28
0.50	13.00	1.50	0.75	0.028	1.70	24.86	5.30	0.06	24.92	0.28
1.00	13.00	1.50	0.75	0.055	1.70	24.86	5.30	0.06	24.92	0.28
1.50	13.00	1.50	0.75	0.083	1.70	24.86	5.30	0.06	24.92	0.28
2.00	13.00	1.50	0.75	0.110	1.70	24.86	5.30	0.06	24.92	0.28
2.50	13.00	1.50	0.75	0.138	1.70	24.86	5.30	0.06	24.92	0.28
3.00	13.00	1.50	0.75	0.165	1.70	24.86	5.30	0.06	24.92	0.28
3.50	13.00	1.50	0.75	0.193	1.70	24.86	5.30	0.06	24.92	0.28
4.00	13.00	1.50	0.75	0.220	1.70	24.86	5.30	0.06	24.92	0.28
4.50	13.00	1.50	0.75	0.248	1.70	24.86	5.30	0.06	24.92	0.28
5.00	13.00	1.50	0.75	0.275	1.70	24.86	5.30	0.06	24.92	0.28
5.50	12.80	1.50	0.75	0.303	1.70	24.48	5.30	0.06	24.54	0.28
6.00	12.60	1.50	0.75	0.330	1.70	24.10	5.30	0.06	24.16	0.27

6.50	12.40	1.50	0.75	0.358	1.67	23.33	5.30	0.06	23.39	0.26
7.00	12.20	1.50	0.75	0.385	1.61	22.12	5.30	0.06	22.17	0.24
7.50	12.00	1.50	0.75	0.413	1.56	21.02	5.30	0.05	21.07	0.23
8.00	11.80	1.50	0.75	0.440	1.51	20.01	5.30	0.05	20.06	0.22
8.50	11.60	1.50	0.85	0.468	1.46	21.63	5.30	0.05	21.69	0.24
9.00	11.40	1.50	0.85	0.495	1.42	20.66	5.30	0.05	20.71	0.22
9.50	11.20	1.50	0.85	0.523	1.38	19.76	5.30	0.05	19.81	0.21
10.00	11.00	1.50	0.85	0.550	1.35	18.91	5.30	0.05	18.96	0.20
10.50	11.20	1.50	0.85	0.578	1.32	18.79	8.47	0.69	19.48	0.21
11.00	11.40	1.50	0.85	0.605	1.29	18.69	11.64	1.99	20.67	0.22
11.50	11.60	1.50	0.85	0.633	1.26	18.60	14.81	3.32	21.91	0.24
12.00	11.80	1.50	0.85	0.660	1.23	18.52	17.98	4.46	22.98	0.25
12.50	12.00	1.50	0.85	0.688	1.21	18.45	21.15	5.41	23.86	0.27
13.00	12.20	1.50	0.85	0.715	1.18	18.40	24.32	6.24	24.63	0.28
13.50	12.40	1.50	0.85	0.727	1.17	18.54	27.49	7.01	25.55	0.29
14.00	12.60	1.50	0.85	0.739	1.16	18.69	30.66	7.73	26.43	0.31
14.50	12.80	1.50	0.85	0.751	1.15	18.84	33.83	8.44	27.28	0.33
15.00	13.00	1.50	0.95	0.763	1.15	21.21	37.00	9.24	30.46	2.00
15.50	13.20	1.50	0.95	0.775	1.14	21.37	40.99	9.27	30.65	2.00
16.00	13.40	1.50	0.95	0.786	1.13	21.53	44.98	9.31	30.84	2.00
16.50	13.60	1.50	0.95	0.798	1.12	21.69	48.97	9.34	31.03	2.00
17.00	13.80	1.50	0.95	0.810	1.11	21.85	52.96	9.37	31.22	2.00
17.50	14.00	1.50	0.95	0.822	1.10	22.00	56.95	9.40	31.40	2.00
18.00	14.20	1.50	0.95	0.834	1.10	22.16	60.94	9.43	31.59	2.00
18.50	14.40	1.50	0.95	0.846	1.09	22.31	64.93	9.46	31.77	2.00
19.00	14.60	1.50	0.95	0.858	1.08	22.46	68.92	9.49	31.96	2.00
19.50	14.80	1.50	0.95	0.870	1.07	22.61	72.91	9.52	32.14	2.00
20.00	15.00	1.50	0.95	0.882	1.07	22.76	76.90	9.55	32.32	2.00
20.50	17.10	1.50	0.95	0.894	1.06	25.78	72.09	10.16	35.93	2.00
21.00	19.20	1.50	0.95	0.905	1.05	28.75	67.28	10.75	39.50	2.00
21.50	21.30	1.50	0.95	0.917	1.04	31.69	62.47	11.34	43.03	2.00
22.00	23.40	1.50	0.95	0.929	1.04	34.59	57.66	11.92	46.51	2.00
22.50	25.50	1.50	0.95	0.941	1.03	37.46	52.85	12.49	49.95	2.00
23.00	27.60	1.50	0.95	0.953	1.02	40.29	48.04	13.06	53.35	2.00
23.50	29.70	1.50	0.95	0.965	1.02	43.08	43.23	13.62	56.70	2.00
24.00	31.80	1.50	0.95	0.977	1.01	45.85	38.42	14.17	60.02	2.00
24.50	33.90	1.50	0.95	0.989	1.01	48.58	33.61	13.89	62.48	2.00
25.00	36.00	1.50	0.95	1.001	1.00	51.28	28.80	12.04	63.32	2.00
25.50	33.40	1.50	0.95	1.013	0.99	47.30	35.04	14.46	61.76	2.00
26.00	30.80	1.50	0.95	1.024	0.99	43.36	41.28	13.67	57.04	2.00
26.50	28.20	1.50	0.95	1.036	0.98	39.48	47.52	12.90	52.37	2.00
27.00	25.60	1.50	0.95	1.048	0.98	35.63	53.76	12.13	47.76	2.00
27.50	23.00	1.50	0.95	1.060	0.97	31.83	60.00	11.37	43.20	2.00
28.00	20.40	1.50	1.00	1.072	0.97	29.56	66.24	10.91	40.47	2.00
28.50	17.80	1.50	1.00	1.084	0.96	25.65	72.48	10.13	35.78	2.00
29.00	15.20	1.50	1.00	1.096	0.96	21.78	78.72	9.36	31.14	2.00
29.50	12.60	1.50	1.00	1.108	0.95	17.96	84.96	8.59	26.55	0.31
30.00	10.00	1.50	1.00	1.120	0.95	14.18	91.20	7.84	22.01	0.24
30.50	12.40	1.50	1.00	1.132	0.94	17.48	82.61	8.50	25.98	0.30
31.00	14.80	1.50	1.00	1.143	0.94	20.76	74.02	9.15	29.91	0.44
31.50	17.20	1.50	1.00	1.155	0.93	24.00	65.43	9.80	33.80	2.00
32.00	19.60	1.50	1.00	1.167	0.93	27.21	56.84	10.44	37.65	2.00
32.50	22.00	1.50	1.00	1.179	0.92	30.39	48.25	11.08	41.47	2.00
33.00	24.40	1.50	1.00	1.191	0.92	33.54	39.66	11.71	45.24	2.00
33.50	26.80	1.50	1.00	1.203	0.91	36.65	31.07	10.76	47.41	2.00
34.00	29.20	1.50	1.00	1.215	0.91	39.74	22.48	7.83	47.57	2.00
34.50	31.60	1.50	1.00	1.227	0.90	42.80	13.89	3.96	46.76	2.00
35.00	34.00	1.50	1.00	1.239	0.90	45.82	5.30	0.11	45.93	2.00
35.50	31.90	1.50	1.00	1.250	0.89	42.79	14.01	4.02	46.81	2.00
36.00	29.80	1.50	1.00	1.262	0.89	39.79	22.72	7.93	47.72	2.00
36.50	27.70	1.50	1.00	1.274	0.89	36.81	31.43	10.91	47.72	2.00

37.00	25.60	1.50	1.00	1.286	0.88	33.86	40.14	11.77	45.63	2.00
37.50	23.50	1.50	1.00	1.298	0.88	30.94	48.85	11.19	42.13	2.00
38.00	21.40	1.50	1.00	1.310	0.87	28.05	57.55	10.61	38.66	2.00
38.50	19.30	1.50	1.00	1.322	0.87	25.18	66.26	10.04	35.22	2.00
39.00	17.20	1.50	1.00	1.334	0.87	22.34	74.97	9.47	31.81	2.00
39.50	15.10	1.50	1.00	1.346	0.86	19.53	83.68	8.91	28.43	0.36
40.00	13.00	1.50	1.00	1.358	0.86	16.74	92.39	8.35	25.09	0.28
40.50	14.10	1.50	1.00	1.369	0.85	18.07	90.85	8.61	26.69	0.31
41.00	15.20	1.50	1.00	1.381	0.85	19.40	89.30	8.88	28.28	0.35
41.50	16.30	1.50	1.00	1.393	0.85	20.71	87.75	9.14	29.86	0.43
42.00	17.40	1.50	1.00	1.405	0.84	22.02	86.20	9.40	31.42	2.00
42.50	18.50	1.50	1.00	1.417	0.84	23.31	84.65	9.66	32.97	2.00
43.00	19.60	1.50	1.00	1.429	0.84	24.59	83.10	9.92	34.51	2.00
43.50	20.70	1.50	1.00	1.441	0.83	25.87	81.55	10.17	36.04	2.00
44.00	21.80	1.50	1.00	1.453	0.83	27.13	80.00	10.43	37.55	2.00
44.50	22.90	1.50	1.00	1.465	0.83	28.38	78.45	10.68	39.06	2.00
45.00	24.00	1.50	1.00	1.477	0.82	29.62	76.90	10.92	40.55	2.00
45.50	25.10	1.50	1.00	1.488	0.82	30.86	76.90	11.17	42.03	2.00
46.00	26.20	1.50	1.00	1.500	0.82	32.08	76.90	11.42	43.50	2.00
46.50	27.30	1.50	1.00	1.512	0.81	33.30	76.90	11.66	44.96	2.00
47.00	28.40	1.50	1.00	1.524	0.81	34.50	76.90	11.90	46.41	2.00
47.50	29.50	1.50	1.00	1.536	0.81	35.70	76.90	12.14	47.84	2.00
48.00	30.60	1.50	1.00	1.548	0.80	36.89	76.90	12.38	49.27	2.00
48.50	31.70	1.50	1.00	1.560	0.80	38.07	76.90	12.61	50.68	2.00
49.00	32.80	1.50	1.00	1.572	0.80	39.24	76.90	12.85	52.09	2.00
49.50	33.90	1.50	1.00	1.584	0.79	40.41	76.90	13.08	53.49	2.00
50.00	35.00	1.50	1.00	1.596	0.79	41.56	76.90	13.31	54.87	2.00
50.50	35.00	1.50	1.00	1.607	0.79	41.41	76.90	13.28	54.69	2.00
51.00	35.00	1.50	1.00	1.619	0.79	41.26	76.90	13.25	54.51	2.00

CRR is based on water table at 13.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	0.28	1.00	0.28	1.18	0.33	0.37	5.00
0.50	0.02	0.28	1.00	0.28	1.18	0.33	0.37	5.00
1.00	0.04	0.28	1.00	0.28	1.18	0.33	0.37	5.00
1.50	0.05	0.28	1.00	0.28	1.18	0.33	0.37	5.00
2.00	0.07	0.28	1.00	0.28	1.18	0.33	0.37	5.00
2.50	0.09	0.28	1.00	0.28	1.18	0.33	0.37	5.00
3.00	0.11	0.28	1.00	0.28	1.18	0.33	0.37	5.00
3.50	0.13	0.28	1.00	0.28	1.18	0.33	0.36	5.00
4.00	0.14	0.28	1.00	0.28	1.18	0.33	0.36	5.00
4.50	0.16	0.28	1.00	0.28	1.18	0.33	0.36	5.00
5.00	0.18	0.28	1.00	0.28	1.18	0.33	0.36	0.91 *
5.50	0.20	0.28	1.00	0.28	1.18	0.32	0.38	0.85 *
6.00	0.21	0.27	1.00	0.27	1.18	0.32	0.40	0.79 *
6.50	0.23	0.26	1.00	0.26	1.18	0.30	0.42	0.73 *
7.00	0.25	0.24	1.00	0.24	1.18	0.28	0.43	0.66 *
7.50	0.27	0.23	1.00	0.23	1.18	0.27	0.45	0.60 *
8.00	0.29	0.22	1.00	0.22	1.18	0.26	0.46	0.56 *
8.50	0.30	0.24	1.00	0.24	1.18	0.28	0.47	0.59 *
9.00	0.32	0.22	1.00	0.22	1.18	0.26	0.48	0.55 *
9.50	0.34	0.21	1.00	0.21	1.18	0.25	0.49	0.51 *
10.00	0.36	0.20	1.00	0.20	1.18	0.24	0.50	0.48 *
10.50	0.38	0.21	1.00	0.21	1.18	0.25	0.51	0.48 *
11.00	0.39	0.22	1.00	0.22	1.18	0.26	0.52	0.51 *
11.50	0.41	0.24	1.00	0.24	1.18	0.28	0.53	0.53 *
12.00	0.43	0.25	1.00	0.25	1.18	0.30	0.53	0.56 *

12.50	0.45	0.27	1.00	0.27	1.18	0.31	0.54	0.58 *
13.00	0.46	0.28	1.00	0.28	1.18	0.33	0.55	0.59 *
13.50	0.47	0.29	1.00	0.29	1.18	0.34	0.55	0.62 *
14.00	0.48	0.31	1.00	0.31	1.18	0.36	0.56	0.65 *
14.50	0.49	0.33	1.00	0.33	1.18	0.38	0.57	0.68 *
15.00	0.50	2.00	1.00	2.00	1.18	2.35	0.57	4.12
15.50	0.50	2.00	1.00	2.00	1.18	2.35	0.58	4.08
16.00	0.51	2.00	1.00	2.00	1.18	2.35	0.58	4.05
16.50	0.52	2.00	1.00	2.00	1.18	2.35	0.59	4.02
17.00	0.53	2.00	1.00	2.00	1.18	2.35	0.59	3.99
17.50	0.53	2.00	1.00	2.00	1.18	2.35	0.59	3.96
18.00	0.54	2.00	1.00	2.00	1.18	2.35	0.60	3.94
18.50	0.55	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.56	2.00	1.00	2.00	1.18	2.35	0.60	3.89
19.50	0.57	2.00	1.00	2.00	1.18	2.35	0.61	3.87
20.00	0.57	2.00	1.00	2.00	1.18	2.35	0.61	3.85
20.50	0.58	2.00	1.00	2.00	1.18	2.35	0.61	3.83
21.00	0.59	2.00	1.00	2.00	1.18	2.35	0.62	3.82
21.50	0.60	2.00	1.00	2.00	1.18	2.35	0.62	3.80
22.00	0.60	2.00	1.00	2.00	1.18	2.35	0.62	3.78
22.50	0.61	2.00	1.00	2.00	1.18	2.35	0.62	3.77
23.00	0.62	2.00	1.00	2.00	1.18	2.35	0.63	3.75
23.50	0.63	2.00	1.00	2.00	1.18	2.35	0.63	3.74
24.00	0.63	2.00	1.00	2.00	1.18	2.35	0.63	3.73
24.50	0.64	2.00	1.00	2.00	1.18	2.35	0.63	3.72
25.00	0.65	2.00	1.00	2.00	1.18	2.35	0.63	3.71
25.50	0.66	2.00	1.00	2.00	1.18	2.35	0.64	3.70
26.00	0.67	2.00	1.00	2.00	1.18	2.35	0.64	3.69
26.50	0.67	2.00	1.00	2.00	1.18	2.35	0.64	3.68
27.00	0.68	2.00	1.00	2.00	1.18	2.35	0.64	3.67
27.50	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.66
28.00	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.70	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.00	0.71	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.50	0.72	0.31	1.00	0.31	1.18	0.36	0.65	0.56 *
30.00	0.73	0.24	1.00	0.24	1.18	0.28	0.65	0.44 *
30.50	0.74	0.30	1.00	0.30	1.18	0.35	0.65	0.54 *
31.00	0.74	0.44	1.00	0.44	1.18	0.52	0.65	0.80 *
31.50	0.75	2.00	1.00	2.00	1.18	2.35	0.65	3.64
32.00	0.76	2.00	1.00	2.00	1.18	2.35	0.64	3.65
32.50	0.77	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.77	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.78	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.79	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.80	2.00	1.00	2.00	1.18	2.35	0.64	3.68
35.00	0.81	2.00	1.00	2.00	1.18	2.35	0.64	3.69
35.50	0.81	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.82	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.83	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.84	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.84	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.85	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.86	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.87	2.00	1.00	2.00	1.18	2.35	0.62	3.77
39.50	0.87	0.36	1.00	0.36	1.18	0.42	0.62	0.67 *
40.00	0.88	0.28	1.00	0.28	1.18	0.33	0.62	0.54 *
40.50	0.89	0.31	1.00	0.31	1.18	0.37	0.62	0.60 *
41.00	0.90	0.35	1.00	0.35	1.18	0.41	0.62	0.67 *
41.50	0.91	0.43	1.00	0.43	1.18	0.51	0.61	0.83 *
42.00	0.91	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.92	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.93	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.94	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.94	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.95	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.96	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.97	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	0.98	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	0.98	2.00	1.00	2.00	1.18	2.35	0.59	3.97
47.00	0.99	2.00	1.00	2.00	1.18	2.35	0.59	3.98
47.50	1.00	2.00	1.00	2.00	1.18	2.35	0.59	4.00
48.00	1.01	2.00	1.01	2.01	1.18	2.36	0.59	4.03
48.50	1.01	2.00	1.00	2.01	1.18	2.36	0.58	4.04
49.00	1.02	2.00	1.00	2.01	1.18	2.36	0.58	4.06
49.50	1.03	2.00	1.00	2.00	1.18	2.35	0.58	4.07
50.00	1.04	2.00	1.00	2.00	1.18	2.35	0.58	4.08
50.50	1.04	2.00	1.00	2.00	1.18	2.35	0.57	4.09
51.00	1.05	2.00	1.00	2.00	1.18	2.35	0.57	4.10

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	24.92	5.30	0.00	24.92
0.50	-	-	-	24.92	5.30	0.00	24.92
1.00	-	-	-	24.92	5.30	0.00	24.92
1.50	-	-	-	24.92	5.30	0.00	24.92
2.00	-	-	-	24.92	5.30	0.00	24.92
2.50	-	-	-	24.92	5.30	0.00	24.92
3.00	-	-	-	24.92	5.30	0.00	24.92
3.50	-	-	-	24.92	5.30	0.00	24.92
4.00	-	-	-	24.92	5.30	0.00	24.92
4.50	-	-	-	24.92	5.30	0.00	24.92
5.00	-	-	-	24.92	5.30	0.00	24.92
5.50	-	-	-	24.54	5.30	0.00	24.54
6.00	-	-	-	24.16	5.30	0.00	24.16
6.50	-	-	-	23.39	5.30	0.00	23.39
7.00	-	-	-	22.17	5.30	0.00	22.17
7.50	-	-	-	21.07	5.30	0.00	21.07
8.00	-	-	-	20.06	5.30	0.00	20.06
8.50	-	-	-	21.69	5.30	0.00	21.69
9.00	-	-	-	20.71	5.30	0.00	20.71
9.50	-	-	-	19.81	5.30	0.00	19.81
10.00	-	-	-	18.96	5.30	0.00	18.96
10.50	-	-	-	19.48	8.47	0.00	19.48
11.00	-	-	-	20.67	11.64	0.00	20.67
11.50	-	-	-	21.91	14.81	0.00	21.91
12.00	-	-	-	22.98	17.98	0.00	22.98
12.50	-	-	-	23.86	21.15	0.00	23.86
13.00	-	-	-	24.63	24.32	0.00	24.63
13.50	-	-	-	25.55	27.49	0.00	25.55
14.00	-	-	-	26.43	30.66	0.00	26.43
14.50	-	-	-	27.28	33.83	0.00	27.28
15.00	-	-	-	30.46	37.00	0.00	30.46
15.50	-	-	-	30.65	40.99	0.00	30.65
16.00	-	-	-	30.84	44.98	0.00	30.84

16.50	-	-	-	31.03	48.97	0.00	31.03
17.00	-	-	-	31.22	52.96	0.00	31.22
17.50	-	-	-	31.40	56.95	0.00	31.40
18.00	-	-	-	31.59	60.94	0.00	31.59
18.50	-	-	-	31.77	64.93	0.00	31.77
19.00	-	-	-	31.96	68.92	0.00	31.96
19.50	-	-	-	32.14	72.91	0.00	32.14
20.00	-	-	-	32.32	76.90	0.00	32.32
20.50	-	-	-	35.93	72.09	0.00	35.93
21.00	-	-	-	39.50	67.28	0.00	39.50
21.50	-	-	-	43.03	62.47	0.00	43.03
22.00	-	-	-	46.51	57.66	0.00	46.51
22.50	-	-	-	49.95	52.85	0.00	49.95
23.00	-	-	-	53.35	48.04	0.00	53.35
23.50	-	-	-	56.70	43.23	0.00	56.70
24.00	-	-	-	60.02	38.42	0.00	60.02
24.50	-	-	-	62.48	33.61	0.00	62.48
25.00	-	-	-	63.32	28.80	0.00	63.32
25.50	-	-	-	61.76	35.04	0.00	61.76
26.00	-	-	-	57.04	41.28	0.00	57.04
26.50	-	-	-	52.37	47.52	0.00	52.37
27.00	-	-	-	47.76	53.76	0.00	47.76
27.50	-	-	-	43.20	60.00	0.00	43.20
28.00	-	-	-	40.47	66.24	0.00	40.47
28.50	-	-	-	35.78	72.48	0.00	35.78
29.00	-	-	-	31.14	78.72	0.00	31.14
29.50	-	-	-	26.55	84.96	0.00	26.55
30.00	-	-	-	22.01	91.20	0.00	22.01
30.50	-	-	-	25.98	82.61	0.00	25.98
31.00	-	-	-	29.91	74.02	0.00	29.91
31.50	-	-	-	33.80	65.43	0.00	33.80
32.00	-	-	-	37.65	56.84	0.00	37.65
32.50	-	-	-	41.47	48.25	0.00	41.47
33.00	-	-	-	45.24	39.66	0.00	45.24
33.50	-	-	-	47.41	31.07	0.00	47.41
34.00	-	-	-	47.57	22.48	0.00	47.57
34.50	-	-	-	46.76	13.89	0.00	46.76
35.00	-	-	-	45.93	5.30	0.00	45.93
35.50	-	-	-	46.81	14.01	0.00	46.81
36.00	-	-	-	47.72	22.72	0.00	47.72
36.50	-	-	-	47.72	31.43	0.00	47.72
37.00	-	-	-	45.63	40.14	0.00	45.63
37.50	-	-	-	42.13	48.85	0.00	42.13
38.00	-	-	-	38.66	57.55	0.00	38.66
38.50	-	-	-	35.22	66.26	0.00	35.22
39.00	-	-	-	31.81	74.97	0.00	31.81
39.50	-	-	-	28.43	83.68	0.00	28.43
40.00	-	-	-	25.09	92.39	0.00	25.09
40.50	-	-	-	26.69	90.85	0.00	26.69
41.00	-	-	-	28.28	89.30	0.00	28.28
41.50	-	-	-	29.86	87.75	0.00	29.86
42.00	-	-	-	31.42	86.20	0.00	31.42
42.50	-	-	-	32.97	84.65	0.00	32.97
43.00	-	-	-	34.51	83.10	0.00	34.51
43.50	-	-	-	36.04	81.55	0.00	36.04
44.00	-	-	-	37.55	80.00	0.00	37.55
44.50	-	-	-	39.06	78.45	0.00	39.06
45.00	-	-	-	40.55	76.90	0.00	40.55
45.50	-	-	-	42.03	76.90	0.00	42.03
46.00	-	-	-	43.50	76.90	0.00	43.50
46.50	-	-	-	44.96	76.90	0.00	44.96

47.00	-	-	-	46.41	76.90	0.00	46.41
47.50	-	-	-	47.84	76.90	0.00	47.84
48.00	-	-	-	49.27	76.90	0.00	49.27
48.50	-	-	-	50.68	76.90	0.00	50.68
49.00	-	-	-	52.09	76.90	0.00	52.09
49.50	-	-	-	53.49	76.90	0.00	53.49
50.00	-	-	-	54.87	76.90	0.00	54.87
50.50	-	-	-	54.69	76.90	0.00	54.69
51.00	-	-	-	54.51	76.90	0.00	54.51

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.10	76.90	54.53	100.00	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.09	76.90	54.69	100.00	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.08	76.90	54.87	100.00	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.07	76.90	53.49	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.06	76.90	52.09	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.04	76.90	50.68	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.03	76.90	49.27	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.00	76.90	47.84	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	3.98	76.90	46.41	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.97	76.90	44.96	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	76.90	43.50	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	76.90	42.03	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	76.90	40.55	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	78.45	39.06	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	80.00	37.55	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	81.55	36.04	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	83.10	34.51	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	84.65	32.97	97.20	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	86.20	31.42	93.36	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	0.83	87.75	29.86	89.73	0.738	4.4E-3	0.008	0.008
41.00	0.62	1.00	0.62	0.67	89.30	28.28	86.29	1.187	7.1E-3	0.061	0.069
40.50	0.62	1.00	0.62	0.60	90.85	26.69	83.02	1.504	9.0E-3	0.082	0.151
40.00	0.62	1.00	0.62	0.54	92.39	25.09	79.88	1.721	1.0E-2	0.098	0.249
39.50	0.62	1.00	0.62	0.67	83.68	28.43	86.62	1.166	7.0E-3	0.087	0.336
39.00	0.62	1.00	0.62	3.77	74.97	31.81	94.30	0.000	0.0E0	0.026	0.362
38.50	0.63	1.00	0.63	3.76	66.26	35.22	100.00	0.000	0.0E0	0.000	0.362
38.00	0.63	1.00	0.63	3.75	57.55	38.66	100.00	0.000	0.0E0	0.000	0.362
37.50	0.63	1.00	0.63	3.74	48.85	42.13	100.00	0.000	0.0E0	0.000	0.362
37.00	0.63	1.00	0.63	3.73	40.14	45.63	100.00	0.000	0.0E0	0.000	0.362
36.50	0.63	1.00	0.63	3.72	31.43	47.72	100.00	0.000	0.0E0	0.000	0.362
36.00	0.63	1.00	0.63	3.71	22.72	47.72	100.00	0.000	0.0E0	0.000	0.362
35.50	0.64	1.00	0.64	3.70	14.01	46.81	100.00	0.000	0.0E0	0.000	0.362
35.00	0.64	1.00	0.64	3.69	5.30	45.93	100.00	0.000	0.0E0	0.000	0.362
34.50	0.64	1.00	0.64	3.68	13.89	46.76	100.00	0.000	0.0E0	0.000	0.362
34.00	0.64	1.00	0.64	3.68	22.48	47.57	100.00	0.000	0.0E0	0.000	0.362
33.50	0.64	1.00	0.64	3.67	31.07	47.41	100.00	0.000	0.0E0	0.000	0.362
33.00	0.64	1.00	0.64	3.66	39.66	45.24	100.00	0.000	0.0E0	0.000	0.362
32.50	0.64	1.00	0.64	3.65	48.25	41.47	100.00	0.000	0.0E0	0.000	0.362
32.00	0.64	1.00	0.64	3.65	56.84	37.65	100.00	0.000	0.0E0	0.000	0.362
31.50	0.65	1.00	0.65	3.64	65.43	33.80	99.36	0.000	0.0E0	0.000	0.362
31.00	0.65	1.00	0.65	0.80	74.02	29.91	89.86	0.769	4.6E-3	0.005	0.366
30.50	0.65	1.00	0.65	0.54	82.61	25.98	81.62	1.631	9.8E-3	0.080	0.446

30.00	0.65	1.00	0.65	0.44	91.20	22.01	74.17	2.008	1.2E-2	0.111	0.557
29.50	0.65	1.00	0.65	0.56	84.96	26.55	82.75	1.554	9.3E-3	0.107	0.664
29.00	0.65	1.00	0.65	3.64	78.72	31.14	92.69	0.000	0.0E0	0.051	0.715
28.50	0.65	1.00	0.65	3.64	72.48	35.78	100.00	0.000	0.0E0	0.000	0.715
28.00	0.64	1.00	0.64	3.65	66.24	40.47	100.00	0.000	0.0E0	0.000	0.715
27.50	0.64	1.00	0.64	3.66	60.00	43.20	100.00	0.000	0.0E0	0.000	0.715
27.00	0.64	1.00	0.64	3.67	53.76	47.76	100.00	0.000	0.0E0	0.000	0.715
26.50	0.64	1.00	0.64	3.68	47.52	52.37	100.00	0.000	0.0E0	0.000	0.715
26.00	0.64	1.00	0.64	3.69	41.28	57.04	100.00	0.000	0.0E0	0.000	0.715
25.50	0.64	1.00	0.64	3.70	35.04	61.76	100.00	0.000	0.0E0	0.000	0.715
25.00	0.63	1.00	0.63	3.71	28.80	63.32	100.00	0.000	0.0E0	0.000	0.715
24.50	0.63	1.00	0.63	3.72	33.61	62.48	100.00	0.000	0.0E0	0.000	0.715
24.00	0.63	1.00	0.63	3.73	38.42	60.02	100.00	0.000	0.0E0	0.000	0.715
23.50	0.63	1.00	0.63	3.74	43.23	56.70	100.00	0.000	0.0E0	0.000	0.715
23.00	0.63	1.00	0.63	3.75	48.04	53.35	100.00	0.000	0.0E0	0.000	0.715
22.50	0.62	1.00	0.62	3.77	52.85	49.95	100.00	0.000	0.0E0	0.000	0.715
22.00	0.62	1.00	0.62	3.78	57.66	46.51	100.00	0.000	0.0E0	0.000	0.715
21.50	0.62	1.00	0.62	3.80	62.47	43.03	100.00	0.000	0.0E0	0.000	0.715
21.00	0.62	1.00	0.62	3.82	67.28	39.50	100.00	0.000	0.0E0	0.000	0.715
20.50	0.61	1.00	0.61	3.83	72.09	35.93	100.00	0.000	0.0E0	0.000	0.715
20.00	0.61	1.00	0.61	3.85	76.90	32.32	95.55	0.000	0.0E0	0.000	0.715
19.50	0.61	1.00	0.61	3.87	72.91	32.14	95.10	0.000	0.0E0	0.000	0.715
19.00	0.60	1.00	0.60	3.89	68.92	31.96	94.65	0.000	0.0E0	0.000	0.715
18.50	0.60	1.00	0.60	3.91	64.93	31.77	94.21	0.000	0.0E0	0.000	0.715
18.00	0.60	1.00	0.60	3.94	60.94	31.59	93.76	0.000	0.0E0	0.000	0.715
17.50	0.59	1.00	0.59	3.96	56.95	31.40	93.32	0.000	0.0E0	0.000	0.715
17.00	0.59	1.00	0.59	3.99	52.96	31.22	92.87	0.000	0.0E0	0.000	0.715
16.50	0.59	1.00	0.59	4.02	48.97	31.03	92.43	0.000	0.0E0	0.000	0.715
16.00	0.58	1.00	0.58	4.05	44.98	30.84	91.98	0.000	0.0E0	0.000	0.715
15.50	0.58	1.00	0.58	4.08	40.99	30.65	91.54	0.000	0.0E0	0.000	0.715
15.00	0.57	1.00	0.57	4.12	37.00	30.46	91.10	0.000	0.0E0	0.000	0.715
14.50	0.57	1.00	0.57	0.68	33.83	27.28	84.21	1.276	7.7E-3	0.045	0.759
14.00	0.56	1.00	0.56	0.65	30.66	26.43	82.50	1.428	8.6E-3	0.082	0.841
13.50	0.55	1.00	0.55	0.62	27.49	25.55	80.78	1.579	9.5E-3	0.091	0.932
13.00	0.55	1.00	0.55	0.59	24.32	24.63	79.02	1.723	1.0E-2	0.100	1.031
12.50	0.54	1.00	0.54	0.58	21.15	23.86	77.57	1.810	1.1E-2	0.106	1.138
12.00	0.53	1.00	0.53	0.56	17.98	22.98	75.93	1.903	1.1E-2	0.112	1.249
11.50	0.53	1.00	0.53	0.53	14.81	21.91	73.99	2.006	1.2E-2	0.118	1.367
11.00	0.52	1.00	0.52	0.51	11.64	20.67	71.75	2.116	1.3E-2	0.124	1.491
10.50	0.51	1.00	0.51	0.48	8.47	19.48	69.60	2.220	1.3E-2	0.130	1.621
10.00	0.50	1.00	0.50	0.48	5.30	18.96	68.66	2.277	1.4E-2	0.136	1.757
9.50	0.49	1.00	0.49	0.51	5.30	19.81	70.19	2.187	1.3E-2	0.134	1.890
9.00	0.48	1.00	0.48	0.55	5.30	20.71	71.82	2.107	1.3E-2	0.129	2.019
8.50	0.47	1.00	0.47	0.59	5.30	21.69	73.58	2.009	1.2E-2	0.123	2.142
8.00	0.46	1.00	0.46	0.56	5.30	20.06	70.65	2.164	1.3E-2	0.125	2.267
7.50	0.45	1.00	0.45	0.60	5.30	21.07	72.47	2.062	1.2E-2	0.127	2.393
7.00	0.43	1.00	0.43	0.66	5.30	22.17	74.46	1.879	1.1E-2	0.118	2.511
6.50	0.42	1.00	0.42	0.73	5.30	23.39	76.69	1.581	9.5E-3	0.104	2.615
6.00	0.40	1.00	0.40	0.79	5.30	24.16	78.12	1.309	7.9E-3	0.084	2.700
5.50	0.38	1.00	0.38	0.85	5.30	24.54	78.84	1.106	6.6E-3	0.072	2.772
5.00	0.36	1.00	0.36	0.91	5.30	24.92	79.57	0.893	5.4E-3	0.059	2.831

Settlement of Saturated Sands=2.831 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	24.92	0.36	548.96	1.8E-4	0.0341	0.0252	0.94	0.0237	2.84E-4	0.000	0.000
4.50	0.25	0.16	24.92	0.36	523.41	1.7E-4	0.0319	0.0236	0.94	0.0222	2.66E-4	0.002	0.003
4.00	0.22	0.14	24.92	0.36	493.48	1.6E-4	0.0340	0.0251	0.94	0.0236	2.83E-4	0.003	0.005
3.50	0.19	0.13	24.92	0.36	461.61	1.5E-4	0.0301	0.0222	0.94	0.0209	2.50E-4	0.003	0.008
3.00	0.17	0.11	24.92	0.37	427.37	1.4E-4	0.0267	0.0197	0.94	0.0185	2.22E-4	0.002	0.010
2.50	0.14	0.09	24.92	0.37	390.13	1.3E-4	0.0238	0.0176	0.94	0.0166	1.99E-4	0.002	0.013
2.00	0.11	0.07	24.92	0.37	348.95	1.2E-4	0.0246	0.0181	0.94	0.0171	2.05E-4	0.002	0.015
1.50	0.08	0.05	24.92	0.37	302.20	1.0E-4	0.0200	0.0148	0.94	0.0139	1.66E-4	0.002	0.016
1.00	0.06	0.04	24.92	0.37	246.76	8.2E-5	0.0145	0.0107	0.94	0.0101	1.21E-4	0.001	0.018
0.50	0.03	0.02	24.92	0.37	174.50	5.8E-5	0.0088	0.0065	0.94	0.0061	7.34E-5	0.001	0.019
0.00	0.00	0.00	24.92	0.37	3.33	1.1E-6	0.0010	0.0008	0.94	0.0007	8.47E-6	0.000	0.019

Settlement of Unsaturated Sands=0.019 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=2.850 in.
Differential Settlement=1.425 to 1.881 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)	
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022. SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

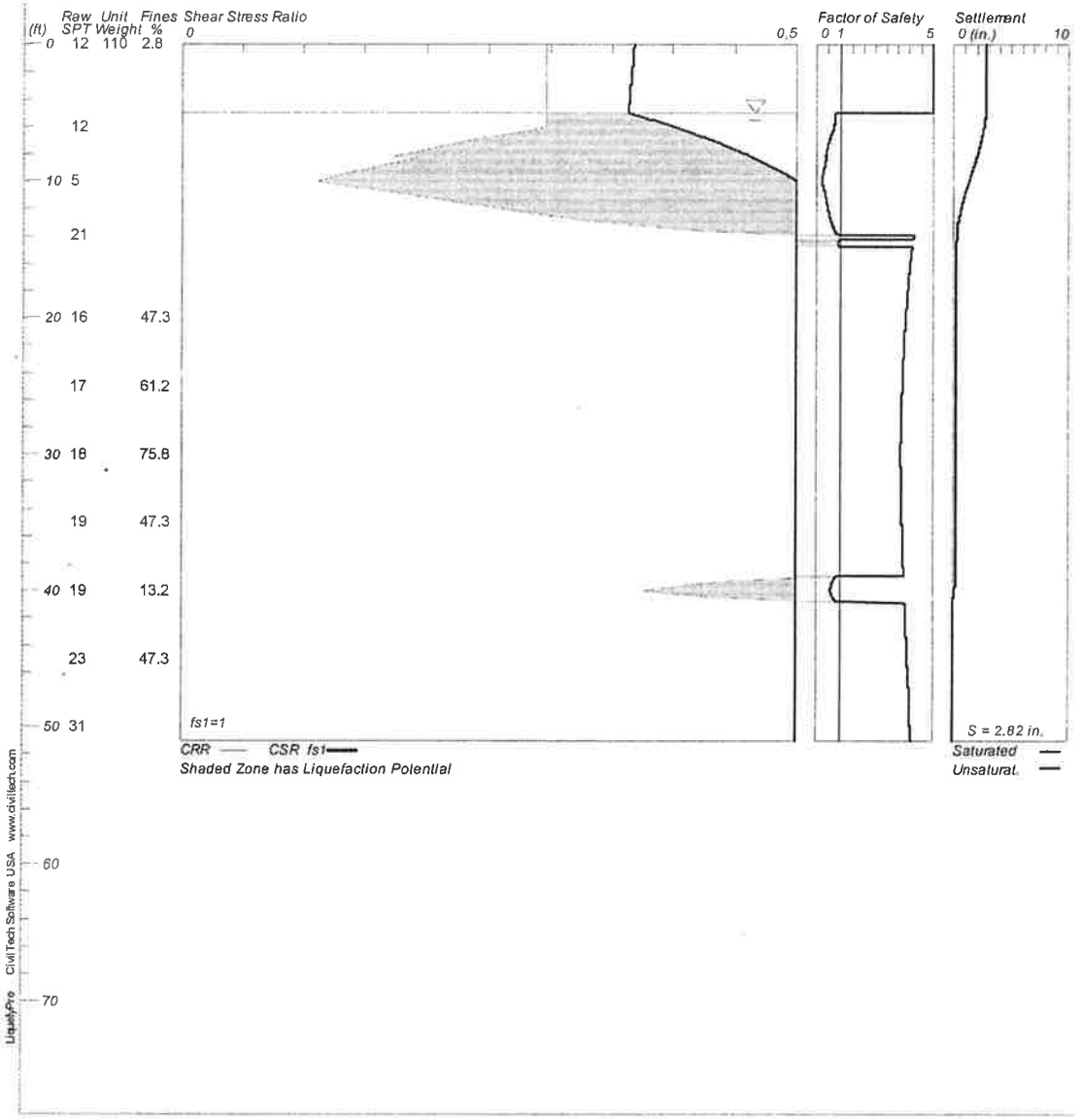
3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

LIQUEFACTION ANALYSIS

Oxnard Shores

Hole No.=AH 09 Water Depth=5 ft

Magnitude=7.04
Acceleration=0.566g



SubSurface Designs, Inc. **5462B** **Plate A-1**

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LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Input File Name: h:\5400\5462 - Oxnard Shores Company, LLC\5462B\Liq for AH 09.liq
Title: Oxnard Shores
Subtitle: 5462B

Input Data:

Surface Elev.=
Hole No.=AH 09
Depth of Hole=51.00 ft
Water Table during Earthquake= 5.00 ft
Water Table during In-Situ Testing= 14.00 ft
Max. Acceleration=0.57 g
Earthquake Magnitude=7.04

1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Idriss/Seed
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = 1.25
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1.2
9. User request factor of safety (apply to CSR) , User= 1
   Plot one CSR curve (fs1=1)
10. Use Curve Smoothing: Yes*

* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	12.00	110.00	2.80
6.00	12.00	110.00	2.80
10.00	5.00	110.00	2.80
14.00	21.00	110.00	2.80
20.00	16.00	110.00	47.30
25.00	17.00	110.00	61.20
30.00	18.00	110.00	75.80
35.00	19.00	110.00	47.30
40.00	19.00	110.00	13.20
45.00	23.00	110.00	47.30
50.00	31.00	110.00	47.30

Output Results:

Calculation segment, dz=0.050 ft
User defined Print Interval, dp=0.50 ft

CSR Calculation:

Depth ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	CSR	x fs1	=CSRfs
0.00	110.00	0.000	110.00	0.000	1.00	0.37	1.00	0.37

0.50	110.00	0.028	110.00	0.028	1.00	0.37	1.00	0.37
1.00	110.00	0.055	110.00	0.055	1.00	0.37	1.00	0.37
1.50	110.00	0.083	110.00	0.083	1.00	0.37	1.00	0.37
2.00	110.00	0.110	110.00	0.110	1.00	0.37	1.00	0.37
2.50	110.00	0.138	110.00	0.138	0.99	0.37	1.00	0.37
3.00	110.00	0.165	110.00	0.165	0.99	0.37	1.00	0.37
3.50	110.00	0.193	110.00	0.193	0.99	0.36	1.00	0.36
4.00	110.00	0.220	110.00	0.220	0.99	0.36	1.00	0.36
4.50	110.00	0.248	110.00	0.248	0.99	0.36	1.00	0.36
5.00	110.00	0.275	47.60	0.275	0.99	0.36	1.00	0.36
5.50	110.00	0.303	47.60	0.287	0.99	0.38	1.00	0.38
6.00	110.00	0.330	47.60	0.299	0.99	0.40	1.00	0.40
6.50	110.00	0.358	47.60	0.311	0.98	0.42	1.00	0.42
7.00	110.00	0.385	47.60	0.323	0.98	0.43	1.00	0.43
7.50	110.00	0.413	47.60	0.335	0.98	0.45	1.00	0.45
8.00	110.00	0.440	47.60	0.346	0.98	0.46	1.00	0.46
8.50	110.00	0.468	47.60	0.358	0.98	0.47	1.00	0.47
9.00	110.00	0.495	47.60	0.370	0.98	0.48	1.00	0.48
9.50	110.00	0.523	47.60	0.382	0.98	0.49	1.00	0.49
10.00	110.00	0.550	47.60	0.394	0.98	0.50	1.00	0.50
10.50	110.00	0.578	47.60	0.406	0.98	0.51	1.00	0.51
11.00	110.00	0.605	47.60	0.418	0.97	0.52	1.00	0.52
11.50	110.00	0.633	47.60	0.430	0.97	0.53	1.00	0.53
12.00	110.00	0.660	47.60	0.442	0.97	0.53	1.00	0.53
12.50	110.00	0.688	47.60	0.454	0.97	0.54	1.00	0.54
13.00	110.00	0.715	47.60	0.465	0.97	0.55	1.00	0.55
13.50	110.00	0.743	47.60	0.477	0.97	0.55	1.00	0.55
14.00	110.00	0.770	47.60	0.489	0.97	0.56	1.00	0.56
14.50	110.00	0.798	47.60	0.501	0.97	0.57	1.00	0.57
15.00	110.00	0.825	47.60	0.513	0.97	0.57	1.00	0.57
15.50	110.00	0.853	47.60	0.525	0.96	0.58	1.00	0.58
16.00	110.00	0.880	47.60	0.537	0.96	0.58	1.00	0.58
16.50	110.00	0.908	47.60	0.549	0.96	0.59	1.00	0.59
17.00	110.00	0.935	47.60	0.561	0.96	0.59	1.00	0.59
17.50	110.00	0.963	47.60	0.573	0.96	0.59	1.00	0.59
18.00	110.00	0.990	47.60	0.584	0.96	0.60	1.00	0.60
18.50	110.00	1.018	47.60	0.596	0.96	0.60	1.00	0.60
19.00	110.00	1.045	47.60	0.608	0.96	0.60	1.00	0.60
19.50	110.00	1.073	47.60	0.620	0.95	0.61	1.00	0.61
20.00	110.00	1.100	47.60	0.632	0.95	0.61	1.00	0.61
20.50	110.00	1.128	47.60	0.644	0.95	0.61	1.00	0.61
21.00	110.00	1.155	47.60	0.656	0.95	0.62	1.00	0.62
21.50	110.00	1.183	47.60	0.668	0.95	0.62	1.00	0.62
22.00	110.00	1.210	47.60	0.680	0.95	0.62	1.00	0.62
22.50	110.00	1.238	47.60	0.692	0.95	0.62	1.00	0.62
23.00	110.00	1.265	47.60	0.703	0.95	0.63	1.00	0.63
23.50	110.00	1.293	47.60	0.715	0.95	0.63	1.00	0.63
24.00	110.00	1.320	47.60	0.727	0.94	0.63	1.00	0.63
24.50	110.00	1.348	47.60	0.739	0.94	0.63	1.00	0.63
25.00	110.00	1.375	47.60	0.751	0.94	0.63	1.00	0.63
25.50	110.00	1.403	47.60	0.763	0.94	0.64	1.00	0.64
26.00	110.00	1.430	47.60	0.775	0.94	0.64	1.00	0.64
26.50	110.00	1.458	47.60	0.787	0.94	0.64	1.00	0.64
27.00	110.00	1.485	47.60	0.799	0.94	0.64	1.00	0.64
27.50	110.00	1.513	47.60	0.811	0.94	0.64	1.00	0.64
28.00	110.00	1.540	47.60	0.822	0.93	0.64	1.00	0.64
28.50	110.00	1.568	47.60	0.834	0.93	0.65	1.00	0.65
29.00	110.00	1.595	47.60	0.846	0.93	0.65	1.00	0.65
29.50	110.00	1.623	47.60	0.858	0.93	0.65	1.00	0.65
30.00	110.00	1.650	47.60	0.870	0.93	0.65	1.00	0.65
30.50	110.00	1.678	47.60	0.882	0.93	0.65	1.00	0.65

31.00	110.00	1.705	47.60	0.894	0.92	0.65	1.00	0.65
31.50	110.00	1.733	47.60	0.906	0.92	0.65	1.00	0.65
32.00	110.00	1.760	47.60	0.918	0.91	0.64	1.00	0.64
32.50	110.00	1.788	47.60	0.930	0.91	0.64	1.00	0.64
33.00	110.00	1.815	47.60	0.941	0.91	0.64	1.00	0.64
33.50	110.00	1.843	47.60	0.953	0.90	0.64	1.00	0.64
34.00	110.00	1.870	47.60	0.965	0.90	0.64	1.00	0.64
34.50	110.00	1.898	47.60	0.977	0.89	0.64	1.00	0.64
35.00	110.00	1.925	47.60	0.989	0.89	0.64	1.00	0.64
35.50	110.00	1.953	47.60	1.001	0.89	0.64	1.00	0.64
36.00	110.00	1.980	47.60	1.013	0.88	0.63	1.00	0.63
36.50	110.00	2.008	47.60	1.025	0.88	0.63	1.00	0.63
37.00	110.00	2.035	47.60	1.037	0.87	0.63	1.00	0.63
37.50	110.00	2.063	47.60	1.049	0.87	0.63	1.00	0.63
38.00	110.00	2.090	47.60	1.060	0.86	0.63	1.00	0.63
38.50	110.00	2.118	47.60	1.072	0.86	0.63	1.00	0.63
39.00	110.00	2.145	47.60	1.084	0.86	0.62	1.00	0.62
39.50	110.00	2.173	47.60	1.096	0.85	0.62	1.00	0.62
40.00	110.00	2.200	47.60	1.108	0.85	0.62	1.00	0.62
40.50	110.00	2.228	47.60	1.120	0.84	0.62	1.00	0.62
41.00	110.00	2.255	47.60	1.132	0.84	0.62	1.00	0.62
41.50	110.00	2.283	47.60	1.144	0.84	0.61	1.00	0.61
42.00	110.00	2.310	47.60	1.156	0.83	0.61	1.00	0.61
42.50	110.00	2.338	47.60	1.168	0.83	0.61	1.00	0.61
43.00	110.00	2.365	47.60	1.179	0.82	0.61	1.00	0.61
43.50	110.00	2.393	47.60	1.191	0.82	0.61	1.00	0.61
44.00	110.00	2.420	47.60	1.203	0.82	0.60	1.00	0.60
44.50	110.00	2.448	47.60	1.215	0.81	0.60	1.00	0.60
45.00	110.00	2.475	47.60	1.227	0.81	0.60	1.00	0.60
45.50	110.00	2.503	47.60	1.239	0.80	0.60	1.00	0.60
46.00	110.00	2.530	47.60	1.251	0.80	0.60	1.00	0.60
46.50	110.00	2.558	47.60	1.263	0.80	0.59	1.00	0.59
47.00	110.00	2.585	47.60	1.275	0.79	0.59	1.00	0.59
47.50	110.00	2.613	47.60	1.287	0.79	0.59	1.00	0.59
48.00	110.00	2.640	47.60	1.298	0.78	0.59	1.00	0.59
48.50	110.00	2.668	47.60	1.310	0.78	0.58	1.00	0.58
49.00	110.00	2.695	47.60	1.322	0.78	0.58	1.00	0.58
49.50	110.00	2.723	47.60	1.334	0.77	0.58	1.00	0.58
50.00	110.00	2.750	47.60	1.346	0.77	0.58	1.00	0.58
50.50	110.00	2.777	47.60	1.358	0.76	0.57	1.00	0.57
51.00	110.00	2.805	47.60	1.370	0.76	0.57	1.00	0.57

CSR is based on water table at 5.00 during earthquake

CRR Calculation from SPT or BPT data:

Depth ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60	(N1)60f	CRR7.5
0.00	12.00	1.50	0.75	0.000	1.70	22.95	2.80	0.00	22.95	0.25
0.50	12.00	1.50	0.75	0.028	1.70	22.95	2.80	0.00	22.95	0.25
1.00	12.00	1.50	0.75	0.055	1.70	22.95	2.80	0.00	22.95	0.25
1.50	12.00	1.50	0.75	0.083	1.70	22.95	2.80	0.00	22.95	0.25
2.00	12.00	1.50	0.75	0.110	1.70	22.95	2.80	0.00	22.95	0.25
2.50	12.00	1.50	0.75	0.138	1.70	22.95	2.80	0.00	22.95	0.25
3.00	12.00	1.50	0.75	0.165	1.70	22.95	2.80	0.00	22.95	0.25
3.50	12.00	1.50	0.75	0.193	1.70	22.95	2.80	0.00	22.95	0.25
4.00	12.00	1.50	0.75	0.220	1.70	22.95	2.80	0.00	22.95	0.25
4.50	12.00	1.50	0.75	0.248	1.70	22.95	2.80	0.00	22.95	0.25
5.00	12.00	1.50	0.75	0.275	1.70	22.95	2.80	0.00	22.95	0.25
5.50	12.00	1.50	0.75	0.303	1.70	22.95	2.80	0.00	22.95	0.25
6.00	12.00	1.50	0.75	0.330	1.70	22.95	2.80	0.00	22.95	0.25

6.50	11.12	1.50	0.75	0.358	1.67	20.93	2.80	0.00	20.93	0.23
7.00	10.25	1.50	0.75	0.385	1.61	18.58	2.80	0.00	18.58	0.20
7.50	9.37	1.50	0.75	0.413	1.56	16.42	2.80	0.00	16.42	0.18
8.00	8.50	1.50	0.75	0.440	1.51	14.42	2.80	0.00	14.42	0.16
8.50	7.62	1.50	0.85	0.468	1.46	14.22	2.80	0.00	14.22	0.15
9.00	6.75	1.50	0.85	0.495	1.42	12.23	2.80	0.00	12.23	0.13
9.50	5.87	1.50	0.85	0.523	1.38	10.36	2.80	0.00	10.36	0.11
10.00	5.00	1.50	0.85	0.550	1.35	8.60	2.80	0.00	8.60	0.09
10.50	7.00	1.50	0.85	0.578	1.32	11.74	2.80	0.00	11.74	0.13
11.00	9.00	1.50	0.85	0.605	1.29	14.75	2.80	0.00	14.75	0.16
11.50	11.00	1.50	0.85	0.633	1.26	17.63	2.80	0.00	17.63	0.19
12.00	13.00	1.50	0.85	0.660	1.23	20.40	2.80	0.00	20.40	0.22
12.50	15.00	1.50	0.85	0.688	1.21	23.07	2.80	0.00	23.07	0.25
13.00	17.00	1.50	0.85	0.715	1.18	25.63	2.80	0.00	25.63	0.29
13.50	19.00	1.50	0.85	0.743	1.16	28.11	2.80	0.00	28.11	0.35
14.00	21.00	1.50	0.85	0.770	1.14	30.51	2.80	0.00	30.51	2.00
14.50	20.58	1.50	0.85	0.782	1.13	29.68	6.51	0.26	29.94	0.45
15.00	20.17	1.50	0.95	0.794	1.12	32.25	10.22	1.67	33.93	2.00
15.50	19.75	1.50	0.95	0.806	1.11	31.35	13.93	3.50	34.85	2.00
16.00	19.33	1.50	0.95	0.818	1.11	30.47	17.63	5.11	35.57	2.00
16.50	18.92	1.50	0.95	0.830	1.10	29.60	21.34	6.45	36.05	2.00
17.00	18.50	1.50	0.95	0.841	1.09	28.74	25.05	7.61	36.35	2.00
17.50	18.08	1.50	0.95	0.853	1.08	27.90	28.76	8.64	36.54	2.00
18.00	17.67	1.50	0.95	0.865	1.08	27.07	32.47	9.59	36.66	2.00
18.50	17.25	1.50	0.95	0.877	1.07	26.25	36.18	10.25	36.50	2.00
19.00	16.83	1.50	0.95	0.889	1.06	25.44	39.88	10.09	35.53	2.00
19.50	16.42	1.50	0.95	0.901	1.05	24.65	43.59	9.93	34.58	2.00
20.00	16.00	1.50	0.95	0.913	1.05	23.86	47.30	9.77	33.64	2.00
20.50	16.10	1.50	0.95	0.925	1.04	23.86	48.69	9.77	33.63	2.00
21.00	16.20	1.50	0.95	0.937	1.03	23.85	50.08	9.77	33.62	2.00
21.50	16.30	1.50	0.95	0.949	1.03	23.85	51.47	9.77	33.62	2.00
22.00	16.40	1.50	0.95	0.960	1.02	23.85	52.86	9.77	33.62	2.00
22.50	16.50	1.50	0.95	0.972	1.01	23.84	54.25	9.77	33.61	2.00
23.00	16.60	1.50	0.95	0.984	1.01	23.84	55.64	9.77	33.61	2.00
23.50	16.70	1.50	0.95	0.996	1.00	23.84	57.03	9.77	33.61	2.00
24.00	16.80	1.50	0.95	1.008	1.00	23.84	58.42	9.77	33.61	2.00
24.50	16.90	1.50	0.95	1.020	0.99	23.85	59.81	9.77	33.62	2.00
25.00	17.00	1.50	0.95	1.032	0.98	23.85	61.20	9.77	33.62	2.00
25.50	17.10	1.50	0.95	1.044	0.98	23.85	62.66	9.77	33.62	2.00
26.00	17.20	1.50	0.95	1.056	0.97	23.86	64.12	9.77	33.63	2.00
26.50	17.30	1.50	0.95	1.068	0.97	23.86	65.58	9.77	33.63	2.00
27.00	17.40	1.50	0.95	1.079	0.96	23.87	67.04	9.77	33.64	2.00
27.50	17.50	1.50	0.95	1.091	0.96	23.87	68.50	9.77	33.65	2.00
28.00	17.60	1.50	1.00	1.103	0.95	25.13	69.96	10.03	35.16	2.00
28.50	17.70	1.50	1.00	1.115	0.95	25.14	71.42	10.03	35.17	2.00
29.00	17.80	1.50	1.00	1.127	0.94	25.15	72.88	10.03	35.18	2.00
29.50	17.90	1.50	1.00	1.139	0.94	25.16	74.34	10.03	35.19	2.00
30.00	18.00	1.50	1.00	1.151	0.93	25.17	75.80	10.03	35.20	2.00
30.50	18.10	1.50	1.00	1.163	0.93	25.18	72.95	10.04	35.21	2.00
31.00	18.20	1.50	1.00	1.175	0.92	25.19	70.10	10.04	35.23	2.00
31.50	18.30	1.50	1.00	1.187	0.92	25.20	67.25	10.04	35.24	2.00
32.00	18.40	1.50	1.00	1.198	0.91	25.21	64.40	10.04	35.25	2.00
32.50	18.50	1.50	1.00	1.210	0.91	25.22	61.55	10.04	35.27	2.00
33.00	18.60	1.50	1.00	1.222	0.90	25.24	58.70	10.05	35.28	2.00
33.50	18.70	1.50	1.00	1.234	0.90	25.25	55.85	10.05	35.30	2.00
34.00	18.80	1.50	1.00	1.246	0.90	25.26	53.00	10.05	35.32	2.00
34.50	18.90	1.50	1.00	1.258	0.89	25.28	50.15	10.06	35.33	2.00
35.00	19.00	1.50	1.00	1.270	0.89	25.29	47.30	10.06	35.35	2.00
35.50	19.00	1.50	1.00	1.282	0.88	25.17	43.89	10.03	35.21	2.00
36.00	19.00	1.50	1.00	1.294	0.88	25.06	40.48	10.01	35.07	2.00
36.50	19.00	1.50	1.00	1.305	0.88	24.94	37.07	9.99	34.93	2.00

37.00	19.00	1.50	1.00	1.317	0.87	24.83	33.66	9.52	34.35	2.00
37.50	19.00	1.50	1.00	1.329	0.87	24.72	30.25	8.59	33.31	2.00
38.00	19.00	1.50	1.00	1.341	0.86	24.61	26.84	7.64	32.25	2.00
38.50	19.00	1.50	1.00	1.353	0.86	24.50	23.43	6.65	31.15	2.00
39.00	19.00	1.50	1.00	1.365	0.86	24.39	20.02	5.56	29.95	0.45
39.50	19.00	1.50	1.00	1.377	0.85	24.29	16.61	4.32	28.61	0.36
40.00	19.00	1.50	1.00	1.389	0.85	24.18	13.20	2.87	27.06	0.32
40.50	19.40	1.50	1.00	1.401	0.84	24.59	16.61	4.34	28.92	0.37
41.00	19.80	1.50	1.00	1.413	0.84	24.99	20.02	5.61	30.59	2.00
41.50	20.20	1.50	1.00	1.424	0.84	25.39	23.43	6.74	32.12	2.00
42.00	20.60	1.50	1.00	1.436	0.83	25.78	26.84	7.79	33.57	2.00
42.50	21.00	1.50	1.00	1.448	0.83	26.17	30.25	8.81	34.99	2.00
43.00	21.40	1.50	1.00	1.460	0.83	26.56	33.66	9.84	36.40	2.00
43.50	21.80	1.50	1.00	1.472	0.82	26.95	37.07	10.39	37.34	2.00
44.00	22.20	1.50	1.00	1.484	0.82	27.34	40.48	10.47	37.80	2.00
44.50	22.60	1.50	1.00	1.496	0.82	27.72	43.89	10.54	38.26	2.00
45.00	23.00	1.50	1.00	1.508	0.81	28.10	47.30	10.62	38.72	2.00
45.50	23.80	1.50	1.00	1.520	0.81	28.96	47.30	10.79	39.75	2.00
46.00	24.60	1.50	1.00	1.532	0.81	29.82	47.30	10.96	40.78	2.00
46.50	25.40	1.50	1.00	1.543	0.80	30.67	47.30	11.13	41.80	2.00
47.00	26.20	1.50	1.00	1.555	0.80	31.51	47.30	11.30	42.81	2.00
47.50	27.00	1.50	1.00	1.567	0.80	32.35	47.30	11.47	43.82	2.00
48.00	27.80	1.50	1.00	1.579	0.80	33.18	47.30	11.64	44.82	2.00
48.50	28.60	1.50	1.00	1.591	0.79	34.01	47.30	11.80	45.81	2.00
49.00	29.40	1.50	1.00	1.603	0.79	34.83	47.30	11.97	46.80	2.00
49.50	30.20	1.50	1.00	1.615	0.79	35.65	47.30	12.13	47.78	2.00
50.00	31.00	1.50	1.00	1.627	0.78	36.46	47.30	12.29	48.75	2.00
50.50	31.00	1.50	1.00	1.639	0.78	36.33	47.30	12.27	48.59	2.00
51.00	31.00	1.50	1.00	1.651	0.78	36.19	47.30	12.24	48.43	2.00

CRR is based on water table at 14.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 7.04:

Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs	F.S.=CRRm/CSRfs
0.00	0.00	0.25	1.00	0.25	1.18	0.30	0.37	5.00
0.50	0.02	0.25	1.00	0.25	1.18	0.30	0.37	5.00
1.00	0.04	0.25	1.00	0.25	1.18	0.30	0.37	5.00
1.50	0.05	0.25	1.00	0.25	1.18	0.30	0.37	5.00
2.00	0.07	0.25	1.00	0.25	1.18	0.30	0.37	5.00
2.50	0.09	0.25	1.00	0.25	1.18	0.30	0.37	5.00
3.00	0.11	0.25	1.00	0.25	1.18	0.30	0.37	5.00
3.50	0.13	0.25	1.00	0.25	1.18	0.30	0.36	5.00
4.00	0.14	0.25	1.00	0.25	1.18	0.30	0.36	5.00
4.50	0.16	0.25	1.00	0.25	1.18	0.30	0.36	5.00
5.00	0.18	0.25	1.00	0.25	1.18	0.30	0.36	0.82 *
5.50	0.20	0.25	1.00	0.25	1.18	0.30	0.38	0.77 *
6.00	0.21	0.25	1.00	0.25	1.18	0.30	0.40	0.74 *
6.50	0.23	0.23	1.00	0.23	1.18	0.27	0.42	0.64 *
7.00	0.25	0.20	1.00	0.20	1.18	0.24	0.43	0.55 *
7.50	0.27	0.18	1.00	0.18	1.18	0.21	0.45	0.47 *
8.00	0.29	0.16	1.00	0.16	1.18	0.18	0.46	0.40 *
8.50	0.30	0.15	1.00	0.15	1.18	0.18	0.47	0.38 *
9.00	0.32	0.13	1.00	0.13	1.18	0.16	0.48	0.32 *
9.50	0.34	0.11	1.00	0.11	1.18	0.13	0.49	0.27 *
10.00	0.36	0.09	1.00	0.09	1.18	0.11	0.50	0.22 *
10.50	0.38	0.13	1.00	0.13	1.18	0.15	0.51	0.29 *
11.00	0.39	0.16	1.00	0.16	1.18	0.19	0.52	0.36 *
11.50	0.41	0.19	1.00	0.19	1.18	0.22	0.53	0.42 *
12.00	0.43	0.22	1.00	0.22	1.18	0.26	0.53	0.49 *

12.50	0.45	0.25	1.00	0.25	1.18	0.30	0.54	0.55 *
13.00	0.46	0.29	1.00	0.29	1.18	0.34	0.55	0.63 *
13.50	0.48	0.35	1.00	0.35	1.18	0.41	0.55	0.73 *
14.00	0.50	2.00	1.00	2.00	1.18	2.35	0.56	4.20
14.50	0.51	0.45	1.00	0.45	1.18	0.53	0.57	0.93 *
15.00	0.52	2.00	1.00	2.00	1.18	2.35	0.57	4.12
15.50	0.52	2.00	1.00	2.00	1.18	2.35	0.58	4.08
16.00	0.53	2.00	1.00	2.00	1.18	2.35	0.58	4.05
16.50	0.54	2.00	1.00	2.00	1.18	2.35	0.59	4.02
17.00	0.55	2.00	1.00	2.00	1.18	2.35	0.59	3.99
17.50	0.55	2.00	1.00	2.00	1.18	2.35	0.59	3.96
18.00	0.56	2.00	1.00	2.00	1.18	2.35	0.60	3.94
18.50	0.57	2.00	1.00	2.00	1.18	2.35	0.60	3.91
19.00	0.58	2.00	1.00	2.00	1.18	2.35	0.60	3.89
19.50	0.59	2.00	1.00	2.00	1.18	2.35	0.61	3.87
20.00	0.59	2.00	1.00	2.00	1.18	2.35	0.61	3.85
20.50	0.60	2.00	1.00	2.00	1.18	2.35	0.61	3.83
21.00	0.61	2.00	1.00	2.00	1.18	2.35	0.62	3.82
21.50	0.62	2.00	1.00	2.00	1.18	2.35	0.62	3.80
22.00	0.62	2.00	1.00	2.00	1.18	2.35	0.62	3.78
22.50	0.63	2.00	1.00	2.00	1.18	2.35	0.62	3.77
23.00	0.64	2.00	1.00	2.00	1.18	2.35	0.63	3.75
23.50	0.65	2.00	1.00	2.00	1.18	2.35	0.63	3.74
24.00	0.66	2.00	1.00	2.00	1.18	2.35	0.63	3.73
24.50	0.66	2.00	1.00	2.00	1.18	2.35	0.63	3.72
25.00	0.67	2.00	1.00	2.00	1.18	2.35	0.63	3.71
25.50	0.68	2.00	1.00	2.00	1.18	2.35	0.64	3.70
26.00	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.69
26.50	0.69	2.00	1.00	2.00	1.18	2.35	0.64	3.68
27.00	0.70	2.00	1.00	2.00	1.18	2.35	0.64	3.67
27.50	0.71	2.00	1.00	2.00	1.18	2.35	0.64	3.66
28.00	0.72	2.00	1.00	2.00	1.18	2.35	0.64	3.65
28.50	0.72	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.00	0.73	2.00	1.00	2.00	1.18	2.35	0.65	3.64
29.50	0.74	2.00	1.00	2.00	1.18	2.35	0.65	3.63
30.00	0.75	2.00	1.00	2.00	1.18	2.35	0.65	3.62
30.50	0.76	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.00	0.76	2.00	1.00	2.00	1.18	2.35	0.65	3.63
31.50	0.77	2.00	1.00	2.00	1.18	2.35	0.65	3.64
32.00	0.78	2.00	1.00	2.00	1.18	2.35	0.64	3.65
32.50	0.79	2.00	1.00	2.00	1.18	2.35	0.64	3.65
33.00	0.79	2.00	1.00	2.00	1.18	2.35	0.64	3.66
33.50	0.80	2.00	1.00	2.00	1.18	2.35	0.64	3.67
34.00	0.81	2.00	1.00	2.00	1.18	2.35	0.64	3.68
34.50	0.82	2.00	1.00	2.00	1.18	2.35	0.64	3.68
35.00	0.83	2.00	1.00	2.00	1.18	2.35	0.64	3.69
35.50	0.83	2.00	1.00	2.00	1.18	2.35	0.64	3.70
36.00	0.84	2.00	1.00	2.00	1.18	2.35	0.63	3.71
36.50	0.85	2.00	1.00	2.00	1.18	2.35	0.63	3.72
37.00	0.86	2.00	1.00	2.00	1.18	2.35	0.63	3.73
37.50	0.86	2.00	1.00	2.00	1.18	2.35	0.63	3.74
38.00	0.87	2.00	1.00	2.00	1.18	2.35	0.63	3.75
38.50	0.88	2.00	1.00	2.00	1.18	2.35	0.63	3.76
39.00	0.89	0.45	1.00	0.45	1.18	0.53	0.62	0.85 *
39.50	0.89	0.36	1.00	0.36	1.18	0.42	0.62	0.68 *
40.00	0.90	0.32	1.00	0.32	1.18	0.38	0.62	0.61 *
40.50	0.91	0.37	1.00	0.37	1.18	0.44	0.62	0.71 *
41.00	0.92	2.00	1.00	2.00	1.18	2.35	0.62	3.82
41.50	0.93	2.00	1.00	2.00	1.18	2.35	0.61	3.83
42.00	0.93	2.00	1.00	2.00	1.18	2.35	0.61	3.84
42.50	0.94	2.00	1.00	2.00	1.18	2.35	0.61	3.85

43.00	0.95	2.00	1.00	2.00	1.18	2.35	0.61	3.87
43.50	0.96	2.00	1.00	2.00	1.18	2.35	0.61	3.88
44.00	0.96	2.00	1.00	2.00	1.18	2.35	0.60	3.89
44.50	0.97	2.00	1.00	2.00	1.18	2.35	0.60	3.91
45.00	0.98	2.00	1.00	2.00	1.18	2.35	0.60	3.92
45.50	0.99	2.00	1.00	2.00	1.18	2.35	0.60	3.94
46.00	1.00	2.00	1.00	2.00	1.18	2.35	0.60	3.95
46.50	1.00	2.00	1.01	2.01	1.18	2.36	0.59	3.99
47.00	1.01	2.00	1.00	2.01	1.18	2.36	0.59	4.00
47.50	1.02	2.00	1.00	2.01	1.18	2.36	0.59	4.01
48.00	1.03	2.00	1.00	2.00	1.18	2.36	0.59	4.02
48.50	1.03	2.00	1.00	2.00	1.18	2.35	0.58	4.03
49.00	1.04	2.00	1.00	2.00	1.18	2.35	0.58	4.04
49.50	1.05	2.00	1.00	2.00	1.18	2.35	0.58	4.05
50.00	1.06	2.00	1.00	1.99	1.18	2.34	0.58	4.07
50.50	1.07	2.00	1.00	1.99	1.18	2.34	0.57	4.08
51.00	1.07	2.00	0.99	1.99	1.18	2.34	0.57	4.09

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)
^ No-liquefiable Soils or above Water Table.
(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:
Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	22.95	2.80	0.00	22.95
0.50	-	-	-	22.95	2.80	0.00	22.95
1.00	-	-	-	22.95	2.80	0.00	22.95
1.50	-	-	-	22.95	2.80	0.00	22.95
2.00	-	-	-	22.95	2.80	0.00	22.95
2.50	-	-	-	22.95	2.80	0.00	22.95
3.00	-	-	-	22.95	2.80	0.00	22.95
3.50	-	-	-	22.95	2.80	0.00	22.95
4.00	-	-	-	22.95	2.80	0.00	22.95
4.50	-	-	-	22.95	2.80	0.00	22.95
5.00	-	-	-	22.95	2.80	0.00	22.95
5.50	-	-	-	22.95	2.80	0.00	22.95
6.00	-	-	-	22.95	2.80	0.00	22.95
6.50	-	-	-	20.93	2.80	0.00	20.93
7.00	-	-	-	18.58	2.80	0.00	18.58
7.50	-	-	-	16.42	2.80	0.00	16.42
8.00	-	-	-	14.42	2.80	0.00	14.42
8.50	-	-	-	14.22	2.80	0.00	14.22
9.00	-	-	-	12.23	2.80	0.00	12.23
9.50	-	-	-	10.36	2.80	0.00	10.36
10.00	-	-	-	8.60	2.80	0.00	8.60
10.50	-	-	-	11.74	2.80	0.00	11.74
11.00	-	-	-	14.75	2.80	0.00	14.75
11.50	-	-	-	17.63	2.80	0.00	17.63
12.00	-	-	-	20.40	2.80	0.00	20.40
12.50	-	-	-	23.07	2.80	0.00	23.07
13.00	-	-	-	25.63	2.80	0.00	25.63
13.50	-	-	-	28.11	2.80	0.00	28.11
14.00	-	-	-	30.51	2.80	0.00	30.51
14.50	-	-	-	29.94	6.51	0.00	29.94
15.00	-	-	-	33.93	10.22	0.00	33.93
15.50	-	-	-	34.85	13.93	0.00	34.85
16.00	-	-	-	35.57	17.63	0.00	35.57

16.50	-	-	-	36.05	21.34	0.00	36.05
17.00	-	-	-	36.35	25.05	0.00	36.35
17.50	-	-	-	36.54	28.76	0.00	36.54
18.00	-	-	-	36.66	32.47	0.00	36.66
18.50	-	-	-	36.50	36.18	0.00	36.50
19.00	-	-	-	35.53	39.88	0.00	35.53
19.50	-	-	-	34.58	43.59	0.00	34.58
20.00	-	-	-	33.64	47.30	0.00	33.64
20.50	-	-	-	33.63	48.69	0.00	33.63
21.00	-	-	-	33.62	50.08	0.00	33.62
21.50	-	-	-	33.62	51.47	0.00	33.62
22.00	-	-	-	33.62	52.86	0.00	33.62
22.50	-	-	-	33.61	54.25	0.00	33.61
23.00	-	-	-	33.61	55.64	0.00	33.61
23.50	-	-	-	33.61	57.03	0.00	33.61
24.00	-	-	-	33.61	58.42	0.00	33.61
24.50	-	-	-	33.62	59.81	0.00	33.62
25.00	-	-	-	33.62	61.20	0.00	33.62
25.50	-	-	-	33.62	62.66	0.00	33.62
26.00	-	-	-	33.63	64.12	0.00	33.63
26.50	-	-	-	33.63	65.58	0.00	33.63
27.00	-	-	-	33.64	67.04	0.00	33.64
27.50	-	-	-	33.65	68.50	0.00	33.65
28.00	-	-	-	35.16	69.96	0.00	35.16
28.50	-	-	-	35.17	71.42	0.00	35.17
29.00	-	-	-	35.18	72.88	0.00	35.18
29.50	-	-	-	35.19	74.34	0.00	35.19
30.00	-	-	-	35.20	75.80	0.00	35.20
30.50	-	-	-	35.21	72.95	0.00	35.21
31.00	-	-	-	35.23	70.10	0.00	35.23
31.50	-	-	-	35.24	67.25	0.00	35.24
32.00	-	-	-	35.25	64.40	0.00	35.25
32.50	-	-	-	35.27	61.55	0.00	35.27
33.00	-	-	-	35.28	58.70	0.00	35.28
33.50	-	-	-	35.30	55.85	0.00	35.30
34.00	-	-	-	35.32	53.00	0.00	35.32
34.50	-	-	-	35.33	50.15	0.00	35.33
35.00	-	-	-	35.35	47.30	0.00	35.35
35.50	-	-	-	35.21	43.89	0.00	35.21
36.00	-	-	-	35.07	40.48	0.00	35.07
36.50	-	-	-	34.93	37.07	0.00	34.93
37.00	-	-	-	34.35	33.66	0.00	34.35
37.50	-	-	-	33.31	30.25	0.00	33.31
38.00	-	-	-	32.25	26.84	0.00	32.25
38.50	-	-	-	31.15	23.43	0.00	31.15
39.00	-	-	-	29.95	20.02	0.00	29.95
39.50	-	-	-	28.61	16.61	0.00	28.61
40.00	-	-	-	27.06	13.20	0.00	27.06
40.50	-	-	-	28.92	16.61	0.00	28.92
41.00	-	-	-	30.59	20.02	0.00	30.59
41.50	-	-	-	32.12	23.43	0.00	32.12
42.00	-	-	-	33.57	26.84	0.00	33.57
42.50	-	-	-	34.99	30.25	0.00	34.99
43.00	-	-	-	36.40	33.66	0.00	36.40
43.50	-	-	-	37.34	37.07	0.00	37.34
44.00	-	-	-	37.80	40.48	0.00	37.80
44.50	-	-	-	38.26	43.89	0.00	38.26
45.00	-	-	-	38.72	47.30	0.00	38.72
45.50	-	-	-	39.75	47.30	0.00	39.75
46.00	-	-	-	40.78	47.30	0.00	40.78
46.50	-	-	-	41.80	47.30	0.00	41.80

47.00	-	-	-	42.81	47.30	0.00	42.81
47.50	-	-	-	43.82	47.30	0.00	43.82
48.00	-	-	-	44.82	47.30	0.00	44.82
48.50	-	-	-	45.81	47.30	0.00	45.81
49.00	-	-	-	46.80	47.30	0.00	46.80
49.50	-	-	-	47.78	47.30	0.00	47.78
50.00	-	-	-	48.75	47.30	0.00	48.75
50.50	-	-	-	48.59	47.30	0.00	48.59
51.00	-	-	-	48.43	47.30	0.00	48.43

(N1)60s has been fines corrected in liquefaction analysis, therefore d(N1)60=0.
Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:
Settlement Analysis Method: Ishihara / Yoshimine

Depth ft	CSRsf	/ MSF*	=CSRm	F.S.	Fines %	(N1)60s	Dr %	ec %	dsz in.	dsp in.	S in.
50.95	0.57	1.00	0.57	4.09	47.30	48.45	100.00	0.000	0.0E0	0.000	0.000
50.50	0.57	1.00	0.57	4.08	47.30	48.59	100.00	0.000	0.0E0	0.000	0.000
50.00	0.58	1.00	0.58	4.07	47.30	48.75	100.00	0.000	0.0E0	0.000	0.000
49.50	0.58	1.00	0.58	4.05	47.30	47.78	100.00	0.000	0.0E0	0.000	0.000
49.00	0.58	1.00	0.58	4.04	47.30	46.80	100.00	0.000	0.0E0	0.000	0.000
48.50	0.58	1.00	0.58	4.03	47.30	45.81	100.00	0.000	0.0E0	0.000	0.000
48.00	0.59	1.00	0.59	4.02	47.30	44.82	100.00	0.000	0.0E0	0.000	0.000
47.50	0.59	1.00	0.59	4.01	47.30	43.82	100.00	0.000	0.0E0	0.000	0.000
47.00	0.59	1.00	0.59	4.00	47.30	42.81	100.00	0.000	0.0E0	0.000	0.000
46.50	0.59	1.00	0.59	3.99	47.30	41.80	100.00	0.000	0.0E0	0.000	0.000
46.00	0.60	1.00	0.60	3.95	47.30	40.78	100.00	0.000	0.0E0	0.000	0.000
45.50	0.60	1.00	0.60	3.94	47.30	39.75	100.00	0.000	0.0E0	0.000	0.000
45.00	0.60	1.00	0.60	3.92	47.30	38.72	100.00	0.000	0.0E0	0.000	0.000
44.50	0.60	1.00	0.60	3.91	43.89	38.26	100.00	0.000	0.0E0	0.000	0.000
44.00	0.60	1.00	0.60	3.89	40.48	37.80	100.00	0.000	0.0E0	0.000	0.000
43.50	0.61	1.00	0.61	3.88	37.07	37.34	100.00	0.000	0.0E0	0.000	0.000
43.00	0.61	1.00	0.61	3.87	33.66	36.40	100.00	0.000	0.0E0	0.000	0.000
42.50	0.61	1.00	0.61	3.85	30.25	34.99	100.00	0.000	0.0E0	0.000	0.000
42.00	0.61	1.00	0.61	3.84	26.84	33.57	98.76	0.000	0.0E0	0.000	0.000
41.50	0.61	1.00	0.61	3.83	23.43	32.12	95.07	0.000	0.0E0	0.000	0.000
41.00	0.62	1.00	0.62	3.82	20.02	30.59	91.42	0.000	0.0E0	0.000	0.000
40.50	0.62	1.00	0.62	0.71	16.61	28.92	87.68	1.048	6.3E-3	0.041	0.041
40.00	0.62	1.00	0.62	0.61	13.20	27.06	83.76	1.441	8.6E-3	0.076	0.117
39.50	0.62	1.00	0.62	0.68	16.61	28.61	87.00	1.128	6.8E-3	0.076	0.193
39.00	0.62	1.00	0.62	0.85	20.02	29.95	89.95	0.707	4.2E-3	0.055	0.248
38.50	0.63	1.00	0.63	3.76	23.43	31.15	92.71	0.000	0.0E0	0.004	0.252
38.00	0.63	1.00	0.63	3.75	26.84	32.25	95.38	0.000	0.0E0	0.000	0.252
37.50	0.63	1.00	0.63	3.74	30.25	33.31	98.06	0.000	0.0E0	0.000	0.252
37.00	0.63	1.00	0.63	3.73	33.66	34.35	100.00	0.000	0.0E0	0.000	0.252
36.50	0.63	1.00	0.63	3.72	37.07	34.93	100.00	0.000	0.0E0	0.000	0.252
36.00	0.63	1.00	0.63	3.71	40.48	35.07	100.00	0.000	0.0E0	0.000	0.252
35.50	0.64	1.00	0.64	3.70	43.89	35.21	100.00	0.000	0.0E0	0.000	0.252
35.00	0.64	1.00	0.64	3.69	47.30	35.35	100.00	0.000	0.0E0	0.000	0.252
34.50	0.64	1.00	0.64	3.68	50.15	35.33	100.00	0.000	0.0E0	0.000	0.252
34.00	0.64	1.00	0.64	3.68	53.00	35.32	100.00	0.000	0.0E0	0.000	0.252
33.50	0.64	1.00	0.64	3.67	55.85	35.30	100.00	0.000	0.0E0	0.000	0.252
33.00	0.64	1.00	0.64	3.66	58.70	35.28	100.00	0.000	0.0E0	0.000	0.252
32.50	0.64	1.00	0.64	3.65	61.55	35.27	100.00	0.000	0.0E0	0.000	0.252
32.00	0.64	1.00	0.64	3.65	64.40	35.25	100.00	0.000	0.0E0	0.000	0.252
31.50	0.65	1.00	0.65	3.64	67.25	35.24	100.00	0.000	0.0E0	0.000	0.252
31.00	0.65	1.00	0.65	3.63	70.10	35.23	100.00	0.000	0.0E0	0.000	0.252
30.50	0.65	1.00	0.65	3.63	72.95	35.21	100.00	0.000	0.0E0	0.000	0.252

30.00	0.65	1.00	0.65	3.62	75.80	35.20	100.00	0.000	0.0E0	0.000	0.252
29.50	0.65	1.00	0.65	3.63	74.34	35.19	100.00	0.000	0.0E0	0.000	0.252
29.00	0.65	1.00	0.65	3.64	72.88	35.18	100.00	0.000	0.0E0	0.000	0.252
28.50	0.65	1.00	0.65	3.64	71.42	35.17	100.00	0.000	0.0E0	0.000	0.252
28.00	0.64	1.00	0.64	3.65	69.96	35.16	100.00	0.000	0.0E0	0.000	0.252
27.50	0.64	1.00	0.64	3.66	68.50	33.65	98.95	0.000	0.0E0	0.000	0.252
27.00	0.64	1.00	0.64	3.67	67.04	33.64	98.93	0.000	0.0E0	0.000	0.252
26.50	0.64	1.00	0.64	3.68	65.58	33.63	98.91	0.000	0.0E0	0.000	0.252
26.00	0.64	1.00	0.64	3.69	64.12	33.63	98.90	0.000	0.0E0	0.000	0.252
25.50	0.64	1.00	0.64	3.70	62.66	33.62	98.89	0.000	0.0E0	0.000	0.252
25.00	0.63	1.00	0.63	3.71	61.20	33.62	98.88	0.000	0.0E0	0.000	0.252
24.50	0.63	1.00	0.63	3.72	59.81	33.62	98.87	0.000	0.0E0	0.000	0.252
24.00	0.63	1.00	0.63	3.73	58.42	33.61	98.86	0.000	0.0E0	0.000	0.252
23.50	0.63	1.00	0.63	3.74	57.03	33.61	98.86	0.000	0.0E0	0.000	0.252
23.00	0.63	1.00	0.63	3.75	55.64	33.61	98.86	0.000	0.0E0	0.000	0.252
22.50	0.62	1.00	0.62	3.77	54.25	33.61	98.86	0.000	0.0E0	0.000	0.252
22.00	0.62	1.00	0.62	3.78	52.86	33.62	98.87	0.000	0.0E0	0.000	0.252
21.50	0.62	1.00	0.62	3.80	51.47	33.62	98.88	0.000	0.0E0	0.000	0.252
21.00	0.62	1.00	0.62	3.82	50.08	33.62	98.89	0.000	0.0E0	0.000	0.252
20.50	0.61	1.00	0.61	3.83	48.69	33.63	98.91	0.000	0.0E0	0.000	0.252
20.00	0.61	1.00	0.61	3.85	47.30	33.64	98.93	0.000	0.0E0	0.000	0.252
19.50	0.61	1.00	0.61	3.87	43.59	34.58	100.00	0.000	0.0E0	0.000	0.252
19.00	0.60	1.00	0.60	3.89	39.88	35.53	100.00	0.000	0.0E0	0.000	0.252
18.50	0.60	1.00	0.60	3.91	36.18	36.50	100.00	0.000	0.0E0	0.000	0.252
18.00	0.60	1.00	0.60	3.94	32.47	36.66	100.00	0.000	0.0E0	0.000	0.252
17.50	0.59	1.00	0.59	3.96	28.76	36.54	100.00	0.000	0.0E0	0.000	0.252
17.00	0.59	1.00	0.59	3.99	25.05	36.35	100.00	0.000	0.0E0	0.000	0.252
16.50	0.59	1.00	0.59	4.02	21.34	36.05	100.00	0.000	0.0E0	0.000	0.252
16.00	0.58	1.00	0.58	4.05	17.63	35.57	100.00	0.000	0.0E0	0.000	0.252
15.50	0.58	1.00	0.58	4.08	13.93	34.85	100.00	0.000	0.0E0	0.000	0.252
15.00	0.57	1.00	0.57	4.12	10.22	33.93	99.69	0.000	0.0E0	0.000	0.252
14.50	0.57	1.00	0.57	0.93	6.51	29.94	89.92	0.585	3.5E-3	0.020	0.271
14.00	0.56	1.00	0.56	4.20	2.80	30.51	91.23	0.000	0.0E0	0.015	0.287
13.50	0.55	1.00	0.55	0.73	2.80	28.11	85.95	1.072	6.4E-3	0.045	0.331
13.00	0.55	1.00	0.55	0.63	2.80	25.63	80.94	1.547	9.3E-3	0.080	0.412
12.50	0.54	1.00	0.54	0.55	2.80	23.07	76.09	1.897	1.1E-2	0.106	0.517
12.00	0.53	1.00	0.53	0.49	2.80	20.40	71.26	2.139	1.3E-2	0.122	0.639
11.50	0.53	1.00	0.53	0.42	2.80	17.63	66.25	2.424	1.5E-2	0.137	0.776
11.00	0.52	1.00	0.52	0.36	2.80	14.75	60.79	2.756	1.7E-2	0.156	0.933
10.50	0.51	1.00	0.51	0.29	2.80	11.74	54.55	3.194	1.9E-2	0.179	1.112
10.00	0.50	1.00	0.50	0.22	2.80	8.60	47.05	3.815	2.3E-2	0.210	1.322
9.50	0.49	1.00	0.49	0.27	2.80	10.36	51.40	3.419	2.1E-2	0.215	1.537
9.00	0.48	1.00	0.48	0.32	2.80	12.23	55.61	3.118	1.9E-2	0.195	1.732
8.50	0.47	1.00	0.47	0.38	2.80	14.22	59.73	2.823	1.7E-2	0.177	1.909
8.00	0.46	1.00	0.46	0.40	2.80	14.42	60.13	2.796	1.7E-2	0.168	2.077
7.50	0.45	1.00	0.45	0.47	2.80	16.42	64.00	2.561	1.5E-2	0.160	2.237
7.00	0.43	1.00	0.43	0.55	2.80	18.58	67.98	2.319	1.4E-2	0.146	2.383
6.50	0.42	1.00	0.42	0.64	2.80	20.93	72.22	2.041	1.2E-2	0.131	2.513
6.00	0.40	1.00	0.40	0.74	2.80	22.95	75.88	1.602	9.6E-3	0.109	2.622
5.50	0.38	1.00	0.38	0.77	2.80	22.95	75.88	1.500	9.0E-3	0.093	2.715
5.00	0.36	1.00	0.36	0.82	2.80	22.95	75.88	1.369	8.2E-3	0.086	2.801

Settlement of Saturated Sands=2.801 in.
qc1 and (N1)60 is after fines correction in liquefaction analysis
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec	ec	dsz	dsp	S
ft	atm	atm			atm			%		%	in.	in.	in.

4.95	0.27	0.18	22.95	0.36	534.08	1.9E-4	0.0355	0.0292	0.94	0.0275	3.30E-4	0.000	0.000
4.50	0.25	0.16	22.95	0.36	509.22	1.8E-4	0.0332	0.0273	0.94	0.0257	3.08E-4	0.003	0.003
4.00	0.22	0.14	22.95	0.36	480.10	1.7E-4	0.0360	0.0296	0.94	0.0278	3.34E-4	0.003	0.006
3.50	0.19	0.13	22.95	0.36	449.10	1.6E-4	0.0316	0.0260	0.94	0.0244	2.93E-4	0.003	0.009
3.00	0.17	0.11	22.95	0.37	415.78	1.4E-4	0.0278	0.0229	0.94	0.0215	2.58E-4	0.003	0.012
2.50	0.14	0.09	22.95	0.37	379.56	1.3E-4	0.0246	0.0202	0.94	0.0190	2.28E-4	0.002	0.015
2.00	0.11	0.07	22.95	0.37	339.49	1.2E-4	0.0254	0.0209	0.94	0.0197	2.36E-4	0.002	0.017
1.50	0.08	0.05	22.95	0.37	294.01	1.0E-4	0.0209	0.0172	0.94	0.0161	1.94E-4	0.002	0.019
1.00	0.06	0.04	22.95	0.37	240.07	8.4E-5	0.0151	0.0124	0.94	0.0117	1.40E-4	0.002	0.021
0.50	0.03	0.02	22.95	0.37	169.77	6.0E-5	0.0092	0.0076	0.94	0.0071	8.53E-5	0.001	0.022
0.00	0.00	0.00	22.95	0.37	3.24	1.1E-6	0.0010	0.0008	0.94	0.0008	9.44E-6	0.000	0.022

Settlement of Unsaturated Sands=0.022 in.
dsz is per each segment, dz=0.05 ft
dsp is per each print interval, dp=0.50 ft
S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=2.823 in.
Differential Settlement=1.412 to 1.863 in.

Units: Depth = ft, Stress or Pressure = atm (tsf), Unit Weight = pcf, Settlement = in.

1 atm (atmosphere) = 1 tsf (ton/ft2)	
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm (tsf)]
sigma'	Effective vertical stress [atm (tsf)]
sigC'	Effective confining pressure [atm (tsf)]
rd	Stress reduction coefficient
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction F.S.=CRRm/CSRsf
Cebs	Energy Ratio, Borehole Dia., and Sampling Method Corrections
Cr	Rod Length Corrections
Cn	Overburden Pressure Correction
(N1)60	SPT after corrections, (N1)60=SPT * Cr * Cn * Cebs
d(N1)60	Fines correction of SPT
(N1)60f	(N1)60 after fines corrections, (N1)60f=(N1)60 + d(N1)60
Cq	Overburden stress correction factor
qc1	CPT after Overburden stress correction
dqc1	Fines correction of CPT
qc1f	CPT after Fines and Overburden correction, qc1f=qc1 + dqc1
qc1n	CPT after normalization in Robertson's method
Kc	Fine correction factor in Robertson's Method
qc1f	CPT after Fines correction in Robertson's Method
Ic	Soil type index in Suzuki's and Robertson's Methods

(N1)60s	(N1)60 after settlement fines corrections
CSRm	After magnitude scaling correction for Settlement calculation CSRm=CSRsf / MSF*
CSRfs	Cyclic stress ratio induced by earthquake with user inputed fs
MSF*	Scaling factor from CSR, MSF*=1, based on Item 2 of Page C.
ec	Volumetric strain for saturated sands
dz	Calculation segment, dz=0.050 ft
dsz	Settlement in each segment, dz
dp	User defined print interval
dsp	Settlement in each print interval, dp
Gmax	Shear Modulus at low strain
g_eff	gamma_eff, Effective shear Strain
g*Ge/Gm	gamma_eff * G_eff/G_max, Strain-modulus ratio
ec7.5	Volumetric Strain for magnitude=7.5
Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, ec=Cec * ec7.5
NoLiq	No-Liquefy Soils

References:

1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.

2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth
International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.

3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center,
Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

APPENDIX IV

SEISMIC ANALYSIS

Seismic Programs

Seismic Calculations

EQSEARCH

The program EQSEARCH was used to determine all historical earthquakes with event magnitudes ranging from 4.5 to 9.0 on the Richter Scale within a 50 mile search radius of the subject property over the past 100 years. EQSEARCH effectively performs searches of a historical-earthquake catalog using an abbreviated (M=4.0 and above, and latitude from 30.0 to 36.5) and supplemented Southern California version of the California Division of Mines and Geology computerized earthquake catalog for the State of California. Search parameters (i.e., geographic limits, limiting dates, and limiting magnitudes) are specified and the user selects one of 14 available acceleration-attenuation relations. Site specific peak-horizontal-acceleration probability of exceedance is also estimated from the historical search. For each historical earthquake in the search area, EQSEARCH prints latitude, longitude, date, depth, Richter magnitude, computed site-acceleration, computed site-Modified-Mercalli Intensity, and the approximate earthquake-to-site distance in both miles and kilometers. Data files needed to generate an epicenter map and a seismic recurrence curve is also created by EQSEARCH.

EQFAULT

The program EQFAULT was used to estimate the proximity of various faults within a 50 mile radius, determine their maximum probable event magnitudes, and calculate the resulting ground accelerations on the subject property. EQFAULT effectively performs deterministic seismic hazard analyses using up to 150 digitized California faults as earthquake sources. The program estimates the closest distance between each fault and a user-specified site (given as latitude/longitude). If a fault is found to be within a user-selected radius, the program estimates peak horizontal ground acceleration that may occur at the site from the "maximum credible" and "maximum probable" earthquakes on that fault. Site acceleration (g) is computed by any of the 14 user-selected acceleration-attenuation relations that are contained in EQFAULT. Site Modified Mercalli Intensities are also predicted (based on the peak acceleration) for each earthquake event. Data files needed to generate a fault model map and a comparison plot of earthquake accelerations is also created by EQFAULT.

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*                      *
*    E Q S E A R C H   *
*                      *
*     Version 3.00     *
*                      *
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     ESTIMATION OF
  PEAK ACCELERATION FROM
CALIFORNIA EARTHQUAKE CATALOGS

JOB NUMBER: 5462B

JOB NAME: Oxnard Shores

EARTHQUAKE-CATALOG-FILE NAME: ALLQUAKE.DAT


MAGNITUDE RANGE:
   MINIMUM MAGNITUDE:  4.50
   MAXIMUM MAGNITUDE:  9.00

SITE COORDINATES:
   SITE LATITUDE:  34.1935
   SITE LONGITUDE:  119.2365

SEARCH DATES:
           START DATE:   1900
           END DATE:   2000

SEARCH RADIUS:
           50.0 mi
           80.5 km

ATTENUATION RELATION:  14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
   UNCERTAINTY (M=Median, S=Sigma): S       Number of Sigmas:  1.0
   ASSUMED SOURCE TYPE:  DS [SS=Strike-slip, DS=Reverse-slip, BT=Blind-thrust]
   SCOND:   0  Depth Source:  A
   Basement Depth:  1.00 km     Campbell SSR:  0     Campbell SHR:  0
   COMPUTE RHGA HORIZ. ACCEL. (FACTOR:   0.65    DISTANCE:   20  miles)

MINIMUM DEPTH VALUE (km):  3.0
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EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
MGI	34.3000	119.3000	05/01/1904	1830 0.0	0.0	4.60	0.083	VII	8.2(13.2)
MGI	34.0000	119.0000	12/14/1912	0 0 0.0	0.0	5.70	0.111	VII	19.0(30.6)
MGI	34.2000	119.2000	06/16/1914	1052 0.0	0.0	4.60	0.171	VIII	2.1(3.4)
DMG	34.0000	118.5000	11/08/1914	1140 0.0	0.0	4.50	0.013	III	44.2(71.1)
DMG	34.7000	119.0000	10/23/1916	254 0.0	0.0	5.50	0.037	V	37.5(60.3)
DMG	34.2500	119.5000	04/13/1917	359 0.0	0.0	4.50	0.055	VI	15.5(25.0)
MGI	34.0000	118.5000	11/19/1918	2018 0.0	0.0	5.00	0.019	IV	44.2(71.1)
MGI	34.0000	118.4000	02/22/1920	1610 0.0	0.0	4.60	0.012	III	49.7(79.9)
DMG	34.0000	118.5000	06/22/1920	248 0.0	0.0	4.90	0.018	IV	44.2(71.1)
DMG	34.5000	119.5000	12/05/1920	1158 0.0	0.0	4.50	0.027	V	25.9(41.8)
DMG	34.3000	119.8000	06/29/1925	144216.0	0.0	6.25	0.080	VII	33.0(53.1)
MGI	34.3000	119.8000	07/03/1925	1638 0.0	0.0	5.30	0.037	V	33.0(53.1)
MGI	34.3000	119.8000	07/03/1925	1821 0.0	0.0	5.30	0.037	V	33.0(53.1)
DMG	34.0000	119.5000	02/18/1926	1818 0.0	0.0	5.00	0.058	VI	20.1(32.4)
DMG	34.5000	119.5000	06/29/1926	2321 0.0	0.0	5.50	0.061	VI	25.9(41.8)
MGI	34.0000	118.4000	02/07/1927	429 0.0	0.0	4.60	0.012	III	49.7(79.9)
DMG	34.0000	118.5000	08/04/1927	1224 0.0	0.0	5.00	0.019	IV	44.2(71.1)
MGI	34.4000	119.8000	09/09/1929	515 0.0	0.0	4.60	0.019	IV	35.2(56.6)
DMG	34.5000	119.5000	08/05/1930	1125 0.0	0.0	5.00	0.041	V	25.9(41.8)
DMG	33.9500	118.6320	08/31/1930	04036.0	0.0	5.20	0.028	V	38.4(61.9)
MGI	34.0000	118.4000	10/01/1930	040 0.0	0.0	4.60	0.012	III	49.7(79.9)
DMG	34.8850	119.0020	02/23/1939	91846.7	10.0	4.50	0.011	III	49.6(79.8)
DMG	34.3670	119.5830	07/01/1941	75054.8	0.0	5.90	0.100	VII	23.1(37.2)
DMG	34.3330	119.5830	07/01/1941	2354 0.0	0.0	4.50	0.034	V	22.0(35.4)
DMG	34.3330	119.5830	07/12/1941	1618 0.0	0.0	4.50	0.034	V	22.0(35.4)
DMG	34.3330	119.5830	09/08/1941	31245.0	0.0	4.50	0.034	V	22.0(35.4)
DMG	34.8670	118.9330	09/21/1941	1953 7.2	0.0	5.20	0.019	IV	49.6(79.8)
DMG	34.4830	118.9830	09/03/1942	14 6 1.0	0.0	4.50	0.029	V	24.7(39.7)
DMG	34.4830	118.9830	09/04/1942	63433.0	0.0	4.50	0.029	V	24.7(39.7)
DMG	34.0000	120.0170	04/01/1945	234342.0	0.0	5.40	0.025	V	46.6(75.0)
DMG	34.0170	118.9670	04/16/1948	222624.0	0.0	4.70	0.047	VI	19.6(31.6)
DMG	34.6170	119.0830	02/26/1950	0 622.0	0.0	4.70	0.026	V	30.5(49.1)
DMG	33.9170	119.5000	08/26/1954	1348 3.0	0.0	4.80	0.038	V	24.3(39.1)
DMG	34.5860	118.6130	02/07/1956	31638.6	2.6	4.60	0.014	IV	44.7(71.9)
DMG	34.1180	119.2200	03/18/1957	185628.0	13.8	4.70	0.125	VII	5.3(8.5)
DMG	34.3490	119.4920	07/14/1958	52555.3	16.0	4.70	0.053	VI	18.1(29.1)
DMG	34.1180	119.7020	07/05/1968	04517.2	5.9	5.20	0.045	VI	27.1(43.6)
DMG	34.1760	119.7540	07/07/1968	143330.8	12.8	4.50	0.023	IV	29.6(47.6)
DMG	34.4110	118.4010	02/09/1971	14 041.8	8.4	6.40	0.050	VI	50.0(80.4)
DMG	34.4110	118.4010	02/09/1971	14 1 8.0	8.0	5.80	0.031	V	50.0(80.4)
DMG	34.4110	118.4010	02/09/1971	14 150.0	8.0	4.50	0.011	III	50.0(80.4)
DMG	34.4110	118.4010	02/09/1971	14 231.0	8.0	4.70	0.013	III	50.0(80.4)
DMG	34.4110	118.4010	02/09/1971	14 244.0	8.0	5.80	0.031	V	50.0(80.4)
DMG	34.4110	118.4010	02/09/1971	14 745.0	8.0	4.50	0.011	III	50.0(80.4)
DMG	34.4110	118.4010	02/09/1971	14 838.0	8.0	4.50	0.011	III	50.0(80.4)
DMG	34.4110	118.4010	02/09/1971	14 853.0	8.0	4.60	0.012	III	50.0(80.4)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
DMG	34.4110	118.4010	02/09/1971	141028.0	8.0	5.30	0.021	IV	50.0(80.4)
DMG	34.3440	118.6360	02/09/1971	143436.1	-2.0	4.90	0.024	V	35.8(57.6)
DMG	34.3080	118.4540	02/09/1971	144346.7	6.2	5.20	0.022	IV	45.3(73.0)
DMG	34.4260	118.4140	02/10/1971	518 7.2	5.8	4.50	0.011	III	49.6(79.8)
DMG	34.3970	118.4390	02/21/1971	55052.6	6.9	4.70	0.014	III	47.6(76.6)
DMG	34.3920	118.4270	02/21/1971	71511.7	7.2	4.50	0.011	III	48.2(77.5)
DMG	34.3530	118.4560	03/07/1971	13340.5	3.3	4.50	0.012	III	45.9(73.8)
DMG	34.2860	118.5150	03/31/1971	145222.5	2.1	4.60	0.015	IV	41.7(67.1)
DMG	34.0650	119.0350	02/21/1973	144557.3	8.0	5.90	0.175	VIII	14.5(23.4)
DMG	33.9860	119.4750	08/06/1973	232917.0	16.9	5.00	0.059	VI	19.8(31.8)
DMG	34.3990	118.4730	03/09/1974	05431.9	24.4	4.70	0.014	IV	45.8(73.7)
PAS	34.3470	118.6560	04/08/1976	152138.1	14.5	4.60	0.020	IV	34.8(56.0)
PAS	34.3800	118.4590	08/12/1977	21926.1	9.5	4.50	0.012	III	46.2(74.3)
PAS	34.3470	119.6960	08/13/1978	225453.4	12.8	5.10	0.039	V	28.3(45.5)
PAS	33.9440	118.6810	01/01/1979	231438.9	11.3	5.00	0.026	V	36.1(58.2)
PAS	33.6710	119.1110	09/04/1981	155050.3	5.0	5.30	0.032	V	36.8(59.2)
PAS	33.6300	119.0200	10/23/1981	172816.9	12.0	4.60	0.016	IV	40.8(65.7)
PAS	33.6370	119.0560	10/23/1981	191552.5	6.3	4.60	0.016	IV	39.8(64.0)
PAS	34.0160	118.9880	10/26/1984	172043.5	13.3	4.60	0.046	VI	18.8(30.2)
PAS	33.9190	118.6270	01/19/1989	65328.8	11.9	5.00	0.023	IV	39.7(63.9)
GSP	34.2130	118.5370	01/17/1994	123055.4	18.0	6.70	0.087	VII	40.0(64.3)
GSP	34.2610	118.5340	01/17/1994	123939.8	14.0	4.50	0.015	IV	40.4(65.0)
GSP	34.2540	118.5450	01/17/1994	130627.9	0.0	4.60	0.016	IV	39.7(63.9)
GSP	34.3170	118.4550	01/17/1994	132644.7	2.0	4.70	0.015	IV	45.4(73.1)
GSB	34.2850	118.6240	01/17/1994	135602.4	19.0	4.70	0.021	IV	35.5(57.2)
GSP	34.3310	118.4420	01/17/1994	141430.3	1.0	4.50	0.012	III	46.3(74.5)
GSP	34.3740	118.6220	01/17/1994	155410.8	12.0	4.80	0.021	IV	37.2(59.9)
GSP	34.2280	118.5730	01/17/1994	175608.2	19.0	4.60	0.017	IV	38.0(61.1)
GSB	34.3010	118.5650	01/17/1994	204602.4	9.0	5.20	0.027	V	39.0(62.8)
GSP	34.3260	118.6980	01/17/1994	233330.7	9.0	5.60	0.050	VI	32.1(51.6)
GSP	34.3770	118.6980	01/18/1994	004308.9	11.0	5.20	0.034	V	33.2(53.5)
GSB	34.3580	118.6220	01/18/1994	040126.8	1.0	4.50	0.017	IV	36.8(59.3)
GSB	34.3190	118.5580	01/18/1994	132444.1	1.0	4.50	0.015	IV	39.7(63.8)
GSP	34.3790	118.5610	01/18/1994	152346.9	7.0	4.80	0.019	IV	40.6(65.3)
GSB	34.3600	118.5710	01/19/1994	044048.0	2.0	4.50	0.015	IV	39.7(63.8)
GSP	34.2150	118.5100	01/19/1994	140914.8	17.0	4.50	0.014	IV	41.5(66.8)
GSB	34.3790	118.7110	01/19/1994	210928.6	14.0	5.50	0.045	VI	32.6(52.5)
GSP	34.3780	118.6180	01/19/1994	211144.9	11.0	5.10	0.026	V	37.5(60.4)
GSB	34.3000	118.4660	01/21/1994	183915.3	10.0	4.70	0.015	IV	44.6(71.7)
GSB	34.3450	118.5520	01/24/1994	041518.8	6.0	4.80	0.019	IV	40.4(65.1)
GSP	34.2740	118.5630	01/27/1994	171958.8	14.0	4.60	0.017	IV	38.8(62.5)
GSP	34.3050	118.5790	01/29/1994	112036.0	1.0	5.10	0.026	V	38.3(61.6)
GSP	34.2310	118.4750	03/20/1994	212012.3	13.0	5.30	0.025	V	43.6(70.1)
GSP	34.2930	118.3890	12/06/1994	034834.5	9.0	4.50	0.011	III	48.9(78.6)
GSP	34.3940	118.6690	06/26/1995	084028.9	13.0	5.00	0.027	V	35.2(56.7)
GSP	34.3690	118.6720	04/26/1997	103730.7	16.0	5.10	0.030	V	34.4(55.4)

EARTHQUAKE SEARCH RESULTS

FILE CODE	LAT. NORTH	LONG. WEST	DATE	TIME (UTC) H M Sec	DEPTH (km)	QUAKE MAG.	SITE ACC. g	SITE MM INT.	APPROX. DISTANCE mi [km]
GSP	34.3770	118.6490	04/27/1997	110928.4	15.0	4.80	0.022	IV	35.8(57.7)

-END OF SEARCH-

93 EARTHQUAKES FOUND WITHIN THE SPECIFIED SEARCH AREA.

TIME PERIOD OF SEARCH: 1900 TO 2000

LENGTH OF SEARCH TIME: 101 years

THE EARTHQUAKE CLOSEST TO THE SITE IS ABOUT 2.1 MILES (3.4 km) AWAY.

LARGEST EARTHQUAKE MAGNITUDE FOUND IN THE SEARCH RADIUS: 6.7

LARGEST EARTHQUAKE SITE ACCELERATION FROM THIS SEARCH: 0.175 g

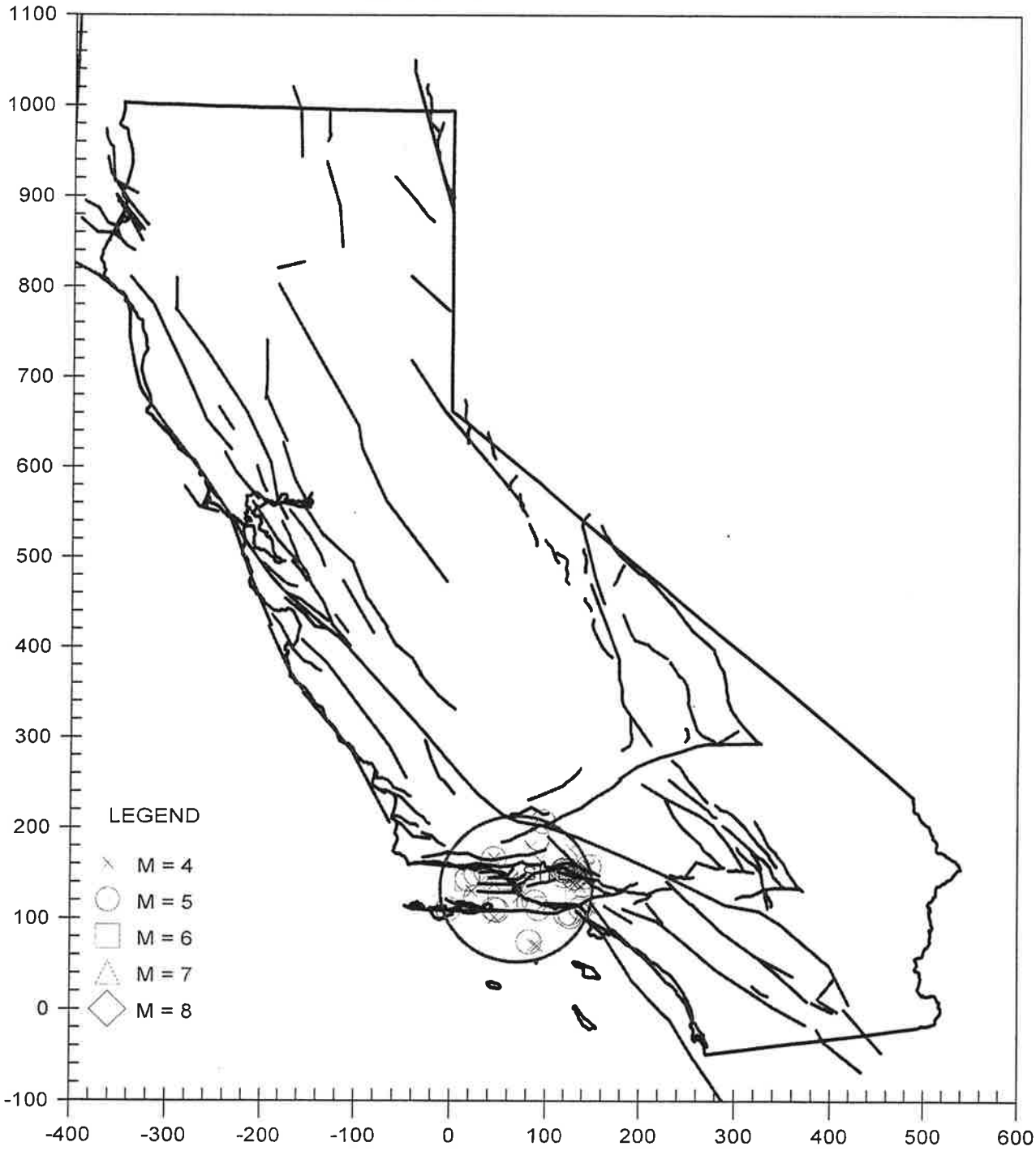
COEFFICIENTS FOR GUTENBERG & RICHTER RECURRENCE RELATION:
a-value= 3.278
b-value= 0.774
beta-value= 1.783

TABLE OF MAGNITUDES AND EXCEEDANCES:

Earthquake Magnitude	Number of Times Exceeded	Cumulative No. / Year
4.0	93	0.92079
4.5	93	0.92079
5.0	36	0.35644
5.5	12	0.11881
6.0	3	0.02970
6.5	1	0.00990

EARTHQUAKE EPICENTER MAP

Oxnard Shores



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*                    *
*    E Q F A U L T   *
*                    *
*    Version 3.00    *
*                    *
**********************
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DETERMINISTIC ESTIMATION OF
PEAK ACCELERATION FROM DIGITIZED FAULTS

JOB NUMBER: 5462B

JOB NAME: Oxnard Shores

CALCULATION NAME: Test Run Analysis

FAULT-DATA-FILE NAME: CDMGFLTE.DAT

SITE COORDINATES:
SITE LATITUDE: 34.1935
SITE LONGITUDE: 119.2365

SEARCH RADIUS: 50 mi

ATTENUATION RELATION: 14) Campbell & Bozorgnia (1997 Rev.) - Alluvium
UNCERTAINTY (M=Median, S=Sigma): S Number of Sigmas: 1.0
DISTANCE MEASURE: cdist
SCOND: 0
Basement Depth: 1.00 km Campbell SSR: 0 Campbell SHR: 0
COMPUTE RHGA HORIZ. ACCEL. (FACTOR: 0.65 DISTANCE: 20 miles)

FAULT-DATA FILE USED: CDMGFLTE.DAT

MINIMUM DEPTH VALUE (km): 3.0

EQFAULT SUMMARY

DETERMINISTIC SITE PARAMETERS

ABBREVIATED FAULT NAME	APPROXIMATE DISTANCE mi (km)	ESTIMATED MAX. EARTHQUAKE EVENT: MAXIMUM EARTHQUAKE MAG. (Mw)	RHGA SITE ACCEL. g	EST. SITE INTENSITY MOD. MERC.
SAN ANDREAS - Carrizo	45.9(73.8)	7.2	0.111	VII
SAN ANDREAS - 1857 Rupture	45.9(73.8)	7.8	0.174	VIII
GARLOCK (West)	47.6(76.6)	7.1	0.097	VII
BIG PINE	33.8(54.4)	6.7	0.106	VII
HOLLYWOOD	47.0(75.6)	6.4	0.055	VI
HOLSER	31.6(50.9)	6.5	0.104	VII
MALIBU COAST	19.8(31.9)	6.7	0.206	VIII
M.RIDGE-ARROYO PARIDA-SANTA ANA	17.8(28.6)	6.7	0.232	IX
OAK RIDGE (Onshore)	4.2(6.8)	6.9	0.534	X
PALOS VERDES	41.8(67.3)	7.1	0.115	VII
PLEITO THRUST	45.4(73.0)	7.2	0.108	VII
RED MOUNTAIN	13.0(20.9)	6.8	0.343	IX
SAN CAYETANO	19.6(31.6)	6.8	0.221	IX
SAN GABRIEL .	39.3(63.3)	7.0	0.114	VII
SANTA MONICA	34.1(54.8)	6.6	0.101	VII
SANTA YNEZ (East)	22.4(36.1)	7.0	0.206	VIII
SANTA YNEZ (West)	30.6(49.2)	6.9	0.139	VIII
SANTA SUSANA	30.0(48.2)	6.6	0.120	VII
SIERRA MADRE (San Fernando)	44.4(71.4)	6.7	0.075	VII
SIMI-SANTA ROSA	7.6(12.2)	6.7	0.357	IX
VENTURA - PITAS POINT	7.4(11.9)	6.8	0.379	IX
VERDUGO	48.2(77.5)	6.7	0.067	VI
NORTHRIDGE (E. Oak Ridge)	29.1(46.9)	6.9	0.151	VIII
ANACAPA-DUME	10.4(16.7)	7.3	0.352	IX
CHANNEL IS. THRUST (Eastern)	7.5(12.1)	7.4	0.447	X
MONTALVO-OAK RIDGE TREND	5.5(8.8)	6.6	0.439	X
NORTH CHANNEL SLOPE	28.9(46.5)	7.1	0.173	VIII
OAK RIDGE(Blind Thrust Offshore)	3.6(5.8)	6.9	0.566	X
SANTA CRUZ ISLAND	21.4(34.4)	6.8	0.202	VIII
SANTA ROSA ISLAND	40.1(64.5)	6.9	0.102	VII

-END OF SEARCH-

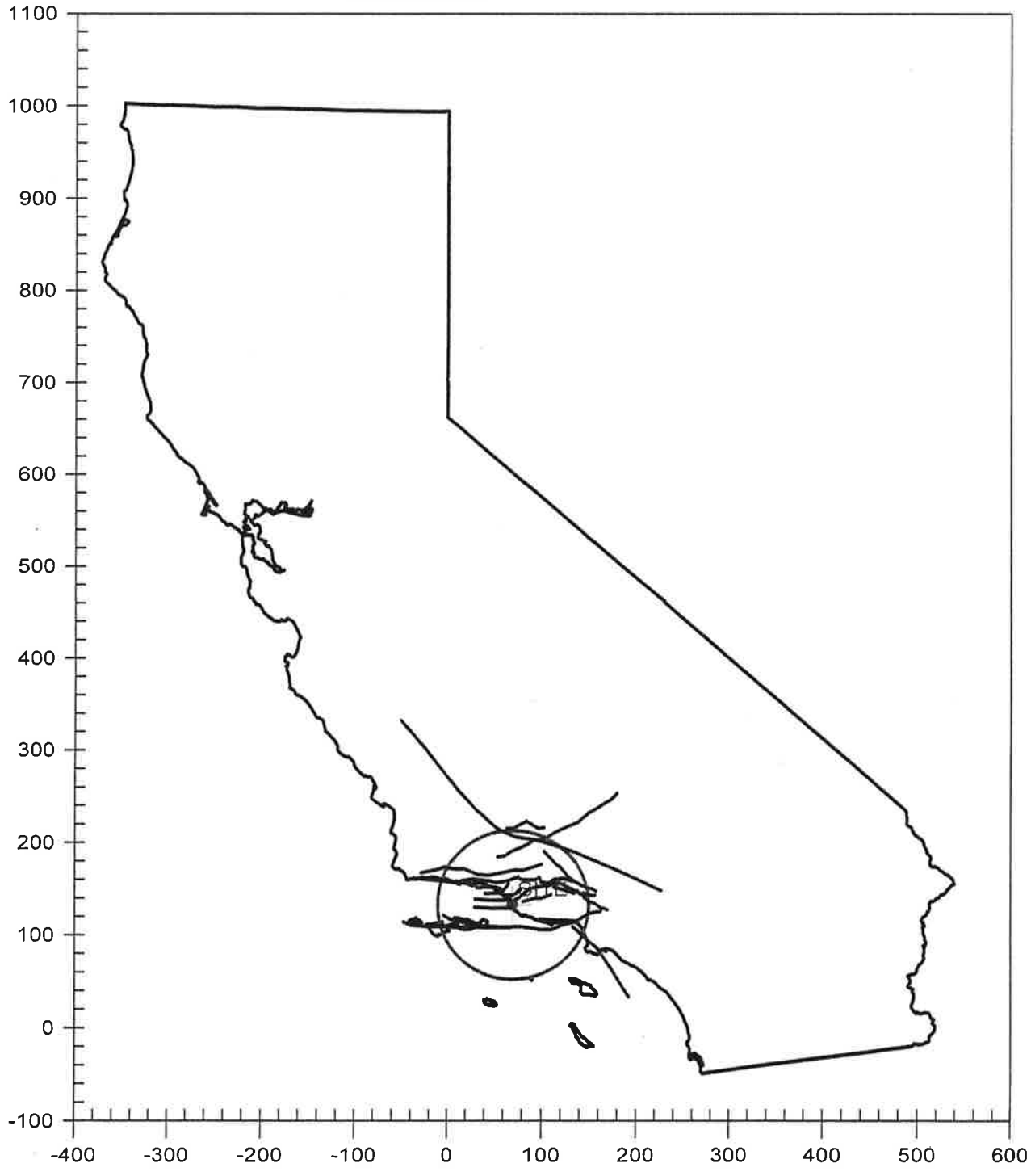
30 FAULTS FOUND WITHIN THE SPECIFIED SEARCH RADIUS.

THE OAK RIDGE(Blind Thrust Offshore) FAULT IS CLOSEST TO THE SITE.
IT IS ABOUT 3.6 MILES (5.8 km) AWAY.

LARGEST MAXIMUM-EARTHQUAKE SITE ACCELERATION: 0.5659 g

CALIFORNIA FAULT MAP

Oxnard Shores



APPENDIX V

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Area References

Geotechnical References

REFERENCES

Area References

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NOTE: This document has been created from a digital topographic base map and plans prepared by Jensen Design and Survey, Inc. Analyses and/or professional opinions generated from this plan are only as accurate as the plan(s) provided to this office. If discrepancies are found to exist between the plan(s) and the actual site conditions, they should be brought to our immediate attention so that revisions may be made as required.

SubSurface Designs Inc.
12848 Foothill Boulevard, Sylmar, CA 91342
(818) 898-1595 or (Fax) 898-4003

Oxnard Shores Company, LLC
Northern Extension of Canal Street
Ref # 5462B.01S

Site Plan

April, 2011

Plate A

Appendix F

Phase I Environmental Site Assessment Report

CONVERSE CONSULTANTS

Phase I Environmental Site Assessment Report

Proposed Dunes Subdivision
APN: 196-0-010-275
Oxnard, California

Converse Project No. 11-42-171-01
January 28, 2014

Prepared For:

City of Oxnard-Planning Division
214 South C Street
Oxnard, California 93030

Prepared By:

CONVERSE CONSULTANTS
185 East Paularino Avenue
Suite B
Costa Mesa, California 92626

Converse Consultants
Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

January 28, 2014

Ms. Kathleen Mallory
City of Oxnard
Planning Division
214 South C Street
Oxnard, California 93030

Subject: **PHASE I ENVIRONMENTAL SITE ASSESSMENT REPORT**
Proposed Dunes Subdivision
APN: 196-0-010-275
Oxnard, California
Converse Project No. 11-42-171-01

Ms. Mallory:

Converse Consultants (Converse) is pleased to submit the attached report that summarizes the activities and the results of a Phase I Environmental Site Assessment (Phase I ESA) that was conducted at the referenced property (Property).

A summary of the assessment is presented in the Executive Summary, as well as in Sections 7.0, 8.0, and 9.0 of the report. Non-scope items are discussed in Section 11.0. No Recognized Environmental Conditions were identified during this assessment.

We appreciate the opportunity to be of service. Should you have any questions or comments regarding this report, please contact Laura Tanaka at (714) 444-9660 or Norman Eke at (626) 930-1260.

CONVERSE CONSULTANTS

Spencer Wagner
Senior Staff Environmental Scientist

Laura Tanaka
Principal Environmental Professional

Dist.: 1/Addressee via Electronic Mail (PDF Format)]

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Executive Summary

The following is an Executive Summary of the Phase I Environmental Site Assessment (Phase I ESA) that was conducted by Converse Consultants (Converse). Please refer to the appropriate sections of the report for a complete discussion of these issues. In the event of a conflict between this Executive Summary and the report, or an omission in the Executive Summary, the report shall prevail.

This report presents the results of the Converse Phase I ESA performed at Proposed Dunes Subdivision, APN: 196-0-010-275 in the City of Oxnard, County of Ventura, California, referred to as the Property in this report. Converse was retained by Impact Sciences to conduct this Phase I ESA. Our study has been conducted in order to identify, to the extent practical within the scope of an ESA, Recognized Environmental Conditions (RECs) in connection with the Property.

Converse has compiled and reviewed information that was obtained from interviews, document research, and on-site and area reconnaissance to identify potential environmental conditions at the Property, in conformance with *the* American Society for Testing and Materials (ASTM) Standard E: 1527-05 Environmental Site Assessment Standard Practice (ASTM Standard: E1527-05). This Phase I ESA was conducted during the period of December 2013 to January 28, 2014.

According to historical resources, interviews, and site observations, the Property has never been developed. It is currently undeveloped coastal sand dunes with sparse native coastal vegetation and is part of a larger parcel of land that includes additional undeveloped sand dunes with sparse native coastal vegetation north of the Property.

The southern adjoining property (existing Dunes Neighborhood), was historically used as an oil waste storage/disposal site. The DTSC conducted several investigation of the property, and determined that current conditions resulting from historical uses of the site were not a threat to human health. The Property was delisted by the DTSC in July 1991. This is considered a historic recognized environmental condition (HREC) in connection with the Property.

A subsurface investigation was conducted by Waterstone Environmental in 2009 on the northern portion of the Property parcel to determine whether groundwater impacted from historical oil waste storage/disposal activities at the property north of the northern portion of the Property parcel had migrated offsite. Waterstone concluded that impacts were negligible and no further investigation related to potential impacts from the historical oil waste storage/disposal operations was warranted.

This assessment has revealed no evidence of RECs in connection with the Property.

No further assessment appears warranted at this time.

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1.0 Introduction

1.1 Purpose and Scope of Services

This report presents the results of the Converse Consultants (Converse) Phase I Environmental Site Assessment (ESA) performed at the Proposed Dunes Subdivision, APN: 196-0-010-275 in the City of Oxnard, County of Ventura, California, referred to as the Property in this report. Converse was retained by Impact Sciences to conduct this Phase I ESA. Our study has been conducted in order to identify, to the extent practical, Recognized Environmental Conditions (RECs) in connection with the Property. The term Recognized Environmental Conditions is defined in Section 1.1.1 of the American Society of Testing and Materials (ASTM) Standard Practice as *the presence or likely presence of any hazardous substances or petroleum products on a property under Conditions that indicate an existing release, past release, or material threat of a release… into structures on the property or into the ground, ground water or surface water of the property.*

On January 11, 2002, Public Law 107-118 was signed. The Small Business Liability Relief and Brownfields Revitalization Act (SBLRBRA) directed the United States Environmental Protection Agency (EPA) to promulgate a rule defining due diligence for compliance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). This rule, which is generally referred to as All Appropriate Inquiry (AAI) was adopted on November 1, 2005. The AAI rule states that ASTM E1527-05 complies with the EPA requirements for AAI. In some cases the ASTM 1527-05 is more stringent than AAI.

This Phase I ESA was completed in accordance with our proposed scope of services provided to Impact Sciences in October 2011. Our work consisted of the following and was completed in general conformance with the scope and limitations of the ASTM Practice E1527-05 and complies with standards and practices set forth in 40 Code of Federal Regulations (CFR) Part 312 for AAI.

- Interviews with the Property owner representatives
- Property and vicinity reconnaissance
- Review of regulatory agency records
- Description of physical setting
- Historical review
- Interviews with public agency personnel
- Preparation of this report

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1.2 Non-Scope Considerations

There are a number of non-scope issues which are sometimes assessed concurrently with a Phase I ESA. Unless specifically agreed in the contract proposal documents, these non-scope considerations are not included as part of the Phase I assessment. Examples of non-scope issues include:

- Asbestos-containing building material
- Lead-base Paint
- Wetlands
- Cultural & Historic Resources
- Industrial Hygiene
- Health & Safety
- Mold
- Diffuse Anthropogenic Pollution
- Radon
- Lead in Drinking Water
- Regulatory Compliance
- Ecological Resources
- Endangered Species
- Indoor Air Quality
- Biological Agents
- Non-liquid Polychlorinated Biphenyls

No Non-scope issues were addressed in this report.

1.3 Significant Assumptions

No assumptions were made for this assessment that need to be noted as significant.

1.4 Limitations and Exceptions

The following limitations and exceptions were encountered during the course of this assessment:

- The Ventura County Environmental Health Division and DTSC indicated a physical address was needed in order to search for files pertaining to the Property. Because there is no address currently associated with the Property, files were not available to be searched or reviewed.

1.5 Special Terms and Conditions

No other users were identified.

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1.6 Reliance

This report is for the sole benefit and exclusive use of Impact Sciences and the City of Oxnard in accordance with the terms and conditions attached to our proposal under which these services have been provided. Its preparation has been in accordance with generally accepted environmental practices. No other warranty, either express or implied, is made. The Scope of Services associated with the report was designed solely in accordance with the objectives, schedule, budget, and risk-management preferences of Impact Sciences.

This report should not be regarded as a guarantee that no further contamination, beyond that which could be detected within the scope of this assessment, is present at the Property. Converse makes no warranties or guarantees as to the accuracy or completeness of information provided or compiled by others. It is possible that information exists beyond the scope of this assessment. It is not possible to absolutely confirm that no hazardous materials and/or substances exist at the Property. If none are identified as part of a limited scope of work, such a conclusion should not be construed as a guaranteed absence of such materials, but merely the results of the evaluation of the property at the time of the assessment. Also, events may occur after the Property visit, which may result in contamination of the Property. Additional information, which was not found or available to Converse at the time of report preparation, may result in a modification of the conclusions and recommendations presented.

Any reliance on this report by Third Parties shall be at the Third Party's sole risk. Should Impact Sciences wish to identify any additional relying parties not previously identified, a completed *Application of Authorization to Use* (see Appendix A of this report) must be submitted to Converse Consultants.

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2.0 Property Description

2.1 Current Use(s) of the Property

The Property is owned by Oxnard Shores, LLC, and is currently vacant land covered with sand dunes and native coastal vegetation.

A Property location map and a field generated Property plan are provided in Appendix B. Pertinent Property photographs are provided in Appendix C.

2.2 Location and Legal Description

The Property consists of the southern portion of assessor parcel number 196-0-010-275. The northern portion of the parcel is not currently planned for development and is, therefore, not covered in the scope of this investigation.

The Property is located north of the terminus of Canal Street, east of the intersection of Dunes Street and Beachcomber Street, and north and east of Catamaran Street. The Property is bordered by vacant coastal sand dunes with native shrubbery to the north, Edison canal to the east and the existing Dunes neighborhood to the south and west, in the City of Oxnard, County of Ventura, California. The Property is located approximately 0.4-mile east of the Pacific Ocean and 4.5-miles southwest of Interstate 101 (Ventura Freeway).

The Ventura County Assessor's Parcel Number for the Property is 196-0-010-275.

2.3 Zoning Information

According to the City of Oxnard, Planning Department, the zoning for the Property is R-2-C, which is defined as Coastal Multiple-Family subzone.

2.4 Property Characteristics

The Property is an irregular-shaped parcel containing approximately 10 acres. The Property is uneven and covered in sandy soil and native vegetation. There are no structures located on the Property.

Property in the general area is vacant or developed for residential and agricultural purposes.

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2.5 Description of Property Structure(s)

The Property is currently vacant. There are no structures currently located on the Property.

The following services were present at the Property at the time of the assessment.

- Electricity: No service
- Gas: No service
- Potable Water: No service
- Sanitary Sewer: No service
- Heating, Ventilation, Air Conditioning (HVAC): Not applicable
- Solid Waste: Not applicable.

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3.0 User/Owner Provided Information & Responsibilities

3.1 Requested Documents and Information

The ASTM E1527 specifies that the Property owner, key site manager and the User provide any helpful documents that may be available. In order to facilitate, and document, the collection of this information, Converse prepared a form titled Owner Interview and Helpful Information. Converse requested that the User, Impact Sciences, as well as the Property owner, Oxnard Shores Co., LLC, complete the form.

The following documents and information were requested from Impact Sciences:

- Environmental site assessment or environmental compliance audit reports
- Environmental permits or hazardous waste generator notices/reports
- Registrations for aboveground and underground storage tanks
- Septic systems, oil wells, or water wells
- Registrations for underground injection systems
- Material Safety Data Sheets; Community Right to Know Plans; or Safety, Preparedness and prevention Plans; Spill Protection Countermeasures and Control Plans
- Reports regarding hydrologic conditions on the Property or surrounding area
- Notices or other correspondence form any government agency relating to past or current violations of environmental laws with respect to the Property or relating to environmental liens encumbering the Property.
- Hazardous waste generator notices or reports
- Geotechnical studies
- Risk assessments
- Recorded Activity Use Limitations (AULs)
- Proceedings regarding hazardous substances and petroleum products including any pending, threatened or past: litigation; administrative proceedings; or notices from any governmental entity regarding possible violations of environmental laws or other possible liability related to hazardous substances or petroleum products.

Summaries of the documents are provided as follows:

<u>City of Oxnard Planning Department, Draft Initial Study, Dunes Subdivision Project, October 4, 2011</u>
The report provides and introduction to the proposed development including current property owner information, project location, proposed development characteristics, nature of proposed development, surrounding property use, a listing of all potential agencies involved in the proposed project, and a determination of the degree of

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potential impact (i.e. potentially significant impact, less than significant with mitigation, less than significant impact and no impact) on aesthetics, agricultural resources, air quality, biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public services, recreation, transportation/traffic, utilities and service and systems, and mandatory findings of significance.

The Draft Initial Study determined that biological resources, hazards and hazardous materials and land use and planning would be potentially affected by this project and that an environmental impact report (EIR) is required.

The following three documents were reviewed under separate cover by Converse.

- *Phase II Sample Results, the Dunes Property, Oxnard, California*, prepared by Waterstone Environmental, Inc., dated October 9, 2008.
- *Preliminary Soils Engineering Investigation, Proposed Development of 16 Multi-Family Lots, Construction of 48 Residential Structures, Oxnard Shores North, Northern Extension of Canal Street, parcels 196001012 & 196001014, Oxnard, California*, prepared by SubSurface Designs, Inc., dated April 28, 2011. The compete text and figures A-I-1, A-I-2, and A-I-3 were provided. The remaining portions of Appendix I, and Appendices II, III, IV, or V were not provided.
- *Preliminary Hydrology Report, Oxnard Shores North, Tentative Tract No. 588, Oxnard, CA*, prepared by Jensen Design & Survey, Inc., dated September 9, 2011. The complete text and pages 77 and 78 of Appendix I were provided. None of the other appendices were provided.

The following documents and information were requested from Mr. Mike Marlow of Oxnard Shores Co. LLC:

- Environmental site assessment or environmental compliance audit reports
- Environmental permits or hazardous waste generator notices/reports
- Registrations for aboveground and underground storage tanks
- Septic systems, oil wells, or water wells
- Registrations for underground injection systems
- Material Safety Data Sheets; Community Right to Know Plans; or Safety, Preparedness and Prevention Plans; Spill Protection Countermeasures and Control Plans
- Reports regarding hydrologic conditions on the Property or surrounding area
- Notices or other correspondence form any government agency relating to past or current violations of environmental laws with respect to the Property or relating to environmental liens encumbering the Property.
- Hazardous waste generator notices or reports
- Geotechnical studies

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- Risk assessments
- Recorded AULs
- Proceedings regarding hazardous substances and petroleum products including any pending, threatened or past: litigation; administrative proceedings; or notices from any governmental entity regarding possible violations of environmental laws or other possible liability related to hazardous substances or petroleum products.

Mr. Marlow stated at the time of the Property Reconnaissance that the Owner Interview and Helpful Information form had not been completed and that he was working in conjunction with other partners of Oxnard Shores Co., LLC to complete the form. As of the date of this report, the form has not been received.

3.2 User Provided Information

Section 6 of ASTM E1527-05 outlines specific User's responsibilities. This information will help identify the possibility of RECs in connection with the Property. The ASTM Standard provides a questionnaire to help the User to comply with the statutory requirements to perform tasks which would help identify RECs. Converse included the questionnaire as Attachment A to our proposal. In general, any Users should make Converse aware of information they have regarding the following:

- Environmental Cleanup Liens filed or recorded against the Property
- Activity and land use limitations that are in place on the Property or have been filed or recorded in a registry.
- Specialized knowledge or experience of the person seeking to qualify for the Legal Liability Protections (LLP)
- Relationship of the purchase price to fair market value of the Property if it were not contaminated
- Commonly known or reasonably ascertainable information about the Property
- The degree or obviousness of the presence or likely presence of contamination at the Property, and the ability to detect this contamination by appropriate investigation.

The following information was requested from the User, Impact Sciences:

3.2.1 Environmental Cleanup Liens

The User provided no information regarding environmental cleanup liens or title records.

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3.2.2 Activity and Use Limitations

The User did not provide any information indicating they were aware of any AULs.

3.2.3 Specialized Knowledge or Experience

The User provided documents with respect to the Property. See Section 3.1 for a summary of User provided documents.

3.2.4 Reason for Significantly Lower Purchase Price

Converse has no information regarding the purchase price of the Property or comparable properties. The User has not indicated to Converse that there is any conclusion that there was a lower purchase price because of known or suspected contamination at the Property.

3.2.5 Commonly Known or Reasonably Ascertainable Information

The User provided documents with respect to the Property. See Section 3.1 for a summary of User provided documents.

3.2.6 Obviousness of Contamination

The User provided documents with respect to the Property. See Section 3.1 for a summary of User provided documents.

Unless specifically stated otherwise in the Scope of Services, the purpose of this Phase I ESA was to qualify for the landowner liability protections to CERCLA Liability as described in ASTM E1527-05.

Business risk unrelated to the CERCLA innocent landowners defense are only assessed as specifically agreed in the Scope of Services and discussed in Section 11.0, Additional Non-Scope Services, of this report.

3.3 Continuing Obligations

In order to assert a LLP, the User must satisfy a number of statutory requirements that are generally referred to as Continuing Obligations, which are outside the Scope of Services of the Phase I ESA. Examples of Continuing Obligations include providing legally required notices stopping continuing releases and complying with land use restrictions. Failure to comply with these and other statutory post-acquisition requirements will jeopardize liability protection.

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It is the responsibility of the User to comply with the Continuing Obligations requirements of ASTM E1527-05 and AAI.

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4.0 Records Review

4.1 Physical Setting

4.1.1 Geology

The Property is located approximately 37 feet above mean sea level with surface topography sloping towards the south and west (United States Geological Survey [USGS] Topographic Map, Oxnard, California, 1967.

The Property is underlain by alluvium (State of California Department of Conservation, Geologic Atlas of California, 1959).

4.1.2 Groundwater

The Property is located within the Oxnard Plain Pressure Basin which consists of two aquifer systems, the Upper Aquifer System and the Lower Aquifer System. The shallowest aquifer is the Oxnard aquifer with average depth to water bearing material of 80-feet (Ventura County Watershed Protection District, 2011).

The nearest groundwater well to the Property is well GR-2 which is located approximately 0.85-mile east of the Property near S. Victoria Avenue. The Ventura County Watershed Protection District did not have available groundwater measurement data available in the groundwater section of the 2011 Annual Report.

The direction of regional groundwater flow is expected to be to the west toward the Pacific Ocean.

4.1.3 Potable Water Supplier

Potable water is not currently supplied to the Property. According to the City of Oxnard Planning Department's Draft Initial Study, were the Property to be developed, the potable water supply would be provided by the City of Oxnard which obtains most of its water from the Calleguas Water District which purchases most of its water from the Metropolitan Water District.

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4.2 Historical Review

4.2.1 Aerial Photograph and Map Review

Available historical aerial photographs (Environmental Data Resources Inc. (EDR) Aerial Photograph Collection), and EDR topographic maps, as described in Table 1, were reviewed. Copies of the Aerial Photographs and Topographic Maps are included in Appendix E and F, respectively.

Table 1 – Aerial Photograph and Map Review

Date	Reference	Observations
1904 and 1910	Topographic Maps	The Property and adjoining properties appear undeveloped in the 1904 Topographic Map. Due to the scale of the 1910 Topographic Map, the Property and adjoining properties were not able to be identified on the map.
1947 1951	Aerial Photograph and Topographic Map Topographic Map	The Property and adjoining properties appear as undeveloped coastal sand dunes covered with coastal shrubbery. The surrounding area appears undeveloped coastal sand dunes, agricultural land and riverine habitat.
1959	Aerial Photograph	The Property remains undeveloped. Several small unpaved pathways through the Property are visible in the northeastern and southern portions of the Property. The adjoining properties appear as follows: • **North** – undeveloped coastal sand dunes. • **Northeast** – Partially developed with large commercial building • **East** – undeveloped land followed by the Edison Canal • **Southeast** – undeveloped land. • **South** – site appears developed with oil industry related waste pits. • **Southwest** – site appears developed with oil industry related waste pits. • **West** – undeveloped coastal sand dunes. • **Northwest** – undeveloped coastal sand dunes and coastal shrubbery. The general vicinity appears primarily undeveloped with commercial/light industrial buildings to the northeast and southeast and agricultural land to the east.
1964	Aerial	The Property remains undeveloped. The southern-

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Table 1 – Aerial Photograph and Map Review

Date	Reference	Observations
1967	Photograph Topographic Map	southeastern portion of the Property appears graded as part of the grading of the south contiguous property. The adjoining properties appear as follows: • **North** – undeveloped coastal sand dunes. • **Northeast** – Partially developed with large commercial building • **East** – undeveloped land followed by the Edison Canal • **Southeast** – undeveloped land, followed by the Edison Canal. • **South** – undeveloped land that appears graded. • **Southwest** – undeveloped land • **West** – undeveloped coastal sand dunes; residential housing beyond Harbor Boulevard. • **Northwest** – undeveloped coastal sand dunes and coastal shrubbery; residential housing beyond Harbor Boulevard. The general vicinity is predominantly undeveloped coastal sand dunes, residential, commercial/light industrial and agricultural.
1970, 1977, 1989 and 1994	Aerial Photographs	The Property remains undeveloped. It no longer appears graded. Coastal shrubbery is visible. The adjoining properties appear as follows: • **North** – undeveloped coastal sand dunes. • **Northeast** – Partially developed with large commercial building until at least 1977. Building not located at property in 1989 aerial photograph. • **East** – undeveloped land followed by the Edison Canal • **Southeast** – undeveloped land. • **South** – The Dunes Neighborhood is partially developed. • **Southwest** – The Dunes Neighborhood is partially developed. • **West** – Paved roadway and undeveloped sand dunes; residential housing beyond Harbor Boulevard. • **Northwest** – undeveloped coastal sand dunes and coastal shrubbery; residential housing beyond Harbor Boulevard.
2005,	Aerial Photographs	There are no significant changes to the Property or adjacent properties to the north, northeast, east,

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Table 1 – Aerial Photograph and Map Review

Date	Reference	Observations
2009, 2010 and 2012		southeast, west and northwest. The southern-southwestern contiguous Dunes Neighborhood has been further developed.

4.2.2 Building Permit Review

According to the clerk at the City of Oxnard Building Department, permits are issued to specific addresses. Because the Property does not have a site specific address, the clerk was unable to locate records for the Property.

Based on subsequent historical research, it is not anticipated that building permits were issued for the portion of the Property that falls under the scope of this assessment.

4.2.3 City Directories

A city directory search was completed on the Property by EDR. The complete city directory is provided in Appendix G, EDR-City Directory.

The Property was not identified in any of the city directories searched because there is no official address associated with the Property.

Southern adjoining properties on Catamaran Street were listed in city directories as residential listings or under business names that appear to be registered at the residential addresses.

4.2.4 Data Failure

Historical information regarding the Property was dated as early as 1904 and indicated the Property as undeveloped land. Therefore, there is no historical data failure for this assessment.

4.2.5 Summary of Historical Property Use

The Property has never been developed. Small unpaved pathways were noted in the 1959 aerial photograph.

4.2.6 Summary of Past Uses of Adjoining Properties

The northern, eastern and southeastern adjoining properties have never been developed.

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The northeastern adjoining property was undeveloped sand dunes from at least 1904 until it was developed with a commercial/light industrial structure as early as 1959. The structure remained at the property until at least 1977. The property is currently vacant coastal sand dunes covered with coastal shrubbery.

The southern-southwestern adjoining property was undeveloped land from 1904 until as early as 1959 when it appeared to be developed with oil industry related waste pits. By 1964, the property appeared graded for development. By 1970 the property was developed with portions of the existing Dunes Neighborhood.

The western-northwestern adjoining properties were undeveloped coastal sand dunes as early as 1904. The properties west of Harbor Boulevard were developed with residential housing by 1964.

4.2.7 Summary of Past Uses of the Surrounding Area

According to files provided by the User and documents reviewed from the State Water Resource Control Board's Geotracker database, the site north of the northern portion of the Property parcel and the southern contiguous property have historically been used for oil industry related waste storage.

The southern contiguous property is considered a HREC in connection with the Property based on the issuance of closure to the site by the California Department of Toxic Substances Control in July 1991. The site located north of the northern portion of the Property parcel is not considered a HREC in connection with the Property.

The general vicinity has been primarily undeveloped sand dunes, residential developments or in agricultural use.

4.3 Results of Environmental Records Sources Review

An Environmental Data Resources (EDR) report of Standard Environmental Record Sources (Records) was prepared specifically for the Property. The search included queries to the following databases for cases within specified ASTM search distances. The EDR Radius Map Report is included as Appendix H.

4.3.1 Property Listings

The portion of the parcel referred to herein as the "Property" was not listed in any of the databases searched by EDR. However, the Property, along

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with the northern portion of the Property parcel, and the southern adjoining property (existing Dunes neighborhood), are referred to as on property, the "Dunes Subdivision Site", within the EDR report. The Dunes Subdivision Site (EDR Map ID No. 1) is listed in the following databases:

California Bond Expenditure Plan (CA BOND EXP. PLAN)
Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

- According to the EDR report, the site was utilized for disposal of oil field wastes during the 1950s and 1960s. Wastes included crude oil breakdown products, primarily of the cyclohexane group. The database suggests the potential for threats to groundwater and/or indoor air but indicates that residential monitoring has not detected any elevated levels of contaminants in the air. The database describes attempts by California Department of Health Services (DHS) to identify responsible parties and funding streams to mitigate results of past oil field waste disposal practices and the subsequent issuance of noncompliance notices to identified responsible parties. The database identifies at least five legal actions filed by residents and/or identified responsible parties.

State and tribal equivalent National Priority List (NPL) - State Response Sites (RESPONSE)
Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

- The EDR report lists the site as previously being under the oversight of the DTSC but that the site was de-listed in July 1991. The site is listed as having no restricted use.

  Confirmed chemicals of concern at the site are listed as unspecified oil containing waste, waste-oil and mixed oil, and drilling mud. Humacid Macleod Co. and Oxnard Dunes are listed as potential responsible parties.

  Project history includes a consent order completed June 14, 1994, a de-listing document completed July 29, 1991, a Remedial Action Plan completed June 19, 1991, a Remedial Investigation/Feasibility Study completed December 31, 1990, a Public Participation Plan/Community Relations Plan completed January 31, 1989, a Final Determination of Non-Compliance completed January 31, 1988, a Site Screening completed December 4, 1987 and an Order completed November 30, 1987.

ENVIROSTOR: EnviroStor Database
The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

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– See RESPONSE database description above.

4.3.2 Adjoining Properties

One property located within the southern adjoining Dunes Neighborhood, 4906 Dunes Street (EDR Map ID No. 2), was listed in the EDR Historical Auto Stations database as KB Swedish Automotives in city directories from 2007, 2008, and 2009. This appears to be the result of a business using a residential address.

4.3.3 Other Off-site Locations of Concern

Other off-site locations of concern identified by EDR within a maximum one-mile radius from the Property included leaking underground storage tank (LUST) sites, ENVIROSTOR sites hazardous waste generators, historical underground storage tank (UST) sites and one Comprehensive Environmental Response Compensation and Liability Information System – No Further Remedial Action Planned (CERCLIS NFRAP) site.

The potential for environmental impact to the Property from these off-site locations of concern appear to be low due to one or more of the following: type of regulatory listing, location with respect to the direction of regional groundwater, distance from the Property, status of the case, remedial efforts being directed by a regulatory agency, and/or potential responsible parties have been identified.

4.3.4 Orphan Listings

The database frequently contains information on sites that cannot be plotted because of insufficient address information (orphan sites). The EDR database report identified 14 orphan listings. The locations of sites that were identified by address were found to be in the general vicinity of the Property; however, due to distance, location with respect to the direction of regional groundwater, and/or type of listing were determined to have a low potential for environmental impact to the Property.

Other orphan sites were identified only by street name. These street names were found in the general vicinity of the Property; however, the specific site locations could not be determined. These orphan sites appeared to have a low potential for environmental impact to the Property due to one or more of the following: type of regulatory listing, remedial efforts being directed by a regulatory agency, and/or potential responsible parties have been identified.

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4.4 Additional Environmental Record Sources

4.4.1 U.S. Department of Transportation, Pipeline and Hazardous Material Safety Administration (PHMSA)

PHMSA online mapping system for gas transmission pipelines or hazardous liquid pipelines in Ventura County was reviewed (https://www.npms.phmsa.dot.gov/default.htm). No pipelines are located on the Property or adjacent properties.

4.4.2 California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC)

The DTSC was not able to search for records pertaining to the Property because the Property does not have an identified address.

The Envirostor website (http://www.envirostor.dtsc.ca.gov/public/) was reviewed for information, and the Property was not listed in the database.

Multiple documents relating to the southern Dunes Neighborhood site were listed in the database. According to the database, DTSC completed several investigations at the Dunes Neighborhood site and determined that no further action was necessary at the site. The DTSC delisted the site in July 1991.

4.4.3 Cal/EPA, Los Angeles Regional Water Quality Control Board (RWQCB)

The RWQCB did not respond to our records request as of the date of this report.

The Geotracker website (http://geotracker.waterboards.ca.gov/) was reviewed for information, and the Property was not listed in the database.

4.4.4 California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR)

According the DOGGR District 2, TO1N R23W Map (http://maps.conservation. ca.gov/doms/doms-app.html), there are six oil wells located with 0.5-mile of the Property.

Wells API 11100829, 11100830, 11120220, 11100261, 11100828, and 11100821 are located 0.20, 0.22, 0.22, 0.33, 0.43 and 0.44 miles northeast, south, northeast, west, northwest and north of the Property, respectively. All six wells are listed as plugged.

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Well 1110829 appears to be located on one of the northeastern adjoining properties that is contiguous with the northern portion of the Property parcel.

4.4.5 Ventura County Air Pollution Control District (VCAPCD)

No information regarding the Property was on file with VCAPCD.

4.4.6 Ventura County Environmental Health Division

Ventura County Environmental Health could not determine whether information relating to the Property was on file because a property address was needed to search for records.

4.4.8 City of Oxnard Fire Department

There is no information regarding the Property on file with Oxnard Fire Department.

4.4.10 Methane Area

According to Mr. Juan Martinez of the City of Oxnard Planning Department, there are no methane regulations in the City of Oxnard.

Requests for methane zone information from the counter receptionist at the County of Ventura Planning Department were referred to City of Oxnard Planning Department.

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5.0 Property Reconnaissance

5.1 Methodology

On December 16, 2013, Converse visited the Property to evaluate present use and to identify observable environmental conditions at the Property. Our methodology involved walking the perimeters and center lines while noting observed evidence of present and potential environmental concerns

A field-generated map is provided in Appendix B. Pertinent Property photographs are provided in Appendix C.

5.2 Limiting Conditions

Converse's findings are based on the Property conditions observed on December 16, 2013.

5.3 Interior Observations of Property

There are no buildings developed at the Property.

5.4 Exterior Observations of Property

During our Property visit, Converse made the following observations of the exterior of the Property:

Table 2 – Exterior Observations of Property

Item or Condition	Observed Evidence	No Evidence Observed	Comments
Hazardous Substances & Petroleum Products:	☐	☒	
Storage Tanks & Related Equipment:	☐	☒	
Odors:	☐	☒	
Standing Surface Water or Other Pools of Liquid:	☐	☒	

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Table 2 – Exterior Observations of Property

Item or Condition	Observed Evidence	No Evidence Observed	Comments
Drums & Other Containers of Hazardous Substances, Petroleum Products, or Other Unidentified Contents:	☐	☒	
Transformers or Equipment containing Polychlorinated Biphenyls (PCBs):	☐	☒	
Pits, Ponds, or Lagoons:	☐	☒	
Stained Soil or Pavement:	☐	☒	
Stressed Vegetation (other than from insufficient water):	☐	☒	
Evidence of Mounds, Depressions or Filled or Graded Areas Suggesting Trash or Other Solid Waste Disposal:	☐	☒	The Property terrain is uneven and covered with sand and native coastal vegetation.
Waste Water or any discharge (including storm water) into a Drain, Ditch, or Stream on or Adjacent to the Property:	☐	☒	
Wells (active, inactive, or abandoned):	☐	☒	
Septic Systems or Cesspools:	☐	☒	
Prior Structures:	☐	☒	
Roads, Tracks, Railroad Tracks or Spurs:	☐	☒	

5.5 Current Uses of Adjoining Properties

Based on our research and observations during our Property visit, the Property is bordered by the following:

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Table 3 – Adjoining Property Use

Direction	Current Development
North:	Northern portion of Property parcel; currently undeveloped sand dunes covered with native coastal vegetation.
Northeast:	Undeveloped coastal sand dunes and native coastal vegetation.
Northwest:	Undeveloped coastal sand dunes and native coastal vegetation; Residential housing beyond Harbor Boulevard.
South:	Dunes Neighborhood – residential housing.
Southeast	Undeveloped coastal sand dunes and native coastal vegetation.
Southwest:	Dunes Neighborhood – residential housing.
East:	Undeveloped land and riverine habitat followed by the Edison Canal.
West:	Access way to Dunes Neighborhood, portions of Dunes Neighborhood and Harbor Boulevard.

5.6 Current Uses of Surrounding Area

Based on our research and observations during our Property visit, the surrounding area of the Property consists primarily of residential neighborhoods, undeveloped coastal sand dunes and agricultural land.

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6.0 Interviews

During the interviews, the owners and occupants were asked if they had any available documents that would be helpful. The documents that were requested are detailed in Section 3.1 of this report:

6.1 Property Owner

Mr. Mike Marlow was interviewed regarding his knowledge of past and present uses and/or problems at the Property. The following concerns were addressed during an on site interview conducted on December 16, 2013.

Mr. Marlow stated that the Property had never been developed and that he was unaware of any environmental issues related to the Property.

6.2 Tenant/Occupant

There are no occupants at the Property as the Property is not developed.

6.3 State or Local Government Officials

Mr. Greg Abille, Senior Fire Environmental Specialist with the City of Oxnard Fire Department, was interviewed on December 16, 2013. Mr. Abille stated that he was familiar with the Property from having grown up in and around Oxnard, but stated that there were no files on record with the City of Oxnard Fire Department. Mr. Abille also stated that he did not believe that the Property had ever been developed.

Mr. Juan Martinez of the City of Oxnard Planning Department was interviewed on December 16, 2013. Mr. Martinez provided zoning and land use information relating to the Property. Mr. Martinez was asked about any methane zones, methane building standards or methane issues involving the Property or surrounding area. Mr. Martinez stated that the City of Oxnard does not have any methane regulations relating to building standards/codes and that he was unfamiliar with methane zone designations by either the City or the County of Ventura.

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7.0 Findings

A cursory summary of findings is provided below. However, details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein.

- According to historical resources, interviews, and Property observations, the Property has never been developed. It is currently undeveloped coastal sand dunes with sparse native coastal vegetation.
- The Property is part of a larger parcel of land that includes additional undeveloped sand dunes with sparse native coastal vegetation.
- The owners of the Property are currently proposing to develop the Property with a multi building condominium cluster.
- The Property, northern portion of the Property parcel, and southern adjoining property are identified as the "Dunes Subdivision Site" within the EDR report and DTSC Envirostor databases.
- Although the Property itself is not identified in the EDR report, the Dunes Subdivision Site is identified as part of the in the Envirostor, Response and California Bond Expenditure Plan databases within the EDR report based on the previous use of the southern adjoining property as an oil-waste storage site.
- The DTSC conducted several investigation of the southern adjoining property and determined that current conditions were not a threat to human health. The Property was delisted in July 1991.
- A subsurface investigation was conducted by Waterstone Environmental in 2009 on the northern portion of the Property parcel to determine whether groundwater impacted from historical oil waste storage/disposal activities at the property north of the northern portion of the Property parcel had migrated offsite. Results indicated that trace levels of methyl ethyl ketone and acetone, below published regulatory levels for tap water, were detected in some of the groundwater samples collected.
- Six oil wells are located within 0.5-mile of the Property. All six wells are listed as plugged by DOGGR District 2 records.

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8.0 Opinion

- Although the Property is identified as part of the “Dunes Subdivision Site”, the DTSC reporting identifies the existing Dunes neighborhood as encompassing the “Dunes Subdivision Site”. Therefore, the Property is actually located contiguous to the north of this site.
- The southern adjoining property (“Dunes Subdivision Site”) was delisted by the DTSC following extensive investigations that determined that existing subsurface conditions at the site are not a threat to human health. Based on the results of the DTSC investigations and the delisted status of the site, the site is considered an HREC in connection with the Property.
- Based on the results of the Waterstone Environmental groundwater investigation on the northern portion of the Property parcel, the historical oil waste storage/disposal activities at the site north of the northern portion of the Property parcel are not considered a REC in connection with the Property.

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9.0 Conclusions and Recommendations

Converse has performed a Phase I Environmental Site Assessment in general conformance with the scope and limitations of ASTM Practice E1527-05 for Proposed Dunes Subdivision, APN: 196-0-010-275 in the City of Oxnard, County of Ventura, California. Any exceptions to or deletions from this practice are described in the Limitations and Exceptions of Assessment section of this report. This assessment has revealed no evidence of *recognized environmental conditions* in connection with the Property.

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10.0 Deviations and Limitations

The Ventura County Environmental Health Division and DTSC indicated a physical address was needed in order to search for files pertaining to the Property. Because there is no address currently associated with the Property, files were not available to be searched or reviewed.

The RWQCB did not respond to our records request in time for inclusion in this report.

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11.0 Additional Non-Scope Services

There are environmental issues outside the scope of the ASTM E1527-05 that can be assessed in connection with a commercial real estate transaction. These are dealt with as non-scope considerations since they do not typically present a Superfund Liability. The specific level of inquiry (if any) is defined in the Proposal which contains a Scope of Work. These non-scope services are very client specific and not covered by the ASTM standard. They are frequently related to the business environmental risk which is defined in the standard as "risk which can have a material environmental or environmentally-driven impact on the business associated with the current or planned use of a parcel of commercial real estate…"

No non-scope issues were addressed in this report.

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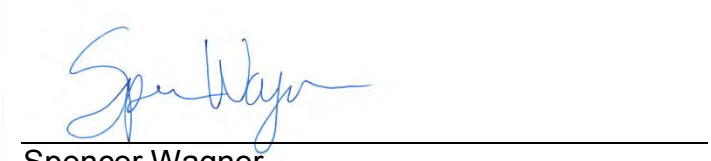
12.0 Signature of Environmental Professional

I declare that, to the best of my professional knowledge and belief, I meet the definition of *Environmental Professional* as defined in §312.10 of 40 CFR 312.

I have the specific qualifications based on education, training and experience to assess a *property* of the nature, history, and setting of the *subject property*. I have developed and performed the all appropriate inquiries in conformance with the standard and practices set forth in 40 CFR Part 312.



Spencer Wagner
Senior Staff Environmental Scientist

This Phase I ESA was completed by the above Environmental Professional. A complete list of preparers, and their responsibilities for this assessment, is provided in the following section (Section 13.0, List of Preparers).

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13.0 List of Preparers

Laura Tanaka
Principal Environmental Scientist

B.S., Biology, California State Polytechnic University, Pomona, 1987
Cal/OSHA Asbestos Consultant, 11-4708
DPH Certified Lead Inspector/Assessor, #I-3086
DPH Certified Project Designer, #D-3086
DPH Certified Project Monitor, #M-3086

Ms. Tanaka is currently responsible for the day-to-day operations of the Costa Mesa office. Ms. Tanaka has 23 years experience with Phase I and II ESAs, Preliminary Endangerment Assessments, asbestos surveys, lead-based paint surveys, abatement monitoring, as well as hazardous material audits, completing business plans, and SCAQMD permitting. Current duties at Converse include project management, business development and client maintenance, conducting/managing ESAs, and completing third party documents reviews.

Principal area of responsibility for this ESA report: Project Management, Client Point of Contact, and Report Review.

Spencer Wagner
Senior Staff Environmental Scientist

B.A., Environmental Science and Policy, California State University, Long Beach, 2006
B.A., Geography, California State University, Long Beach, 2006
40-Hour HAZWOPER Certified
Certified Wood Destroying Organism (WDO) Inspector

Mr. Wagner has over 6 years of experience conducting Phase I and II Environmental Site Assessments throughout California. Mr. Wagner has completed Phase I ESAs on undeveloped land, residential properties, commercial/retail facilities, industrial facilities, and school sites. His Phase II ESA experience includes collection of soil matrix, soil vapor, indoor air and groundwater samples, remediation system design and installation, project management, regulatory liaising, conducting/supervising field activities, and document preparation and review. Projects worked on have included residential properties, commercial warehousing sites, school sites, dry cleaning facilities, automotive service sites, metal plating facilities and multi-tenant commercial properties

Principal area of responsibility for this ESA report: Project Management, Historical Research, Regulatory Agency Interaction, Property Reconnaissance, Interviews, and Report Generation.

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Application for Authorization to Use

Appendix A

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Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

Application for Authorization to Use

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Costa Mesa, California 92626

Project Title & Date: _____

Project Address: _____

FROM: (Please identify name & address of person/entity applying for permission to use the referenced report.)

_____

_____

_____

Applicant _____ hereby applies for permission to use the referenced report in order to:

_____

_____

_____

Applicant wishes or needs to use the referenced report because:

_____

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_____

Applicant also understands and agrees that the referenced document is a copyrighted document and shall remain the sole property of Converse Consultants. Unauthorized use or copying of the report is strictly prohibited without the express written permission of Converse Consultants. *Applicant* understands and agrees that Converse Consultants may withhold such permission at its sole discretion, or grant such permission upon agreement to Terms and Conditions, such as the payment of a re-use fee, amongst others.

Applicant Signature: _____

Applicant Name (print): _____

Title: _____

Date: _____

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Property Plans

Appendix B

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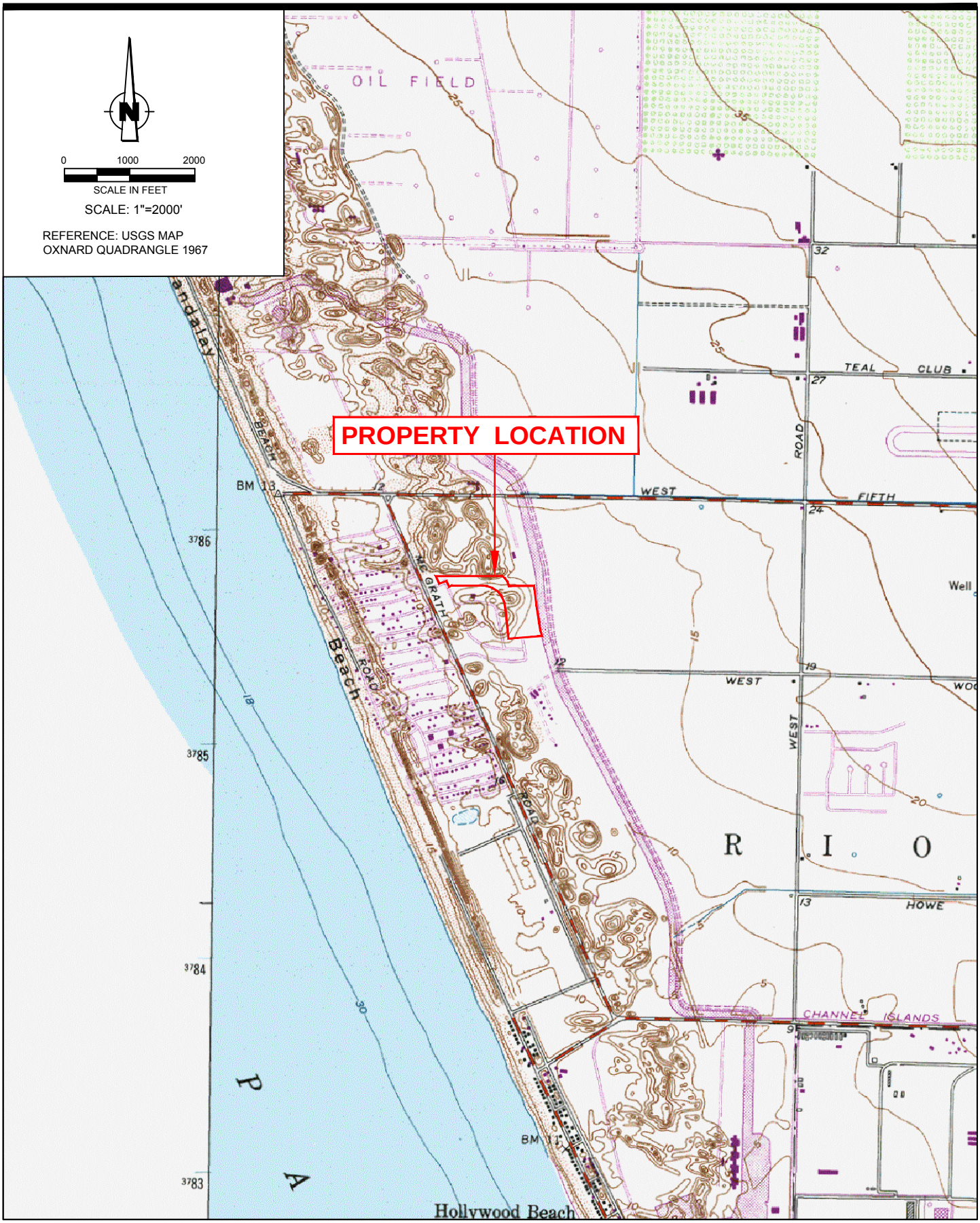

PROPERTY LOCATION MAP

Converse Consultants

CITY OF OXNARD PLANNING DIVISION
PROPOSED DUNES SUBDIVISION
OXNARD, CA 93035

Project No.
11-42-171-01

Figure No.
1



REFERENCE: GOOGLE EARTH PRO

N

0 250 500

APPROXIMATE SCALE IN FEET

PROPERTY MAP

Converse Consultants

CITY OF OXNARD PLANNING DIVISION
PROPOSED DUNES SUBDIVISION
OXNARD, CALIFORNIA

Project No. 11-42-171-01

Figure No. 2

Pertinent Property Photographs

Appendix C

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View of Property (looking east).



View of Property (looking west)



View of Property (looking south).



View of western boundary of Property.



View of northern property boundary.



View of eastern Property boundary.



View of southern Property boundary.



View of western adjoining Dunes Neighborhood.



View of southwestern adjoining Dunes Neighborhood.



View of southern adjoining Dunes Neighborhood.



View of northern portion of Property parcel.



View of eastern adjoining undeveloped property.

User Provided Documents

Appendix D

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Preliminary Hydrology Report

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PLANNING DIVISION
CITY OF OXNARD

PRELIMINARY HYDROLOGY & HYDRAULIC REPORT

Oxnard Shores North

Tentative Tract No. 5888

Oxnard, CA

September 9, 2011

Prepared by:

Jensen Design & Survey, Inc.
1672 Donlon Street
Ventura, CA 93009
(805) 654-6977

Prepared by: Frederick T. Giroux, P.E.
License No. C057289 Exp. 12/31/2011

JENSEN DESIGN & SURVEY, INC

September 9, 2011

Engineers Planners Surveyors

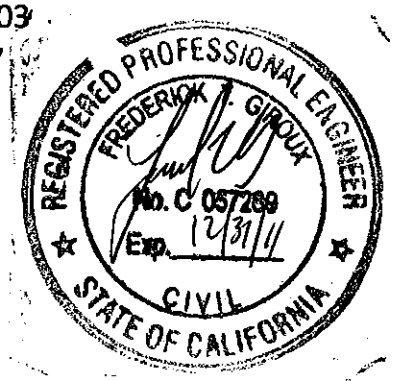
PRELIMINARY HYDROLOGY & HYDRAULIC REPORT

Oxnard Shores North

Tentative Tract No. 5888
North of Wooley Road and East of Harbor Boulevard
Oxnard, CA

Prepared by:

Jensen Design & Survey, Inc.
1672 Donlon Street
Ventura, CA 93003
(805) 654-6977



Frederick T. Giroux, P.E.
License No. C057289 Exp. 12/31/2011

September 9, 2011

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INTRODUCTION

Oxnard Shores North, also known as Tentative Tract 5888 (herein referred to as TT5888), is located North of Wooley Road and East of Harbor Boulevard in the City of Oxnard (Location Map – Appendix A). Proposed development of this site consists of construction of single family homes in four pack clusters and the extension of Canal Street. The proposed development will disturb an approximate area of 8.5 acres of currently undeveloped land.

This preliminary drainage study has been prepared to identify the storm drain runoff impacts due to the development of the vacant site. Methods for treating runoff to meet current NPDES (Order No. 00-108) requirements are identified in this report. Mitigation requirements due to the increase in runoff are also identified in this report. Runoff calculations were performed using the City of Oxnard's Cooks Method in conjunction with the Ventura County Watershed Protection District's (VCWPD) VCRat program.

EXISTING CONDITIONS

TT5888 is located within a larger watershed comprising approximately 30 acres. Runoff from all drainage areas within this watershed are directed towards three existing catch basins, two located along Dunes Street and one along Canal Street. Runoff entering these catch basins is routed to a system of storm drain lines that ultimately discharge to the Southern California Edison (SCE) Canal. Refer to Figure 1 of Appendix B for existing drainage area and inlet/outlet structure locations.

Drainage Area A is an existing residential development. Runoff from this area is primarily street surface flow from northwest to southeast along Dunes Street, towards existing Catch Basin 2 (CB2 – Figure 1). Runoff entering this structure is routed to an existing 27" RCP line prior to entering two existing 42" RCP lines that discharge directly into the SCE Canal.

Drainage Areas B through D and I represent an existing residential development. Runoff from these drainage areas surface flows along Dunes Street towards an existing catch basin (CB1 – Figure 1). Runoff from Drainage area G (which is currently undeveloped) sheet flows from North to South towards Canal Street and eventually enters CB1. Runoff entering this structure is directed towards an existing 36" RCP line prior to entering the two existing 42" RCP lines.

Drainage Area E directs its runoff via street surface flow towards an existing catch basin (CB3 – Figure 1). Runoff entering this catch basin is directed to the two existing 42" RCP lines that discharge into SCE Canal.

Runoff from drainage areas F and H (as shown in Figure 1 of Appendix B) do not contribute to the above described watershed. These areas were considered in the existing condition analysis because they will be disturbed during development of the site. Runoff from some of these areas will be routed through the watershed described above.

Drainage Area F is currently undeveloped. Runoff from this area is primarily sheet flow towards several existing natural channels. These channels direct their runoff directly into the SCE Canal. Drainage Area H is an existing residential development. Runoff from this area street surface flows towards Harbor Boulevard. Runoff entering Harbor Boulevard street surface flows towards the South, where it enters an existing inlet structure (CB4 – Figure 1). This structure is

connected to an existing storm drain line located along Wooley Road and ultimately discharges directly into SCE Canal.

Existing peak runoff calculations for the 10, 50 and 100 year storm events were calculated by using the City of Oxnard Cook's Method. Table 1 summarizes the peak runoff for each drainage area described above; (refer to Appendix B for more detail calculations.)

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)
A	6.35	7.42	12.61	14.84
B	3.68	4.30	7.31	8.60
C	3.73	4.59	7.80	9.18
D	4.01	4.92	8.36	9.84
E	0.88	1.24	2.11	2.48
F*	6.31	5.07	8.62	10.14
G*	2.20	1.65	2.81	3.30
H	0.66	0.81	1.38	1.62
I	2.54	4.17	7.09	8.34
Total	30.36	34.17	58.09	68.34

* Areas to be disturbed

Table 1 – Existing Peak Runoff Summary

In their existing condition the storm drain lines receiving runoff from CB1 through CB3 are adequately sized to handle the 10 year storm event. Refer to Appendix C for a preliminary analysis of the existing capacity of these storm drain lines.

DEVELOPED CONDITIONS

Development of TT5888 will disturb an approximate area of 8.5 acres. Development will consist of construction of several residential structures and the extension of Canal Street. The proposed development will take place within drainages areas F and G as shown in Figure 1 of Appendix B, which also correspond to Areas F1, F2, G1 and G2 of Figure 3 of Appendix D.

Runoff from the existing residential development (Areas A-E, I and H) will remain unchanged from those of the pre-developed conditions. Runoff from areas F1 and F2 (Figure 2 – Appendix D) will street surface flow along the newly extended Canal Street towards two proposed intercept catch basins. Runoff from Area G1 will surface flow in the street towards Dunes Road where it will be directed towards existing CB-1 (Figure 2 – Appendix D). Runoff from area G2 will surface flow and mix with runoff from drainage area H prior to discharging onto Harbor Boulevard.

Catch basin CB-5a and CB-5b, as shown in Figure 2 of Appendix D, will collect runoff from Area F1. Runoff entering these structures will be directed to proposed 18" SD lines that connect directly into CB-6b (Figure 2 – Appendix D). Similarly, runoff from Area F2 surface flows along Canal Street towards CB-6a and CB-6b (figure 2 – Appendix D). Runoff from all of these catch basins will be directed to either the proposed underground detention basin or towards the main on-site storm drain system. A more detail description of how this flow is diverted can be found in the detention concept section of this report.

Runoff from Areas F1 and F2 not being detained will be directed to a proposed 18" line along Canal Street. This line will connect directly into the existing 36" storm drain line. The total runoff entering this line will increase since some of the runoff from areas F1, F2 and G1 previously sheet flowed directly into SCE Canal. The total runoff entering existing CB-1 will decrease slightly – from an existing10 year peak flow of 19.6 cfs to a post-developed flow of 19.2 cfs. The total peak runoff being directed towards the existing 36" line however, will increase – from an existing 10 year peak flow of 19.6 cfs to a post developed peak flow of approximately 24.28 cfs. The capacity of the existing 36" line was checked to ensure that it is able to handle the additional flow from areas F1 and F2. This analysis can be found in Appendix E.

The total runoff entering the existing 36" RCP line increased due to the re-direction of flows from areas F and G. However, the total runoff being released from the site from the two existing 42" SD lines and runoff entering Harbor Boulevard will not exceed the pre-developed runoff amounts from each storm event. Refer to the detention concept analysis of this report for a more detail explanation.

Developed peak runoff calculations for the 10, 50 and 100 year storm events were calculated by using the City of Oxnard Cook's Method. Table 2 summarizes the peak runoff for each drainage area described above; refer to Appendix D for more detail calculations.

Drainage Area	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)
A	6.35	7.42	12.61	14.84
B	3.68	4.30	7.31	8.60
C	3.73	4.59	7.80	9.18
D	4.01	4.92	8.36	9.84
E	0.88	1.24	2.11	2.48
F1*	4.12	4.80	8.16	9.60
F2*	3.05	3.56	6.05	7.12
G1*	1.03	1.24	2.11	2.48
G2*	0.31	0.36	0.61	0.72
H	0.66	0.81	1.38	1.62
I	2.54	4.17	7.09	8.34
Total	30.36	37.41	63.59	74.82

*Areas to be developed

Table 2 – Developed Peak Runoff Summary

All proposed storm drain lines have been preliminarily sized for the 10 year storm event. Sizing calculations for the proposed storm drain lines can be found in Appendix E. The proposed catch basins have been sized to ensure that the total runoff leaving the site does not exceed the pre-developed runoff amounts for each storm event. That is each catch basin was sized to capture at the minimum the required runoff to be detained. Refer to Appendix J for catch basin sizing analysis.

SECONDARY FLOW PATH/PAD PROTECTION

Post developed secondary flows for the 100 year storm event will be contained within the street right of way. An analysis was conducted assuming the proposed catch basins become plugged,

to show that runoff from the 100 year storm event will be contained within the street right of ways. Refer to Appendix L for this analysis. Several cross sections were analyzed to verify that the water surface elevation within Canal Street provides enough free board to the proposed building finish floors. Refer to Figure 2 of Appendix D for section locations and to Appendix L for analysis.

If the overall proposed storm drain system were to fail, overland flows would be routed towards Wooley Road as shown in Figure 2 of Appendix D.

DETENTION CONCEPT

To mitigate the increase in runoff produced by the development of TT5888, an underground detention structure is proposed at the southeast end of the project (Appendix D – figure 2). The basin was preliminarily sized as on "Offline" detention basin. This means that all flows less than or equal to the allowable flows (Table 3) will be allowed to pass directly to the main storm drain system, while flows exceeding the allowable values will be routed into the detention basin.

The detention facility was sized by first calculating the allowable and developed peak flows by using the City of Oxnard Cook's Method (Appendix B and D respectively). Times of concentration for each drainage area as specified in Figure 2 of Appendix D were calculated by using the County of Ventura Time of Concentration Calculator. These Times of Concentration were input into VCRat to generate an appropriate hydrograph for each drainage area. A corresponding yield adjustment factor was applied to each storm event to 'fatten' the hydrograph volume. The 'fattened' hydrograph was then routed through the Hydraflow program to determine the size of the detention basin, outlet structure and release rates. The detention system was preliminarily sized to ensure that the total runoff leaving the site for each storm event is less than or equal to the pre-developed runoff amounts. Table 3 outlines the detention requirements for each storm event.

	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)
Total Existing Runoff	34.17	58.09	68.34
Total Developed Runoff	37.41	63.59	74.82
Runoff to be detained	3.24	5.50	6.48
Developed Runoff from Areas F1 & F2	8.36	14.21	16.72
Max. Allowable Runoff from Areas F1 & F2	5.12	8.71	10.24

Table 3 – Detention Requirements

Runoff from drainage areas F1 and F2 will be directed towards an underground diversion structure. This structure has been preliminarily designed to direct flows in two directions. Storm flows that are less than the allowable flows from areas F1 & F2 (Table 3) will be allowed to flow through the diversion structure into the main onsite storm drain line. Storm flows greater than the allowable flows will discharge into the proposed underground detention area where they will be detained until flows in the main storm drain line have subsided.

Appendix F has a breakdown of allowable flows for all storm events. Tables outlining the total allowable flows and flows being detained can also be found within this appendix. Preliminary sizing calculations for the underground detention system can be found in Appendix F. The sizing and description for the proposed diversion structure can be found in Appendix K.

For preliminary design purposes, two options for underground detention systems are presented in Appendix J. Both of these options have been preliminarily sized with a total storage volume of 3,500 cf for detention purposes only.

STORMWATER TREATMENT MEASURES

To comply with the NPDES requirements for stormwater treatment, it is proposed to treat the required Stormwater Quality Design Volume (SQDV) by using pervious pavement and infiltration facilities incorporated into the detention system. A preliminary soils report prepared by SubSurface Designs, Inc, shows that the ground water depth for this area is approximately 15' deep. This value will be verified prior to final design of any treatment facility. The total SQDV was calculated by the methodology described in the Ventura County Technical Guidance Manual. The required SQDV was found to be approximately 18,600 cubic feet. (refer to Appendix G for SQDV calculations.)

Pervious pavement is proposed along the parking areas as shown in Figure 3 of Appendix H. The proposed pervious pavement will provide a total volume for treatment of approximately 11,800 cf. Preliminary sizing of this treatment option can be found in Appendix H.

The remaining treatment volume will be provided by a gravel bed located underneath the proposed detention facility. The detention facility options proposed will act as an infiltration trench. These options will be either chambers with open bottoms or a system of perforated pipes both sitting on top of a gravel bed. The footprint of this gravel bed has been preliminary sized to provided approximately 9,000 cubic feet of volume for treatment. Preliminary sizing and description of both of these options can be found in Appendix H.

All proposed treatment facilities have been preliminarily sized to ensure that there is a minimum of 5 foot vertical separation from the bottom of the facility to the groundwater table. A study confirming groundwater table needs to be conducted prior to final design of any treatment facility.

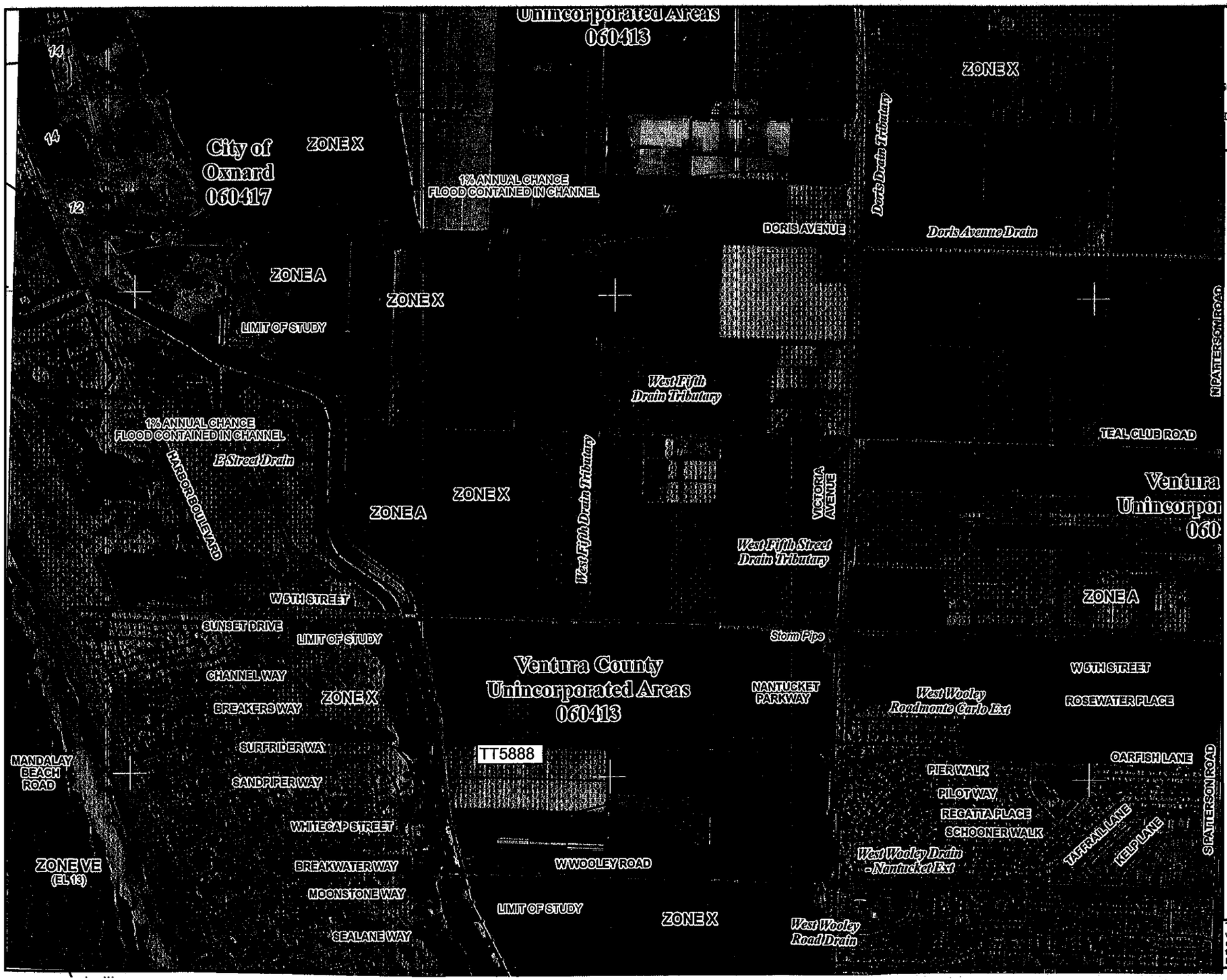
100 YEAR FLOOD PLAIN ANALYSIS

The site is located within Flood Zone X (shaded), per FIRM Panel 06111C0905E (Appendix I). Zone Flood X (shaded) is an area being protected from the 1 percent-annual chance or greater of flood hazard by a levee system that has not been provisionally accredited.

CONCLUSION

The preliminary drainage system for this project has been designed to meet the requirements of the City of Oxnard. All structures should be protected from the 100 year storm. On-site pervious pavement and infiltration facilities will provide the necessary storm water treatment.

The detention area will prevent runoff from the site from exceeding the respective undeveloped storm amounts. All storm drain systems have been sized to handle the 10 year storm event.



MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METER

NFIP

PANEL 0905E

FIRM

FLOOD INSURANCE RATE MAP

VENTURA COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 905 OF 1275
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OXNARD, CITY OF	060417	0905	E
SAN BUENAVENTURA, CITY OF	060419	0905	E
VENTURA COUNTY	060413	0905	E

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

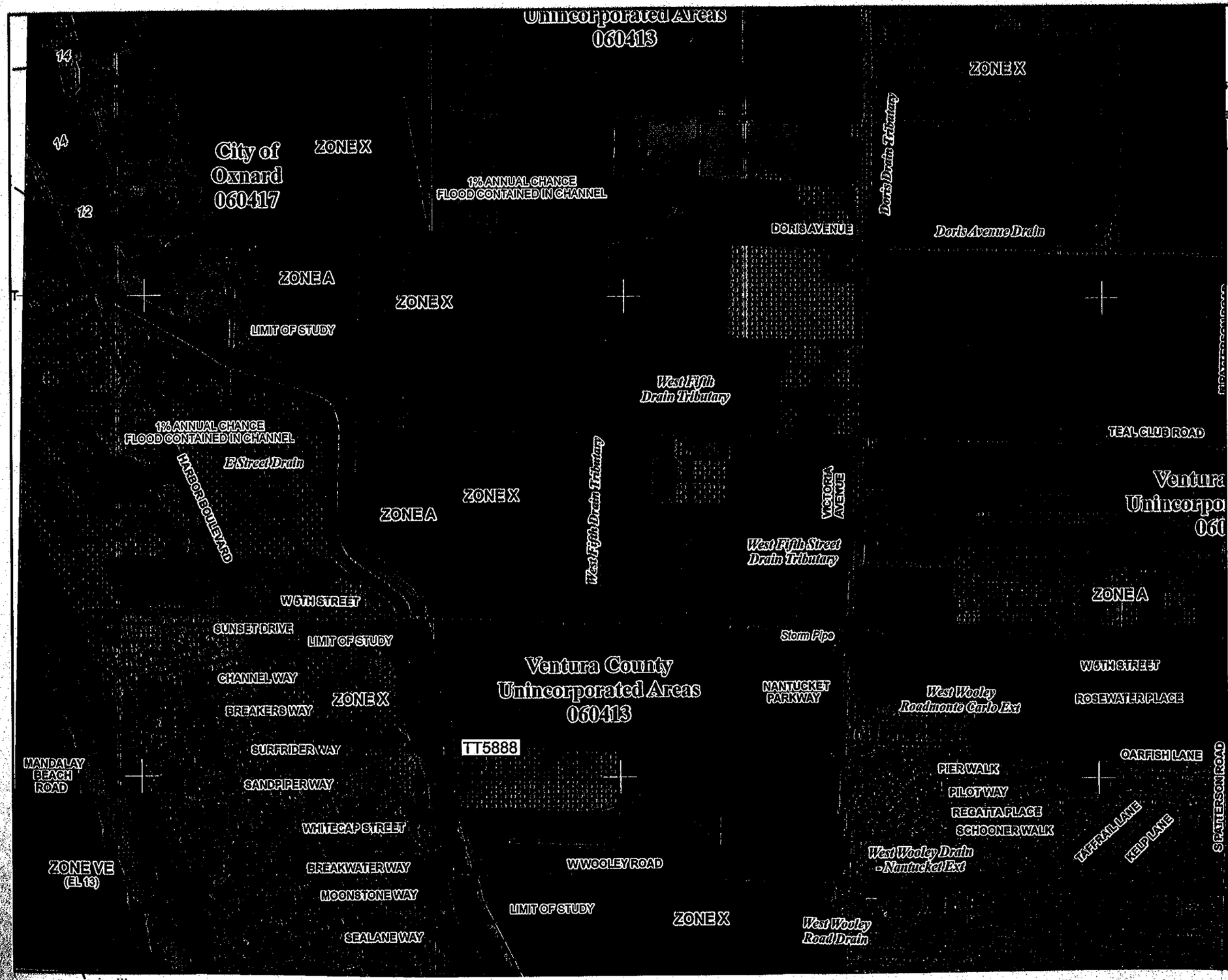
MAP NUMBER
06111C0905E

EFFECTIVE DATE
JANUARY 20, 2010

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METER

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

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SubSurface Designs Inc.

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(818) 898-1595 • (Fax) 898-4003

PRELIMINARY SOILS ENGINEERING INVESTIGATION

PROPOSED DEVELOPMENT OF 16 MULTI-FAMILY LOTS

CONSTRUCTION OF 48± RESIDENTIAL STRUCTURES

OXNARD SHORES NORTH

NORTHERN EXTENSION OF CANAL STREET

PARCELS 196001012 & 196001014

OXNARD, CALIFORNIA

FOR

OXNARD SHORES COMPANY, LLC

% MR. MIKE MARLOW

1015 S. HARBOR BOULEVARD

OXNARD, CALIFORNIA

PIN# 5462B

APRIL 28, 2011

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INTRODUCTION

This report presents the results of our Preliminary Soils Engineering Investigation performed at the northern extension of Canal Street in the City of Oxnard, California. The purpose of the investigation was to determine the subsurface conditions as they relate to the proposed construction of 48± residential structures. This investigation is limited to the area of the proposed development and does not warrant the remaining portions of the property.

SCOPE

This investigation is based upon:

- A topographic site plan by Jensen Design & Survey, Inc., a licensed land surveyor, that was utilized as our base map. This map appears to accurately reflect topographic conditions as observed at the subject property.
- The review of nine (9) exploratory borings. The materials encountered were logged by a representative of this office, and the explorations were backfilled with the excavated materials. However, backfill was not compacted and should be monitored for future settlement.
- Preparation of the enclosed Site Plan which locates the proposed development and our explorations (see APPENDIX I).
- Preparation of site exploration logs (see APPENDIX I).
- Laboratory testing and analysis of samples obtained within the excavations (see APPENDIX II).
- Calculations which may include, but are not limited to, bearing value, lateral pressure, active earth pressure, slope stability (see APPENDIX III).
- A search of earthquake, fault, and seismic parameters and conditions relevant to the subject site utilizing the EQSEARCH and EQFAULT computer programs (see APPENDIX IV).
- The review available maps and reports prepared by this office and others (see APPENDIX V).
- Preparation of this report.

The data that supports the following SUMMARY OF FINDINGS, CONCLUSIONS and RECOMMENDATIONS are contained within Appendices I through V.

The scope of our exploration is limited to the areas explored for the proposed development as delineated on the enclosed Site Plan. This report should not be considered as a comprehensive evaluation of the entire property. This report has not been prepared for use by other parties or for other purposes (or developments), and may not contain sufficient information for other than the intended use. If construction is delayed more than one year, this office should be contacted to perform an update and to verify the current site conditions.

LOCATION AND TOPOGRAPHY

The subject property is located in the City of Oxnard, California. The subject property is an undeveloped, irregular-shape parcel that extends from the northern terminus of Canal Street. See enclosed Vicinity Map for location of subject property (see APPENDIX I).

PROPOSED DEVELOPMENT

Final building plans have not been prepared and await the conclusions and recommendations of this investigation. However, it is our understanding that the proposed development will consist of constructing 48± residential structures. Grading will consist of the removal and recompaction of the near surface soil for support of the proposed structures. In addition, foundation excavations will be made for the support of the proposed structures. For reference, the locations of proposed structures are shown on the attached Site Plan, Plate A.

SUMMARY OF FINDINGS

Research

A representative from this office conducted research of available geotechnical engineering reports prepared for the subject property and adjacent properties at the City of Oxnard on April 11, 2011. In addition, research of available maps and publications prepared for the area was conducted. SubSurface Designs, Inc. has reviewed the referenced reports and has incorporated applicable information from these sources into this report.

It should be noted that other reports may have been prepared for the subject site in the past but were not found during records research, or were not submitted to the governing reviewing agency, and thus are not part of the public record.

Field Investigation

A field investigation of the site was conducted on March 14, 22 & 23, 2011. This included logging and sampling nine (9) drilled explorations that were excavated on the site. The explorations were excavated to a maximum depth of fifty-one feet (51') below an adjacent grade. For reference, excavations are located on the attached Site Plan, Plate A (see APPENDIX I).

The subsurface conditions encountered in these explorations were logged in detail by a representative of this office. Further, representative samples of the earth materials encountered were obtained.

Undisturbed samples were obtained within the test borings with a Modified California (M.C.) ring sampler (ASTM D 3550 with a shoe similar to ASTM D 1586), and with a Standard Penetration Test (SPT) sampler (ASTM D 1586). The M.C. sampler has a 3" outside diameter and a 2.37" inside diameter. The SPT sampler has a 2.00" outside diameter and a 1.37" inside diameter. The samples were obtained by driving the sampler with successive drops of the Kelly bar or 140 pound hammer dropping 30 inches in accordance with ASTM D 1586. The soil is retained in the brass rings of 2½" outside diameter and 1" in height.

Bulk samples were obtained for testing and analysis. All undisturbed and bulk samples were sent to the laboratory for examination, testing, and classification, using the Unified Classification system and group symbol.

Earth Materials

A thick sequence of alluvial deposits (Qa) underlie the entire property and surrounding areas.

The earth materials encountered on the subject property are briefly described below. For approximate depths and more detailed descriptions, refer to the enclosed Exploration Logs Figure E.1 through E.9 (see APPENDIX I).

Alluvium (Qa)

Site alluvium consists of a medium brown to dark brown silty sand to silty clay.

The earth fill materials, natural soil and alluvial deposits were visually classified in accordance with the Unified Soils Classification System.

Earth material profiles can only be obtained from individual explorations placed on the subject property. Care should be exercised when using these profiles to determine changes in depth or thickness of the earth materials between the explorations.

Site Drainage & Groundwater

Drainage within the site comprises essentially of sheet flow runoff of precipitation derived primarily within property boundaries.

Groundwater was encountered at a depth of nine to fourteen feet (9'-14') below the existing ground surface. However, historic high groundwater data is available within the Seismic Hazard Evaluation of the Oxnard Quadrangle, Open File Report 02-52, dated 2002, prepared by the State of California Division of Mines and Geology. Plate 1.2 of the aforementioned report illustrates that the depth to the historic high groundwater level is approximately five feet (5') below the ground surface in the area of the subject site.

It must be noted that fluctuations in the level of the groundwater may occur. The depth to groundwater, if encountered in the explorations, is only valid for the date of exploration. Changes may occur in this groundwater level due to climatic conditions and/or alterations in the existing groundwater recharge area (i.e. changes in landscaping irrigation rates, surface drainage and surface water infiltration conditions).

SEISMIC EVALUATION

General

The Southern California region is located within a tectonically active portion of the earth's crust which has produced both small and sizeable earthquakes throughout time. Faults are generally classified as active, potentially active, or inactive. A fault is considered "active" if it has produced seismic activity within the past 11,000 years. A "potentially active" fault is one where there has been seismic activity along the fault between 11,000 and 1,000,000 years. "Inactive" faults have not produced any seismic activity within the past 1,000,000 years. Active faults are considered to have a high probability of future seismic activity, potentially active faults are considered to have a low probability of future seismic activity, and inactive faults are considered to be no longer capable of producing seismic activity.

The potential exists throughout Southern California for strong ground motion similar to that which occurred during the 1994 Northridge Earthquake. Earthquakes with a magnitude of 5.0 and greater have occurred in Southern California throughout historic time. Strong ground shaking from a moderate to major earthquake can be expected during the lifetime of the structure. This may result in significant damage to the structure and hardscape. Since there are so many variables associated with ground movement during an intense earthquake, it is almost impossible to predict the impact of a seismic event to a particular site.

Earthquake Fault Zones

Following the 1971 Sylmar Earthquake, the State of California passed the Alquist-Priolo Special Studies Act in 1972. Active faults within the state were identified and zones were established which prohibited construction of most structures for human occupancy across a known active fault. The Alquist-Priolo Special Studies Act requires the State Geologist to delineate "special studies zones" along active faults, whereby development therein must include geologic investigation demonstrating the absence of a surface displacement threat prior to construction of habitable structures. "Special Studies Zones" have since been renamed "Earthquake Fault Zones".

The subject property is not located within the confines of an "Earthquake Fault Zone", and no zoned faults extend through the site or are in close proximity to the property. Although the site is not located within a State designated "Earthquake Fault Zone" it is located in an active seismic region where large numbers of earthquakes occur each year.

Seismic Hazard Zones

Following the 1989 Loma Prieta Earthquake, the State of California enacted the Seismic Hazard Mapping Act (SHMA) in 1990. As a result, the Department of Conservation prepared a set of maps designating areas within the state that may be susceptible to seismic slope instability and/or liquefaction during a strong seismic event. The seismic safety zones were published in a series of maps initially released in 1996.

The Seismic Hazards Mapping Act was prompted by damaging earthquakes in northern and southern California, and is intended to protect public safety from the effects of strong ground shaking, liquefaction, landslides, and other earthquake-related hazards. The Seismic Hazards Mapping Act requires that the State Geologist delineate the various "seismic hazards zones." The maps depicting the zones are released by the CGS. The fact that a site lies outside of a zone does not mean it is free of seismic or geologic hazards such as landslides, lateral spreading, liquefaction or rockfall. Southern California has not been completely mapped, although new maps are issued and existing maps are refined occasionally.

The Seismic Hazards Mapping Act requires a site investigation by a certified Engineering Geologist and/or Civil Engineer prior to development of a project within a hazard zone. The investigation is to include recommendations for a "minimum level of mitigation" that should reduce the risk of ground failure during an earthquake to a level that does not cause the collapse of buildings for human occupancy. The Seismic Hazards Mapping Act does not require mitigation to a level of no ground failure and/or no structural damage.

Seismic Hazard Zone delineations are based on correlation of a combination factors, including: surf,ace distribution of soil deposits and bedrock, slope steepness, depth to groundwater, bedding orientation with respect to slopes, bedrock shear strength, and occunence of past seismic failure. Maps within the series are further designated as Reconnaissance, Preliminary or Official. Official Seismic Hazard Zone Maps are the culmination of mapping, analysis, review and comment of CGS, other State agencies, and the public following review and revision of the Preliminary Review Map. The Official Maps are the most rigorous and have the highest confidence level.

As defined, a "Liquefaction Hazard" area is an area where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693© would be required. As defined, an "Earthquake-Induced Landslide" area is an area where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation as defined in Public Resources Code Section 2693© would be required.

This office has reviewed the Seismic Hazards Map of the Oxnard Quadrangle prepared by the State of California Division of Mines and Geology. According to this map, the site is located within an area of study for earthquake-induced liquefaction. However, the site is not located within an area subject to earthquake-induced landsliding.

Recent Seismic Activity

The most recent largest earthquake within the specified search radius and time period is the Northridge Earthquake. The 6.7 magnitude Northridge Earthquake occurred on January 17, 1994 at 4:31 a.m., PST, and created strong ground shaking for approximately 10 seconds in the Los Angeles area resulting in wide spread, random damage. The earthquake occurred along a previously unrecognized south dipping thrust fault. The causative fault, as defined by a pattern of aftershocks, moved under an area roughly 19-miles across its front (approximately east-west in orientation) and 13 miles from front to back (approximately north-south in orientation). Although slip magnitude was approximately 9- to 10-feet, surface rupture along the causative fault did not occur as a result of the earthquake.) The epicenter of the Northridge Earthquake is located approximately forty miles east of the subject property. The earthquake produced an estimated repeatable high ground acceleration of 0.087g on the subject property.

The computer program EQSEARCH was used to determine all historical earthquakes with event magnitudes ranging from 4.5 to 9.0 on the Richter Scale within a 50 mile search radius of the subject property over the past 100 years. Data obtained from utilizing the EQSEARCH program may be found in APPENDIX IV.

Active Faults with Historic Surface Rupture

The 1857 Fort Tejon Earthquake (8.3±M) occurred along the San Andreas Fault Zone. The San Andreas Fault Zone is located approximately forty-six miles to the north and has a maximum probable event magnitude of 7.40. The 1933 Long Beach Earthquake (6.3M) occurred along the Newport-Inglewood Fault Zone. The 1971 San Fernando Earthquake (6.4M) occurred along the San Fernando Fault Zone. The San Fernando-Sierra Madre Fault Zone is located approximately forty-four miles to the northeast and has a maximum probable event magnitude of 6.30.

The program EQFAULT was used to estimate the proximity of various faults within a 50 mile radius, determine their maximum probable event magnitudes, and calculate the resulting ground accelerations on the subject property. Data obtained from utilizing the EQFAULT program may be found in APPENDIX IV.

Horizontal Ground Acceleration

Predicted maximum credible and probable event magnitudes, credible and repeatable high ground accelerations, and fault distances from the site have been estimated by using a method developed by Campbell & Bozorgnia (1994). Mean plus one standard deviation values have been determined for each known active fault zone within a 50 mile radius of the subject property. By definition, a mean plus one standard deviation" value has an 84 percent probability of non-exceedance. For additional information refer to the attached results obtained from EQFAULT, APPENDIX IV.

CBC Seismic Design Parameters

The majority of southern California, including all of Los Angeles and Ventura counties, is within a zone requiring structural design to resist earthquake loads. Section 1613A of the 2007 California Building Code (CBC) which is based on the 2006 International Building Code (IBC) requires mapped spectral response acceleration parameters. These parameters include 5-percent critical damping at 0.2 seconds ($\mathbf{S_s}$)and 1.0 seconds ($\mathbf{S_1}$). In addition, a Site Class and site coefficients ($\mathbf{F_a}$ and $\mathbf{F_v}$) must be assigned for use in structural design relative to strong ground shaking.

The mapped spectral acceleration parameters S_s and S_1 are determined utilizing Figures 1613.5(3) and 1613.5(4), and site coefficients F_a and F_v can be obtained from tables 1613A.5.3(1) and 1613A.5.3(2) of the CBC 2007. The spectral acceleration parameters and site coefficients can also be determined using the program "Earthquake Ground Motion Parameter Java Application" obtained from the U.S. Geological Survey website (http://earthquake.usgs.gov/research/hazmaps/design/index.php).

The following seismic coefficient values were obtained from use of the U.S. Geological Survey & Java Ground Motion Parameter Calculator. It is recommended that the project Structural Engineer independently verify the accuracy of all the parameters outlined in the following table, excluding Site Class, prior to use.

2007 California Building Code (Section 1613) - Site Coefficients & Data	
Site Latitude	34.1935°
Site Longitude	119.2365°
Site Class (average soil properties within the upper 100')	D
0.2 Second Spectral Response - $\mathbf{S_s}$	1.857
1.0 Second Spectral Response - $\mathbf{S_1}$	0.820
Site Coefficient - $\mathbf{F_a}$	1.0
Site Coefficient - $\mathbf{F_v}$	1.5
Adjusted Maximum Considered Earthquake Spectral Response Acceleration Parameter	
$\mathbf{S_{MS}} = F_{a\ \text{Silty sand}}$ (0.2 Second Spectral Response)	1.857
$\mathbf{S_{M1}} = F_v S_1$ (1.0 Second Spectral Response)	1.230
Five Percent Damped Design Spectral Response Acceleration	

2007 California Building Code (Section 1613) - Site Coefficients & Data	
$S_{DS} = \frac{2}{3}S_{MS}$ (0.2 Second Spectral Response)	1.238
$S_{D1} = \frac{2}{3}S_{M1}$ (1.0 Second Spectral Response)	0.820

Conformance with the presented criteria for seismic structural design does not constitute any kind of warranty, guarantee, or assurance that significant damage, or ground failure, will not occur in the event of a maximum level earthquake. The primary goal of the code-required minimum seismic design is to protect life and limb, and catastrophic failure, and not avoid all damage, as such design may be economically prohibitive. The Project Structural Engineer and owner must decide if the level of risk associated with utilizing the minimum required code values is acceptable and, if not, assign appropriate seismic values above the minimum code values for use in the structural design.

SITE STABILITY

Liquefaction Potential

Liquefaction refers to the momentary loss of shear strength. The necessary components for liquefaction include: a shallow groundwater condition; relatively loose soils; fine grained sands and silty sands; and repeated cyclic loading. During an earthquake cyclic loading occurs, allowing pore pressures to increase as a result of individual soil grain particles realign themselves. The realignment of the soil particles allows the water to completely separate and surround the grains. As cyclic loading continues the shear resistance of the soil decreases until the pore pressures equal the confining pressures. The result of the increases in the pore pressure and the decrease in the shear resistance is termed "Liquefaction".

According to the Guidelines for Evaluating and Mitigating Seismic Hazards in California (SP 117A). There are two general levels of liquefaction hazards; large-scale displacement, and more localized failures including the loss of bearing strength, differential settlement and small-scale flows and lateral spreads. Areas with a potential for large-scale displacements will often require multiple methods of remediation to protect against liquefaction. Treating the site with soil improvement methods can often mitigate smaller scale ground deformations. These methods help reduce future settlements due to the static forces created by building loads and the dynamic forces from earthquake-imposed stress. With improvement, safe construction can be accomplished on marginal soils; i.e., loose sand, unconsolidated fill, collapsible soil, expandable clay and mine spoils.

SP 177A defines large-scale ground displacements as those that exceed 1-3 feet horizontally and 4-6 inches vertically. Only removal and densification of liquefiable soils, or permanently lowering the groundwater by dewatering, can fully eliminate liquefaction hazards.

Localized ground failures are smaller scale displacements that can often be mitigated by treating the site with soil improvement methods. There are several published articles with additional information on the success of specific soil improvement techniques (Hayden and Baez, 1994). Suitable mitigation alternatives may include one or more of the following:

- Excavation and removal or re-compaction of potentially liquefiable soils;
- Soil densification or other types of in-situ ground modifications;
- Deep foundations that have been designed to accommodate liquefaction effects; and,
- Reinforced shallow foundations and improved structural design to withstand predicted vertical and lateral ground displacements.

Three types of deformations cause most of the damage in small-scale failures; loss of bearing strength, differential settlement and soil spreads and flows.

Loss of bearing strength due to liquefaction can occur in saturated clean sand under strong earthquake loading conditions. This type of failure often occurs in natural deposits of clean sands that have interbedded lenses of finer-grained sediments at some depth below the ground surface. In addition, overburden pressure tends to increase density with depth. The fill deposits most susceptible to liquefaction and excessive settlement are thick accumulations of clean, cohesionless sand that are saturated and do not strengthen substantially with depth.

Differential settlement is a localized loss of support under the footprint or across the span of a building. It commonly occurs in interbedded sediments at alluvial sites. The variable lensing character of the material makes the extent and thickness of the liquefiable layers; and therefore, the amount of settlement, hard to predict.

Localized lateral spreads and small-scale flows are formed by the displacement of a surface layer in response to liquefaction of an underlying layer. This type of failure is dependent upon a gentle slope or a nearby free face or open area that will allow the displacement.

Treating the site with soil improvement methods can often mitigate smaller scale ground deformations. These methods help reduce future settlements due to the static forces created by building loads and the dynamic forces from earthquake-imposed stress.

It should be recognized that structural mitigation might not reduce the potential of the soils to liquefy during an earthquake. There will remain some risk that the structure could still suffer damage and may not be useable if liquefaction occurs. Utilities and lifeline services provided from outside the structure could still suffer disruption unless mitigation measures are employed that would account for the soil deformations that could occur between the structure and the supporting soils. Repair and remedial work should be anticipated after a liquefaction event if structural mitigation is used.

The intent of the State's Seismic Hazard Map Zoning program is to ensure that a minimum level of public safety and protection is met for projects in zones of required investigation. The acceptable level of risk by State standards is one that ensures life safety in most residential and commercial structures. For more details and information refer to California Geological Survey SP 177A.

During our explorations at the subject property, groundwater was encountered at a depth of nine to fourteen feet (9'-14') below the existing ground surface. However, historic high groundwater data is available within the Seismic Hazard Evaluation of the Oxnard Quadrangle, Open File Report 02-52, dated 2002, prepared by the State of California Division of Mines and Geology. Plate 1.2 of the aforementioned report illustrates that the depth to the historic high groundwater level is approximately five feet (5') below the ground surface in the area of the subject site.

A liquefaction analysis was performed for each of the explorations place on site utilizing LiquefyPro computer program prepared by Civiltech Corporation. Calculations, attached hereto, have been performed for the nine exploration placed on site by this office. The calculations show that there is a potential for earthquake induced liquefaction at the subject site. Generally, liquefaction at the subject property is predominately within soil layers in upper twenty five feet (25'). Some liquefaction potential has been calculated within soil layers below twenty five feet (25'), however, the largest amounts of settlement occur within the liquefiable layers in the upper twenty five feet (25'), please refer to the attached calculations. The calculations indicate settlement between approximately one and three inches (1"-3") may occur as a result of the design earthquake event. A potential differential settlement of one to two inches (1"-2") should be considered for design.

In order to help mitigate the effects of liquefaction related settlement, recommendations for support of the proposed structures include a mat foundation. Grading will also be necessary for development. As an alternative to a mat foundation system, ground modification could be performed. Recommendations for ground modification can be provided upon request.

Lateral Spread

Lateral spreading is an associated problem caused by liquefaction. Lateral spreading is typically associated in areas of gently sloping ground that undergo liquefaction. As a result, the ground surface moves in the direction of the slope. The effects of lateral spreading can be the elongation of, or cracks in the ground surface perpendicular to the direction of the slope. These cracks, if situated below or adjacent to structures, can result in settlement, lateral movement and damage to the structure. Based on the relatively level topography of the subject property, the potential for lateral spreading to occur is considered low.

Seismically Induced Settlement

As discussed above, calculations show that there is a potential for earthquake induced liquefaction at the subject site. The calculations indicate settlement between approximately one and three inches (1"-3") may occur as a result of the design earthquake event. A potential differential settlement of one to two inches (1"-2") should be considered for design.

Hydro-compression

Hydro-compression of soils is a phenomenon where loosely to medium dense and/or soft to firm soils "collapse" with moisture inundation. Infiltration of moisture into the subsurface may be attributed to various conditions or occurrences (i.e., either a rise in groundwater levels, excessive surface water percolating through the surficial sediments or by broken or leaking utility lines, etc.) and thus, must be considered when applicable. A review of the research materials, laboratory testing, field exploration and analysis contained herein suggests that the unsaturated soil has a potential for hydro-compression to occur. Recommendations contained herein are being provided to partially mitigate the potential for hydro-compression.

Expansive Soils

Expansive soils are considered to be one of the most costly natural hazards as related to light structures, slabs, retaining walls, paving etc. Expansive soils are influenced greatly by changes in moisture content and can lead to damage when the moisture content changes significantly over short durations of time (i.e. seasonal).

These changes can result from may factors including the initial moisture content of the soil, climate, groundwater, drainage conditions, irrigation and vegetation to name a few. Therefore, it is imperative that soils underlying the subject property are maintained at a consistent moisture content in order to reduce the potential damage caused by expansive soils. A watering schedule that allows the soil to become saturated, then dry out can result in foundation movement and distress. In addition, the recommendations outlined in the DRAINAGE AND MAINTENANCE section should be followed.

The near surface earth materials encountered in the explorations consist of silty sands, sandy silts and sands. The expansion potential of the underlying earth material is very low.

Tsunamis

Tsunamis are large waves or ocean surges caused by offshore earthquakes, large underwater landslides, and submarine volcanic eruptions which can travel for thousands of miles from the source. The potential for tsunami activity is typically discussed for all sites located below an elevation of thirty-five feet (35').

If a tsunami strikes and inundation occurs, the residence could be severely damaged or completely destroyed and thus there is an obvious hazard to life and limb should the tsunami strike while the residence is occupied. However, this is a known and accepted risk of beachfront or coastal living as there is no practical method of protecting a beachfront/coastal residential structure from a large tsunami. In the case of low-lying residential structures situated along an unprotected coastline, the protection of life and limb shall rely on the accuracy and efficiency of the government tsunami warning system and the actions of the occupants.

The potential for tsunami activity must be discussed for all sites located below an elevation of thirty-five feet (35'). Based upon the plan, the site is located at an elevation of approximately twelve to twenty-seven feet (12'-27') above mean sea-level. Due to the coastal location and elevation of the subject property, it is the opinion of this office that there is a threat of inundation of the site should a large tsunami develop and collide with this portion of the west coast. The costs incurred from such an event may be partially mitigated by appropriate insurance.

CONCLUSIONS

General

It is the professional opinion of this office that construction of the proposed residences is feasible provided that the recommendations contained herein are followed. In addition, all applicable elements of the governing agency Building Codes shall be followed.

Based upon our field observations, laboratory testing and analysis, the alluvium found at depth in the explorations should possess sufficient strength to support the proposed compacted fill pad and structures. The near surface soil deposits encountered in the explorations excavated on site are not considered suitable for foundation support as these materials may possess adverse deformational characteristics.

RECOMMENDATIONS

1. Grading for the proposed development shall include the removal and recompaction of the upper six feet (6') of the existing alluvium for support of the proposed foundation system. The grading shall extend outside of the footprint of the proposed structure ten feet (10'). A minimum of four feet (4') of compacted fill shall be maintained below the bottom of all foundations. A layer of bi-directional geogrid shall be placed within the bottom of the grading limits prior to the placement of compacted fill. Portions of the bottom excavation for the recommended removals are anticipated to require stabilization prior to the placement of compacted fill. In areas where excessive pumping is encountered, the geogrid shall be covered with one foot (1') of six inch (6") minus rock then covered with a geofrabric. The earth material outside of the grading limits for the proposed structure shall be removed and recompacted down two feet (2') for support in all areas to receive concrete slab, decking or paving.

Grading shall be carried fourth as described in the GRADING AND EARTHWORK section below. Based on the granular nature of the upper alluvium, each layer shall be compacted to 95 percent of the maximum density as determined by the latest version of ASTM D 1557

2. It is recommended that the proposed structures be supported by a mat foundation. A mat foundation is a thickened rigid slab that encompasses the entire building footprint, which spreads the load of the structure to a wider area. It should be noted that, the proposed mat foundation is not intended to mitigate the potential liquefaction hazard. The mat foundation is however intended to mitigate potential life and safety issues associated with resulting settlement that may be caused by liquefaction. In the case of settlement and/or differential settlement following a liquefaction event, the structure can be re-leveled by jacking or by other construction methods. Foundations should be designed as outlined in the FOUNDATIONS section below.

3. The site shall be maintained as outlined in the DRAINAGE AND MAINTENANCE section below.

It should be noted that, the recommendations contained within this report may be more restrictive than applicable building codes. All recommendations of this report which are in addition to or more restrictive than those outlined in a subsequent review letter, by your governing reviewing agency, shall be incorporated into the plans.

GRADING AND EARTHWORK

Proposed Grading

Grading for the proposed development shall include the removal and recompaction of the upper six feet (6') of the existing alluvium for support of the proposed foundation system. The grading shall extend outside of the footprint of the proposed structure ten feet (10'). A minimum of four feet (4') of compacted fill shall be maintained below the bottom of all foundations. A layer of bi-directional geogrid shall be placed within the bottom of the grading limits prior to the placement of compacted fill. Portions of the bottom excavation for the recommended removals are anticipated to require stabilization prior to the placement of compacted fill. In areas where excessive pumping is encountered, the geogrid shall be covered with one foot (1') of six inch (6") minus rock then covered with a geofrabric. The earth material outside of the grading limits for the proposed structure shall be removed and recompacted down two feet (2') for support in all areas to receive concrete slab, decking or paving.

Additionally, foundation excavations will be made. All grading shall be carried forth as outlined herein. Based on the granular nature of the upper alluvium, each layer shall be compacted to 95 percent of the maximum density as determined by the latest version of ASTM D 1557

Flatland

1. Prior to commencement of work, a pre-grading meeting shall be held. Participants at this meeting will consist of the contractor, the owner or his representative, and the soils engineer. The purpose of this meeting is to avoid misunderstanding of the recommendations set forth in this report that might cause delays in the project.

2. Prior to placement of fill, all vegetation, rubbish, and other deleterious material should be disposed of off site. The proposed structures should be staked out in the field by a surveyor. This staking should, as a minimum, include areas for overexcavation, toes of slopes, tops of cuts, setbacks, and easements. All staking shall be offset from the proposed grading area at least five feet (5').

   The proposed construction areas should be excavated down six feet (6') below existing grade, and a minimum of four feet (4') below all foundations.

3. The natural ground, which is determined to be satisfactory for the support of the filled ground, shall then be scarified to a depth of at least six inches (6") and moistened as required. The scarified ground should be compacted to at least 90 percent of the maximum laboratory density.

4. The fill soils shall consist of materials approved by the project Soils Engineer or his representative. These materials may be obtained from the excavation areas and any other approved sources, and by blending soils from one or more source. The material used shall be free from organic vegetable matter and other deleterious substances, and shall not contain rocks greater than eight inches (8") in diameter nor of a quantity sufficient to make compaction difficult.

5. The approved fill material shall be placed in approximately level layers six inches (6") thick, and moistened as required. Each layer shall be thoroughly mixed to attain uniformity of moisture in each layer.

   When the moisture content of the fill is below the optimum moisture content, as specified by the Soils Engineer, water shall be added and thoroughly mixed in until the moisture content is within three percent (3%) above the optimum moisture content.

   When the moisture content of the fill is more than three percent (3%) above the optimum moisture content, as specified by the Soils Engineer, the fill material shall be aerated by scarifying or shall be blended with additional materials and thoroughly mixed until the moisture content is within three percent (3%) above the optimum moisture content.

   Each layer shall be compacted to 90 percent of the maximum density as determined by the latest version of ASTM D 1557, using approved compaction equipment.

6. Review of the fill placement should be provided by the Soils Engineer or his representative during the progress of grading. In general, density tests will be made at intervals not exceeding two feet (2') of fill height or every 500 cubic yards of fill placed.

7. The materials can experience a shrinkage of ten to fifteen percent (10-15%).

8. During the inclement part of the year, or during periods when rain is threatening, all fill that has been spread and awaits compaction shall be compacted before stopping work for the day or before stopping because of inclement weather. These fills, once compacted, shall have the surfaces sloped to drain to one area where water may be removed.

   Work may start again, after the rainy period, once the site has been reviewed by the Soils Engineer and he has given his authorization to resume. Loose materials not compacted prior to the rain shall be removed and aerated so that the moisture content of these fills will be within three percent (3%) above the optimum moisture content.

   Surface materials previously compacted before the rain, shall be scarified, brought to the proper moisture content, and re-compacted prior to placing additional fill, if deemed necessary by the Soils Engineer.

9. Review of geotechnical data available for the local vicinity of the site indicates that septic tanks, seepage pits, or leach fields may be encountered during site grading. If encountered, these should be drained of effluent or drilled out if they have been backfilled. The cleaned-out area should be inspected by the soils engineer and governing inspector prior to backfill. The excavation may be filled with approved compacted fill, lean concrete, or gravel. Whichever backfill material is selected, at least five feet (5') of approved manmade fill, placed at 90 percent relative compaction should cap the excavation.

FOUNDATIONS

It is recommended that the proposed structures be supported by a mat foundation. A mat foundation is a thickened rigid slab that encompasses the entire building footprint, which spreads the load of the structure to a wider area. It should be noted that, the proposed mat foundation is not intended to mitigate the potential liquefaction hazard. The mat foundation is however intended to mitigate potential life and safety issues associated with resulting settlement that may be caused by liquefaction. In the case of settlement and/or differential settlement following a liquefaction event, the structure can be re-leveled by jacking or by other construction methods.

All earth materials derived from the excavations of foundations shall be removed from the site or placed as certified compacted fill. Fill temporarily stockpiled on site should be placed in a stable area, away from slopes, excavations and improvements. Earth materials shall not be cast over any descending slopes in an uncontrolled manner.

Mat Foundation

The thickness of the mat foundation and required reinforcement shall be specified by the Project Structural Engineer. A coefficient of subgrade modulus (K) of 150 lb/cubic inch may be utilized for the design. Perimeter foundations and interior pads shall be a minimum of 24 inches below grade and can utilize a soil bearing of 1500 pounds per square foot.

Lateral loads may be resisted by friction at the base of the foundations and by passive resistance within the certified fill (cef). A lateral bearing of 150 pounds per square foot shall be taken is passive pressure calculations. A coefficient of friction of 0.35 is recommended. The coefficient of friction shall be used between the base of the foundation and the recommended bearing material. When combining passive and friction for resistance of lateral loads, the passive component should be reduced by one-third.

Residential floor slab should be protected by a 10 mil vapor retarder/barrier placed beneath the slab. These types of retarders/barriers should be placed between two inches (2") of sand to prevent punctures in the vapor retarder/barrier and to aid in the cure of the concrete. It should be noted that this type of barrier will not preclude moisture damage to wood floors or vapor sensitive flooring. The commonly used 6-mil and 10-mil polyethylene plastic sheeting can produce less-than-satisfactory results due to its low puncture resistance, inconsistent vapor permeability, and variable product longevity. It is recommend that the retarder/barrier conform with ASTM E1745. These products should be installed in accordance with the manufacturer's recommendations. In particular, care should be utilized to seal sheet boundaries and seal around penetrations.

It should be noted that cracking of concrete floor slabs is very common during curing. The cracking occurs because concrete shrinks as it dries. It is important that additional water not be added to concrete at the site to make pumping easier as this will increase the magnitude of shrinkage.

Crack-control joints which are commonly used in exterior decking to control such cracking are normally not used in interior slabs. The reinforcement recommended is intended to reduce cracking, and its proper placement is critical to concrete slab performance. The minor shrinkage cracks which often form in interior slabs generally do not present a problem when carpeting, linoleum, or wood floor coverings are used. The slab cracks can, however, lead to surface cracks in brittle floor coverings such as stone or tile. A mortarbed or slip sheet is recommended between the slab and brittle floor covering to limit the potential for cracking.

SETTLEMENT

Settlement and differential settlement can result in cracks in the exterior and interior finishes, flooring, etc. Controlling drainage around the structure as outlined in the DRAINAGE AND MAINTENANCE section below can help to control settlement/differential settlement. Additionally, foundation excavations cleared of all loose material prior to the placement of steel, then prior to the placement of concrete is required and can significantly minimize future settlement and differential settlement.

Future settlement and/or differential settlement of the structure and secondary features due to long term deformation and natural occurrences are still possible. Any site drainage improvements, such as those outlined in the DRAINAGE AND MAINTENANCE section below, will result in a lower risk of future foundation problems.

Static settlement of the proposed single family residence will occur. Settlement of ½" to ¾" between walls, within 30 feet or less of each other and under similar loading conditions, are considered normal. Total settlement on the order of ¾" should be anticipated. Differential settlement is not expected to exceed ¾".

Seismic settlement due to liquefaction is also possible. The calculations indicate settlement between approximately one and three inches (1"-3") may occur as a result of the design earthquake event. A potential differential settlement of one to two inches (1"-2") should be considered for design.

EXCAVATION EROSION CONTROL

During inclement periods of the year, when rain is threatening (between October 1, and April 15) an erosion control plan shall be implemented and approved by the reviewing agency, to reduce the potential of site erosion. The following are several recommendations prepared by this office. The following recommendations are valid any time of the year that rain threatens an excavation.

Open Excavations

All open excavations shall be protected from inclement weather. This is required to keep the surface of the open excavation from becoming saturated during rainfall. Saturation of the excavation may result in a relaxation of the soils which may result in failures.

Hillside Excavations

All hillside excavations shall be covered during the rainy seasons. Stakes, ropes, and sandbags, along with plastic may be employed to help facilitate the coverage of the excavations. Coverage of the open excavations shall over-extend from the edges of the excavations in all directions.

The project Civil Engineer shall be consulted for the limits of coverage. If possible, slopes around the open excavations shall be trimmed to slope away from the open excavation, so water runoff will not drain into the excavation. Any trees or planters that might cause failure around the open excavations, due to the saturated hillside, shall be anchored safely. After the rain has ceased, the excavations shall be reviewed by the project soil engineer and geologist for safety prior to recommencement of work.

Open Trenches

No water shall be allowed to pond or saturate open trenches. All open trenches shall be covered with plastic and sandbags. Areas around trenches shall be sloped in such a way that water will not runoff into the trenches. After the rain has ceased, trenches shall be reviewed by project soil engineer for safety prior to recommencing work. All footing excavations must be reviewed by the project soil engineer again, prior to pouring concrete.

Open Pile/Caisson Excavations

All open excavations for piles or caissons shall be reviewed and poured prior to rainfall. We do not recommend any pile excavations being left open through any rain storms. However, if it is necessary to leave pile excavations open through any rain storms, all water and runoff must be prevented from entering these pile excavations.

Grading in Progress

During the inclement part of the year, or during periods when rain is threatening, all fill that has been spread and awaits compaction shall be compacted before stopping work for the day or before stopping because of inclement weather. These fills, once compacted, shall have the surfaces sloped to drain to one area where water may be removed.

Work may start again, after the rainy period, once the site has been reviewed by the project soils engineer. Loose materials not compacted prior to the rain shall be removed and aerated so that the moisture content of these fills will be within three percent (3%) above the optimum moisture content.

Surface materials previously compacted before the rain, shall be scarified, brought to the proper moisture content, and re-compacted prior to placing additional fill, if deemed necessary by the Soils Engineer.

Additionally, it is suggested that all stock-piled loose fill materials, not compacted prior to anticipated rainfall, shall be covered with plastic. This action will keep the loose fill from being saturated with water, and will allow the grading to resume when the rain stops. It is always easier and less time consuming to increase moisture content of the fill than to aerate the fill to achieve optimum moisture.

All of the above recommendations shall be considered as part of the erosion control plan for the subject property. However, these recommendations shall and will not supersede, nor limit any erosion control plans produced by the Project Civil Engineer.

EXCAVATIONS

Excavations ranging in vertical height up to six feet (6') will be required for the proposed development. Conventional excavation equipment may be used to make these excavations. Excavations should expose alluvium. The alluvium is suitable for vertical excavations up to four feet (4'). Excavations that exceed the stated height limits, and all loose surficial material, shall be trimmed back at a gradient of 1:1 (h:v). This should be verified by a representative of this office during construction so that modifications can be made if variations in the soil occur. The earth material exposed in the proposed cuts should be kept moist, but not saturated, to reduce the potential for raveling and sloughing that may occur during construction.

Excavations made as outlined herein will be safe for employees to perform work adjacent to the excavation which may include: foundation construction, wall construction, backdrain installation, finishing, and waterproofing. Prior to any work being performed adjacent to the excavation, other than performing the excavation with heavy equipment, excavations **must** be reviewed by a representative of this office in order to verify that the conditions encountered during grading are similar to those encountered during our initial investigation. If the conditions vary from those anticipated, additional recommendations may be required so that safe and stable excavations are made. Additional recommendations may include, but not be limited to, shoring, slot cutting or trimming of cuts to a safe inclination.

Construction excavations shall be made under the supervision of a qualified "competent person" along with periodic review performed by this office. A "competent person" as defined by California/OSHA, is one who is capable of identifying existing and predictable hazards that are unsanitary or dangerous to employees. The competent person has the authority to impose prompt corrective measures to eliminate these hazards.

All excavations should be stabilized within 15 days of initial excavation. If this time is exceeded, the project soils engineer must be notified, and modifications, such as shoring or slope trimming may be required. Water should not be allowed to pond on top of the excavation, nor to flow toward it. All excavations should be protected from inclement weather. The top of the excavations should be barricaded to ensure that no vehicular surcharge be allowed within five feet (5') of the top of cut.

All other construction methods shall meet the requirements of the Construction and General Industry Safety Orders, the Occupational Safety and Health Act, California OSHA in addition to other public agencies having jurisdiction.

CONCRETE DECKING

Concrete decking should be a minimum of four inches (4") thick, reinforced with minimum #3 reinforcing bars placed at eighteen inches (18") on center each way. The decking should be underlain by two inches (2") sand to aid in concrete curing. For crack control in concrete decking, the maximum control joint spacing should be eight feet (8'). A closer control joint spacing would provide greater crack control. Additional control joints at 90° corners, curves, angle points and where decking transitions to a narrower segment are recommended.

Decking that adjoins a lawn, planter or the top of a slope should be provided with an 8-inch-thick deepened edge. The deck reinforcement should be bent down into the thickened edge. Steel reinforcing bars (#3) should be provided at the top and bottom of the deepened edge. Although precautions can be taken, the recommendations are not intended to stop movement, settlement, differential settlement, or cracking. Recommendations provided are only to reduce movement, settlement and cracking as a result of expansion/contraction or consolidation of the supporting soil.

It should be noted that cracking of concrete decking is very common during curing. The cracking occurs because concrete shrinks as it dries. It is important that additional water not be added to concrete at the site to make pumping easier as this will increase the magnitude of shrinkage.

UTILITY TRENCHES

It is recommended that utility tenches are not planned or placed parallel to and below a 1½:1 plane projected down from the base of the outer edge of a conventional foundation. Footings should be deepened to satisfy the above recommendations. Clean sand should be placed around utility lines and properly jetted. Flooding and/or jetting of utility trenches does not create compact trench backfill and should be limited to backfilling around, and up to six inches (6") above, utility pipes. Backfill for the remaining portion of the trench above the pipes should be placed by mechanical compaction methods to a minimum of 90% of the maximum density, as determined by the latest version of ASTM D 1557. The upper twelve inches (12") of the certified fill shall be compacted to at least 95% of the maximum density in all areas where vehicle loading occurs. All compaction should be tested and certified by this office. Failure to properly backfill and compact utility trenches can result in water migrating through the trench which could lead to foundation settlement or slope instability. Utility penetrations through footings should be tightly sealed when raised-floor construction is utilized.

DRAINAGE AND MAINTENANCE

General

Maintenance of structures and slopes must be performed to minimize the chance of serious damage and/or instability to improvements. Most problems are associated with, or triggered by water. Therefore, a comprehensive drainage system should be designed and incorporated into the final plans. In addition, pad areas should be maintained and planted in a way that will allow this drainage system to function as intended. The following are drainage, maintenance and landscaping recommendations that should be implemented at minimum. Reductions in these recommendations will reduce their effectiveness and may lead to damage and/or instability to site improvements and adjacent properties. It is the responsibility of the property owner to ensure that the residence and site drainage devices are maintained in accordance with the following recommendations, including the requirements of applicable governing agency.

1. Pad Drainage

   (a) Positive pad drainage shall be incorporated into the final plans. All drainage from the roof and pad shall be directed so that water does not pond adjacent to the foundations or flow toward them. All drainage from the site shall be collected and directed via non-erosive devices to a location approved by the building official. **No alteration of this system shall be allowed.**

   (b) Planters placed adjacent to the structures shall be designed to drain away from the structure. Care should be taken to not saturate the soils (i.e. leaking irrigation lines or excessive landscape watering).

2. Slope Drainage

   No water shall be allowed to flow over any slopes. The drainage structures constructed to enhance slope stability shall be cleaned and/or maintained. This includes, but is not limited to, interceptor ditches, drainage terraces, downdrains, berms, debris fences, grates, and exits for subsurface devices.

3. Landscaping (Planting)

   It is recommended that a landscape architect be consulted regarding planting adjacent to the development and on any slopes. Plants surrounding the development shall be of a variety that requires a minimum of watering. Slope landscaping shall consist of plants with dense and deep root structures that require a minimum of watering. It will be the responsibility of the property owner to maintain the planting. Alterations of planting schemes shall be reviewed by the landscape architect.

4. Irrigation

   An adequate irrigation system will be required to sustain landscaping. Any leaks or defective sprinklers shall be repaired immediately. To mitigate erosion and saturation, automatic sprinkling systems shall be adjusted for rainy seasons. A landscape irrigation specialist should be consulted to determine the best times for landscape watering and the maximum amount of water usage.

5. Rodent Control

   The property owner must undertake and maintain a program which eliminates or controls burrowing animals. This must be an ongoing program in order to provide protection to the slope's stability. The uncontrolled burrowing by rodents has proven to be one of the major causes for surficial slope stability problems.

REVIEWS

Plan Review and Plan Notes

The final construction and/or grading plans shall be reviewed and approved by the consultants. This is required to determine if the recommendations of the report have been properly understood and carried forth in the design drawings.

The final plans should reflect the following:

1. The Soils Engineering Investigation by SubSurface Designs, Inc., as a part of the plans.

2. Plans must be reviewed and signed by the soils engineer.

3. All grading must be reviewed by the project soils engineer.

4. All foundations shall be reviewed by the project soils engineer.

5. All deep foundation excavation must be performed under the continuous review of the project soils engineer.

Reviews will be required to verify all work. A review will be performed to determine if the intent of the report has been adequately carried forth. This office should be notified at least **two working days** in advance of any reviews of this nature so that staff personnel may be made available.

Construction Review

It is required that all foundation excavations and grading be reviewed by this office. A review will be performed to determine if the intent of the report has been adequately carried forth. This office should be notified at least two working days in advance of any reviews of this nature so that staff personnel may be made available. The reviews will be billed at our current hourly rate.

LIMITATIONS

General

Subsurface conditions were determined on the basis of our field explorations and appear to be relatively uniform. Although, between exploratory excavations, subsurface earth materials may vary in type, strength, and many other properties. The recommendations presented herein are for soil conditions encountered in specific locations. Other soil conditions due to non-uniformity of the soil conditions or manmade alterations may be revealed during construction. At that time, further recommendations may be made if required.

Conclusions and recommendations presented herein are based on our experience and background. Therefore, the conclusions and recommendations are professional opinions and are not meant to indicate a control of nature. This report makes no other warranty, either expressed or implied, concerning the advice presented herein.

Conclusions on building site stability, settlement, slippage, and its affects on off-site property are based on our visual examination, the placement of explorations, laboratory testing of samples obtained during explorations, analysis of our data, and our experience. It is our opinion that our standard-of-care analysis provides an adequate assessment of the site conditions. Our examination does not, however, imply that the subject property is risk free.

This report may not be copied. If you wish additional copies, you may order them from this office. See your contract for charges.

Construction Notice

Construction can be difficult. Recommendations contained herein are based upon several windows (explorations) excavated at locations deemed suitable by your consultants. It is this corporation's aim to advise you through this report of the general site conditions, suitability for construction, and overall stability. It must be understood that the opinions are based upon testing, analysis, and interpretation thereof.

All properties are subject to risk, these risks can be mitigated but not be eliminated. Properties are subject to hazards including but not limited to, floods, mudslides, landslides, seepage, erosion, raveling of slopes, concentrated drainage, limited access, differential settlement, heaving and fire. The damage from these hazards may be reduced by the property owner by maintaining yards, slopes, walls, slough protection devices, drainage facilities, and by correcting any deficiencies found during occupancy of the property. It is not possible to eliminate all hazards.

Quantities for foundation concrete and steel may be estimated, based on the findings given in this report. However, you must be aware that depths and magnitudes will most likely vary between the excavated windows (explorations) given in the report.

If you have any questions concerning this report, please contact this office.

Respectfully submitted:
SUBSURFACE DESIGNS, INC.

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(1) file

APPENDIX I

SITE INFORMATION

Vicinity Map

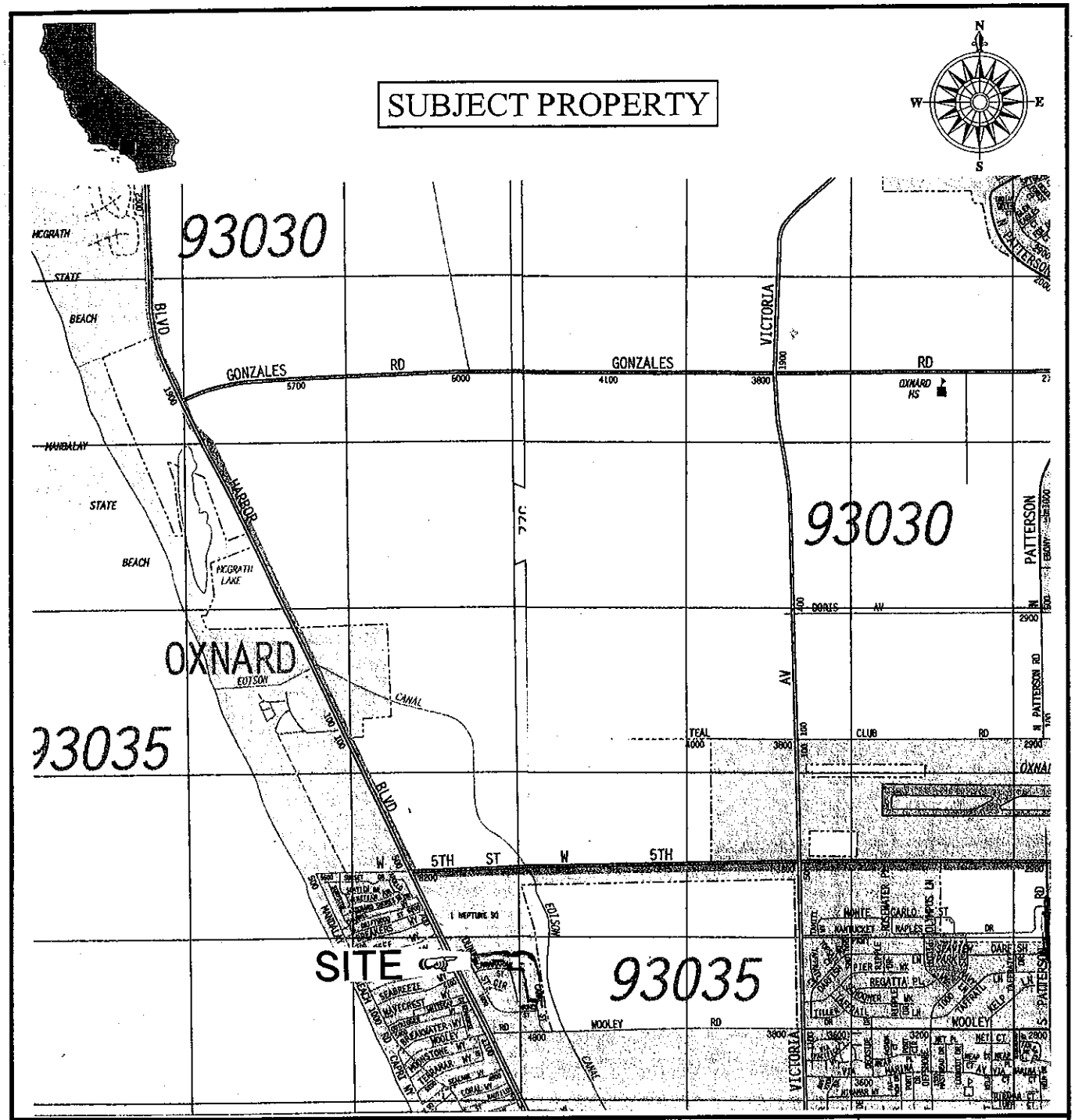
Seismic Hazard Map

Historic High Groundwater Map

Site Plan, Plate A (pocket attachments)

Exploration Logs, Figure E.1 through E.9

Exploration Logs (SubSurface Designs, Inc., 2008)

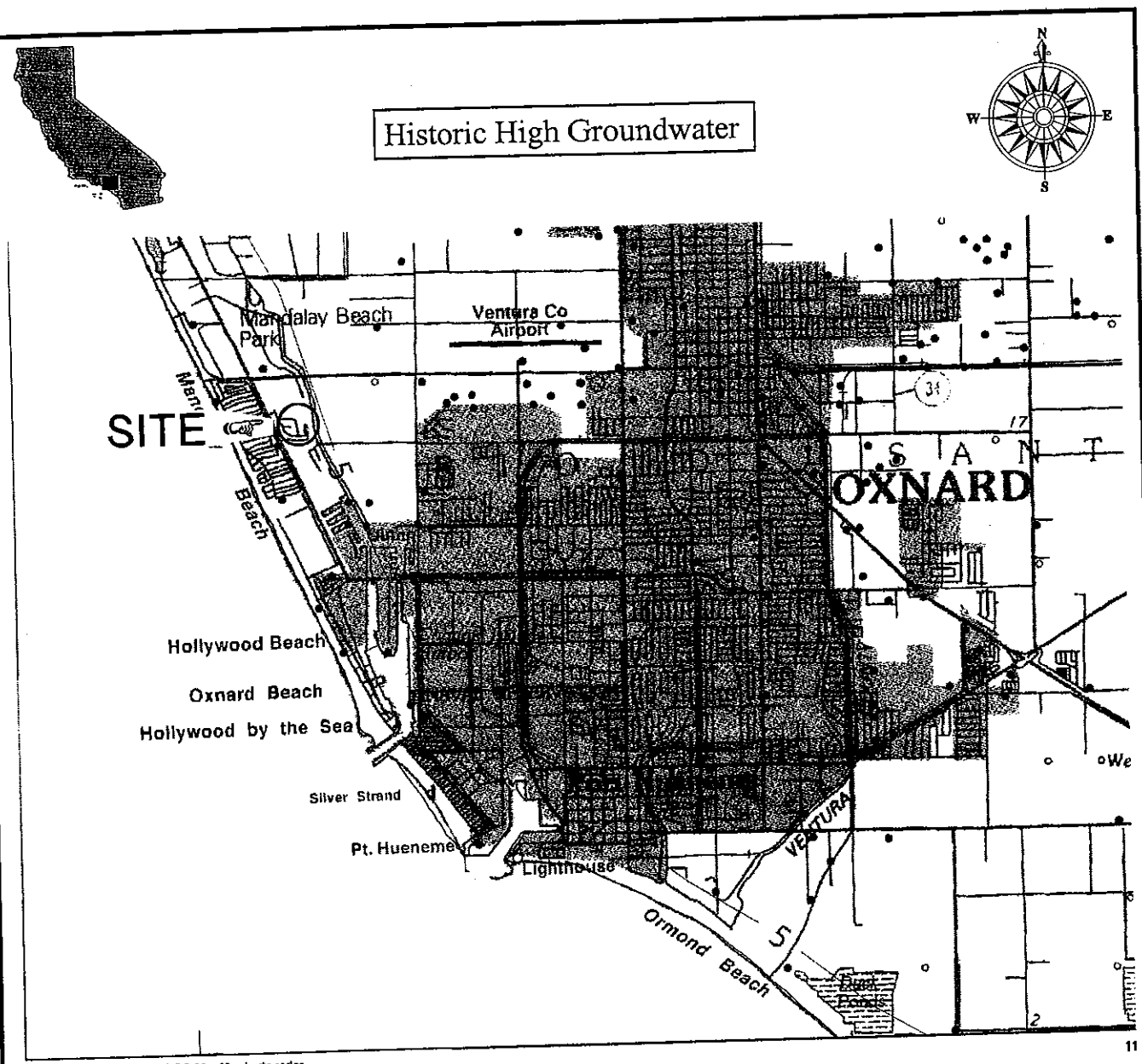


SubSurface Designs, Inc. Geotechnical Engineers Engineering Geologists	**Client**: Oxnard Shores Company, LLC	**PIN#** 5462B
	Subject: Vicinity Map **Ref**: Thomas Bros. Maps L. A. County, Page 521 & 522 **Scale**: 1" = 2400'	

SEISMIC HAZARD MAP



SubSurface Designs, Inc. Geotechnical Engineers Engineering Geologists	**Client**: Oxnard Shores Company, LLC	**PIN#** 5462B
	Ref: Modified from the Seismic Hazard Zone Map of the Oxnard Quadrangle, prepared by the State of California Division of Mines and Geology, 2002. **Scale:** 1: = 1000'	



SubSurface Designs, Inc. Geotechnical Engineers Engineering Geologists	**Client**: Oxnard Shores Company, LLC	**PIN#** 5462B
	Ref: Historically Highest Groundwater Contours, From the Seismic Hazard Zone Report of the Oxnard Quadrangle, prepared by the State of California Division of Mines and Geology, 2002.	

EDR Aerial Photographs

Appendix E

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Harbor Boulevard
Harbor Boulevard
Oxnard, CA 93035

Inquiry Number: 3787629.5
November 20, 2013

The EDR Aerial Photo Decade Package

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

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Please contact EDR at 1-800-352-0050
with any questions or comments.

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Date EDR Searched Historical Sources:

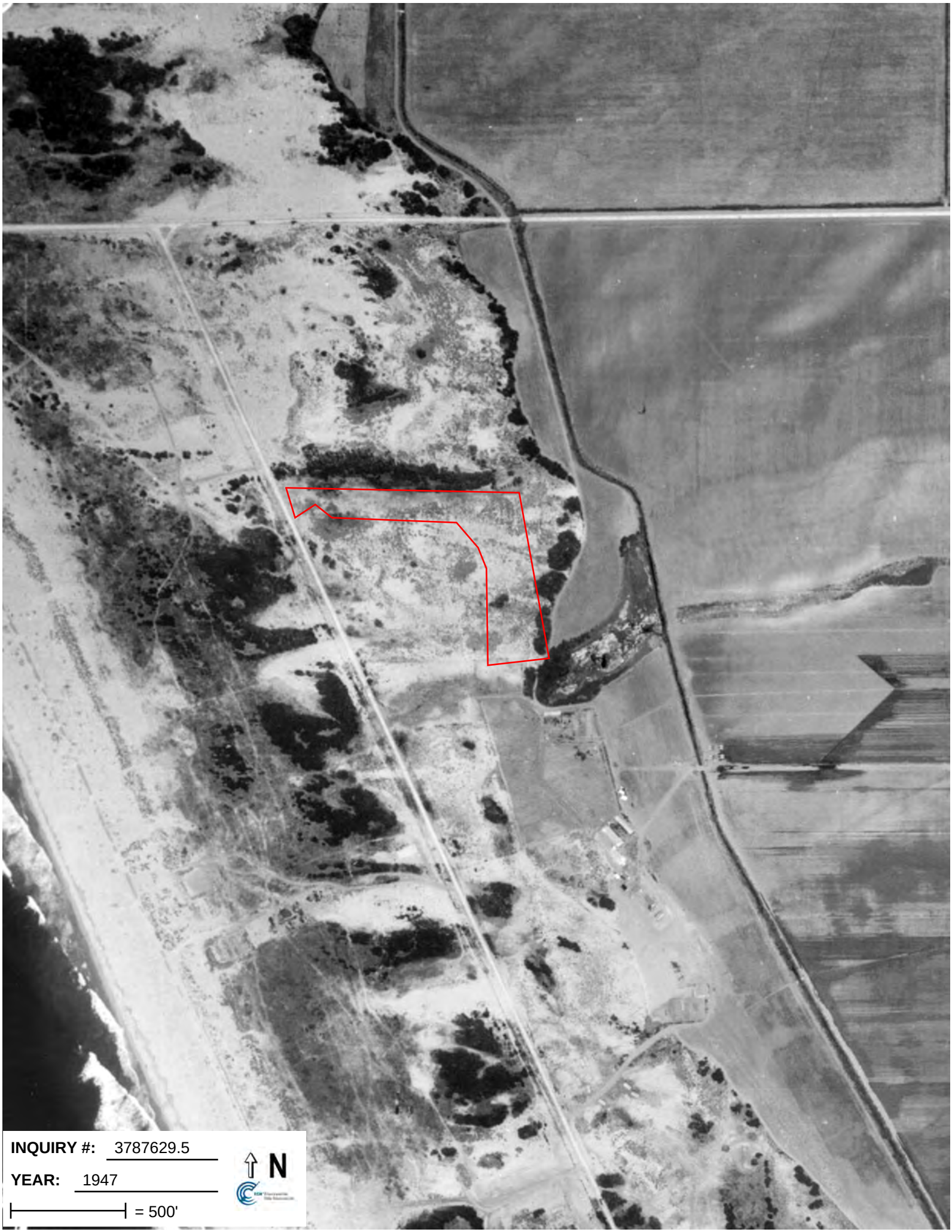
Aerial Photography November 20, 2013

Target Property:

Harbor Boulevard

Oxnard, CA 93035

Year	***Scale***	***Details***	***Source***
1947	Aerial Photograph. Scale: 1"=500'	Flight Year: 1947	Tubis
1959	Aerial Photograph. Scale: 1"=500'	Flight Year: 1959	Robinson
1964	Aerial Photograph. Scale: 1"=500'	Flight Year: 1964	Mark Hurd
1970	Aerial Photograph. Scale: 1"=500'	Flight Year: 1970	Mark Hurd
1977	Aerial Photograph. Scale: 1"=500'	Flight Year: 1977	Teledyne
1989	Aerial Photograph. Scale: 1"=500'	Flight Year: 1989	USGS
1994	Aerial Photograph. Scale: 1"=500'	/DOQQ - acquisition dates: 1994	EDR
2005	Aerial Photograph. Scale: 1"=500'	Flight Year: 2005	EDR
2009	Aerial Photograph. Scale: 1"=500'	Flight Year: 2009	EDR
2010	Aerial Photograph. Scale: 1"=500'	Flight Year: 2010	EDR
2012	Aerial Photograph. Scale: 1"=500'	Flight Year: 2012	EDR


INQUIRY #: 3787629.5
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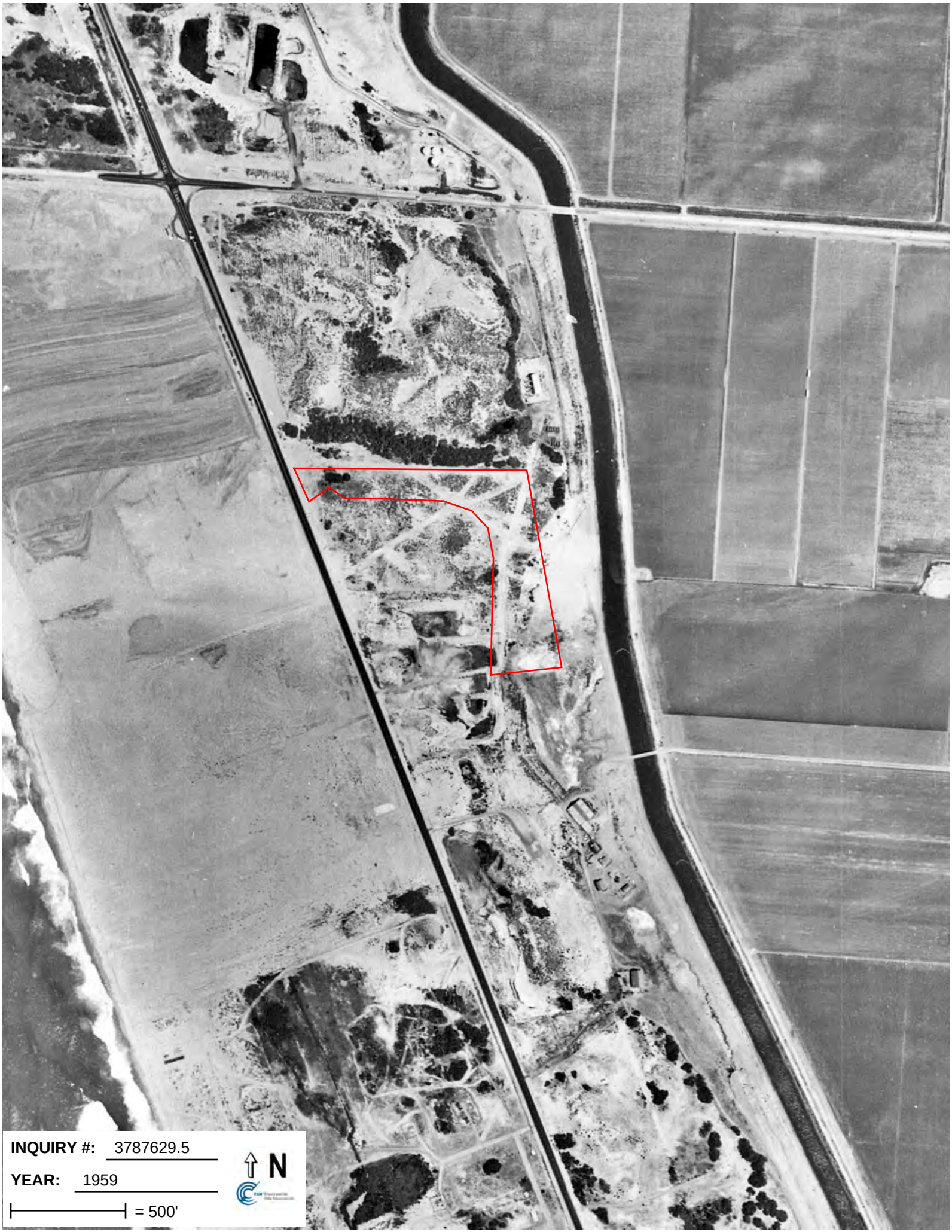
= 500'
N


INQUIRY #: 3787629.5
YEAR: 1959
= 500'
N

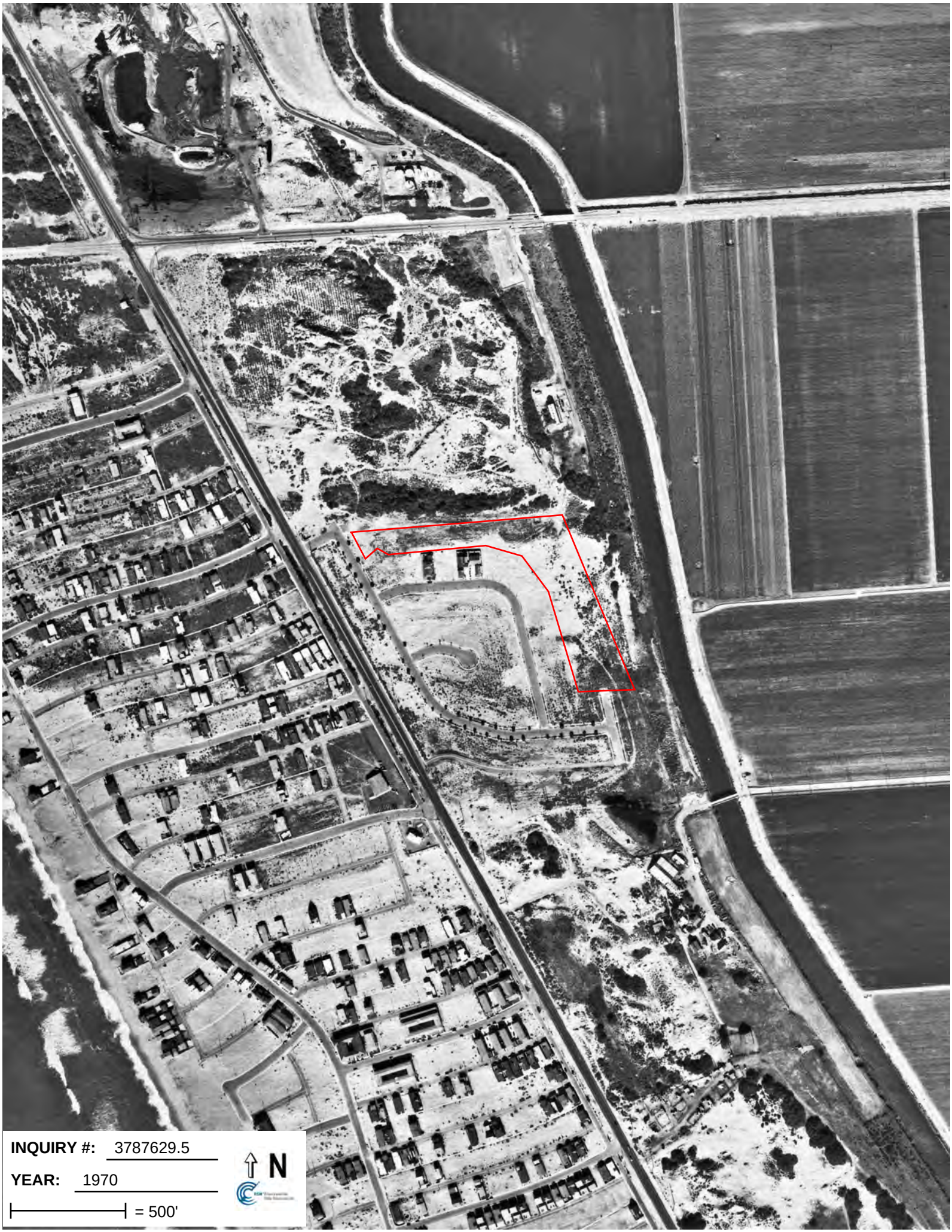


INQUIRY #: 3787629.5

YEAR: 1964

= 500'

N


INQUIRY #: 3787629.5
YEAR: 1970
= 500'
N


INQUIRY #: 3787629.5
YEAR: 1977
= 500'
N


INQUIRY #: 3787629.5
YEAR: 1989
= 500'
N


INQUIRY #: 3787629.5
YEAR: 1994
= 500'
N


INQUIRY #: 3787629.5
YEAR: 2005
= 500'
N


INQUIRY #: 3787629.5
YEAR: 2009
= 500'
N


INQUIRY #: 3787629.5
YEAR: 2010
= 500'
N


INQUIRY #: 3787629.5
YEAR: 2012
= 500'
N

EDR Topographic Maps

Appendix F

Converse Project No. 11-42-171-01
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Harbor Boulevard
Harbor Boulevard
Oxnard, CA 93035

Inquiry Number: 3787629.4
November 15, 2013

EDR Historical Topographic Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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Historical Topographic Map



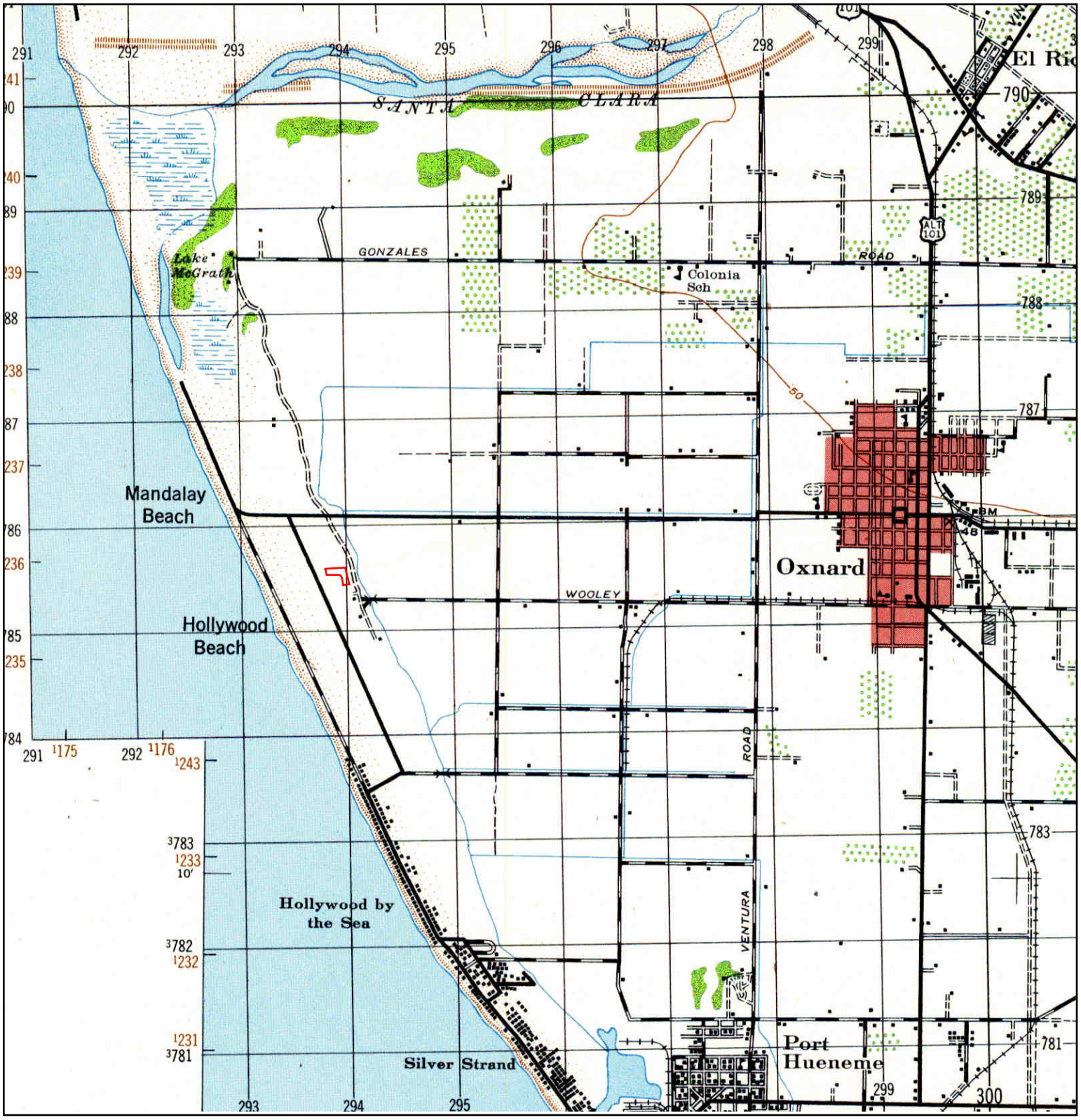
N	TARGET QUAD NAME: HUENEME MAP YEAR: 1904 SERIES: 15 SCALE: 1:62500	SITE NAME: Harbor Boulevard ADDRESS: Harbor Boulevard Oxnard, CA 93035 LAT/LONG: 34.1935 / -119.2363	CLIENT: Converse Consultants CONTACT: Denise Gutierrez INQUIRY#: 3787629.4 RESEARCH DATE: 11/15/2013

Historical Topographic Map



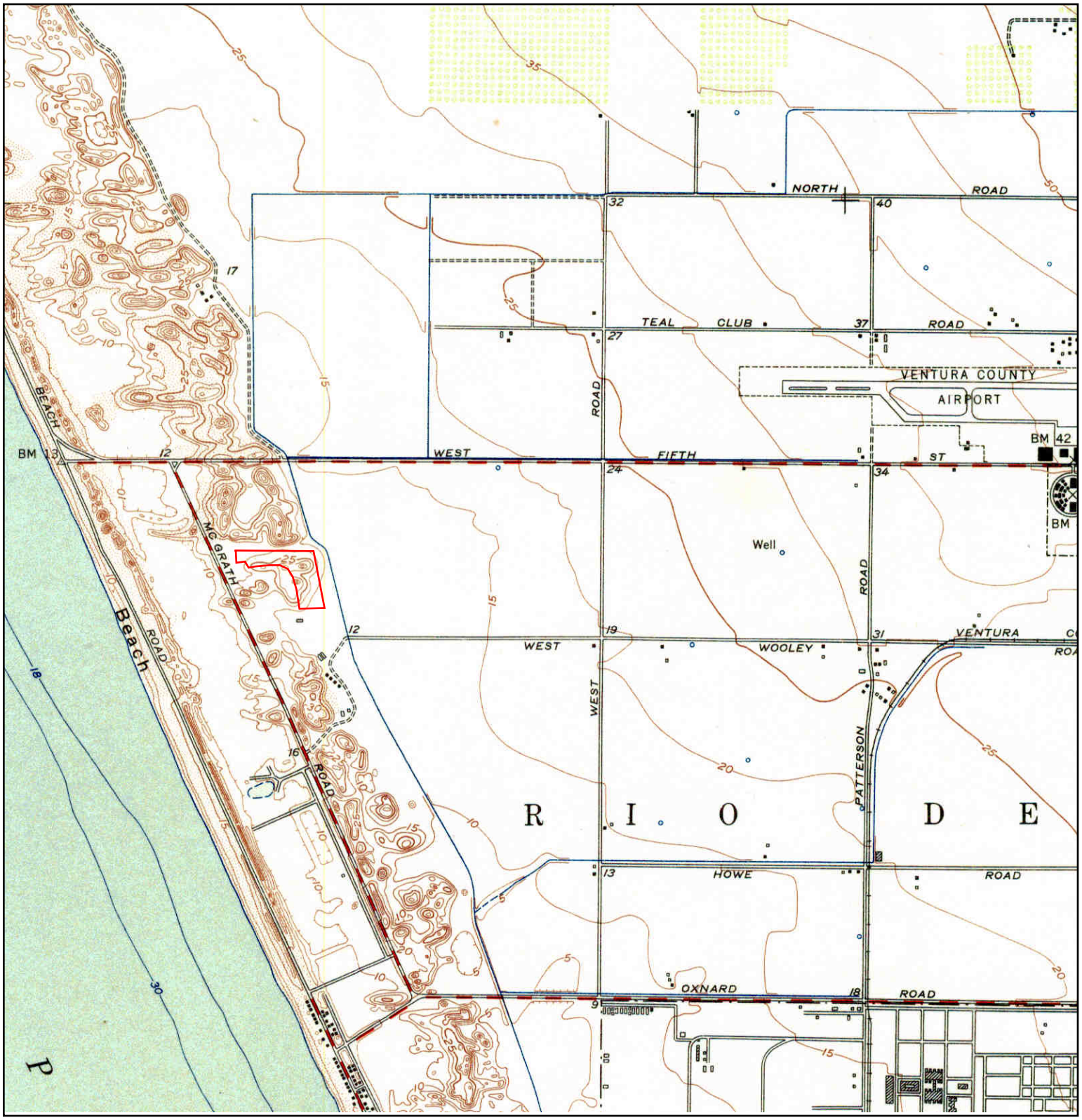
N	TARGET QUAD NAME: SOUTHERN CA SHEET 3 MAP YEAR: 1910 SERIES: 60 SCALE: 1:250000	SITE NAME: Harbor Boulevard ADDRESS: Harbor Boulevard Oxnard, CA 93035 LAT/LONG: 34.1935 / -119.2363	CLIENT: Converse Consultants CONTACT: Denise Gutierrez INQUIRY#: 3787629.4 RESEARCH DATE: 11/15/2013

Historical Topographic Map



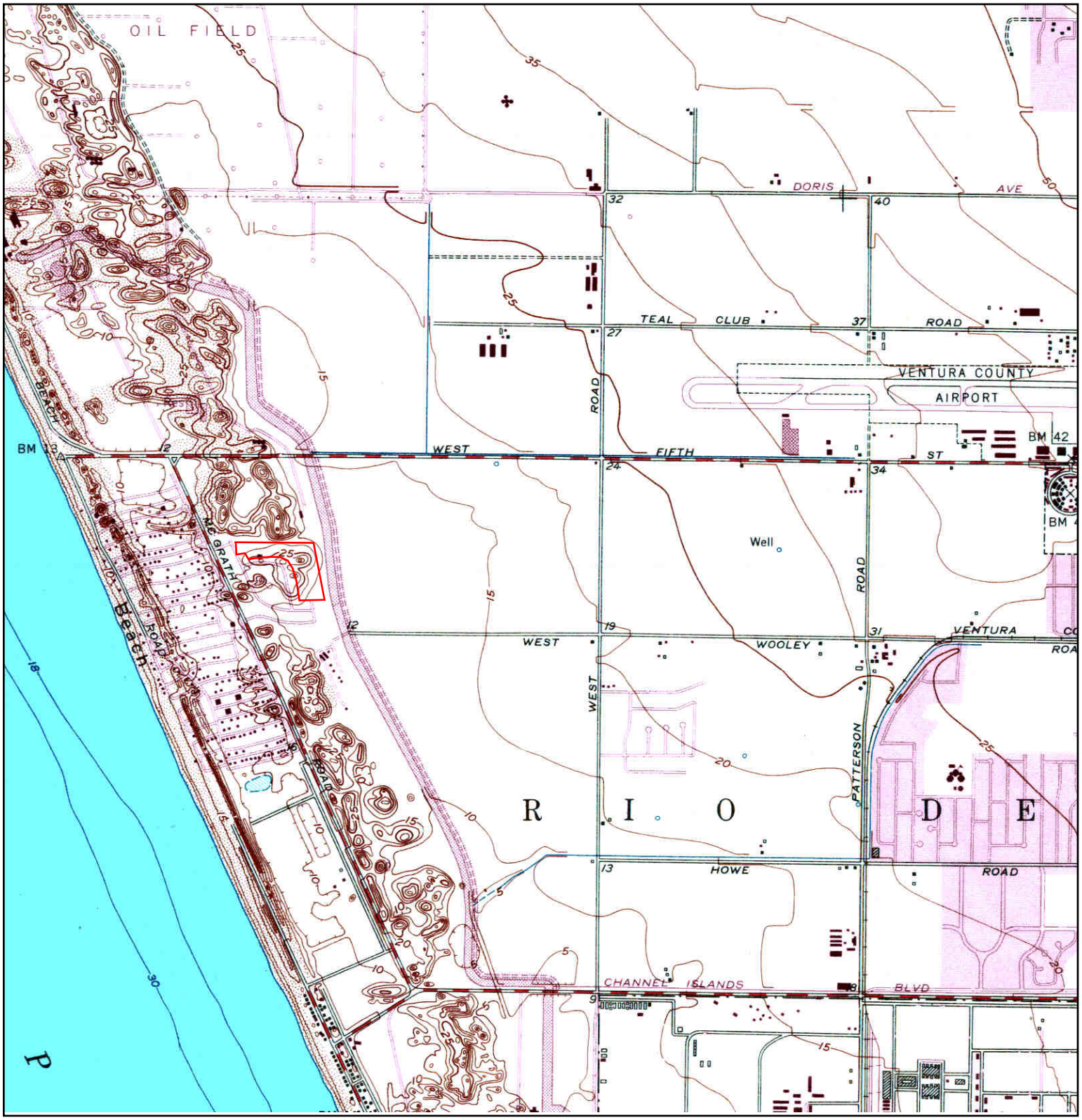
N	TARGET QUAD NAME: HUENEME MAP YEAR: 1947 SERIES: 15 SCALE: 1:50000	SITE NAME: Harbor Boulevard ADDRESS: Harbor Boulevard Oxnard, CA 93035 LAT/LONG: 34.1935 / -119.2363	CLIENT: Converse Consultants CONTACT: Denise Gutierrez INQUIRY#: 3787629.4 RESEARCH DATE: 11/15/2013

Historical Topographic Map



N	TARGET QUAD NAME: OXNARD MAP YEAR: 1951 SERIES: 7.5 SCALE: 1:24000	SITE NAME: Harbor Boulevard ADDRESS: Harbor Boulevard Oxnard, CA 93035 LAT/LONG: 34.1935 / -119.2363	CLIENT: Converse Consultants CONTACT: Denise Gutierrez INQUIRY#: 3787629.4 RESEARCH DATE: 11/15/2013

Historical Topographic Map



N	TARGET QUAD		SITE NAME:	Harbor Boulevard	CLIENT:	Converse Consultants
	NAME:	OXNARD	ADDRESS:	Harbor Boulevard	CONTACT:	Denise Gutierrez
	MAP YEAR:	1967		Oxnard, CA 93035	INQUIRY#:	3787629.4
	PHOTOREVISED FROM :	1949	LAT/LONG:	34.1935 / -119.2363	RESEARCH DATE:	11/15/2013
	SERIES:	7.5				
	SCALE:	1:24000				

EDR City Directory Abstract

Appendix G

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Harbor Boulevard
Harbor Boulevard
Oxnard, CA 93035

Inquiry Number: 3787629.6
November 18, 2013

The EDR-City Directory Abstract

Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

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Executive Summary

Findings

City Directory Images

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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This Report contains certain information obtained from a variety of public and other sources reasonably available to Environmental Data Resources, Inc. It cannot be concluded from this Report that coverage information for the target and surrounding properties does not exist from other sources. **NO WARRANTY EXPRESSED OR IMPLIED, IS MADE WHATSOEVER IN CONNECTION WITH THIS REPORT. ENVIRONMENTAL DATA RESOURCES, INC. SPECIFICALLY DISCLAIMS THE MAKING OF ANY SUCH WARRANTIES, INCLUDING WITHOUT LIMITATION, MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE OR PURPOSE. ALL RISK IS ASSUMED BY THE USER. IN NO EVENT SHALL ENVIRONMENTAL DATA RESOURCES, INC. BE LIABLE TO ANYONE, WHETHER ARISING OUT OF ERRORS OR OMISSIONS, NEGLIGENCE, ACCIDENT OR ANY OTHER CAUSE, FOR ANY LOSS OR DAMAGE, INCLUDING, WITHOUT LIMITATION, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES. ANY LIABILITY ON THE PART OF ENVIRONMENTAL DATA RESOURCES, INC. IS STRICTLY LIMITED TO A REFUND OF THE AMOUNT PAID FOR THIS REPORT.** Purchaser accepts this Report "AS IS". Any analyses, estimates, ratings, environmental risk levels or risk codes provided in this Report are provided for illustrative purposes only, and are not intended to provide, nor should they be interpreted as providing any facts regarding, or prediction orforecast of, any environmental risk for any property. Only a Phase I Environmental Site Assessment performed by an environmental professional can provide information regarding the environmental risk for any property. Additionally, the information provided in this Report is not to be construed as legal advice.

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EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Abstract is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's City Directory Abstract includes a search and abstract of available city directory data. For each address, the directory lists the name of the corresponding occupant at five year intervals.

Business directories including city, cross reference and telephone directories were reviewed, if available, at approximately five year intervals for the years spanning 1926 through 2013. This report compiles information gathered in this review by geocoding the latitude and longitude of properties identified and gathering information about properties within 660 feet of the target property.

A summary of the information obtained is provided in the text of this report.

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. An "X" indicates where information was identified in the source and provided in this report.

Year	Source	TP	Adjoining	Text Abstract	Source Image
2013	Cole Information Services	-	-	-	-
2008	Cole Information Services	-	X	X	-
2003	Cole Information Services	-	X	X	-
2002	Haines & Company, Inc.	-	X	X	-
2000	Pacific Bell Telephone Co	-	-	-	-
1996	Pacific Bell	-	X	X	-
1993	GTE	-	X	X	-
1986	Pacific Bell	-	X	X	-
1985	Pacific Telephone Co	-	X	X	-
1980	Polk	-	X	X	-
1976	R. L. Polk & Co.	-	X	X	-
1975	General Telephone Company of California	-	X	X	-
	Pacific Telephone Co	-	X	X	-
1971	B&G Publications	-	-	-	-
1970	General Telephone Company of California	-	X	X	-
1968	B&G Publications	-	-	-	-
1965	Polk	-	-	-	-
1964	Pacific Telephone Co	-	-	-	-
1961	R. L. Polk & Co.	-	-	-	-
1957	R. L. Polk & Co.	-	-	-	-
1953	R. L. Polk & Co. of California	-	-	-	-
1949	Los Angeles Directory Co.	-	-	-	-
1940	Southern California	-	-	-	-
1930	Los Angeles Directory Co.	-	-	-	-

EXECUTIVE SUMMARY

Year	Source	TP	Adjoining	Text Abstract	Source Image
1926	Los Angeles Directory Co.	-	-	-	-

FINDINGS

TARGET PROPERTY INFORMATION

ADDRESS

Harbor Boulevard
Oxnard, CA 93035

FINDINGS DETAIL

Target Property research detail.

FINDINGS

ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

CANAL ST

1010 CANAL ST

Year	Uses	Source
2002	MB 1 LERB radey	Haines & Company, Inc.
1986	Blanche GR	Pacific Bell
	Blanchard Steve	Pacific Bell
1976	No Return	R. L. Polk & Co.

1011 CANAL ST

Year	Uses	Source
2002	041 ESE 0st 0wen	Haines & Company, Inc.
1980	Boone Kenneth B	Polk

1015 CANAL ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.
1980	Billings David & Kathy	Polk

CATAMARAN ST

1000 CATAMARAN ST

Year	Uses	Source
1986	Trout Wes	Pacific Bell
1985	Trout Wes	Pacific Telephone Co
1980	Trout Wes	Polk
1976	No Return	R. L. Polk & Co.

1002 CATAMARAN ST

Year	Uses	Source
1993	Schroeder Tamara L @Oxnard	GTE
	Schroeder Stephen	GTE
	Schroeder Stephen	GTE
	Schroeder Stuart L @Camarillo	GTE
	Schroeder T	GTE
1980	Steffy D Michael & Karen M	Polk

FINDINGS

4900 CATAMARAN ST

Year	Uses	Source
2002	HORN Medrn	Haines & Company, Inc.
	LAWSON P	Haines & Company, Inc.
1986	Knight Suzanne	Pacific Bell
1985	Knight Suzanne	Pacific Telephone Co

4902 CATAMARAN ST

Year	Uses	Source
1993	South Coast Boat Maintenance	GTE
	South Coast Boat Maintenance	GTE

4905 CATAMARAN ST

Year	Uses	Source
2008	LA DOLCE VITA	Cole Information Services
2002	MORENOGeraldne	Haines & Company, Inc.
1986	Smith Carlton & Misook	Pacific Bell
	Newton Robt	Pacific Bell
1985	Newton Robt	Pacific Telephone Co
	Smith Carlton & Misook	Pacific Telephone Co
1980	Newton Robt	Polk

4907 CATAMARAN ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.
1980	Glover Paul & Lorraine	Polk

4910 CATAMARAN ST

Year	Uses	Source
1986	Shaner Kenneth	Pacific Bell
1985	Shaner Kenneth	Pacific Telephone Co

4911 CATAMARAN ST

Year	Uses	Source
2002	STOVALAI	Haines & Company, Inc.
1993	Bello Amrner Kepola	GTE
	Arner Brian	GTE
	Bello Kepola	GTE
	Bello Amrner Kepola	GTE
	Arner Brian	GTE
	Bello Kepola	GTE

FINDINGS

Year	Uses	Source
1993	Bello M @Oxnard	GTE
1986	Amrner Brian	Pacific Bell
	Arnesen Edw B	Pacific Bell
	Bello Kepola	Pacific Bell
	Bello M @Oxnard	Pacific Bell
1985	Bello Kepola	Pacific Telephone Co
1980	Deren Paul & Cindy	Polk

4913 CATAMARAN ST

Year	Uses	Source
1993	Mc Manus Marshall	GTE
	Mc Manus Marshall	GTE
1986	Kingsbury T R	Pacific Bell
1985	Kingsbury T R	Pacific Telephone Co

4915 CATAMARAN ST

Year	Uses	Source
2002	SSKOPPDann	Haines & Company, Inc.
1993	Lapointe Michelle	GTE
	Lockard Matt & Chris	GTE
	Lapointe Michelle	GTE
	Lockard Matt & Chris	GTE
1986	Bagley Willerd	Pacific Bell
1980	Nelson Billy	Polk
	Welch Thos W Jr	Polk
1976	Earl David E	R. L. Polk & Co.
	Sanders Oliver	R. L. Polk & Co.
1975	Jones Luisa	General Telephone Company of California
	Jones Luisa	Pacific Telephone Co
1970	OTero Phil	General Telephone Company of California

4921 CATAMARAN ST

Year	Uses	Source
2002	SKUMAGAIJules	Haines & Company, Inc.
1985	Hall B Jean	Pacific Telephone Co
1980	Mc Donald Michael Jr	Polk
	Bennett Wm B	Polk
1976	Chase Lee E	R. L. Polk & Co.
	Ward Jon N	R. L. Polk & Co.

FINDINGS

Year	Uses	Source
1975	Hinkle Joyce E	Pacific Telephone Co
	Hinkle Joyce E	General Telephone Company of California
	Hinkle Thos L atty	General Telephone Company of California

4931 CATAMARAN ST

Year	Uses	Source
1986	Soukup Wm Bill	Pacific Bell
	Soul Ajax	Pacific Bell
1985	Soukup Wm Bill	Pacific Telephone Co

4933 CATAMARAN ST

Year	Uses	Source
2003	STANLEY J KOTT	Cole Information Services
1996	Roberton Wilam	Pacific Bell
1980	Gibbons Tom	Polk

4941 CATAMARAN ST

Year	Uses	Source
2008	PHOENIX ELECTRICAL CONSTRUCTORS	Cole Information Services
2003	PHOENIX ELECTRICAL CONTRA	Cole Information Services
2002	OMCNULTYJohn	Haines & Company, Inc.
1996	Apartment A A Zaragoza Irene	Pacific Bell
1986	Board Darold @Newbury Park	Pacific Bell
	Boals M Brian & Kathy @Newbury Park	Pacific Bell
	Boales Pat	Pacific Bell
1985	Boales Pat	Pacific Telephone Co
1976	b No Return	R. L. Polk & Co.
	a Boone Homer	R. L. Polk & Co.
1975	Boone Homer	Pacific Telephone Co
	Boone Homer	General Telephone Company of California

4944 CATAMARAN ST

Year	Uses	Source
1985	Lozier Jas C	Pacific Telephone Co

4950 CATAMARAN ST

Year	Uses	Source
1986	Salem J & P	Pacific Bell
1985	Salem J & P	Pacific Telephone Co

FINDINGS

4951 CATAMARAN ST

Year	Uses	Source
1986	Barrett Wm	Pacific Bell
	Barrett Wm & Emily	Pacific Bell
1980	Sprague W L	Polk
1976	a Wills E	R. L. Polk & Co.
	bHopkins Scott	R. L. Polk & Co.
1975	Summers Dolores	Pacific Telephone Co
	Summers Dolores I	General Telephone Company of California
1970	Rasor Phillip	General Telephone Company of California

4954 CATAMARAN ST

Year	Uses	Source
2002	HIRATATakeshi	Haines & Company, Inc.
1993	Hirata Takeshi	GTE
	Hirata Takeshi	GTE
1986	Boehm Mark	Pacific Bell
1985	Boehm Mark	Pacific Telephone Co
1980	Sims John	Polk

5011 CATAMARAN ST

Year	Uses	Source
2003	RYAN TRANSPORTATION	Cole Information Services
1993	Sahagun Magdalena	GTE
	Sahagun Magdalena	GTE
1986	Bradshaw B L @Oxnard	Pacific Bell
	Bradney Melinda & Gerald	Pacific Bell
	Bradrick Gary D @Camarillo	Pacific Bell
1985	Bradney Melinda & Gerald	Pacific Telephone Co

900 CATAMARAN ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.

902 CATAMARAN ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.
1986	Mc Cormac Jim & Patty	Pacific Bell
1985	Mc Cormac Jim & Patty	Pacific Telephone Co
1980	Hernandez Leo	Polk

FINDINGS

906 CATAMARAN ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.
1985	Burton Terry N	Pacific Telephone Co
1980	Burton Terry N	Polk

908 CATAMARAN ST

Year	Uses	Source
2002	BURKEGlona	Haines & Company, Inc.
1986	Compton Bert Anthony	Pacific Bell
1985	Ironside Sidney W	Pacific Telephone Co
1980	Thompson Wayne Dental Equip & Repair Service	Polk

915 CATAMARAN ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.
1980	Lopez Robt	Polk

917 CATAMARAN ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.
1980	Mc Grath Dennis	Polk

921 CATAMARAN ST

Year	Uses	Source
2002	LYON Richard	Haines & Company, Inc.
1993	Lyon Richard	GTE
	Lyon Richard	GTE
1986	Lyon Richard	Pacific Bell
1985	Musgrove Robt	Pacific Telephone Co
1976	Vacant	R. L. Polk & Co.

925 CATAMARAN ST

Year	Uses	Source
2002	RIPLEYRichard	Haines & Company, Inc.
1996	pley Richard	Pacific Bell
1993	Ripley V	GTE
	Riptey Samme	GTE
	Ripley Richard	GTE
	Ripley Richard	GTE

FINDINGS

Year	Uses	Source
1980	Velasquez Sal	Polk
1976	Crosson Walter M	R. L. Polk & Co.

930 CATAMARAN ST

Year	Uses	Source
2002	NIESEN Barry	Haines & Company, Inc.

931 CATAMARAN ST

Year	Uses	Source
2002	GRIGG Leo	Haines & Company, Inc.
	GRIGGLaune	Haines & Company, Inc.

934 CATAMARAN ST

Year	Uses	Source
1986	Macias Leandro J DDS	Pacific Bell
1985	Macias Leandro J DDS	Pacific Telephone Co

940 CATAMARAN ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.

941 CATAMARAN ST

Year	Uses	Source
2002	CURTISTammara	Haines & Company, Inc.
1996	Curta Tammara	Pacific Bell
1980	Blayney Stephen	Polk

944 CATAMARAN ST

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.
1996	Baker Chria	Pacific Bell
1986	Cochrane Raymond	Pacific Bell
1985	Cochrane Raymond	Pacific Telephone Co
1980	Henry Wayne E	Polk

945 CATAMARAN ST

Year	Uses	Source
1980	Fleming Michael	Polk

FINDINGS

950 CATAMARAN ST

Year	Uses	Source
2002	SDIBENEDETTON	Haines & Company, Inc.

951 CATAMARAN ST

Year	Uses	Source
2008	J F DUKE MARKETING	Cole Information Services

955 CATAMARAN ST

Year	Uses	Source
2002	CASEY Nathan	Haines & Company, Inc.
1986	Gehrke C H	Pacific Bell
1985	Gehrke C H	Pacific Telephone Co

960 CATAMARAN ST

Year	Uses	Source
2002	KOMATSUEllena	Haines & Company, Inc.
1980	Thompson Donald E	Polk

964 CATAMARAN ST

Year	Uses	Source
1980	Porter Max	Polk

DUNES CIR

4902 DUNES CIR

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.

4904 DUNES CIR

Year	Uses	Source
2002	XXXX	Haines & Company, Inc.
1980	Carobine Danl	Polk

4930 DUNES CIR

Year	Uses	Source
2008	GEORGE H COLE	Cole Information Services
2002	7 TAYLOR Thomas	Haines & Company, Inc.
1993	Ward Leslie M	GTE
	Ward Lew	GTE
	Ward M	GTE
	From @Ojai @ Telephones Call	GTE

FINDINGS

Year	Uses	Source
1993	Ward Leslie M	GTE
1986	Ward Lesile M	Pacific Bell
	Ward Lewis @Oxnard	Pacific Bell
	Ward M @Oxnard	Pacific Bell
1985	Ward Leslie M	Pacific Telephone Co

4932 DUNES CIR

Year	Uses	Source
2002	0 ERWAY 0 B 3ran	Haines & Company, Inc.
1985	Chiles Jerry R	Pacific Telephone Co

4934 DUNES CIR

Year	Uses	Source
1993	Mc Connell Micharl & Christine	GTE
	Mc Connell Micharl & Christine	GTE
1985	Murphy Jos G & Rose Ann	Pacific Telephone Co

4941 DUNES CIR

Year	Uses	Source
2002	DEDOMENICOJe	Haines & Company, Inc.

4950 DUNES CIR

Year	Uses	Source
2002	UNDERWOOD Chnr	Haines & Company, Inc.
1985	Thomason Arthur M & Vie	Pacific Telephone Co

4953 DUNES CIR

Year	Uses	Source
2002	0 BE 61 El Izabeth	Haines & Company, Inc.

4963 DUNES CIR

Year	Uses	Source
2002	VASINAJohn	Haines & Company, Inc.
1980	Vanoy Wm L	Polk
	Poma Cheryl M	Polk
	van Pappelendam C M	Polk
	Wilson Jas B	Polk

FINDINGS

TARGET PROPERTY: ADDRESS NOT IDENTIFIED IN RESEARCH SOURCE

The following Target Property addresses were researched for this report, and the addresses were not identified in the research source.

Address Researched	Address Not Identified in Research Source
Harbor Boulevard	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926

ADJOINING PROPERTY: ADDRESSES NOT IDENTIFIED IN RESEARCH SOURCE

The following Adjoining Property addresses were researched for this report, and the addresses were not identified in research source.

Address Researched	Address Not Identified in Research Source
1000 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
1002 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
1010 CANAL ST	2013, 2008, 2003, 2000, 1996, 1993, 1985, 1980, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
1011 CANAL ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
1015 CANAL ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4900 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4902 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4902 DUNES CIR	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4904 DUNES CIR	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4905 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4905 CATAMARAN ST	2013, 2003, 2002, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4907 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4910 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4911 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4913 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4915 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1985, 1971, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926

FINDINGS

Address Researched	Address Not Identified in Research Source
4921 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4930 DUNES CIR	2013, 2008, 2003, 2000, 1996, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4930 DUNES CIR	2013, 2003, 2002, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4931 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4932 DUNES CIR	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4933 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4933 CATAMARAN ST	2013, 2008, 2002, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4934 DUNES CIR	2013, 2008, 2003, 2002, 2000, 1996, 1986, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4941 CATAMARAN ST	2013, 2008, 2003, 2000, 1993, 1980, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4941 CATAMARAN ST	2013, 2002, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4941 DUNES CIR	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4944 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1986, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4950 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4950 DUNES CIR	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4951 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1985, 1971, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4953 DUNES CIR	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4954 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
4963 DUNES CIR	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
5011 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
5011 CATAMARAN ST	2013, 2008, 2002, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
900 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
902 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
906 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
908 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926

FINDINGS

Address Researched	Address Not Identified in Research Source
915 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
917 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
921 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1980, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
925 CATAMARAN ST	2013, 2008, 2003, 2000, 1986, 1985, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
930 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
931 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
934 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
940 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
941 CATAMARAN ST	2013, 2008, 2003, 2000, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
944 CATAMARAN ST	2013, 2008, 2003, 2000, 1993, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
945 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
950 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
951 CATAMARAN ST	2013, 2003, 2002, 2000, 1996, 1993, 1986, 1985, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
955 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1980, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
960 CATAMARAN ST	2013, 2008, 2003, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926
964 CATAMARAN ST	2013, 2008, 2003, 2002, 2000, 1996, 1993, 1986, 1985, 1976, 1975, 1971, 1970, 1968, 1965, 1964, 1961, 1957, 1953, 1949, 1940, 1930, 1926

EDR Radius Map Report

Appendix H

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Harbor Boulevard
Harbor Boulevard
Oxnard, CA 93035

Inquiry Number: 3787629.2s
November 18, 2013

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

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Overview Map	2
Detail Map	3
Map Findings Summary	4
Map Findings	8
Orphan Summary	51
Government Records Searched/Data Currency Tracking	GR-1

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

HARBOR BOULEVARD
OXNARD, CA 93035

COORDINATES

Latitude (North):	34.1935000 - 34° 11' 36.60''
Longitude (West):	119.2363000 - 119° 14' 10.68''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	293927.9
UTM Y (Meters):	3785677.0
Elevation:	37 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	34119-B2 OXNARD, CA
Most Recent Revision:	1967
West Map:	34119-B3 OXNARD OE W, CA
Most Recent Revision:	0

AERIAL PHOTOGRAPHY IN THIS REPORT

Photo Year:	2012
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls
LUCIS ---------- Land Use Control Information System

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- Solid Waste Information System

State and tribal leaking storage tank lists

SLIC ---------- Statewide SLIC Cases
INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST ---------- Active UST Facilities
AST ---------- Aboveground Petroleum Storage Tank Facilities
INDIAN UST ---------- Underground Storage Tanks on Indian Land
FEMA UST ---------- Underground Storage Tank Listing

State and tribal voluntary cleanup sites

INDIAN VCP ---------- Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ---------- A Listing of Brownfields Sites

EXECUTIVE SUMMARY

Local Lists of Landfill / Solid Waste Disposal Sites

ODI	Open Dump Inventory
DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations
WMUDS/SWAT	Waste Management Unit Database
SWRCY	Recycler Database
HAULERS	Registered Waste Tire Haulers Listing
INDIAN ODI	Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL	Clandestine Drug Labs
HIST Cal-Sites	Historical Calsites Database
SCH	School Property Evaluation Program
CDL	Clandestine Drug Labs
US HIST CDL	National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

CA FID UST	Facility Inventory Database
SWEEPS UST	SWEEPS UST Listing

Local Land Records

LIENS 2	CERCLA Lien Information
LIENS	Environmental Liens Listing
DEED	Deed Restriction Listing

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators
DOT OPS	Incident and Accident Data
DOD	Department of Defense Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
US MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System

RADINFO ---- Radiation Information Database
FINDS ---- Facility Index System/Facility Registry System
RAATS ---- RCRA Administrative Action Tracking System
RMP ---- Risk Management Plans
UIC ---- UIC Listing
NPDES ---- NPDES Permits Listing
Cortese ---- "Cortese" Hazardous Waste & Substances Sites List
CUPA Listings ---- CUPA Resources List
Notify 65 ---- Proposition 65 Records
DRYCLEANERS ---- Cleaner Facilities
WIP ---- Well Investigation Program Case List
VENTURA CO. BWT ---- Business Plan, Hazardous Waste Producers, and Operating Underground Tanks
ENF ---- Enforcement Action Listing
HAZNET ---- Facility and Manifest Data
EMI ---- Emissions Inventory Data
INDIAN RESERV ---- Indian Reservations
SCRD DRYCLEANERS ---- State Coalition for Remediation of Drycleaners Listing
PROC ---- Certified Processors Database
MWMP ---- Medical Waste Management Program Listing
COAL ASH DOE ---- Steam-Electric Plant Operation Data
COAL ASH EPA ---- Coal Combustion Residues Surface Impoundments List
HWT ---- Registered Hazardous Waste Transporter Database
HWP ---- EnviroStor Permitted Facilities Listing
Financial Assurance ---- Financial Assurance Information Listing
LEAD SMELTERS ---- Lead Smelter Sites
2020 COR ACTION ---- 2020 Corrective Action Program List
MED WASTE VENTURA ---- Medical Waste Program List
US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
PRP ---- Potentially Responsible Parties
WDS ---- Waste Discharge System
EPA WATCH LIST ---- EPA WATCH LIST
US FIN ASSUR ---- Financial Assurance Information
PCB TRANSFORMER ---- PCB Transformer Registration Database

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

Federal CERCLIS NFRAP site List

CERC-NFRAP: Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

A review of the CERC-NFRAP list, as provided by EDR, and dated 04/26/2013 has revealed that there is 1 CERC-NFRAP site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
CARNEY & SONS	5085 W 5TH ST	NNW 1/8 - 1/4 (0.245 mi.)	8	20

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 07/11/2013 has revealed that there is 1 RCRA-SQG site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SEABREEZE CLEANERS	***1003 HARBOR BLVD***	***SW 1/8 - 1/4 (0.141 mi.)***	***A5***	***13***

State- and tribal - equivalent NPL

RESPONSE: Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

A review of the RESPONSE list, as provided by EDR, and dated 09/05/2013 has revealed that there is 1 RESPONSE site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
DUNES SUBDIVISION SITE - OXNAR	***OXNARD DUNES SUBDIVISIO***	***NW 0 - 1/8 (0.034 mi.)***	***1***	***8***

EXECUTIVE SUMMARY

State- and tribal - equivalent CERCLIS

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

A review of the ENVIROSTOR list, as provided by EDR, and dated 09/05/2013 has revealed that there are 5 ENVIROSTOR sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
DUNES SUBDIVISION SITE - OXNAR	***OXNARD DUNES SUBDIVISIO***	***NW 0 - 1/8 (0.034 mi.)***	***1***	***8***
Status: * De-listed				
NORTH SHORE AT MANDALAY BAY	***(NO NUMBER) HARBOR BLVD***	***NW 1/4 - 1/2 (0.271 mi.)***	***9***	***21***
Status: Active				
SOUTHWEST ELEMENTARY SCHOOL SI	***4200 WOOLEY ROAD***	***ESE 1/2 - 1 (0.524 mi.)***	***11***	***35***
Status: No Further Action				
SOUTHERN CALIFORNIA EDISON - M	***373 NORTH HARBOR BLVD***	***NW 1/2 - 1 (0.575 mi.)***	***12***	***39***
Status: Active				
OXNARD SHORES		S 1/2 - 1 (0.964 mi.)	C14	42
Status: Inactive - Needs Evaluation				

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the State Water Resources Control Board Leaking Underground Storage Tank Information System.

A review of the LUST list, as provided by EDR, and dated 09/16/2013 has revealed that there is 1 LUST site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
OXNARD SHORES EXXON	***5012 WOOLEY RD***	***SW 1/8 - 1/4 (0.181 mi.)***	***B7***	***17***
Status: Completed - Case Closed				

State and tribal voluntary cleanup sites

VCP: Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

A review of the VCP list, as provided by EDR, and dated 09/05/2013 has revealed that there is 1 VCP

site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
NORTH SHORE AT MANDALAY BAY	***(NO NUMBER) HARBOR BLVD***	***NW 1/4 - 1/2 (0.271 mi.)***	***9***	***21***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

Toxic Pits: The Toxic Pits Cleanup Act Sites database identifies sites suspected of containing hazardous substances where cleanup has not yet been completed. The data come from the State Water Resources Control Board.

A review of the Toxic Pits list, as provided by EDR, and dated 07/01/1995 has revealed that there is 1 Toxic Pits site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
MANDALAY POWER GENERATION Closure Date: / /	***393 NORTH HARBOR BLVD***	***NW 1/2 - 1 (0.969 mi.)***	***15***	***43***

Local Lists of Registered Storage Tanks

HIST UST: Historical UST Registered Database.

A review of the HIST UST list, as provided by EDR, and dated 10/15/1990 has revealed that there is 1 HIST UST site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
BOB BROOKS EXXON	5012 W WOOLEY RD	SW 1/8 - 1/4 (0.181 mi.)	B6	16

Other Ascertainable Records

FUDS: The Listing includes locations of Formerly Used Defense Sites Properties where the US Army Corps Of Engineers is actively working or will take necessary cleanup actions.

A review of the FUDS list, as provided by EDR, and dated 12/31/2011 has revealed that there are 2 FUDS sites within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
OXNARD SEACOAST BATTERY		WNW 1/4 - 1/2 (0.435 mi.)	10	35
ADVANCED BASE DEPOT-RIFLE RANG		S 1/2 - 1 (0.959 mi.)	C13	41

CA BOND EXP. PLAN: Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

A review of the CA BOND EXP. PLAN list, as provided by EDR, and dated 01/01/1989 has revealed that there is 1 CA BOND EXP. PLAN site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
DUNES SUBDIVISION SITE - OXNAR	***OXNARD DUNES SUBDIVISIO***	***NW 0 - 1/8 (0.034 mi.)***	***1***	***8***

HIST CORTESE: The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 HIST CORTESE site within approximately 0.5 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
OXNARD SHORES EXXON	***5012 WOOLEY RD***	***SW 1/8 - 1/4 (0.181 mi.)***	***B7***	***17***

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR US Hist Auto Stat: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR US Hist Auto Stat list, as provided by EDR, has revealed that there is 1 EDR US Hist Auto Stat site within approximately 0.25 miles of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	4906 DUNES ST	SSW 0 - 1/8 (0.047 mi.)	2	12

EDR US Hist Cleaners: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR US Hist Cleaners list, as provided by EDR, has revealed that there are 2 EDR US

EXECUTIVE SUMMARY

Hist Cleaners sites within approximately 0.25 miles of the target property.

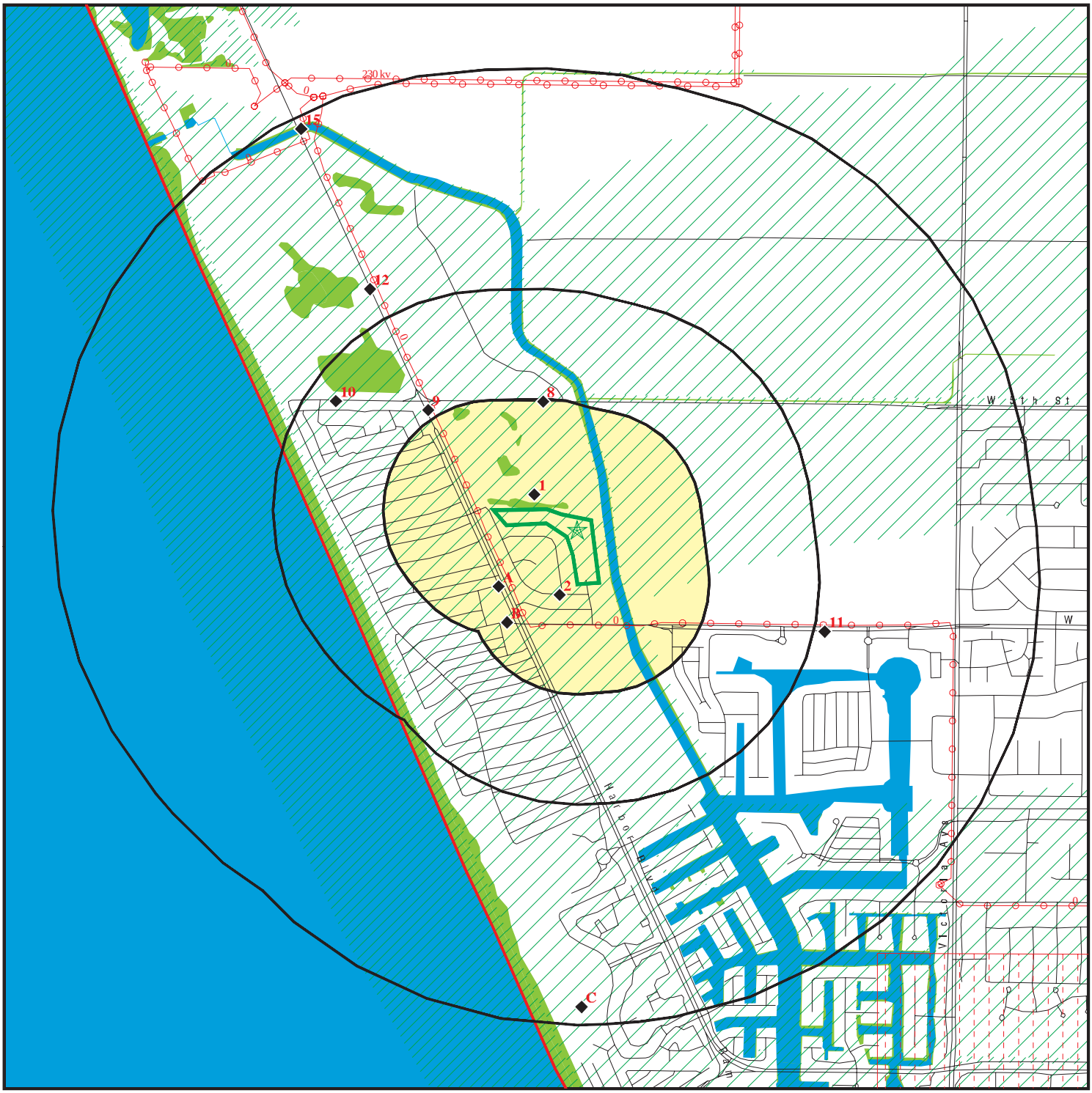
Lower Elevation	Address	Direction / Distance	Map ID	Page
Not reported	1001 HARBOR BLVD	SW 1/8 - 1/4 (0.140 mi.)	A3	12
Not reported	1003 HARBOR BLVD	SW 1/8 - 1/4 (0.141 mi.)	A4	13

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 14 records.

Site Name	Database(s)
WALKER'S VENTURA SALVAGE CITY DUMP	CERC-NFRAP
DUNES SUBDIVISION	CERC-NFRAP
BAILARD LDFL	CERC-NFRAP
OXNARD 1962	SWF/LF
WAGON WHEEL AKA: SANTA CLARA (WAGO	SWF/LF
SHELL SS - CHANNEL ISLANDS	LUST
HILLS AUTOMOTIVE	LUST
MIDAS MUFFLER	LUST
PATTERSON RANCH	HIST UST
VENTURA COUNTY HARBOR OFFICE	HIST UST
OXNARD HARBOR DIST	HAZNET
VENTURA COUNTY CHANNEL HARBOR	FINDS
OXNARD DUNES SUBDIVISION	SLIC
CITY OF OXNARD	SLIC

OVERVIEW MAP - 3787629.2s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Harbor Boulevard	CLIENT: Converse Consultants
ADDRESS: Harbor Boulevard Oxnard CA 93035	CONTACT: Denise Gutierrez
LAT/LONG: 34.1935 / 119.2363	INQUIRY #: 3787629.2s DATE: November 18, 2013 9:58 am

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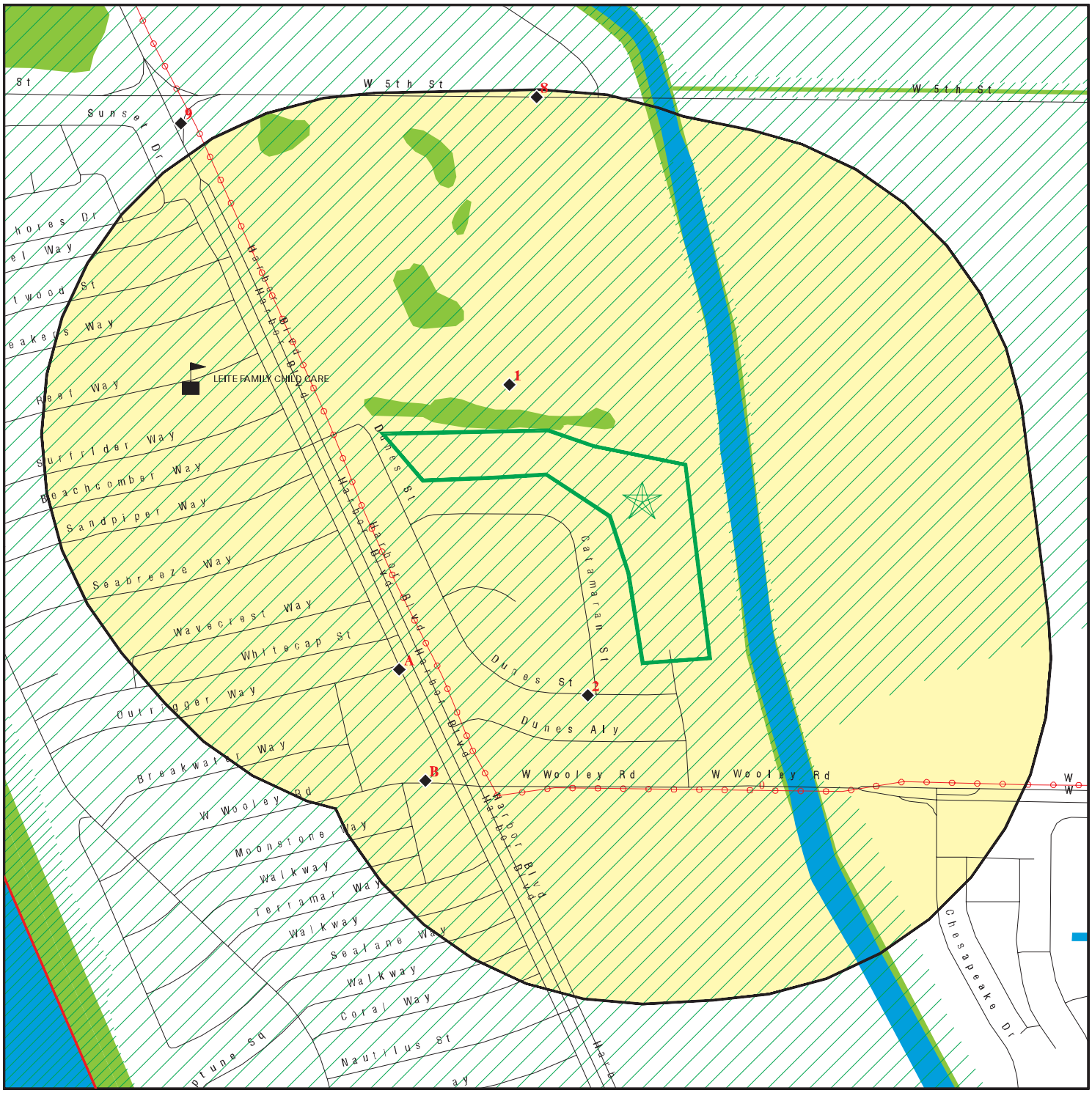
DETAIL MAP - 3787629.2s



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

Sensitive Receptors

National Priority List Sites

Dept. Defense Sites

0 1/16 1/8 1/4 Miles

Indian Reservations BIA

County Boundary

Power transmission lines

Oil & Gas pipelines from USGS

100-year flood zone

500-year flood zone

National Wetland Inventory

Areas of Concern

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Harbor Boulevard	CLIENT: Converse Consultants
ADDRESS: Harbor Boulevard Oxnard CA 93035	CONTACT: Denise Gutierrez
LAT/LONG: 34.1935 / 119.2363	INQUIRY #: 3787629.2s DATE: November 18, 2013 9:59 am

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	1	0	NR	NR	1
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	1	NR	NR	NR	1
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		1	0	0	0	NR	1
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		1	0	1	3	NR	5
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	1	0	NR	NR	1

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SLIC	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	1	NR	NR	1
INDIAN VCP	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	1	NR	1
CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
CA FID UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	1	NR	NR	NR	1
SWEEPS UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
LIENS	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	1	1	NR	2
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		1	0	0	0	NR	1
UIC	TP		NR	NR	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
Cortese	0.500		0	0	0	NR	NR	0
HIST CORTESE	0.500		0	1	0	NR	NR	1
CUPA Listings	0.250		0	0	NR	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
VENTURA CO. BWT	TP		NR	NR	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
HWT	0.250		0	0	NR	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
MED WASTE VENTURA	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
WDS	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		1	0	NR	NR	NR	1
EDR US Hist Cleaners	0.250		0	2	NR	NR	NR	2

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
NW
< 1/8
0.034 mi.
180 ft.

DUNES SUBDIVISION SITE - OXNARD
OXNARD DUNES SUBDIVISION
OXNARD, CA 93030

CA BOND EXP. PLAN
RESPONSE
ENVIROSTOR

S100833376
N/A

Relative:
Lower

Actual:
22 ft.

CA BOND EXP. PLAN:

Reponsible Party:	DETAILED SITE EXPENDITURE PLAN
Project Revenue Source Company:	Not reported
Project Revenue Source Addr:	Not reported
Project Revenue Source City,St,Zip:	Not reported
Project Revenue Source Desc:	The PRPs have been found to be in noncompliance with an order issued by the Department. Therefore, it will be necessary to utilize Bond funds to remediate this site. DHS will undertake appropriate cost recovery actions. This site has not been identified as a NPL, site, nor does it appear to be a likely candidate in the future. Therefore, it appears unlikely that federal funds are a viable source of revenue for this site.
Site Description:	Oil field wastes were disposed of onsite during the 1950's and early 1960's. The site was subsequently subdivided and has been partially developed for residences.
Hazardous Waste Desc:	Wastes include crude oil breakdown products, primarily of the cyclohexane group.
Threat To Public Health & Env:	The site may have contaminated ground water. There could be emissions of soil gas to confined spaces such as residences or underground utilities. Residential monitoring has not detected any elevated levels of contaminants in the air.
Site Activity Status:	DHS issued RAO to PRPs in November, 1987. PRPs were found in noncompliance with the orders in January, 1988. One PRP filed suit against DHS in January, 1988 to prevent DHS from initiating site characterization. A temporary stay was granted, but a permanent injunction was denied in March, 1988, allowing DHS to resume work. In March and July 1988, DHS conducted residential air monitoring and in March, 1988 collected residential tap water samples. The monitoring did not indicate the potential for increased exposure related to hazardous substances. At least five legal actions have been filed by residents or PRPs to date. Inasmuch as such actions have in the past delayed or interfered with site work, it may be anticipated that further delays could occur. A work plan is currently being developed to take soil samples and conduct a soil vapor investigation. These activities are expected to commence in December, 1988.

RESPONSE:

Facility ID:	56290172
Site Type:	State Response
Site Type Detail:	State Response or NPL
Acres:	Not reported
National Priorities List:	NO
Cleanup Oversight Agencies:	DTSC
Lead Agency:	DTSC
Lead Agency Description:	* DTSC
Project Manager:	Dave Stuck
Supervisor:	Hamid Saebfar
Division Branch:	Cleanup Chatsworth
Site Code:	Not reported
Site Mgmt. Req.:	NONE SPECIFIED
Assembly:	37
Senate:	19
Special Program Status:	Not reported
Status:	* De-listed
Status Date:	07/29/1991
Restricted Use:	NO
Funding:	Orphan Funds
Latitude:	34.19472

DUNES SUBDIVISION SITE - OXNARD (Continued) **S100833376**

Longitude:	-119.2380
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	* UNSPECIFIED OIL CONTAINING WASTE, * WASTE OIL & MIXED OIL, * DRILLING MUD
Confirmed COC:	* UNSPECIFIED OIL CONTAINING WASTE, * WASTE OIL & MIXED OIL, * DRILLING MUD, NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	HUMACID-MACLEOD CO
Alias Type:	Alternate Name
Alias Name:	OXNARD DUNES
Alias Type:	Alternate Name
Alias Name:	CAD981418171
Alias Type:	EPA Identification Number
Alias Name:	110033618583
Alias Type:	EPA (FRS #)
Alias Name:	P33052
Alias Type:	PCode
Alias Name:	56290172
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Plan
Completed Date:	06/19/1991
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation / Feasibility Study
Completed Date:	12/31/1990
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Public Participation Plan / Community Relations Plan
Completed Date:	01/31/1989
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Screening
Completed Date:	12/04/1987
Comments:	SITE SCREENING DONE BEP SITE; FORMERLY A CERCLA 104 PA (SI-HIGH)
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Consent Order
Completed Date:	06/14/1994
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Delisting Document
Completed Date:	07/29/1991
Comments:	Not reported

DUNES SUBDIVISION SITE - OXNARD (Continued) **S100833376**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Final Determination of Non-Compliance
Completed Date: 01/31/1988
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Order
Completed Date: 11/30/1987
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Site Type: State Response
Site Type Detailed: State Response or NPL
Acres: Not reported
NPL: NO
Regulatory Agencies: DTSC
Lead Agency: DTSC
Program Manager: Dave Stuck
Supervisor: Hamid Saebfar
Division Branch: Cleanup Chatsworth
Facility ID: 56290172
Site Code: Not reported
Assembly: 37
Senate: 19
Special Program: Not reported
Status: * De-listed
Status Date: 07/29/1991
Restricted Use: NO
Site Mgmt. Req.: NONE SPECIFIED
Funding: Orphan Funds
Latitude: 34.19472
Longitude: -119.2380
APN: NONE SPECIFIED
Past Use: NONE SPECIFIED
Potential COC: * UNSPECIFIED OIL CONTAINING WASTE, * WASTE OIL & MIXED OIL, * DRILLING MUD
Confirmed COC: * UNSPECIFIED OIL CONTAINING WASTE, * WASTE OIL & MIXED OIL, * DRILLING MUD, NONE SPECIFIED
Potential Description: NONE SPECIFIED
Alias Name: HUMACID-MACLEOD CO
Alias Type: Alternate Name
Alias Name: OXNARD DUNES
Alias Type: Alternate Name
Alias Name: CAD981418171
Alias Type: EPA Identification Number

DUNES SUBDIVISION SITE - OXNARD (Continued) **S100833376**

Alias Name: 110033618583
Alias Type: EPA (FRS #)
Alias Name: P33052
Alias Type: PCode
Alias Name: 56290172
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 06/19/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation / Feasibility Study
Completed Date: 12/31/1990
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Public Participation Plan / Community Relations Plan
Completed Date: 01/31/1989
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Screening
Completed Date: 12/04/1987
Comments: SITE SCREENING DONE BEP SITE; FORMERLY A CERCLA 104 PA (SI-HIGH)

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consent Order
Completed Date: 06/14/1994
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Delisting Document
Completed Date: 07/29/1991
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Final Determination of Non-Compliance
Completed Date: 01/31/1988
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Order
Completed Date: 11/30/1987
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported

DUNES SUBDIVISION SITE - OXNARD (Continued) **S100833376**

Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

2
SSW
< 1/8
0.047 mi.
246 ft.

4906 DUNES ST
OXNARD, CA 93035

EDR US Hist Auto Stat **1015517767**
N/A

Relative:
Lower

Actual:
16 ft.

EDR Historical Auto Stations:

Name: KB SWEDISH AUTOMOTIVE
Year: 2007
Address: 4906 DUNES ST

Name: KB SWEDISH AUTOMOTIVE
Year: 2008
Address: 4906 DUNES ST

Name: KB SWEDISH AUTOMOTIVE
Year: 2009
Address: 4906 DUNES ST

A3
SW
1/8-1/4
0.140 mi.
738 ft.

1001 HARBOR BLVD
OXNARD, CA 93035

Site 1 of 3 in cluster A

EDR US Hist Cleaners **1014966754**
N/A

Relative:
Lower

Actual:
18 ft.

EDR Historical Cleaners:

Name: MAGGIES LAUNDROMAT
Year: 2002
Address: 1001 HARBOR BLVD

Name: MAGGIES LAUNDROMAT
Year: 2004
Address: 1001 HARBOR BLVD

Name: MAGGIES LAUNDROMAT
Year: 2005
Address: 1001 HARBOR BLVD

A4
SW
1/8-1/4
0.141 mi.
747 ft.

1003 HARBOR BLVD
OXNARD, CA 93035

Site 2 of 3 in cluster A

EDR US Hist Cleaners **1014967012**
N/A

Relative:
Lower

Actual:
17 ft.

EDR Historical Cleaners:

Name:	SEABREEZE CLEANERS
Year:	2001
Address:	1003 HARBOR BLVD
Name:	SEABREEZE CLEANERS
Year:	2002
Address:	1003 HARBOR BLVD
Name:	SEABREEZE CLEANERS
Year:	2004
Address:	1003 HARBOR BLVD
Name:	SEABREEZE CLEANERS
Year:	2005
Address:	1003 HARBOR BLVD
Name:	SEABREEZE CLEANERS
Year:	2006
Address:	1003 HARBOR BLVD
Name:	SEABREEZE CLEANERS
Year:	2010
Address:	1003 HARBOR BLVD
Name:	SEABREEZE CLEANERS
Year:	2011
Address:	1003 HARBOR BLVD
Name:	SEABREEZE CLEANERS
Year:	2012
Address:	1003 HARBOR BLVD

A5
SW
1/8-1/4
0.141 mi.
747 ft.

SEABREEZE CLEANERS
1003 HARBOR BLVD
OXNARD, CA

Site 3 of 3 in cluster A

RCRA-SQG **1000164629**
FINDS **CAD981636236**
HAZNET

Relative:
Lower

Actual:
17 ft.

RCRA-SQG:

Date form received by agency:	09/01/1996
Facility name:	SEABREEZE CLEANERS
Facility address:	1003 HARBOR BLVD OXNARD, CA 93030
EPA ID:	CAD981636236
Contact:	Not reported
Contact address:	Not reported Not reported
Contact country:	Not reported
Contact telephone:	Not reported
Contact email:	Not reported
EPA Region:	09
Classification:	Small Small Quantity Generator
Description:	Handler: generates more than 100 and less than 1000 kg of hazardous

SEABREEZE CLEANERS (Continued) **1000164629**

waste during any calendar month and accumulates less than 6000 kg of hazardous waste at any time; or generates 100 kg or less of hazardous waste during any calendar month, and accumulates more than 1000 kg of hazardous waste at any time

Owner/Operator Summary:

Owner/operator name:	TERESA CORRALESO
Owner/operator address:	NOT REQUIRED
	NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Owner
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Owner/operator name:	NOT REQUIRED
Owner/operator address:	NOT REQUIRED
	NOT REQUIRED, ME 99999
Owner/operator country:	Not reported
Owner/operator telephone:	(415) 555-1212
Legal status:	Private
Owner/Operator Type:	Operator
Owner/Op start date:	Not reported
Owner/Op end date:	Not reported

Handler Activities Summary:

U.S. importer of hazardous waste:	No
Mixed waste (haz. and radioactive):	No
Recycler of hazardous waste:	No
Transporter of hazardous waste:	No
Treater, storer or disposer of HW:	No
Underground injection activity:	No
On-site burner exemption:	No
Furnace exemption:	No
Used oil fuel burner:	No
Used oil processor:	No
User oil refiner:	No
Used oil fuel marketer to burner:	No
Used oil Specification marketer:	No
Used oil transfer facility:	No
Used oil transporter:	No

Historical Generators:

Date form received by agency:	12/15/1986
Facility name:	SEABREEZE CLEANERS
Classification:	Large Quantity Generator

Violation Status: No violations found

FINDS:

Registry ID: 110002733105

Environmental Interest/Information System
California Hazardous Waste Tracking System - Datamart (HWTS-DATAMART)

SEABREEZE CLEANERS (Continued) **1000164629**

provides California with information on hazardous waste shipments for generators, transporters, and treatment, storage, and disposal facilities.

RCRAInfo is a national information system that supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities that generate, transport, and treat, store, or dispose of hazardous waste. RCRAInfo allows RCRA program staff to track the notification, permit, compliance, and corrective action activities required under RCRA.

HAZNET:

Year:	2011
Gepaid:	CAD981636236
Contact:	MARGARITA AVALOS OWNER
Telephone:	8059859393
Mailing Name:	Not reported
Mailing Address:	1003 S HARBOR BLVD
Mailing City,St,Zip:	OXNARD, CA 930351131
Gen County:	Not reported
TSD EPA ID:	CAT000613893
TSD County:	Not reported
Waste Category:	Liquids with halogenated organic compounds >= 1,000 Mg./L
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.2
Facility County:	Ventura

Year:	2011
Gepaid:	CAD981636236
Contact:	MARGARITA AVALOS OWNER
Telephone:	8059859393
Mailing Name:	Not reported
Mailing Address:	1003 S HARBOR BLVD
Mailing City,St,Zip:	OXNARD, CA 930351131
Gen County:	Not reported
TSD EPA ID:	CAT000613893
TSD County:	Not reported
Waste Category:	Liquids with halogenated organic compounds >= 1,000 Mg./L
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons:	0.2
Facility County:	Ventura

Year:	2009
Gepaid:	CAD981636236
Contact:	MARGARITA AVALOS OWNER
Telephone:	8059859393
Mailing Name:	Not reported
Mailing Address:	1003 S HARBOR BLVD
Mailing City,St,Zip:	OXNARD, CA 930351131
Gen County:	Not reported
TSD EPA ID:	CAT000613893
TSD County:	Not reported
Waste Category:	Liquids with halogenated organic compounds >= 1,000 Mg./L
Disposal Method:	Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery

SEABREEZE CLEANERS (Continued) **1000164629**

(H010-H129) Or (H131-H135)
Tons: 0.1
Facility County: Ventura

Year: 2009
Gepaid: CAD981636236
Contact: MARGARITA AVALOS OWNER
Telephone: 8059859393
Mailing Name: Not reported
Mailing Address: 1003 S HARBOR BLVD
Mailing City,St,Zip: OXNARD, CA 930351131
Gen County: Not reported
TSD EPA ID: CAT000613893
TSD County: Not reported
Waste Category: Not reported
Disposal Method: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: Not reported
Facility County: Ventura

Year: 2009
Gepaid: CAD981636236
Contact: MARGARITA AVALOS OWNER
Telephone: 8059859393
Mailing Name: Not reported
Mailing Address: 1003 S HARBOR BLVD
Mailing City,St,Zip: OXNARD, CA 930351131
Gen County: Not reported
TSD EPA ID: CAT000613893
TSD County: Not reported
Waste Category: Not reported
Disposal Method: Storage, Bulking, And/Or Transfer Off Site--No Treatment/Reovery (H010-H129) Or (H131-H135)
Tons: Not reported
Facility County: Ventura

Click this hyperlink while viewing on your computer to access
67 additional CA_HAZNET: record(s) in the EDR Site Report.

B6 **BOB BROOKS EXXON** **HIST UST** **U001579690**
SW **5012 W WOOLEY RD** **N/A**
1/8-1/4 **OXNARD, CA 93030**
0.181 mi.
956 ft. **Site 1 of 2 in cluster B**

Relative:
Lower

Actual:
14 ft.

HIST UST:
Region: STATE
Facility ID: 00000021691
Facility Type: Gas Station
Other Type: Not reported
Total Tanks: 0004
Contact Name: BOB BROOKS
Telephone: 8059842006
Owner Name: OXNARD SHORES
Owner Address: 11520 SAN VICENTE BOULEVARD
Owner City,St,Zip: LOS ANGELES, CA 90049

Tank Num: 001

BOB BROOKS EXXON (Continued) **U001579690**

Container Num: 01
Year Installed: Not reported
Tank Capacity: 00010000
Tank Used for: PRODUCT
Type of Fuel: PREMIUM
Tank Construction: Not reported
Leak Detection: Visual, Stock Inventor

Tank Num: 002
Container Num: 02A
Year Installed: Not reported
Tank Capacity: 00005000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Tank Construction: Not reported
Leak Detection: Visual, Stock Inventor

Tank Num: 003
Container Num: 02B
Year Installed: Not reported
Tank Capacity: 00005000
Tank Used for: PRODUCT
Type of Fuel: UNLEADED
Tank Construction: Not reported
Leak Detection: Visual, Stock Inventor

Tank Num: 004
Container Num: 03
Year Installed: Not reported
Tank Capacity: 00008000
Tank Used for: PRODUCT
Type of Fuel: REGULAR
Tank Construction: Not reported
Leak Detection: Visual, Stock Inventor

B7 **OXNARD SHORES EXXON** **HIST CORTESE** **S102434770**
SW **5012 WOOLEY RD** **LUST** **N/A**
1/8-1/4 **OXNARD, CA 93030**
0.181 mi.
956 ft. **Site 2 of 2 in cluster B**

Relative:
Lower

Actual:
14 ft.

CORTESE:
Region: CORTESE
Facility County Code: 56
Reg By: LTNKA
Reg Id: C-89066

LUST:
Region: STATE
Global Id: T0611100481
Latitude: 34.190204
Longitude: -119.238836
Case Type: LUST Cleanup Site
Status: Completed - Case Closed
Status Date: 11/21/1994
Lead Agency: VENTURA COUNTY LOP
Case Worker: EHD

OXNARD SHORES EXXON (Continued) **S102434770**

Local Agency:	Not reported
RB Case Number:	C-89066
LOC Case Number:	89066
File Location:	Not reported
Potential Media Affect:	Other Groundwater (uses other than drinking water)
Potential Contaminants of Concern:	Gasoline
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

Contact:

Global Id:	T0611100481
Contact Type:	Regional Board Caseworker
Contact Name:	DANIEL PIROTTON
Organization Name:	LOS ANGELES RWQCB (REGION 4)
Address:	Not reported
City:	R4 UNKNOWN
Email:	dpirotton@waterboards.ca.gov
Phone Number:	2135766714

Status History:

Global Id:	T0611100481
Status:	Completed - Case Closed
Status Date:	11/21/1994
Global Id:	T0611100481
Status:	Open - Case Begin Date
Status Date:	06/16/1989
Global Id:	T0611100481
Status:	Open - Remediation
Status Date:	12/15/1990
Global Id:	T0611100481
Status:	Open - Remediation
Status Date:	07/30/1994
Global Id:	T0611100481
Status:	Open - Site Assessment
Status Date:	06/16/1989
Global Id:	T0611100481
Status:	Open - Site Assessment
Status Date:	01/20/1990
Global Id:	T0611100481
Status:	Open - Site Assessment
Status Date:	02/15/1990

Regulatory Activities:

Global Id:	T0611100481
Action Type:	ENFORCEMENT
Date:	06/16/1989
Action:	* Historical Enforcement
Global Id:	T0611100481
Action Type:	Other

OXNARD SHORES EXXON (Continued) **S102434770**

Date: 01/01/1950
Action: Leak Discovery

Global Id: T0611100481
Action Type: Other
Date: 01/01/1950
Action: Leak Reported

LUST REG 4:
Region: 4
Regional Board: 04
County: Ventura
Facility Id: C-89066
Status: Case Closed
Substance: Gasoline
Substance Quantity: Not reported
Local Case No: 89066
Case Type: Groundwater
Abatement Method Used at the Site: Excavate and Dispose
Global ID: T0611100481
W Global ID: Not reported
Staff: UNK
Local Agency: 56000L
Cross Street: Not reported
Enforcement Type: EF
Date Leak Discovered: 6/16/1989
Date Leak First Reported: 6/16/1989
Date Leak Record Entered: Not reported
Date Confirmation Began: 6/16/1989
Date Leak Stopped: Not reported
Date Case Last Changed on Database: Not reported
Date the Case was Closed: 11/21/1994
How Leak Discovered: Not reported
How Leak Stopped: Not reported
Cause of Leak: Not reported
Leak Source: Not reported
Operator: Not reported
Water System: Not reported
Well Name: Not reported
Approx. Dist To Production Well (ft): 8485.074519935094373584480324
Source of Cleanup Funding: F
Preliminary Site Assessment Workplan Submitted: 6/16/1989
Preliminary Site Assessment Began: 1/20/1990
Pollution Characterization Began: 2/15/1990
Remediation Plan Submitted: 12/15/1990
Remedial Action Underway: 7/30/1994
Post Remedial Action Monitoring Began: 11/21/1994
Enforcement Action Date: 6/16/1989
Historical Max MTBE Date: Not reported
Hist Max MTBE Conc in Groundwater: Not reported
Hist Max MTBE Conc in Soil: Not reported
Significant Interim Remedial Action Taken: Not reported
GW Qualifier: Not reported
Soil Qualifier: Not reported
Organization: Not reported
Owner Contact: Not reported

OXNARD SHORES EXXON (Continued) **S102434770**

Responsible Party: OXNARD SHORES DEVEL
RP Address: Not reported
Program: LUST
Lat/Long: 34.1903896 / -1
Local Agency Staff: EHD
Beneficial Use: Not reported
Priority: Not reported
Cleanup Fund Id: Not reported
Suspended: Not reported
Assigned Name: Not reported
Summary: Not reported

VENTURA CO. LUST:
Region: VENTURA
Facility ID: 89066
Status: Case Closed

8
NNW
1/8-1/4
0.245 mi.
1291 ft.

Relative:
Lower

Actual:
24 ft.

CARNEY & SONS **CERC-NFRAP** **1003878421**
5085 W 5TH ST **CAD980496905**
OXNARD, CA 93030

CERC-NFRAP:
Site ID: 0901740
Federal Facility: Not a Federal Facility
NPL Status: Not on the NPL
Non NPL Status: NFRAP-Site does not qualify for the NPL based on existing information

CERCLIS-NFRAP Site Contact Details:
Contact Sequence ID: 13050838.00000
Person ID: 9271184.00000

Contact Sequence ID: 13288715.00000
Person ID: 13003854.00000

Contact Sequence ID: 13294310.00000
Person ID: 13003858.00000

Contact Sequence ID: 13300168.00000
Person ID: 13004003.00000

CERCLIS-NFRAP Site Alias Name(s):
Alias Name: J&J DISPOSAL
Alias Address: Not reported
CA

CERCLIS-NFRAP Assessment History:
Action: SITE INSPECTION
Date Started: / /
Date Completed: 01/23/92
Priority Level: NFRAP-Site does not qualify for the NPL based on existing information

Action: ARCHIVE SITE
Date Started: / /
Date Completed: 01/23/92

CARNEY & SONS (Continued) **1003878421**

Priority Level: Not reported

Action: SITE INSPECTION
Date Started: / /
Date Completed: 03/30/90
Priority Level: NFRAP-Site does not qualify for the NPL based on existing information

Action: PRELIMINARY ASSESSMENT
Date Started: / /
Date Completed: 04/01/80
Priority Level: Low priority for further assessment

Action: PRELIMINARY ASSESSMENT
Date Started: / /
Date Completed: 05/18/89
Priority Level: Low priority for further assessment

Action: DISCOVERY
Date Started: / /
Date Completed: 11/01/79
Priority Level: Not reported

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9 **NORTH SHORE AT MANDALAY BAY** **VCP** **S106665381**
NW **(NO NUMBER) HARBOR BLVD. WEST 5TH ST.** **ENVIROSTOR** **N/A**
1/4-1/2 **OXNARD, CA 93035**
0.271 mi.
1433 ft.

Relative:
Lower

Actual:
15 ft.

VCP:
Facility ID: 19000021
Site Type: Voluntary Cleanup
Site Type Detail: Voluntary Cleanup
Site Mgmt. Req.: NONE SPECIFIED
Acres: 90
National Priorities List: NO
Cleanup Oversight Agencies: SMBRP
Lead Agency: SMBRP
Lead Agency Description: DTSC - Site Cleanup Program
Project Manager: Javier Hinojosa
Supervisor: Javier Hinojosa
Division Branch: Cleanup Chatsworth
Site Code: 301242
Assembly: 37
Senate: 19
Special Programs Code: Voluntary Cleanup Program
Status: Active
Status Date: 10/11/2012
Restricted Use: NO
Funding: Responsible Party
Lat/Long: 34.1975 / -119.2422
APN: NONE SPECIFIED
Past Use: LANDFILL - DOMESTIC, OIL FIELD, OIL FIELD
Potential COC: 10003, 10009, 30018, 30003, 30019, 30009, 30018, 30024, 3002502
Confirmed COC: 30019-NO,30003-NO,,
Potential Description: OTH, SOIL
Alias Name: CARNEX AND SON LANDFILL
Alias Type: Alternate Name
Alias Name: JNJ DISPOSAL LANDFILL

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Alias Type: Alternate Name
Alias Name: 110033611946
Alias Type: EPA (FRS #)
Alias Name: 56-CR-0055
Alias Type: HWTS Identification Code
Alias Name: 301242
Alias Type: Project Code (Site Code)
Alias Name: 19000021
Alias Type: Envirostor ID Number
Alias Name: 56000001
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Consultative Service Agreement
Completed Date: 01/23/2013
Comments: Contract was executed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 10/20/2005
Comments: DTSC approved report

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Plan
Completed Date: 08/31/2006
Comments: Final FS/RAP approval letter

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 12/06/2006
Comments: Site preparation activities including "Grubbing and clearing" was approved on November 6, 2006.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 12/18/2006
Comments: Phase 2 approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Design - Preliminary/Intermediate
Completed Date: 12/18/2006
Comments: Phase:2 approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 07/13/2007
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Completed Document Type: Site Characterization Report
Completed Date: 03/19/2007
Comments: Limited sampling was performed on the Mc grath site for the soil import which was later followed by stockpile sampling after importing the Mc Grath soil on the site.Samples were analyzed for Organochlorine Pesticides, CAM 17 Metals,Total Petroleum Hydrocarbons - Carbon Chain (TPHcc) , and Polycyclic Aromatic Hydrocarbons (PAHs) .Sampling results continued to show the same trends of non detect or very low levels (below residential PRGs) , hence there were no health concerns about placing the soils in the resources protection area or 10 feet or deeper below surface in the residential areas.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 07/11/2007
Comments: Ground Water Extraction and Treatment design approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 02/01/2007
Comments: The report complied the data from investigations conducted at site between july 2006 and January 2007.The over all objective of this investigation was to define the distribution of chemicals in Ground Water and soils to facilitate design and implementation of appropriate remedial efforts.Data Gaps were identified and discussed during the meeting between DTSC and LFR on 2/1/07.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 10/17/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 10/17/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/14/2009
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 02/12/2009
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 08/30/2009

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 11/30/2009
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 02/12/2010
Comments: Tri-Monthly Monitoring Reportfor Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/12/2010
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 08/13/2010
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 11/12/2010
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 02/14/2011
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/13/2011
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 08/13/2011
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 11/15/2011
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 03/01/2012
Comments: Annual Summary report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 02/14/2012
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/15/2012
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 11/30/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 03/26/2013
Comments: Partial RACR was approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 02/22/2013
Comments: Report was approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 02/22/2013
Comments: The report was approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 08/03/2006
Comments: Temporary and Permanent GW monitoring wells were installed at the site on july 25th through july 28th, july 31st, and August 1st through august 3rd, 2006.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 10/18/2006
Comments: LFR Conducted a soil and soil gas investigation in the area of TMW-7 and former soil gas location SG-36 to evaluate the potential presence of VOC affected soil in this vicinity.ten GW samples were collected from both shallow and deep perched zone on the site.

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	11/17/2006
Comments:	MIP Investigation was conducted to evaluate the extent and distribution of the VOC mass relative to lithology in the areas of known VOC impacts from previously evaluated soil, soil gas and GW analytical data.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	12/05/2006
Comments:	Soil and GW Confirmation Sampling for MIP Investigation was performed on the site.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	12/19/2006
Comments:	Additional hydropunch GW Sampling was conducted at two locations within the VOC area to further delineate the lateral extent of VOC concentration detected during MIP Investigation and subsequent confirmation sampling.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	01/12/2007
Comments:	Additional GW sampling was conducted to further delineate the area of VOC-affected ground water in the north eastern portion of the site.Additional sampling was conducted in the area around GW-6, between GW-3 and former well TMW-5 and various other location including the vicinity of TMW-3 and GW-18 to define the lateral extent of VOC Affected ground water.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	02/07/2007
Comments:	Additional hydropunch GW sampling was conducted to further characterize the extent of contamination and collecting depth-specific samples within UpperBeachSand aquifier.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	02/27/2007
Comments:	Soil Sampling was conducted to delineate the extent of previously identified source areas.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	03/09/2007
Comments:	six test pits were excavated to the top of the clayey silt within the VOC area.The purpose of the testpits was to evaluate the volume of

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

sludge,sand and silt within VOC area.In addition, samples of the sand and top of the clayey silt were collected to evaluate soil concentration above the less affected ground water.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 11/29/2007
Comments: Soil Excavation, Relocation and Consolidation activities were accomplished on the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 12/31/2010
Comments: Field work was completed.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 10/09/2012
Comments: report reviewed and discussed in meeting on october 9.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 04/10/2012
Comments: Report sent to EPA

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 06/14/2011
Comments: EPA extended LUC

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 06/11/2012
Comments: LARWQCB Approval Letter

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 10/17/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Voluntary Cleanup Agreement
Completed Date: 07/22/2004
Comments: This VCA is for review and approval of existing data. In addition, under DTSC's oversight, the Proponent may complete a Remedial Action Plan and conduct remedial and/or removal actions to address site soil contamination in order to achieve soil conditions for unrestricted use of the Site.

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: PROJECT WIDE
Schedule Sub Area Name: Not reported
Schedule Document Type: Consultative Service Agreement
Schedule Due Date: 03/23/2013
Schedule Revised Date: Not reported

ENVIROSTOR:
Site Type: Voluntary Cleanup
Site Type Detailed: Voluntary Cleanup
Acres: 90
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Javier Hinojosa
Supervisor: Javier Hinojosa
Division Branch: Cleanup Chatsworth
Facility ID: 19000021
Site Code: 301242
Assembly: 37
Senate: 19
Special Program: Voluntary Cleanup Program
Status: Active
Status Date: 10/11/2012
Restricted Use: NO
Site Mgmt. Req.: NONE SPECIFIED
Funding: Responsible Party
Latitude: 34.1975
Longitude: -119.2422
APN: NONE SPECIFIED
Past Use: LANDFILL - DOMESTIC, OIL FIELD, OIL FIELD
Potential COC: * HALOGENATED SOLVENTS, * HYDROCARBON SOLVENTS, Polychlorinated biphenyls (PCBs, Benzene, Polynuclear aromatic hydrocarbons (PAHs, Dioxin (as 2,3,7,8-TCDD TEQ, Polychlorinated biphenyls (PCBs, TPH-diesel, TPH-MOTOR OIL
Confirmed COC: * HALOGENATED SOLVENTS, * HYDROCARBON SOLVENTS, Polychlorinated biphenyls (PCBs, Benzene, Polynuclear aromatic hydrocarbons (PAHs, Dioxin (as 2,3,7,8-TCDD TEQ, Polychlorinated biphenyls (PCBs, TPH-diesel, TPH-MOTOR OIL, 30019-NO, 30003-NO, ,
Potential Description: OTH, SOIL
Alias Name: CARNEX AND SON LANDFILL
Alias Type: Alternate Name
Alias Name: JNJ DISPOSAL LANDFILL
Alias Type: Alternate Name
Alias Name: 110033611946
Alias Type: EPA (FRS #)
Alias Name: 56-CR-0055
Alias Type: HWTS Identification Code
Alias Name: 301242
Alias Type: Project Code (Site Code)
Alias Name: 19000021
Alias Type: Envirostor ID Number
Alias Name: 56000001
Alias Type: Envirostor ID Number

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Consultative Service Agreement
Completed Date:	01/23/2013
Comments:	Contract was executed.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Investigation Report
Completed Date:	10/20/2005
Comments:	DTSC approved report
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Action Plan
Completed Date:	08/31/2006
Comments:	Final FS/RAP approval letter
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	12/06/2006
Comments:	Site preparation activities including "Grubbing and clearing" was approved on November 6, 2006.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Design/Implementation Workplan
Completed Date:	12/18/2006
Comments:	Phase 2 approved.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Remedial Design - Preliminary/Intermediate
Completed Date:	12/18/2006
Comments:	Phase:2 approved.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Design/Implementation Workplan
Completed Date:	07/13/2007
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Characterization Report
Completed Date:	03/19/2007
Comments:	Limited sampling was performed on the Mc grath site for the soil import which was later followed by stockpile sampling after importing the Mc Grath soil on the site.Samples were analyzed for Organochlorine Pesticides, CAM 17 Metals,Total Petroleum Hydrocarbons - Carbon Chain (TPHcc) , and Polycyclic Aromatic Hydrocarbons (PAHs) .Sampling results continued to show the same trends of non detect or very low levels (below residential PRGs) , hence there were no health concerns about placing the soils in the resources protection area or 10 feet or deeper below surface in the residential areas.

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Design/Implementation Workplan
Completed Date: 07/11/2007
Comments: Ground Water Extraction and Treatment design approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Report
Completed Date: 02/01/2007
Comments: The report complied the data from investigations conducted at site between july 2006 and January 2007.The over all objective of this investigation was to define the distribution of chemicals in Ground Water and soils to facilitate design and implementation of appropriate remedial efforts.Data Gaps were identified and discussed during the meeting between DTSC and LFR on 2/1/07.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 10/17/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: CEQA - Responsible Agency Review
Completed Date: 10/17/2006
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/14/2009
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 02/12/2009
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 08/30/2009
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 11/30/2009
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 02/12/2010

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Comments: Tri-Monthly Monitoring Reportfor Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/12/2010
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 08/13/2010
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 11/12/2010
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 02/14/2011
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/13/2011
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 08/13/2011
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 11/15/2011
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 03/01/2012
Comments: Annual Summary report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 02/14/2012
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/15/2012
Comments: Tri-Monthly Monitoring Report for Monitoring and Reporting Program

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 11/30/2012
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Action Completion Report
Completed Date: 03/26/2013
Comments: Partial RACR was approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Characterization Report
Completed Date: 02/22/2013
Comments: Report was approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Risk Assessment Report
Completed Date: 02/22/2013
Comments: The report was approved.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 08/03/2006
Comments: Temporary and Permanent GW monitoring wells were installed at the site on july 25th through july 28th, july 31st, and August 1st through august 3rd, 2006.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 10/18/2006
Comments: LFR Conducted a soil and soil gas investigation in the area of TMW-7 and former soil gas location SG-36 to evaluate the potential presence of VOC affected soil in this vicinity.ten GW samples were collected from both shallow and deep perched zone on the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 11/17/2006
Comments: MIP Investigation was conducted to evaluate the extent and distribution of the VOC mass relative to lithology in the areas of known VOC impacts from previously evaluated soil, soil gas and GW analytical data.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Completed Document Type: Fieldwork
Completed Date: 12/05/2006
Comments: Soil and GW Confirmation Sampling for MIP Investigation was performed on the site.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 12/19/2006
Comments: Additional hydropunch GW Sampling was conducted at two locations within the VOC area to further delineate the lateral extent of VOC concentration detected during MIP Investigation and subsequent confirmation sampling.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 01/12/2007
Comments: Additional GW sampling was conducted to further delineate the area of VOC-affected ground water in the north eastern portion of the site.Additional sampling was conducted in the area around GW-6, between GW-3 and former well TMW-5 and various other location including the vicinity of TMW-3 and GW-18 to define the lateral extent of VOC Affected ground water.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 02/07/2007
Comments: Additional hydropunch GW sampling was conducted to further characterize the extent of contamination and collecting depth-specific samples within UpperBeachSand aquifier.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 02/27/2007
Comments: Soil Sampling was conducted to delineate the extent of previously identified source areas.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 03/09/2007
Comments: six test pits were excavated to the top of the clayey silt within the VOC area.The purpose of the testpits was to evaluate the volume of sludge,sand and silt within VOC area.In addition, samples of the sand and top of the clayey silt were collected to evaluate soil concentration above the less affected ground water.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 11/29/2007
Comments: Soil Excavation, Relocation and Consolidation activities were accomplished on the site.

NORTH SHORE AT MANDALAY BAY (Continued) **S106665381**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Fieldwork
Completed Date:	12/31/2010
Comments:	Field work was completed.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Monitoring Report
Completed Date:	10/09/2012
Comments:	report reviewed and discussed in meeting on october 9.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Other Report
Completed Date:	04/10/2012
Comments:	Report sent to EPA
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Other Report
Completed Date:	06/14/2011
Comments:	EPA extended LUC
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Other Report
Completed Date:	06/11/2012
Comments:	LARWQCB Approval Letter
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	CEQA - Responsible Agency Review
Completed Date:	10/17/2006
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Voluntary Cleanup Agreement
Completed Date:	07/22/2004
Comments:	This VCA is for review and approval of existing data. In addition, under DTSC's oversight, the Proponent may complete a Remedial Action Plan and conduct remedial and/or removal actions to address site soil contamination in order to achieve soil conditions for unrestricted use of the Site.
Future Area Name:	Not reported
Future Sub Area Name:	Not reported
Future Document Type:	Not reported
Future Due Date:	Not reported
Schedule Area Name:	PROJECT WIDE
Schedule Sub Area Name:	Not reported
Schedule Document Type:	Consultative Service Agreement
Schedule Due Date:	03/23/2013
Schedule Revised Date:	Not reported

10
WNW
1/4-1/2
0.435 mi.
2295 ft.

OXNARD SEACOAST BATTERY
OXNARD, CA

FUDS **1009484548** **N/A**

Relative:
Lower

Actual:
13 ft.

FUDS:

Federal Facility ID:	CA9799F5550
FUDS #:	J09CA0530
INST ID:	61152
Facility Name:	OXNARD SEACOAST BATTERY
City:	OXNARD
State:	CA
EPA Region:	09
County:	VENTURA
Congressional District:	23
US Army District:	Los Angeles District (SPL)
Fiscal Year:	2011
Telephone:	213-452-3920
NPL Status:	Not Listed
RAB:	Not reported
CTC:	65
Current Owner:	PRIVATE
Current Prog:	Not reported
Future Prog:	Not reported
Description:	+ OR - 19 ACRES SEACOAST DEFENSE SITE

11
ESE
1/2-1
0.524 mi.
2765 ft.

SOUTHWEST ELEMENTARY SCHOOL SITE #4
4200 WOOLEY ROAD
OXNARD, CA 93030

SCH **S107737391**
ENVIROSTOR **N/A**

Relative:
Lower

Actual:
18 ft.

SCH:

Facility ID:	60000122
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	9
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Christine Chiu
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	304504
Assembly:	37
Senate:	19
Special Program Status:	Not reported
Status:	No Further Action
Status Date:	02/10/2011
Restricted Use:	NO
Funding:	School District
Latitude:	34.18963
Longitude:	-119.2263
APN:	188-0-110-500, 188-0-250-001, 188-0-250-002, 188-0-250-015, 188-0-250-025
Past Use:	AGRICULTURAL - ROW CROPS

SOUTHWEST ELEMENTARY SCHOOL SITE #4 (Continued) **S107737391**

Potential COC: DDT, DDT, Toxaphene
Confirmed COC: NONE SPECIFIED
Potential Description: SOIL
Alias Name: OXNARD SD-PROPOSED ES NO. 4
Alias Type: Alternate Name
Alias Name: 188-0-110-500
Alias Type: APN
Alias Name: 188-0-250-001
Alias Type: APN
Alias Name: 188-0-250-002
Alias Type: APN
Alias Name: 188-0-250-015
Alias Type: APN
Alias Name: 188-0-250-025
Alias Type: APN
Alias Name: 304504
Alias Type: Project Code (Site Code)
Alias Name: 60000122
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 03/25/2009
Comments: DTSC prepared a project close out Cost Recovery Unit memorandum

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 07/06/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 03/10/2010
Comments: Signed EOA sent (FedEx) to District.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Inactive Status Letter
Completed Date: 08/29/2006
Comments: Inactive status letter sent to the District. Project will be on hold until notification from the District.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 02/10/2011
Comments: DTSC prepared project close out Cost Recovery Unit Memorandum.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 09/22/2010
Comments: On September 22, 2010, DTSC approved the Preliminary Environmental Assessment Workplan for implementation.

SOUTHWEST ELEMENTARY SCHOOL SITE #4 (Continued) **S107737391**

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 02/09/2011
Comments: DTSC approved the PEA with a No Further Action determination.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

ENVIROSTOR:
Site Type: School Investigation
Site Type Detailed: School
Acres: 9
NPL: NO
Regulatory Agencies: SMBRP
Lead Agency: SMBRP
Program Manager: Christine Chiu
Supervisor: Shahir Haddad
Division Branch: Southern California Schools & Brownfields Outreach
Facility ID: 60000122
Site Code: 304504
Assembly: 37
Senate: 19
Special Program: Not reported
Status: No Further Action
Status Date: 02/10/2011
Restricted Use: NO
Site Mgmt. Req.: NONE SPECIFIED
Funding: School District
Latitude: 34.18963
Longitude: -119.2263
APN: 188-0-110-500, 188-0-250-001, 188-0-250-002, 188-0-250-015, 188-0-250-025
Past Use: AGRICULTURAL - ROW CROPS
Potential COC: DDT, DDT, Toxaphene
Confirmed COC: DDT, DDT, Toxaphene, NONE SPECIFIED
Potential Description: SOIL
Alias Name: OXNARD SD-PROPOSED ES NO. 4
Alias Type: Alternate Name
Alias Name: 188-0-110-500
Alias Type: APN
Alias Name: 188-0-250-001
Alias Type: APN
Alias Name: 188-0-250-002
Alias Type: APN
Alias Name: 188-0-250-015
Alias Type: APN
Alias Name: 188-0-250-025
Alias Type: APN
Alias Name: 304504

SOUTHWEST ELEMENTARY SCHOOL SITE #4 (Continued) **S107737391**

Alias Type: Project Code (Site Code)
Alias Name: 60000122
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 03/25/2009
Comments: DTSC prepared a project close out Cost Recovery Unit memorandum

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 07/06/2005
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 03/10/2010
Comments: Signed EOA sent (FedEx) to District.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Inactive Status Letter
Completed Date: 08/29/2006
Comments: Inactive status letter sent to the District. Project will be on hold until notification from the District.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 02/10/2011
Comments: DTSC prepared project close out Cost Recovery Unit Memorandum.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Workplan
Completed Date: 09/22/2010
Comments: On September 22, 2010, DTSC approved the Preliminary Environmental Assessment Workplan for implementation.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 02/09/2011
Comments: DTSC approved the PEA with a No Further Action determination.

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

12
NW
1/2-1
0.575 mi.
3034 ft.

SOUTHERN CALIFORNIA EDISON - MANDALAY GENERATING STATION
373 NORTH HARBOR BLVD
OXNARD, CA 93030

Database(s): SLIC, ENVIROSTOR
EDR ID Number: S106483686
EPA ID Number: N/A

Relative:
Lower

Actual:
11 ft.

SLIC:

Region:	STATE
Facility Status:	**Completed - Case Closed**
Status Date:	07/07/2003
Global Id:	SL0611182835
Lead Agency:	LOS ANGELES RWQCB (REGION 4)
Lead Agency Case Number:	Not reported
Latitude:	34.182059
Longitude:	-119.232559
Case Type:	Cleanup Program Site
Case Worker:	MC
Local Agency:	Not reported
RB Case Number:	0710F
File Location:	Not reported
Potential Media Affected:	Not reported
Potential Contaminants of Concern:	Not reported
Site History:	Not reported

Click here to access the California GeoTracker records for this facility:

ENVIROSTOR:

Site Type:	Corrective Action
Site Type Detailed:	Corrective Action
Acres:	70
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Steven Rounds
Supervisor:	Allan Plaza
Division Branch:	Cleanup Chatsworth
Facility ID:	60001191
Site Code:	400439
Assembly:	35
Senate:	19
Special Program:	Not reported
Status:	Active
Status Date:	02/01/1995
Restricted Use:	NO
Site Mgmt. Req.:	NONE SPECIFIED
Funding:	Responsible Party
Latitude:	34.20676
Longitude:	-119.25
APN:	NONE SPECIFIED
Past Use:	ABOVE GROUND STORAGE TANKS
Potential COC:	Polychlorinated biphenyls (PCBs, Vanadium and compounds
Confirmed COC:	Polychlorinated biphenyls (PCBs, Vanadium and compounds, 30587-NO, 30018-NO
Potential Description:	OTH, SOIL
Alias Name:	CAD000630913
Alias Type:	EPA Identification Number
Alias Name:	110018952365
Alias Type:	EPA (FRS #)
Alias Name:	400439

SOUTHERN CALIFORNIA EDISON - MANDALAY GENERATING STATION (Continued) **S106483686**

Alias Type: Project Code (Site Code)
Alias Name: 60001191
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 03/29/2010
Comments: document received, no comment

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Other Report
Completed Date: 01/19/2010
Comments: Not reported

Completed Area Name: RCRA Surface Impoundments
Completed Sub Area Name: Not reported
Completed Document Type: Remedial Investigation Workplan
Completed Date: 11/15/2007
Comments: draft closure plan approved by DTSC, passed public coment period - currently implementing

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 06/14/2011
Comments: Reviewed by DTSC.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 10/10/2012
Comments: DTSC e-mail to facility

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Fieldwork
Completed Date: 06/30/2013
Comments: Completed

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Monitoring Report
Completed Date: 05/07/2013
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Judicial Order
Completed Date: 02/06/1995
Comments: Order signed and recorded.

Future Area Name: RCRA Surface Impoundments
Future Sub Area Name: Not reported
Future Document Type: Remedial Action Completion Report
Future Due Date: 2014

SOUTHERN CALIFORNIA EDISON - MANDALAY GENERATING STATION (Continued) **S106483686**

Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

C13 **ADVANCED BASE DEPOT-RIFLE RANGE** **FUDS** **1009484304**
South **N/A**
1/2-1 **OXNARD, CA**
0.959 mi.
5065 ft. **Site 1 of 2 in cluster C**

Relative:
Lower

Actual:
17 ft.

FUDS:
Federal Facility ID: CA9799F9784
FUDS #: J09CA7074
INST ID: 54037
Facility Name: ADVANCED BASE DEPOT-RIFLE RANGE
City: OXNARD
State: CA
EPA Region: 09
County: VENTURA
Congressional District: 23
US Army District: Los Angeles District (SPL)
Fiscal Year: 2011
Telephone: 213-452-3920
NPL Status: Not Listed
RAB: Not reported
CTC: 124.7
Current Owner: STATE; PRIVATE
Current Prog: Not reported
Future Prog: Not reported
Description: The Navy first acquired 325 acres by lease agreement on 3 December 1942, as part of the Port Hueneme Advance Base Depo. The site is located in Ventura County, California, about 4 miles west of the City of Oxnard adjacent to the ocean shoreline. Site improvements included an armory school, officer's demonstration area, hand grenade school, pistol range, obstacle course, two powder magazines, decontamination and gas buildings, rifle range, a 1,000-ft range, a 300-yd range, and a school range. The only undeveloped portions of the 325-acre area include numerous individual parcels within the residential neighborhoods that appear to have been graded in preparation for construction. The Oxnard State Beach Park is almost entirely planted with grass except where parking lots, playground equipment, picnic areas, and paths are constructed. Landscaping with small shrubs and trees is present along the northern border, in addition to the planting of palm trees along constructed walking and bike paths. The western edge of the park borders a series of coastal sand dunes. The only potential remnant of past military activity in the entire area identified during the site inspection was two large concrete blocks outside the park area, within the sand dunes to the west of the park. This property is known or suspected to contain military munitions and explosives of concern (e.g., unexploded ordnance) and therefore may present an explosive hazard
The Navy first acquired 325 acres by lease agreement on 3 December 1942, as part of the Port Hueneme Advance Base Depot. Extensive military training facilities (i.e., Advance Base Depot - Rifle Range) were constructed for Navy personnel stationed at Camp Rousseau, the World War II Seabee Camp at Port Hueneme. Following WWII (late 1946

ADVANCED BASE DEPOT-RIFLE RANGE (Continued) **1009484304**

to early 1947), the diminishing need for military training resulted in the demolition of the Advance Base Depot - Rifle Range and termination of the lease. The site was again leased at the onset of the Korean War in the early 1950s. A limited number of new military training facilities were constructed on the southern portion of the property for use by the Port Hueneme Construction Battalion Center. The northern portion of the site was returned to a private party before May 1959, when they sold it to the Oxnard Shores Development Company for residential development. The southern portion of the area was in use by the CBC through October 1959. The Navy lease was terminated after this time and prior to subsequent development. The site remained undeveloped beach land until the late 1980s. The 325-acre site that composed the Advance Base Depot - Rifle Range is now almost fully developed to residential and commercial uses, in addition to the Oxnard State Beach Park.

C14 **OXNARD SHORES** **ENVIROSTOR** **S107736987**
South **N/A**
1/2-1 **OXNARD, CA**
0.964 mi.
5091 ft. **Site 2 of 2 in cluster C**

Relative:
Lower

Actual:
17 ft.

ENVIROSTOR:

Site Type:	Military Evaluation
Site Type Detailed:	FUDS
Acres:	Not reported
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Not reported
Supervisor:	Douglas Bautista
Division Branch:	Cleanup Cypress
Facility ID:	80000749
Site Code:	Not reported
Assembly:	37
Senate:	19
Special Program:	Not reported
Status:	Inactive - Needs Evaluation
Status Date:	07/01/2005
Restricted Use:	NO
Site Mgmt. Req.:	NONE SPECIFIED
Funding:	DERA
Latitude:	34.17777
Longitude:	-119.2361
APN:	NONE SPECIFIED
Past Use:	NONE SPECIFIED
Potential COC:	NONE SPECIFIED
Confirmed COC:	NONE SPECIFIED, NONE SPECIFIED
Potential Description:	NONE SPECIFIED
Alias Name:	CA99799F978400
Alias Type:	Federal Facility ID
Alias Name:	J09CA7074
Alias Type:	INPR
Alias Name:	80000749
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	Not reported
Completed Sub Area Name:	Not reported

OXNARD SHORES (Continued) **S107736987**

Completed Document Type: Not reported
Completed Date: Not reported
Comments: Not reported

Future Area Name: Not reported
Future Sub Area Name: Not reported
Future Document Type: Not reported
Future Due Date: Not reported
Schedule Area Name: Not reported
Schedule Sub Area Name: Not reported
Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

15
NW
1/2-1
0.969 mi.
5118 ft.

MANDALAY POWER GENERATION **Toxic Pits** **S100676238**
393 NORTH HARBOR BLVD **CHMIRS** **N/A**
OXNARD, CA 93030 **EMI**

Relative:
Lower

Actual:
0 ft.

Toxic Pits:
Region: 04
Task #: 04012
Owner: SOUTHERN CALIFORNIA EDISON
1/2 Mi Limit: Y
Num. of Pits: 1
Cease Discharge Due: 02/26/95
Cease Discharge Complete: / /
Closure Due: / /
Closure Completed: / /
Status: ACTIVE
Hydro Geological Assessment Report Due: / /
Final Hydro Geological Assessment Review Completed: 05/27/88

CHMIRS:
OES Incident Number: 00-3530
OES notification: 08/07/2000
OES Date: Not reported
OES Time: Not reported
Incident Date: Not reported
Date Completed: Not reported
Property Use: Not reported
Agency Id Number: Not reported
Agency Incident Number: Not reported
Time Notified: Not reported
Time Completed: Not reported
Surrounding Area: Not reported
Estimated Temperature: Not reported
Property Management: Not reported
Special Studies 1: Not reported
Special Studies 2: Not reported
Special Studies 3: Not reported
Special Studies 4: Not reported
Special Studies 5: Not reported
Special Studies 6: Not reported
More Than Two Substances Involved?: Not reported
Resp Agncy Personel # Of Decontaminated: Not reported

MANDALAY POWER GENERATION (Continued) **S100676238**

Responding Agency Personel # Of Injuries:	Not reported
Responding Agency Personel # Of Fatalities:	Not reported
Others Number Of Decontaminated:	Not reported
Others Number Of Injuries:	Not reported
Others Number Of Fatalities:	Not reported
Vehicle Make/year:	Not reported
Vehicle License Number:	Not reported
Vehicle State:	Not reported
Vehicle Id Number:	Not reported
CA/DOT/PUC/ICC Number:	Not reported
Company Name:	Not reported
Reporting Officer Name/ID:	Not reported
Report Date:	Not reported
Comments:	Not reported
Facility Telephone:	Not reported
Waterway Involved:	Yes
Waterway:	Pacific Ocean
Spill Site:	Not reported
Cleanup By:	Unknown
Containment:	Not reported
What Happened:	Not reported
Type:	Not reported
Measure:	Not reported
Other:	Not reported
Date/Time:	Not reported
Year:	2000
Agency:	Reliant Energy
Incident Date:	8/7/200012:00:00 AM
Admin Agency:	Oxnard Fire Department
Amount:	Not reported
Contained:	No
Site Type:	Utilities/Substation
E Date:	Not reported
Substance:	Oil
Quantity Released:	Not reported
BBLS:	0
Cups:	0
CUFT:	0
Gallons:	5
Grams:	0
Pounds:	0
Liters:	0
Ounces:	0
Pints:	0
Quarts:	0
Sheen:	0
Tons:	0
Unknown:	0
Evacuations:	0
Number of Injuries:	0
Number of Fatalities:	0
Description:	2 patches of sheen on water 4 ft x 4 inches wide. While cleaning a retenion basin a sheen appeared. Sheen disipated

EMI:

Year:	1987
County Code:	56

MANDALAY POWER GENERATION (Continued) **S100676238**

Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	91
Reactive Organic Gases Tons/Yr:	42
Carbon Monoxide Emissions Tons/Yr:	155
NOX - Oxides of Nitrogen Tons/Yr:	1495
SOX - Oxides of Sulphur Tons/Yr:	38
Particulate Matter Tons/Yr:	28
Part. Matter 10 Micrometers & Smllr Tons/Yr:	28

Year:	1990
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	75
Reactive Organic Gases Tons/Yr:	47
Carbon Monoxide Emissions Tons/Yr:	100
NOX - Oxides of Nitrogen Tons/Yr:	1148
SOX - Oxides of Sulphur Tons/Yr:	213
Particulate Matter Tons/Yr:	50
Part. Matter 10 Micrometers & Smllr Tons/Yr:	48

Year:	1995
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	28
Reactive Organic Gases Tons/Yr:	13
Carbon Monoxide Emissions Tons/Yr:	144
NOX - Oxides of Nitrogen Tons/Yr:	546
SOX - Oxides of Sulphur Tons/Yr:	4
Particulate Matter Tons/Yr:	13
Part. Matter 10 Micrometers & Smllr Tons/Yr:	13

Year:	1996
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Not reported

MANDALAY POWER GENERATION (Continued) **S100676238**

Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	22
Reactive Organic Gases Tons/Yr:	10
Carbon Monoxide Emissions Tons/Yr:	236
NOX - Oxides of Nitrogen Tons/Yr:	146
SOX - Oxides of Sulphur Tons/Yr:	11
Particulate Matter Tons/Yr:	16
Part. Matter 10 Micrometers & Smllr Tons/Yr:	16
Year:	1997
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	24
Reactive Organic Gases Tons/Yr:	11
Carbon Monoxide Emissions Tons/Yr:	265
NOX - Oxides of Nitrogen Tons/Yr:	54
SOX - Oxides of Sulphur Tons/Yr:	8
Particulate Matter Tons/Yr:	17
Part. Matter 10 Micrometers & Smllr Tons/Yr:	17
Year:	1998
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	17
Reactive Organic Gases Tons/Yr:	5
Carbon Monoxide Emissions Tons/Yr:	120
NOX - Oxides of Nitrogen Tons/Yr:	36
SOX - Oxides of Sulphur Tons/Yr:	2
Particulate Matter Tons/Yr:	8
Part. Matter 10 Micrometers & Smllr Tons/Yr:	8
Year:	1999
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	25
Reactive Organic Gases Tons/Yr:	9
Carbon Monoxide Emissions Tons/Yr:	243
NOX - Oxides of Nitrogen Tons/Yr:	72
SOX - Oxides of Sulphur Tons/Yr:	4

MANDALAY POWER GENERATION (Continued) **S100676238**

Particulate Matter Tons/Yr:	16
Part. Matter 10 Micrometers & Smllr Tons/Yr:	16
Year:	2000
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Not reported
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	65
Reactive Organic Gases Tons/Yr:	19
Carbon Monoxide Emissions Tons/Yr:	510
NOX - Oxides of Nitrogen Tons/Yr:	201
SOX - Oxides of Sulphur Tons/Yr:	7
Particulate Matter Tons/Yr:	36
Part. Matter 10 Micrometers & Smllr Tons/Yr:	36
Year:	2001
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	B
Total Organic Hydrocarbon Gases Tons/Yr:	55
Reactive Organic Gases Tons/Yr:	15
Carbon Monoxide Emissions Tons/Yr:	411
NOX - Oxides of Nitrogen Tons/Yr:	174
SOX - Oxides of Sulphur Tons/Yr:	6
Particulate Matter Tons/Yr:	29
Part. Matter 10 Micrometers & Smllr Tons/Yr:	29
Year:	2002
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	23
Reactive Organic Gases Tons/Yr:	7
Carbon Monoxide Emissions Tons/Yr:	198
NOX - Oxides of Nitrogen Tons/Yr:	63
SOX - Oxides of Sulphur Tons/Yr:	3
Particulate Matter Tons/Yr:	14
Part. Matter 10 Micrometers & Smllr Tons/Yr:	14
Year:	2003
County Code:	56
Air Basin:	SCC

MANDALAY POWER GENERATION (Continued) **S100676238**

Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	16
Reactive Organic Gases Tons/Yr:	5
Carbon Monoxide Emissions Tons/Yr:	133
NOX - Oxides of Nitrogen Tons/Yr:	38
SOX - Oxides of Sulphur Tons/Yr:	2
Particulate Matter Tons/Yr:	9
Part. Matter 10 Micrometers & Smllr Tons/Yr:	9

Year:	2004
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	11.155
Reactive Organic Gases Tons/Yr:	4.71
Carbon Monoxide Emissions Tons/Yr:	134.81
NOX - Oxides of Nitrogen Tons/Yr:	17.12
SOX - Oxides of Sulphur Tons/Yr:	2.022
Particulate Matter Tons/Yr:	8.426
Part. Matter 10 Micrometers & Smllr Tons/Yr:	8.43

Year:	2005
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	6.793
Reactive Organic Gases Tons/Yr:	2.5030255
Carbon Monoxide Emissions Tons/Yr:	70.035
NOX - Oxides of Nitrogen Tons/Yr:	9.359
SOX - Oxides of Sulphur Tons/Yr:	1.035
Particulate Matter Tons/Yr:	4.553
Part. Matter 10 Micrometers & Smllr Tons/Yr:	4.551362

Year:	2006
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	Not reported

MANDALAY POWER GENERATION (Continued) **S100676238**

Total Organic Hydrocarbon Gases Tons/Yr:	8.06728
Reactive Organic Gases Tons/Yr:	2.84650172
Carbon Monoxide Emissions Tons/Yr:	72.27637
NOX - Oxides of Nitrogen Tons/Yr:	8.830865
SOX - Oxides of Sulphur Tons/Yr:	1.05555
Particulate Matter Tons/Yr:	4.84756
Part. Matter 10 Micrometers & Smllr Tons/Yr:	4.84448458
Year:	2007
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	Y
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	8.980717
Reactive Organic Gases Tons/Yr:	3.51876364
Carbon Monoxide Emissions Tons/Yr:	90.198275
NOX - Oxides of Nitrogen Tons/Yr:	10.003
SOX - Oxides of Sulphur Tons/Yr:	1.33593
Particulate Matter Tons/Yr:	5.8342785
Part. Matter 10 Micrometers & Smllr Tons/Yr:	5.832445191
Year:	2008
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	N
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	11.77825
Reactive Organic Gases Tons/Yr:	4.57830054
Carbon Monoxide Emissions Tons/Yr:	121.73627
NOX - Oxides of Nitrogen Tons/Yr:	13.40991
SOX - Oxides of Sulphur Tons/Yr:	1.80444
Particulate Matter Tons/Yr:	7.85767
Part. Matter 10 Micrometers & Smllr Tons/Yr:	7.8553498
Year:	2009
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	N
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	9.50958975
Reactive Organic Gases Tons/Yr:	2.93305478
Carbon Monoxide Emissions Tons/Yr:	71.574044999999998
NOX - Oxides of Nitrogen Tons/Yr:	8.6668900000000004
SOX - Oxides of Sulphur Tons/Yr:	1.0230840000000001
Particulate Matter Tons/Yr:	5.0577078000000002

MANDALAY POWER GENERATION (Continued) **S100676238**

Part. Matter 10 Micrometers & Smllr Tons/Yr: 5.0522618328000002

Year:	2010
County Code:	56
Air Basin:	SCC
Facility ID:	13
Air District Name:	VEN
SIC Code:	4911
Air District Name:	VENTURA COUNTY APCD
Community Health Air Pollution Info System:	N
Consolidated Emission Reporting Rule:	Not reported
Total Organic Hydrocarbon Gases Tons/Yr:	3.598732
Reactive Organic Gases Tons/Yr:	1.08057
Carbon Monoxide Emissions Tons/Yr:	20.488160000000001
NOX - Oxides of Nitrogen Tons/Yr:	4.1501169999999998
SOX - Oxides of Sulphur Tons/Yr:	0.28337699999999999
Particulate Matter Tons/Yr:	1.5582450000000001
Part. Matter 10 Micrometers & Smllr Tons/Yr:	1.5556506000000001

Count: 14 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
OXNARD	S112855601	OXNARD HARBOR DIST	5851 S ARCTURUS AVE	93030	HAZNET
OXNARD	1003878781	WALKER'S VENTURA SALVAGE CITY DUMP	4400 BLOCK VINEYARD AVE	93030	CERC-NFRAP
OXNARD	S105974816	SHELL SS - CHANNEL ISLANDS	1440 CHANNEL ISLANDS BLVD.		LUST
OXNARD	1016064158	VENTURA COUNTY CHANNEL HARBOR	CHANNEL ISLND HBR DEPT		FINDS
OXNARD	1003878951	DUNES SUBDIVISION	DUNES ST	93030	CERC-NFRAP
OXNARD	U001579831	PATTERSON RANCH	W. END OF WOOLEY RD.	93030	HIST UST
OXNARD	S105520867	OXNARD DUNES SUBDIVISION	HARBOR	93030	SLIC
OXNARD	S105692211	HILLS AUTOMOTIVE	1560 OXNARD BLVD.		LUST
OXNARD	S104532756	MIDAS MUFFLER	541 OXNARD BLVD		LUST
OXNARD	U001579898	VENTURA COUNTY HARBOR OFFICE	3400 PELICAN WAY	93030	HIST UST
OXNARD	S100779164	OXNARD 1962	PERKINS RD. AND ORMOND BEACH W		SWF/LF
OXNARD	S109521349	CITY OF OXNARD	ROSE AVENUE HWY 101	93030	SLIC
OXNARD	1003878694	BAILARD LDFL	VICTORIA RD XING @SN CLARA RIV	93030	CERC-NFRAP
OXNARD	S106539394	WAGON WHEEL AKA: SANTA CLARA (WAGO	2401 VINEYARD AVE.	93030	SWF/LF

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/09/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 11/11/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/09/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 11/11/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/09/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 11/11/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/29/2013
Date Made Active in Reports: 08/09/2013
Number of Days to Update: 72

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 11/11/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 10/09/2012
Date Made Active in Reports: 12/20/2012
Number of Days to Update: 72

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 10/11/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 05/29/2013
Date Made Active in Reports: 08/09/2013
Number of Days to Update: 72

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 11/11/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 07/11/2013
Date Data Arrived at EDR: 08/08/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 36

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 10/02/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 07/11/2013
Date Data Arrived at EDR: 08/08/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/02/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 07/11/2013
Date Data Arrived at EDR: 08/08/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/02/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 07/11/2013
Date Data Arrived at EDR: 08/08/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/02/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 07/11/2013
Date Data Arrived at EDR: 08/08/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/02/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 06/17/2013
Date Data Arrived at EDR: 06/21/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 104

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 06/17/2013
Date Data Arrived at EDR: 06/21/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 104

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 08/20/2013
Date Data Arrived at EDR: 08/23/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 70

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 08/15/2013
Next Scheduled EDR Contact: 09/02/2013
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/17/2013
Date Made Active in Reports: 02/15/2013
Number of Days to Update: 29

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 10/01/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites

Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 09/05/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/06/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 09/05/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/06/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 08/19/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 50

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 08/19/2013
Next Scheduled EDR Contact: 12/02/2013
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 6L: Leaking Underground Storage Tank Case Listing
For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 09/16/2013
Date Data Arrived at EDR: 09/17/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 29

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 10/17/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Quarterly

LUST REG 9: Leaking Underground Storage Tank Report
Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 6V: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks
California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 7: Leaking Underground Storage Tank Case Listing
Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST REG 1: Active Toxic Site Investigation
Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC: Statewide SLIC Cases
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/16/2013
Date Data Arrived at EDR: 09/17/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 10/17/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 08/27/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 66

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 08/20/2013
Date Data Arrived at EDR: 08/23/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 70

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 07/30/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 94

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Quarterly

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 09/12/2011
Date Data Arrived at EDR: 09/13/2011
Date Made Active in Reports: 11/11/2011
Number of Days to Update: 59

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/01/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

State and tribal registered storage tank lists

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 09/16/2013
Date Data Arrived at EDR: 09/17/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 29
Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 10/17/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21
Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 10/07/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/05/2013
Date Data Arrived at EDR: 02/06/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 65
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 02/21/2013
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 45
Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 07/29/2013
Date Data Arrived at EDR: 08/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 92

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 43

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 08/20/2013
Date Data Arrived at EDR: 08/23/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 70

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Semi-Annually

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 11/07/2012
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 156

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 11/01/2014
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 10/17/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC's costs.

Date of Government Version: 09/05/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/06/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Quarterly

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/28/2012
Date Data Arrived at EDR: 10/02/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 14

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 10/01/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 06/24/2013
Date Data Arrived at EDR: 06/25/2013
Date Made Active in Reports: 08/09/2013
Number of Days to Update: 45

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 09/24/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: No Update Planned

WMUDS/SWAT: Waste Management Unit Database
Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30
Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 09/16/2013
Date Data Arrived at EDR: 09/19/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 28
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/16/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 04/26/2013
Date Made Active in Reports: 05/16/2013
Number of Days to Update: 20
Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 10/01/2013
Next Scheduled EDR Contact: 12/02/2013
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 08/06/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 22

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 09/04/2013
Next Scheduled EDR Contact: 12/16/2013
Data Release Frequency: Quarterly

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 09/05/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 35

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/06/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 09/03/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 37

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 09/03/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Lists of Registered Storage Tanks

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 09/03/2013
Next Scheduled EDR Contact: 12/16/2013
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/06/2013
Date Data Arrived at EDR: 04/25/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 11/13/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 06/14/2013
Date Data Arrived at EDR: 06/17/2013
Date Made Active in Reports: 08/21/2013
Number of Days to Update: 65

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 09/11/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/13/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 55

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 10/01/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 03/12/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 06/25/2013
Number of Days to Update: 55

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 10/30/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 09/16/2013
Date Data Arrived at EDR: 09/17/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 29

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 10/17/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 09/16/2013
Date Data Arrived at EDR: 09/17/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 29

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 10/17/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 07/11/2013
Date Data Arrived at EDR: 08/08/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 10/02/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 11/06/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 10/18/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 03/13/2013
Number of Days to Update: 15

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 08/07/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 57

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 04/26/2013
Date Data Arrived at EDR: 06/11/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 143

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 09/13/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/28/2013
Next Scheduled EDR Contact: 09/09/2013
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 28

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 09/05/2013
Next Scheduled EDR Contact: 12/16/2013
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 08/30/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 09/24/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 07/20/2011
Date Data Arrived at EDR: 11/10/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 61

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/09/2014
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2013
Date Data Arrived at EDR: 07/17/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 107

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/18/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/09/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 23

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 10/09/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 03/08/2013
Date Data Arrived at EDR: 03/21/2013
Date Made Active in Reports: 07/10/2013
Number of Days to Update: 111

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 09/11/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 05/08/2012
Date Data Arrived at EDR: 05/25/2012
Date Made Active in Reports: 07/10/2012
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 08/26/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Biennially

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NPDES: NPDES Permits Listing

A listing of NPDES permits, including stormwater.

Date of Government Version: 08/19/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 50

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 08/19/2013
Next Scheduled EDR Contact: 12/02/2013
Data Release Frequency: Quarterly

UIC: UIC Listing
A listing of underground control injection wells.

Date of Government Version: 08/21/2013
Date Data Arrived at EDR: 09/17/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 30
Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 09/17/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Varies

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 07/05/2013
Date Data Arrived at EDR: 07/05/2013
Date Made Active in Reports: 08/26/2013
Number of Days to Update: 52
Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 10/01/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18
Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: No Update Planned

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 35
Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/24/2012
Data Release Frequency: Annually

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13
Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 08/09/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 56

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 07/16/2013
Date Made Active in Reports: 08/26/2013
Number of Days to Update: 41

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 10/15/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 06/25/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 58

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 09/27/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 10/18/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 10/21/2013
Next Scheduled EDR Contact: 02/03/2014
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 03/04/2013
Date Data Arrived at EDR: 03/15/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 56

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 09/27/2013
Next Scheduled EDR Contact: 12/02/2013
Data Release Frequency: Quarterly

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 11/01/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 09/16/2013
Date Data Arrived at EDR: 09/19/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 28
Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 09/16/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Quarterly

MWMP: Medical Waste Management Program Listing
The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 08/29/2013
Date Data Arrived at EDR: 09/13/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 31
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 09/11/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 10/15/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 09/13/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Varies

HWT: Registered Hazardous Waste Transporter Database
A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/15/2013
Date Data Arrived at EDR: 07/16/2013
Date Made Active in Reports: 08/12/2013
Number of Days to Update: 27
Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 10/15/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Quarterly

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 08/28/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 44

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 08/27/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Quarterly

Financial Assurance 2: Financial Assurance Information Listing

A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 08/12/2013
Date Data Arrived at EDR: 08/20/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 49

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 08/15/2013
Next Scheduled EDR Contact: 12/02/2013
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 08/08/2013
Date Made Active in Reports: 08/27/2013
Number of Days to Update: 19

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/25/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 01/29/2013
Date Data Arrived at EDR: 02/14/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 13

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 09/24/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/15/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 10/18/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: N/A

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 07/03/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 72

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 10/04/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Quarterly

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Quarterly

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)
The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/30/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/30/2013
Date Made Active in Reports: 05/10/2013
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-5962
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Annually

EPA WATCH LIST: EPA WATCH LIST
EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 31

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/15/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Proprietary Historic Dry Cleaners - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Auto Stat: EDR Proprietary Historic Gas Stations - Cole

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: N/A
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 07/25/2013
Date Data Arrived at EDR: 07/26/2013
Date Made Active in Reports: 08/09/2013
Number of Days to Update: 14

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 07/25/2013
Date Data Arrived at EDR: 07/26/2013
Date Made Active in Reports: 08/20/2013
Number of Days to Update: 25

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 06/20/2013
Date Data Arrived at EDR: 06/21/2013
Date Made Active in Reports: 08/21/2013
Number of Days to Update: 61

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 20

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 10/09/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 07/24/2013
Date Made Active in Reports: 08/09/2013
Number of Days to Update: 16

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/20/2013
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 08/09/2013
Number of Days to Update: 39

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 11/15/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 08/20/2013
Date Data Arrived at EDR: 08/23/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 46

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 01/09/2013
Date Data Arrived at EDR: 01/10/2013
Date Made Active in Reports: 02/25/2013
Number of Days to Update: 46

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 08/20/2013
Date Data Arrived at EDR: 08/23/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 46

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List

Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 06/30/2013
Date Data Arrived at EDR: 07/16/2013
Date Made Active in Reports: 07/24/2013
Number of Days to Update: 8

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 10/09/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 08/09/2013
Date Data Arrived at EDR: 08/09/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 13

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 08/09/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 07/26/2013
Date Data Arrived at EDR: 08/09/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 13

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing

Kern County Sites and Tanks Listing.

Date of Government Version: 08/31/2010
Date Data Arrived at EDR: 09/01/2010
Date Made Active in Reports: 09/30/2010
Number of Days to Update: 29

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List

A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 08/22/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 42

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/23/2013
Date Data Arrived at EDR: 01/25/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 33

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 10/21/2013
Next Scheduled EDR Contact: 02/03/2014
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern

San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: No Update Planned

HMS: Street Number List

Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 03/28/2013
Date Data Arrived at EDR: 06/17/2013
Date Made Active in Reports: 08/21/2013
Number of Days to Update: 65

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 10/09/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities

Solid Waste Facilities in Los Angeles County.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 07/22/2013
Date Made Active in Reports: 08/26/2013
Number of Days to Update: 35

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/22/2013
Next Scheduled EDR Contact: 02/03/2014
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/17/2013
Next Scheduled EDR Contact: 11/04/2013
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/30/2013
Date Data Arrived at EDR: 02/21/2013
Date Made Active in Reports: 03/25/2013
Number of Days to Update: 32
Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 10/21/2013
Next Scheduled EDR Contact: 02/03/2014
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 07/31/2013
Date Data Arrived at EDR: 08/01/2013
Date Made Active in Reports: 08/27/2013
Number of Days to Update: 26
Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 10/21/2013
Next Scheduled EDR Contact: 02/03/2014
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank
Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 03/28/2003
Date Data Arrived at EDR: 10/23/2003
Date Made Active in Reports: 11/26/2003
Number of Days to Update: 34
Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Annually

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 07/15/2013
Date Data Arrived at EDR: 07/18/2013
Date Made Active in Reports: 08/20/2013
Number of Days to Update: 33
Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 10/09/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 09/20/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/18/2013
Number of Days to Update: 24
Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 11/26/2012
Date Data Arrived at EDR: 11/28/2012
Date Made Active in Reports: 01/21/2013
Number of Days to Update: 54
Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 10/07/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 08/23/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 42

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 09/04/2013
Date Data Arrived at EDR: 09/05/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 39

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 09/03/2013
Next Scheduled EDR Contact: 12/16/2013
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 09/11/2013
Date Data Arrived at EDR: 09/12/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 32

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 09/03/2013
Next Scheduled EDR Contact: 12/16/2013
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 09/03/2013
Next Scheduled EDR Contact: 12/16/2013
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 05/29/2013
Date Data Arrived at EDR: 05/30/2013
Date Made Active in Reports: 07/15/2013
Number of Days to Update: 46

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 56

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 56

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/13/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 56

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 08/22/2013
Date Data Arrived at EDR: 08/22/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 49

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 08/20/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/18/2013
Date Data Arrived at EDR: 07/18/2013
Date Made Active in Reports: 07/24/2013
Number of Days to Update: 6

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 07/18/2013
Date Data Arrived at EDR: 07/18/2013
Date Made Active in Reports: 08/20/2013
Number of Days to Update: 33

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 05/03/2013
Date Data Arrived at EDR: 07/08/2013
Date Made Active in Reports: 07/24/2013
Number of Days to Update: 16

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/07/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/03/2013
Date Data Arrived at EDR: 07/08/2013
Date Made Active in Reports: 08/23/2013
Number of Days to Update: 46

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 10/07/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 09/03/2013
Date Data Arrived at EDR: 09/03/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 37

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database
The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 23

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Quarterly

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2012
Date Data Arrived at EDR: 11/06/2012
Date Made Active in Reports: 11/30/2012
Number of Days to Update: 24
Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

Environmental Case Listing
The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24
Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities
A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10
Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5
Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 09/25/2013
Date Data Arrived at EDR: 09/27/2013
Date Made Active in Reports: 10/18/2013
Number of Days to Update: 21
Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 08/26/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 44
Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 07/02/2013
Date Data Arrived at EDR: 07/05/2013
Date Made Active in Reports: 08/23/2013
Number of Days to Update: 49
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/13/2013
Next Scheduled EDR Contact: 09/30/2013
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 09/16/2013
Date Data Arrived at EDR: 09/17/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 29
Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 09/16/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28
Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 09/03/2013
Date Data Arrived at EDR: 09/04/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 36
Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 09/03/2013
Next Scheduled EDR Contact: 12/16/2013
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report
A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22
Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing
A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 09/03/2013
Date Data Arrived at EDR: 09/06/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 38
Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 09/03/2013
Next Scheduled EDR Contact: 12/16/2013
Data Release Frequency: Annually

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 08/14/2013
Date Data Arrived at EDR: 08/16/2013
Date Made Active in Reports: 10/08/2013
Number of Days to Update: 53

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 11/08/2013
Next Scheduled EDR Contact: 02/24/2014
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 08/22/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 44

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 09/09/2013
Date Data Arrived at EDR: 09/10/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 34

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 08/22/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks
A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 09/18/2013
Date Data Arrived at EDR: 09/20/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 27

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 09/16/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/18/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/18/2013
Number of Days to Update: 24

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 09/16/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

Date of Government Version: 07/05/2013
Date Data Arrived at EDR: 07/05/2013
Date Made Active in Reports: 08/21/2013
Number of Days to Update: 47

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/02/2013
Date Data Arrived at EDR: 07/05/2013
Date Made Active in Reports: 08/12/2013
Number of Days to Update: 38

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 09/30/2013
Next Scheduled EDR Contact: 01/13/2014
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 09/10/2013
Next Scheduled EDR Contact: 12/23/2013
Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 01/14/2013
Date Data Arrived at EDR: 01/16/2013
Date Made Active in Reports: 02/27/2013
Number of Days to Update: 42

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 08/19/2013
Date Data Arrived at EDR: 08/27/2013
Date Made Active in Reports: 10/10/2013
Number of Days to Update: 44

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 08/19/2013
Next Scheduled EDR Contact: 12/02/2013
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/07/2013
Next Scheduled EDR Contact: 01/20/2014
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites
Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 08/19/2013
Next Scheduled EDR Contact: 12/02/2013
Data Release Frequency: Quarterly

Medical Waste Program List
To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 05/28/2013
Date Data Arrived at EDR: 06/24/2013
Date Made Active in Reports: 08/12/2013
Number of Days to Update: 49
Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/28/2013
Next Scheduled EDR Contact: 02/11/2014
Data Release Frequency: Quarterly

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/29/2013
Date Data Arrived at EDR: 09/18/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 28
Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 09/16/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 06/24/2013
Date Data Arrived at EDR: 06/26/2013
Date Made Active in Reports: 08/20/2013
Number of Days to Update: 55
Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 09/23/2013
Next Scheduled EDR Contact: 01/08/2014
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/05/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 17
Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 11/04/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 08/19/2013
Next Scheduled EDR Contact: 12/02/2013
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 10/18/2013
Next Scheduled EDR Contact: 01/27/2014
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 11/01/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 11/18/2013
Number of Days to Update: 11

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/07/2013
Next Scheduled EDR Contact: 02/17/2014
Data Release Frequency: Annually

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 07/24/2013
Date Made Active in Reports: 08/19/2013
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/21/2013
Next Scheduled EDR Contact: 02/03/2014
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 06/21/2013
Date Made Active in Reports: 08/05/2013
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 08/23/2013
Next Scheduled EDR Contact: 12/09/2013
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 08/09/2013
Date Made Active in Reports: 09/27/2013
Number of Days to Update: 49

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 09/16/2013
Next Scheduled EDR Contact: 12/30/2013
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data

Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

HARBOR BOULEVARD
HARBOR BOULEVARD
OXNARD, CA 93035

TARGET PROPERTY COORDINATES

Latitude (North):	34.1935 - 34° 11' 36.60''
Longitude (West):	119.2363 - 119° 14' 10.68''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	293927.9
UTM Y (Meters):	3785677.0
Elevation:	37 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	34119-B2 OXNARD, CA
Most Recent Revision:	1967
West Map:	34119-B3 OXNARD OE W, CA
Most Recent Revision:	0

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

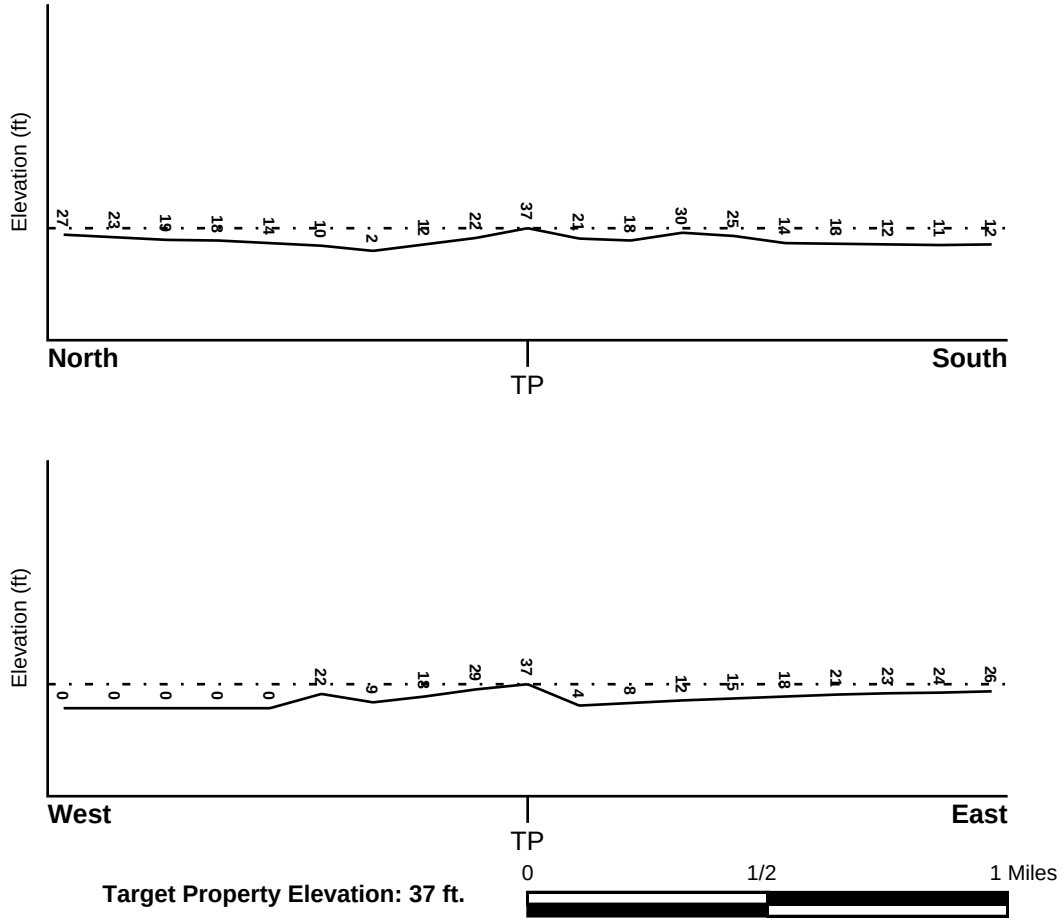
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General ENE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
VENTURA, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 06111C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
OXNARD	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius:	1.25 miles
Location Relative to TP:	1/4 - 1/2 Mile NW
Site Name:	J N J Sales & Serv
Site EPA ID Number:	CAD980636773
Groundwater Flow Direction:	SW, BUT VARIABLE IN THE SEMI-PERCHED AQUIFER BECAUSE OF TIDAL INFLUENCES, CANAL DRAINAGE, AND AGRICULTURAL WATER RETURN.
Inferred Depth to Water:	less than 75 feet in the semi-perched aquifer.
Hydraulic Connection:	A clay cap aquitard under the semi-perched aquifer allows vertical migration of ground water.
Sole Source Aquifer:	No information about a sole source aquifer is available
Data Quality:	Information is inferred in the CERCLIS investigation report(s)

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

* ©1996 Site--specific hydrogeological data gathered by CERCLIS Alerts, Inc., Bainbridge Island, WA. All rights reserved. All of the information and opinions presented are those of the cited EPA report(s), which were completed under a Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) investigation.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

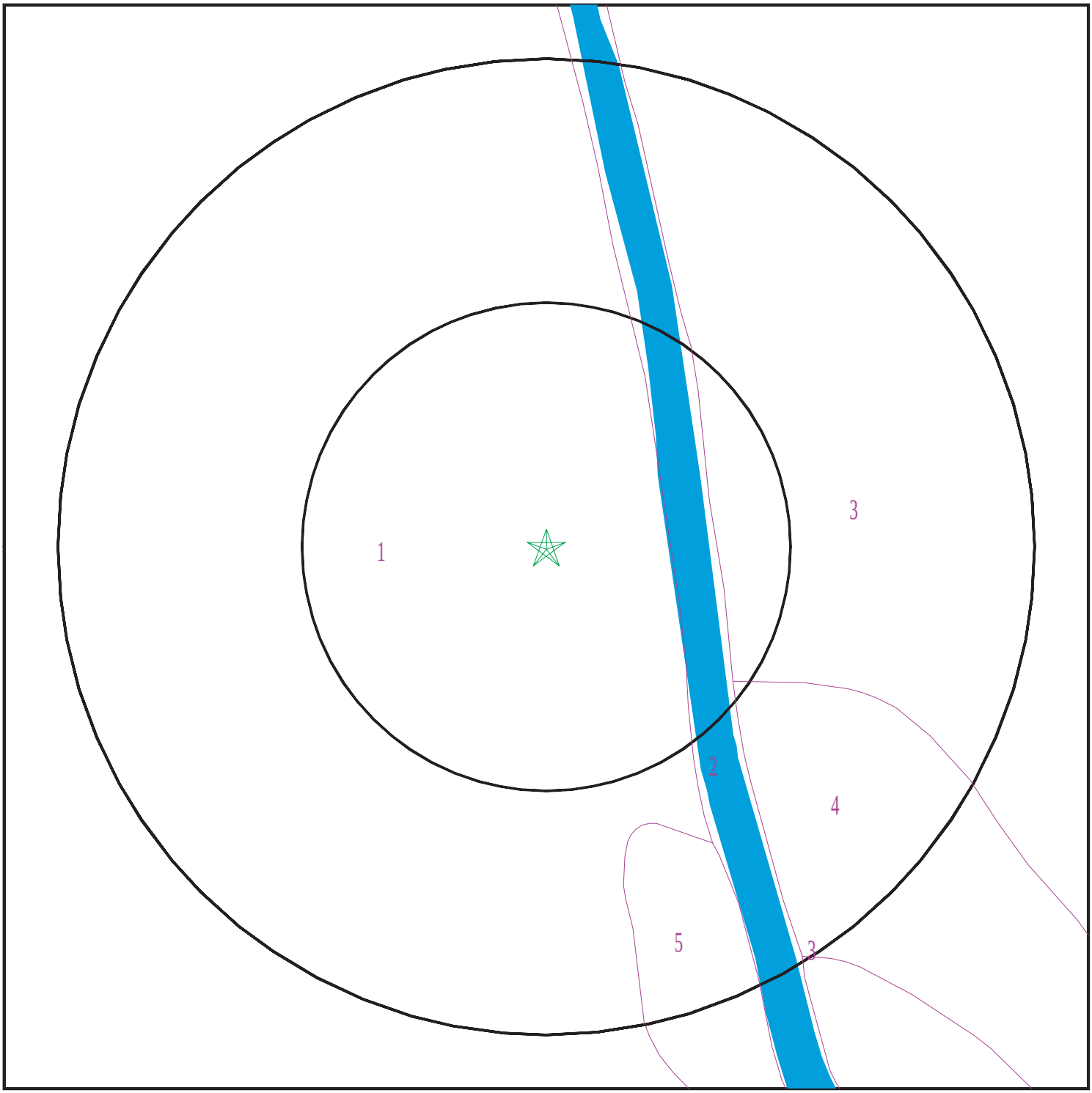
Era:	Cenozoic
System:	Quaternary
Series:	Quaternary
Code:	Q *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Stratifed Sequence

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 3787629.2s



Target Property
SSURGO Soil
Water

SITE NAME:	Harbor Boulevard	CLIENT:	Converse Consultants
ADDRESS:	Harbor Boulevard Oxnard CA 93035	CONTACT:	Denise Gutierrez
		INQUIRY #:	3787629.2s
LAT/LONG:	34.1935 / 119.2363	DATE:	November 18, 2013 10:00 am

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: COASTAL BEACHES

Soil Surface Texture: fine sand

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class: Poorly drained

Hydric Status: All hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 92 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	fine sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.1
2	5 inches	59 inches	coarse sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Clean Sands, Poorly graded sand.	Max: 141 Min: 42	Max: 7.8 Min: 5.1

Soil Map ID: 2

Soil Component Name: Water

Soil Surface Texture: fine sand

Hydrologic Group: Class D - Very slow infiltration rates. Soils are clayey, have a high water table, or are shallow to an impervious layer.

Soil Drainage Class:
Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

Soil Map ID: 3

Soil Component Name: CAMARILLO

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 107 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	24 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay. FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 8.4 Min: 7.9

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	24 inches	50 inches	stratified sandy loam to sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 14 Min: 4	Max: 8.4 Min: 7.9
3	50 inches	79 inches	fine sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 7.9

Soil Map ID: 4

Soil Component Name: HUENEME

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 107 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	16 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 7.4

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	16 inches	64 inches	stratified sand to silt loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 7.4

Soil Map ID: 5

Soil Component Name: HUENEME

Soil Surface Texture: loamy sand

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 107 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	16 inches	loamy sand	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 7.4
2	16 inches	59 inches	stratified sandy loam to silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 42 Min: 14	Max: 8.4 Min: 7.4

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
2	USGS40000142486	1/2 - 1 Mile NE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	CADW50000005020	1/4 - 1/2 Mile NNW
3	CADW50000004952	1/2 - 1 Mile South
4	CADW50000005014	1/2 - 1 Mile ENE

OTHER STATE DATABASE INFORMATION

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	CAOG9A000034080	1/8 - 1/4 Mile NNE
2	CAOG9A000034092	1/8 - 1/4 Mile North
3	CAOG9A000033959	1/4 - 1/2 Mile South
4	CAOG9A000033986	1/4 - 1/2 Mile WSW
5	CAOG9A000034246	1/2 - 1 Mile North
6	CAOG9A000034150	1/2 - 1 Mile NW
7	CAOG9A000033920	1/2 - 1 Mile SSE
8	CAOG9A000034335	1/2 - 1 Mile NNW
A9	CAOG9A000034392	1/2 - 1 Mile NNW
A10	CAOG9A000034404	1/2 - 1 Mile NNW
11	CAOG9A000034411	1/2 - 1 Mile North
B12	CAOG9A000034421	1/2 - 1 Mile North

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

STATE OIL/GAS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
13	CAOG9A000034262	1/2 - 1 Mile NW
C15	CAOG9A000034419	1/2 - 1 Mile NNW
C14	CAOG9A000034418	1/2 - 1 Mile NNW
D16	CAOG9A000034410	1/2 - 1 Mile NNW
C17	CAOG9A000034417	1/2 - 1 Mile NNW
D18	CAOG9A000034413	1/2 - 1 Mile NNW
B19	CAOG9A000034467	1/2 - 1 Mile North
20	CAOG9A000034468	1/2 - 1 Mile North
21	CAOG9A000034361	1/2 - 1 Mile NW
22	CAOG9A000033994	1/2 - 1 Mile East
D23	CAOG9A000034427	1/2 - 1 Mile NNW
D24	CAOG9A000034446	1/2 - 1 Mile NNW
D25	CAOG9A000034448	1/2 - 1 Mile NNW
26	CAOG9A000034490	1/2 - 1 Mile NNE
E27	CAOG9A000034477	1/2 - 1 Mile NNW
E28	CAOG9A000034471	1/2 - 1 Mile NNW

PHYSICAL SETTING SOURCE MAP - 3787629.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake Fault Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- HD Closest Hydrogeological Data
- Oil, gas or related wells

SITE NAME:	Harbor Boulevard	CLIENT:	Converse Consultants
ADDRESS:	Harbor Boulevard Oxnard CA 93035	CONTACT:	Denise Gutierrez
		INQUIRY #:	3787629.2s
LAT/LONG:	34.1935 / 119.2363	DATE:	November 18, 2013 10:00 am

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
NNW
1/4 - 1/2 Mile
Lower

CA WELLS **CADW50000005020**

Latitude :	34.1986		
Longitude :	119.2387		
Site code:	341986N1192387W001	Casgem sta:	01N23W01H001S
Local well:	Not Reported	Casgem s 1:	Unknown
County id:	56		
Basin cd:	4-4.02	Basin desc:	Oxnard
Org unit n:	Southern Region Office	Site id:	CADW50000005020

2
NE
1/2 - 1 Mile
Lower

FED USGS **USGS40000142486**

Org. Identifier:	USGS-CA		
Formal name:	USGS California Water Science Center		
Monloc Identifier:	USGS-341209119132801		
Monloc name:	001N022W06B001S		
Monloc type:	Well		
Monloc desc:	Not Reported		
Huc code:	18070103	Drainagearea value:	Not Reported
Drainagearea Units:	Not Reported	Contrib drainagearea:	Not Reported
Contrib drainagearea units:	Not Reported	Latitude:	34.2025046
Longitude:	-119.2253867	Sourcemap scale:	24000
Horiz Acc measure:	5	Horiz Acc measure units:	seconds
Horiz Collection method:	Interpolated from map		
Horiz coord refsys:	NAD83	Vert measure val:	23
Vert measure units:	feet	Vertacc measure val:	5
Vert accmeasure units:	feet		
Vertcollection method:	Interpolated from topographic map		
Vert coord refsys:	NGVD29	Countrycode:	US
Aquifername:	California Coastal Basin aquifers		
Formation type:	Not Reported		
Aquifer type:	Not Reported		
Construction date:	19860601	Welldepth:	230
Welldepth units:	ft	Wellholedepth:	230
Wellholedepth units:	ft		

Ground-water levels, Number of Measurements: 0

3
South
1/2 - 1 Mile
Lower

CA WELLS **CADW50000004952**

Latitude :	34.1806		
Longitude :	119.2337		
Site code:	341806N1192337W001	Casgem sta:	01N22W07M001S
Local well:	Not Reported	Casgem s 1:	Unknown
County id:	56		
Basin cd:	4-4.02	Basin desc:	Oxnard
Org unit n:	Southern Region Office	Site id:	CADW50000004952

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation

	Database	EDR ID Number
4 **ENE** **1/2 - 1 Mile** **Lower**	**CA WELLS**	**CADW50000005014**

Latitude :	34.1972		
Longitude :	119.2209		
Site code:	341972N1192209W001	Casgem sta:	01N22W06J001S
Local well:	Not Reported	Casgem s 1:	Unknown
County id:	56		
Basin cd:	4-4.02	Basin desc:	Oxnard
Org unit n:	Southern Region Office	Site id:	CADW50000005014

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance

Database EDR ID Number

1
NNE **OIL_GAS** **CAOG9A000034080**
1/8 - 1/4 Mile

Districtnu:	2	Apinumber:	11120220
Blmwell:	N	Redrillcan:	No
Dryhole:	Y	Wellstatus:	P
Operatorna:	Prudential Minerals Exploration Corp.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	6		
Township:	01N	Range:	22W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.196546		
Glong:	-119.234475		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Alpine-McGrath Estate	Wellnumber:	7-1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034080

2
North **OIL_GAS** **CAOG9A000034092**
1/8 - 1/4 Mile

Districtnu:	2	Apinumber:	11100829
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.19703		
Glong:	-119.237121		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 2	Wellnumber:	921
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034092

3
South **OIL_GAS** **CAOG9A000033959**
1/4 - 1/2 Mile

Districtnu:	2	Apinumber:	11100830
Blmwell:	N	Redrillcan:	No
Dryhole:	Y	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.188671		
Glong:	-119.236404		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 2	Wellnumber:	1024
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000033959

4
WSW **OIL_GAS** **CAOG9A000033986**
1/4 - 1/2 Mile

Districtnu:	2	Apinumber:	11100261
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.191355		
Glong:	-119.243895		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 2	Wellnumber:	1222
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000033986

5
North **OIL_GAS** **CAOG9A000034246**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	11100821
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.201656		
Glong:	-119.237671		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	919
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	07/28/1957
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034246

6
NW **OIL_GAS** **CAOG9A000034150**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	11100828
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.199384		
Glong:	-119.244125		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	1119 A
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034150

7
SSE **OIL_GAS** **CAOG9A000033920**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	11100831
Blmwell:	N	Redrillcan:	No
Dryhole:	Y	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	7		
Township:	01N	Range:	22W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.183907		
Glong:	-119.232565		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 2	Wellnumber:	1028
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000033920

8
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034335**

Districtnu:	2	Apinumber:	11100824
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.203317		
Glong:	-119.242386		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	1018
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	01/19/1957
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034335

A9
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034392**

Districtnu:	2	Apinumber:	11120797
Blmwell:	N	Redrillcan:	No
Dryhole:	Y	Wellstatus:	P
Operatorna:	Hilliard Oil & Gas, Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.204548		
Glong:	-119.240015		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Chevron P.R. 1	Wellnumber:	920
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034392

A10
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034404**

Districtnu:	2	Apinumber:	11100825
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.204839		
Glong:	-119.239892		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	1019
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034404

11
North
1/2 - 1 Mile

OIL_GAS **CAOG9A000034411**

Districtnu:	2	Apinumber:	11105501
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	6		
Township:	01N	Range:	22W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.205666		
Glong:	-119.235316		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	717A
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034411

B12
North
1/2 - 1 Mile

OIL_GAS **CAOG9A000034421**

Districtnu:	2	Apinumber:	11100820
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.206127		
Glong:	-119.237023		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	918
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	04/04/1960
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034421

13
NW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034262**

Districtnu:	2	Apinumber:	11100792
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	A
Operatorna:	Venoco, Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.202054		
Glong:	-119.248038		
Gissourcec:	gps		
Comments:	Not Reported		
Leasename:	McGrath 4	Wellnumber:	1218
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034262

C15
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034419**

Districtnu:	2	Apinumber:	11100813
Blmwell:	N	Redrillcan:	01
Dryhole:	N	Wellstatus:	I
Operatorna:	Venoco, Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.206009		
Glong:	-119.240543		
Gissourcec:	gps		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	917
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	09/03/1958
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	12/31/09
Gissymbol:	Not Reported	Site id:	CAOG9A000034419

C14
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034418**

Districtnu:	2	Apinumber:	11100813
Blmwell:	N	Redrillcan:	01
Dryhole:	N	Wellstatus:	I
Operatorna:	Venoco, Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.206009		
Glong:	-119.240543		
Gissourcec:	gps		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	917
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	09/03/1958
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034418

D16
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034410**

Districtnu:	2	Apinumber:	11100826
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.205534		
Glong:	-119.242252		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	1016
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034410

C17
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034417**

Districtnu:	2	Apinumber:	21121316
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	A
Operatorna:	Venoco, Inc.		
Countyname:	VENTURA OFFSHORE	Fieldname:	Montalvo, West
Areaname:	Offshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	FR RANCHO COR 11227S 381E		
Glat:	34.206009		
Glong:	-119.241828		
Gissourcec:	gps		
Comments:	Not Reported		
Leasename:	State PRC 3314	Wellnumber:	1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034417

D18
NNW **OIL_GAS** **CAOG9A000034413**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	21122186
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	N
Operatorna:	Venoco, Inc.		
Countyname:	VENTURA OFFSHORE	Fieldname:	Montalvo, West
Areaname:	Offshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	57KB
Locationde:	Not Reported		
Glat:	34.205933		
Glong:	-119.242301		
Gissourcec:	noi		
Comments:	Not Reported		
Leasename:	State PRC 3314	Wellnumber:	7
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034413

B19
North **OIL_GAS** **CAOG9A000034467**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	11100814
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	I
Operatorna:	Venoco, Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.20697		
Glong:	-119.23733		
Gissourcec:	gps		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	918A
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034467

20
North
1/2 - 1 Mile

OIL_GAS **CAOG9A000034468**

Districtnu:	2	Apinumber:	11100750
Blmwell:	N	Redrillcan:	No
Dryhole:	Y	Wellstatus:	P
Operatorna:	Shell Oil Company		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	31		
Township:	02N	Range:	22W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.206986		
Glong:	-119.2346		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	McGrath	Wellnumber:	4-1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034468

21
NW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034361**

Districtnu:	2	Apinumber:	11100827
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	I
Operatorna:	Venoco, Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	1		
Township:	01N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.20383		
Glong:	-119.24699		
Gissourcec:	gps		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	1118
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034361

22
East
1/2 - 1 Mile

OIL_GAS **CAOG9A000033994**

Districtnu:	2	Apinumber:	11105611
Blmwell:	N	Redrillcan:	No
Dryhole:	Y	Wellstatus:	P
Operatorna:	Shell Western Exploration & Production Inc.		
Countyname:	Ventura	Fieldname:	Any Field
Areaname:	Any Area		
Section:	6		
Township:	01N	Range:	22W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.192236		
Glong:	-119.219909		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Terry	Wellnumber:	1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000033994

D23
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034427**

Districtnu:	2	Apinumber:	21122185
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	N
Operatorna:	Venoco, Inc.		
Countyname:	VENTURA OFFSHORE	Fieldname:	Montalvo, West
Areaname:	Offshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	57KB
Locationde:	Not Reported		
Glat:	34.206234		
Glong:	-119.242429		
Gissourcec:	noi		
Comments:	Not Reported		
Leasename:	State PRC 3314	Wellnumber:	6
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034427

D24
NNW **OIL_GAS** **CAOG9A000034446**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	11100822
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	A
Operatorna:	Venoco, Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.20663		
Glong:	-119.242385		
Gissourcec:	gps		
Comments:	Not Reported		
Leasename:	State PRC 3314	Wellnumber:	2
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	09/20/1962
Welldeptha:	14065	Redrillfoo:	10032
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034446

D25
NNW **OIL_GAS** **CAOG9A000034448**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	11101235
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	P
Operatorna:	Holly Development Company		
Countyname:	Ventura	Fieldname:	Ojai
Areaname:	Oakview (ABD)		
Section:	27		
Township:	04N	Range:	23W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.20664		
Glong:	-119.242371		
Gissourcec:	gps		
Comments:	Not Reported		
Leasename:	Macrate	Wellnumber:	1
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	06/19/1938
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034448

26
NNE **OIL_GAS** **CAOG9A000034490**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	11100819
Blmwell:	N	Redrillcan:	No
Dryhole:	Y	Wellstatus:	P
Operatorna:	Chevron U.S.A. Inc.		
Countyname:	Ventura	Fieldname:	Montalvo, West
Areaname:	Onshore		
Section:	31		
Township:	02N	Range:	22W
Basemeridi:	SB	Elevation:	Not Reported
Locationde:	Not Reported		
Glat:	34.207396		
Glong:	-119.231828		
Gissourcec:	hud		
Comments:	Not Reported		
Leasename:	Patterson Ranch 1	Wellnumber:	618
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	03/24/1963
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034490

E27
NNW **OIL_GAS** **CAOG9A000034477**
1/2 - 1 Mile

Districtnu:	2	Apinumber:	21122184
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	N
Operatorna:	Venoco, Inc.		
Countyname:	VENTURA OFFSHORE	Fieldname:	Montalvo, West
Areaname:	Offshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	57KB
Locationde:	Not Reported		
Glat:	34.207114		
Glong:	-119.241975		
Gissourcec:	noi		
Comments:	Not Reported		
Leasename:	State PRC 3314	Wellnumber:	5
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034477

E28
NNW
1/2 - 1 Mile

OIL_GAS **CAOG9A000034471**

Districtnu:	2	Apinumber:	21122183
Blmwell:	N	Redrillcan:	No
Dryhole:	N	Wellstatus:	N
Operatorna:	Venoco, Inc.		
Countyname:	VENTURA OFFSHORE	Fieldname:	Montalvo, West
Areaname:	Offshore		
Section:	36		
Township:	02N	Range:	23W
Basemeridi:	SB	Elevation:	57KB
Locationde:	Not Reported		
Glat:	34.207045		
Glong:	-119.242333		
Gissourcec:	noi		
Comments:	Not Reported		
Leasename:	State PRC 3314	Wellnumber:	4
Epawell:	N	Hydraulica:	N
Confidenti:	N	Spuddate:	12/30/1899
Welldeptha:	Not Reported	Redrillfoo:	Not Reported
Abandonedd:	/ /	Completion:	/ /
Gissymbol:	Not Reported	Site id:	CAOG9A000034471

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
93035	22	0

Federal EPA Radon Zone for VENTURA County: 1

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 93035

Number of sites tested: 3

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	1.000 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Health Services
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

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Appendix G

Preliminary Hydrology & Hydraulic Report

PRELIMINARY HYDROLOGY & HYDRAULIC REPORT

Oxnard Shores North

Tentative Tract No. 5888
North of Wooley Road and East of Harbor Boulevard
Oxnard, CA

Prepared by:

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Frederick T. Giroux, P.E.
License No. C057289 Exp. 12/31/2013

September 12, 2013
Revised February 26, 2016

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INTRODUCTION

Tentative Tract 5888, also known as Oxnard Shores North, (herein referred to as TT5888), is located North of Wooley Road and East of Harbor Boulevard, in the City of Oxnard (Location Map – Appendix A). The proposed development of this site consists of construction of single family homes and the extension of Canal Street. The proposed development will disturb approximately 8.5 acres of currently undeveloped land.

This preliminary drainage study has been prepared to identify the storm drain runoff impacts from the development of the vacant site. The City of Oxnard deemed the application for this project complete on October 6, 2011, therefore the methods for treating runoff will follow the requirements outlined in the 2002 Technical Guidance Manual. Mitigation requirements due to the increase in runoff are also identified in this report. Runoff calculations were performed using the City of Oxnard's Cooks Method to determine peak runoff rates, and the Ventura County Watershed Protection District's (VCWPD) VCRat program for hydrograph generation.

EXISTING CONDITIONS

TT5888 is located within a larger watershed comprising approximately 30 acres. Runoff from all drainage areas within this watershed are directed towards three existing catch basins, two located along Dunes Street and one along Canal Street. Runoff entering these catch basins is routed to a system of storm drain lines that ultimately discharge to the Southern California Edison (SCE) Canal, just east of the site. Refer to Figure 1 of Appendix B for existing drainage areas and inlet/outlet structure locations.

Drainage Area A is an existing residential development. Runoff from this area is primarily street surface flow from northwest to southeast along Dunes Street, towards an existing catch basin (CB2 – Figure 1). Runoff entering this structure is routed to an existing 27" RCP line prior to entering two existing 42" RCP lines that discharge directly into the SCE Canal.

Drainage Areas B through D and I also represent an existing residential development. Runoff from these drainage areas surface flows along Dunes Street towards an existing catch basin (CB1 – Figure 1). Runoff from Drainage area G (which is currently undeveloped) sheet flows from North to South towards Canal Street and eventually enters CB1. Runoff entering this structure is directed towards an existing 36" RCP line prior to entering the two existing 42" RCP lines.

Drainage Area E directs its runoff via street surface flow towards an existing catch basin (CB3 – Figure 1). Runoff entering this catch basin is directed to the two existing 42" RCP lines that discharge into SCE Canal.

Runoff from drainage areas F and H (as shown in Figure 1 of Appendix B) do not contribute to the above described watershed. These areas were considered in the existing condition analysis because they will be disturbed during development of the site. Runoff from some of these areas will be routed through the watershed described above.

Drainage Area F is currently undeveloped. Runoff from this area is primarily sheet flow towards several existing natural channels. These channels direct their runoff directly into the SCE Canal. Drainage Area H is an existing residential development. Runoff from this area street surface flows towards Harbor Boulevard. Runoff entering Harbor Boulevard street surface flows towards the South, where it enters an existing inlet structure (CB4 – Figure 1). This structure is

connected to an existing storm drain line located in Wooley Road, which ultimately discharges directly into the SCE Canal.

Existing peak runoff calculations for the 10, 50 and 100 year storm events were calculated by using the City of Oxnard Cook's Method. Table 1 summarizes the peak runoff for each drainage area described above; (refer to Appendix B for more detailed calculations.)

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)
A	6.35	7.42	12.61	14.84
B	3.68	4.30	7.31	8.60
C	3.73	4.59	7.80	9.18
D	4.01	4.92	8.36	9.84
E	0.88	1.24	2.11	2.48
F*	6.31	5.07	8.62	10.14
G*	2.20	1.65	2.81	3.30
H	0.66	0.81	1.38	1.62
I	2.54	4.17	7.09	8.34
Total	30.36	34.17	58.09	68.34

* Areas to be disturbed

Table 1 – Existing Peak Runoff Summary

In their existing condition the storm drain lines receiving runoff from CB1 through CB3 are adequately sized to handle the 10 year storm event. Existing pipe capacity calculations were performed to check the hgl for these pipes. Per available historical data from the City of Oxnard (Drawing 64-43A) and County of Ventura Watershed Protection District (Drawing Y-2-111), a starting water surface elevation of 5.81 within Edison Canal was used to model the existing system. Refer to Appendix C for a preliminary analysis of the existing capacity of these storm drain line.

DEVELOPED CONDITIONS

Development of TT5888 will disturb approximately 8.5 acres. Development will consist of construction of several residential structures and the extension of Canal Street. The proposed development will take place within drainage areas F and G as shown in Figure 1 of Appendix B, which correspond to Areas F1, F2, G1 and G2 of Figure 3 of Appendix D.

Runoff from the existing residential development (Areas A-E, I and H) will remain unchanged from those of the pre-developed conditions. Runoff from the proposed development (area F and G) will street surface flow along the newly extended Canal Street towards proposed catch basins. For a detailed view on location of runoff areas and proposed catch basins see Figure 2 – Appendix D.

Catch basin CB-5 and CB-6, as shown in Figure 2 of Appendix D, will collect runoff from areas F1 and F2 respectively. Runoff entering CB-5 and CB-6 will be directed to proposed 18" storm drain lines that converge at a manhole structure. Runoff from both catch basins will be directed to either the proposed underground detention basin or towards the main on site storm drain system. A more detailed description of how this flow is diverted can be found in the detention concept section of this report.

Catch basin CB-7, as shown in Figure 2 of Appendix D, will collect runoff from areas G1 and G2 respectively. Runoff entering CB-7 will be directed to a proposed bio-swale then exit onto the existing Dunes St, as shown in Figure 2 of Appendix D. A more detailed description of how this flow is diverted can be found in the stormwater treatment measures section of this report.

Catch basin CB-1 and CB-2, as shown in Figure 2 of Appendix D, will have an increase of runoff because of developed areas G1 and G2. An analysis was done to confirm that the catch basins had enough capacity to take in this increase of runoff. See existing catch basin capacity in Appendix J.

Runoff from areas F1 and F2 not being detained will be directed to a proposed 24" line along Canal Street. This line will connect directly into the existing 36" storm drain line. The total runoff entering this line will increase since some of the runoff from areas F1 and F2 previously sheet flowed directly into SCE Canal. The total runoff entering existing CB-1 will increase – from an existing 10 year peak flow of 19.6 cfs to post developed flow of 20.33 cfs. The total peak runoff being directed towards the existing 36" line will increase – from an existing 10 year peak flow of 19.6 cfs to a post developed peak flow of 24.6 cfs. The capacity of the existing 36" line was checked to ensure that it is able to handle the additional flow from areas F and G. This analysis can be found in Appendix E.

The total runoff entering the existing 36" RCP line increases due to the re-direction of flows from Areas F and G. However, the total runoff being released from the site from the two existing 42" SD lines and runoff entering Harbor Boulevard will not exceed the pre-developed runoff amounts from each storm event. Refer to the detention concept analysis of this report for a more detailed explanation.

Developed peak runoff calculations for the 10, 50 and 100 year storm events were calculated by using the City of Oxnard Cook's Method. Table 2 summarizes the peak runoff for each drainage area described above; refer to Appendix D for more detail calculations.

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)
A	6.35	7.42	12.61	14.84
B	3.68	4.30	7.31	8.60
C	3.73	4.59	7.80	9.18
D	4.01	4.92	8.36	9.84
E	0.88	1.24	2.11	2.48
F1*	2.50	2.9	5.0	5.9
F2*	3.95	4.6	7.9	9.3
G1*	0.25	0.3	0.5	0.6
G2*	1.71	2.0	3.5	4.1
H	0.66	0.8	1.4	1.6
I	2.54	4.2	7.1	8.3

*Areas to be developed

Table 2 – Developed Peak Runoff Summary

All proposed storm drain lines have been preliminarily sized for the 10 year storm event. Sizing calculations for the proposed storm drain lines can be found in Appendix E. The proposed catch basins have been sized for the 10 year storm event, sizing calculations for these catch basins can be found in Appendix J.

SECONDARY FLOW PATH/PAD PROTECTION

Post developed secondary flows for the 100 year storm event will be contained within the street right of way. An analysis was conducted assuming the proposed catch basins become plugged, to show that runoff from the 100 year storm event will be contained within the street right of ways. Refer to Appendix K for this analysis. Several cross sections were analyzed to verify that the water surface elevation within Canal Street provides enough free board to the proposed building finish floors. Refer to Figure 2 of Appendix D for section locations and to Appendix K for analysis.

An analysis was conducted on the existing Dunes Street to show how the increase of peak runoff diverted towards it would affect existing conditions. The analysis was conducted at the furthest downstream part of Dunes Street assuming both existing catch basins at the end of the street were plugged. Refer to Appendix K for this analysis and figure 2 of Appendix D for section location. The analysis shows that although there was a 0.7 cfs increase in 10-year storm runoff into the existing catch basin (see Figure 2 Appendix D for location), the 50 year storm event will be contained within the street right of way.

If the overall proposed storm drain system were to fail, overland flows would be routed towards Wooley Road as shown in Figure 2 of Appendix D.

DETENTION CONCEPT

To mitigate the increase in runoff produced by the development of TT5888, an underground detention structure will be located at the southeast end of the project (Appendix D – Figure 2). The basin was preliminarily sized as on “Offline” detention basin, where all flows less than or equal to the allowable flows (Table 3) will be allowed to pass directly to the main storm drain system. Those flows exceeding the allowable values will be routed into the detention basin.

The detention facility was sized by first calculating the allowable and developed peak flows by using the City of Oxnard Cook’s Method (Appendix B and D respectively). Times of concentration (Tc) for each drainage area as specified in Figure 2 of Appendix D were calculated by using the County of Ventura Time of Concentration Calculator. These Tc’s were used in VCRat to generate an appropriate hydrograph for each drainage area. A corresponding yield adjustment factor was applied to each storm event to ‘fatten’ the hydrograph volume. The ‘fattened’ hydrograph was then routed through the Hydraflow program to determine the size of the detention basin, outlet structure and release rates. The detention system is preliminarily sized to ensure that the total runoff leaving the site for each storm event is less than or equal to the pre-developed runoff amounts. Table 3 at the end of this section outlines the detention requirements for each storm event.

Runoff from drainage areas F1 and F2 will be directed towards two underground diversion structures in series. These structures have been preliminarily designed to direct flows in two directions. The first will be a proposed Contech CDS unit that will serve as stormwater treatment and a divergent structure (DIV-1). The amount of flow required for infiltration will discharge towards the proposed underground detention basin. The rest of the storm flows will move onto the next divergent structure (DIV-2). Storm flows that are less than the allowable flows from

areas F1 and F2 (Table 3) will be allowed to flow through the second diversion structure into the main onsite storm drain line. Storm flows greater than the allowable flows will discharge into the proposed underground detention area where they will be detained until flows in the main storm drain line have subsided. See Appendix E for developed pipe configuration and location of divergent structures.

Appendix F has a breakdown of allowable flows for all storm events. Tables outlining the total allowable flows and flows being detained can also be found within this appendix. Preliminary sizing calculations for the underground detention system can be found in Appendix F.

For preliminary design purposes, two options for underground detention systems are presented in Appendix J. Both of these options have been preliminarily sized with a total storage volume of 3,500 cf for detention purposes only.

	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)
Total Existing Runoff	34.2	58.1	68.3
Total Developed Runoff	35.7	63.5	74.7
Developed Runoff from Areas F1 & F2 (Directed towards Detention Area)	7.6	12.9	15.2
Developed Runoff not being directed towards Detention Area (A-E, G, H-I)	28.1	50.6	59.5
Max. Allowable Runoff from areas F1 & F2 (into existing SD System)	4.4	7.5	8.9
Total Runoff to be directed to Detention Area from Areas F1 & F2	3.7	6.2	7.5

Table 3 – Detention Requirements

STORMWATER TREATMENT MEASURES

All stormwater treatment requirements will be designed based on the Ventura County 2015 Technical Guidance Manual for Stormwater Quality Control Measures.

To comply with the NPDES requirements for stormwater treatment, it is proposed to treat the required Stormwater Quality Design Volume (SQDV) by using a Contech CDS unit, pervious pavement, and infiltration facilities incorporated into the detention system. A preliminary soils report prepared by SubSurface Designs, Inc, shows that the ground water depth for this area is approximately 15' deep. This value will be verified prior to final design of any treatment facility. The total SQDV was calculated by the methodology described in the Ventura County Technical Guidance Manual. The required SQDV was found to be approximately 18,600 cubic feet. (refer to Appendix G for SQDV calculations.)

Pervious pavement is proposed along the parking areas as shown in Figure 3 of Appendix H. The proposed pervious pavement will provide a total volume for treatment of approximately 11,800 cf. Preliminary sizing of this treatment option can be found in Appendix H.

A vegetated bio swale is proposed in the northwest side of the site to treat runoff from developed areas G1 and G2. Any runoff that does not infiltrate or is detained will be directed to Dunes Street.

In addition to infiltration treatment the NPDES requires the removal of trash, debris, sediment, and hydrocarbons from stormwater runoff. A Contech CDS unit is proposed to be installed prior to stormwater entering the proposed detention facility and existing into the existing 36" storm drain line. The CDS unit will be sized by Contech based on the total Q50 entering it. See Appendix N for CDS unit details.

The remaining treatment volume will be provided by a gravel bed located underneath the proposed detention facility. The detention facility options proposed will act as an infiltration trench. These options will be either chambers with open bottoms or a system of perforated pipes both sitting on top of a gravel bed. The footprint of this gravel bed has been preliminary sized to provided approximately 9,000 cubic feet of volume for treatment. Preliminary sizing and description of both of these options can be found in Appendix H.

All proposed treatment facilities are sized to ensure that there is a minimum of 5 foot vertical separation from the bottom of the facility to the groundwater table. A study confirming groundwater table and percolation rates needs to be conducted prior to final design of any treatment facility.

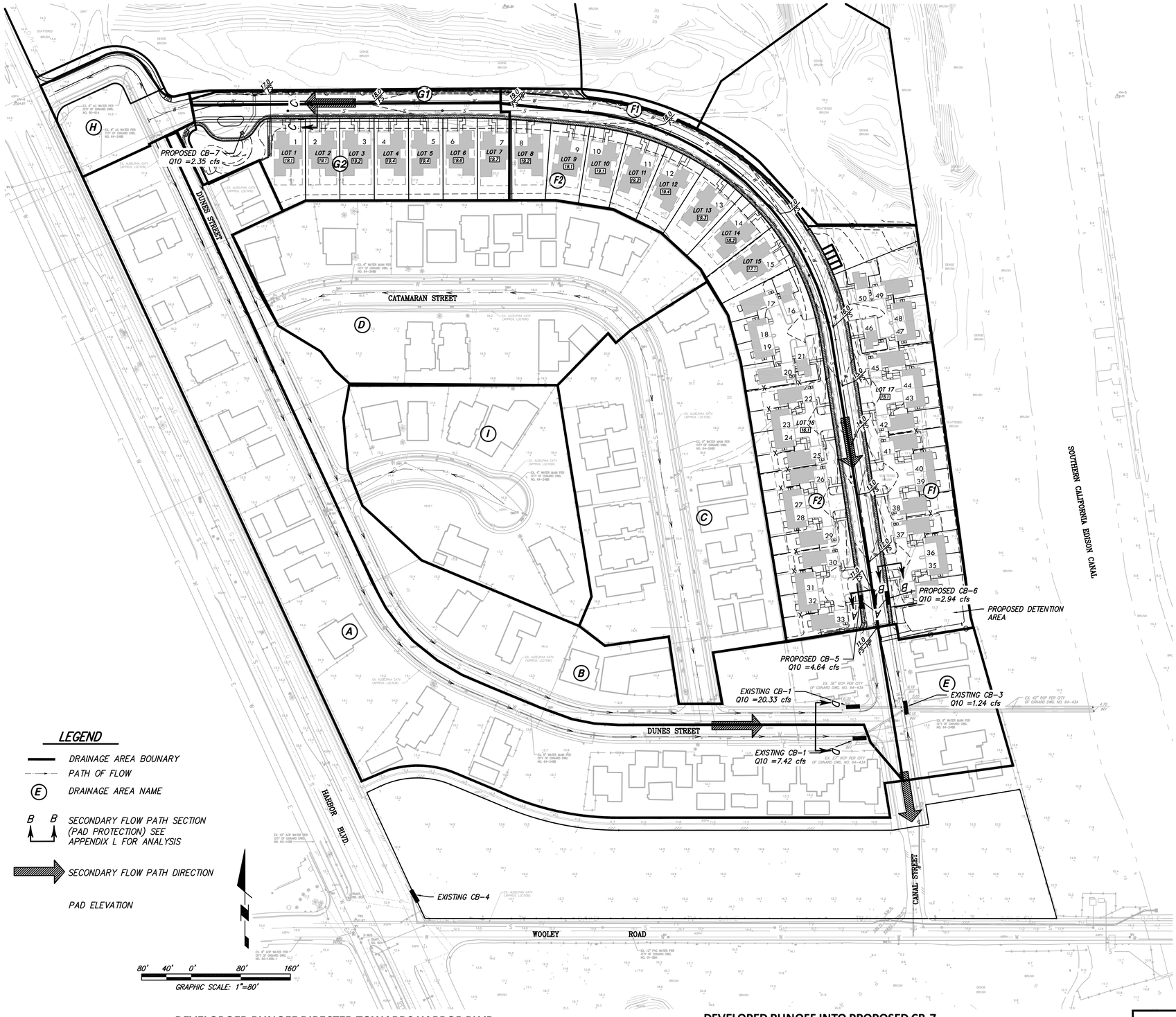
100 YEAR FLOOD PLAIN ANALYSIS

The site is located within Flood Zone X (shaded), per FIRM Panel 06111C0905E (Appendix I). Zone Flood X (shaded) is an area being protected from the 1 percent-annual chance or greater of flood hazard by a levee system that has not been provisionally accredited.

CONCLUSION

The preliminary drainage system for this project has been designed to meet the requirements of the City of Oxnard. All structures should be protected from the 100 year storm. On-site pervious pavement, CDS unit, and infiltration facilities will provide the necessary stormwater treatment.

The detention area will prevent runoff from the site from exceeding the respective undeveloped storm amounts. All storm drain systems have been sized to handle the 10 year storm event.



DEVELOPED CONDITION PEAK RUNOFF SUMMARY FROM COOK'S METHOD
(See App. D for Calculations)

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
A	6.35	7.42	12.61	14.84	1.17	2.34
B	3.68	4.30	7.31	8.60	1.17	2.34
C	3.73	4.59	7.80	9.18	1.23	2.46
D	4.01	4.92	8.36	9.84	1.23	2.45
E	0.88	1.24	2.11	2.48	1.41	2.82
F1	2.52	2.94	5.01	5.89	1.17	2.34
F2	3.98	4.64	7.89	9.28	1.17	2.33
G1	0.27	0.32	0.54	0.63	1.19	2.33
G2	1.74	2.03	3.46	4.07	1.17	2.34
H	0.66	0.81	1.38	1.62	1.23	2.45
I	2.54	4.17	7.09	8.34	1.64	3.28
TOTAL	30.36	37.38	63.56	74.77		

DEVELOPED RUNOFF INTO EXISTING CB-1

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
B	3.68	4.30	7.31	8.60	1.17	2.34
C	3.73	4.59	7.80	9.18	1.23	2.46
D	4.01	4.92	8.36	9.84	1.23	2.45
G1	0.27	0.32	0.54	0.63	1.19	2.33
G2	1.74	2.03	3.46	4.07	1.17	2.34
I	2.54	4.17	7.09	8.34	1.64	3.28
TOTAL	15.97	20.33	34.56	40.66		

DEVELOPED RUNOFF INTO EXISTING CB-2

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
A	6.35	7.42	12.61	14.84	1.17	2.34
TOTAL	6.35	7.42	12.61	14.84		

DEVELOPED RUNOFF INTO EXISTING CB-3

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
E	0.88	1.24	2.11	2.48	1.41	2.82
TOTAL	0.88	1.24	2.11	2.48		

DEVELOPED RUNOFF INTO PROPOSED CB-5

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
F2	3.98	4.64	7.89	9.28	1.17	2.33
TOTAL	3.98	4.64	7.89	9.28		

DEVELOPED RUNOFF INTO PROPOSED CB-6

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
F1	2.52	2.94	5.01	5.89	1.17	2.34
TOTAL	2.52	2.94	5.01	5.89		

DEVELOPOED RUNOFF DIRECTED TOWARDS HARBOR BLVD

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
H	0.66	0.81	1.38	1.62	1.23	2.45
TOTAL	0.66	0.81	1.38	1.62		

DEVELOPED RUNOFF INTO PROPOSED CB-7

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
G1	0.27	0.32	0.54	0.63	1.19	2.33
G2	1.74	2.03	3.46	4.07	1.17	2.34
TOTAL	2.01	2.35	4.00	4.70		

DEVELOPED CONDITION

JENSEN DESIGN & SURVEY, INC
www.jdscivil.com
1672 DONLON STREET
VENTURA, CALIF. 93003
PHONE 805/654-6977
FAX 805/654-6979

SCALE: 1"=80' | J.N.: OSC1 3650
DATE: Mar. 22, 2016 | DWG. NAME: 3650 DEV. HYDRO NORTH.dwg

HYDROLOGY EXHIBIT
FOR
OXNARD SHORES NORTH

Tentative Tract No. 5888
City of Oxnard
COUNTY OF VENTURA STATE OF CALIFORNIA

FIGURE 2 APPENDIX D

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APPENDIX A

Vicinity Map



Prepared by: Jensen Design & Survey Inc.

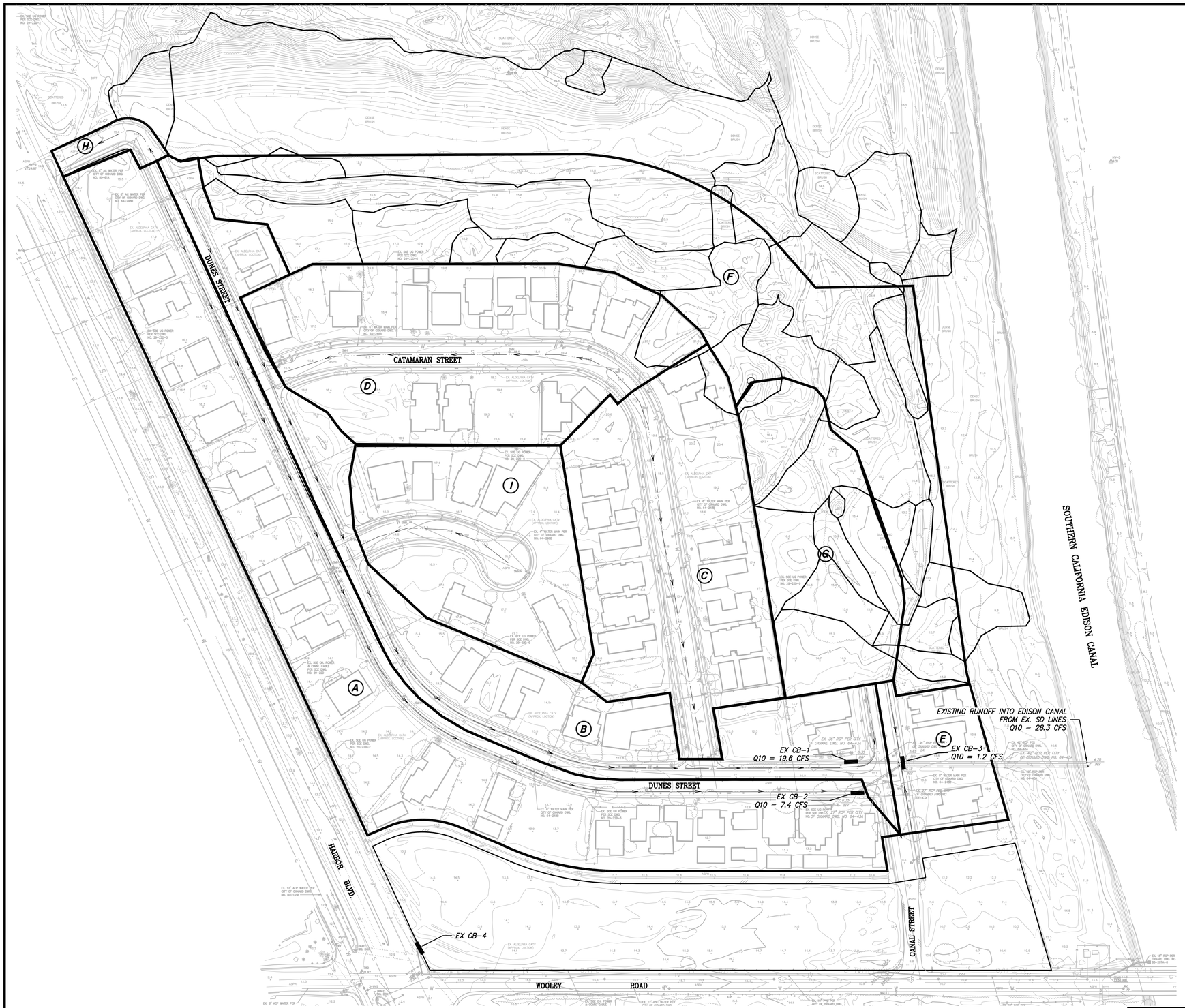
Parcel boundaries on this exhibit are a graphical representation only. They should not be used in place of record boundary information and/or field survey data and do not accurately define property boundaries.

Location Map
Oxnard Shores North TT 5888

1 inch = 300 feet

APPENDIX B

Existing Condition Calculations & Exhibit



EXISTING CONDITION PEAK RUNOFF SUMMARY

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
A	6.35	7.42	12.61	14.84	1.17	2.34
B	3.68	4.30	7.31	8.60	1.17	2.34
C	3.73	4.59	7.80	9.18	1.23	2.46
D	4.01	4.92	8.36	9.84	1.23	2.45
E	0.88	1.24	2.11	2.48	1.41	2.82
F	6.31	5.07	8.62	10.14	0.80	1.61
G	2.20	1.65	2.81	3.30	0.75	1.50
H	0.66	0.81	1.38	1.62	1.23	2.45
I	2.54	4.17	7.09	8.34	1.64	3.28
Tctal	30.36	34.17	58.09	68.34		

EXISTING RUNOFF INTO EX. CATCH BASIN 1

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
B	3.68	4.30	7.31	8.60	1.17	2.34
C	3.73	4.59	7.80	9.18	1.23	2.46
D	4.01	4.92	8.36	9.84	1.23	2.45
G	2.20	1.65	2.81	3.30	0.75	1.50
I	2.54	4.17	7.09	8.34	1.64	3.28
TOTAL	16.16	19.63	33.37	39.26		

EXISTING RUNOFF INTO EX. CATCH BASIN 2

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
A	6.35	7.42	12.61	14.84	1.17	2.34
TOTAL	6.35	7.42	12.61	14.84		

EXISTING RUNOFF INTO EX. CATCH BASIN 3

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
E	0.88	1.24	2.11	2.48	1.41	2.82
TOTAL	0.88	1.24	2.11	2.48		

EXISTING RUNOFF INTO EDISON CANAL FROM EX. SD LINES

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
A-E, G, I	23.39	28.29	48.09	56.58	8.60	17.19
TOTAL	23.39	28.29	48.09	56.58		

EXISTING RUNOFF DIRECTED TOWARDS HARBORD BLVD.

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
H	0.66	0.81	1.38	1.62	1.23	2.45
TOTAL	0.66	0.81	1.38	1.62		

EXISTING RUNOFF SHEET FLOWING DIRECLTY TOWARDS EDISON CANAL

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
F	6.31	5.07	8.62	10.14	0.80	1.61
TOTAL	6.31	5.07	8.62	10.14		

80' 40' 0' 80' 160'

GRAPHIC SCALE: 1"=80'

EXISTING CONDITION

JENSEN DESIGN & SURVEY, INC
www.jdscivil.com
1672 DONLON STREET
VENTURA, CALIF. 93003
PHONE 805/654-6977
FAX 805/654-6979

SCALE: 1"=80' | J.N.: OSC1 3650

DATE: Feb. 1, 2011 | DWG. NAME: 3650 EX.HYDRO NORTH.dwg

HYDROLOGY EXHIBIT
FOR
OXNARD SHORES NORTH

Tentative Tract No. 5888
City of Oxnard

COUNTY OF VENTURA STATE OF CALIFORNIA

FIGURE 1
APPENDIX B

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MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **A - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**6.35**	Acres			
Length	**1674.6**	Feet	Fall	**6.61**	Feet
Width	**165.18**	Feet	Slope	**0.39**	%
Length/Width	**10.14**		Shape Correction Factor	**95.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **6.35** x L/W Factor **0.95** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	4.82 cfs
10%	Q_{10}	100%	**7.42** cfs
4%	Q_{25}	135%	10.02 cfs
2%	Q_{50}	170%	12.61 cfs
1%	Q_{100}	200%	14.84 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **B - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**3.68**	Acres			
Length	**1605.9**	Feet	Fall	**6.62**	Feet
Width	**99.82**	Feet	Slope	**0.41**	%
Length/Width	**16.09**		Shape Correction Factor	**95.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **3.68** x L/W Factor **0.95** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	2.80 cfs
10%	Q_{10}	100%	**4.30** cfs
4%	Q_{25}	135%	5.81 cfs
2%	Q_{50}	170%	7.31 cfs
1%	Q_{100}	200%	8.60 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **C - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**3.73**	Acres			
Length	**613.07**	Feet	Fall	**9.84**	Feet
Width	**265.02**	Feet	Slope	**1.61**	%
Length/Width	**2.31**		Shape Correction Factor	**100.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **3.73** x L/W Factor **1.00** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**	
20%	Q_5	65%	2.98	cfs
10%	Q_{10}	100%	**4.59**	cfs
4%	Q_{25}	135%	6.20	cfs
2%	Q_{50}	170%	7.80	cfs
1%	Q_{100}	200%	9.18	cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **D - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**4.01**	Acres			
Length	**593.93**	Feet	Fall	**5.34**	Feet
Width	**294.10**	Feet	Slope	**0.90**	%
Length/Width	**2.02**		Shape Correction Factor	**100.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **4.00** x L/W Factor **1.00** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	3.20 cfs
10%	Q_{10}	100%	**4.92** cfs
4%	Q_{25}	135%	6.64 cfs
2%	Q_{50}	170%	8.36 cfs
1%	Q_{100}	200%	9.84 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **E - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**0.88**	Acres			
Length	**123.18**	Feet	Fall	**0.27**	Feet
Width	**311.19**	Feet	Slope	**0.22**	%
Length/Width	**0.40**		Shape Correction Factor	**115.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **0.88** x L/W Factor **1.15** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**	
20%	Q_5	65%	0.81	cfs
10%	Q_{10}	100%	**1.24**	cfs
4%	Q_{25}	135%	1.67	cfs
2%	Q_{50}	170%	2.11	cfs
1%	Q_{100}	200%	2.48	cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **F - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Undeveloped

Watershed Constants:

Drainage Area	**6.31**	Acres			
Length	**515.99**	Feet	Fall	**13.62**	Feet
Width	**532.69**	Feet	Slope	**2.64**	%
Length/Width	**0.97**		Shape Correction Factor	**115.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		0%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **3.58** x L/W Factor **1.15** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	3.30 cfs
10%	Q_{10}	100%	**5.07** cfs
4%	Q_{25}	135%	6.84 cfs
2%	Q_{50}	170%	8.62 cfs
1%	Q_{100}	200%	10.14 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **G - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Undeveloped

Watershed Constants:

Drainage Area	**2.2**	Acres			
Length	**427**	Feet	Fall	**12.01**	Feet
Width	**224.43**	Feet	Slope	**2.81**	%
Length/Width	**1.90**		Shape Correction Factor	**108.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		0%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **1.24** x L/W Factor **1.08** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**	
20%	Q_5	65%	1.07	cfs
10%	Q_{10}	100%	**1.65**	cfs
4%	Q_{25}	135%	2.23	cfs
2%	Q_{50}	170%	2.81	cfs
1%	Q_{100}	200%	3.30	cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **H - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**0.66**	Acres			
Length	**277.12**	Feet	Fall	**2.69**	Feet
Width	**103.74**	Feet	Slope	**0.97**	%
Length/Width	**2.67**		Shape Correction Factor	**100.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **0.66** x L/W Factor **1.00** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	0.53 cfs
10%	Q_{10}	100%	**0.81** cfs
4%	Q_{25}	135%	1.09 cfs
2%	Q_{50}	170%	1.38 cfs
1%	Q_{100}	200%	1.62 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **I - Existing** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**2.54**	Acres			
Length	**284.6**	Feet	Fall	**2.414**	Feet
Width	**388.76**	Feet	Slope	**0.85**	%
Length/Width	**0.73**		Shape Correction Factor	**115.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

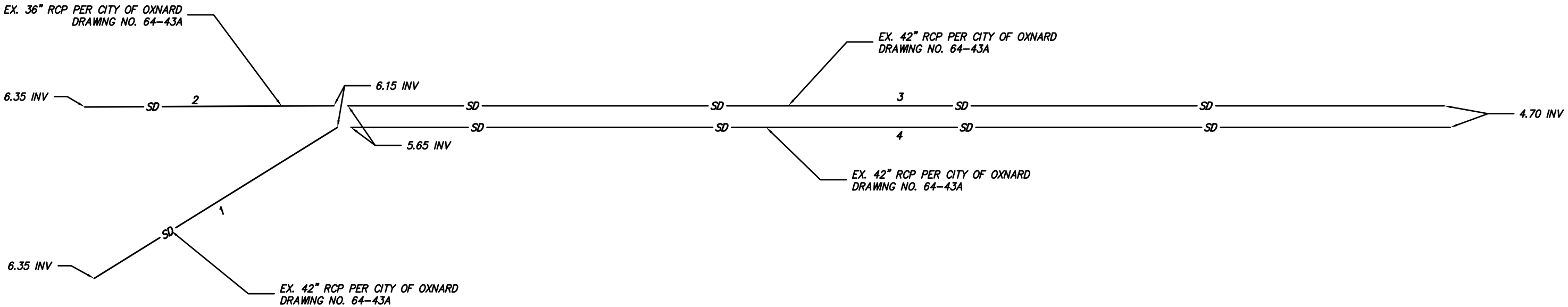
Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **2.95** x L/W Factor **1.15** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	2.71 cfs
10%	Q_{10}	100%	**4.17** cfs
4%	Q_{25}	135%	5.63 cfs
2%	Q_{50}	170%	7.09 cfs
1%	Q_{100}	200%	8.34 cfs

APPENDIX C

Existing Conditions – Pipe Analysis



EXISTING PIPES LAYOUT

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	EX-27 IN	7.42	27	Cir	79.635	6.15	6.35	0.251	7.09	7.43	0.24	7.67	End	None
2	EX-36 IN	19.63	36	Cir	69.298	6.15	6.35	0.289	7.56	7.90	0.44	8.34	End	None
3	EX-42 IN	14.15	42	Cir	304.916	4.70	5.65	0.312	5.85	6.81	0.40	7.21	End	None
4	EX-42 IN	14.15	42	Cir	305.763	4.70	5.65	0.311	5.85	6.81	0.40	7.21	End	None

Project File: 3650 Ex Pipe Capacity - Ex Q10 Peak Flow.stm | Number of lines: 4 | Run Date: 2/15/2011

NOTES: Return period = 10 Yrs.

Hydraflow HGL Computation Procedure

General Procedure:

Hydraflow computes the HGL using the Bernoulli energy equation. Manning's equation is used to determine energy losses due to pipe friction. In a standard step, iterative procedure, Hydraflow assumes upstream HGLs until the energy equation balances. If the energy equation cannot balance, supercritical flow exists and critical depth is temporarily assumed at the upstream end. A supercritical flow Profile is then computed using the same procedure in a downstream direction using momentum principles.

Col. 1 The line number being computed. Calculations begin at Line 1 and proceed upstream.

Col. 2 The line size. In the case of non-circular pipes, the line rise is printed above the span.

Col. 3 Total flow rate in the line.

Col. 4 The elevation of the downstream invert.

Col. 5 Elevation of the hydraulic grade line at the downstream end. This is computed as the upstream HGL + Minor loss of this line's downstream line.

Col. 6 The downstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 7 Cross-sectional area of the flow at the downstream end.

Col. 8 The velocity of the flow at the downstream end, (Col. 3 / Col. 7).

Col. 9 Velocity head (Velocity squared / 2g).

Col. 10 The elevation of the energy grade line at the downstream end, HGL + Velocity head, (Col. 5 + Col. 9).

Col. 11 The friction slope at the downstream end (the S or Slope term in Manning's equation).

Col. 12 The line length.

Col. 13 The elevation of the upstream invert.

Col. 14 Elevation of the hydraulic grade line at the upstream end.

Col. 15 The upstream depth of flow inside the pipe (HGL - Invert elevation) but not greater than the line size.

Col. 16 Cross-sectional area of the flow at the upstream end.

Col. 17 The velocity of the flow at the upstream end, (Col. 3 / Col. 16).

Col. 18 Velocity head (Velocity squared / 2g).

Col. 19 The elevation of the energy grade line at the upstream end, HGL + Velocity head, (Col. 14 + Col. 18) .

Col. 20 The friction slope at the upstream end (the S or Slope term in Manning's equation).

Col. 21 The average of the downstream and upstream friction slopes.

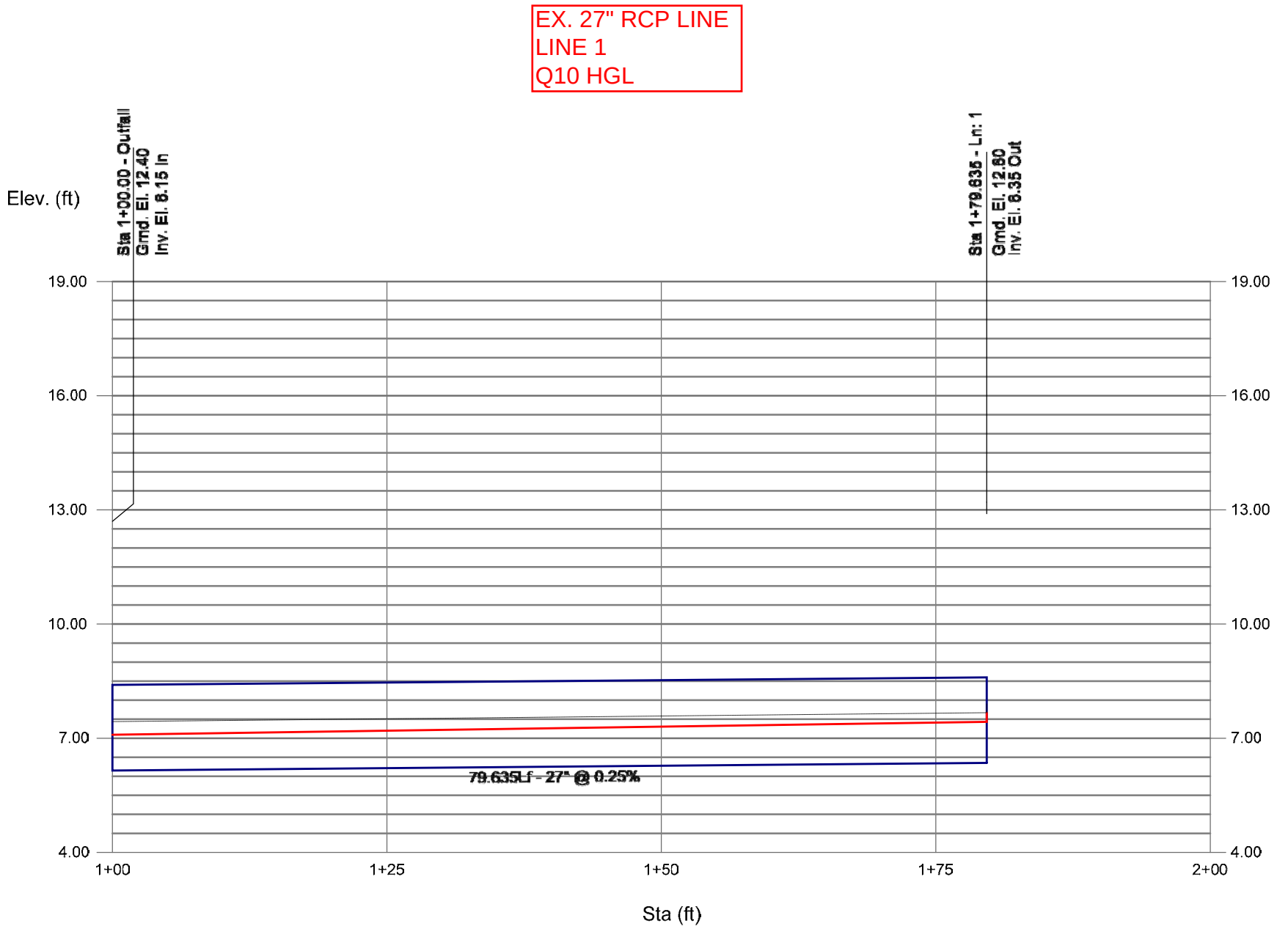
Col. 22 Energy loss. Average Sf/100 x Line Length (Col. 21/100 x Col. 12). Equals (EGL upstream - EGL downstream) +/- tolerance.

Col. 23 The junction loss coefficient (K).

Col. 24 Minor loss. (Col. 23 x Col. 18). Is added to upstream HGL and used as the starting HGL for the next upstream line(s).

Storm Sewer Profile

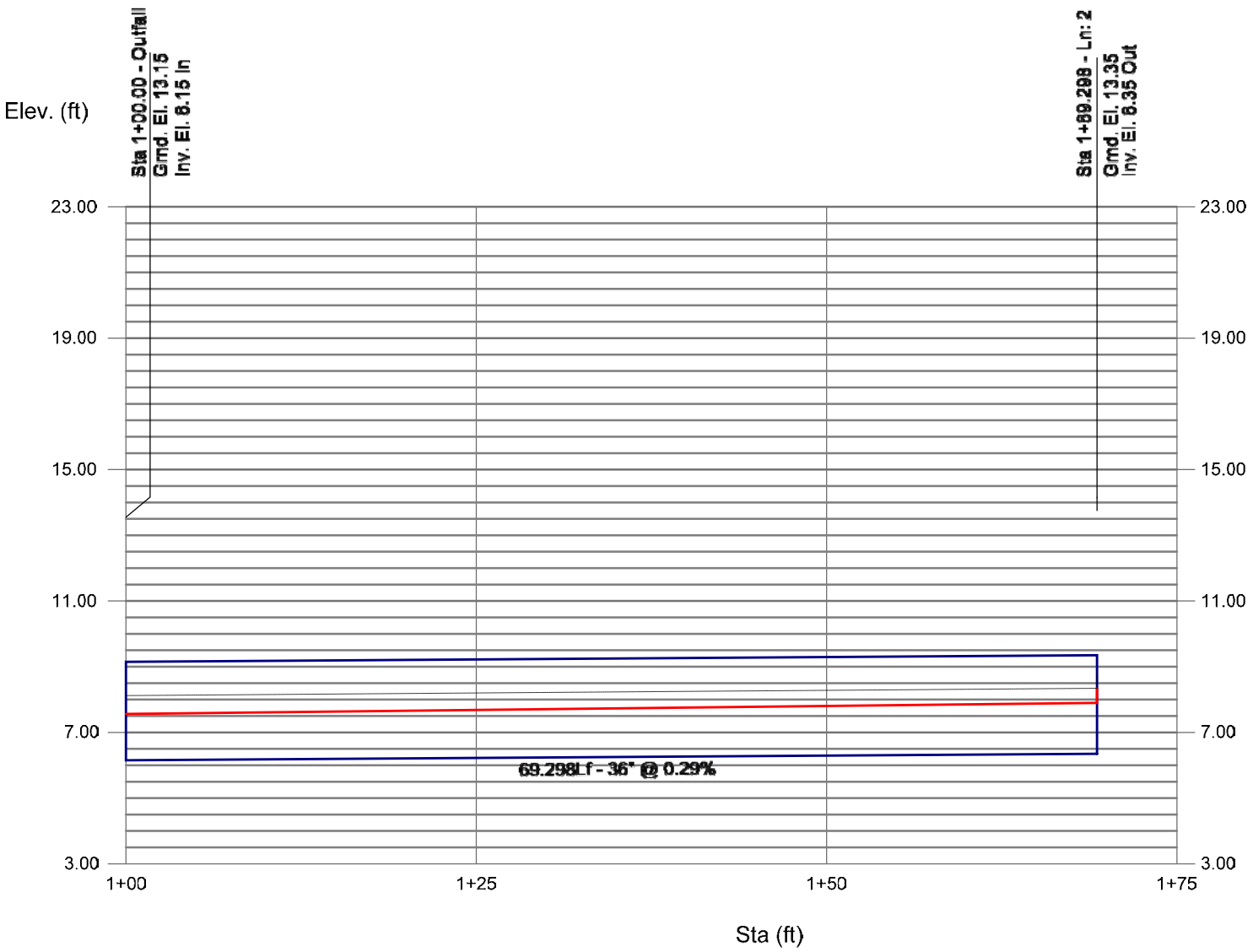
Proj. file: 3650 Ex Pipe Capacity - Ex Q10 Peak Flow.stm



Storm Sewer Profile

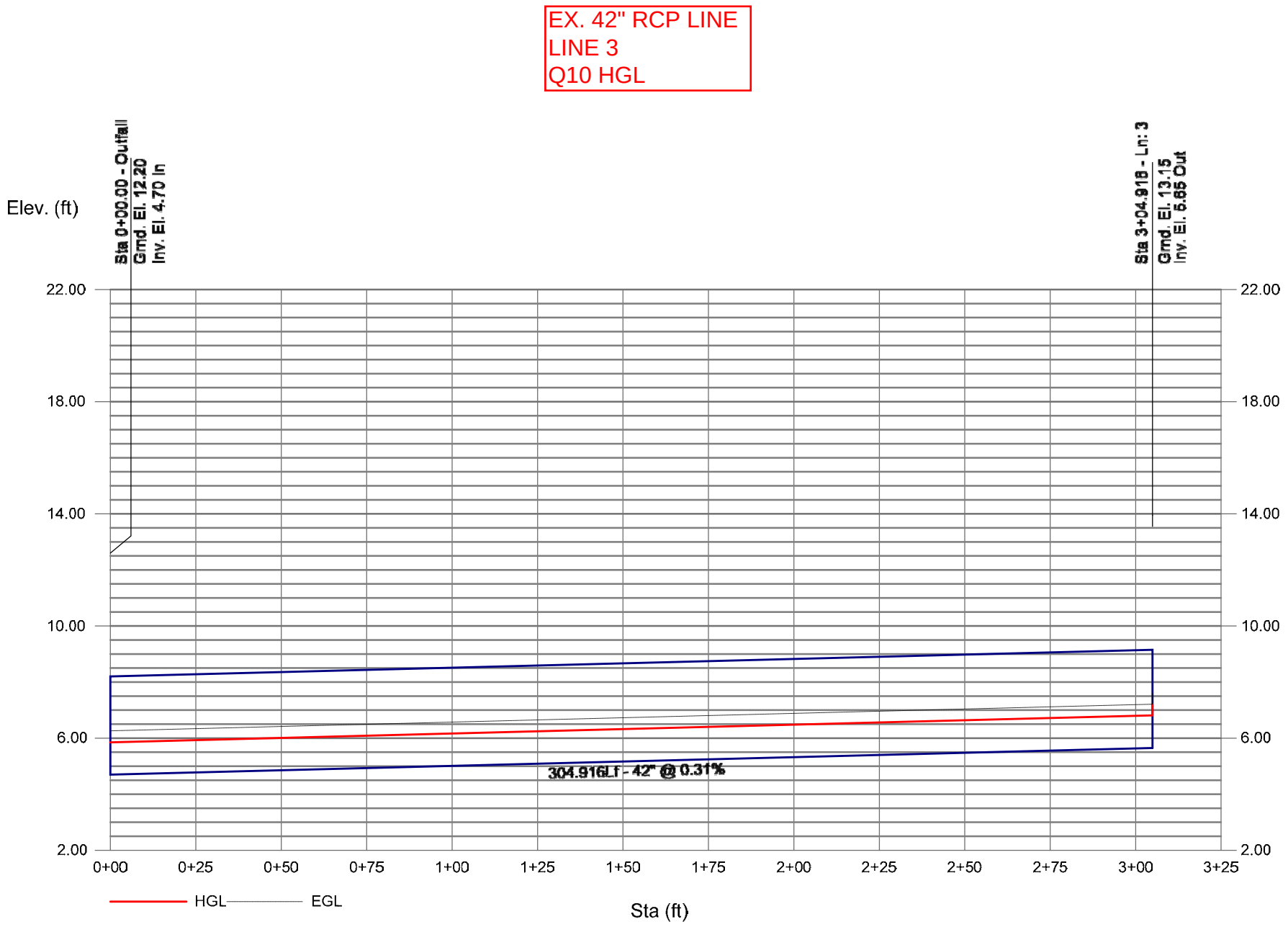
Proj. file: 3650 Ex Pipe Capacity - Ex Q10 Peak Flow.stm

EX. 36" RCP LINE
LINE 2
Q10 HGL



Storm Sewer Profile

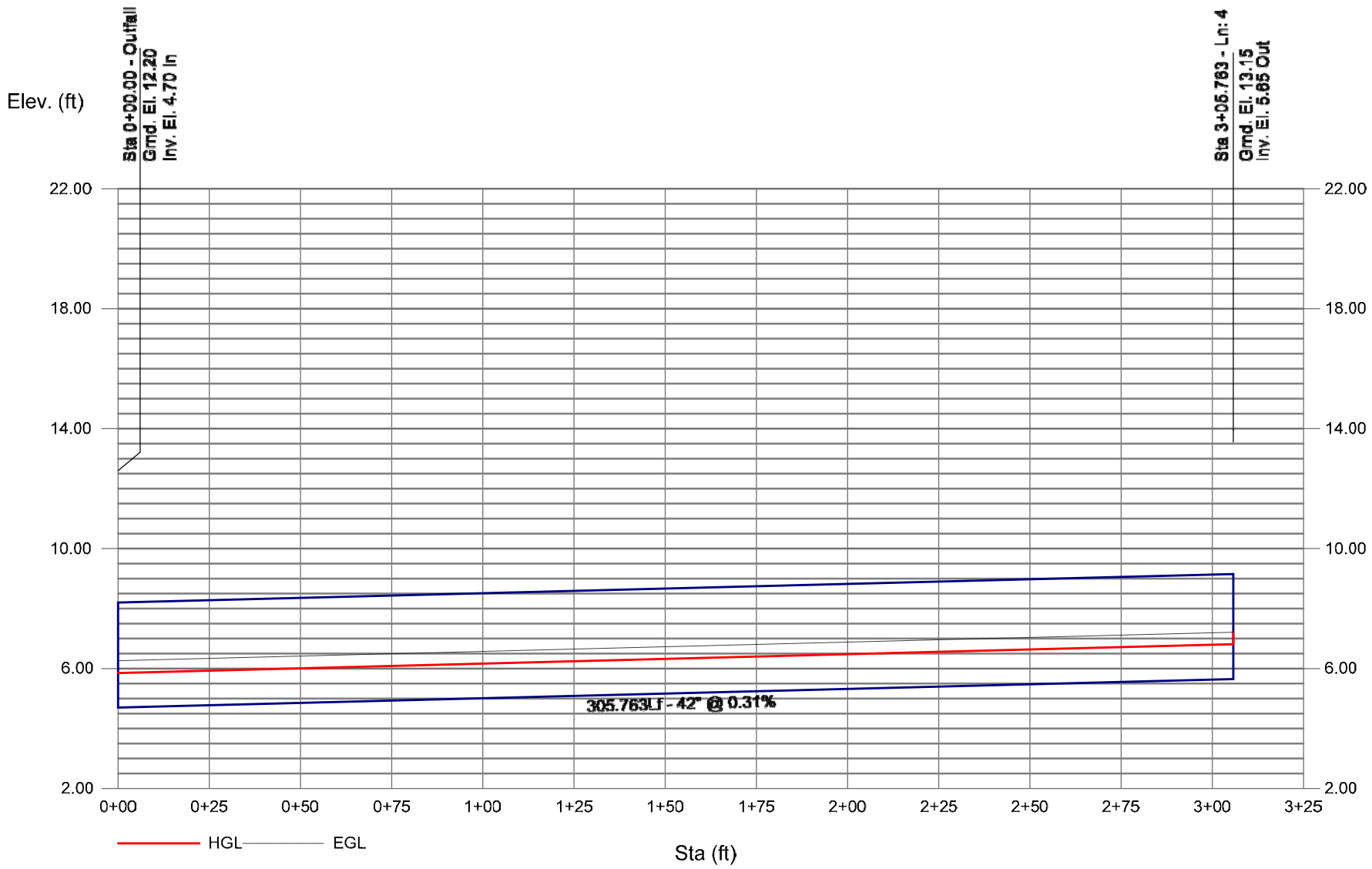
Proj. file: 3650 Ex Pipe Capacity - Ex Q10 Peak Flow.stm



Storm Sewer Profile

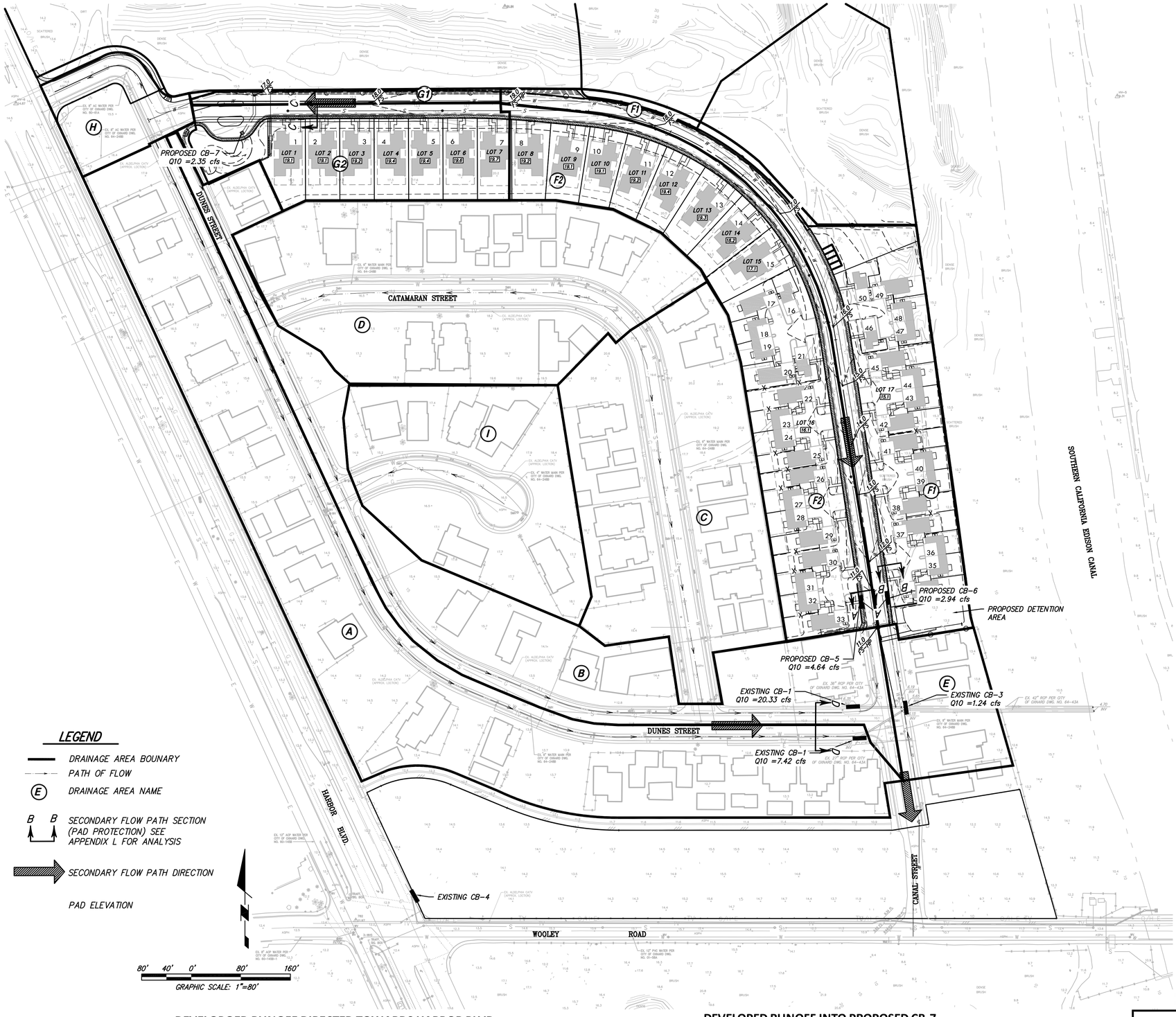
Proj. file: 3650 Ex Pipe Capacity - Ex Q10 Peak Flow.stm

EX. 42" RCP LINE
LINE 4
Q10 HGL



APPENDIX D

Developed Conditions Calculations & Exhibit



DEVELOPED CONDITION PEAK RUNOFF SUMMARY FROM COOK'S METHOD
(See App. D for Calculations)

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
A	6.35	7.42	12.61	14.84	1.17	2.34
B	3.68	4.30	7.31	8.60	1.17	2.34
C	3.73	4.59	7.80	9.18	1.23	2.46
D	4.01	4.92	8.36	9.84	1.23	2.45
E	0.88	1.24	2.11	2.48	1.41	2.82
F1	2.52	2.94	5.01	5.89	1.17	2.34
F2	3.98	4.64	7.89	9.28	1.17	2.33
G1	0.27	0.32	0.54	0.63	1.19	2.33
G2	1.74	2.03	3.46	4.07	1.17	2.34
H	0.66	0.81	1.38	1.62	1.23	2.45
I	2.54	4.17	7.09	8.34	1.64	3.28
TOTAL	30.36	37.38	63.56	74.77		

DEVELOPED RUNOFF INTO EXISTING CB-1

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
B	3.68	4.30	7.31	8.60	1.17	2.34
C	3.73	4.59	7.80	9.18	1.23	2.46
D	4.01	4.92	8.36	9.84	1.23	2.45
G1	0.27	0.32	0.54	0.63	1.19	2.33
G2	1.74	2.03	3.46	4.07	1.17	2.34
I	2.54	4.17	7.09	8.34	1.64	3.28
TOTAL	15.97	20.33	34.56	40.66		

DEVELOPED RUNOFF INTO EXISTING CB-2

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
A	6.35	7.42	12.61	14.84	1.17	2.34
TOTAL	6.35	7.42	12.61	14.84		

DEVELOPED RUNOFF INTO EXISTING CB-3

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
E	0.88	1.24	2.11	2.48	1.41	2.82
TOTAL	0.88	1.24	2.11	2.48		

DEVELOPED RUNOFF INTO PROPOSED CB-5

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
F2	3.98	4.64	7.89	9.28	1.17	2.33
TOTAL	3.98	4.64	7.89	9.28		

DEVELOPED RUNOFF INTO PROPOSED CB-6

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
F1	2.52	2.94	5.01	5.89	1.17	2.34
TOTAL	2.52	2.94	5.01	5.89		

DEVELOPOED RUNOFF DIRECTED TOWARDS HARBOR BLVD

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
H	0.66	0.81	1.38	1.62	1.23	2.45
TOTAL	0.66	0.81	1.38	1.62		

DEVELOPED RUNOFF INTO PROPOSED CB-7

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)	Q10/Area (cfs/ac)	Q100/Area (cfs/ac)
G1	0.27	0.32	0.54	0.63	1.19	2.33
G2	1.74	2.03	3.46	4.07	1.17	2.34
TOTAL	2.01	2.35	4.00	4.70		

DEVELOPED CONDITION

JENSEN DESIGN & SURVEY, INC
www.jdscivil.com
1672 DONLON STREET
VENTURA, CALIF. 93003
PHONE 805/654-6977
FAX 805/654-6979

SCALE: 1"=80' | J.N.: OSC1 3650
DATE: Mar. 22, 2016 | DWG. NAME: 3650 DEV. HYDRO NORTH.dwg

HYDROLOGY EXHIBIT
FOR
OXNARD SHORES NORTH

Tentative Tract No. 5888
City of Oxnard
COUNTY OF VENTURA STATE OF CALIFORNIA

FIGURE 2 APPENDIX D

z:\OSC1\3650\Planning\Cook's Hydrology Oxnard Shores North\3650 DEV. HYDRO NORTH.dwg Mar 22, 2016, 2:58pm keyon

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **A - Developed** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**6.35**	Acres			
Length	**1674.6**	Feet	Fall	**6.61**	Feet
Width	**165.18**	Feet	Slope	**0.39**	%
Length/Width	**10.14**		Shape Correction Factor	**95.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **6.35** x L/W Factor **0.95** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**	
20%	Q_5	65%	4.82	cfs
10%	Q_{10}	100%	**7.42**	cfs
4%	Q_{25}	135%	10.02	cfs
2%	Q_{50}	170%	12.61	cfs
1%	Q_{100}	200%	14.84	cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **B - Developed** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**3.68**	Acres			
Length	**1605.9**	Feet	Fall	**6.62**	Feet
Width	**99.82**	Feet	Slope	**0.41**	%
Length/Width	**16.09**		Shape Correction Factor	**95.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **3.68** x L/W Factor **0.95** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	2.80 cfs
10%	Q_{10}	100%	**4.30** cfs
4%	Q_{25}	135%	5.81 cfs
2%	Q_{50}	170%	7.31 cfs
1%	Q_{100}	200%	8.60 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **C - Developed** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**3.73**	Acres			
Length	**613.07**	Feet	Fall	**9.84**	Feet
Width	**265.02**	Feet	Slope	**1.61**	%
Length/Width	**2.31**		Shape Correction Factor	**100.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **3.73** x L/W Factor **1.00** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**	
20%	Q_5	65%	2.98	cfs
10%	Q_{10}	100%	**4.59**	cfs
4%	Q_{25}	135%	6.20	cfs
2%	Q_{50}	170%	7.80	cfs
1%	Q_{100}	200%	9.18	cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **D - Developed** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**4.01**	Acres			
Length	**593.93**	Feet	Fall	**5.34**	Feet
Width	**294.10**	Feet	Slope	**0.90**	%
Length/Width	**2.02**		Shape Correction Factor	**100.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **4.00** x L/W Factor **1.00** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	3.20 cfs
10%	Q_{10}	100%	**4.92** cfs
4%	Q_{25}	135%	6.64 cfs
2%	Q_{50}	170%	8.36 cfs
1%	Q_{100}	200%	9.84 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **E - Developed** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**0.88**	Acres			
Length	**123.8**	Feet	Fall	**0.27**	Feet
Width	**309.63**	Feet	Slope	**0.22**	%
Length/Width	**0.40**		Shape Correction Factor	**115.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **0.88** x L/W Factor **1.15** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	0.81 cfs
10%	Q_{10}	100%	**1.24** cfs
4%	Q_{25}	135%	1.67 cfs
2%	Q_{50}	170%	2.11 cfs
1%	Q_{100}	200%	2.48 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **F1- DEVELOPED** Designed: Date: **Feb 26,2016**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**2.52**	Acres			
Length	**1193.4**	Feet	Fall	**8.3**	Feet
Width	**91.98**	Feet	Slope	**0.69**	%
Length/Width	**12.98**		Shape Correction Factor	**95.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **2.52** x L/W Factor **0.95** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	1.91 cfs
10%	Q_{10}	100%	**2.94** cfs
4%	Q_{25}	135%	3.98 cfs
2%	Q_{50}	170%	5.01 cfs
1%	Q_{100}	200%	5.89 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **F2- DEVELOPED** Designed: Date: **Feb 26,2016**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**3.97**	Acres			
Length	**1193.44**	Feet	Fall	**8.3**	Feet
Width	**144.90**	Feet	Slope	**0.69**	%
Length/Width	**8.24**		Shape Correction Factor	**95.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **3.97** x L/W Factor **0.95** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	3.02 cfs
10%	Q_{10}	100%	**4.64** cfs
4%	Q_{25}	135%	6.26 cfs
2%	Q_{50}	170%	7.89 cfs
1%	Q_{100}	200%	9.28 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **G1- DEVELOPED** Designed: Date: **Feb 26,2016**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**0.27**	Acres			
Length	**400**	Feet	Fall	**2.2**	Feet
Width	**29.40**	Feet	Slope	**0.55**	%
Length/Width	**13.6**		Shape Correction Factor	**95.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **0.32** x L/W Factor **0.95** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	0.21 cfs
10%	Q_{10}	100%	**0.32** cfs
4%	Q_{25}	135%	0.43 cfs
2%	Q_{50}	170%	0.54 cfs
1%	Q_{100}	200%	0.63 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **G2- DEVELOPED** Designed: Date: **Feb 26,2016**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area **1.74** Acres
Length **400** Feet Fall **2.2** Feet
Width **189.49** Feet Slope **0.55** %

Length/Width **2.11** Shape Correction Factor **95.0**
Soil Type RI-Correction Factor **123** %

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **1.74** x L/W Factor **0.95** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**
20%	Q_5	65%	1.32 cfs
10%	Q_{10}	100%	**2.03** cfs
4%	Q_{25}	135%	2.74 cfs
2%	Q_{50}	170%	3.46 cfs
1%	Q_{100}	200%	4.07 cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **I - Developed** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**2.54**	Acres			
Length	**284.6**	Feet	Fall	**2.414**	Feet
Width	**388.76**	Feet	Slope	**0.85**	%
Length/Width	**0.73**		Shape Correction Factor	**115.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **2.95** x L/W Factor **1.15** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**	
20%	Q_5	65%	2.71	cfs
10%	Q_{10}	100%	**4.17**	cfs
4%	Q_{25}	135%	5.63	cfs
2%	Q_{50}	170%	7.09	cfs
1%	Q_{100}	200%	8.34	cfs

MODIFIED COOKS - HYDROLOGY CALCULATIONS

Project: **Oxnard Shores North TTM & Coastal** Job No. **OSC01.3650.006** Sheet: **1** of **1**
Watershed: **H - Developed** Designed: Date: **Feb 01,2011**
Concentration Point: Checked Date:
Residential

Watershed Constants:

Drainage Area	**0.66**	Acres			
Length	**277.12**	Feet	Fall	**2.69**	Feet
Width	**103.74**	Feet	Slope	**0.97**	%
Length/Width	**2.67**		Shape Correction Factor	**100.0**	
Soil Type			RI-Correction Factor	**123**	%

Computation of "C"

Type of Development	"C" Factor	Present	Future
Undeveloped	40-45	100%	
Residential	60		100%
Commercial & Industrial	70		0%

Composite "C" Factor (Plate 62 Oxnard Standards)
Runoff: Q (from Curve): **0.66** x L/W Factor **1.00** x RI Factor **1.23**

Frequency		Frequency Factor	**Q**	
20%	Q_5	65%	0.53	cfs
10%	Q_{10}	100%	**0.81**	cfs
4%	Q_{25}	135%	1.09	cfs
2%	Q_{50}	170%	1.38	cfs
1%	Q_{100}	200%	1.62	cfs

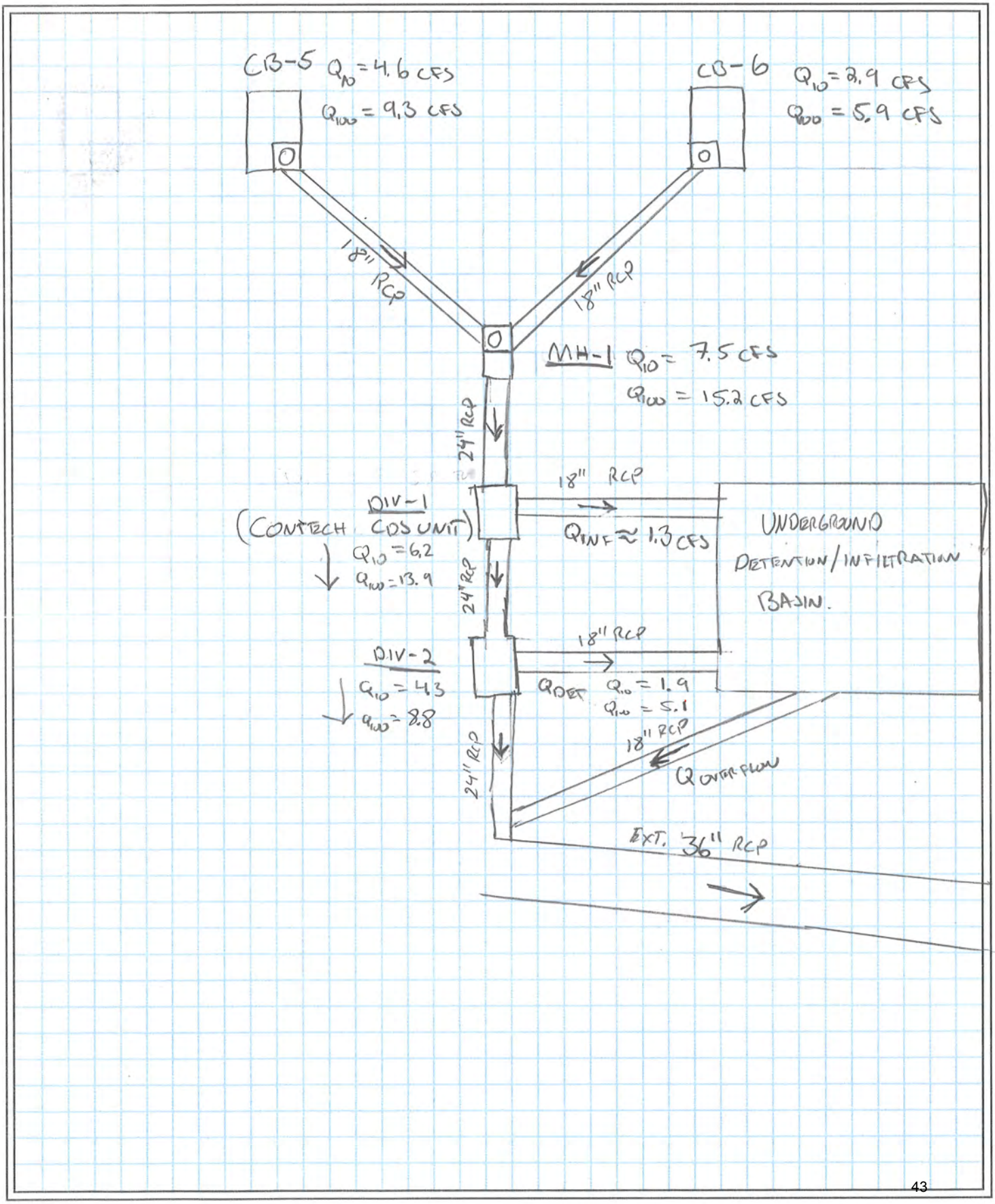
APPENDIX E

Developed Conditions – Pipe Analysis

JENSEN DESIGN & SURVEY, INC

PROJECT: OXNARD SHORES NORTH J.N. OSC-3650

DESCRIPTION: DEVELOPED PIPE LAYOUT DATE: 3/21/16



Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line Size (in)	Line shape	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line Slope (%)	HGL Down (ft)	HGL Up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns Line No.	Junction Type
1	Ex-36in	24.28	36	Cir	9.286	5.65	5.74	0.969	7.22	7.31	0.10	7.31	End	None
2	Ex-36in	19.22	36	Cir	60.012	5.74	6.35	1.016	7.31	7.75	n/a	7.75 j	1	None
3	Ex-27in	7.42	27	Cir	79.635	6.15	6.35	0.251	7.09	7.43	0.24	7.67	End	None
4	Ex-42in	16.47	42	Cir	304.916	4.70	5.65	0.312	5.94	6.90	0.44	7.34	End	None
5	Ex-42in	16.47	42	Cir	305.763	4.70	5.65	0.311	5.94	6.90	0.44	7.34	End	None
6	SD-18in Downstream of Diversion St	3.06	18	Cir	88.884	5.97	6.50	0.596	6.83	7.36	n/a	7.36 j	End	None
7	SD-18in Downstream of Diversion St	3.06	18	Cir	36.093	6.50	6.72	0.610	7.36	7.58	0.36	7.94	6	None
8	SD-18in Upstream of Diversion Stru	4.80	18	Cir	21.773	6.82	7.04	1.010	7.66	7.88	n/a	7.88 j	End	None
9	SD-18in upstream of Diversion Stru	4.80	18	Cir	40.227	7.04	7.44	0.994	7.88	8.28	n/a	8.28	8	None
10	SD-18in upstream of Diversion Stru	2.24	18	Cir	461.956	7.04	10.74	0.801	7.61	11.31	0.06	11.31	End	None
11	SD-18in upstream of Diversion Stru	2.24	18	Cir	205.214	10.74	12.40	0.809	11.31	12.97	0.13	12.97	10	None
12	SD-18in Upstream of Diversion Stru	2.24	18	Cir	338.061	12.40	15.16	0.816	12.97	15.73	0.20	15.73	11	None

Storm drain line configuration changed.
Existing storm drain lines remain the same.

Project File: 3650 Developed Condition.stm | Number of lines: 12 | Run Date: 2/17/2011

NOTES: Return period = 10 Yrs. ; j - Line contains hyd. jump.

Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	36	24.28	5.65	7.22	1.57	3.75	6.48	0.65	7.87	0.387	9.286	5.74	7.31	1.57**	3.75	6.48	0.65	7.96	0.387	0.387	n/a	0.15	0.10
2	36	19.22	5.74	7.31	1.57	3.75	5.13	0.41	7.72	0.243	60.012	6.35	7.75 j	1.40**	3.23	5.96	0.55	8.30	0.361	0.302	n/a	1.00	0.55
3	27	7.42	6.15	7.09	0.94	1.57	4.72	0.35	7.44	0.368	79.635	6.35	7.43	1.08	1.89	3.93	0.24	7.67	0.224	0.296	0.236	1.00	0.24
4	42	16.47	4.70	5.94	1.24*	3.06	5.38	0.45	6.39	0.313	304.916	5.65	6.90	1.25**	3.09	5.33	0.44	7.34	0.305	0.309	0.942	1.00	0.44
5	42	16.47	4.70	5.94	1.24*	3.06	5.38	0.45	6.39	0.313	305.763	5.65	6.90	1.25**	3.09	5.33	0.44	7.34	0.305	0.309	0.945	1.00	0.44
~~6~~	~~18~~	~~5.06~~	~~5.97~~	~~6.83~~	~~0.86~~	~~1.05~~	~~4.83~~	~~0.36~~	~~7.19~~	~~0.505~~	~~88.884~~	~~6.50~~	~~7.36 j~~	~~0.86**~~	~~1.05~~	~~4.84~~	~~0.36~~	~~7.72~~	~~0.508~~	~~0.506~~	~~n/a~~	~~0.75~~	~~0.27~~
~~7~~	~~18~~	~~5.06~~	~~6.50~~	~~7.36~~	~~0.86*~~	~~1.05~~	~~4.84~~	~~0.36~~	~~7.72~~	~~0.508~~	~~36.093~~	~~6.72~~	~~7.58~~	~~0.86**~~	~~1.05~~	~~4.81~~	~~0.36~~	~~7.94~~	~~0.501~~	~~0.504~~	~~0.182~~	~~1.00~~	~~0.36~~
~~8~~	~~18~~	~~4.80~~	~~6.82~~	~~7.66~~	~~0.84~~	~~1.02~~	~~4.71~~	~~0.35~~	~~8.01~~	~~0.490~~	~~21.773~~	~~7.04~~	~~7.88 j~~	~~0.84**~~	~~1.01~~	~~4.74~~	~~0.35~~	~~8.23~~	~~0.497~~	~~0.493~~	~~n/a~~	~~0.15~~	~~0.05~~
~~9~~	~~18~~	~~4.80~~	~~7.04~~	~~7.88~~	~~0.84*~~	~~1.01~~	~~4.74~~	~~0.35~~	~~8.23~~	~~0.497~~	~~40.227~~	~~7.44~~	~~8.28~~	~~0.84**~~	~~1.01~~	~~4.74~~	~~0.35~~	~~8.63~~	~~0.497~~	~~0.497~~	~~n/a~~	~~1.00~~	~~n/a~~
~~10~~	~~18~~	~~2.24~~	~~7.04~~	~~7.61~~	~~0.57*~~	~~0.62~~	~~3.62~~	~~0.20~~	~~7.82~~	~~0.409~~	~~481.956~~	~~10.74~~	~~11.31~~	~~0.57**~~	~~0.62~~	~~3.62~~	~~0.20~~	~~11.52~~	~~0.409~~	~~0.409~~	~~n/a~~	~~0.27~~	~~0.06~~
~~11~~	~~18~~	~~2.24~~	~~10.74~~	~~11.31~~	~~0.57*~~	~~0.62~~	~~3.62~~	~~0.20~~	~~11.52~~	~~0.409~~	~~205.214~~	~~12.40~~	~~12.97~~	~~0.57**~~	~~0.62~~	~~3.62~~	~~0.20~~	~~13.18~~	~~0.409~~	~~0.409~~	~~n/a~~	~~0.63~~	~~0.13~~
~~12~~	~~18~~	~~2.24~~	~~12.40~~	~~12.97~~	~~0.57*~~	~~0.62~~	~~3.62~~	~~0.20~~	~~13.18~~	~~0.409~~	~~338.061~~	~~15.16~~	~~15.73~~	~~0.57**~~	~~0.62~~	~~3.62~~	~~0.20~~	~~15.94~~	~~0.409~~	~~0.409~~	~~n/a~~	~~1.00~~	~~0.20~~

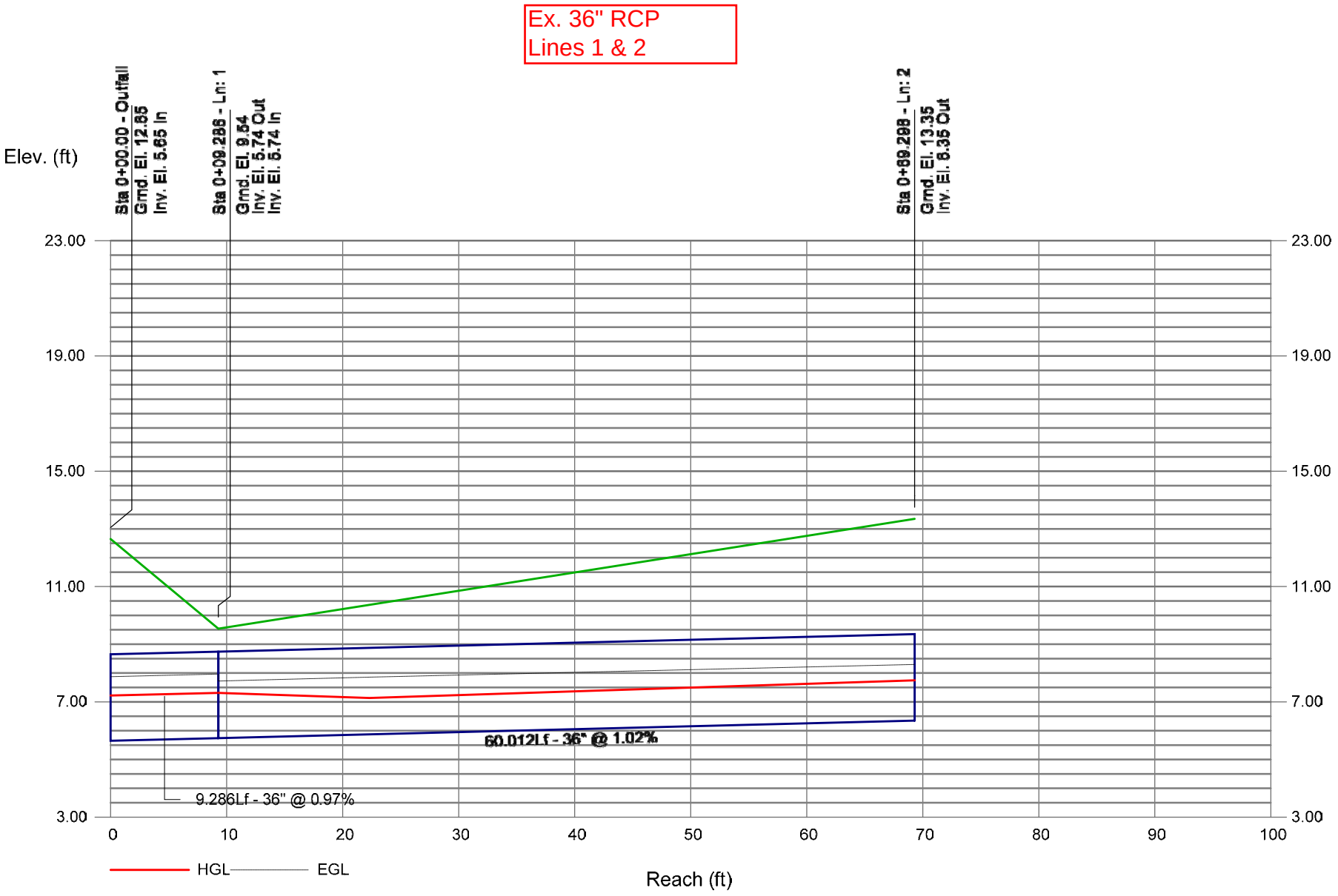
Storm drain line configuration changed.
Existing storm drain lines remain the same.

Project File: 3650 Developed Condition.stm | Number of lines: 12 | Run Date: 2/17/2011

Notes: * depth assumed.; ** Critical depth.; j-Line contains hyd. jump. ; c = cir e = ellip b = box

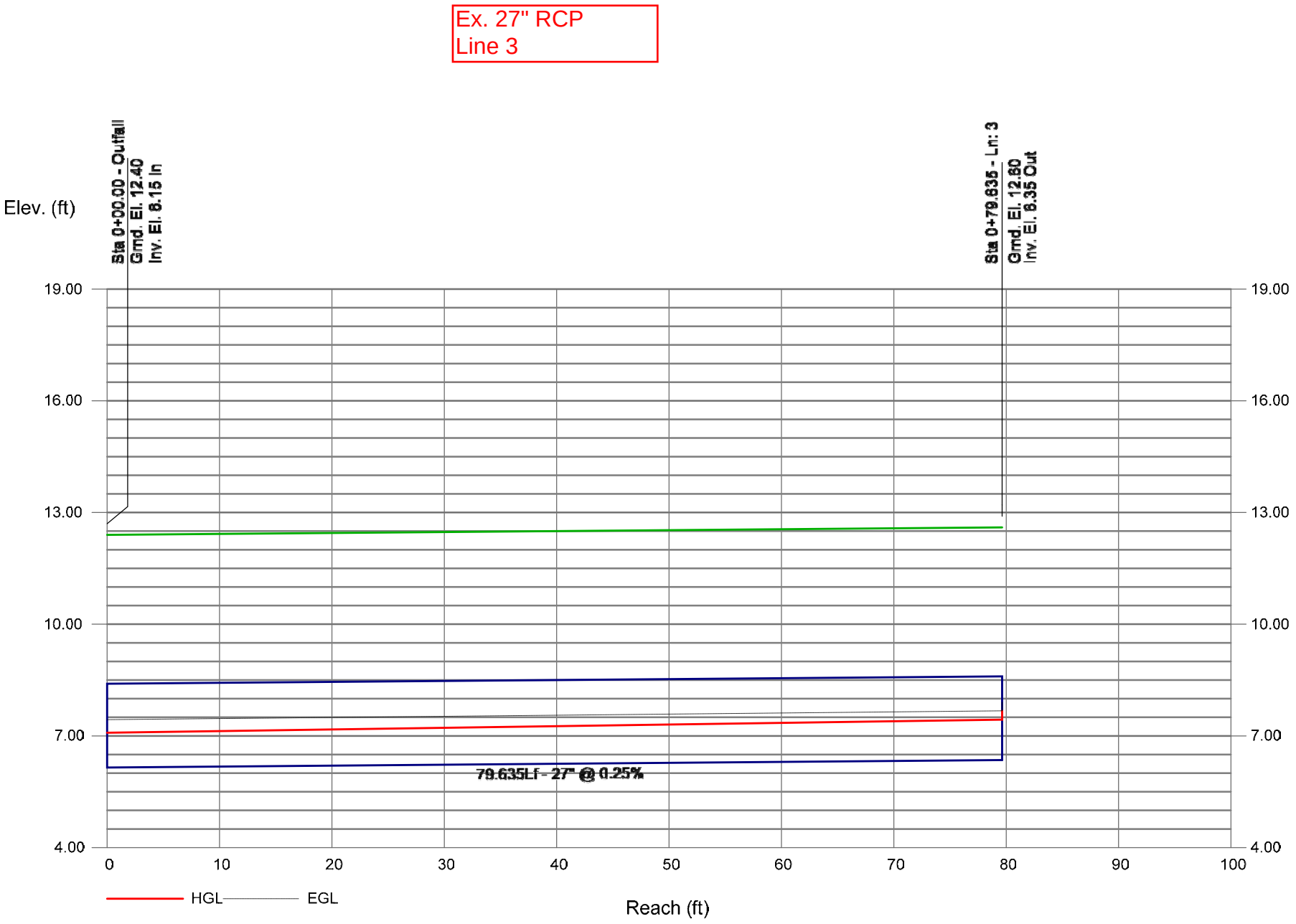
Storm Sewer Profile

Proj. file: 3650 Developed Condition.stm



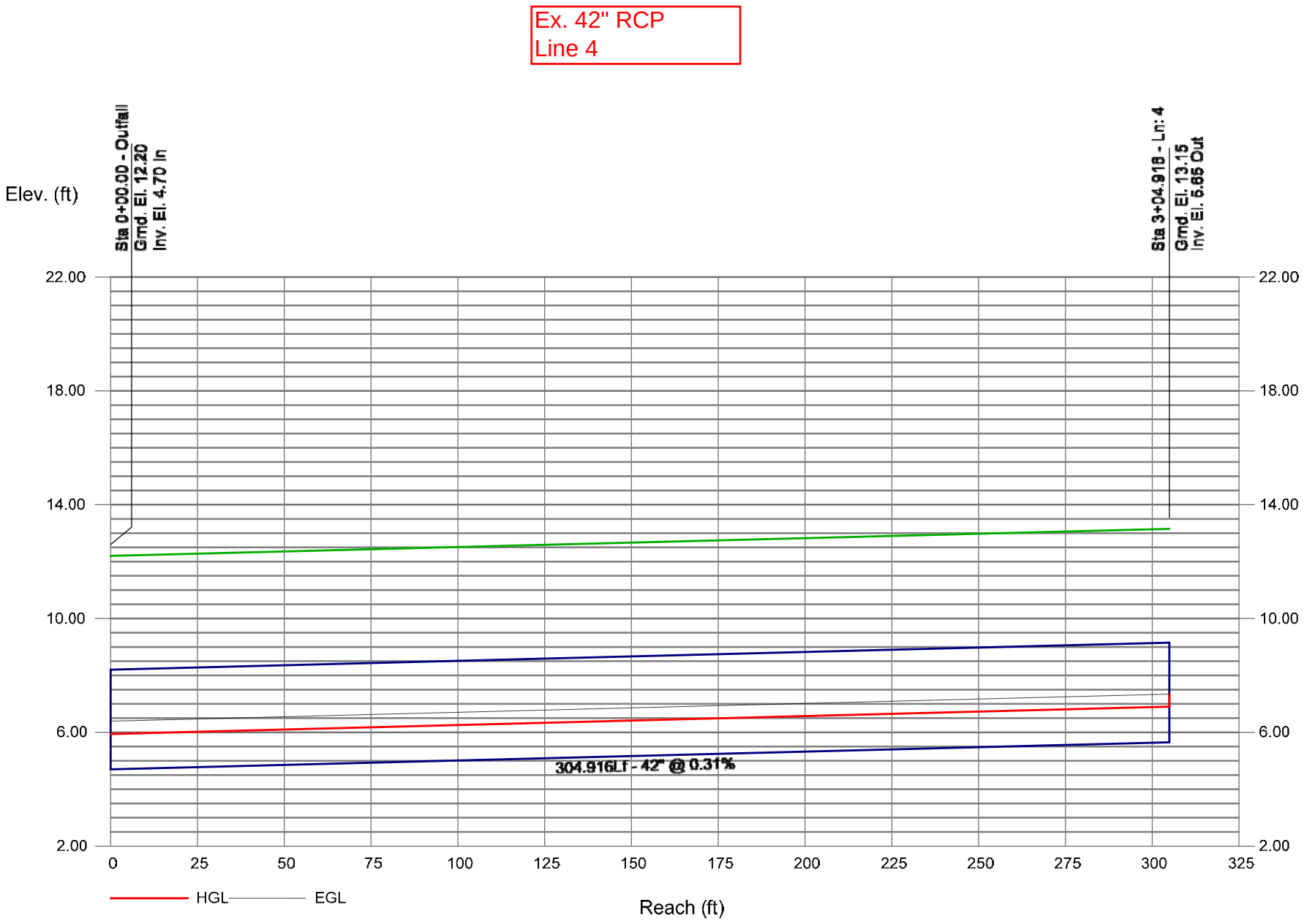
Storm Sewer Profile

Proj. file: 3650 Developed Condition.stm



Storm Sewer Profile

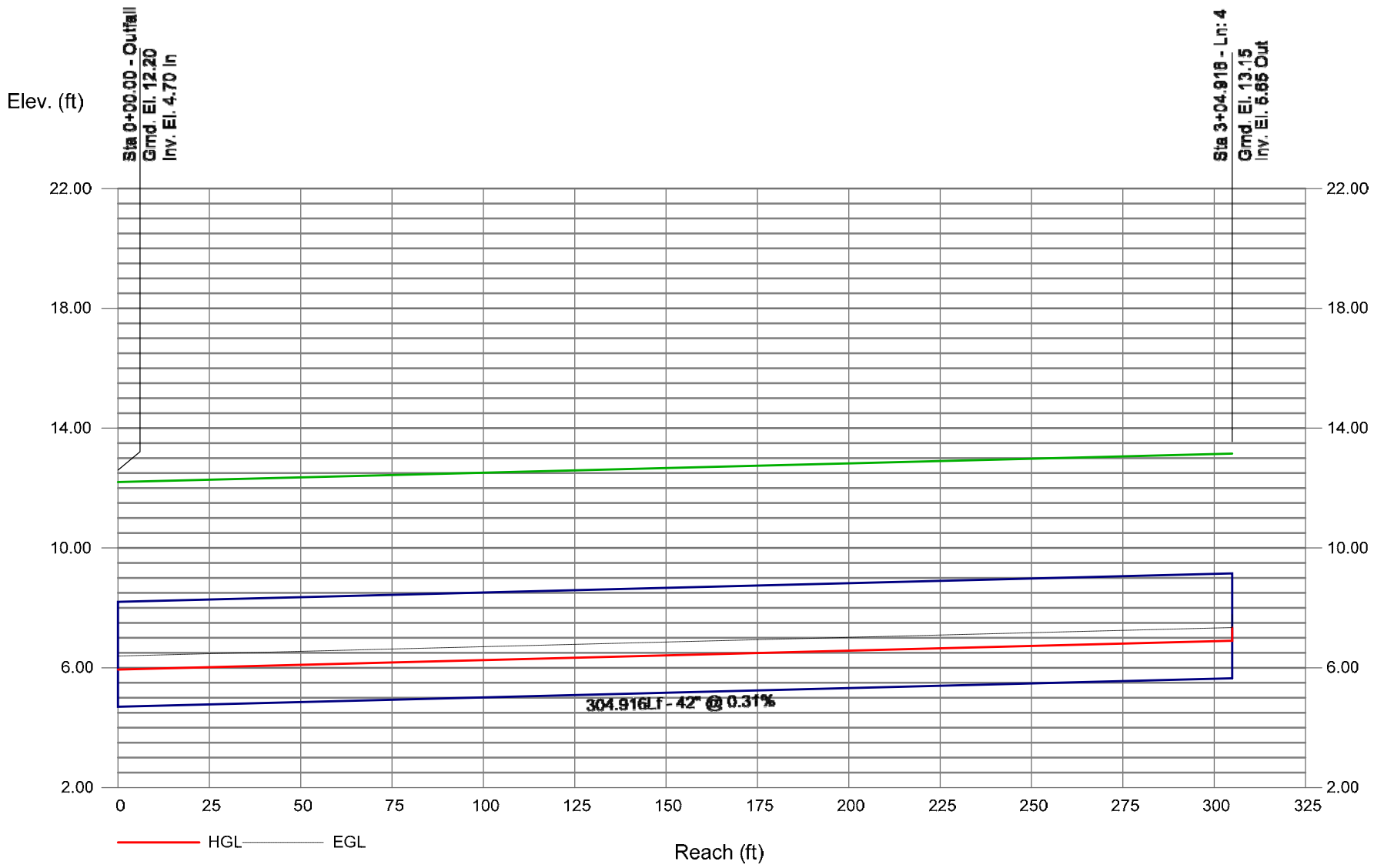
Proj. file: 3650 Developed Condition.stm



Storm Sewer Profile

Proj. file: 3650 Developed Condition.stm

Ex. 42" RCP
Line 5



APPENDIX F

Detention Area Analysis and Description

Hydrograph Summary Report

Hydraflow Hydrographs by Intelisolve v9.23

Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph description
1	Manual	490.82	1	1156	3,618,325	----	------	------	10 Year VCRAT Hydrograph
3	Manual	7.590	1	1156	55,968	----	------	------	Q10 Area F
4	Diversion1	3.910	1	1151	54,277	3	------	------	Q10 Not Being Detained
5	Diversion2	3.680	1	1156	1,684	3	------	------	Q10 Into Detention Area
6	Reservoir	0.080	1	1163	1,552	5	7.87	1,644	Q10 Detention
8	Manual	702.16	1	1155	5,260,517	----	------	------	50 Year VCRAT Hydrograph
10	Manual	12.92	1	1155	96,803	----	------	------	Q50 Area F
11	Diversion1	6.660	1	1151	94,260	10	------	------	Q50 Not Being Detained
12	Diversion2	6.260	1	1155	2,536	10	------	------	Q50 Into Detention Area
13	Reservoir	0.097	1	1162	2,404	12	8.30	2,490	Q50 Detention
15	Manual	811.13	1	1155	7,209,525	----	------	------	100 Year VCRAT Hydrograph
17	Manual	15.19	1	1155	135,039	----	------	------	Q100 Area F
18	Diversion1	7.650	1	1150	131,819	17	------	------	Q100 Not Being Detained
19	Diversion2	7.540	1	1155	3,190	17	------	------	Q100 Into Detention Area
20	Reservoir	0.110	1	1162	3,057	19	8.71	3,135	Q100 Detention

Pond Report

Hydraflow Hydrographs by Intelisolve v9.23 Tuesday, Mar 15, 2016

Pond No. 1 - Chamber Max

Pond Data

UG Chambers - Invert elev. = 6.93 ft, Rise x Span = 2.00 x 2.00 ft, Barrel Len = 94.00 ft, No. Barrels = 12, Slope = 0.40%, Headers = No

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	6.93	n/a	0	0
0.24	7.17	n/a	164	164
0.48	7.41	n/a	481	645
0.71	7.64	n/a	524	1,169
0.95	7.88	n/a	506	1,675
1.19	8.12	n/a	480	2,155
1.43	8.36	n/a	442	2,597
1.66	8.59	n/a	391	2,988
1.90	8.83	n/a	318	3,307
2.14	9.07	n/a	198	3,505
2.38	9.31	n/a	40	3,544

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 3.00	0.00	0.00	0.00
Span (in)	= 3.00	0.00	0.00	0.00
No. Barrels	= 1	0	0	0
Invert El. (ft)	= 7.10	0.00	0.00	0.00
Length (ft)	= 110.00	0.00	0.00	0.00
Slope (%)	= 0.40	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.00	0.00	0.00	0.00
Crest El. (ft)	= 0.00	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= ---	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Wet area)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	6.93	0.00	---	---	---	---	---	---	---	---	---	0.000
0.02	16	6.95	0.00	---	---	---	---	---	---	---	---	---	0.000
0.05	33	6.98	0.00	---	---	---	---	---	---	---	---	---	0.000
0.07	49	7.00	0.00	---	---	---	---	---	---	---	---	---	0.000
0.10	66	7.03	0.00	---	---	---	---	---	---	---	---	---	0.000
0.12	82	7.05	0.00	---	---	---	---	---	---	---	---	---	0.000
0.14	98	7.07	0.00	---	---	---	---	---	---	---	---	---	0.000
0.17	115	7.10	0.00	---	---	---	---	---	---	---	---	---	0.000
0.19	131	7.12	0.00 oc	---	---	---	---	---	---	---	---	---	0.001
0.21	147	7.14	0.00 oc	---	---	---	---	---	---	---	---	---	0.004
0.24	164	7.17	0.01 oc	---	---	---	---	---	---	---	---	---	0.009
0.26	212	7.19	0.02 oc	---	---	---	---	---	---	---	---	---	0.016
0.29	260	7.22	0.02 oc	---	---	---	---	---	---	---	---	---	0.024
0.31	308	7.24	0.03 oc	---	---	---	---	---	---	---	---	---	0.032
0.33	356	7.26	0.04 oc	---	---	---	---	---	---	---	---	---	0.041
0.36	404	7.29	0.05 oc	---	---	---	---	---	---	---	---	---	0.049
0.38	452	7.31	0.06 oc	---	---	---	---	---	---	---	---	---	0.055
0.40	501	7.33	0.06 oc	---	---	---	---	---	---	---	---	---	0.058
0.43	549	7.36	0.05 oc	---	---	---	---	---	---	---	---	---	0.055
0.45	597	7.38	0.06 oc	---	---	---	---	---	---	---	---	---	0.056
0.48	645	7.41	0.06 oc	---	---	---	---	---	---	---	---	---	0.058
0.50	697	7.43	0.06 oc	---	---	---	---	---	---	---	---	---	0.059
0.52	750	7.45	0.06 oc	---	---	---	---	---	---	---	---	---	0.060
0.55	802	7.48	0.06 oc	---	---	---	---	---	---	---	---	---	0.062
0.57	854	7.50	0.06 oc	---	---	---	---	---	---	---	---	---	0.063
0.59	907	7.52	0.06 oc	---	---	---	---	---	---	---	---	---	0.064
0.62	959	7.55	0.07 oc	---	---	---	---	---	---	---	---	---	0.066
0.64	1,012	7.57	0.07 oc	---	---	---	---	---	---	---	---	---	0.067
0.67	1,064	7.60	0.07 oc	---	---	---	---	---	---	---	---	---	0.068
0.69	1,116	7.62	0.07 oc	---	---	---	---	---	---	---	---	---	0.069
0.71	1,169	7.64	0.07 oc	---	---	---	---	---	---	---	---	---	0.070
0.74	1,219	7.67	0.07 oc	---	---	---	---	---	---	---	---	---	0.071
0.76	1,270	7.69	0.07 oc	---	---	---	---	---	---	---	---	---	0.072
0.78	1,321	7.71	0.07 oc	---	---	---	---	---	---	---	---	---	0.074

Continues on next page...

Chamber Max

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.81	1,371	7.74	0.07 oc	---	---	---	---	---	---	---	---	---	0.075
0.83	1,422	7.76	0.08 oc	---	---	---	---	---	---	---	---	---	0.076
0.86	1,472	7.79	0.08 oc	---	---	---	---	---	---	---	---	---	0.077
0.88	1,523	7.81	0.08 oc	---	---	---	---	---	---	---	---	---	0.078
0.90	1,574	7.83	0.08 oc	---	---	---	---	---	---	---	---	---	0.079
0.93	1,624	7.86	0.08 oc	---	---	---	---	---	---	---	---	---	0.080
0.95	1,675	7.88	0.08 oc	---	---	---	---	---	---	---	---	---	0.081
0.97	1,723	7.90	0.08 oc	---	---	---	---	---	---	---	---	---	0.082
1.00	1,771	7.93	0.08 oc	---	---	---	---	---	---	---	---	---	0.083
1.02	1,819	7.95	0.08 oc	---	---	---	---	---	---	---	---	---	0.084
1.05	1,867	7.98	0.08 oc	---	---	---	---	---	---	---	---	---	0.085
1.07	1,915	8.00	0.09 oc	---	---	---	---	---	---	---	---	---	0.086
1.09	1,963	8.02	0.09 oc	---	---	---	---	---	---	---	---	---	0.087
1.12	2,011	8.05	0.09 oc	---	---	---	---	---	---	---	---	---	0.087
1.14	2,059	8.07	0.09 oc	---	---	---	---	---	---	---	---	---	0.088
1.16	2,107	8.09	0.09 oc	---	---	---	---	---	---	---	---	---	0.089
1.19	2,155	8.12	0.09 oc	---	---	---	---	---	---	---	---	---	0.090
1.21	2,199	8.14	0.09 oc	---	---	---	---	---	---	---	---	---	0.091
1.24	2,243	8.17	0.09 oc	---	---	---	---	---	---	---	---	---	0.092
1.26	2,287	8.19	0.09 oc	---	---	---	---	---	---	---	---	---	0.093
1.28	2,332	8.21	0.09 oc	---	---	---	---	---	---	---	---	---	0.094
1.31	2,376	8.24	0.09 oc	---	---	---	---	---	---	---	---	---	0.095
1.33	2,420	8.26	0.10 oc	---	---	---	---	---	---	---	---	---	0.095
1.35	2,464	8.28	0.10 oc	---	---	---	---	---	---	---	---	---	0.096
1.38	2,509	8.31	0.10 oc	---	---	---	---	---	---	---	---	---	0.097
1.40	2,553	8.33	0.10 oc	---	---	---	---	---	---	---	---	---	0.098
1.43	2,597	8.36	0.10 oc	---	---	---	---	---	---	---	---	---	0.099
1.45	2,636	8.38	0.10 oc	---	---	---	---	---	---	---	---	---	0.099
1.47	2,675	8.40	0.10 oc	---	---	---	---	---	---	---	---	---	0.100
1.50	2,714	8.43	0.10 oc	---	---	---	---	---	---	---	---	---	0.101
1.52	2,754	8.45	0.10 oc	---	---	---	---	---	---	---	---	---	0.102
1.54	2,793	8.47	0.10 oc	---	---	---	---	---	---	---	---	---	0.103
1.57	2,832	8.50	0.10 oc	---	---	---	---	---	---	---	---	---	0.103
1.59	2,871	8.52	0.10 oc	---	---	---	---	---	---	---	---	---	0.104
1.62	2,910	8.55	0.10 oc	---	---	---	---	---	---	---	---	---	0.105
1.64	2,949	8.57	0.11 oc	---	---	---	---	---	---	---	---	---	0.106
1.66	2,988	8.59	0.11 oc	---	---	---	---	---	---	---	---	---	0.106
1.69	3,020	8.62	0.11 oc	---	---	---	---	---	---	---	---	---	0.107
1.71	3,052	8.64	0.11 oc	---	---	---	---	---	---	---	---	---	0.108
1.73	3,084	8.66	0.11 oc	---	---	---	---	---	---	---	---	---	0.109
1.76	3,116	8.69	0.11 oc	---	---	---	---	---	---	---	---	---	0.109
1.78	3,147	8.71	0.11 oc	---	---	---	---	---	---	---	---	---	0.110
1.81	3,179	8.74	0.11 oc	---	---	---	---	---	---	---	---	---	0.111
1.83	3,211	8.76	0.11 oc	---	---	---	---	---	---	---	---	---	0.112
1.85	3,243	8.78	0.11 oc	---	---	---	---	---	---	---	---	---	0.112
1.88	3,275	8.81	0.11 oc	---	---	---	---	---	---	---	---	---	0.113
1.90	3,307	8.83	0.11 oc	---	---	---	---	---	---	---	---	---	0.114
1.92	3,326	8.85	0.11 oc	---	---	---	---	---	---	---	---	---	0.114
1.95	3,346	8.88	0.12 oc	---	---	---	---	---	---	---	---	---	0.115
1.97	3,366	8.90	0.12 oc	---	---	---	---	---	---	---	---	---	0.116
2.00	3,386	8.93	0.12 oc	---	---	---	---	---	---	---	---	---	0.117
2.02	3,406	8.95	0.12 oc	---	---	---	---	---	---	---	---	---	0.117
2.04	3,426	8.97	0.12 oc	---	---	---	---	---	---	---	---	---	0.118
2.07	3,445	9.00	0.12 oc	---	---	---	---	---	---	---	---	---	0.119
2.09	3,465	9.02	0.12 oc	---	---	---	---	---	---	---	---	---	0.119
2.11	3,485	9.04	0.12 oc	---	---	---	---	---	---	---	---	---	0.120
2.14	3,505	9.07	0.12 oc	---	---	---	---	---	---	---	---	---	0.121
2.16	3,509	9.09	0.12 oc	---	---	---	---	---	---	---	---	---	0.121
2.19	3,513	9.12	0.12 oc	---	---	---	---	---	---	---	---	---	0.122
2.21	3,517	9.14	0.12 oc	---	---	---	---	---	---	---	---	---	0.123
2.23	3,521	9.16	0.12 oc	---	---	---	---	---	---	---	---	---	0.123
2.26	3,525	9.19	0.12 oc	---	---	---	---	---	---	---	---	---	0.124
2.28	3,529	9.21	0.12 oc	---	---	---	---	---	---	---	---	---	0.124
2.30	3,533	9.23	0.13 oc	---	---	---	---	---	---	---	---	---	0.125
2.33	3,537	9.26	0.13 oc	---	---	---	---	---	---	---	---	---	0.126
2.35	3,540	9.28	0.13 oc	---	---	---	---	---	---	---	---	---	0.126
2.38	3,544	9.31	0.13 oc	---	---	---	---	---	---	---	---	---	0.127

...End

Hydrograph Report

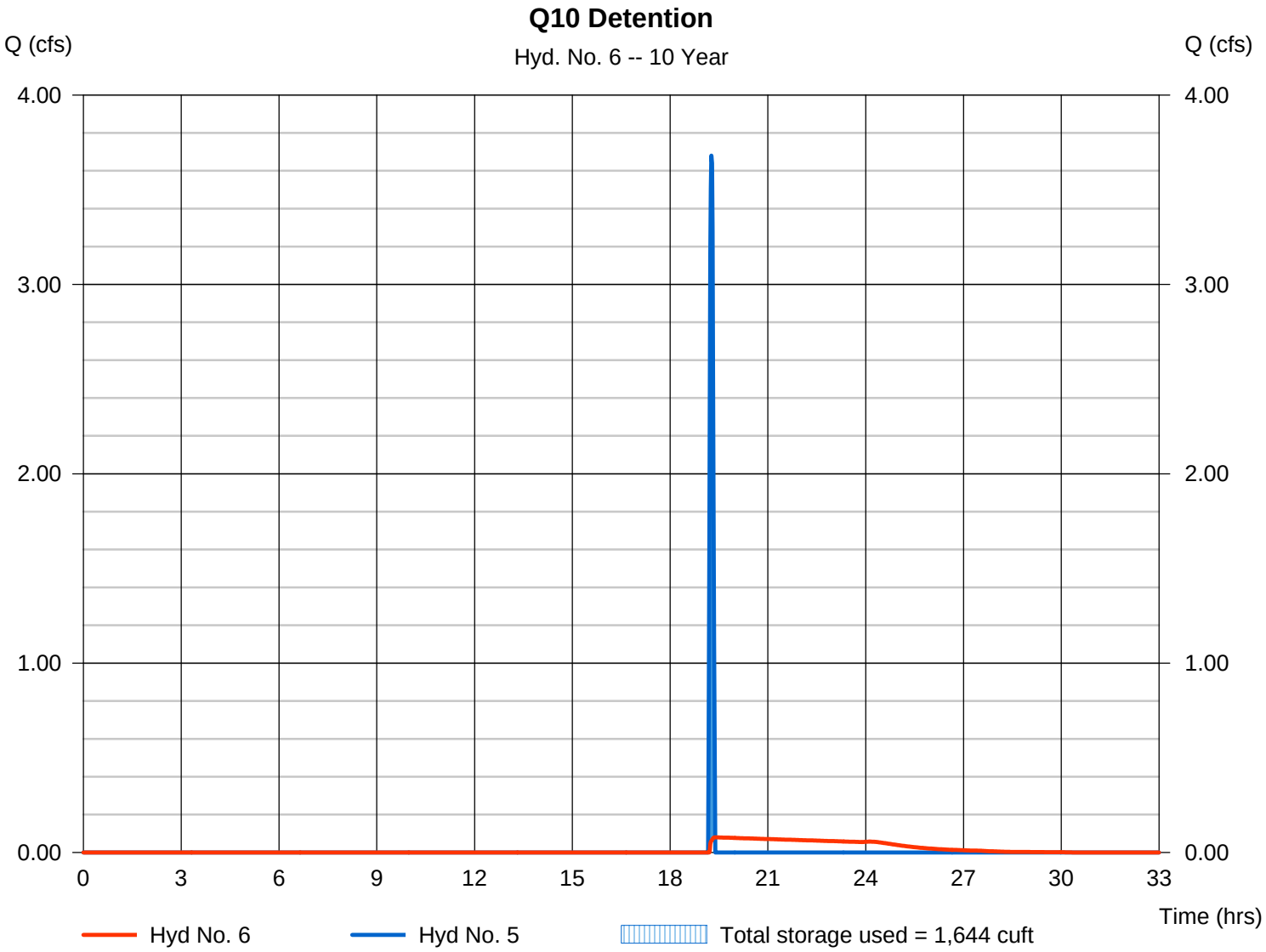
Hydraflow Hydrographs by Intelisolve v9.23 Tuesday, Mar 15, 2016

Hyd. No. 6

Q10 Detention

Hydrograph type	=	Reservoir	Peak discharge	=	0.080 cfs
Storm frequency	=	10 yrs	Time to peak	=	19.38 hrs
Time interval	=	1 min	Hyd. volume	=	1,552 cuft
Inflow hyd. No.	=	5 - Q10 Into Detention Area	Max. Elevation	=	7.87 ft
Reservoir name	=	Chamber Max	Max. Storage	=	1,644 cuft

Storage Indication method used.



Hydrograph Report

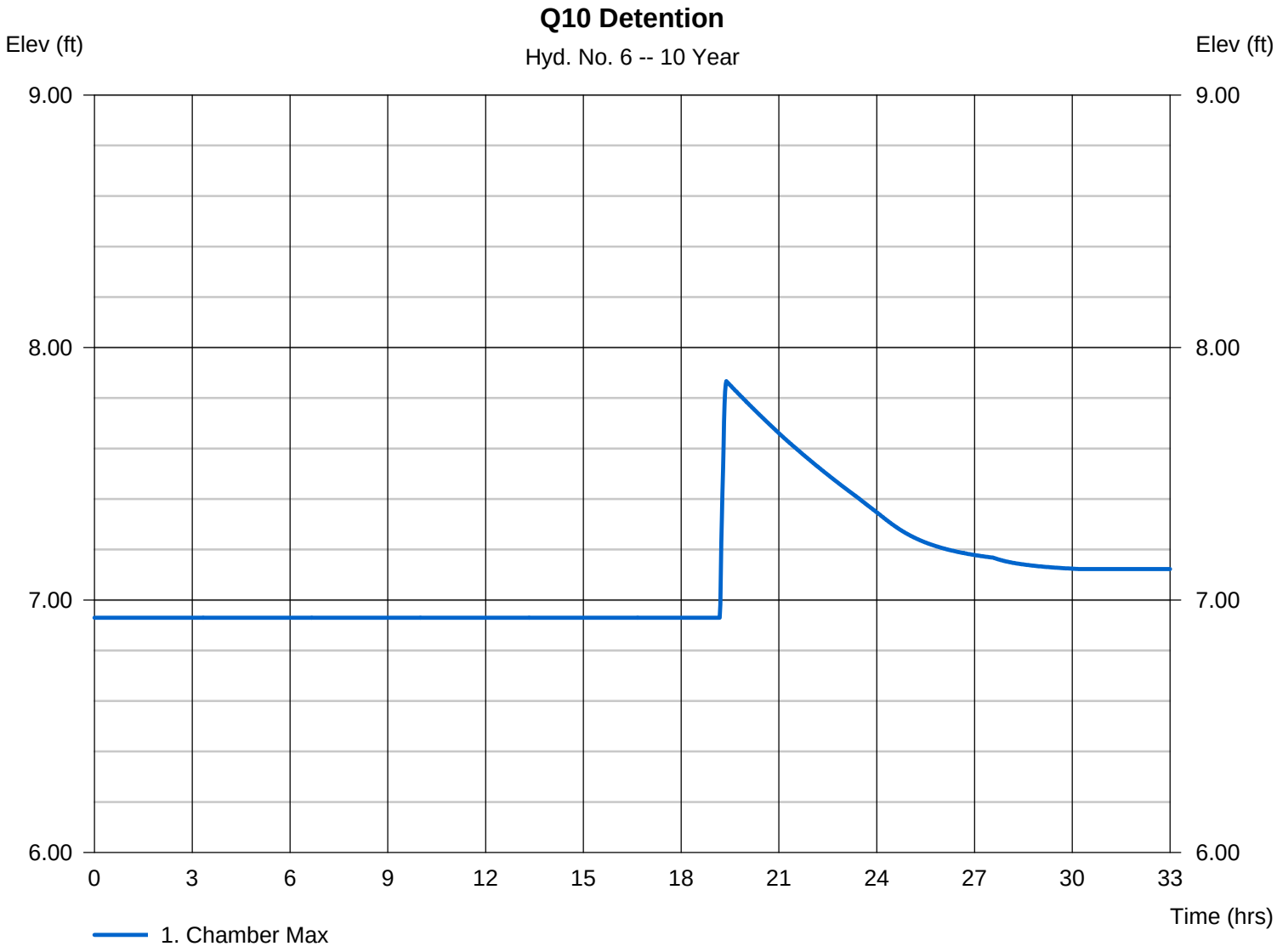
Hydraflow Hydrographs by Intelisolve v9.23 Tuesday, Mar 15, 2016

Hyd. No. 6

Q10 Detention

Hydrograph type	=	Reservoir	Peak discharge	=	0.080 cfs
Storm frequency	=	10 yrs	Time to peak	=	19.38 hrs
Time interval	=	1 min	Hyd. volume	=	1,552 cuft
Inflow hyd. No.	=	5 - Q10 Into Detention Area	Max. Elevation	=	7.87 ft
Reservoir name	=	Chamber Max	Max. Storage	=	1,644 cuft

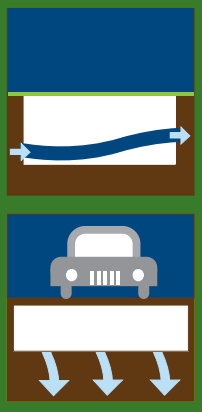
Storage Indication method used.





UrbanGreen™

Metal Detention and Infiltration Products

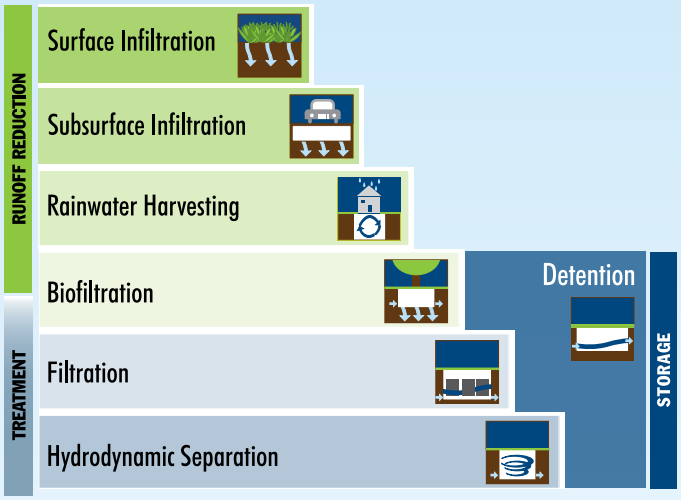


CONTECH® CONSTRUCTION PRODUCTS INC.

Corrugated Metal Pipe for Stormwater Detention and Infiltration

Selecting the right stormater solution just got easier...

It's simple to choose the right low impact development (LID) solution to achieve your runoff reduction goals with the CONTECH UrbanGreen Staircase. First, select the runoff reduction practices that are most appropriate for your site, paying particular attention to pretreatment needs. If the entire design storm cannot be retained, select a treatment best management practice (BMP) for the balance. Finally, select a detention system to address any outstanding downstream erosion.



Learn more about our available coatings at www.contech-cpi.com/lid

Meet your stormwater quantity and runoff reduction requirements with ease.

CONTECH's corrugated metal pipe (CMP) underground detention/infiltration systems can be sized and shaped to meet your site-specific needs. The versatile material provides almost limitless opportunities to match individual site requirements while lowering site development costs.

Durable

- Proven service life — Exceeds 100-years with proper specification that meets all AASHTO and ASTM pipe specifications
- Handles fill heights in excess of 100 feet – steel gains strength from soil
- 100% traceable material — maintains performance even when recycled
- Homogenous material — eliminates failures due to stress cracks, shrinkage cracks and air voids
- Various coatings available with predictable service life
  - Aluminized Steel™ Type 2
  - Galvanized
  - CORLIX®
  - TRENCHCOAT®

Learn more about our available coatings at www.contech-cpi/cmp



various coatings available

Versatile

- Wide range of shapes and sizes – round and pipe-arch in diameters from 6 to 144 inches
- Variety of layouts – rectangular, L-shape and staggered cells are frequently used
- Array of fittings – tees, wyes, elbow, saddle branches, manifolds, reducers and custom fabrication available

Sustainable

- World's most recycled content – can count towards LEED® credits
- Requires less energy and materials to produce – lowers carbon footprint

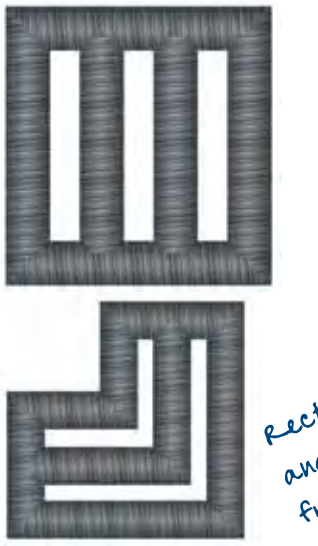
Learn how CONTECH products can help contribute to LEED credits at www.contech-cpi.com/LEED

Easy to Install and Maintain

- Flexible and forgiving during installation
- Lightweight for easy handling
- Quick assembly shortens site development time
- Integrated outlet control structure eliminates need for downstream control structure
- Manhole riser sections, complete with ladders facilitate any access and scheduled maintenance

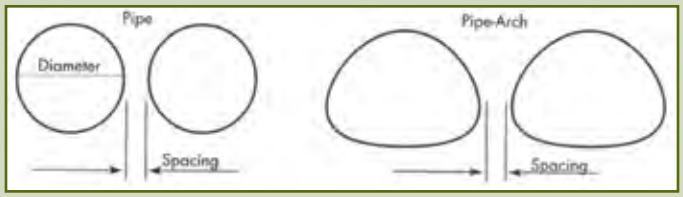


Tees, wyes, elbows, saddle branches, manifolds and reducers are available.



Rectangular, L-shaped and staggered shapes are frequently used.

Typical Spacing for Multiple Barrels



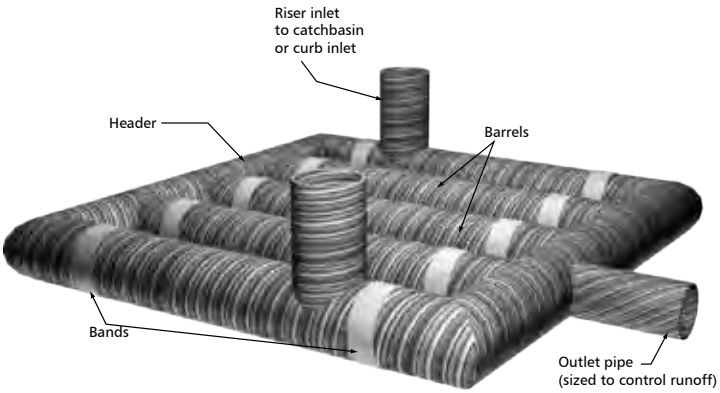
Diameter	Spacing*	Pipe-Arch Span	Spacing*
Up to 24"	12"	Up to 36"	12"
24" to 72"	1/2 Diameter of Pipe	36" to 108"	1/3 Span of Pipe-Arch
72" +	36"	108" to 189"	36"

* Spacing shown provides room for proper backfill to enable the structure to develop adequate side support. Spacing with AASHTO M-145, A-1, A-2, A-3 granular fill. Closer spacing is possible depending on quality of backfill and placing and compaction methods.

Applications

Detention

CONTECH CMP detention systems store stormwater runoff exceeding a site's allowable discharge rate and release it slowly over time. Installed belowgrade, the systems maximize property usage and meet your specific water quantity requirements. CMP detention systems are available in all AASHTO M-36 Types. For larger systems, the Optimizer™ flow control device can reduce required storage volume.





CMP detention system

High Volume Storage

CONTECH plate systems allow for high volume stormwater storage in small footprint areas. The systems are offered in a wide variety of shapes and sizes in both aluminum and galvanized steel. Full-pipe systems and three-sided structures with open bottoms can be used for infiltration.

Typically, CONTECH plate systems are used on high vertical rise applications or in areas where the smallest possible footprint is of the greatest concern. The systems are bolted together in the field, which reduces the number of freight loads. Remote sites or projects with challenging accessibility often utilize plate systems.



Plate system for high volume storage.



CMP infiltration system

Infiltration

CMP pipe and pipe-arch is available fully or partially perforated to meet your Low Impact Development (LID) requirements. Standard pipe-wall perforations (3/8" diameter holes meeting AASHTO M-36, Class 2) provide approximately 2.5% open area. Subsurface perforated CMP infiltration systems store stormwater runoff in the pipe and surrounding stone during a storm until it can be slowly released into the surrounding native soil.



Stormwater runoff is stored in the pipe and surrounding stone.

Meet Your Low Impact Development Requirements

Pipe-arch for low profile application.

Low Profile

When vertical space must be maximized, the CMP can be utilized in a pipe-arch shape. The low, wide pipe-arch design allows for greater storage in a shallow profile than typical round pipe without losing any structural integrity. Like our round pipe, pipe arch is produced in six wall thicknesses including 18, 16, 14, 12, 10 and 8 gage, which are available with either helical or annular corrugations.

Applications

On-Site Manufacturing

If your job site is remote or you have limited storage space or restricted traffic patterns, take advantage of our Mobile Production Vehicle (MPV) for fast and cost effective on-site steel pipe manufacturing. The PIPE MPV® is designed to be a self-supporting factory that can be quickly deployed and put into production. Once on site, pipe manufacturing progresses quickly enough to allow pipe installation within four hours.

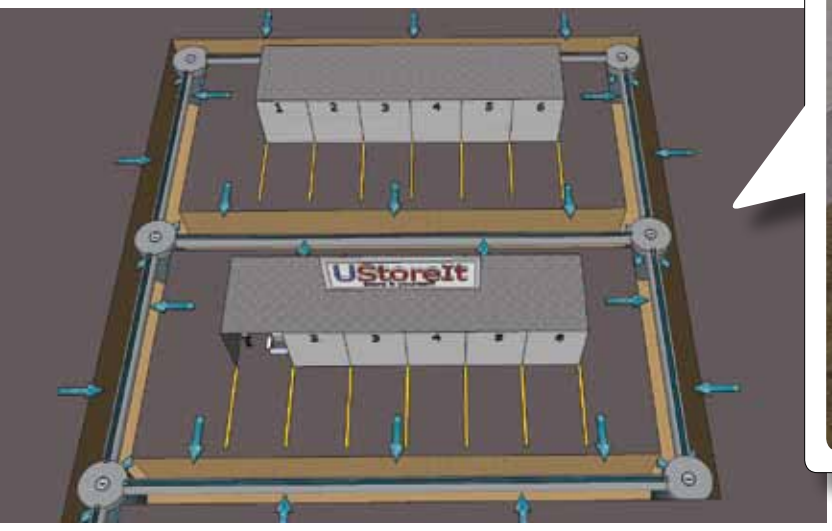
The PIPE MPV can produce corrugated metal pipe in a variety of sizes. Diameters from 36" — 192" and lengths up to 35' can be accommodated. This pipe meets the same levels of quality construction as does all CONTECH manufactured pipe, with high coil feedrate speeds and the same lock-seem edge process used in conventional pipe manufacturing.



Mobile Production Vehicle

Innovative Solutions for Challenging Sites

The flexibility of CMP allows you to create innovative solutions when dealing with challenging sites. For example, when trying to meet runoff reduction requirements, your site may be mostly impervious or you may have a thin, shallow clay layer just below the surface, limiting the infiltration capacity of surface BMPs. One solution is to utilize CMP infiltration wells. First, collect the site runoff using our Slotted Drain™ around the perimeter of each drive isle. The Slotted Drain then directs water into vertical lengths of perforated CMP. The vertical perforated CMP is long enough to penetrate the clay layer and infiltrate the stormwater into a highly permeable alluvial layer about 12'-14' belowground. This allows the developer to meet the LID requirements and eliminate the need for the extended detention basin.





Sizing

Round Pipe - CMP and Plate (CMP → 12-in to 144-in; Plate → 60-in to 240-in)

Diameter (inches)	Volume (ft^3/ft)	Min. Cover Height	Diameter (inches)	Volume (ft^3/ft)	Min. Cover Height	Diameter (inches)	Volume (ft^3/ft)	Min. Cover Height	Diameter (inches)	Volume (ft^3/ft)	Min. Cover Height
12	.78	12″	60	. 19.6	12″	120	. 78.5	18″	180	. 176	24″
15	1.22	12″	66	. 23.7	12″	126	86.5	18″	186	. 188	24″
18	1.76	12″	72	. 28.2	12″	132	95.0	18″	192	. 201	24″
21	2.40	12″	78	. 33.1	12″	138	103.8	18″	198	. 213	30″
24	3.14	12″	84	. 38.4	12″	144	113.1	18″	204	. 227	30″
30	4.9	12″	90	. 44.1	12″	150	122	24″	210	. 240	30″
36	7.0	12″	96	. 50.2	12″	156	132	24″	216	. 254	30″
42	9.6	12″	102	. 56.7	18″	162	143	24″	222	. 268	30″
48	12.5	12″	108	. 63.6	18″	168	153	24″	228	. 283	30″
54	15.9	12″	114	. 70.8	18″	174	165	24″	234	. 298	30″

Pipe-Arch - CMP

1/2″ Deep Corrugations											
Shape (inches)	Volume (ft^3/ft)	Min. Cover Height	Shape (inches)	Volume (ft^3/ft)	Min. Cover Height	Shape (inches)	Volume (ft^3/ft)	Min. Cover Height	Shape (inches)	Volume (ft^3/ft)	Min. Cover Height
17 x 13	. 1.1	12″	28 x 20	. 2.9	12″	49 x 33	. 8.9	12″	71 x 47	18.1	12″
21 x 15	. 1.6	12″	35 x 24	. 4.5	12″	57 x 38	11.6	12″	77 x 52	21.9	12″
24 x 18	. 2.2	12″	42 x 29	. 6.5	12″	64 x 43	14.7	12″	83 x 57	26.0	12″
1″ Deep Corrugations											
60 x 46	15.6	15″	81 x 59	27.4	18″	103 x 71	42.4	18″	128 x 83	60.5	24″
66 x 51	19.3	15″	87 x 63	32.1	18″	112 x 75	48.0	21″	137 x 87	67.4	24″
73 x 5.	23.2	18″	95 x 67	37.0	18″	117 x 79	54.2	21″	142 x 91	74.5	24″

Pipe-Arch - Multi Plate

	2″ Deep Corrugations											
	Shape (Inches)	Volume (ft^3/ft)	Min. Cover Height	Shape (Inches)	Volume (ft^3/ft)	Min. Cover Height	Shape (Inches)	Volume (ft^3/ft)	Min. Cover Height	Shape (Inches)	Volume (ft^3/ft)	Min. Cover Height
18-in Corner Radius (Rc)	6-1 x 4-7	22	12″	8-7 x 5-11	41	18″	8-7 x 5-11	41	18″	14-1 x 8-9	97	24″
	6-4 x 4-9	24	12″	8-10 x 6-1	43	18″	8-10 x 6-1	43	18″	14-3 x 8-11	101	24″
	6-9 x 4-11	26	12″	9-4 x 6-3	46	18″	9-4 x 6-3	46	18″	14-10 x 9-1	105	24″
	7-0 x 5-1	29	12″	9-6 x 6-5	49	18″	9-6 x 6-5	49	18″	15-4 x 9-3	109	24″
	7-3 x 5-3	31	12″	9-9 x 6-7	52	18″	9-9 x 6-7	52	18″	15-6 x 9-5	114	24″
	7-8 x 5-5	33	12″	10-3 x 6-9	55	18″	10-3 x 6-9	55	18″	15-8 x 9-7	118	24″
	7-11 x 5-7	36	12″	10-8 x 6-11	58	18″	10-8 x 6-11	58	18″	15-10 x 9-10	122	24″
	8-2 x 5-9	38	18″	10-11 x 7-1	61	18″	10-11 x 7-1	61	18″	16-5 x 9-11	126	30″
							13-11 x 8-7	93	24″	16-7 x 10-1	131	30″
31-in Corner Radius (Rc)	13-3 x 9-4	98	24″	15-4 x 10-4	124	24″	17-2 x 11-4	153	30″	19-3 x 12-4	185	30″
	13-6 x 9-6	102	24″	15-7 x 10-6	129	24″	17-5 x 11-6	158	30″	19-6 x 12-6	191	30″
	14-0 x 9-8	106	24″	15-10 x 10-8	134	24″	17-11 x 11-8	163	30″	19-8 x 12-8	196	30″
	14-2 x 9-10	111	24″	16-3 x 10-10	138	30″	18-1 x 11-10	168	30″	19-11 x 12-10	202	30″
	14-5 x 10-0	115	24″	16-6 x 11-0	143	30″	18-7 x 12-0	174	30″	20-5 x 13-0	208	36″
	14-11 x 10-2	120	24″	17-0 x 11-2	148	30″	18-9 x 12-2	179	30″	20-7 x 13-2	214	36″



Next Steps

Learn more

Read our white paper, *Economic Optimization of Infiltration Systems*, to learn more. You'll receive free PDH credits for completing a quick quiz.

Available at www.contech-cpi.com/cmp

Connect with us

We're always available to make your job easier. Search for your local rep at www.contech-cpi.com. While you're there, be sure to check out our upcoming seminar schedule or request an in-house technical presentation.

Start a Project

If you are ready to begin a project, check out our DYODS calculator available for adjustable and rectangular CMP systems. Download at www.contech-cpi.com/cmp.

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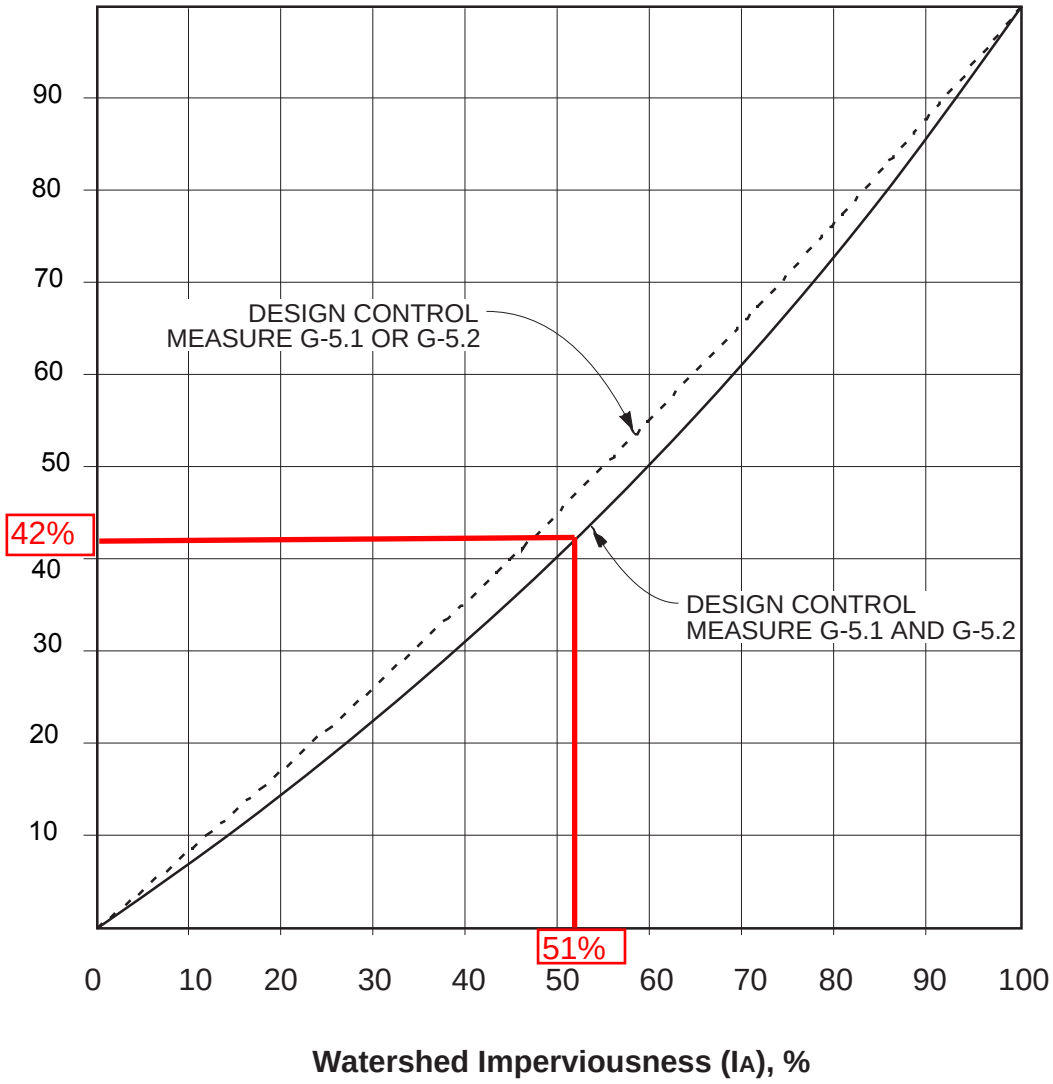
FSC

APPENDIX G

Treatment Volume Calculations

Table 3.4 Calculation Sheet for Determination of Total Imperviousness				
Site Element	**Unit Area (sf)**	**% Imperviousness**	**Weighting Factor (2)**	**Weighted % Impervious (3,4)**
Asphalt/Concrete - Street	30074.7851	100	0.08	8
Asphalt/Concrete - Sidewalk	11382	100	0.03	3
Gravel Pavement	0	40	0.00	0
Roofs	155200	90	0.42	38
Porous Pavement	27052	35	0.07	3
Lawn/Open Space	146988.2976	0	0.40	0
Total Contributing Area (1)	370697.0827	-	-	51

From Ventura County Technical Guidance Manual



G-5.1: TURF BUFFER
G-5.2: GRASS-LINED CHANNEL

ADAPTED FROM URBAN STORM DRAIN CRITERIA MANUAL VOL. 3 - BEST MANAGEMENT PRACTICES, URBAN DRAINAGE AND FLOOD CONTROL DISTRICT,11/99

Figure 3-4. DETERMINATION OF EFFECTIVE IMPERVIOUSNESS

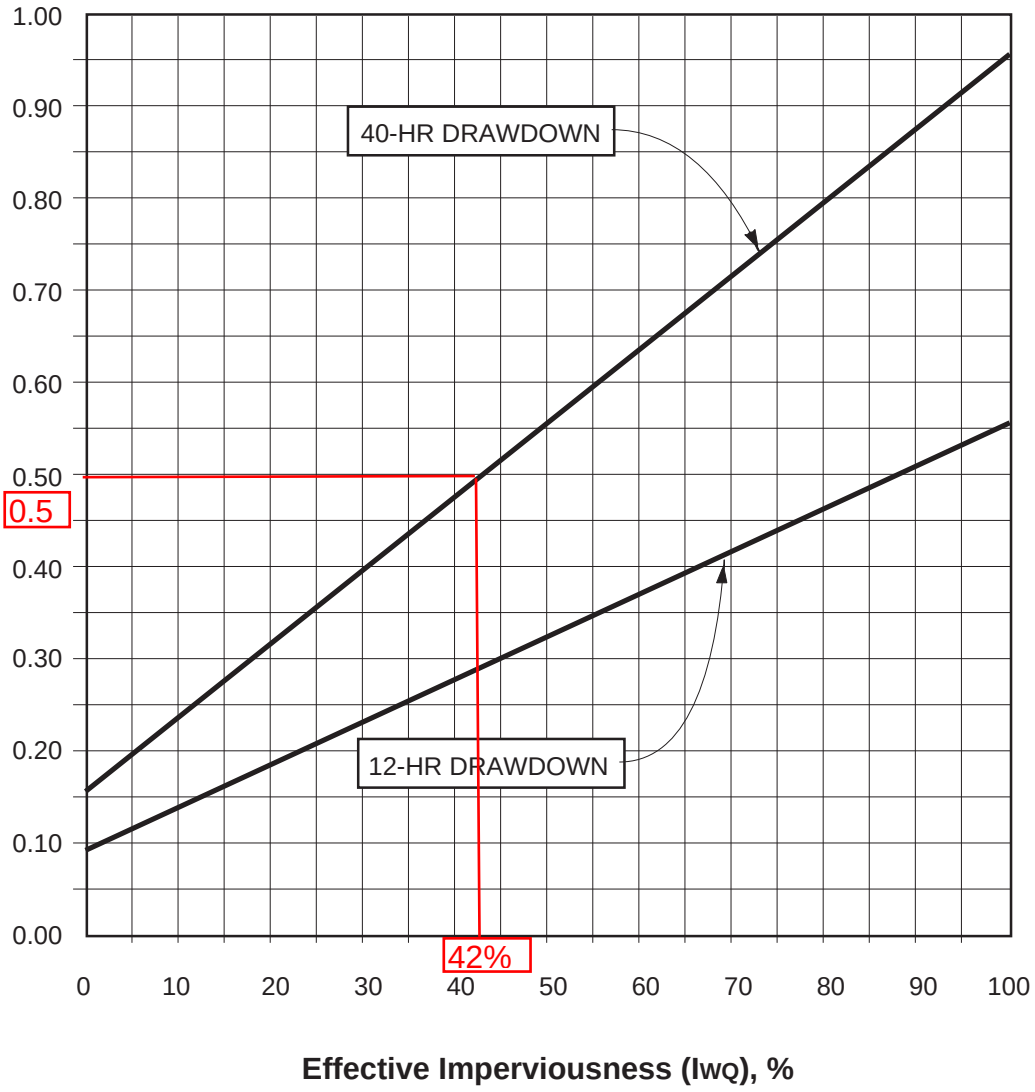


Figure 5-1. Unit Basin Storage Volume vs. Effective Imperviousness

PROJECT: Oxnard Shores North TT5888 J.N OSC1 3650

DESCRIPTION: Volume Required for Stormwater Treatment Date: 9/12/2013

Purpose: Calculate Volume required for stormwater Treatment

Reference: (1) Ventura County Stormwater Quality Control Measures

At	Drainage area contributing to control measure
Ai	Area of impervious surfaces in drainage area

At	8.51	ac
Ai	4.38	ac

Ia Percentage of Impervious Area

Ia = (Ai/At)*100

Ia	51.5	%

Determine Efective Imperviousness (Iwq) using figure 3-4 of reference 1

Iwq	42	%

Determine design drawdown period (T) for proposed control measure

T	40	hrs

Determine unit basin storage volume (Vu) for 80% annual capture using figure 5.1 of reference 1

Vu	0.5	in

Calculate the Stormwater Quality Design Volume (SQDV)

Vb = Vu*At

Vb	4.26	in-ac
	0.35	ft-ac
	15445.71	cf

Calculate Design Volume

1.2*SQDV	18534.85	cf

APPENDIX H

Treatment Facility Analysis and Description

Treatment Facilities

Drainage Area Name	Area (ac)	Q10 (cfs)	Q50 (cfs)	Q100 (cfs)
F1	2.52	2.92	4.97	5.84
F2	3.98	3.95	7.95	9.35
G1	0.27	0.25	0.50	0.58
G2	1.74	1.71	3.40	4.00
Total	8.51	8.83	16.82	19.77

Treatment Volume (SQDV) 18,535.00 cf (see SQDV Calculation - Appendix G)

Pervious Pavement

Total Pervious Pavement height

	Porosity	height (in)	Actual height for retention (in)
Pavement	15.0%	4.00	0.60
Base	40.0%	6.00	2.40
Curb	100.0%	3.00	3.00
Total Height for retention			6.00

Treatment Volume from Pervious Pavement:

Drainage Area Name	Area (ac)	Pervious Pavement Area (sf)	Available Volume for Treatment (cf)
F1	2.52	7754.50	3,877.25
F2	3.98	7754.50	3,877.25
G1	0.27	2401.75	1,200.88
G2	1.74	4967.13	2,483.57
Total	8.51	----	11,438.95

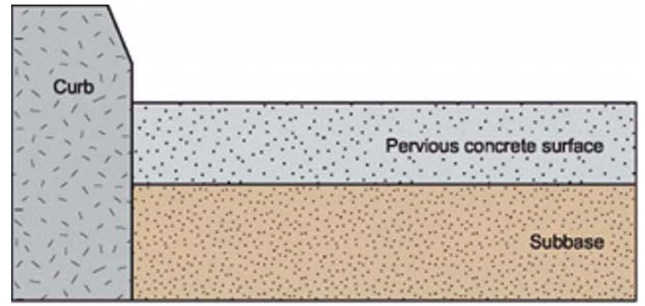
Underground Detention - Infiltration Trench Treatment Option

Treatment Volume from Underground Detention Area:

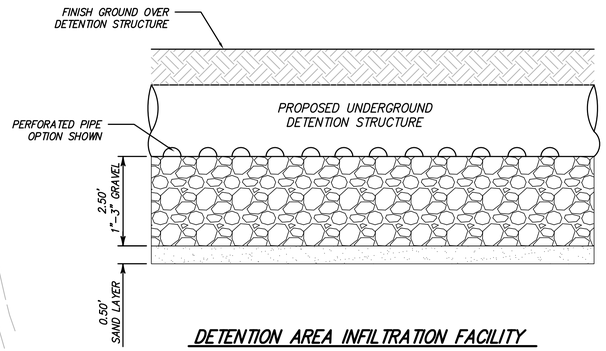
Surface Area:

L=	90	ft
W	40	ft
Area=	3600	sf
total depth of Gravel Bed:	2.5	ft
Total SQDV available=	9000	cf

Total Available SQDV from Pervious Pavement & Trench= 20772.21 cf



PERVIOUS PAVAMENT SECTION



DETENTION AREA INFILTRATION FACILITY

DUNES STREET
CATAMARAN STREET
HARBOR BLVD.
WOOLEY ROAD
CANAL STREET
SOUTHERN CALIFORNIA EDISON CANAL
LOT 1 (9.1)
LOT 2 (9.1)
LOT 3 (9.2)
LOT 4 (9.4)
LOT 5 (9.4)
LOT 6 (9.6)
LOT 7 (9.7)
LOT 8 (9.2)
LOT 9 (9.1)
LOT 10 (9.1)
LOT 11 (9.2)
LOT 12 (9.4)
LOT 13 (9.3)
LOT 14 (6.2)
LOT 15 (7.1)
LOT 16 (6.1)
LOT 17 (6.1)

LEGEND

PROPOSE PREVIOUS PAVEMENT AREAS

PROPOSE INFILTRATION AREA UNDER DETENTION BASIN

80' 40' 0' 80' 160'
GRAPHIC SCALE: 1"=80'

PROPOSED TREATMENT

JENSEN DESIGN & SURVEY, INC
www.jdscivil.com
1672 DONLON STREET
VENTURA, CALIF. 93003
PHONE 805/654-6977
FAX 805/654-6979

SCALE: 1"=80' | J.N.: OSC1 3650
DATE: Mar. 15, 2016 | DWG. NAME: 3650 Treatment options.dwg

HYDROLOGY EXHIBIT
FOR
OXNARD SHORES NORTH

Tentative Tract No. 5888
City of Oxnard
COUNTY OF VENTURA STATE OF CALIFORNIA

FIGURE 3
APPENDIX H

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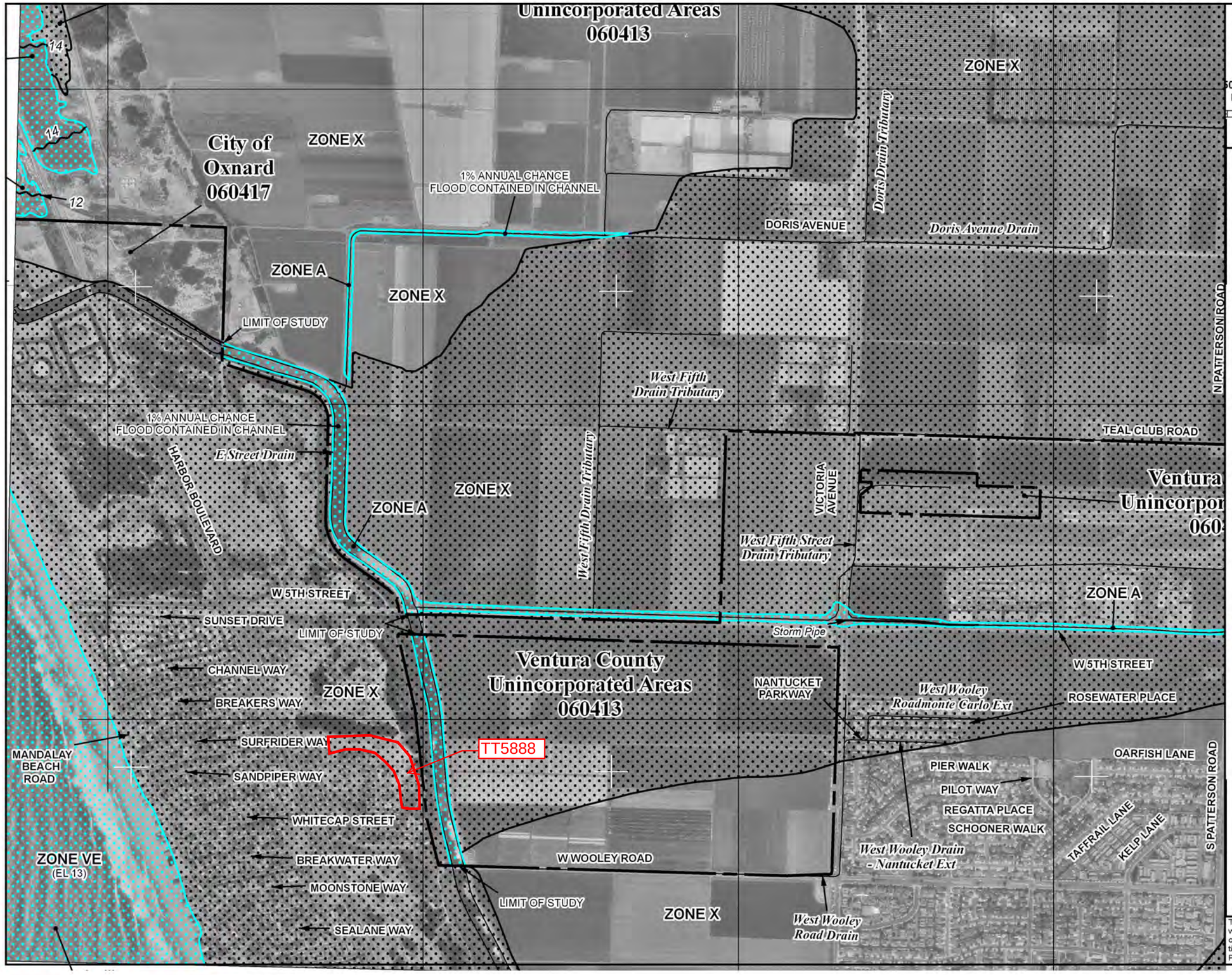
APPENDIX I

Flood Insurance Rate Map



MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METER

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0905E

FIRM

FLOOD INSURANCE RATE MAP

VENTURA COUNTY, CALIFORNIA
AND INCORPORATED AREAS

PANEL 905 OF 1275
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
OXNARD, CITY OF	060417	0905	E
SAN BUENAVENTURA, CITY OF	060419	0905	E
VENTURA COUNTY	060413	0905	E

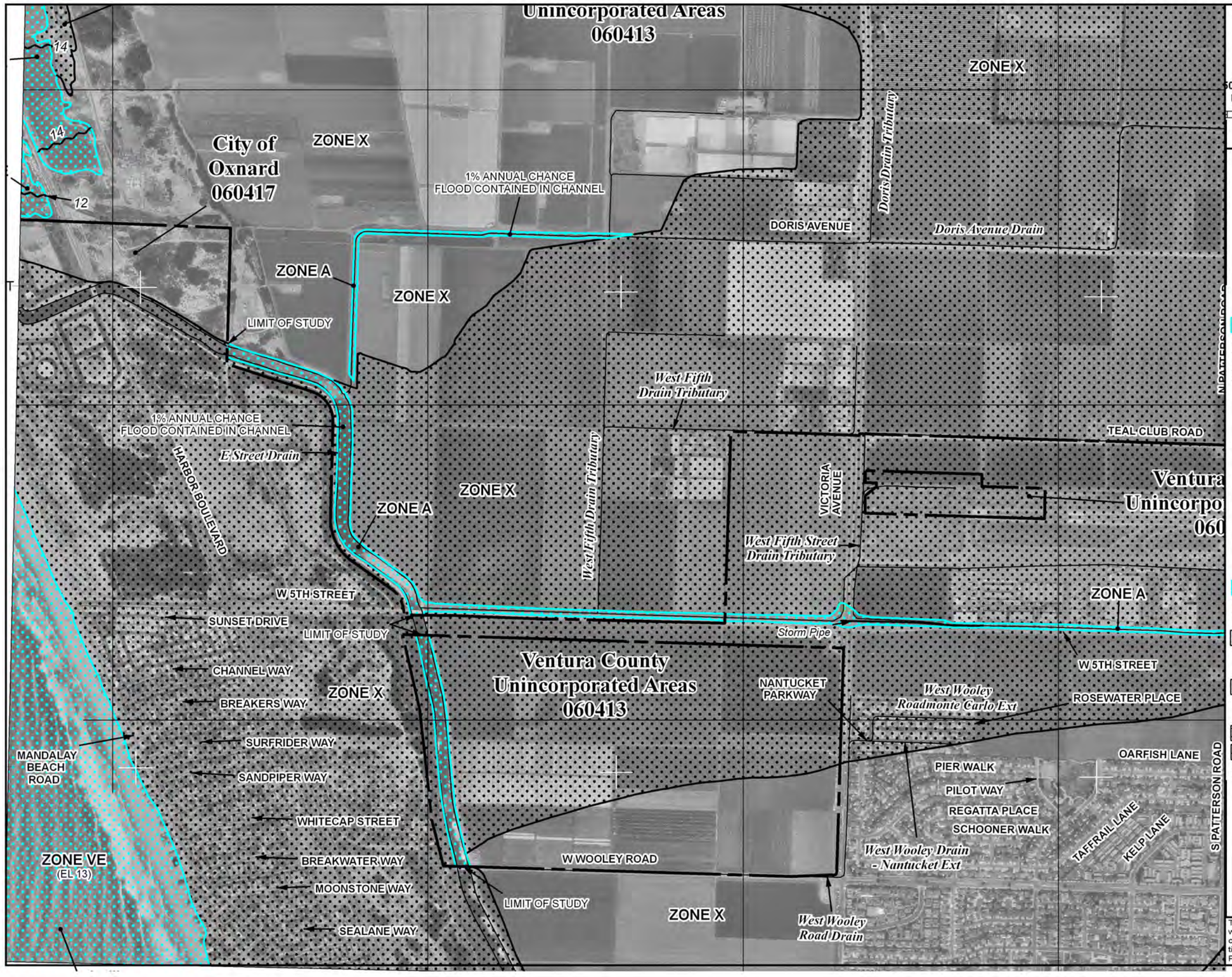
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06111C0905E

EFFECTIVE DATE
JANUARY 20, 2010

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 1000'

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FEET

METER

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

1% annual chance floodplain boundary

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APPENDIX J

Catch Basin Sizing Analysis

Catch Basin Sizing

Date: 22-Mar-16

Project: Oxnard Shores North TT 5888

Sump Condition

Based on:

Q=3.087W(h)^1.5

h = height of opening

W = width of opening

Proposed Catch Basin No. 7 (Sump)

Runoff from Drainage Area G1, G2

	Q (cfs)	Catch Basin h (in)	Required Width (ft)	Proposed Width (ft)	Capacity of Proposed CB (cfs)
10-Year Storm	2.4	7.00	1.71	3.50	4.8
50-Year Storm	4.0	7.00	2.91	3.50	4.8
100-Year Storm	4.7	7.00	3.42	3.50	4.8

Proposed Catch Basin No. 5 (SUMP)

Runoff from Drainage Area F2

	Q (cfs)	Catch Basin h (in)	Required Width (ft)	Proposed Width (ft)	Capacity of Proposed CB (cfs)
10-Year Storm	4.6	7.00	3.37	7.00	9.6
50-Year Storm	7.9	7.00	5.74	7.00	9.6
100-Year Storm	9.3	7.00	6.75	7.00	9.6

Proposed Catch Basin No. 6 (SUMP)

Runoff from Drainage Area F1

	Q (cfs)	Catch Basin h (in)	Required Width (ft)	Proposed Width (ft)	Capacity of Proposed CB (cfs)
10-Year Storm	2.9	7.00	2.14	4.50	6.2
50-Year Storm	5.0	7.00	3.64	4.50	6.2
100-Year Storm	5.9	7.00	4.28	4.50	6.2

Existing Catch Basin No. 1 (SUMP)

Runoff from Drainage Area B,C,D,G,I	Q (cfs)	Catch Basin h (in)	Required Width (ft)	Width (ft)	Capacity of Proposed CB (cfs)
10-Year Storm	19.6	7.00	14.27	21.00	28.9
50-Year Storm	33.4	7.00	24.26	21.00	28.9
100-Year Storm	39.3	7.00	28.55	21.00	28.9

Proposed Runoff for Existing Catch Basin No. 1 (SUMP)

Runoff from Drainage Area B,C,D,G1,G2,I	Proposed Q (cfs)	Catch Basin h (in)	Required Width (ft)	Width (ft)	Capacity of Proposed CB (cfs)
10-Year Storm	20.3	7.00	14.78	21.00	28.9
50-Year Storm	34.6	7.00	25.13	21.00	28.9
100-Year Storm	40.7	7.00	29.56	21.00	28.9

APPENDIX K

PAD Protection Analysis

PAD PROTECTION SECTION A-A

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

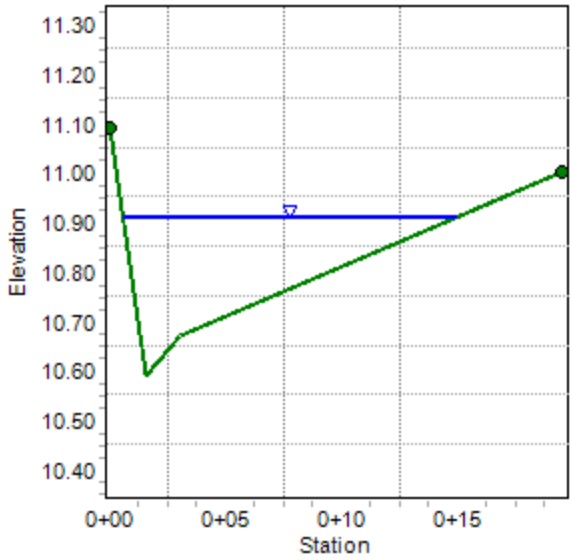
Refer to Figure 2 of Appendix D for section location

Input Data

Channel Slope	0.02300	ft/ft
Normal Depth	0.32	ft
Discharge	9.28	ft^3/s

Q100 Area F2

Cross Section Image



PAD PROTECTION SECTION B-B

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

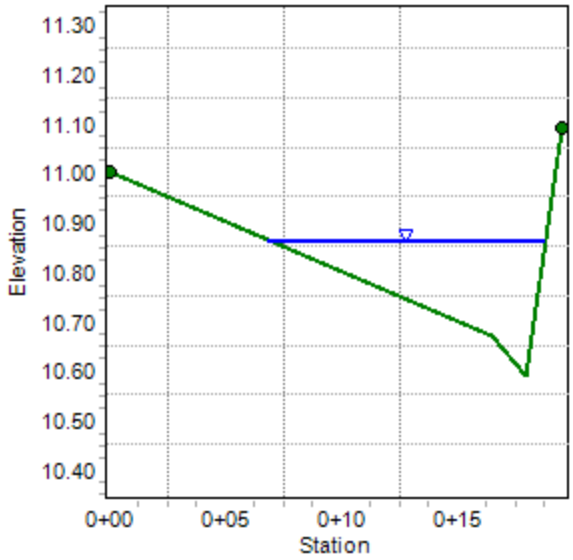
Refer to Figure 2 of Appendix D for section location

Input Data

Channel Slope	0.02300	ft/ft
Normal Depth	0.28	ft
Discharge	5.89	ft^3/s

Q100 Area F1

Cross Section Image



PAD PROTECTION SECTION C-C

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

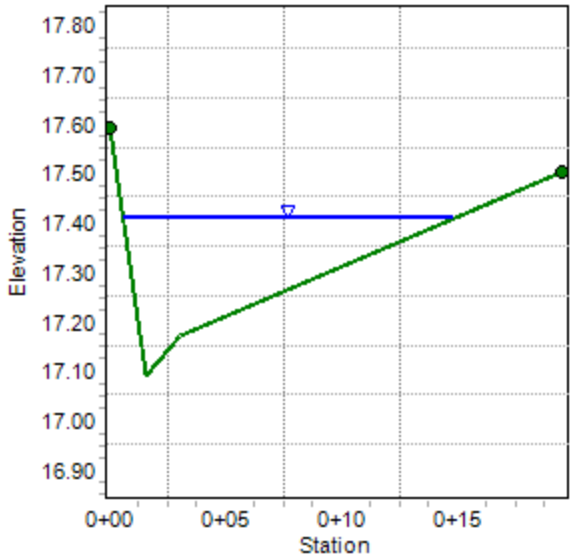
Refer to Figure 2 of Appendix D for section location

Input Data

Channel Slope	0.00450	ft/ft
Normal Depth	0.32	ft
Discharge	4.07	ft^3/s

Q100 Area G2

Cross Section Image



PAD PROTECTION SECTION D-D

Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

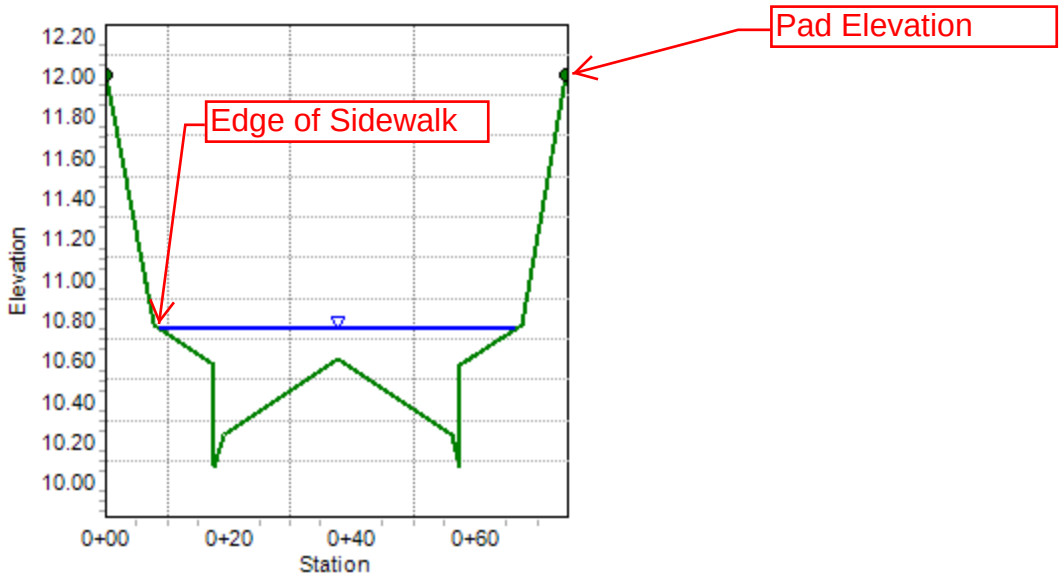
Refer to Figure 2 of Appendix D for section location

Input Data

Channel Slope	0.00400	ft/ft
Normal Depth	0.68	ft
Discharge	47.17	ft³/s

Q50
Areas:
B,C,D,G1,G2,I,A

Cross Section Image



APPENDIX L

Tc & VCRat Results

VENTURA COUNTY WATERSHED PROTECTION DISTRICT
TIME OF CONCENTRATION
TC Program Version: 2.6.2008.11
Project:
Date: 12:00:00 AM
Engineer:
Consultant:

S U M M A R Y O F C O M P U T A T I O N S

Watershed Name: Watershed

Name	Zone	Storm	Soil	Area (acres)	TC (min)
Area A	K	10	6.90	6.4 / 6	18.395 / 18
Area A	K	25	6.90	6.4 / 6	16.178 / 16
Area A	K	50	6.90	6.4 / 6	14.720 / 15
Area A	K	100	6.90	6.4 / 6	12.959 / 13
Area B	K	10	6.90	3.7 / 4	18.956 / 19
Area B	K	25	6.90	3.7 / 4	16.763 / 17
Area B	K	50	6.90	3.7 / 4	15.179 / 15
Area B	K	100	6.90	3.7 / 4	13.511 / 14
Area C	K	10	6.90	3.7 / 4	5.710 / 6
Area C	K	25	6.90	3.7 / 4	TC ERROR Use 5
Area C	K	50	6.90	3.7 / 4	TC ERROR Use 5
Area C	K	100	6.90	3.7 / 4	TC ERROR Use 5
Area D	K	10	6.90	4.0 / 4	5.230 / 5
Area D	K	25	6.90	4.0 / 4	TC ERROR Use 5
Area D	K	50	6.90	4.0 / 4	TC ERROR Use 5
Area D	K	100	6.90	4.0 / 4	TC ERROR Use 5
Area F1	K	10	6.90	4.1 / 4	10.229 / 10
Area F1	K	25	6.90	4.1 / 4	9.558 / 10
Area F1	K	50	6.90	4.1 / 4	8.946 / 9
Area F1	K	100	6.90	4.1 / 4	8.267 / 8
Area F2	K	10	6.90	3.1 / 3	12.196 / 12
Area F2	K	25	6.90	3.1 / 3	11.221 / 11
Area F2	K	50	6.90	3.1 / 3	10.590 / 11
Area F2	K	100	6.90	3.1 / 3	9.754 / 10
Area G1	K	10	6.90	1.0 / 1	6.047 / 6
Area G1	K	25	6.90	1.0 / 1	5.589 / 6
Area G1	K	50	6.90	1.0 / 1	5.204 / 5
Area G1	K	100	6.90	1.0 / 1	TC ERROR Use 5
Area E	K	10	6.90	0.9 / 1	TC ERROR Use 5
Area E	K	25	6.90	0.9 / 1	TC ERROR Use 5
Area E	K	50	6.90	0.9 / 1	TC ERROR Use 5
Area E	K	100	6.90	0.9 / 1	NaN / Na Use 5
Area I	K	10	6.90	2.5 / 3	7.348 / 7
Area I	K	25	6.90	2.5 / 3	6.027 / 6
Area I	K	50	6.90	2.5 / 3	5.291 / 5
Area I	K	100	6.90	2.5 / 3	TC ERROR Use 5

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Job: 1 Project: Oxnard Shores North TT 5888

10 Year Results

Project Description

VCRat version: 2.6.2008.11
VCRain version: 200703
DOS EXE version: PC 2.2-200809

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: Oxnard Shores North TT 5888

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	ACCUMULATED AREA (AC)	ACCUMULATED FLOW (CFS)	TIME (MIN)	CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)	N VALUES CHNL	N VALUES SIDES	VEL (FT/S)	DEPTH (FT)
1A : Area A																		
1A	070	K10	18	70	64	80	64	80	1154	PIPE	80	0.00499	3.75	----	-----	-----	--	--
2B : Area B																		
2B	070	K10	19	70	37	45	37	45	1154	-------	----	-------	---	----	-----	-----	--	--
3C : Area G1																		
3C	070	K10	6	70	10	27	10	27	1153	40' ROAD	344	0.00576	---	----	-----	-----	--	--
4C : Area D																		
4C	070	K10	5	70	40	118	50	130	1153	#PIPE	313	0.00316	4.75	----	-----	-----	--	--
5C : Area I																		
5C	070	K10	7	70	25	60	75	184	1155	#PIPE	746	0.00466	5.00	----	-----	-----	--	--
6C : Area C																		
6C	070	K10	6	70	37	99	112	253	1156	#PIPE	207	0.00400	5.75	----	-----	-----	--	--
7BC: Bank B & C																		
7BC	**********																	
	* Peak in B: 44.70 cfs @ 1154 min Q in C: 209.62 cfs Combined Q: 254.32 cfs *																	
	* Peak in C: 247.47 cfs @ 1156 min Q in B: 44.47 cfs Combined Q: 291.93 cfs *																	
	* Combined Peak: 291.93 cfs @ 1156 min Q in B: 44.47 cfs Q in C: 247.47 cfs *																	
	**********																	
7BC	---	---	--	--	112	247	149	292	1156	PIPE	69	0.00288	6.50	----	-----	-----	--	--
8A : Clearing Hydrograph Bank: C																		
8A	---	---	--	--	---	---	64	80	1154	-------	----	-------	---	----	-----	-----	--	--
9AB: Junction Bank A & B																		
9AB	**********																	
	* Peak in A: 79.53 cfs @ 1154 min Q in B: 247.87 cfs Combined Q: 327.40 cfs *																	
	* Peak in B: 291.08 cfs @ 1157 min Q in A: 78.71 cfs Combined Q: 369.79 cfs *																	
	* Combined Peak: 369.79 cfs @ 1157 min Q in A: 78.71 cfs Q in B: 291.08 cfs *																	
	**********																	
9AB	---	---	--	--	149	291	213	370	1157	-------	----	-------	---	----	-----	-----	--	--
10A : Clear Bank B																		
10A : Clearing Hydrograph Bank: B																		
10A	---	---	--	--	---	---	213	370	1157	-------	----	-------	---	----	-----	-----	--	--
11B : Area F1																		
11B	070	K10	10	70	41	77	41	77	1154	-------	----	-------	---	----	-----	-----	--	--
12C : Area F2																		
12C	070	K10	12	70	31	52	31	52	1154	-------	----	-------	---	----	-----	-----	--	--
13BC: Junction Areas F1 & F2																		
13BC	---	---	--	--	31	52	72	129	1154	PIPE	134	0.00400	4.50	----	-----	-----	--	--
14AB: Junction all areas																		
14AB	**********																	
	* Peak in A: 369.79 cfs @ 1157 min Q in B: 123.96 cfs Combined Q: 493.75 cfs *																	
	* Peak in B: 128.41 cfs @ 1154 min Q in A: 327.40 cfs Combined Q: 455.81 cfs *																	
	* Combined Peak: 494.16 cfs @ 1156 min Q in A: 367.92 cfs Q in B: 126.24 cfs *																	
	**********																	
14AB	---	---	--	--	72	128	285	494	1156	PIPE	304	0.00312	7.75	----	-----	-----	--	--
15A : 10 Year Flow (Non Fatten Hydrograph)																		
15A	---	---	--	--	---	---	285	491	1157	-------	----	-------	---	----	-----	-----	--	--

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: Oxnard Shores North TT 5888

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	ACCUMULATED DATA -- AREA (AC)	ACCUMULATED DATA -- FLOW (CFS)	ACCUMULATED DATA -- TIME (MIN)	ROUTING AFTER ACCUMULATION -- CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)	N VALUES -- CHNL	N VALUES -- SIDES	VEL (FT/S)	DEPTH (FT)
16A : 10 Year Storm Fattened Hydrograph																		
16A	---	---	--	--	---	---	285	491	1157	-------	----	-------	---	----	-----	-----	--	--
16A : Fatten Hydrograph																		
	* INCOMING HYDROGRAPH PEAK (cfs): 490.82 VOLUME (acre-ft): 83.06 *																	
	* NO HYDROGRAPH ADJUSTMENT *																	
	* RUNOFF FACTOR(in): 1.82 TOTAL RAIN(in): 4.50 SCS Curve: 72 *																	
	* FATTENED HYDROGRAPH PEAK (cfs): 490.82 VOLUME (acre-ft): 43.28 *																	
16A	---	---	--	--	---	---	285	491	----	-------	----	-------	---	----	-----	-----	--	--
17A	---	---	--	--	---	---	285	491	1157	-------	----	-------	---	----	-----	-----	--	--

Issue/Warning Messages

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE
Warning	Err1260	FATTENING	16A	Fattening reduced the volume of the hydrograph. It is recommended to remove fattening from the model.

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Q50 Results

Job: 1 Project: Oxnard Shores North TT 5888

Project Description

VCRat version: 2.6.2008.11
VCRain version: 200703
DOS EXE version: PC 2.2-200809

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	ACCUMULATED AREA (AC)	ACCUMULATED FLOW (CFS)	TIME (MIN)	CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)	N VALUES CHNL	N VALUES SIDES	VEL (FT/S)	DEPTH (FT)
1A : Area A																		
1A	070	K50	15	70	64	126	64	126	1154	PIPE	80	0.00499	4.25	----	-----	-----	--	--
2B : Area B																		
2B	070	K50	15	70	37	73	37	73	1154	-------	----	-------	---	----	-----	-----	--	--
3C : Area G1																		
3C	070	K50	5	70	10	37	10	37	1153	40' ROAD	344	0.00576	---	----	-----	-----	--	--
4C : Area D																		
4C	070	K50	5	70	40	148	50	169	1154	#PIPE	313	0.00316	5.25	----	-----	-----	--	--
5C : Area I																		
5C	070	K50	5	70	25	92	75	249	1155	#PIPE	746	0.00466	5.75	----	-----	-----	--	--
6C : Area C																		
6C	070	K50	5	70	37	137	112	345	1155	#PIPE	207	0.00400	6.50	----	-----	-----	--	--
7BC: Bank B & C																		
7BC	**********																	
* Peak in B: 73.13 cfs @ 1154 min Q in C: 298.00 cfs Combined Q: 371.13 cfs *																		
* Peak in C: 337.93 cfs @ 1156 min Q in B: 71.36 cfs Combined Q: 409.29 cfs *																		
* Combined Peak: 409.29 cfs @ 1156 min Q in B: 71.36 cfs Q in C: 337.93 cfs *																		
7BC	**********																	
7BC	---	---	--	--	112	338	149	409	1156	PIPE	69	0.00288	7.50	----	-----	-----	--	--
8A : Clearing Hydrograph Bank: B																		
8A	---	---	--	--	---	---	64	126	1154	-------	----	-------	---	----	-----	-----	--	--
9AB: Junction Bank A & B																		
9AB	**********																	
* Peak in A: 126.22 cfs @ 1154 min Q in B: 362.48 cfs Combined Q: 488.71 cfs *																		
* Peak in B: 408.64 cfs @ 1156 min Q in A: 124.35 cfs Combined Q: 532.98 cfs *																		
* Combined Peak: 532.98 cfs @ 1156 min Q in A: 124.35 cfs Q in B: 408.64 cfs *																		
9AB	**********																	
9AB	---	---	--	--	149	409	213	533	1156	-------	----	-------	---	----	-----	-----	--	--
10A : Clear Bank B																		
10A : Clearing Hydrograph Bank: B																		
10A	---	---	--	--	---	---	213	533	1156	-------	----	-------	---	----	-----	-----	--	--
11B : Area F1																		
11B	070	K50	9	70	41	107	41	107	1154	-------	----	-------	---	----	-----	-----	--	--
12C : Area F2																		
12C	070	K50	11	70	31	72	31	72	1154	-------	----	-------	---	----	-----	-----	--	--
13BC: Junction Areas F1 & F2																		
13BC	---	---	--	--	31	72	72	180	1154	PIPE	134	0.00400	5.25	----	-----	-----	--	--
14AB: Junction all areas																		
14AB	**********																	
* Peak in A: 532.98 cfs @ 1156 min Q in B: 173.24 cfs Combined Q: 706.23 cfs *																		
* Peak in B: 179.42 cfs @ 1154 min Q in A: 488.71 cfs Combined Q: 668.12 cfs *																		
* Combined Peak: 706.23 cfs @ 1156 min Q in A: 532.98 cfs Q in B: 173.24 cfs *																		
14AB	**********																	
14AB	---	---	--	--	72	179	285	706	1156	#CHANNEL	304	0.00312	11	0.00	0.000	0.000	--	--
15A : 50 Year Flow (Non Fatten Hydrograph)																		
15A	---	---	--	--	---	---	285	702	1156	-------	----	-------	---	----	-----	-----	--	--

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	ACCUMULATED DATA AREA (AC)	ACCUMULATED DATA FLOW (CFS)	ACCUMULATED DATA TIME (MIN)	ROUTING AFTER ACCUMULATION CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)	N VALUES CHNL	N VALUES SIDES	VEL (FT/S)	DEPTH (FT)
16A : 50 Year Storm Fattened Hydrograph																		
16A	---	---	--	--	---	---	285	702	1156	-------	----	-------	---	----	-----	-----	--	--
16A : Fatten Hydrograph																		
* INCOMING HYDROGRAPH PEAK (cfs): 702.16 VOLUME (acre-ft): 120.76 *																		
* NO HYDROGRAPH ADJUSTMENT *																		
* RUNOFF FACTOR(in): 2.99 TOTAL RAIN(in): 6.00 SCS Curve: 72 *																		
* FATTENED HYDROGRAPH PEAK (cfs): 702.16 VOLUME (acre-ft): 71.12 *																		
16A	---	---	--	--	---	---	285	702	----	-------	----	-------	---	----	-----	-----	--	--
17A	---	---	--	--	---	---	285	702	1156	-------	----	-------	---	----	-----	-----	--	--

Issue/Warning Messages

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE
Warning	Err1260	FATTENING	16A	Fattening reduced the volume of the hydrograph. It is recommended to remove fattening from the model.

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Modified Rational Model Results Report

Job: 1 Project: Oxnard Shores North TT 5888

Q100 Results

Project Description

VCRat version: 2.6.2008.11
VCRain version: 200703
DOS EXE version: PC 2.2-200809

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: Oxnard Shores North TT 5888

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	ACCUMULATED AREA (AC)	ACCUMULATED FLOW (CFS)	TIME (MIN)	CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)	N VALUES CHNL	N VALUES SIDES	VEL (FT/S)	DEPTH (FT)
1A : Area A																		
1A	070	K100	13	70	64	154	64	154	1154	PIPE	80	0.00499	4.75	----	-----	-----	--	--
2B : Area B																		
2B	070	K100	14	70	37	85	37	85	1154	-------	----	-------	---	----	-----	-----	--	--
3C : Area G1																		
3C	070	K100	5	70	10	42	10	42	1153	40' ROAD	344	0.00576	---	----	-----	-----	--	--
4C : Area D																		
4C	070	K100	5	70	40	167	50	190	1153	#PIPE	313	0.00316	5.50	----	-----	-----	--	--
5C : Area I																		
5C	070	K100	5	70	25	105	75	271	1154	#PIPE	746	0.00466	5.75	----	-----	-----	--	--
6C : Area C																		
6C	070	K100	5	70	37	155	112	370	1156	#PIPE	207	0.00400	6.75	----	-----	-----	--	--
7BC: Bank B & C																		
7BC	**********																	
	* Peak in B: 85.37 cfs @ 1154 min Q in C: 345.89 cfs Combined Q: 431.26 cfs *																	
	* Peak in C: 364.77 cfs @ 1156 min Q in B: 84.79 cfs Combined Q: 449.56 cfs *																	
	* Combined Peak: 449.56 cfs @ 1156 min Q in B: 84.79 cfs Q in C: 364.77 cfs *																	
	**********																	
7BC	---	---	--	--	112	365	149	450	1156	PIPE	69	0.00288	7.75	----	-----	-----	--	--
8A : Clearing Hydrograph Bank: C																		
8A	---	---	--	--	---	---	64	154	1155	-------	----	-------	---	----	-----	-----	--	--
9AB: Junction Bank A & B																		
9AB	**********																	
	* Peak in A: 153.94 cfs @ 1155 min Q in B: 441.86 cfs Combined Q: 595.80 cfs *																	
	* Peak in B: 448.10 cfs @ 1156 min Q in A: 153.39 cfs Combined Q: 601.49 cfs *																	
	* Combined Peak: 601.49 cfs @ 1156 min Q in A: 153.39 cfs Q in B: 448.10 cfs *																	
	**********																	
9AB	---	---	--	--	149	448	213	601	1156	-------	----	-------	---	----	-----	-----	--	--
10A : Clear Bank B																		
10A : Clearing Hydrograph Bank: B																		
10A	---	---	--	--	---	---	213	601	1156	-------	----	-------	---	----	-----	-----	--	--
11B : Area F1																		
11B	070	K100	8	70	41	130	41	130	1154	-------	----	-------	---	----	-----	-----	--	--
12C : Area F2																		
12C	070	K100	10	70	31	88	31	88	1154	-------	----	-------	---	----	-----	-----	--	--
13BC: Junction Areas F1 & F2																		
13BC	---	---	--	--	31	88	72	217	1154	PIPE	134	0.00400	5.50	----	-----	-----	--	--
14AB: Junction all areas																		
14AB	**********																	
	* Peak in A: 601.49 cfs @ 1156 min Q in B: 210.41 cfs Combined Q: 811.89 cfs *																	
	* Peak in B: 216.42 cfs @ 1154 min Q in A: 577.31 cfs Combined Q: 793.73 cfs *																	
	* Combined Peak: 811.89 cfs @ 1156 min Q in A: 601.49 cfs Q in B: 210.41 cfs *																	
	**********																	
14AB	---	---	--	--	72	216	285	812	1156	#CHANNEL	304	0.00312	12	0.00	0.000	0.000	--	--
15A : 100 Year Flow (Non Fatten Hydrograph)																		
15A	---	---	--	--	---	---	285	811	1156	-------	----	-------	---	----	-----	-----	--	--

Ventura County Watershed Protection District
Modified Rational Method Hydrology Program (VCRat v2.6)

Job: 1 Project: Oxnard Shores North TT 5888

Model Results

NODE ID	SOIL TYPE	RAIN ZONE	TC (MIN)	% IMP	AREA (AC)	FLOW (CFS)	ACCUMULATED DATA -- AREA (AC)	ACCUMULATED DATA -- FLOW (CFS)	ACCUMULATED DATA -- TIME (MIN)	ROUTING AFTER ACCUMULATION -- CHANNEL TYPE	LENGTH (FT)	SLOPE (FT/FT)	SIZE (FT)	H:V (Z)	N VALUES -- CHNL	N VALUES -- SIDES	VEL (FT/S)	DEPTH (FT)
16A : 100 Year Storm Fattened Hydrograph																		
16A	---	---	--	--	---	---	285	811	1156	-------	----	-------	---	----	-----	-----	--	--
16A : Fatten Hydrograph																		
********** INCOMING HYDROGRAPH PEAK (cfs): 811.13 VOLUME (acre-ft): 165.48 **********																		
* NO HYDROGRAPH ADJUSTMENT *																		
* RUNOFF FACTOR(in): 3.83 TOTAL RAIN(in): 7.00 SCS Curve: 72 *																		
* FATTENED HYDROGRAPH PEAK (cfs): 811.13 VOLUME (acre-ft): 91.06 *																		
16A	---	---	--	--	---	---	285	811	----	-------	----	-------	---	----	-----	-----	--	--
17A	---	---	--	--	---	---	285	811	1156	-------	----	-------	---	----	-----	-----	--	--

Issue/Warning Messages

TYPE	ERR NO	PROCEDURE	LOCATION	MESSAGE
Warning	Err1260	FATTENING	16A	Fattening reduced the volume of the hydrograph. It is recommended to remove fattening from the model.

APPENDIX M

City of Oxnard Letter of Completeness

Development Services Department
Planning Division
214 South C Street • Oxnard, CA 93030 • (805) 385-7858 • Fax (805) 385-7417

October 6, 2011

Mike Marlow
Oxnard Shores Co., LLC
1015 S. Harbor Blvd.
Oxnard, CA 93035

Subject: *Determination of Application Completeness.*
Dunes Subdivision Project – Oxnard Shores North – Planning & Zoning Permit Nos. 11-400-01 (Coastal Development Permit) and 11-300-01 (Tentative Tract Map No. 5888)

Dear Mr. Marlow,

The Planning Division has reviewed the above-referenced application items submitted on September 15, 2011, and additional items received on October 6, 2011. Staff has deemed the application to be Complete as of the date of this letter. I have been assigned as your case planner, and will process, review, analyze, and prepare a staff report for your project.

Your proposed project is subject to the California Environmental Quality Act (CEQA), and an environmental analysis will be required. Planning Division staff will coordinate the environmental analysis in accordance with the CEQA Guidelines, and I will contact you regarding the level of environmental review and any additional fees or deposits that may be necessary.

On **Wednesday, November 2, 2011**, the Development Advisory Committee (DAC) will conduct a preliminary review of the proposed project. The DAC is comprised of representatives from various City departments. The DAC reviews development proposals to ensure they comply with the City's design goals, objectives and standards, including issues relating to site planning, landscaping, building design, and community integration. Due to size limitations of the meeting room, we request that no more than four representatives of your project team attend this meeting. About one week before the meeting date, I will let you know what time to arrive. After the DAC reviews your project, you will receive a written copy of the DAC's comments, concerns and recommendations. To enable further processing of your application, you will need to revise and correct your project exhibits to address these concerns and resubmit the exhibits as required. No further evaluation and permit processing by the DAC and Planning Division staff will occur until we receive the complete set of revised plans, and the DAC members determine all issues have been satisfactorily addressed. Once the DAC is satisfied that the project complies with City standards and their recommendations, I will schedule your project for a Community Workshop.

After completion of the site plan review, your project will be scheduled for a Community Workshop presentation. Staff prepares an agenda for each Community Workshop, and it is the Applicant's responsibility to reproduce and distribute (via U.S. Mail) the agenda to all property owners within the neighborhood in which your proposed development is located. If your project is adjacent to one or more neighborhoods, all property owners of the adjacent neighborhood(s) must also be notified. Signs on the project site will be required for the Community Workshop. The Community Workshop Requirements and On-Site Posting Requirements are available from the City webpage. Go to www.planning.cityofoxnard.org then "Handouts & Applications" (on the right side of the page) to locate these selections.

The Planning Division may, in the course of processing your permit, request that you clarify, amplify, correct or otherwise supplement the information provided for the application in accordance with Section 65944 of the State Government Code.

If you have questions regarding this letter or the permit process, please call me at (805) 385-8312 or e-mail at 'Brian.Foote@ci.oxnard.ca.us'.

Sincerely,



Brian Foote, AICP
Associate Planner

Appendix H

Noise Data and Modeling

- Measurement A – Wooley
- Measurement B – Harbor
- Model Results Existing Morning
- Model Results Existing Afternoon
- Model Results Existing Afternoon+Project
- Model Results Cumulative Afternoon
- Model Results Cumulative Afternoon+Project
- TNM Input Data (Existing Morning sample)

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 69.9 - 2016/07/30 07:32:17
- Level Range : 40-100
- SEL : 83.6
- Leq : 54.0
-

No.s	Date Time	(dB)				
1	2016/07/30 07:23:24	56.8	48.6	50.4	50.7	46.5
6	2016/07/30 07:23:39	45.6	46.1	45.4	50.3	53.4
11	2016/07/30 07:23:54	50.7	51.6	51.1	49.2	49.0
16	2016/07/30 07:24:09	47.8	46.5	46.4	49.3	45.0
21	2016/07/30 07:24:24	47.7	53.5	52.5	49.1	47.0
26	2016/07/30 07:24:39	47.2	49.5	50.5	51.4	50.9
31	2016/07/30 07:24:54	52.1	52.1	53.3	54.5	54.0
36	2016/07/30 07:25:09	54.3	53.8	51.1	50.1	49.6
41	2016/07/30 07:25:24	54.0	54.9	53.8	54.9	53.6
46	2016/07/30 07:25:39	53.3	53.4	54.3	53.1	53.4
51	2016/07/30 07:25:54	54.9	54.8	53.4	56.8	53.5
56	2016/07/30 07:26:09	52.7	51.7	51.1	49.2	48.5
61	2016/07/30 07:26:24	48.0	46.0	44.3	44.1	47.6
66	2016/07/30 07:26:39	45.9	53.2	52.4	48.9	50.4
71	2016/07/30 07:26:54	57.9	58.3	54.4	53.6	53.5
76	2016/07/30 07:27:09	56.2	55.6	54.1	53.3	51.9
81	2016/07/30 07:27:24	49.8	45.9	47.5	48.2	51.0
86	2016/07/30 07:27:39	48.8	48.4	48.2	50.7	53.5
91	2016/07/30 07:27:54	56.3	52.7	48.5	53.1	50.0
96	2016/07/30 07:28:09	46.6	47.5	49.4	56.3	57.5
101	2016/07/30 07:28:24	54.1	50.1	50.8	54.8	55.4
106	2016/07/30 07:28:39	52.0	51.3	60.7	57.5	61.9
111	2016/07/30 07:28:54	68.3	62.3	58.0	54.8	56.1
116	2016/07/30 07:29:09	56.4	56.8	54.9	54.6	52.4
121	2016/07/30 07:29:24	54.5	53.4	52.6	52.0	51.4
126	2016/07/30 07:29:39	46.6	46.7	46.7	47.8	55.1
131	2016/07/30 07:29:54	52.0	47.7	46.7	48.1	52.9
136	2016/07/30 07:30:09	55.4	55.6	56.4	53.6	51.4
141	2016/07/30 07:30:24	52.1	48.4	46.9	45.2	45.2
146	2016/07/30 07:30:39	46.1	47.8	46.4	47.2	48.6
151	2016/07/30 07:30:54	52.1	50.5	48.9	52.4	52.0
156	2016/07/30 07:31:09	54.5	56.0	53.5	50.0	48.2
161	2016/07/30 07:31:24	47.2	47.3	45.8	45.6	45.6
166	2016/07/30 07:31:39	45.5	46.0	45.8	55.8	47.8
171	2016/07/30 07:31:54	51.5	54.0	49.9	53.9	54.2
176	2016/07/30 07:32:09	56.1	59.2	68.9	64.5	58.6
181	2016/07/30 07:32:24	55.2	53.2	49.7	47.1	44.9
186	2016/07/30 07:32:39	46.3	47.4	52.1	61.5	63.6
191	2016/07/30 07:32:54	56.3	55.3	57.1	59.4	61.7
196	2016/07/30 07:33:09	56.1	51.6	48.5	49.2	48.3
201	2016/07/30 07:33:24	52.4	52.9	50.4	48.7	54.6
206	2016/07/30 07:33:39	51.4	48.0	49.1	52.2	51.9
211	2016/07/30 07:33:54	50.9	50.0	48.5	49.1	49.0
216	2016/07/30 07:34:09	51.4	53.9	53.6	52.2	48.8
221	2016/07/30 07:34:24	55.0	52.8	49.2	51.2	54.1
226	2016/07/30 07:34:39	53.7	52.3	51.9	52.5	55.7
231	2016/07/30 07:34:54	49.1	54.2	56.5	58.3	58.4
236	2016/07/30 07:35:09	49.9	46.3	47.0	47.5	49.4
241	2016/07/30 07:35:24	51.7	50.7	49.2	47.4	46.8
246	2016/07/30 07:35:39	49.5	48.0	47.0	49.9	47.5
251	2016/07/30 07:35:54	50.0	52.7	49.9	46.2	46.6
256	2016/07/30 07:36:09	47.9	47.6	46.9	49.1	53.7
261	2016/07/30 07:36:24	61.4	58.5	53.5	51.9	49.1
266	2016/07/30 07:36:39	48.3	44.8	43.8	44.4	43.9
271	2016/07/30 07:36:54	46.0	51.3	53.5	53.0	53.0
276	2016/07/30 07:37:09	50.0	48.7	44.9	44.0	44.1
281	2016/07/30 07:37:24	45.0	46.9	50.5	49.5	48.2
286	2016/07/30 07:37:39	48.9	52.1	52.1	50.4	50.3
291	2016/07/30 07:37:54	54.6	57.4	55.0	51.8	48.8
296	2016/07/30 07:38:09	47.1	46.8	46.9	46.2	44.0

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 87.5 - 2016/07/30 07:49:49
- Level Range : 40-100
- SEL : 96.3
- Leq : 66.8
-

No.s	Date Time	(dB)				
1	2016/07/30 07:45:56	68.3	71.0	64.4	62.8	63.9
6	2016/07/30 07:46:11	64.4	57.0	63.9	64.9	67.1
11	2016/07/30 07:46:26	54.8	65.7	52.9	48.4	49.6
16	2016/07/30 07:46:41	67.2	67.6	73.4	72.0	67.2
21	2016/07/30 07:46:56	71.2	69.4	60.5	61.3	55.3
26	2016/07/30 07:47:11	57.1	65.9	57.3	61.7	56.4
31	2016/07/30 07:47:26	74.9	59.0	51.0	66.6	55.5
36	2016/07/30 07:47:41	50.5	61.3	68.5	59.9	55.2
41	2016/07/30 07:47:56	60.5	70.8	60.6	58.6	60.1
46	2016/07/30 07:48:11	70.9	64.7	72.7	69.7	66.8
51	2016/07/30 07:48:26	69.8	65.7	57.4	58.5	62.2
56	2016/07/30 07:48:41	65.4	66.5	63.9	54.7	71.4
61	2016/07/30 07:48:56	59.2	53.9	55.5	64.6	61.5
66	2016/07/30 07:49:11	52.5	59.4	49.7	48.4	51.4
71	2016/07/30 07:49:26	54.1	62.2	72.8	75.0	69.3
76	2016/07/30 07:49:41	74.0	70.1	85.5	63.8	61.4
81	2016/07/30 07:49:56	66.2	70.6	58.1	70.8	62.7
86	2016/07/30 07:50:11	55.1	51.0	62.7	64.5	53.8
91	2016/07/30 07:50:26	50.4	52.0	70.0	66.9	70.3
96	2016/07/30 07:50:41	62.4	64.1	67.6	66.2	69.7
101	2016/07/30 07:50:56	62.5	54.0	53.0	69.4	68.7
106	2016/07/30 07:51:11	57.7	60.6	67.4	71.7	69.7
111	2016/07/30 07:51:26	69.7	66.8	71.2	63.1	65.4
116	2016/07/30 07:51:41	65.3	67.1	67.6	69.4	59.0
121	2016/07/30 07:51:56	61.8	55.4	66.2	62.7	66.5
126	2016/07/30 07:52:11	60.0	63.4	60.3	62.8	68.6
131	2016/07/30 07:52:26	72.0	64.4	65.2	64.3	64.8
136	2016/07/30 07:52:41	56.5	57.9	63.4	72.0	64.7
141	2016/07/30 07:52:56	59.0	64.8	65.6	56.3	58.0
146	2016/07/30 07:53:11	61.1	67.9	61.2	57.1	71.0
151	2016/07/30 07:53:26	57.9	51.4	48.2	47.1	47.5
156	2016/07/30 07:53:41	69.8	61.8	70.9	67.5	57.8
161	2016/07/30 07:53:56	64.6	65.3	53.2	51.7	67.5
166	2016/07/30 07:54:11	68.9	62.7	57.7	55.1	52.5
171	2016/07/30 07:54:26	51.0	54.4	64.7	60.0	63.9
176	2016/07/30 07:54:41	68.0	72.2	62.8	63.8	56.2
181	2016/07/30 07:54:56	62.4	58.5	60.0	55.1	62.4
186	2016/07/30 07:55:11	67.6	66.4	62.6	51.5	51.7
191	2016/07/30 07:55:26	47.6	61.9	72.6	65.5	68.1
196	2016/07/30 07:55:41	58.1	50.5	52.4	56.6	63.3
201	2016/07/30 07:55:56	56.7	46.9	47.9	66.6	57.2
206	2016/07/30 07:56:11	63.1	62.9	59.0	56.3	66.5
211	2016/07/30 07:56:26	59.8	52.2	58.6	80.1	69.6
216	2016/07/30 07:56:41	69.9	68.7	69.5	67.3	58.2
221	2016/07/30 07:56:56	68.4	56.9	60.7	58.3	62.3
226	2016/07/30 07:57:11	53.4	53.7	54.3	64.4	72.0
231	2016/07/30 07:57:26	62.9	56.1	48.3	52.6	67.5
236	2016/07/30 07:57:41	68.3	61.8	61.5	60.8	63.2
241	2016/07/30 07:57:56	65.7	58.8	52.4	53.6	57.0
246	2016/07/30 07:58:11	61.5	52.6	62.8	62.6	54.0
251	2016/07/30 07:58:26	51.1	49.6	46.4	50.9	47.8
256	2016/07/30 07:58:41	45.3	59.0	63.8	50.0	49.3
261	2016/07/30 07:58:56	47.7	56.3	62.6	72.1	73.4
266	2016/07/30 07:59:11	69.9	64.1	53.1	47.4	54.4
271	2016/07/30 07:59:26	70.1	53.4	46.4	44.7	42.8
276	2016/07/30 07:59:41	42.3	42.4	44.1	44.1	45.3
281	2016/07/30 07:59:56	45.0	46.9	49.1	60.2	57.8
286	2016/07/30 08:00:11	62.6	62.8	60.9	53.8	58.9
291	2016/07/30 08:00:26	48.6	45.4	45.3	45.6	47.1
296	2016/07/30 08:00:41	49.0	51.8	61.9	68.6	73.2

<Organization?>
<Analysis By?>
12 August 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Avalong Homes -Existing Run
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
SR1	8	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
SR2	10	1	0.0	59.2	66	59.2	10	----	59.2	0.0	8	-8.0
NM1	14	1	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
NM2	16	1	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

<Organization?>
<Analysis By?>
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Avalong Homes -Existing Run
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

12 August 2016
TNM 2.5
Calculated with TNM 2.5

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
SR1	8	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
SR2	10	1	0.0	59.4	66	59.4	10	----	59.4	0.0	8	-8.0
NM1	14	1	0.0	57.9	66	57.9	10	----	57.9	0.0	8	-8.0
NM2	16	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
SR3	18	1	0.0	41.6	66	41.6	10	----	41.6	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	5	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

RESULTS: SOUND LEVELS **<Project Name?>**

<Organization?> **12 August 2016**
<Analysis By?> **TNM 2.5**
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: **<Project Name?>**
RUN: **Avalong Homes -Existing Run**
BARRIER DESIGN: **INPUT HEIGHTS**
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.
ATMOSPHERICS: **20 deg C, 50% RH**

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
SR1	8	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
SR2	10	1	0.0	59.5	66	59.5	10	----	59.5	0.0	8	-8.0
NM1	14	1	0.0	58.0	66	58.0	10	----	58.0	0.0	8	-8.0
NM2	16	1	0.0	59.8	66	59.8	10	----	59.8	0.0	8	-8.0
SR3	18	1	0.0	41.7	66	41.7	10	----	41.7	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	5	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

<Organization?>
<Analysis By?>
12 August 2016
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: <Project Name?>
RUN: Avalong Homes -Existing Run
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 20 deg C, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
SR1	8	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
SR2	10	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
NM1	14	1	0.0	58.3	66	58.3	10	----	58.3	0.0	8	-8.0
NM2	16	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
SR3	18	1	0.0	41.9	66	41.9	10	----	41.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	5	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

RESULTS: SOUND LEVELS **<Project Name?>**

<Organization?> **12 August 2016**
<Analysis By?> **TNM 2.5**
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: **<Project Name?>**
RUN: **Avalong Homes -Existing Run**
BARRIER DESIGN: **INPUT HEIGHTS**
Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.
ATMOSPHERICS: **20 deg C, 50% RH**

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Increase over existing Crit'n Sub'l Inc	With Barrier Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Noise Reduction Goal	Noise Reduction Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
SR1	8	1	0.0	64.7	66	64.7	10	----	64.7	0.0	8	-8.0
SR2	10	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
NM1	14	1	0.0	58.4	66	58.4	10	----	58.4	0.0	8	-8.0
NM2	16	1	0.0	60.0	66	60.0	10	----	60.0	0.0	8	-8.0
SR3	18	1	0.0	42.0	66	42.0	10	----	42.0	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction Min	Noise Reduction Avg	Noise Reduction Max
		dB	dB	dB
All Selected	5	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

				Peak Hour Trips Percentages		
Roadway Segment	Width (m)	Peak Hour Trips	Speed Limit (km/hr)	%Auto	%Medium	%Heavy
RUN: Existing -Afternoon						
1 Harbor South of 5 -NB	9.7	593	88.5139	99%	1%	0%
1 Harbor South of 5 -SB	9.7	1082	88.5139	99%	1%	0%
2 Harbor North of Wooley -NB	9	583	88.5139	99%	1%	0%
3 Harbor South of Wooley -SB	10.1	815	88.5139	99%	1%	0%
4 Wooley West of Vict. -WB	4.5	413	72.4205	99%	1%	0%
4 Wooley West of Vict -EB	4.5	405	72.4205	99%	1%	0%
RUN: Existing+Project						
1 Harbor South of 5 -NB	9.7	599	88.5139	99%	1%	0%
1 Harbor South of 5 -SB	9.7	1092	88.5139	99%	1%	0%
2 Harbor North of Wooley -NB	9	587	88.5139	99%	1%	0%
2 Harbor North of Wooley -SB	9	1008	88.5139	99%	1%	0%
4 Wooley West of Vict. -WB	4.5	438	72.4205	99%	1%	0%
4 Wooley West of Vict -EB	4.5	410	72.4205	99%	1%	0%
RUN: Cumulative						
1 Harbor South of 5 -NB	9.7	632	88.5139	99%	1%	0%
1 Harbor South of 5 -SB	9.7	1109	88.5139	99%	1%	0%
2 Harbor North of Wooley -NB	9	619	88.5139	99%	1%	0%
2 Harbor North of Wooley -SB	9	1021	88.5139	99%	1%	0%
4 Wooley West of Vict. -WB	4.5	476	72.4205	99%	1%	0%
4 Wooley West of Vict -EB	4.5	415	72.4205	99%	1%	0%
RUN: Cumulative + Project						
1 Harbor South of 5 -NB	9.7	638	88.5139	99%	1%	0%
1 Harbor South of 5 -SB	9.7	1119	88.5139	99%	1%	0%
2 Harbor North of Wooley -NB	9	623	88.5139	99%	1%	0%
2 Harbor North of Wooley -SB	9	1024	88.5139	99%	1%	0%
4 Wooley West of Vict. -WB	4.5	501	72.4205	99%	1%	0%
4 Wooley West of Vict -EB	4.5	420	72.4205	99%	1%	0%

Peak Hour Trips				Peak Hour Trips	Pe Auto
Auto	Medium	Heavy	RUN: Existing Morning		
587	6	0		1003	993
1071	11	0		448	444
577	6	0		949	940
807	8	0		503	498
409	4	0		371	367
401	4	0		221	219
593	6	0			
1081	11	0			
581	6	0			
998	10	0			
434	4	0			
406	4	0			
626	6	0			
1098	11	0			
613	6	0			
1011	10	0			
471	5	0			
411	4	0			
632	6	0			
1108	11	0			
617	6	0			
1014	10	0			
496	5	0			
416	4	0			

eak Hour Trips

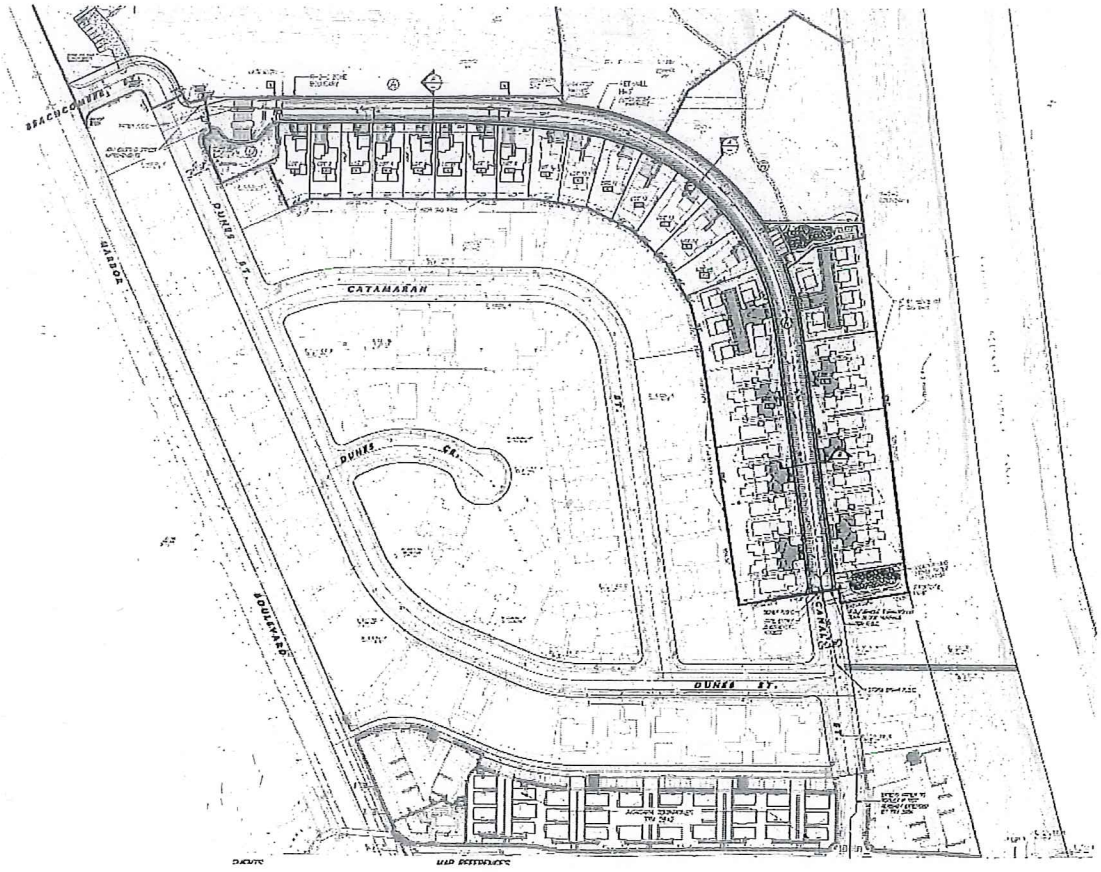
Medium	Heavy
10	0
4	0
9	0
5	0
4	0
2	0

Appendix I

Traffic and Circulation Study

AVALON HOMES
OXNARD, CALIFORNIA

TRAFFIC AND CIRCULATION STUDY



December 19, 2019 **ATE Project 19033**

Prepared for:

Rincon Consultants
180 North Ashwood Avenue
Ventura, California 93003

ASSOCIATED TRANSPORTATION ENGINEERS

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Since 1978

Richard L. Pool, P.E.
Scott A. Schell, AICP, PTP

December 19, 2019

Mr. Joe Power
Rincon Consultants
180 North Ashwood Avenue
Ventura, California 93003

TRAFFIC AND CIRCULATION STUDY FOR THE AVALON HOMES RESIDENTIAL DEVELOPMENT - CITY OF OXNARD

Associated Transportation Engineers (ATE) is pleased to submit the following traffic and circulation study for the Avalon Homes Residential Development. The study examines existing and future traffic conditions within the study-area and assesses the traffic and circulation impacts associated with the Project. It our understanding that the results of the study will be used by the City of Oxnard to process the Project's development application.

We appreciate the opportunity to assist Rincon Consultants, Inc. with this Project.

Associated Transportation Engineers

By: Scott A. Schell, AICP, PTP
Vice President

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INTRODUCTION

The following traffic study contains an analysis of the potential traffic and circulation impacts associated with the Avalon Homes Project, located in the northwestern portion of the City of Oxnard. The guidelines set forth in the City of Oxnard's Traffic Impact Study standards were utilized in formatting the various sections of the traffic study. The study provides information relative to Existing, Existing + Project, Cumulative (Existing + Approved/Pending Projects) and Cumulative + Project traffic conditions. Site access and circulation are also evaluated in the traffic study.

PROJECT DESCRIPTION

As shown on Figure 1, the Avalon Homes residential development is located on the north side of Wooley Road, east of Harbor Boulevard and west of the Edison Canal in the City of Oxnard. The Project is proposing to construct 65 single family dwellings units. Primary access to the Project site will be provided from Harbor Boulevard via Beachcomber Street/Dunes Street. Secondary emergency access will be provided via Canal Street at Wooley Road. The Project site plan is illustrated on Figure 2.

EXISTING CONDITIONS

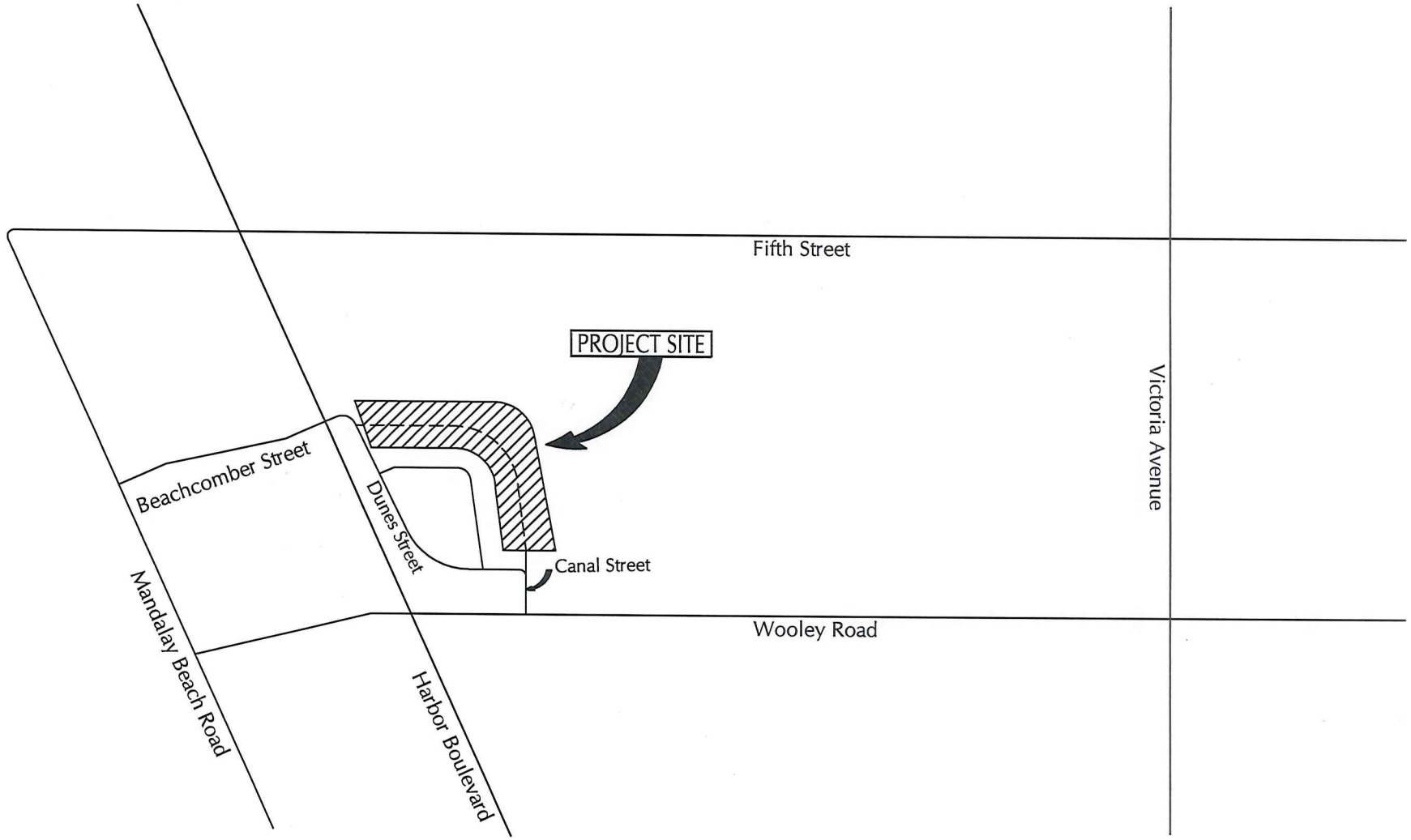
Existing Street Network

The Project site is served by a circulation system comprised of arterial and collector streets, which are illustrated on Figure 1 and discussed in the following text.

Harbor Boulevard, located adjacent to the project site, is a north-south arterial street that extends northerly from the Channel Islands Harbor area to the City of Ventura. Harbor Boulevard is a 2- to 4-lane divided arterial roadway north of Fifth Street and a 4-lane divided arterial roadway south of Fifth Street. The Harbor Boulevard/Gonzales Road, Harbor Boulevard/Fifth Street and Harbor Boulevard/Wooley Road intersections are signalized.

Victoria Avenue, a north-south arterial roadway located east of the project site, extends northerly from the Channel Islands Harbor area to the eastern portion of the City of Ventura. Victoria Avenue is a 6- to 8-lane arterial roadway north of U.S. Highway 101 and a 4-lane roadway south of U.S. Highway 101. Victoria Avenue has freeway interchanges at U.S. Highway 101 and State Route 126. In the study-area, this roadway is signalized at Gonzales Road, Doris Avenue, Fifth Street and Wooley Road.

West Fifth Street, is a 2- to 4-lane roadway that extends easterly from Harbor Boulevard to the City of Camarillo. East of Oxnard Boulevard, the roadway is designated as State Route 34.



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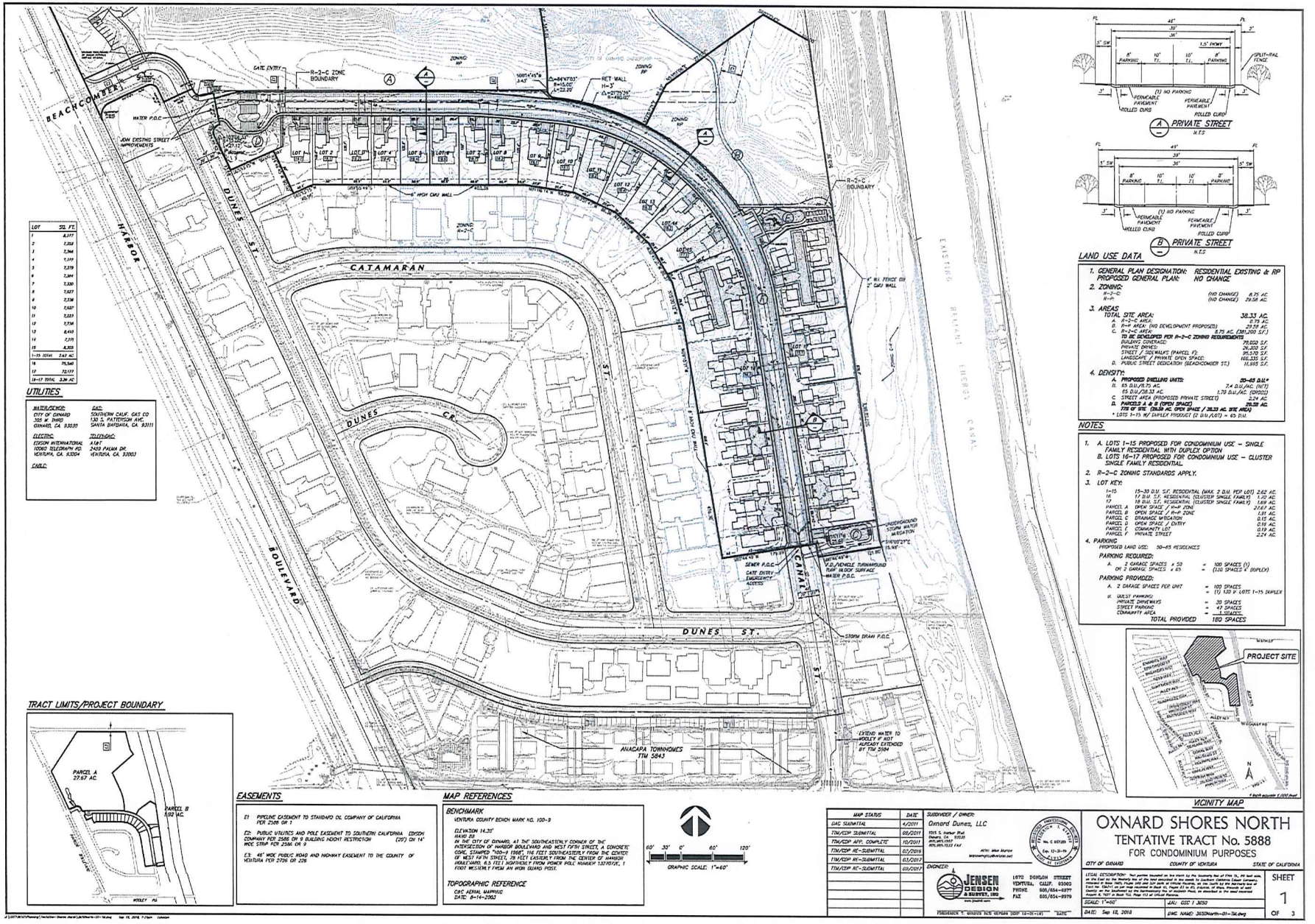
EXISTING STREET NETWORK/PROJECT SITE LOCATION

FIGURE 1

KAB - #19033



LOT	SQ. FT.
1	8,377
2	7,259
3	7,366
4	7,177
5	7,279
6	7,304
7	7,330
8	7,527
9	7,258
10	7,037
11	7,223
12	7,736
13	8,410
14	7,771
15	8,303
1-15 TOTAL	2.62 AC
16	75,560
17	72,177
16-17 TOTAL	3.36 AC

UTILITIES

WATER/SEWER:
CITY OF OXNARD
305 W. THIRD
OXNARD, CA. 93030

GAS:
SOUTHERN CALIF. GAS CO
130 S. PATTERSON AVE.
SANTA BARBARA, CA. 93111

ELECTRIC:
EDISON INTERNATIONAL
10060 TELEGRAPH RD.
VENTURA, CA. 93004

TELEPHONE:
AT&T
2450 PALMA DR.
VENTURA, CA. 93003

CABLE:

EASEMENTS

E1 PIPELINE EASEMENT TO STANDARD OIL COMPANY OF CALIFORNIA PER 2526 OR 1

E2: PUBLIC UTILITIES AND POLE EASEMENT TO SOUTHERN CALIFORNIA EDISON COMPANY PER 2586 OR 9 BUILDING HEIGHT RESTRICTION (20') ON 14' WIDE STRIP PER 2586 OR 9

E3: 48' WIDE PUBLIC ROAD AND HIGHWAY EASEMENT TO THE COUNTY OF VENTURA PER 2726 OR 226

MAP REFERENCES

BENCHMARK
VENTURA COUNTY BENCH MARK NO. 100-9

ELEVATION 14.20'
NAVD 88
IN THE CITY OF OXNARD, AT THE SOUTHEASTERLY CORNER OF THE INTERSECTION OF HARBOR BOULEVARD AND WEST FIFTH STREET, A CONCRETE CORE, STAMPED "100-9 1968", 116 FEET SOUTHEASTERLY FROM THE CENTER OF WEST FIFTH STREET, 28 FEET EASTERLY FROM THE CENTER OF HARBOR BOULEVARD, 6.5 FEET NORTHERLY FROM POWER POLE NUMBER 1307/07/4E, 1 FOOT WESTERLY FROM AN IRON GUARD POST.

TOPOGRAPHIC REFERENCE
CAC AERIAL MAPPING
DATE: 8-14-2003

LAND USE DATA

1. GENERAL PLAN DESIGNATION: RESIDENTIAL EXISTING & RP
   PROPOSED GENERAL PLAN: NO CHANGE
2. ZONING:
   R-2-C (NO CHANGE) 8.75 AC
   R-P (NO CHANGE) 29.58 AC
3. AREAS
   TOTAL SITE AREA: 38.33 AC
   A. R-2-C AREA: 8.75 AC
   B. R-P AREA: (NO DEVELOPMENT PROPOSED) 29.58 AC
   C. R-2-C AREA: 8.75 AC. (381,200 S.F.)
   TO BE DEVELOPED PER R-2-C ZONING REQUIREMENTS
   BUILDING COVERAGE: 78,000 S.F.
   PRIVATE DRIVES: 76,800 S.F.
   STREET / SIDEWALKS (PARCEL F): 95,570 S.F.
   LANDSCAPE / PRIVATE OPEN SPACE: 100,335 S.F.
   B. PUBLIC STREET DEDICATION (BEACHCOMBER ST.) 11,995 S.F.
4. DENSITY:
   A. PROPOSED DWELLING UNITS: 50-65 D.U.*
   B. 65 D.U./8.75 AC. 7.4 D.U./AC. (NET)
   65 D.U./38.33 AC. 1.70 D.U./AC. (GROSS)
   C. STREET AREA (PROPOSED PRIVATE STREET) 2.24 AC
   D. PARCELS A & B (OPEN SPACE) 29.58 AC
   TOTAL OF SITE (TOTAL AC. OPEN SPACE / TOTAL AC. SITE AREA)
   * LOTS 1-15 W/ DUPLEX PRODUCT (2 DU/LOT) = 65 DU.

NOTES

1. A. LOTS 1-15 PROPOSED FOR CONDOMINIUM USE - SINGLE FAMILY RESIDENTIAL WITH DUPLEX OPTION
   B. LOTS 16-17 PROPOSED FOR CONDOMINIUM USE - CLUSTER SINGLE FAMILY RESIDENTIAL.
2. R-2-C ZONING STANDARDS APPLY.
3. LOT KEY:

1-15	15-30 D.U. S.F. RESIDENTIAL (MAX. 2 D.U. PER LOT)	2.62 AC
16	17 D.U. S.F. RESIDENTIAL (CLUSTER SINGLE FAMILY)	1.93 AC
17	18 D.U. S.F. RESIDENTIAL (CLUSTER SINGLE FAMILY)	1.69 AC
PARCEL A	OPEN SPACE / R-P ZONE	27.67 AC
PARCEL B	OPEN SPACE / R-P ZONE	1.91 AC
PARCEL C	DRAINAGE MITIGATION	0.15 AC
PARCEL D	OPEN SPACE / ENTRY	0.19 AC
PARCEL E	COMMUNITY LOT	0.19 AC
PARCEL F	PRIVATE STREET	2.24 AC

4. PARKING
   PROPOSED LAND USE: 50-65 RESIDENCES

   PARKING REQUIRED:
   A. 2 GARAGE SPACES x 50 = 100 SPACES (1)
   OR 2 GARAGE SPACES x 65 = (130 SPACES W/ DUPLEX)

   PARKING PROVIDED:
   A. 2 GARAGE SPACES PER UNIT = 100 SPACES
   = (1) 120 @ LOTS 1-15 DUPLEX
   B. GUEST PARKING:
   PRIVATE DRIVEWAYS = 30 SPACES
   STREET PARKING = 47 SPACES
   COMMUNITY AREA = 3 SPACES
   TOTAL PROVIDED 180 SPACES

MAP STATUS	DATE
CAC SUBMITTAL	4/2011
TTM/CDP SUBMITTAL	08/2011
TTM/CDP APP. COMPLETE	10/2011
TTM/CDP RE-SUBMITTAL	02/2016
TTM/CDP RE-SUBMITTAL	03/2017
TTM/CDP RE-SUBMITTAL	08/2017

SUBDIVIDER / OWNER:
Oxnard Dunes, LLC
1555 S. Harbor Blvd.
Oxnard, CA. 93035
805.985.1065
805.985.1533 FAX
ATTN: Mike Morrow
MMorrow@LaBellaHomes.com

ENGINEER:
JENSEN DESIGN & SURVEY, INC.
1672 DONLON STREET
VENTURA, CALIF. 93003
PHONE 805/654-0277
FAX 805/654-9979

OXNARD SHORES NORTH
TENTATIVE TRACT No. 5888
FOR CONDOMINIUM PURPOSES

CITY OF OXNARD — COUNTY OF VENTURA — STATE OF CALIFORNIA

LEGAL DESCRIPTION: That portion situated on the tract to the Southerly line of 17th St., 99 feet wide, on the East by the Westerly line of the 100 foot wide strip of land conveyed to Southern California Edison Company by deed recorded June 27, 1929 in Book 226, Page 226 of Official Records, on the South by the Northerly line of that tract of land described in Book 61, Pages 67 to 71, inclusive, of Deeds of said County, on the Southwest by the Northeasterly line of Mandalay Road, as described in the deed recorded August 6, 1929 in Book 232, Page 153 of Official Records.

SCALE: 1"=60' — JAL: CGC 1 3030 — SHEET 1 OF 3

DATE: Sep 18, 2018 — DWG NAME: 3030north-01-TM.dwg

Associated Transportation Engineers

FIGURE 2

PROJECT SITE PLAN

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Wooley Road, located adjacent to the Project's southern boundary, is a 2- to 4-lane roadway that extends easterly from Harbor Boulevard to Rice Avenue. Directly east of the Project, Wooley Road spans the Edison Canal via a 2-lane bridge structure. In the study-area, Wooley Road is signalized at the Harbor Boulevard and Victoria Avenue intersections.

Canal Street, is a 2-lane north-south local residential roadway. Canal Street serves residential land-uses within the existing Dunes at Mandalay Shores subdivision. Within the study-area the Wooley Road/Canal Street intersection is STOP-sign controlled.

Beachcomber Street, is a 2-lane east-west local residential roadway. Beachcomber Street serves residential land-uses within the existing Dunes at Mandalay Shores subdivision. Within the study-area the Harbor Boulevard /Beachcomber Street intersection is STOP-sign controlled.

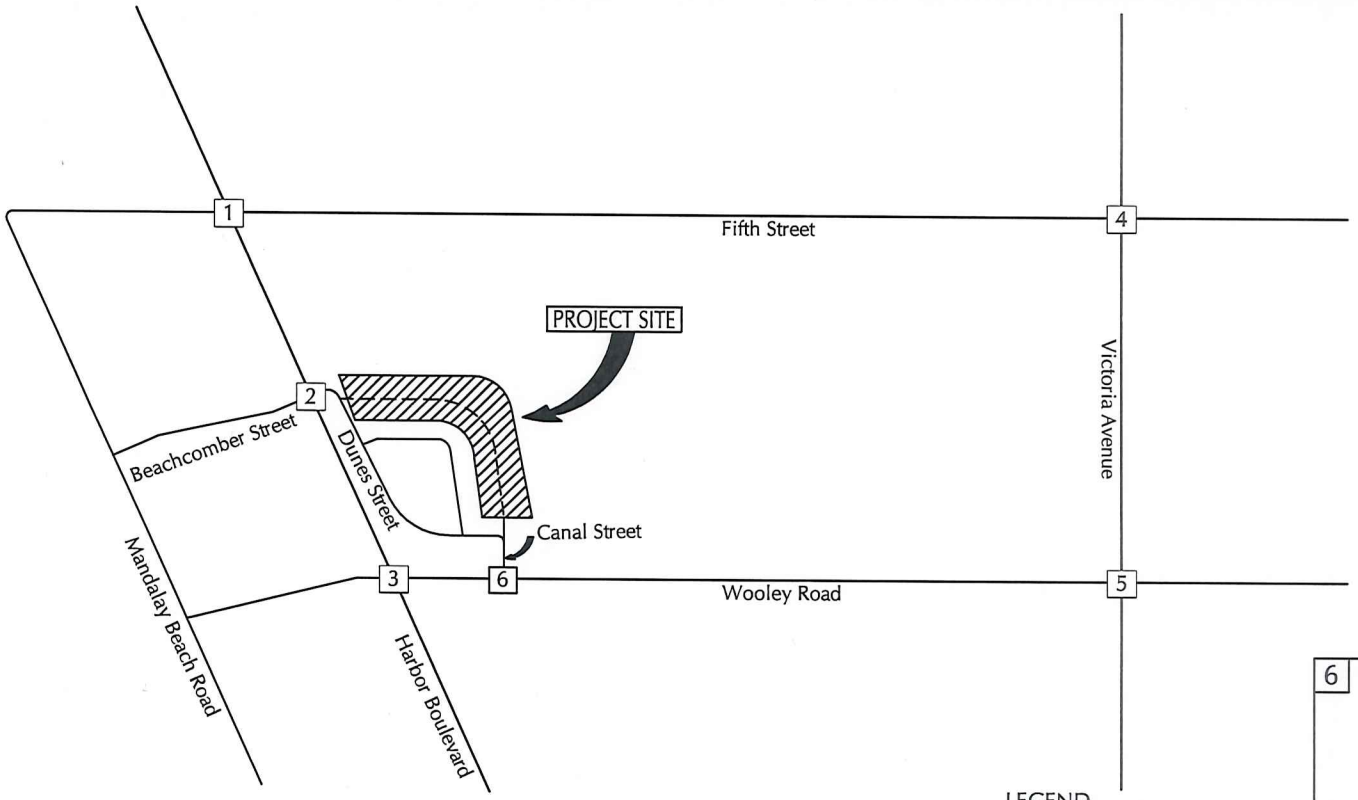
Existing Volumes and Levels of Service

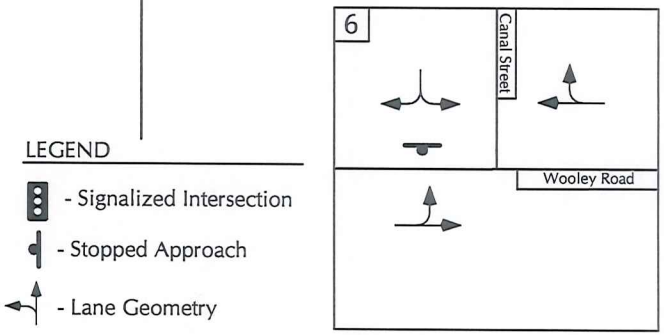
Intersection Operations

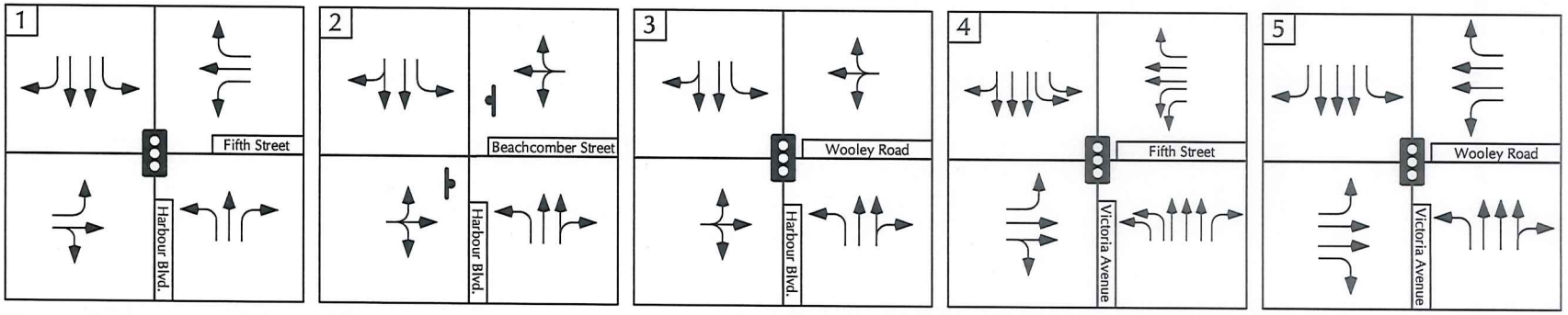
Traffic flow on urban arterials is most constrained at intersections. Therefore, a detailed analysis of traffic flows must examine the operating conditions of critical intersections during peak travel periods. In rating intersection operations, "Levels of Service" (LOS) A through F are used, with LOS A indicating free flow operations and LOS F indicating congested operations (more complete definitions of levels of service are included in the Technical Appendix). In the City of Oxnard LOS "C" is the acceptable operating standard for intersections.

Figure 3 illustrates the study-area intersections, the existing traffic controls and the intersection geometries. The existing A.M. and P.M. peak hour traffic volumes at the study-area intersections are illustrated on Figure 4. These volumes were collected in June of 2019 for this study and are included in the Technical Appendix.

Existing levels of service for the study-area intersections were calculated using the Intersection Capacity Utilization (ICU) methodology for signalized intersections and the Highway Capacity Manual unsignalized methodology as required by the City of Oxnard. Worksheets illustrating the level of service calculations are contained in the Technical Appendix for reference. Table 1 lists the existing levels of service for the six study-area intersections during the A.M. and P.M. peak hour periods.







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EXISTING LANE GEOMETRIES AND TRAFFIC CONTROLS

FIGURE 3

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EXISTING TRAFFIC VOLUMES

FIGURE 4

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Table 1
Existing Peak Hour Levels of Service

No.	Intersection	Control Type	A.M. Peak Hour		P.M. Peak Hour	
			ICU/Delay	LOS	ICU/Delay	LOS
1.	Harbor Boulevard/5th Street	Signal	0.72	LOS C	0.59	LOS A
2.	Harbor Boulevard/Beachcomber Street	STOP-Sign	13.6 sec.	LOS B	16.6 sec.	LOS B
3.	Harbor Boulevard/Wooley Road	Signal	0.56	LOS A	0.65	LOS B
4.	Wooley Road/Canal Street	STOP-Sign	11.9 sec.	LOS B	15.5 sec.	LOS C
5.	Victoria Avenue/5th Street	Signal	0.59	LOS A	0.51	LOS A
6.	Victoria Avenue/Wooley Road	Signal	0.62	LOS B	0.61	LOS B

The data presented in Table 1 indicates that the study-area intersections currently operate at LOS C or better during the A.M. peak hour and P.M. peak hour periods, which meets the City's LOS C standard.

Wooley Road 2-Lane Section

As noted previously, the section of Wooley Road east of the project site spans the Edison Canal via a 2-lane bridge that is approximately 30-feet wide (two 15-foot travel lanes) with sidewalks on each side. Traffic counts conducted on Wooley Road indicate that the bridge carries 8,700 average daily trips, 582 A.M. and 820 P.M. peak hour trips. These volumes are well within the capacity of the 2-lane section (27,000 ADT). The existing roadway and the Harbor Boulevard/Wooley Road intersection currently operate in the LOS A - C range. The existing 2-lane bridge across the Edison Canal accommodates the existing traffic volumes.

IMPACT THRESHOLD CRITERIA

The City of Oxnard's criteria for evaluating Project impacts at intersections is based upon the change in ICU/LOS attributable to the Project. The City of Oxnard has established LOS "C" as the threshold of significance for determining Project impacts at intersections. If the addition of Project traffic increases the ICU by 0.02 or more at an intersection operating at LOS C or worse, it should be mitigated to the ICU level identified without the Project traffic. These criteria were used to determine the significance of the impacts generated by the Project at the study-area intersections.

PROJECT GENERATED TRAFFIC VOLUMES

Project Trip Generation

The trip generation estimates for the Avalon Homes Project were developed using the Single Family Detached Housing (Land Use Code 210) rates published in the Institute of Transportation Engineers (ITE), Trip Generation, 10th Edition. Table 2 summarizes the average daily, A.M. and P.M. peak hour trip generation estimates for the Avalon Homes Project.

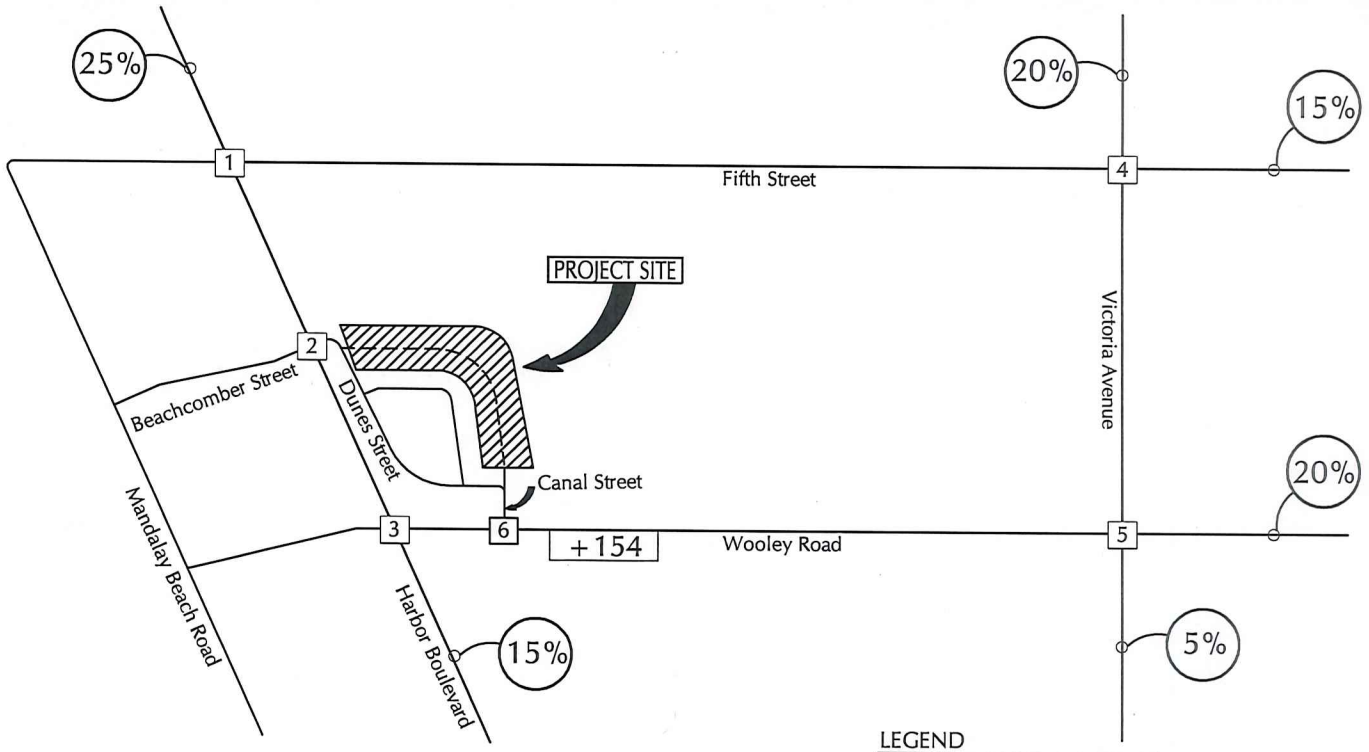
Table 2
Project Trip Generation Estimates

Land Use	Size	ADT		Weekday Peak Hour Trips			
				A.M. Peak Hour		P.M. Peak Hour	
		Rate	Trips	Rate	Trips	Rate	Trips
Single Family Residential	65 Units	9.44	614	0.74	48 (12 In/36 Out)	0.99	64 (40 In/24 Out)

As shown in Table 2 the Project would generate 614 average daily trips, 48 A.M. peak hour trips and 64 P.M. peak hour trips.

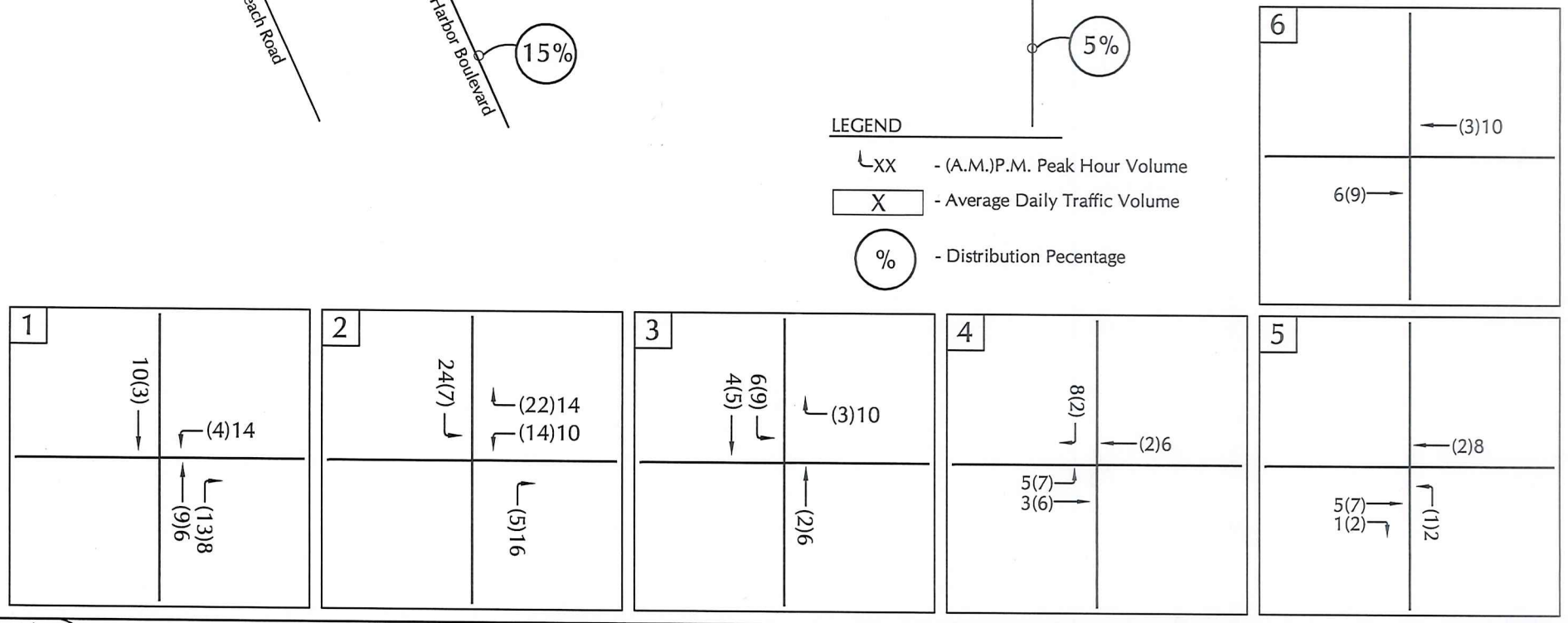
Project Trip Distribution and Assignment

The project-generated A.M. and P.M. peak hour traffic volumes were distributed and assigned to the study-area intersections based on travel data derived from the existing traffic volumes as well as a general knowledge of the population, employment and commercial centers in the Oxnard/Ventura area. Figure 5 illustrates the trip distribution and assignment assumed for the Project's trips. Figure 6 illustrates the Existing + Project traffic volumes.



LEGEND

- XX - (A.M.)P.M. Peak Hour Volume
- X - Average Daily Traffic Volume
- % - Distribution Pecentage



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PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

FIGURE 5

KAB - #19033

N
NOT TO SCALE
Victoria Avenue
Fifth Street
Wooley Road
8,854
PROJECT SITE
Canal Street
Dunes Street
Harbor Boulevard
Beachcomber Street
Mandalay Beach Road
1
2
3
4
5
6
LEGEND
XX - (A.M.)P.M. Peak Hour Volume
X - Average Daily Traffic Volume
1
178(44)
991(386)
41(16)
40(54)
47(43)
27(6)
(162)83
(19)48
(60)104
(94)78
(902)607
(5)24
2
57(24)
1039(433)
18(10)
16(25)
2(0)
11(12)
(35)59
(2)2
(14)13
(5)21
(926)664
(15)30
3
261(81)
723(349)
34(18)
30(60)
69(48)
35(12)
(236)174
(29)70
(87)124
(85)85
(634)504
(12)34
4
303(211)
1509(1012)
66(37)
79(87)
168(93)
38(9)
(384)216
(161)121
(130)191
(121)131
(1665)1422
(58)58
5
222(119)
1300(768)
179(96)
180(153)
308(167)
126(48)
(381)205
(201)230
(79)157
(70)102
(1257)1055
(103)96
6
27(21)
5(8)
3(6)
409(217)
(9)34
(347)366
EXISTING + PROJECT TRAFFIC VOLUMES
FIGURE 6
ASSOCIATED TRANSPORTATION ENGINEERS
JH - #19033

PROJECT-SPECIFIC IMPACTS

Levels of service were calculated for the study-area intersections assuming the Existing + Project volumes. Tables 3 and 4 show the results of the calculations and identify the Project's impacts based on the City of Oxnard impact thresholds.

Table 3
Existing + Project A.M. Peak Hour Levels of Service

No.	Intersection	Existing		Existing + Project		Change	Impact?
		ICU/Delay	LOS	ICU/Delay	LOS		
1.	Harbor Boulevard/Fifth Street	0.72	LOS C	0.73	LOS C	0.01	No
2.	Harbor Boulevard/Beachcomber Way	13.6 sec.	LOS B	15.4 sec.	LOS B	1.8 sec.	No
3.	Harbor Boulevard/Wooley Road	0.56	LOS A	0.57	LOS A	0.01	No
4.	Wooley Road/Canal Street	11.9 sec.	LOS B	12.0 sec.	LOS B	0.1 sec.	No
5	Victoria Avenue/Fifth Street	0.59	LOS A	0.59	LOS A	0.00	No
6.	Victoria Avenue/Wooley Road	0.62	LOS B	0.62	LOS B	0.00	No

Table 4
Existing + Project P.M. Peak Hour Levels of Service

No.	Intersection	Existing		Existing + Project		Change	Impact?
		ICU/Delay	LOS	ICU/Delay	LOS		
1.	Harbor Boulevard/Fifth Street	0.59	LOS A	0.59	LOS A	0.00	No
2.	Harbor Boulevard/Beachcomber Way	16.6 sec.	LOS B	17.3 sec.	LOS C	0.7 sec.	No
3.	Harbor Boulevard/Wooley Road	0.65	LOS B	0.66	LOS B	0.01	No
4.	Wooley Road/Canal Street	15.5 sec.	LOS B	15.8 sec.	LOS B	0.3 sec.	No
5.	Victoria Avenue/Fifth Street	0.51	LOS A	0.52	LOS A	0.01	No
6.	Victoria Avenue/Wooley Road	0.61	LOS B	0.61	LOS B	0.00	No

The data presented in Tables 3 and 4 indicate that the Project would not have a significant impact to the study-area intersections based on the City of Oxnard's impact thresholds during the A.M. or the P.M. peak hour periods. All of the study-area intersections would continue to operate at LOS C or better with the addition of Project traffic.

Wooley Road 2-Lane Section

The Project's traffic additions to the 2-lane section of the Wooley Road would increase volumes to 8,854 average daily trips, 594 A.M. and 836 P.M. peak hour trips. The Existing + Project traffic volumes would be well within the capacity of a 2-lane roadway section. With the Existing + Project traffic volumes, the 2-lane roadway section and the Harbor

Boulevard/Wooley Road intersection would operate in the LOS A - C range. The existing 2-lane bridge across the Edison Canal can accommodate the Existing + Project peak hour traffic volumes.

CUMULATIVE (EXISTING + APPROVED/PENDING PROJECTS) CONDITIONS

The City of Oxnard requires that the intersections be analyzed with the addition of traffic generated by projects which have been approved or are pending within the Project study-area. ATE developed a list of cumulative projects from the City of Oxnard's website. City staff reviewed and approved the list of cumulative developments evaluated in the traffic study. Trip generation estimates were developed for the following cumulative developments using the rates presented in the ITE, Trip Generation, 10th Edition. Table 5 summarizes the average daily, A.M. and P.M. peak hour trip generation estimates for the approved and pending projects.

Table 5
Approved/Pending Development Projects Trip Generation

No.	Project	Land Use	Units/Size	ADT	A.M. Peak Hour	P.M. Peak Hour
1.	Rodriguez	Single-Family Res.	1 unit	9	1	1
2.	Rogue	Multi-Family Res.	2 units	15	1	1
3.	Picciotti	Single-Family Res.	1 unit	9	1	1
4.	Moraga	Multi-Family Res.	3 units	22	1	2
5.	Hernandez	Single-Family Res.	1 unit	9	1	1
6.	Vail and Murray	Multi-Family Res.	3 units	22	1	2
7.	Moraga	Multi-Family Res.	2 units	15	1	1
8.	Rogue	Multi-Family Res.	2 units	15	1	1
9.	Keshmeshian	Multi-Family Res.	2 units	15	1	1
10.	Faulconer	Single-Family Res.	1 unit	9	1	1
11.	Li	Multi-Family Res.	2 units	15	1	1
12.	Stevens	Single-Family Res.	1 unit	9	1	1
13.	Hernandez	Single-Family Res.	1 unit	9	1	1
14.	Shellnut	Single-Family Res.	1 unit	9	1	1
15.	Millbrandt	Single-Family Res.	1 unit	9	1	1
16.	Marini	Multi-Family Res.	50 units	366	23	28
17.	Mellon	Single-Family Res. Multi-Family Res.	183 units 109 units	1,728 798	135 50	181 61
18.	Water Drops	Car Wash	5,500 sq.ft.	780	0	78
19.	Rancho Victoria Plaza	Retail Commercial	53,950 sq.ft.	2,037	51	206
20.	Teal Club Specific Plan	Single Family Res. Multi-Family Res. Apartment Retail Commercial Gov. Office Business Park School Park	350 units 410 units 230 units 60,000 sq.ft. 2,000 sq.ft. 132,000 sq.ft. 400 students 20 acres	3,350 3,280 1,540 3,600 78 1,378 516 46	263 275 117 87 7 177 168 0	354 320 143 314 10 157 60 1
			Total Trips:	19,694	1,368	1,930

The data presented in Table 5 indicates that the approved and pending projects would generate a total of 19,694 average daily trips, 1,368 A.M. peak hour trips and 1,930 P.M. peak hour trips. The traffic generated by the approved and pending projects was distributed and assigned to the study-area intersections. The trip assignment for the cumulative development projects was developed based on the location of each project, data presented in recent traffic studies, existing traffic patterns observed in the study-area as well as a general knowledge of the population, employment and commercial centers in Oxnard and surrounding Ventura County area. Figure 7 illustrates the cumulative peak hour traffic volumes at the study-area intersections. The cumulative levels of service for the study-area intersections are shown in Table 6.

Table 6
Cumulative Peak Hour Levels of Service

Intersection	Control Type	A.M. Peak Hour		P.M. Peak Hour	
		ICU/Delay	LOS	ICU/Delay	LOS
Harbor Boulevard/Fifth Street	Signal	0.75	LOS C	0.59	LOS A
Harbor Boulevard/Beachcomber Way	STOP-Sign	17.8 sec.	LOS C	22.7 sec.	LOS C
Harbor Boulevard/Wooley Road	Signal	0.59	LOS A	0.68	LOS B
Wooley Road/Canal Street	STOP-Sign	12.2 sec.	LOS B	16.1 sec.	LOS C
Victoria Avenue/Fifth Street	Signal	0.62	LOS A	0.52	LOS A
Victoria Avenue/Wooley Road	Signal	0.66	LOS B	0.66	LOS B

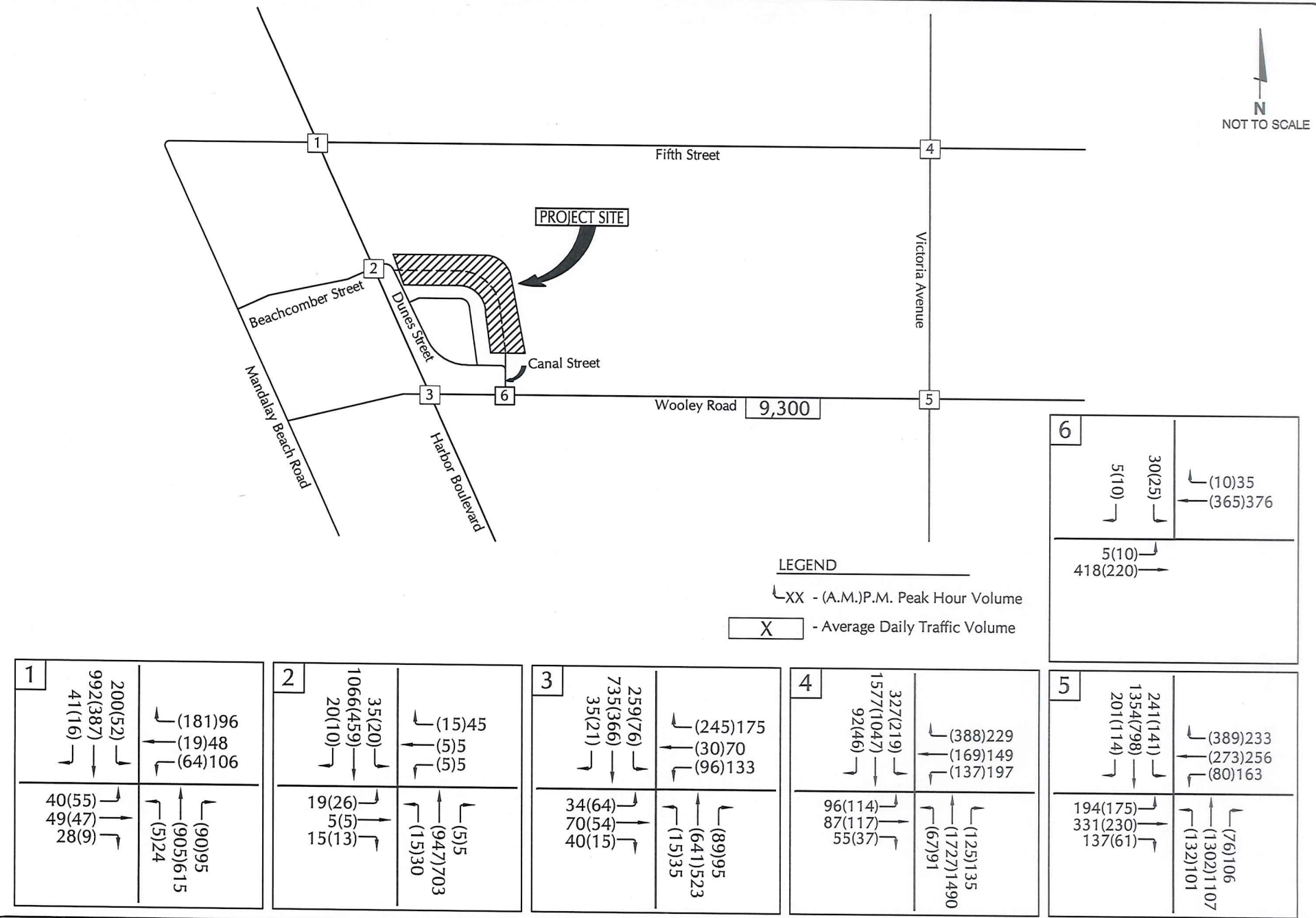
The data presented in Table 6 indicate that the study-area intersections would operate at LOS C or better during the A.M. peak hour and P.M. peak hour periods under cumulative conditions, which meets the City's LOS C standard.

Wooley Road 2-Lane Section

The cumulative traffic forecasts of 9,300 average daily trips, 620 A.M. and 859 P.M. peak hour trips along the existing 2-lane section of Wooley Road would be well within the capacity of a 2-lane roadway section. With the cumulative traffic volumes the roadway section would and the Harbor Boulevard/Wooley Road intersection would operate in the LOS A - C range. The existing 2-lane bridge across the Edison Canal can accommodate the cumulative peak hour traffic volumes.

Cumulative + Project Impacts

Levels of service were calculated for the study-area intersections assuming the Cumulative + Project volumes illustrated on Figure 8. Tables 7 and 8 show the results of the calculations and identify the impacts of the Project based on City of Oxnard impact thresholds.

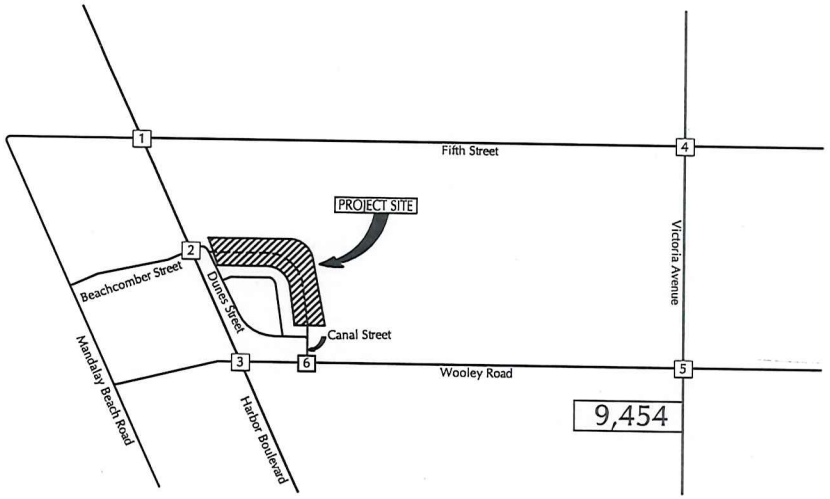


ASSOCIATED
TRANSPORTATION
ENGINEERS

CUMULATIVE TRAFFIC VOLUMES

FIGURE 7

JH - #19033

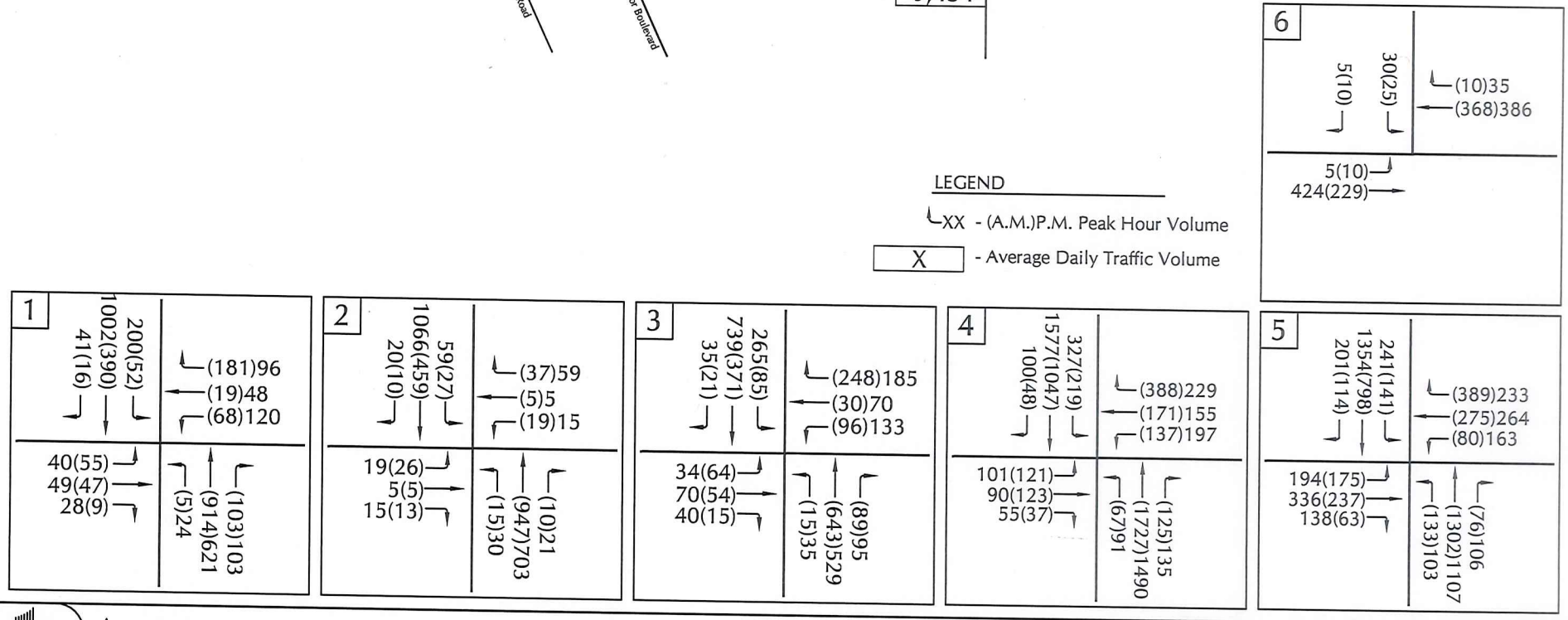


N
NOT TO SCALE

LEGEND

XX - (A.M.)P.M. Peak Hour Volume

X - Average Daily Traffic Volume



ASSOCIATED
TRANSPORTATION
ENGINEERS

CUMULATIVE + PROJECT TRAFFIC VOLUMES

FIGURE 8

JH - #19033

Table 7
Cumulative + Project A.M. Peak Hour Levels of Service

No.	Intersection	Cumulative		Cumulative + Project		Change	Impact?
		ICU/Delay	LOS	ICU/Delay	LOS		
1.	Harbor Boulevard/Fifth Street	0.75	LOS C	0.75	LOS C	0.00	No
2.	Harbor Boulevard/Beachcomber Way	17.8 sec.	LOS C	19.2 sec.	LOS C	1.4 sec.	No
3.	Harbor Boulevard/Wooley Road	0.59	LOS A	0.60	LOS A	0.01	No
4.	Wooley Road/Canal Street	12.2 sec.	LOS B	12.3 sec.	LOS B	0.1 sec.	No
5	Victoria Avenue/Fifth Street	0.62	LOS B	0.63	LOS B	0.01	No
6.	Victoria Avenue/Wooley Road	0.66	LOS B	0.66	LOS B	0.00	No

Table 8
Cumulative + Project P.M. Peak Hour Levels of Service

No.	Intersection	Cumulative		Cumulative + Project		Change	Impact?
		ICU/Delay	LOS	ICU/Delay	LOS		
1.	Harbor Boulevard/Fifth Street	0.62	LOS B	0.64	LOS B	0.02	No
2.	Harbor Boulevard/Beachcomber Way	22.7 sec.	LOS C	24.1 sec.	LOS C	1.4 sec.	No
3.	Harbor Boulevard/Wooley Road	0.68	LOS B	0.69	LOS B	0.01	No
4.	Wooley Road/Canal Street	16.1 sec.	LOS C	16.4 sec.	LOS C	0.3 sec.	No
5.	Victoria Avenue/Fifth Street	0.52	LOS A	0.52	LOS A	0.00	No
6.	Victoria Avenue/Wooley Road	0.66	LOS B	0.66	LOS B	0.00	No

The data presented in Tables 7 and 8 indicate that the Project would not have a significant cumulative impact to the study-area intersections based on the City of Oxnard's impact thresholds during the A.M. or the P.M. peak hour periods. All of the study-area intersections would continue to operate at LOS C or better with the addition of project traffic.

Wooley Road 2-Lane Section

The Project's traffic additions to the 2-lane section of the Wooley Road would increase cumulative volumes to 9,454 average daily trips, 632 A.M. and 875 P.M. peak hour trips. The Cumulative + Project traffic volumes would be well within the capacity of a 2-lane roadway section. With the Cumulative + Project traffic volumes, the 2-lane roadway section and the Harbor Boulevard/Wooley Road intersection would operate in the LOS A - C range. The existing 2-lane bridge across the Edison Canal can accommodate the Cumulative + Project peak hour traffic volumes.

SITE ACCESS AND CIRCULATION

As shown on Figure 2, primary access to the Avalon Homes development will be provided by Harbor Boulevard via Beachcomber Street/Dunes Street. Secondary emergency only access will be provided by Wooley Road via Canal Street. The existing median break on Harbor Boulevard allows both left-turns in and out of Beachcomber Street. Given the existing and forecasted traffic volumes, the Harbor Boulevard/Beachcomber Street intersection will operate acceptably with Project traffic. The internal street system will be a private street with gurb, gutter and sidewalks. The street sections will provide two 10-foot travel lanes with 8-foot parking lanes on each side. Which will accommodate project-generated traffic.

PROJECT MITIGATION MEASURES

Based on the City of Oxnard traffic impact thresholds, it was determined that the Project would not have a significant impact to any of the study-area roadways or intersections. Thus no mitigation measures were developed for the study-area intersections under the City's jurisdiction.

VENTURA COUNTY GENERAL PLAN CONSISTENCY

The City of Oxnard and Ventura County have executed a "Reciprocal Traffic Mitigation Agreement" wherein the City and the County agree that a pro-rata share of the cost of mitigations will be collected by each agency for identified traffic impacts in the other jurisdiction. The project would be consistent with the Ventura County General Plan by complying with the terms of the "Reciprocal Traffic Mitigation Agreement" between the City of Oxnard and the County of Ventura approved on February 2, 1993. Payment of the traffic impact fee would mitigate the project's impacts to the County regional roadway system.

VENTURA COUNTY CONGESTION MANAGEMENT PROGRAM

According to the County's Congestion Management Program (CMP), the minimum acceptable standard for traffic operations is LOS E.[1] However, so that local jurisdictions are not unfairly penalized for existing congestion, CMP locations currently operating in the LOS F range are considered acceptable.

Intersection Operation

The study-area intersections along Victoria Avenue are included in the County's CMP. The intersections are all expected to operate at LOS C or better with the addition of cumulative + project peak hour volumes, and thus would not exceed the CMP LOS E standard.

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[1] Traffic LOS Monitoring for the Ventura County Congestion Management Program, Ventura County Transportation Commission, 2009.

REFERENCES AND PERSONS CONTACTED

Associated Transportation Engineers

Scott A. Schell, AICP, PTP, Principal Planner
Darryl F. Nelson, Senior Transportation Planner
Erica Monson, Transportation Planner
Jiho Ha, Transportation Engineer I

Persons Contacted

Earnel Bihis, City of Oxnard

References

Highway Capacity Manual, Transportation Research Board, National Research Council, 2000.

Trip Generation, Institute of Transportation Engineers, 10th Edition, 2017.

Traffic LOS Monitoring for the Ventura County Congestion Management Program, Ventura County Transportation Commission, 2009.

TECHNICAL APPENDIX

CONTENTS

TRAFFIC COUNT DATA

INTERSECTION LEVEL OF SERVICE CRITERIA/DEFINITIONS

INTERSECTION LEVEL OF SERVICE CALCULATION WORKSHEETS

Reference 1 - Harbor Boulevard/West Fifth Street
Reference 2 - Harbor Boulevard/Beachcomber Street
Reference 3 - Harbor Boulevard/Wooley Road
Reference 4 - Wooley Road/Canal Street
Reference 5 - Victoria Avenue/West Fifth Street
Reference 6 - Victoria Avenue/Wooley Road

TRAFFIC COUNT DATA

Prepared by National Data & Surveying Services

VOLUME

Wooley Rd E/O Canal St

Day: Tuesday
Date: 6/11/2019

City: Oxnard
Project #: CA19_5387_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,144	4,588	8,732

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		4		11		12:00			62		59		121	
00:15			12		7		19		12:15			59		61		120	
00:30			11		6		17		12:30			73		60		133	
00:45			5	35	4	21	9	56	12:45			51	245	64	244	115	489
01:00			2		3		5		13:00			59		80		139	
01:15			8		0		8		13:15			65		55		120	
01:30			5		3		8		13:30			57		64		121	
01:45			1	16	1	7	2	23	13:45			82	263	69	268	151	531
02:00			3		2		5		14:00			71		82		153	
02:15			1		3		4		14:15			69		65		134	
02:30			3		0		3		14:30			65		65		130	
02:45			0	7	0	5	0	12	14:45			68	273	66	278	134	551
03:00			2		0		2		15:00			75		91		166	
03:15			1		1		2		15:15			79		83		162	
03:30			2		0		2		15:30			77		67		144	
03:45			2	7	2	3	4	10	15:45			87	318	71	312	158	630
04:00			5		4		9		16:00			88		88		176	
04:15			1		8		9		16:15			78		92		170	
04:30			12		7		19		16:30			92		86		178	
04:45			10	28	12	31	22	59	16:45			111	369	96	362	207	731
05:00			6		21		27		17:00			103		112		215	
05:15			8		24		32		17:15			114		79		193	
05:30			10		44		54		17:30			108		107		215	
05:45			23	47	46	135	69	182	17:45			104	429	81	379	185	808
06:00			22		48		70		18:00			84		81		165	
06:15			34		44		78		18:15			79		83		162	
06:30			45		74		119		18:30			71		74		145	
06:45			34	135	59	225	93	360	18:45			71	305	72	310	143	615
07:00			52		67		119		19:00			67		51		118	
07:15			40		69		109		19:15			51		64		115	
07:30			61		98		159		19:30			56		40		96	
07:45			58	211	94	328	152	539	19:45			60	234	57	212	117	446
08:00			65		89		154		20:00			58		55		113	
08:15			47		75		122		20:15			57		45		102	
08:30			55		64		119		20:30			44		45		89	
08:45			45	212	76	304	121	516	20:45			36	195	33	178	69	373
09:00			50		63		113		21:00			37		46		83	
09:15			33		61		94		21:15			32		41		73	
09:30			43		76		119		21:30			26		28		54	
09:45			50	176	61	261	111	437	21:45			24	119	27	142	51	261
10:00			40		49		89		22:00			20		23		43	
10:15			35		44		79		22:15			16		27		43	
10:30			54		64		118		22:30			17		16		33	
10:45			51	180	59	216	110	396	22:45			15	68	14	80	29	148
11:00			60		56		116		23:00			10		9		19	
11:15			68		68		136		23:15			16		6		22	
11:30			43		62		105		23:30			11		10		21	
11:45			56	227	67	253	123	480	23:45			8	45	9	34	17	79
TOTALS				1281		1789		3070	TOTALS				2863		2799		5662
SPLIT %				41.7%		58.3%		35.2%	SPLIT %				50.6%		49.4%		64.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	4,144	4,588	8,732

AM Peak Hour			11:45	07:30	07:30	PM Peak Hour			16:45	16:45	16:45
AM Pk Volume			250	356	587	PM Pk Volume			436	394	830
Pk Hr Factor			0.856	0.908	0.923	Pk Hr Factor			0.956	0.879	0.965
7 - 9 Volume	0	0	423	632	1055	4 - 6 Volume	0	0	798	741	1539
7 - 9 Peak Hour			07:30	07:30	07:30	4 - 6 Peak Hour			16:45	16:45	16:45
7 - 9 Pk Volume	0	0	231	356	587	4 - 6 Pk Volume	0	0	436	394	830
Pk Hr Factor	0.000	0.000	0.888	0.908	0.923	Pk Hr Factor	0.000	0.000	0.956	0.879	0.965

FIGURE 4.2.2

AVERAGE DAILY TRAFFIC (ADT) LEVEL OF SERVICE (LOS) THRESHOLDS COUNTY ROADS AND CONVENTIONAL STATE HIGHWAYS					
	CLASS I			CLASS II	CLASS III
LOS	2 LANES	4 LANES	6 LANES	2 LANES	2 LANES
A	2,400	19,000	29,000	1,500	350
B	5,600	28,000	42,000	3,900	2,000
C	10,000	38,000	57,000	7,000	3,300
D	16,000	47,000	70,000	11,000	5,900
E	27,000	58,000	87,000	21,000	16,000

ADT/LOS THRESHOLDS FREEWAYS				
LOS	4 LANES	6 LANES	8 LANES	10 LANES
A	31,000	46,000	62,000	77,000
B	48,000	71,000	95,000	119,000
C	68,000	102,000	136,000	169,000
D	82,000	123,000	164,000	205,000
E	88,000	132,000	176,000	220,000

SOURCE: VENTURA COUNTY PUBLIC WORKS AGENCY 9/94

R. 12/20/94

Prepared by National Data & Surveying Services

Harbor Blvd & 5th St

Peak Hour Turning Movement Count

ID: 19-05386-001
City: Oxnard

Day: Tuesday
Date: 06/11/2019

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:45 PM - 05:45 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Harbor Blvd

SOUTHBOUND

AM	16	383	44	0	1109	AM
NOON	0	0	0	0	0	NOON
PM	41	981	178	0	724	PM
	0.5	1.5	1	0		

EASTBOUND (5th St)

AM	NOON	PM	
40	0	113	
0	0	0	0
54	0	40	1
43	0	47	1
6	0	27	0
AM	NOON	PM	

WESTBOUND (5th St)

PM	NOON	AM	
83	0	162	0.5
48	0	19	1.5
90	0	56	1
0	0	0	0
295	0	168	
PM	NOON	AM	

CONTROL

Signalized

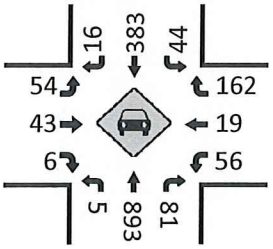
TEV	1762 AM	0 NOON	2230 PM
PHF	0.87		0.97

NORTHBOUND

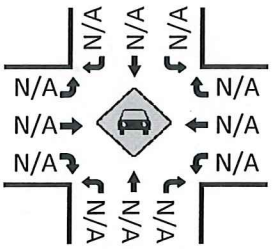
PM	1098	0	24	601	70	PM
NOON	0	0	0	0	0	NOON
AM	445	0	5	893	81	AM
		0	1	1	1	

Harbor Blvd

Total Vehicles (AM)



Total Vehicles (NOON)



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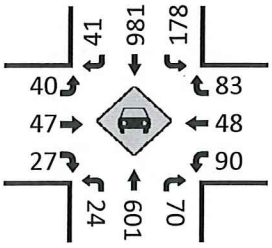
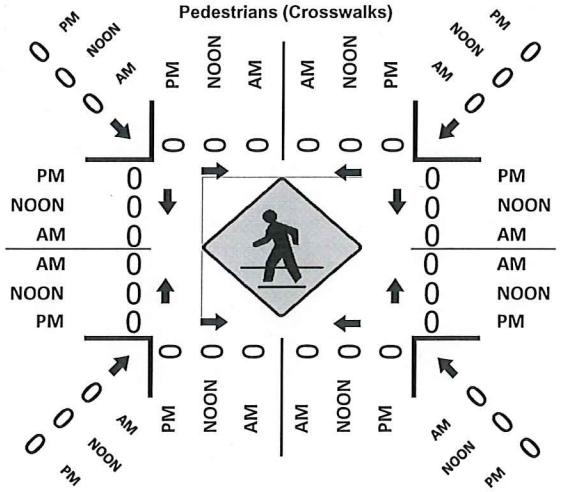
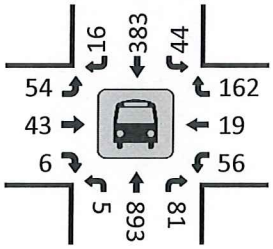


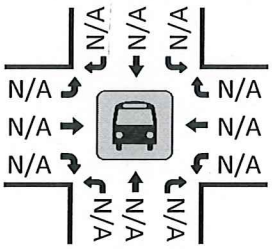
Pedestrians (Crosswalks)



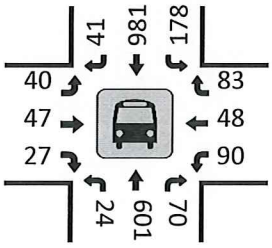
Total Vehicles (AM)



Total Vehicles (NOON)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Harbor Blvd & Beachcomber St

Peak Hour Turning Movement Count

ID: 19-05386-002
City: Oxnard

Day: Tuesday
Date: 06/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Harbor Blvd

SOUTHBOUND

AM	10	433	5	12	1008	AM
NOON	0	0	0	0	0	NOON
PM	18	1039	29	4	697	PM
	0	2	1	0		

EASTBOUND (Beachcomber St)

AM	NOON	PM		
27	0	50	⇦	
0	0	0	↶	0
25	0	16	↱	0
0	0	2	→	1
12	0	11	↴	0
AM	NOON	PM		

WESTBOUND (Beachcomber St)

PM	NOON	AM		
13	0	45	↰	0
2	0	2	←	1
3	0	0	↰	0
0	0	0	↶	0
36	0	5	⇨	
PM	NOON	AM		

CONTROL

2-Way Stop (EB/WB)

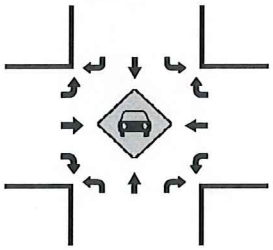
TEV	1485	0	1836
	AM	NOON	PM
PHF	0.89		0.96

NORTHBOUND

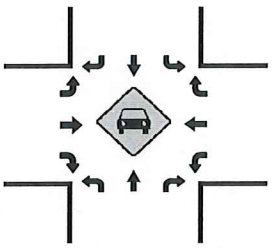
PM	1053	0	30	664	5	PM
NOON	0	0	0	0	0	NOON
AM	445	0	15	926	0	AM
		0	1	2	0	

Harbor Blvd

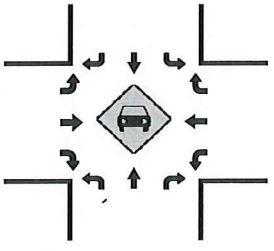
Total Vehicles (AM)



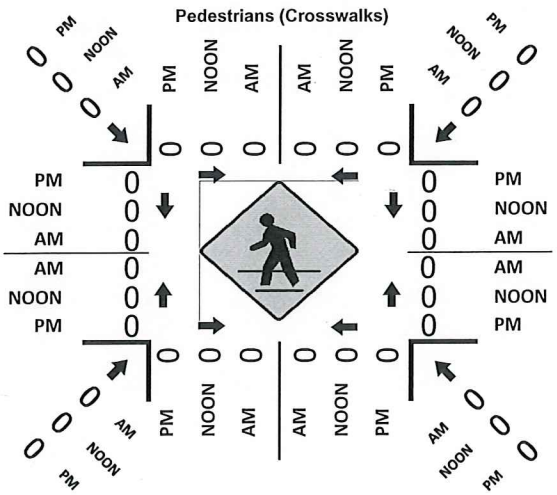
Total Vehicles (NOON)



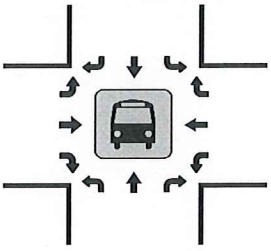
Total Vehicles (PM)



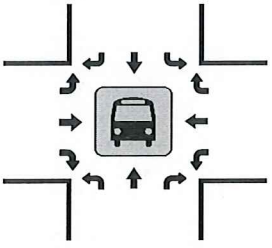
Pedestrians (Crosswalks)



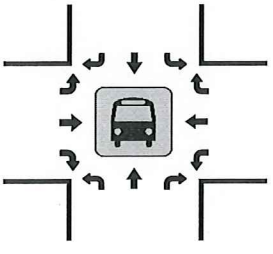
Total Vehicles (AM)



Total Vehicles (NOON)



Total Vehicles (PM)



Prepared by National Data & Surveying Services

Harbor Blvd & Wooley Rd

Peak Hour Turning Movement Count

ID: 19-05386-004
City: Oxnard

Day: Tuesday
Date: 06/11/2019

PEAK HOURS		COUNT PERIODS
07:15 AM - 08:15 AM	AM	07:00 AM - 09:00 AM
NONE	NOON	NONE
04:45 PM - 05:45 PM	PM	04:00 PM - 06:00 PM

Harbor Blvd — SOUTHBOUND

AM	18	344	72	0	925	AM
NOON	0	0	0	0	0	NOON
PM	34	719	255	0	692	PM
	0	2	1	0		

Wooley Rd — EASTBOUND

AM	NOON	PM	
59	0	136	
0	0	0	0
60	0	30	0
48	0	69	1
12	0	35	0
AM	NOON	PM	

Wooley Rd — WESTBOUND

	PM	NOON	AM
0	164	0	233
1	70	0	29
0	124	0	87
0	0	0	0
	409	0	205
	PM	NOON	AM

CONTROL

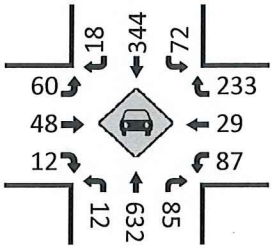
Signalized

	AM	NOON	PM
TEV	1632	0	2117
PHF	0.89		0.98

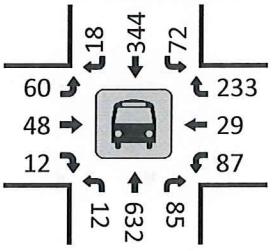
Harbor Blvd — NORTHBOUND

		0	1	2	0	
PM	880	2	32	498	85	PM
NOON	0	0	0	0	0	NOON
AM	443	0	12	632	85	AM

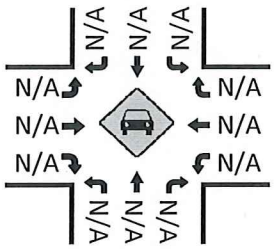
Total Vehicles (AM)



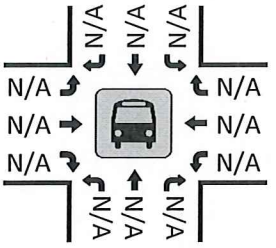
Total Vehicles (AM)



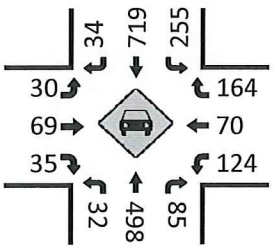
Total Vehicles (NOON)



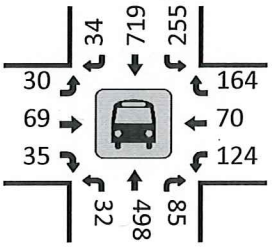
Total Vehicles (NOON)



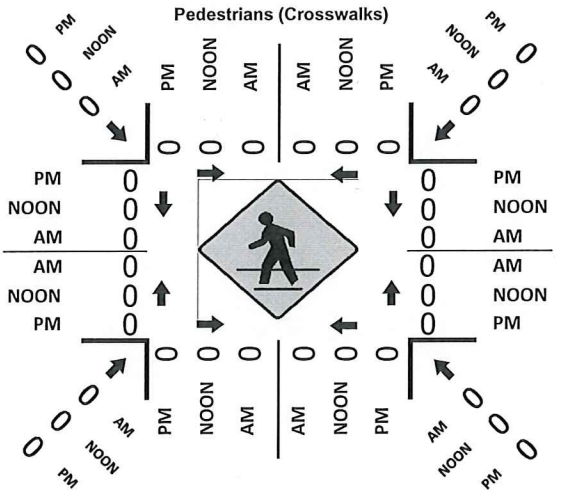
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Canal St & Wooley Rd

Peak Hour Turning Movement Count

ID: 19-05386-003
City: Oxnard

Day: Tuesday
Date: 06/11/2019

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:45 PM - 05:45 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Canal St — SOUTHBOUND

AM	8	0	21	0	15	AM
NOON	0	0	0	0	0	NOON
PM	5	0	27	0	37	PM

0 1 0 0

Wooley Rd — EASTBOUND

AM	NOON	PM	
352	0	361	⇦
0	0	0	0 ↶
6	0	3	0 ↱
208	0	403	1 →
0	0	0	0 ↷
AM	NOON	PM	

WESTBOUND — Wooley Rd

	PM	NOON	AM
0 ↶	34	0	9
1 ←	356	0	344
0 ↰	0	0	0
0 ↷	1	0	0
⇨	431	0	229
	PM	NOON	AM

CONTROL

1-Way Stop (SB)

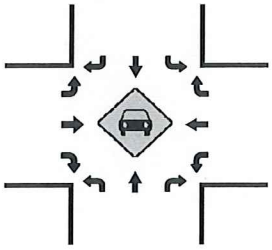
TEV	596 AM	0 NOON	829 PM
PHF	0.93		0.96

0 0 0 0

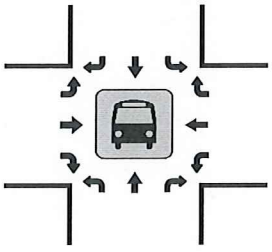
Canal St — NORTHBOUND

PM	0	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	0	0	0	0	0	AM

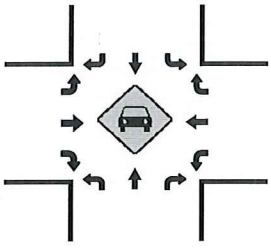
Total Vehicles (AM)



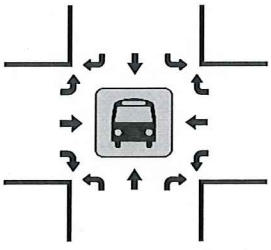
Total Vehicles (AM)



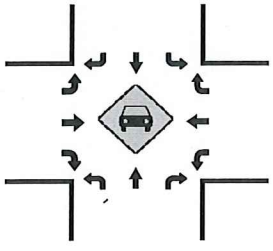
Total Vehicles (NOON)



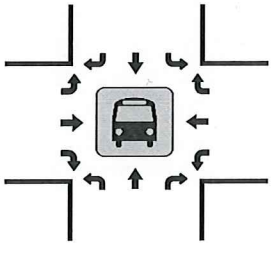
Total Vehicles (NOON)



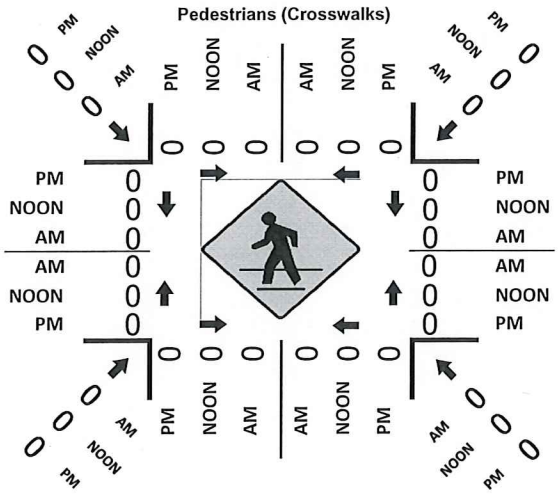
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Victoria Ave & 5th St

Peak Hour Turning Movement Count

ID: 19-05386-006
City: Oxnard

Day: Tuesday
Date: 06/11/2019

PEAK HOURS

AM	07:30 AM - 08:30 AM
NOON	NONE
PM	04:15 PM - 05:15 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

Victoria Ave — SOUTHBOUND

AM	35	1012	204	7	2136	AM
NOON	0	0	0	0	0	NOON
PM	58	1509	300	3	1714	PM
	0	3	2	0		

EASTBOUND — 5th St

AM	NOON	PM	
247	0	204	
0	0	1	0
80	0	73	1
87	0	165	2
9	0	38	0
AM	NOON	PM	

WESTBOUND — 5th St

PM	NOON	AM	
216	0	384	1
115	0	159	2
185	0	125	2
6	0	5	0
602	0	417	
PM	NOON	AM	

CONTROL

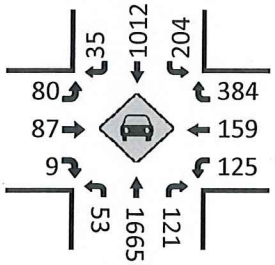
Signalized

TEV	3951 AM	0 NOON	4280 PM
PHF	0.83		0.97

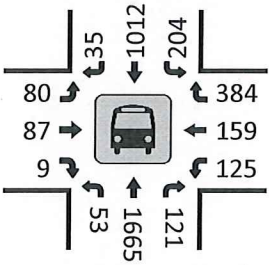
PM	1760	28	30	1422	131	PM
NOON	0	0	0	0	0	NOON
AM	1151	5	53	1665	121	AM
	0	2	3	1		

NORTHBOUND — Victoria Ave

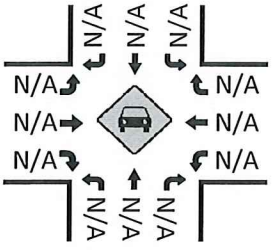
Total Vehicles (AM)



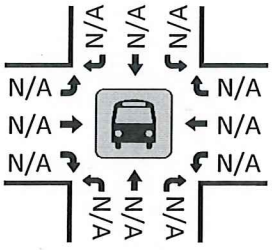
Total Vehicles (AM)



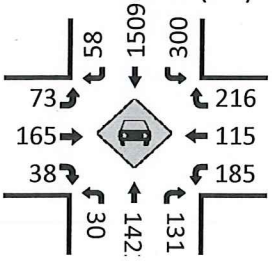
Total Vehicles (NOON)



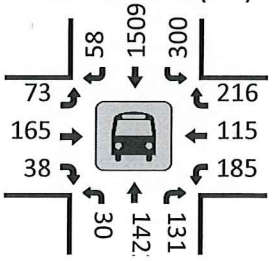
Total Vehicles (NOON)



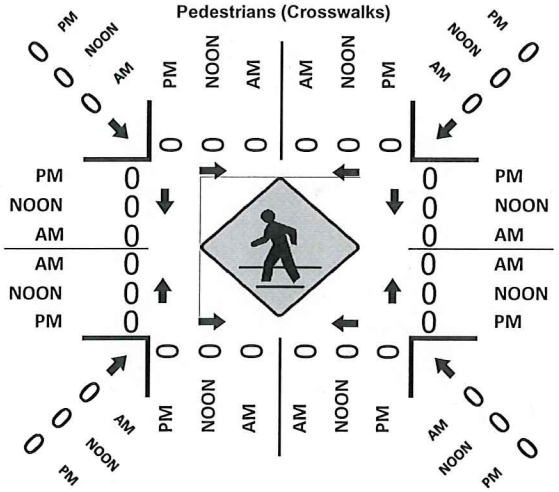
Total Vehicles (PM)



Total Vehicles (PM)



Pedestrians (Crosswalks)



Prepared by National Data & Surveying Services

Victoria Ave & Wooley Rd

Peak Hour Turning Movement Count

ID: 19-05386-005
City: Oxnard

Day: Tuesday
Date: 06/11/2019

PEAK HOURS

AM: 07:15 AM - 08:15 AM
NOON: NONE
PM: 04:45 PM - 05:45 PM

COUNT PERIODS

AM: 07:00 AM - 09:00 AM
NOON: NONE
PM: 04:00 PM - 06:00 PM

Victoria Ave — SOUTHBOUND

AM	96	768	119	0	1791	AM
NOON	0	0	0	0	0	NOON
PM	179	1300	222	0	1440	PM
	1	3	1	0		

Wooley Rd — EASTBOUND

AM	NOON	PM		
397	0	492	⇦	
0	0	0	↶	0
153	0	180	↱	1
160	0	303	→	2
46	0	125	↴	1
AM	NOON	PM		

Wooley Rd — WESTBOUND

PM	NOON	AM		
205	0	381	↰	1
222	0	199	←	2
154	0	79	↰	1
3	0	0	↶	0
630	0	349	⇨	
PM	NOON	AM		

CONTROL: Signalized

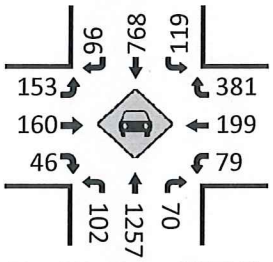
TEV	3430	0	4144
	AM	NOON	PM
PHF	0.84		0.96

0 1 3 0

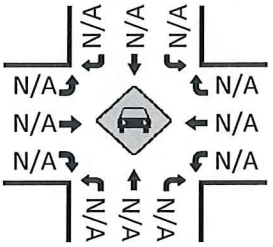
NORTHBOUND — Victoria Ave

PM	1582	3	91	1055	102	PM
NOON	0	0	0	0	0	NOON
AM	893	0	102	1257	70	AM

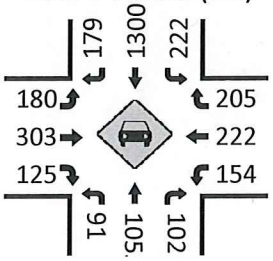
Total Vehicles (AM)



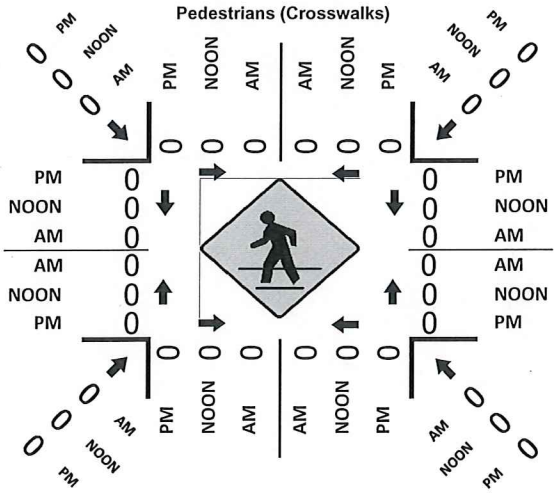
Total Vehicles (NOON)



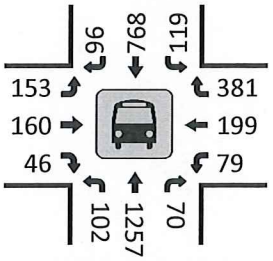
Total Vehicles (PM)



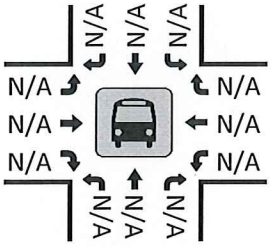
Pedestrians (Crosswalks)



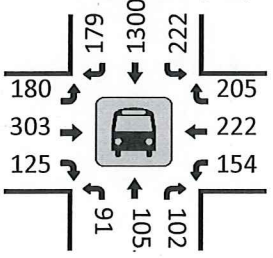
Total Vehicles (AM)



Total Vehicles (NOON)



Total Vehicles (PM)



INTERSECTION LEVEL OF SERVICE CRITERIA/DEFINITIONS

DISCUSSION OF INTERSECTION CAPACITY UTILIZATION (ICU)

The ability of a roadway to carry traffic is referred to as capacity. The capacity is usually less at intersections because traffic flows continuously between them and only during the green phase at them. Capacity at intersections is best defined in terms of vehicles per lane per hour of green. The technique used to compare the volumes and capacity of an intersection is known as Intersection Capacity Utilization (ICU). ICU or volume-to-capacity ratio, usually expressed as a percentage, is the proportion of an hour required to provide sufficient capacity to accommodate all intersection traffic if all approaches operate at capacity. If an intersection is operating at 80 percent of capacity, then 20 percent of the signal cycle is not used.

The ICU calculation assumes that an intersection is signalized and that the signal is ideally timed. Although calculating ICU for an unsignalized intersection is invalid, the presumption is that a signal can be installed and the calculation shows whether the geometrics are capable of accommodating the expected volumes. It is possible to have an ICU well below 100 percent, yet have severe traffic congestion. This would occur if one or more movements is not getting sufficient time to satisfy its demand, and excess time exists on other movements. This is an operational problem which should be addressed.

Capacity is often defined in terms of roadway width. However, standard lanes have approximately the same capacity whether they are 11 or 14 feet wide. Data collected by Kunzman Associates indicates a typical lane, whether a through-lane or a left-turn lane, has a capacity of approximately 1,700 vehicles per hour, with nearly all locations showing a capacity greater than 1,600 vehicles per hour per lane. This finding is published in the August, 1978 issue of ITE Journal in the article entitled, "Another Look at Signalized Intersection Capacity" by William Kunzman. For this study, a capacity of 1,600 vehicles per hour per lane will be assumed for left-turn, through, and right-turn lanes as per City policy.

The yellow time can either be assumed to be completely used and no penalty applied, or it can be assumed to be only partially usable. Total yellow time accounts for less than 10 percent of a cycle, and a penalty of up to five percent is reasonable. On the other hand, during peak hour traffic operation, the yellow times are nearly completely used. In this study, no penalty will be applied for the yellow because the capacities have been assumed to be only 1,600 vehicles per hour per lane when in general they are 1,700-1,800 vehicles per hour per lane.

The ICU technique is an ideal tool to quantify existing as well as future intersection operations. The impact of adding a lane can be quickly determined by examining the effect the lane has on the intersection capacity utilization.

Source: Oxnard Airport Business Park Traffic Study, Kunzman Assoc., City of Oxnard, 1985.

Signalized Intersection Level of Service Definitions

LOS	Delay[a]	V/C Ratio	Definition
A	< 10.0	< 0.60	Progression is extremely favorable. Most vehicles arrive during the green phase. Many vehicles do not stop at all.
B	10.1 - 20.0	0.61 - 0.70	Good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.
C	20.1 - 35.0	0.71 - 0.80	Only fair progression, longer cycle lengths, or both, result in higher cycle lengths. Cycle lengths may fail to serve queued vehicles, and overflow occurs. Number of vehicles stopped is significant, though many still pass through intersection without stopping.
D	35.1 - 55.0	0.81 - 0.90	Congestion becomes more noticeable. Unfavorable progression, long cycle lengths and high v/c ratios result in longer delays. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	55.1 - 80.0	0.91 - 1.00	High delay values indicate poor progression, long cycle lengths and high v/c ratios. Individual cycle failures are frequent
F	> 80.0	> 1.00	Considered unacceptable for most drivers, this level occurs when arrival flow rates exceed the capacity of lane groups, resulting in many individual cycle failures. Poor progression and long cycle lengths may also contribute to high delay levels.

[a] Average control delay per vehicle in seconds.

Unsignalized Intersection Level of Service Definitions

The HCM[1] uses *control delay* to determine the level of service at unsignalized intersections. Control delay is the difference between the travel time actually experienced at the control device and the travel time that would occur in the absence of the traffic control device. Control delay includes deceleration from free flow speed, queue move-up time, stopped delay and acceleration back to free flow speed.

LOS	Control Delay Seconds per Vehicle
A	< 10.0
B	10.1 - 15.0
C	15.1 - 25.0
D	25.1 - 35.0
E	35.1 - 50.0
F	> 50.0

[1] Highway Capacity Manual, National Research Board, 2000

INTERSECTION LOS CALCULATION WORKSHEETS

Reference 1 - Harbor Boulevard/West Fifth Street
Reference 2 - Harbor Boulevard/Beachcomber Street
Reference 3 - Harbor Boulevard/Wooley Road
Reference 4 - Wooley Road/Canal Street
Reference 5 - Victoria Avenue/West Fifth Street
Reference 6 - Victoria Avenue/Wooley Road

PROJECT: AVALON HOMES **REFERENCE #01AM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***AM***

N/S STREET: ***HARBOR BOULEVARD***

E/W STREET: ***WEST FIFTH STREET***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	T	R	SOUTH BOUND L	T	R	EAST BOUND L	T	R	WEST BOUND L	T	R
(B) EXISTING	5	893	81	44	383	16	54	43	6	56	19	162
(C) PROJECT	0	9	3	0	3	0	4	0	0	0	0	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L T R	L TT R	L TR	L T R

TRAFFIC SCENARIOS

SCENARIO 2: EXISTING (B)
SCENARIO 3: EXISTING+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600		5	5		0.003	0.003
NBT	1	1600		893	902		0.558 *	0.564 *
NBR	1	1600		81	84		0.051	0.053
SBL	1	1600		44	44		0.028 *	0.028 *
SBT	2	3200		383	386		0.120	0.121
SBR	1	1600		16	16		0.010	0.010
EBL	1	1600		54	58		0.034 *	0.036 *
EBT	1	1600		43	43		0.031	0.031
EBR	0	0		6	6		-	-
WBL	1	1600		56	56		0.035	0.035
WBT	1	1600		19	19		0.012	0.012
WBR	1	1600		162	162		0.101 *	0.101 *
			INTERSECTION CAPACITY UTILIZATION:				**0.72**	**0.73**
			LEVEL OF SERVICE:				**C**	**C**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #01PM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***PM***

N/S STREET: ***HARBOR BOULEVARD***

E/W STREET: ***WEST FIFTH STREET***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(B) EXISTING	24	601	70	178	981	41	40	47	27	90	48	83
(C) PROJECT	0	6	8	0	10	0	14	0	0	0	0	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L T R	L TT R	L TR	L T R

TRAFFIC SCENARIOS

SCENARIO 2: EXISTING (B)
SCENARIO 3: EXISTING+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600		24	24		0.015	0.015
NBT	1	1600		601	607		0.376 *	0.379 *
NBR	1	1600		70	78		0.044	0.049
SBL	1	1600		178	178		0.111 *	0.111 *
SBT	2	3200		981	991		0.307	0.310
SBR	1	1600		41	41		0.026	0.026
EBL	1	1600		40	54		0.025	0.034
EBT	1	1600		47	47		0.046 *	0.046 *
EBR	0	0		27	27		-	-
WBL	1	1600		90	90		0.056 *	0.056 *
WBT	1	1600		48	48		0.030	0.030
WBR	1	1600		83	83		0.052	0.052
			INTERSECTION CAPACITY UTILIZATION:				**0.59**	**0.59**
			LEVEL OF SERVICE:				**A**	**A**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #01AM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***AM***

N/S STREET: ***HARBOR BOULEVARD***

E/W STREET: ***WEST FIFTH STREET***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES		NORTH BOUND L	T	R	SOUTH BOUND L	T	R	EAST BOUND L	T	R	WEST BOUND L	T	R
(A)	EXISTING	5	893	81	44	383	16	54	43	6	56	19	162
(B)	BASELINE	5	905	90	52	397	16	55	47	9	64	19	181
(C)	PROJECT	0	9	13	0	3	0	0	0	0	4	0	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L T R	L TT R	L TR	L T R

TRAFFIC SCENARIOS

SCENARIO 1: EXISTING (A)
SCENARIO 2: BASELINE (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600	5	5	5	0.003	0.003	0.003
NBT	1	1600	893	905	914	0.558 *	0.566 *	0.571 *
NBR	1	1600	81	90	103	0.051	0.056	0.064
SBL	1	1600	44	52	52	0.028 *	0.033 *	0.033 *
SBT	2	3200	383	397	400	0.120	0.124	0.125
SBR	1	1600	16	16	16	0.010	0.010	0.010
EBL	1	1600	54	55	55	0.034 *	0.034 *	0.034 *
EBT	1	1600	43	47	47	0.031	0.035	0.035
EBR	0	0	6	9	9	-	-	-
WBL	1	1600	56	64	68	0.035	0.040	0.043
WBT	1	1600	19	19	19	0.012	0.012	0.012
WBR	1	1600	162	181	181	0.101 *	0.113 *	0.113 *
			INTERSECTION CAPACITY UTILIZATION:			**0.72**	**0.75**	**0.75**
			LEVEL OF SERVICE:			**C**	**C**	**C**

NOTES:

12/19/19

PROJECT: AVALON HOMES REFERENCE #01PM

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: *06/11/19*

TIME PERIOD: *PM*

N/S STREET: *HARBOR BOULEVARD*

E/W STREET: *WEST FIFTH STREET*

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES		NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(A)	EXISTING	24	601	70	178	981	41	40	47	27	90	48	83
(B)	BASELINE	24	615	95	200	992	41	40	49	28	106	48	96
(C)	PROJECT	0	6	8	0	10	0	0	0	0	14	0	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L T R	L TT R	L TR	L T R

TRAFFIC SCENARIOS

SCENARIO 1: EXISTING (A)
SCENARIO 2: BASELINE (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600	24	24	24	0.015	0.015	0.015
NBT	1	1600	601	615	621	0.376 *	0.384 *	0.388 *
NBR	1	1600	70	95	103	0.044	0.059	0.064
SBL	1	1600	178	200	200	0.111 *	0.125 *	0.125 *
SBT	2	3200	981	992	1002	0.307	0.310	0.313
SBR	1	1600	41	41	41	0.026	0.026	0.026
EBL	1	1600	40	40	40	0.025	0.025	0.025
EBT	1	1600	47	49	49	0.046 *	0.048 *	0.048 *
EBR	0	0	27	28	28	-	-	-
WBL	1	1600	90	106	120	0.056 *	0.066 *	0.075 *
WBT	1	1600	48	48	48	0.030	0.030	0.030
WBR	1	1600	83	96	96	0.052	0.060	0.060
			INTERSECTION CAPACITY UTILIZATION:			**0.59**	**0.62**	**0.64**
			LEVEL OF SERVICE:			**A**	**B**	**B**

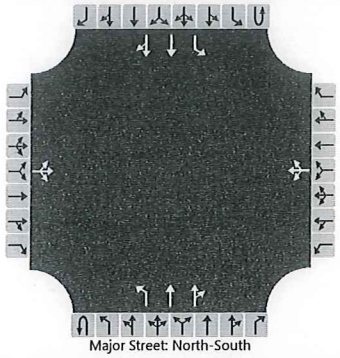
NOTES:

12/19/19

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Harbor Blvd/Beachcomber
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Beachcomber Street
Analysis Year	2019	North/South Street	Harbor Boulevard
Time Analyzed	A.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0
Configuration			LTR				LTR			L	T	TR		L	T	TR
Volume (veh/h)		25	0	12		0	2	13	0	15	926	0	0	17	433	10
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			40				16			16				18		
Capacity, c (veh/h)			362				338			1070				678		
v/c Ratio			0.11				0.05			0.02				0.03		
95% Queue Length, Q_{95} (veh)			0.4				0.2			0.0				0.1		
Control Delay (s/veh)			16.2				16.2			8.4				10.5		
Level of Service (LOS)			C				C			A				B		
Approach Delay (s/veh)	16.2				16.2				0.1				0.4			
Approach LOS	C				C											

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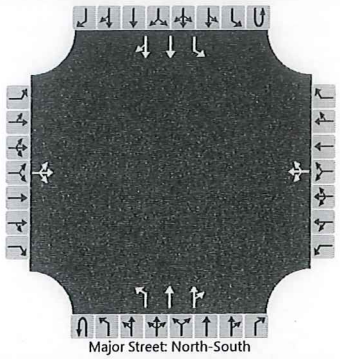
Average Weighted Delay = 13.6 sec. LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Harbor Blvd/Beachcomber
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Beachcomber Street
Analysis Year	2019	North/South Street	Harbor Boulevard
Time Analyzed	P.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0
Configuration			LTR				LTR			L	T	TR		L	T	TR
Volume (veh/h)		16	2	11		3	2	45	0	30	664	5	0	33	1039	18
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			32				54			33				36		
Capacity, c (veh/h)			163				399			598				865		
v/c Ratio			0.19				0.14			0.05				0.04		
95% Queue Length, Q_{95} (veh)			0.7				0.5			0.2				0.1		
Control Delay (s/veh)			32.2				15.4			11.4				9.3		
Level of Service (LOS)			D				C			B				A		
Approach Delay (s/veh)	32.2				15.4				0.5				0.3			
Approach LOS	D				C											

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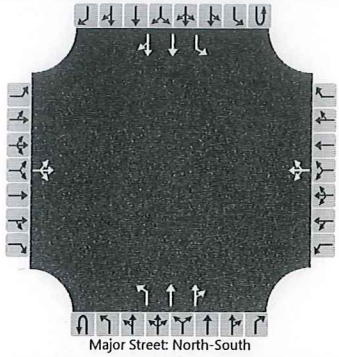
Average Weighted Delay = 16.6 sec LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Harbor Blvd/Beachcomber
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Beachcomber Street
Analysis Year	2019	North/South Street	Harbor Boulevard
Time Analyzed	A.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0
Configuration			LTR				LTR			L	T	TR		L	T	TR
Volume (veh/h)		25	0	12		14	2	35	0	15	926	5	0	24	433	10
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			40				55			16				26		
Capacity, c (veh/h)			343				318			1070				675		
v/c Ratio			0.12				0.17			0.02				0.04		
95% Queue Length, Q_{95} (veh)			0.4				0.6			0.0				0.1		
Control Delay (s/veh)			16.9				18.7			8.4				10.5		
Level of Service (LOS)			C				C			A				B		
Approach Delay (s/veh)	16.9				18.7				0.1				0.5			
Approach LOS	C				C											

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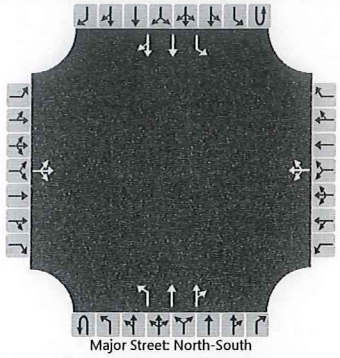
Average Weighted Delay = 15.4 sec LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Harbor Blvd/Beachcomber
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Beachcomber Street
Analysis Year	2019	North/South Street	Harbor Boulevard
Time Analyzed	P.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0
Configuration			LTR				LTR			L	T	TR		L	T	TR
Volume (veh/h)		16	2	11		13	2	59	0	30	664	21	0	57	1039	18
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Left Only								1						

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			32				80			33				62		
Capacity, c (veh/h)			147				351			598				852		
v/c Ratio			0.21				0.23			0.05				0.07		
95% Queue Length, Q_{95} (veh)			0.8				0.9			0.2				0.2		
Control Delay (s/veh)			35.9				18.3			11.4				9.6		
Level of Service (LOS)			E				C			B				A		
Approach Delay (s/veh)		35.9				18.3				0.5				0.5		
Approach LOS		E				C										

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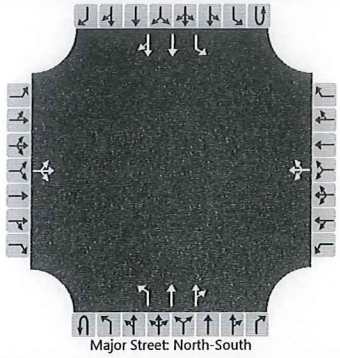
Average Weighted Delay = 12.3 LOS C

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Harbor Blvd/Beachcomber
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Beachcomber Street
Analysis Year	2019	North/South Street	Harbor Boulevard
Time Analyzed	A.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0
Configuration			LTR				LTR			L	T	TR		L	T	TR
Volume (veh/h)		26	5	13		5	5	15	0	15	947	5	0	20	459	10
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			48				27			16				22		
Capacity, c (veh/h)			265				230			1045				661		
v/c Ratio			0.18				0.12			0.02				0.03		
95% Queue Length, Q_{95} (veh)			0.6				0.4			0.0				0.1		
Control Delay (s/veh)			21.6				22.7			8.5				10.6		
Level of Service (LOS)			C				C			A				B		
Approach Delay (s/veh)	21.6				22.7				0.1				0.4			
Approach LOS	C				C											

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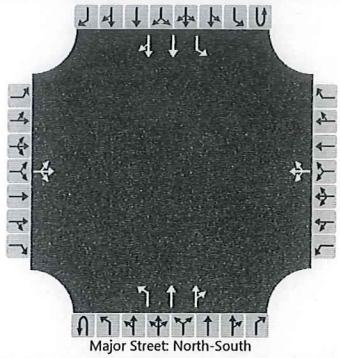
Average Weighted Delay = 17.8 sec. LOS C

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Harbor Blvd/Beachcomber
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Beachcomber Street
Analysis Year	2019	North/South Street	Harbor Boulevard
Time Analyzed	P.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0
Configuration			LTR				LTR			L	T	TR		L	T	TR
Volume (veh/h)		19	5	15		5	5	45	0	30	703	5	0	35	1066	20
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Left Only								1						

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			42				60			33				38		
Capacity, c (veh/h)			135				261			582				834		
v/c Ratio			0.31				0.23			0.06				0.05		
95% Queue Length, Q_{95} (veh)			1.2				0.9			0.2				0.1		
Control Delay (s/veh)			43.6				22.8			11.6				9.5		
Level of Service (LOS)			E				C			B				A		
Approach Delay (s/veh)		43.6				22.8				0.5				0.3		
Approach LOS		E				C										

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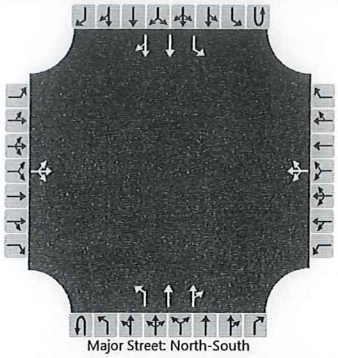
Average Weighted Delay = 22.7 sec. LOS C

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Harbor Blvd/Beachcomber
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Beachcomber Street
Analysis Year	2019	North/South Street	Harbor Boulevard
Time Analyzed	A.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0
Configuration			LTR				LTR			L	T	TR		L	T	TR
Volume (veh/h)		26	5	13		19	5	37	0	15	947	10	0	27	459	10
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3		
Proportion Time Blocked																
Percent Grade (%)		0				0										
Right Turn Channelized																
Median Type | Storage		Left Only								1						

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			48				66			16				29		
Capacity, c (veh/h)			252				263			1045				658		
v/c Ratio			0.19				0.25			0.02				0.04		
95% Queue Length, Q_{95} (veh)			0.7				1.0			0.0				0.1		
Control Delay (s/veh)			22.6				23.2			8.5				10.7		
Level of Service (LOS)			C				C			A				B		
Approach Delay (s/veh)	22.6				23.2				0.1				0.6			
Approach LOS	C				C											

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Avrge Weighted Delay = 19.2 sec. LOS C

HCS7 Two-Way Stop-Control Report

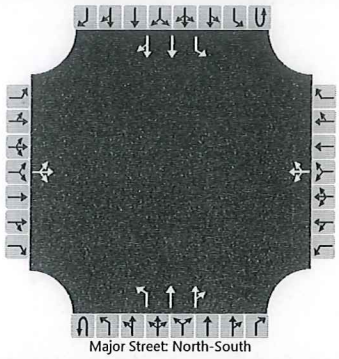
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	6/11/2019
Analysis Year	2019
Time Analyzed	P.M. Peak Hour
Intersection Orientation	North-South
Project Description	Avalon Homes

Site Information

Intersection	Harbor Blvd/Beachcomber
Jurisdiction	City of Oxnard
East/West Street	Beachcomber Street
North/South Street	Harbor Boulevard
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: North-South

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	1	0	0	1	2	0	0	1	2	0
Configuration			LTR				LTR			L	T	TR		L	T	TR
Volume (veh/h)		19	5	15		15	5	59	0	30	703	21	0	59	1066	20
Percent Heavy Vehicles (%)		3	3	3		3	3	3	3	3			3	3		
Proportion Time Blocked																
Percent Grade (%)	0				0											
Right Turn Channelized																
Median Type | Storage	Left Only								1							

Critical and Follow-up Headways

Base Critical Headway (sec)		7.5	6.5	6.9		7.5	6.5	6.9		4.1				4.1		
Critical Headway (sec)		7.56	6.56	6.96		7.56	6.56	6.96		4.16				4.16		
Base Follow-Up Headway (sec)		3.5	4.0	3.3		3.5	4.0	3.3		2.2				2.2		
Follow-Up Headway (sec)		3.53	4.03	3.33		3.53	4.03	3.33		2.23				2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			42				86			33				64		
Capacity, c (veh/h)			120				250			582				822		
v/c Ratio			0.35				0.34			0.06				0.08		
95% Queue Length, Q_{95} (veh)			1.4				1.5			0.2				0.3		
Control Delay (s/veh)			50.4				26.7			11.6				9.8		
Level of Service (LOS)			F				D			B				A		
Approach Delay (s/veh)	50.4				26.7				0.5				0.5			
Approach LOS	F				D											

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Avrge Weighted Delay = 24.1 sec. LOS C

PROJECT: AVALON HOMES **REFERENCE #03AM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***AM***

N/S STREET: ***HARBOR ROAD***

E/W STREET: ***WOOLEY ROAD***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES		NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(B)	BASELINE	12	632	85	72	344	18	60	48	12	87	29	233
(C)	PROJECT	0	2	0	9	5	0	0	0	0	0	0	3

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L TTR	L TTR	LTR	LTR

TRAFFIC SCENARIOS

SCENARIO 2: EXISTING (B)
SCENARIO 3: EXISTING+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600		12	12		0.008	0.008
NBT	2	3200		632	634		0.224 *	0.225 *
NBR	0	0		85	85		-	-
SBL	1	1600		72	81		0.045 *	0.051 *
SBT	2	3200		344	349		0.113	0.115
SBR	0	0		18	18		-	-
EBL	0	0		60	60		-	-
EBT	1	1600		48	48		0.075 *	0.075 *
EBR	0	0		12	12		-	-
WBL	0	0		87	87		-	-
WBT	1	1600		29	29		0.218 *	0.220 *
WBR	0	0		233	236		-	-
			INTERSECTION CAPACITY UTILIZATION:				**0.56**	**0.57**
			LEVEL OF SERVICE:				**A**	**A**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #03PM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***PM***

N/S STREET: ***HARBOR ROAD***

E/W STREET: ***WOOLEY ROAD***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(B) EXISTING	34	498	85	255	719	34	30	69	35	124	70	164
(C) PROJECT	0	6	0	6	4	0	0	0	0	0	0	10

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L TTR	L TTR	LTR	LTR

TRAFFIC SCENARIOS

SCENARIO 2: EXISTING (B)
SCENARIO 3: EXISTING+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600		34	34		0.021	0.021
NBT	2	3200		498	504		0.182 *	0.184 *
NBR	0	0		85	85		-	-
SBL	1	1600		255	261		0.159 *	0.163 *
SBT	2	3200		719	723		0.235	0.237
SBR	0	0		34	34		-	-
EBL	0	0		30	30		-	-
EBT	1	1600		69	69		0.084 *	0.084 *
EBR	0	0		35	35		-	-
WBL	0	0		124	124		-	-
WBT	1	1600		70	70		0.224 *	0.230 *
WBR	0	0		164	174		-	-
			INTERSECTION CAPACITY UTILIZATION:				**0.65**	**0.66**
			LEVEL OF SERVICE:				**B**	**B**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #03AM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***AM***

N/S STREET: ***HARBOR ROAD***

E/W STREET: ***WOOLEY ROAD***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	T	R	SOUTH BOUND L	T	R	EAST BOUND L	T	R	WEST BOUND L	T	R
(A) EXISTING	12	632	85	72	344	18	60	48	12	87	29	233
(B) BASELINE	15	641	89	76	366	21	64	54	15	96	30	245
(C) PROJECT	0	2	0	9	5	0	0	0	0	0	0	3

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L TTR	L TTR	LTR	LTR

TRAFFIC SCENARIOS

SCENARIO 1: EXISTING (A)
SCENARIO 2: BASELINE (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600	12	15	15	0.008	0.009	0.009
NBT	2	3200	632	641	643	0.224 *	0.228 *	0.229 *
NBR	0	0	85	89	89	-	-	-
SBL	1	1600	72	76	85	0.045 *	0.048 *	0.053 *
SBT	2	3200	344	366	371	0.113	0.121	0.123
SBR	0	0	18	21	21	-	-	-
EBL	0	0	60	64	64	-	-	-
EBT	1	1600	48	54	54	0.075 *	0.083 *	0.083 *
EBR	0	0	12	15	15	-	-	-
WBL	0	0	87	96	96	-	-	-
WBT	1	1600	29	30	30	0.218 *	0.232 *	0.234 *
WBR	0	0	233	245	248	-	-	-
			INTERSECTION CAPACITY UTILIZATION:			**0.56**	**0.59**	**0.60**
			LEVEL OF SERVICE:			**A**	**A**	**A**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #03PM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***PM***

N/S STREET: ***HARBOR ROAD***

E/W STREET: ***WOOLEY ROAD***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(A) EXISTING	34	498	85	255	719	34	30	69	35	124	70	164
(B) BASELINE	35	523	95	259	735	35	34	70	40	133	70	175
(C) PROJECT	0	6	0	6	4	0	0	0	0	0	0	10

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L TTR	L TTR	LTR	LTR

TRAFFIC SCENARIOS

SCENARIO 1: EXISTING (A)
SCENARIO 2: BASELINE (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600	34	35	35	0.021	0.022	0.022
NBT	2	3200	498	523	529	0.182 *	0.193 *	0.195 *
NBR	0	0	85	95	95	-	-	-
SBL	1	1600	255	259	265	0.159 *	0.162 *	0.166 *
SBT	2	3200	719	735	739	0.235	0.241	0.242
SBR	0	0	34	35	35	-	-	-
EBL	0	0	30	34	34	-	-	-
EBT	1	1600	69	70	70	0.084 *	0.090 *	0.090 *
EBR	0	0	35	40	40	-	-	-
WBL	0	0	124	133	133	-	-	-
WBT	1	1600	70	70	70	0.224 *	0.236 *	0.243 *
WBR	0	0	164	175	185	-	-	-
			INTERSECTION CAPACITY UTILIZATION:			**0.65**	**0.68**	**0.69**
			LEVEL OF SERVICE:			**B**	**B**	**B**

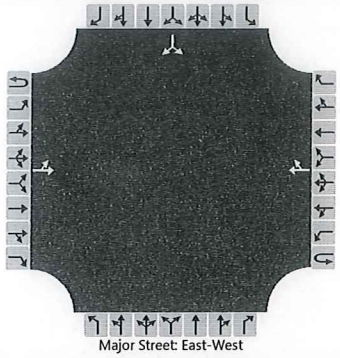
NOTES:

12/19/19

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Wooley Road/Canal Street
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Wooley Road
Analysis Year	2019	North/South Street	Canal Street
Time Analyzed	A.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		6	208				344	9						21		8
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7													32	
Capacity, c (veh/h)		1169													493	
v/c Ratio		0.01													0.06	
95% Queue Length, Q_{95} (veh)		0.0													0.2	
Control Delay (s/veh)		8.1													12.8	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.3												12.8			
Approach LOS													B			

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Average Weighted Delay = 11.9 sec. LOS B

HCS7 Two-Way Stop-Control Report

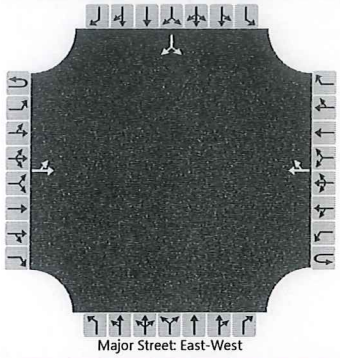
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	6/11/2019
Analysis Year	2019
Time Analyzed	P.M. Peak Hour
Intersection Orientation	East-West
Project Description	Avalon Homes

Site Information

Intersection	Wooley Road/Canal Street
Jurisdiction	City of Oxnard
East/West Street	Wooley Road
North/South Street	Canal Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		3	403				356	34						27		5
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													35	
Capacity, c (veh/h)		1130													355	
v/c Ratio		0.00													0.10	
95% Queue Length, Q_{95} (veh)		0.0													0.3	
Control Delay (s/veh)		8.2													16.2	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.1												16.2			
Approach LOS													C			

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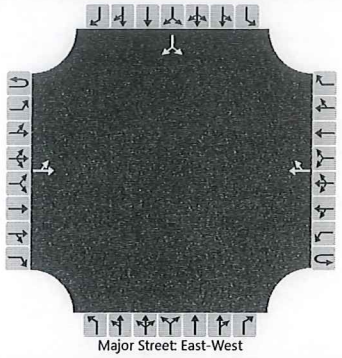
Average Weighted Delay = 15.5 sec. LOS C

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Wooley Road/Canal Street
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Wooley Road
Analysis Year	2019	North/South Street	Canal Street
Time Analyzed	A.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		6	217				347	9						21		8
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		7													32	
Capacity, c (veh/h)		1166													485	
v/c Ratio		0.01													0.06	
95% Queue Length, Q_{95} (veh)		0.0													0.2	
Control Delay (s/veh)		8.1													12.9	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.3												12.9			
Approach LOS													B			

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Average Weighted Delay = 12.0 sec. LOS B

HCS7 Two-Way Stop-Control Report

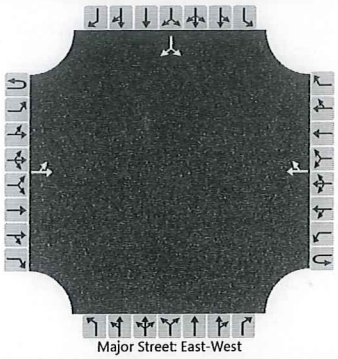
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	6/11/2019
Analysis Year	2019
Time Analyzed	P.M. Peak Hour
Intersection Orientation	East-West
Project Description	Avalon Homes

Site Information

Intersection	Wooley Road/Canal Street
Jurisdiction	City of Oxnard
East/West Street	Wooley Road
North/South Street	Canal Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		3	409				366	34						27		5
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		3													35	
Capacity, c (veh/h)		1120													347	
v/c Ratio		0.00													0.10	
95% Queue Length, Q_{95} (veh)		0.0													0.3	
Control Delay (s/veh)		8.2													16.5	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.1												16.5			
Approach LOS													C			

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Average Weighted Delay = 15.8 sec. LOS C

HCS7 Two-Way Stop-Control Report

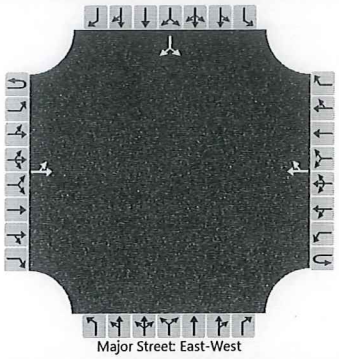
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	6/11/2019
Analysis Year	2019
Time Analyzed	A.M. Peak Hour
Intersection Orientation	East-West
Project Description	Avalon Homes

Site Information

Intersection	Wooley Road/Canal Street
Jurisdiction	City of Oxnard
East/West Street	Wooley Road
North/South Street	Canal Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		10	220				365	10						25		10
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11													38	
Capacity, c (veh/h)		1146													467	
v/c Ratio		0.01													0.08	
95% Queue Length, Q_{95} (veh)		0.0													0.3	
Control Delay (s/veh)		8.2													13.4	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.4												13.4			
Approach LOS													B			

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Average Weighted Delay = 12.2 sec LOS B

HCS7 Two-Way Stop-Control Report

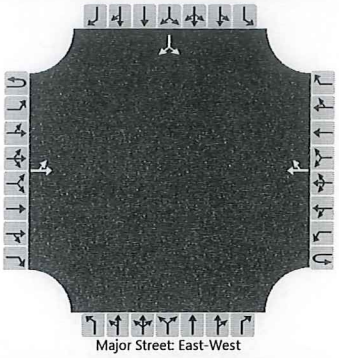
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	6/11/2019
Analysis Year	2019
Time Analyzed	P.M. Peak Hour
Intersection Orientation	East-West
Project Description	Avalon Homes

Site Information

Intersection	Wooley Road/Canal Street
Jurisdiction	City of Oxnard
East/West Street	Wooley Road
North/South Street	Canal Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		5	418				376	35						30		5
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		5													38	
Capacity, c (veh/h)		1108													333	
v/c Ratio		0.00													0.11	
95% Queue Length, Q_{95} (veh)		0.0													0.4	
Control Delay (s/veh)		8.3													17.2	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.2												17.2			
Approach LOS													C			

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Average Weighted Delay = 16.1 sec. LOS C

HCS7 Two-Way Stop-Control Report

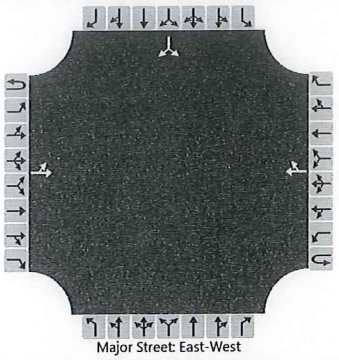
General Information

Analyst	Darryl F Nelson
Agency/Co.	ATE
Date Performed	6/11/2019
Analysis Year	2019
Time Analyzed	A.M. Peak Hour
Intersection Orientation	East-West
Project Description	Avalon Homes

Site Information

Intersection	Wooley Road/Canal Street
Jurisdiction	City of Oxnard
East/West Street	Wooley Road
North/South Street	Canal Street
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		10	229				368	10						25		10
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		11													38	
Capacity, c (veh/h)		1143													460	
v/c Ratio		0.01													0.08	
95% Queue Length, Q_{95} (veh)		0.0													0.3	
Control Delay (s/veh)		8.2													13.5	
Level of Service (LOS)		A													B	
Approach Delay (s/veh)	0.4												13.5			
Approach LOS													B			

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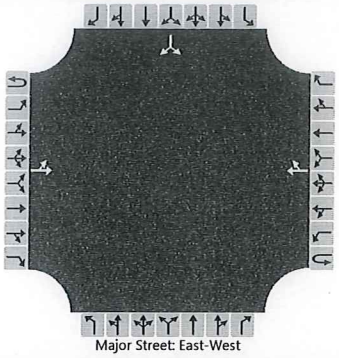
Average Weighted Delay = 12.3 sec. LOS B

HCS7 Two-Way Stop-Control Report

General Information		Site Information	
Analyst	Darryl F Nelson	Intersection	Wooley Road/Canal Street
Agency/Co.	ATE	Jurisdiction	City of Oxnard
Date Performed	6/11/2019	East/West Street	Wooley Road
Analysis Year	2019	North/South Street	Canal Street
Time Analyzed	P.M. Peak Hour	Peak Hour Factor	0.92
Intersection Orientation	East-West	Analysis Time Period (hrs)	0.25
Project Description	Avalon Homes		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	1	0
Configuration		LT						TR							LR	
Volume (veh/h)		5	424				386	35						30		5
Percent Heavy Vehicles (%)		3												3		3
Proportion Time Blocked																
Percent Grade (%)														0		
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1												7.1		6.2
Critical Headway (sec)		4.13												6.43		6.23
Base Follow-Up Headway (sec)		2.2												3.5		3.3
Follow-Up Headway (sec)		2.23												3.53		3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		5													38	
Capacity, c (veh/h)		1098													325	
v/c Ratio		0.00													0.12	
95% Queue Length, Q_{95} (veh)		0.0													0.4	
Control Delay (s/veh)		8.3													17.5	
Level of Service (LOS)		A													C	
Approach Delay (s/veh)	0.2												17.5			
Approach LOS													C			

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Avrg Weighted Delay = 16.4 sec. LOS C

PROJECT: AVALON HOMES REFERENCE #04AM

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***AM***

N/S STREET: ***VICTORIA AVENUE***

E/W STREET: ***WEST FIFTH STREET***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(B) EXISTING	58	1665	121	211	1012	35	80	87	9	130	159	384
(C) PROJECT	0	0	0	0	0	2	7	6	0	0	2	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	LL TTT R	LL TT TR	L T TR	LL TT R

TRAFFIC SCENARIOS

SCENARIO 2: EXISTING (B)
SCENARIO 3: EXISTING+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	2	3200		58	58		0.018	0.018
NBT	3	4800		1665	1665		0.347 *	0.347 *
NBR	1	1600		121	121		0.076	0.076
SBL	2	3200		211	211		0.066 *	0.066 *
SBT	3	4800		1012	1012		0.218	0.219
SBR	0	0		35	37		-	-
EBL	1	1600		80	87		0.050 *	0.054 *
EBT	2	3200		87	93		0.030	0.032
EBR	0	0		9	9		-	-
WBL	2	3200		130	130		0.041	0.041
WBT	2	3200		159	161		0.050	0.050
WBR	1	1600		197	197		0.123 *	0.123 *
			INTERSECTION CAPACITY UTILIZATION:				**0.59**	**0.59**
			LEVEL OF SERVICE:				**A**	**A**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #04PM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***PM***

N/S STREET: ***VICTORIA AVENUE***

E/W STREET: ***WEST FIFTH STREET***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(B) EXISTING	58	1422	131	303	1509	58	74	165	38	191	115	216
(C) PROJECT	0	0	0	0	0	8	5	3	0	0	6	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	LL TTT R	LL TT TR	L T TR	LL TT R

TRAFFIC SCENARIOS

SCENARIO 2: EXISTING (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	2	3200		58	58		0.018	0.018
NBT	3	4800		1422	1422		0.296 *	0.296 *
NBR	1	1600		131	131		0.082	0.082
SBL	2	3200		303	303		0.095 *	0.095 *
SBT	3	4800		1509	1509		0.326	0.328
SBR	0	0		58	66		-	-
EBL	1	1600		74	79		0.046	0.049
EBT	2	3200		165	168		0.063 *	0.064 *
EBR	0	0		38	38		-	-
WBL	2	3200		191	191		0.060 *	0.060 *
WBT	2	3200		115	121		0.036	0.038
WBR	1	1600		94	94		0.059	0.059
			INTERSECTION CAPACITY UTILIZATION:				**0.51**	**0.52**
			LEVEL OF SERVICE:				**A**	**A**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #04AM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***AM***

N/S STREET: ***VICTORIA AVENUE***

E/W STREET: ***WEST FIFTH STREET***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(A) EXISTING	58	1665	121	211	1012	35	80	87	9	130	159	384
(B) BASELINE	67	1727	125	219	1047	46	114	117	37	137	169	388
(C) PROJECT	0	0	0	0	0	3	7	6	0	0	2	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	LL TTT R	LL TT TR	L T TR	LL TT R

TRAFFIC SCENARIOS

SCENARIO 1: EXISTING (A)
SCENARIO 2: BASELINE (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	2	3200	58	67	67	0.018	0.021	0.021
NBT	3	4800	1665	1727	1727	0.347 *	0.360 *	0.360 *
NBR	1	1600	121	125	125	0.076	0.078	0.078
SBL	2	3200	211	219	219	0.066 *	0.068 *	0.068 *
SBT	3	4800	1012	1047	1047	0.218	0.228	0.228
SBR	0	0	35	46	49	-	-	-
EBL	1	1600	80	114	121	0.050 *	0.071 *	0.076 *
EBT	2	3200	87	117	123	0.030	0.048	0.050
EBR	0	0	9	37	37	-	-	-
WBL	2	3200	130	137	137	0.041	0.043	0.043
WBT	2	3200	159	169	171	0.050	0.053	0.053
WBR	1	1600	197	199	199	0.123 *	0.124 *	0.124 *
			INTERSECTION CAPACITY UTILIZATION:			**0.59**	**0.62**	**0.63**
			LEVEL OF SERVICE:			**A**	**B**	**B**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #04PM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***PM***

N/S STREET: ***VICTORIA AVENUE***

E/W STREET: ***WEST FIFTH STREET***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(A) EXISTING	58	1422	131	303	1509	58	74	165	38	191	115	216
(B) BASELINE	91	1490	135	327	1577	92	96	87	55	197	149	229
(C) PROJECT	0	0	0	0	0	8	5	3	0	0	6	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	LL TTT R	LL TT TR	L T TR	LL TT R

TRAFFIC SCENARIOS

SCENARIO 1: EXISTING (A)
SCENARIO 2: BASELINE (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	2	3200	58	91	91	0.018	0.028	0.028
NBT	3	4800	1422	1490	1490	0.296 *	0.310 *	0.310 *
NBR	1	1600	131	135	135	0.082	0.084	0.084
SBL	2	3200	303	327	327	0.095 *	0.102 *	0.102 *
SBT	3	4800	1509	1577	1577	0.326	0.348	0.349
SBR	0	0	58	92	100	-	-	-
EBL	1	1600	74	96	101	0.046	0.060	0.063
EBT	2	3200	165	87	90	0.063 *	0.044 *	0.045 *
EBR	0	0	38	55	55	-	-	-
WBL	2	3200	191	197	197	0.060 *	0.062 *	0.062 *
WBT	2	3200	115	149	155	0.036	0.047	0.048
WBR	1	1600	94	99	99	0.059	0.062	0.062
			INTERSECTION CAPACITY UTILIZATION:			**0.51**	**0.52**	**0.52**
			LEVEL OF SERVICE:			**A**	**A**	**A**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #05AM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***AM***

N/S STREET: ***VICTORIA AVENUE***

E/W STREET: ***WOOLEY ROAD***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(B) EXISTING	102	1257	70	119	768	96	153	160	46	79	199	381
(C) PROJECT	1	0	0	0	0	0	0	7	2	0	2	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L TT TR	L TTT R	L TT R	L TT R

TRAFFIC SCENARIOS

SCENARIO 2: EXISTING (B)
SCENARIO 3: EXISTING+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600		102	103		0.064	0.064
NBT	3	4800		1257	1257		0.276 *	0.276 *
NBR	0	0		70	70		-	-
SBL	1	1600		119	119		0.074 *	0.074 *
SBT	3	4800		768	768		0.160	0.160
SBR	1	1600		96	96		0.060	0.060
EBL	1	1600		153	153		0.096 *	0.096 *
EBT	2	3200		160	167		0.050	0.052
EBR	1	1600		46	48		0.029	0.030
WBL	1	1600		79	79		0.049	0.049
WBT	2	3200		199	201		0.062	0.063
WBR	1	1600		270	270		0.169 *	0.169 *
			INTERSECTION CAPACITY UTILIZATION:				**0.62**	**0.62**
			LEVEL OF SERVICE:				**B**	**B**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #05PM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***PM***

N/S STREET: ***VICTORIA AVENUE***

E/W STREET: ***WOOLEY ROAD***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	T	R	SOUTH BOUND L	T	R	EAST BOUND L	T	R	WEST BOUND L	T	R
(B) EXISTING	94	1055	102	222	1300	179	180	303	125	157	222	205
(C) PROJECT	2	0	0	0	0	0	0	5	1	0	8	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L TT TR	L TTT R	L TT R	L TT R

TRAFFIC SCENARIOS

SCENARIO 2: EXISTING (B)

SCENARIO 3: EXISTING+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600		94	96		0.059	0.060
NBT	3	4800		1055	1055		0.241 *	0.241 *
NBR	0	0		102	102		-	-
SBL	1	1600		222	222		0.139 *	0.139 *
SBT	3	4800		1300	1300		0.271	0.271
SBR	1	1600		179	179		0.112	0.112
EBL	1	1600		180	180		0.113 *	0.113 *
EBT	2	3200		303	308		0.095	0.096
EBR	1	1600		125	126		0.078	0.079
WBL	1	1600		157	157		0.098	0.098
WBT	2	3200		222	230		0.069	0.072
WBR	1	1600		190	190		0.119 *	0.119 *
			INTERSECTION CAPACITY UTILIZATION:				**0.61**	**0.61**
			LEVEL OF SERVICE:				**B**	**B**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #05AM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***AM***

N/S STREET: ***VICTORIA AVENUE***

E/W STREET: ***WOOLEY ROAD***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	T	R	SOUTH BOUND L	T	R	EAST BOUND L	T	R	WEST BOUND L	T	R
(A) EXISTING	94	1055	102	222	1300	179	180	303	125	157	222	205
(B) BASELINE	132	1302	76	141	798	114	175	230	61	80	273	389
(C) PROJECT	1	0	0	0	0	0	0	7	2	0	2	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L TT TR	L TTT R	L TT R	L TT R

TRAFFIC SCENARIOS

SCENARIO 1: EXISTING (A)
SCENARIO 2: BASELINE (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600	94	132	133	0.059	0.083	0.083
NBT	3	4800	1055	1302	1302	0.241 *	0.287 *	0.287 *
NBR	0	0	102	76	76	-	-	-
SBL	1	1600	222	141	141	0.139 *	0.088 *	0.088 *
SBT	3	4800	1300	798	798	0.271	0.166	0.166
SBR	1	1600	179	114	114	0.112	0.071	0.071
EBL	1	1600	180	175	175	0.113 *	0.109 *	0.109 *
EBT	2	3200	303	230	237	0.095	0.072	0.074
EBR	1	1600	125	61	63	0.078	0.038	0.039
WBL	1	1600	157	80	80	0.098	0.050	0.050
WBT	2	3200	222	273	275	0.069	0.085	0.086
WBR	1	1600	205	275	275	0.128 *	0.172 *	0.172 *
			INTERSECTION CAPACITY UTILIZATION:			**0.62**	**0.66**	**0.66**
			LEVEL OF SERVICE:			**B**	**B**	**B**

NOTES:

12/19/19

PROJECT: AVALON HOMES **REFERENCE #05PM**

INTERSECTION CAPACITY UTILIZATION WORKSHEET

COUNT DATE: ***06/11/19***

TIME PERIOD: ***PM***

N/S STREET: ***VICTORIA AVENUE***

E/W STREET: ***WOOLEY ROAD***

CONTROL TYPE: SIGNAL

TRAFFIC VOLUME SUMMARY

VOLUMES	NORTH BOUND L	NORTH BOUND T	NORTH BOUND R	SOUTH BOUND L	SOUTH BOUND T	SOUTH BOUND R	EAST BOUND L	EAST BOUND T	EAST BOUND R	WEST BOUND L	WEST BOUND T	WEST BOUND R
(A) EXISTING	94	1055	102	222	1300	179	180	303	125	157	222	205
(B) BASELINE	101	1107	106	241	1354	201	194	331	137	163	256	233
(C) PROJECT	2	0	0	0	0	0	0	5	1	0	8	0

GEOMETRICS

	NORTH BOUND	SOUTH BOUND	EAST BOUND	WEST BOUND
EXISTING GEOMETRICS	L TT TR	L TTT R	L TT R	L TT R

TRAFFIC SCENARIOS

SCENARIO 1: EXISTING (A)
SCENARIO 2: BASELINE (B)
SCENARIO 3: BASELINE+PROJECT (B+C)

PROJECT: AVALON HOMES

LEVEL OF SERVICE CALCULATIONS

MOVE-MENTS	# OF LANES	CAPACITY	SCENARIO VOLUMES 1	2	3	SCENARIO V/C RATIOS 1	2	3
NBL	1	1600	94	101	103	0.059	0.063	0.064
NBT	3	4800	1055	1107	1107	0.241 *	0.253 *	0.253 *
NBR	0	0	102	106	106	-	-	-
SBL	1	1600	222	241	241	0.139 *	0.151 *	0.151 *
SBT	3	4800	1300	1354	1354	0.271	0.282	0.282
SBR	1	1600	179	201	201	0.112	0.126	0.126
EBL	1	1600	180	194	194	0.113 *	0.121 *	0.121 *
EBT	2	3200	303	331	336	0.095	0.103	0.105
EBR	1	1600	125	137	138	0.078	0.086	0.086
WBL	1	1600	157	163	163	0.098	0.102	0.102
WBT	2	3200	222	256	264	0.069	0.080	0.083
WBR	1	1600	190	216	216	0.119 *	0.135 *	0.135 *
			INTERSECTION CAPACITY UTILIZATION:			**0.61**	**0.66**	**0.66**
			LEVEL OF SERVICE:			**B**	**B**	**B**

NOTES:

12/19/19

Appendix J

Avalon Homes Biological Assessment

BIOLOGICAL RESOURCES

SUMMARY

The project site supports potential jurisdictional resources, special-status habitat, and has a potential to support special-status plants and wildlife. The inland dune complex on the northern parcel is designated as a Resource Protection area and meets the Coastal Act definition of Environmentally Sensitive Habitat Area (ESHA). In order to fully determine if special-status plants or wildlife occur on either parcel, focused surveys following California Department of Fish and Wildlife (CDFW) and California Native Plant Society (CNPS) survey methods will be required. Additionally, a jurisdictional delineation following CDFW and US Army Corps of Engineers (USACE) survey methodology will be required to determine the state and/or federal jurisdictional limits of resources on both the project site and the northern parcel.

1. METHODS

Literature Review

Reviews of the California Natural Diversity Database[1] and CNPS Inventory of Rare and Endangered Plants[2] were conducted prior to field surveys. These databases were searched by 7.5-minute US Geological Survey (USGS) topographic quadrangles. The search region included the project quadrangle (Oxnard) and the following adjacent quadrangles: Ventura, Santa Paula, Camarillo, Point Mugu, and Saticoy. Previously completed survey reports for nearby sites (e.g., North Shore) were also reviewed.[3] That reports describe several focused botanical and wildlife field surveys conducted between 1996 and 1999. Soil data[4] was reviewed to assess the extent to which soil properties could affect vegetation communities and potential for rare plants.

Field Surveys

A general field survey of the proposed development site and adjacent northern parcel was conducted by Dave Crawford of Impact Sciences and Dr. Edith Read of E Read and Associates on January 29, 2014 for the purpose of characterizing on-site habitats and evaluating their potential to support special-status

1 California Department of Fish and Wildlife. California Department of Fish and Wildlife Natural Diversity Data Base. Commercial Version. Accessed January 2014.

2 California Native Plant Society. "Inventory of Rare, Threatened, and Endangered Plants of California." Online database available at: http://www.rareplants.cnps.org/. Accessed January 2014.

3 Impact Sciences, Inc. Multiple focused plant and wildlife surveys and analyses associated with the North Shore Draft Environmental Impact Report. 1996-1999.

4 Natural Resources Conservation Service. "Web Soil Survey." Accessed at http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. February 14, 2014

biological resources. Both parcels were surveyed as they are owned by the same entity and it was appropriate to collect data on the adjacent parcel to determine if the proposed development is in the least environmentally damaging area.

Vegetation associations were also mapped on both parcels during the survey. All plant and wildlife species observed were recorded. The taxonomic reference for all plant species was the current Jepson Manual.[5] Vegetation types were classified according to the current manual for California vegetation.[6] Vegetation communities were mapped in the field using a 2013 aerial photograph.

2 EXISTING CONDITIONS

2.1 General

The Avalon Homes project site is surrounded by a mixture of residential and commercial development, the Southern California Edison Canal, and the approved North Shore residential development to the north of W 5th Street.

The approximately 8.45-acre project site and adjacent open space 29.88-acre parcel to the north are located east of Harbor Boulevard, south of W 5th Street, and north of W Wooley Road, in the Oxnard Dunes area, within the City of Oxnard. The USGS map location of the site is described as occupying a portion of the Oxnard, California, 7.5-minute quadrangle, Range 21W, Township 1N, in the western portion of the Rio De Santa Clara land grant area. Access to the subject property is from the northern terminus of Dunes Street. The proposed development area is relatively flat and is adjacent to the north and east of an existing residential tract. Elevations on the entire site range from approximately 15 to 50 feet above mean sea level.

2.2 Vegetation

Lists of plant species observed on both the proposed development site and the northern parcel are provided in **Appendix A**.

Project Site Communities

Three vegetation associations were recorded on the project site. These associations are described below, and on-site vegetation is shown in **Figure 1, Vegetation Communities on the Avalon Project Site**.

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5 Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. *The Jepson Manual: Vascular Plants of California.* 2nd edition. University of California Press, Berkeley. 2012.

6 Sawyer, J.T. Keeler-Wolf and J. Evens. *A Manual of California Vegetation*. 7th edition. California Native Plant Society, Sacramento, CA. July 2013.



SOURCE: Impact Sciences, Inc., March, 2014

Vegetation Communities on the Avalon Project Site

0039.044•03/14

***Ericameria ericoides* Shrubland Alliance** (5.5 acres)

This vegetation community occupies most of the Project Site. It is a variant of the *Lupinus chamissonis-Ericameria ericoides* Shrubland Alliance defined in the standard classification system for California vegetation,[7] and defined by earlier classification systems as Dune Scrub. Mock heather (*Ericameria ericoides*) is common in the shrub canopy but silver dune lupine (*Lupinus chamissonis*) appears to be absent. Other common species include natives such as deerweed (*Acmispon glaber*) and California croton (*Croton californicus*). Non-native species such as filaree (*Erodium cicutarium*), and annual grasses (*Avena* sp., *Bromus* sp.) dominate the herbaceous understory. Vegetation cover in this community is patchy and typical of coastal dunes, ranging from open sand with zero cover to 100 percent cover on shrub-dominated low dunes. Dense development west and south of the site has reduced the extent to which onshore winds affect natural processes of dune formation and vegetation growth.

***Salix lasiolepis* Shrubland Alliance** (0.4 acre)

An arroyo willow (*Salix lasiolepis*) Shrubland Alliance occupies swales along the north and east boundaries of the Project Site, contiguous with larger stands of the same Alliance off-site. Along with the *Ericameria ericoides* Shrubland Alliance, the willows form part of an upland dune/riparian swale complex that is typical of the region. Canopy cover within this alliance is 100 percent. Non-native vegetation, particularly lollipop tree (*Myoporum laetum*), has invaded the Alliance where the vegetation extends off-site to the Southern California Edison canal.

A jurisdictional delineation would be required to determine whether or not disturbance of the willow stands requires permits under federal and state regulations that govern streambeds and wetlands. Wetland indicators are often difficult to detect in sandy soil, but if present the willow swales would qualify as "adjacent wetlands" under federal jurisdiction despite their apparent isolation from the canal to the east: "Wetlands separated from other waters of the US by man-made dikes or barriers, natural river berms, beach dunes, and the like are adjacent."[8] The same reasoning, based on hydrologic connectivity, would apply to delineation of state jurisdiction.

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7 Sawyer, J.T. Keeler-Wolf and J. Evens. *A Manual of California Vegetation.* 2nd edition. California Native Plant Society, Sacramento, CA. p. 578. 2009.

8 US Army Corps of Engineers. 2007. *Jurisdictional Determination Form Instructional Guidebook.* May 30, 2007. Page 20.

***Carpobrotus* Semi-Natural Herbaceous Stand** (2.3 acres)

The current vegetation classification system for California [9] uses the term "semi-natural" to refer to naturalized non-native vegetation, i.e., species that have colonized on their own and are not part of a cultivated landscape.

While iceplant (*Carpobrotus* sp.) occurs throughout the Project Site in isolated small patches, it forms a large continuous stand in the southeast corner of the site where public access is not restricted. Iceplant is an aggressive non-native species that competes with native vegetation, and eventually dominates a dune community if not removed. Vegetation cover is 80 to 100 percent.

North Parcel Communities

Three vegetation associations were recorded on the parcel north of project site. These associations are described below, and on-site vegetation is shown in **Figure 2, Vegetation Communities on the Avalon North Parcel**.

***Ericameria ericoides* Shrubland Alliance** (23.8 acres)

This vegetation community occupies most of the North Parcel. It is a variant of the *Lupinus chamissonis-Ericameria ericoides* Shrubland Alliance defined in the standard classification system for California vegetation,[10] and defined by earlier classification systems as Dune Scrub. Mock heather is common in the shrub canopy but silver dune lupine appears to be absent. Other common species present include natives such as deerweed and California croton. Non-native species such as iceplant, filaree, and annual grasses (*Avena* sp., *Bromus* sp.) dominate the herbaceous understory. Vegetation cover in this community is patchy and typical of coastal dunes, ranging from open sand with zero cover to 100 percent cover on shrub-dominated high dunes. Dense development west and south of the site has reduced the extent to which onshore winds affect natural processes of dune formation and vegetation growth.

***Salix lasiolepis* Shrubland Alliance** (6.0 acres)

An arroyo willow Shrubland Alliance occupies numerous swales across the site. Along with the *Ericameria ericoides* Shrubland Alliance, the willows form part of an upland dune/riparian swale complex that is typical of the region. Canopy cover is 100 percent.

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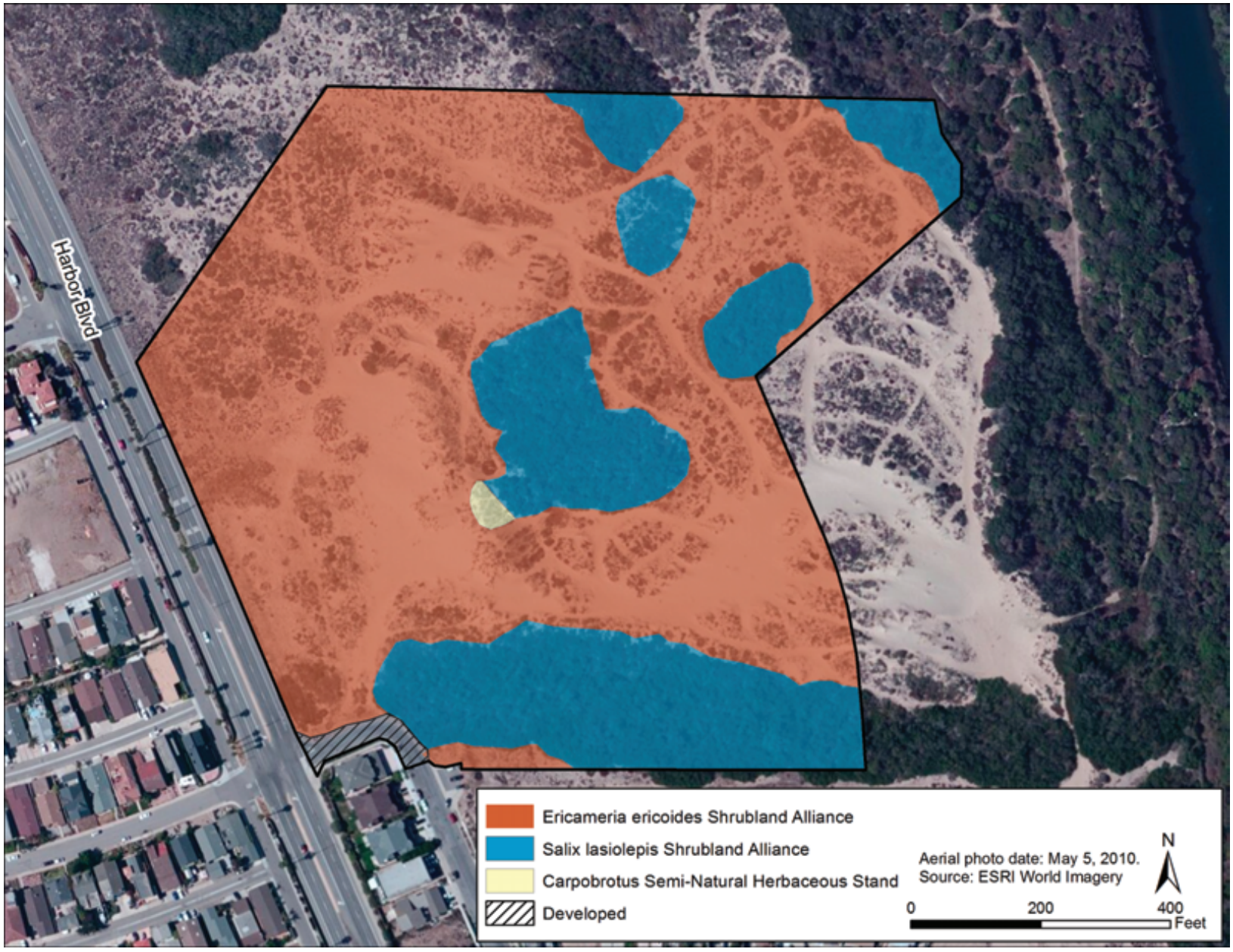
9 Sawyer, J.T. Keeler-Wolf and J. Evens. *A Manual of California Vegetation.* 2nd edition. California Native Plant Society, Sacramento, CA. p. 578. 2009.

10 Sawyer, J.T. Keeler-Wolf and J. Evens. *A Manual of California Vegetation.* 2nd edition. California Native Plant Society, Sacramento, CA. p. 578. 2009.



SOURCE: Impact Sciences, Inc., March, 2014

FIGURE **2**

Vegetation Communities on the Avalon North Parcel

***Carpobrotus* Semi-Natural Herbaceous Stand** (0.1 acre)

Iceplant forms a small patch adjacent to one of the arroyo willow stands, but is otherwise not abundant on the site. Vegetation cover is 100 percent.

2.3 Wildlife

As described, the majority of the proposed development area is characterized by disturbed remnant inland dunes and supports primarily sparse and low-growing shrubs, patches of willow thickets, grasses, and iceplant. The existing development adjacent and south of the proposed development area is expected to have displaced much of the wildlife that was established on-site prior to the grading from that development. All wildlife species detected during the site survey were recorded and are discussed in the following text. Due to the seasonal timing of the site survey, more wildlife species, particularly birds, than those observed are expected to utilize on-site habitats.

Amphibians

No amphibians were observed or otherwise detected and amphibian numbers and diversity are expected to be relatively low on-site due to the limited vegetation cover and lack of regular sources of water. Following larger storm events, there is some limited potential for Pacific chorus frog (*Pseudacris regilla*), California chorus frog (*Pseudacris cadaverina*), and western toad (*Bufo boreas*) from adjacent, more suitable habitats, to enter the site and occupy rain pools that could potentially form among the lower-lying willow thickets on the northern parcel.

Reptiles

Common reptile species observed on both the project site and northern parcel include Great Basin fence lizard (*Sceloporus occidentalis longipes*) and side-blotched lizard. Although not observed, suitable habitat is present in the less disturbed northern parcel for several other reptile species. These include, but are not limited to, southern alligator lizard (*Elgaria multicarinata*), coachwhip (*Masticophis flagellum*), gopher snake (*Pituophis catenifer*), southern Pacific rattlesnake (*Crotalus helleri*), and California kingsnake (*Lampropeltis getula californiae*), each of which has some potential to occur in low densities on-site.

Birds

Despite the isolated and disturbed nature of the site, a variety of more urban-adapted bird species are expected to occur on the project site, especially because of the variety of habitats adjacent to the site in association with the Southern California Edison Canal. Species observed on-site during surveys include American crow (*Corvus brachyrhynchos*), common raven (*C. corax*), Anna's hummingbird (*Calypte anna*),

long-billed curlew (*Numenius americanus*), bushtit (*Psaltriparus minimus*), Say's phoebe (*Saynoris saya*), black phoebe (*S. nigricans*), yellow-rumped warbler (*Setophaga coronata*), house finch (*Haemorhous mexicanus*), American goldfinch (*Spinus tristis*), western gull (*Larus occidentalis*), California towhee (*Melozone crissalis*), wrentit (*Chamaea faciata*), and the non-native rock pigeon (*Columba livia*). Yellow warbler (*Setophaga petechia*) was also observed, but this species is considered to be of special-status by California Department of Fish and Wildlife (CDFW). As such, it discussed in more detail in the Special-Status Biological Resources portion of this section.

Raptors (birds of prey) are another group of bird species expected to periodically utilize the site. The open areas on the site provide a forage base for many raptor species occurring in the region. Turkey vulture (*Cathartes aura*) and red-tailed hawk (*Buteo jamaicensis*), were observed soaring over and near the site during the field surveys Other raptor species including American kestrel (*F. sparverius*), great horned owl (*Bubo virginianus*), barn owl (*Tyto alba*), red-shouldered hawk (*Buteo lineatus*), white-tailed kite (*Elanus leucurus*), and Cooper's hawk (*Accipiter cooperii*) could also occur in the area. White-tailed kite and Cooper's hawk are special-status species and are discussed in more detail in the Special-Status Biological Resources portion of this section.

Due to the seasonal timing of initial surveys, no active bird nests were observed or expected to occur. However, habitats present on-site, particularly the willow thickets, provide suitable nesting for numerous avian species.

Mammals

A variety of mammal species occur in the vicinity of the Avalon Homes project site. Larger species including mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), and bobcat (*Lynx rufus*), are not as likely to occur on-site due to proximity of surrounding development, lack of suitable habitat on and adjacent to the site, and fencing of the site. Medium-sized to small mammal species, including Virginia opossum (*Didelphis virginiana*), common raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and long-tailed weasel (*Mustela frenata*) are expected to occur as they are more tolerant of human disturbance, have suitable refuge in the riparian habitat associated with the adjacent canal, and are able to scale the fences or enter through small openings.

Common mammals either directly observed or for which diagnostic sign was detected during surveys of the Specific Plan Area include common raccoon, Virginia opossum, desert cottontail (*Sylvilagus auduboni*), Botta's pocket gopher (*Thomomys bottae*), and woodrat (*Neotoma* sp.). Presence of woodrat was evidenced by large stick nests within the willow thickets. Based on the form of these nests and the habitat in which they occur, it is anticipated that the woodrats present on-site are the more common dusky-footed

woodrat (*N. fuscipes*), versus the San Diego desert woodrat (*N. lepida intermedia*), which is a California species of special concern; though positive identification cannot be made without direct observation of the animal. Additional small mammals that potentially occur on-site include ornate shrew (*Sorex ornatus*), broad-footed mole (*Scapanus latimanus*), western harvest mouse (*Reithrodontomys megalotis*), deer mouse (*Peromyscus maniculatus*), California mouse (*Peromyscus californicus*), brush mouse (*Peromyscus boylii*), and California vole (*Microtus californicus*). Non-native mammal species including house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), and black rat (*R. rattus*) also commonly occur near urban and other areas subject to regular human disturbance and may occur on-site.

Common bat species with a potential to forage and temporarily roost on-site include western pipistrelle (*Pipistrellus hesperus*), Brazilian free-tailed bat (*Tadarida brasiliensis*), big brown bat (*Eptesicus fuscus*), and California myotis (*Myotis californicus*). Bat species considered to be of special-status potentially occur in the vicinity and are discussed in more detail below.

2.4 Special-Status Resources

Based on a query of California Natural Diversity Database (CNDDB) and the California Native Plant Society (CNPS) Inventory and general knowledge of the project region, 22 special-status plant and 38 special-status animal species are reported within the project region, defined as the USGS 7.5-minute quadrangle containing the project site (Oxnard) and the surrounding five quadrangles. A summary of these species' potential to utilize both the project site and the northern parcel is provided in **Table 1, Special-Status Plant Species Recorded from the Project Vicinity** and **Table 2, Special-Status Wildlife Species Recorded from the Project Vicinity**.

No plant species listed in **Table 1** were observed on-site during the 2014 general surveys, though focused surveys following CDFW and CNPS survey protocol were not conducted due to seasonal timing. One wildlife species listed in **Table 2** was observed on-site during the general surveys. Yellow warbler (*Setophaga petechia*), was observed in a willow thicket in the northern parcel. This CDFW species of special concern is discussed in more detail in the Special Status Wildlife portion of this report. Neither focused surveys for listed wildlife species requiring US Fish and Wildlife Service (USFWS) protocol methodology nor other general special-status surveys following CDFW survey guidelines were completed due to seasonal timing. Notwithstanding, some of the plant and wildlife species listed in **Tables 1** and **2** are considered to have a potential to occur because the species has been recorded in the vicinity of the project site and/or one or more habitat elements for the species is present on-site.

Table 1
Special-Status Plant Species Recorded from the Project Vicinity

Common Name and *Scientific Name*	Status			Habitat Requirements	Elevation Range, Life Form, and Flowering Period	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
	Federal	State	CNPS			
Chaparral sand verbena *Abronia villosa* var. *aurita*	--	--	1B.1	Chaparral, coastal scrub, desert dunes; sandy	75–1600 m AH Jan–Sept	**High Potential**. Suitable habitat present on-site and record of occurrence within 10 miles/ **High Potential.** Suitable habitat present on-site and record of occurrence within 10 miles
Aphanisma *Aphanisma blitoides*	--	--	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub; sandy	1–305 m AH March–June	**Low Potential**. Very limited habitat present on-site and no records of occurrence in the Oxnard quadrangle/ **Moderate Potential.** Somewhat better habitat quality in the northern parcel.
Ventura Marsh milk-vetch *Astragalus pycnostachyus* var. *lanosissimus*	FE	CE	1B.1	Coastal dunes, coastal scrub, marshes and swamps (edges, coastal salt or brackish)	1–35 m PH June–Oct	**High Potential**. Reported occurrence just north of 5th street in similar habitat/ **High Potential.** Reported occurrence just north of 5th street in similar habitat.
Coulter's saltbush *Atriplex coulteri*	--	--	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland	3–460 m PH March–Oct	**Moderate Potential**. No records of occurrence in Oxnard quadrangle, but suitable habitat present/ **Moderate Potential.** No records of occurrence in Oxnard quadrangle, but suitable habitat present.

Common Name and *Scientific Name*	Status: Federal	Status: State	Status: CNPS	Habitat Requirements	Elevation Range, Life Form, and Flowering Period	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
South coast saltscale *Atriplex pacifica*	--	--	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, playas	0–140 m AH) March–Oct	**Moderate Potential**. No records of occurrence in Oxnard quadrangle, but suitable habitat present/ **Moderate Potential.** No records of occurrence in Oxnard quadrangle, but suitable habitat present.
Davidson's saltscale *Atriplex serenana* var. *davidsonii*	--	--	1B.3	Coastal bluff scrub, coastal scrub; alkaline soils	10–200 m AH April–Oct	**Moderate Potential**. Suitable habitat present and one occurrence record in Oxnard quadrangle/ **Moderate Potential.** Suitable habitat present and one occurrence record in Oxnard quadrangle.
Late-flowered mariposa lily *Calochortus fimbriatus*	--	--	1B.3	Chaparral, cismontane woodland, riparian woodland; often serpentinite	275–1,905 m PH(b) June–Aug	**Low Potential**. Typical habitat for this species is not present on-site/ **Low Potential.** Typical habitat for this species is not present on-site.
Orcutt's pincushion *Chaenactis glabriuscula* var. *orcuttiana*	--	--	1B.1	Coastal bluff scrub (sandy), coastal dunes	0–100 m AH Jan–Aug	**High Potential**. Record of occurrence within 5 miles of site in similar dune habitat/ **High Potential.** Record of occurrence within 5 miles of site in similar dune habitat.
Salt marsh bird's-beak *Chloropyron maritimum* ssp. *maritimum*	FE	CE	1B.2	Coastal dunes, marshes and swamps, wetlands	0–425 m AH May–Nov	**Low Potential**. Reported occurrence in dune habitat within 5 miles of site. Poor quality habitat on project site/ **Moderate Potential.** Somewhat better quality habitat for this species in northern parcel.

Common Name and *Scientific Name*	Status			Habitat Requirements	Elevation Range, Life Form, and Flowering Period	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
	Federal	State	CNPS			
Dune larkspur *Delphinium parryi* ssp. *blockmaniae*	--	--	1B.2	Chaparral (maritime), coastal dunes	0–200 m PH April–May	**Moderate Potential**. No nearby occurrence records, but suitable habitat present on-site/ **Moderate Potential.** No nearby occurrence records, but suitable habitat present on-site.
Blochman's dudleya *Dudleya blochmaniae* ssp. *blochmaniae*	--	--	1B.1	Coastal bluff scrub, chaparral, coastal scrub, valley and foothill grasslands; rocky, often clay or serpentinite soils	5–450 m PH April–June	**Low Potential**. No occurrence records in Oxnard quadrangle and low quality habitat on-site/ **Low Potential.** No occurrence records in Oxnard quadrangle and low quality habitat on-site
Verity's dudleya *Dudleya verityi*	FT	--	1B.2	Chaparral, cismontane woodland, coastal scrub; volcanic, rocky substrates	60–120 m PH May–June	**Not Expected**. No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site.
Conejo buckwheat *Eriogonum crocatum*	--	CR	1B.2	Chaparral, coastal scrub, valley and foothill grassland; Conejo volcanic rocky outcrops	50–580 m PH April–July	**Not Expected**. No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site.
Beach goldenaster *Heterotheca sessiflora* ssp. *sessiflora*	--	--	1B.1	Chaparral (coastal), coastal dunes, coastal scrub	0–1,225 m PH March–Dec	**High Potential**. Occurrence record within 1 mile of site and suitable habitat present on-site/ **High Potential.** Occurrence record within 1 mile of site and suitable habitat present on-site.

Common Name and *Scientific Name*	Status: Federal	Status: State	Status: CNPS	Habitat Requirements	Elevation Range, Life Form, and Flowering Period	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
Coulter's goldfields *Lasthenia glabrata* ssp. *coulteri*	--	--	1B.1	Marshes and swamps (coastal salt), playas, vernal pools	1–1,220 m AH Feb–June	**Low Potential**. Limited suitable habitat on project site/ **Moderate Potential.** Marginally suitable habitat on-site. All records in Oxnard quadrangle further inland.
Mexican malcothrix *Malcothrix ximilis*	--	--	2A	Coastal dunes, beaches	0–40 m AH) April–May	**Low Potential**. Suitable habitat on-site, but last recorded occurrence in Oxnard quadrangle is from 1925/ **Low Potential.** Suitable habitat on-site, but last recorded occurrence in Oxnard quadrangle is from 1925.
White-veined monardella *Monardella hypoleuca* ssp. *hypoleuca*	--	--	1B.3	Chaparral, cismontane woodland; often in rich soils of shady canyon bottoms	50–1525 m S April–Dec	**Not Expected**. No suitable habitat present on-site/ **Not Expected**. No suitable habitat present on-site.
Southern curly-leaved monardella *Monardella sinuate* ssp. *sinuata*	--	--	1B.2	Chaparral, cismontane woodland, coastal dunes, coastal scrub (openings); sandy	0–300 m AH April–Sept	**Moderate Potential**. Suitable habitat present on-site, but no records of occurrence in Oxnard quadrangle/ **Moderate Potential**. Suitable habitat present on-site, but no records of occurrence in Oxnard quadrangle.

Common Name and *Scientific Name*	Status: Federal	Status: State	Status: CNPS	Habitat Requirements	Elevation Range, Life Form, and Flowering Period	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
Ojai navarettia *Navarettia ojaiensis*	--	--	1B.1	Valley and foothill grassland, openings in chaparral and coastal scrub	275–620 m AH May–July	**Not Expected**. No suitable habitat present on-site/ **Low Potential.** Low quality habitat present on-site. No records of occurrence in Oxnard quadrangle.
South Coast branching phacelia *Phacelia ramosissima* var. *austrolitoralis*	--	--	3.2	Chaparral, coastal dunes, coastal scrub, marshes and swamps (coastal salt); sandy, sometimes rocky soils	5–300 m PH March–Aug	**High Potential**. Suitable habitat present on-site. Reported occurrence adjacent to the northwest corner of north parcel/ **High Potential.** Suitable habitat present on-site. Reported occurrence adjacent to the northwest corner of north parcel.
Chaparral ragwort *Senecio aphanactis*	--	--	2B.2	Chaparral, coastal scrub, cismontane woodland; sometimes alkaline	15–800 m AH Jan–April	**Not Expected**. No suitable habitat present on-site/ **Low Potential.** Low quality habitat present on-site. No records of occurrence in Oxnard quadrangle.
Estuary seablite *Suaeda esteroa*	--	--	1B.2	Coastal salt marsh	0–5 m PH May–Jan	**Not Expected**. No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site.

Federal
FE: Federally listed as Endangered
FC: Federal Candidate for listing as Endangered or Threatened

State
CE: State listed as Endangered
CR: California Rare

California Rare Plant Ranks
1B: Rare, Threatened, or Endangered in California and elsewhere
2B: Rare, Threatened, or Endangered in California, but more common elsewhere
3: more information needed to determine rarity

CNPS threat ranks
.1: Seriously Threatened in California
.2: Moderately Threatened in California
.3: Not Very Threatened in California

Table 2
Special-Status Wildlife Recorded From the Project Vicinity

Common Name and *Scientific Name*	Status		Habitat Requirements	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
	Federal	State		
Invertebrates				
Sandy beach tiger beetle *Cicindela hirticollis gravida*	--	sa	Sandy beaches of ocean, lakes, rivers and streams	**Not Expected**. Sandy habitat is present, but site is disturbed and lacks any water/ **Low Potential.** Suitable coastal dune habitat is present, but site lacks water
Senile tiger beetle *Cicindela senilis frosti*	--	sa	Mud shore/flats, wetlands	**Not Expected**. No suitable habitat on-site/ **Not Expected.** No suitable habitat on-site
Globose dune beetle *Coelus globosus*	--	sa	Coastal sand dunes, foredunes, and hummocks; usually beneath surface	**High Potential**. Suitable habitat on-site and species known from the area/ **High Potential.** Suitable habitat on-site and species known from the area
Trask shoulderband *Helminthoglypta traskii traskii*	--	sa	Chaparral, coastal scrub	**Not Expected**. Suitable habitat not present on-site/ **Low Potential.** Typical habitat not present on-site
Mimic tryonia (CA brackish water snail) *Tryonia imitator*	--	sa	Brackish marsh, estuary, lagoon, salt marsh	**Not Expected**. No suitable habitat on-site/ **Not Expected.** No suitable habitat on-site
Santa Monica grasshopper *Trimerotropis occidentiloides*	--	sa	Chaparral	**Not Expected**. No suitable habitat on-site and species not recorded outside of Santa Monica Mountains/ **Not Expected.** No suitable habitat on-site and species not recorded outside of Santa Monica Mountains
Monarch butterfly (wintering sites) *Danaus plexippus*	--	sa	Winter roost sites located in wind-protected tree groves (gum trees, Monterey pine, and cypress trees), with water sources nearby.	**Not Expected**. Individual monarchs may occur, but no suitable wintering roost sites are present on the subject property/ **Not Expected.** Individual monarchs may occur, but no suitable wintering roost sites are present on the subject property
Wandering (=saltmarsh) skipper *Panoquina errans*	--	sa	Coastal salt marsh	**Not Expected**. No suitable habitat on-site/ **Not Expected.** No suitable habitat on-site

Common Name and *Scientific Name*	Status Federal	Status State	Habitat Requirements	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
Fishes				
Tidewater goby *Eucyclogobius newberryi*	FE	SSC	Coastal estuaries and streams with brackish water	**Not Expected**. No suitable habitat on-site/ **Not Expected.** No suitable habitat on-site
Santa Ana sucker *Catostomus santaanae*	FE (excludes Santa Clara River population)	SSC	Rivers and streams	**Not Expected**. No suitable habitat on-site/ **Not Expected.** No suitable habitat on-site
Arroyo chub *Gila orcutti*	--	SSC	Rivers and streams	**Not Expected**. No suitable habitat on-site/ **Not Expected.** No suitable habitat on-site
Unarmored threespine stickleback *Gasterosteus aculeatus williamsoni*	FE	CE	Slow-moving or back water sections of warm to cool streams	**Not Expected**. No suitable habitat on-site/ **Not Expected.** No suitable habitat on-site
Southern steelhead (So. CA DPS) *Oncorhynchus mykiss*	FE	SSC	Seasonal to perennial coastal streams with suitable gravel substrate for spawning	**Not Expected**. No suitable habitat on-site/ **Not Expected.** No suitable habitat on-site
AMPHIBIANS & REPTILES				
Silvery legless lizard *Anniella pulchra pulchra*	--	SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential.	**Low Potential.** Some suitable habitat on-site, but isolation of site and disturbance history likely preclude a sustainable population surviving there/ **Moderate to High Potential.** Suitable habitat on-site, but isolation of site from other suitable habitats may preclude a sustainable population surviving there
Coastal whiptail *Aspidoscelis tigris stejnegeri*	--	sa	Open areas in semiarid grasslands, scrublands, and woodlands.	**Low Potential.** Some habitat on-site, but isolation of site may preclude a sustainable population surviving there/ **Moderate Potential.** Suitable habitat on-site, but isolation of site may preclude a sustainable population surviving there
Western pond turtle *Emys marmorata*	--	SSC	Streams, rivers, ponds, freshwater marshes, and lakes with growth of aquatic vegetation.	**Not Expected.** No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site

Common Name and *Scientific Name*	Status Federal	Status State	Habitat Requirements	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
Coast horned lizard *Phrynosoma blainvillii*	--	SSC	Relatively open grasslands, scrublands, and woodlands with fine, loose soil.	**Low Potential.** Some habitat on-site, but isolation of site may preclude a sustainable population surviving there/ **Moderate Potential.** Suitable habitat on-site, but isolation of site may preclude a sustainable population surviving there
Two-striped garter snake *Thamnophis hammondii*	--	SSC	Perennial and intermittent streams and man-made lakes and stock ponds; requires dense riparian vegetation.	**Not Expected.** No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site
South Coast garter snake *Thamnophis sirtalis ssp.*	--	SSC	Perennial and intermittent streams and man-made lakes and stock ponds; requires dense riparian vegetation.	**Not Expected.** No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site
Birds				
Cooper's hawk *Accipiter cooperi*	--	WL (Nesting)	Dense stands of live oaks and riparian woodlands.	**Low Potential.** Species might occur as infrequent forager, and off-site trees adjacent to Southern California Edison Canal provide some nesting opportunities/ **Moderate Potential.** Species could occur as periodic forager, and off-site trees adjacent to Southern California Edison Canal provide some nesting opportunities/
Burrowing owl *Athene cunicularia*	--	SSC (Burrow sites, some wintering sites)	Open, dry annual or perennial grasslands, deserts and scrublands with low-growing vegetation	**Low Potential.** Limited suitable habitat is present on-site, and no sign of suitable burrows during site surveys/ **Low Potential.** Limited suitable habitat is present on-site, and no sign of suitable burrows during site surveys
Ferruginous hawk *Buteo regalis*	--	WL (Wintering)	Grasslands, open scrub, pinon & juniper woodland	**Low Potential.** Species might occur as infrequent forager, but habitat not suitable to support over-wintering/ **Low Potential.** Species might occur as infrequent forager, but habitat not suitable to support over-wintering

Common Name and *Scientific Name*	Status		Habitat Requirements	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
	Federal	State		
Western snowy plover *Charadrius alexandrines nivosus*	FT	SSC (Nesting)	Great Basin standing waters, sandy shore, wetlands	**Not Expected.** Habitat on-site disturbed and not typical of known nesting areas. No standing water on-site/ **Low Potential.** Could possibly occur as rare forager, but habitat on-site not typical of known nesting areas. No standing water on-site.
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FC	CE (Nesting)	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems. Nests in riparian jungles of willow, often mixed with cottonwoods, with dense understory.	**Not Expected.** No suitable habitat on-site/ **Low Potential.** Migrating individuals could periodically utilize willow thickets on-site, but not expected to nest there
White-tailed kite *Elanus leucurus*	--	CFP (Nesting)	Open vegetation and uses dense woodlands for cover.	**Low Potential.** Species might occur as rare forager, and off-site trees adjacent to Southern California Edison Canal provide suitable habitat, but site disturbed and not expected to provide many foraging opportunities/ **Moderate Potential.** Species might occur as infrequent forager, and off-site trees adjacent to Southern California Edison Canal provide suitable habitat, but surrounding development may preclude nesting there.
Southwestern willow flycatcher *Empidonax traillii extimus*	FE	CE (Nesting)	Riparian woodlands.	**Not Expected.** No suitable habitat on-site/ **Low Potential.** Migrating individuals could periodically utilize willow thickets on-site, but not expected to nest there
California horned lark *Eremophila alpestris actia*	--	WL	Grasslands, disturbed areas, agriculture fields, and beach areas.	**Low Potential**. Very limited suitable foraging or nesting habitat on-site/ **Moderate Potential.** some suitable nesting habitat present, but surrounding development may preclude nesting there
Yellow warbler *Dendroica petechial brewsteri*	--	SSC (Nesting)	Riparian scrub and woodlands.	**Low Potential**. Very limited potential to occur along edges of willow thicket along northern boundary of development site/ **Present.** One individual female observed in willow thicket. Marginally suitable nesting habitat present

Belding's savannah sparrow *Passerculus sandwichensis beldingi*	CE	CE	Marshes and swamps, pickleweed flats	**Not Expected**. No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site.
California brown pelican *Pelicanus occidentalis californicus*	delisted	CFP (Nesting colony and communal roosts)	Coastal shores, offshore islands	**Not Expected**. No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site.
California gnatcatcher *Polioptila californica*	FE	SSC	Coastal sage scrub in areas of flat or gently sloping terrain.	**Not Expected**. No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site.
Light-footed clapper rail *Rallus longirostris levipes*	FE	CE	Marshes and swamps, salt marsh, wetland	**Not Expected**. No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site.
Bank swallow *Riparia riparia*	--	CT (Nesting)	Low areas along rivers, streams, coasts, or reservoirs. Nest in colonies in bluffs and stream banks.	**Not Expected**. No suitable habitat present on-site and no recent records in the vicinity/ **Not Expected.** No suitable habitat present on-site and no recent records in the vicinity
California least tern *Sternula antillarum browni*	FE	CE (Nesting colony)	Alkali playa, coastal wetlands	**Not Expected.** This species most commonly nests on beaches and sandy islands in and adjacent to estuaries. They forage on fish, so it is unlikely they would occur on-site/ **Not Expected.** This species most commonly nests on beaches and sandy islands in and adjacent to estuaries. They forage on fish, so it is unlikely they would occur on-site.
Least Bell's vireo *Vireo bellii pusillus*	FE	CE (Nesting)	Low riparian scrub in vicinity of water or in dry riverbeds.	**Low Potential**. Very limited potential to occur along edges of willow thicket along northern boundary of development site/ **Moderate Potential.** Willow thickets may provide suitable nesting habitat, though typical habitat is lest disturbed and closer to water.
MAMMALS				
Mexican long-tongued bat *Choeronycteris mexicana*	--	SSC	Pinon & juniper woodland, riparian scrub, Sonoran thorn woodland	**Not Expected**. No suitable habitat present on-site/ **Not Expected.** No suitable habitat present on-site.
Pallid bat *Antrozous pallidus*	--	SSC	Deserts, grasslands, woodlands and forests; open dry habitats with rocky areas for roosting	**Not Expected.** No roosting habitat on-site and only very limited foraging opportunities/ **Not Expected.** No roosting habitat on-site and only limited foraging opportunities.

Common Name and *Scientific Name*	Status Federal	Status State	Habitat Requirements	Potential Occurrence on the Project Site/ Potential Occurrence on the North Parcel
South Coast marsh vole *Microtus californicus stephensi*	--	SSC	Wetlands	**Not Expected**. Very marginal habitat associated with edge of willow thickets at northern edge of parcel/ **Low Potential**. Limited suitable habitat associated with willow thickets on northern parcel/
Dulzura pocket mouse *Chaetodipus californicus femoralis*	--	SSC	Chaparral, coastal scrub, valley and foothill grassland	**Low Potential**. Marginally suitable habitat present on site, but isolation from other open space habitats might preclude a sustainable population on the site/ **Low Potential**. Marginally suitable habitat present on-site, but isolation from other open space habitats might preclude a sustainable population on the site.
American badger *Taxidea taxus*	--	SSC	Plains, prairies, open edges of woodlands, grassy hillsides	**Not Expected**. No suitable habitat present and no suitable burrows observed on-site/ **Not Expected.** No suitable habitat present and no suitable burrows observed on-site.

KEY:

(nesting) = *For most taxa the CNDDB is interested in sightings for the presence of resident populations. For some species (primarily birds), the CNDDB only tracks certain parts of the species range or life history (e.g., nesting locations). The area or life stage is indicated in parenthesis after the common name.*

Status:

Federal -- US Fish and Wildlife Service

FE: Federally Endangered
FT: Federally Threatened
FC: Proposed for Federal Listing

State -- California Department of Fish and Game

CE: State-listed Endangered Species
CT: State-listed Threatened Species
CFP: California Fully Protected Species
SSC: California Species of Special Concern
WL: CDFW Watch List
sa *California Special Animal (species with no official federal or state status, but are included on CDFW's Special Animals list as CDFW is interested in collecting distribution and population data)*

Special-Status Plant Species

Table 1 lists all of the rare plants recorded from the project region and summarizes the assessment of potential for each to occur on the project site and the adjacent northern parcel. No Threatened, Endangered, or other special-status plant species were observed during general site surveys. However, surveys were not conducted pursuant to survey protocol or during the appropriate season.

Several of the special-status plant species in **Table 1** have been identified as having a "high" or "moderate" potential for occurrence primarily because there have been records of occurrence in the region and at least one primary habitat element is present on-site. Focused rare plant surveys following CDFW and CNPS protocol methods will be required to determine presence or absence of these species. Those special-status plant species with a moderate to high potential for occurrence are described in more detail below.

Special-Status Plant Species with a High Potential for Occurrence

Chaparral sand verbena (*Abronia villosa* var. *aurita*) – *CNPS Rare Plant Rank 1B.1* — This is a small annual herb that is most commonly associated with chaparral, coastal scrub and desert dunes. Sandy soils are usually present where they occur. Suitable habitat is present on-site and there is a record of occurrence within 10 miles of the site. Therefore, there is a high potential for this species to occur on this site.

Ventura Marsh milk-vetch (*Astragalus brauntoni*) – *Federally-listed Endangered Species, State-listed Endangered Species, CNPS Rare Plant Rank 1B.1* — Ventura Marsh milk-vetch is a short-lived, herbaceous perennial with dense clusters of small light yellow flowers. It is most commonly associated with coastal dunes, coastal scrub, marshes and swamps, near the edges where water is coastal salt or brackish. There is a high potential for this species to occur on-site due to an occurrence reported just north of 5th street in similar habitat.

Orcutt's pincushion (*Chaenactis glabriuscula* var. *orcuttiana) — Rare Plant Rank 1B.1.* – This small species is an annual herb that is most commonly associated with sandy coastal bluff scrub and coastal dunes. There is a high potential for occurrence as it was reported within 5 miles of the site in similar dune habitat.

Beach goldenaster (*Heterotheca sessiflora* ssp. *sessiflora*) —*Rare Plant Rank 1B.1* —Beach goldenaster is an herbaceous perennial that is most commonly associated with coastal chaparral, coastal dunes and coastal scrub. There is a high potential for this species to occur on-site due to suitable habitat on-site, and an occurrence within 1 mile of site.

South Coast branching phacelia (*Phacelia ramosissima* var. *austrolitoralis*) — *Rare Plant Rank 3.2* — This perennial herb is most commonly associated with chaparral, coastal dunes, coastal scrub and coastal salt swamps. Sandy and sometimes rocky soils are usually present where they occur. Suitable habitat is present on-site and an occurrence was reported adjacent to the northwest corner of the north parcel. Therefore, there is a high potential for occurrence of this species on-site.

Special-Status Plant Species with a Moderate Potential for Occurrence

Coulter's saltbush (*Atriplex coulteri*) — *Rare Plant Rank 1B.2* — This species of saltbush is typically associated with coastal bluff scrub, coastal dunes, coastal scrub and valley and foothill grassland. Although there are no records of occurrence in the Oxnard quadrangle, suitable habitat is present on-site. Therefore, there is a moderate potential for occurrence on-site.

South coast saltscale (*Atriplex pacifica*) —*Rare Plant Rank 1B.2* — South coast saltscale is associated with coastal bluff scrub, coastal dunes, coastal scrub and playas. There are no records of occurrence in the Oxnard quadrangle, but suitable habitat is present. Therefore, it is still considered to have a moderate potential to occur on-site.

Davidson's saltscale (*Atriplex serenana* var. *davidsonii*) — *Rare Plant Rank 1B.3* — Davidson's saltscale is a species of saltbush commonly occurs in coastal bluff scrub and coastal scrub, and is most commonly associated with alkaline soils. There is one record of occurrence in the Oxnard quadrangle, and suitable habitat is present. Therefore, this species considered to have a moderate potential to occur on-site.

Salt marsh bird's-beak (*Chloropyron maritimum* ssp. *maritimum*) — *Federally listed Endangered Species, State-listed Endangered Species, Rare Plant Rank 1B.2* — Salt marsh bird's-beak is commonly associated with coastal dunes, marshes and swamps and wetlands. There is one record of occurrence within 5 miles of the site. The project site supports only low quality habitat, but the northern parcel supports a higher quality habitat for this species so there is moderate potential for it to occur there.

Dune larkspur (*Delphinium parryi* ssp. *blockmaniae*) — *Rare Plant Rank 1B.2* — This perennial herb usually occurs in chaparral (maritime) and coastal dunes. There are no records of occurrence in the Oxnard quadrangle, but suitable habitat is present on-site. Therefore, it is considered to have a moderate potential to occur on-site.

Southern curly-leaved monardella (*Monardella sinuate* ssp. *sinuata*) — *Rare Plant Rank 1B.2* — This annual herb is usually associated with chaparral, cismontane woodland, coastal scrub openings, and coastal dunes, typically in sandy soils. There are no records of occurrence in the Oxnard quadrangle, but

suitable habitat is present on-site. Therefore, southern curly-leaved monardella is considered to have a moderate potential to occur on-site.

Aphanisma (*Aphanisma blitoides*) — *Rare Plant Rank 1B.2* — This is a species of annual herb commonly associated coastal bluff scrub, coastal dunes and coastal scrub. They usually occur in sandy soils. There are no records of occurrence in the Oxnard quadrangle, and very limited suitable habitat is present on the project site. However, better habitat quality occurs in the northern parcel, and therefore, there is a moderate potential for occurrence there.

Special-Status Wildlife Species

Highly motile special-status wildlife species including birds and mammals can periodically forage on the site or use trees to roost or nest in. However, the limited size and disturbed nature of the proposed project site likely precludes these animals from residing and/or being dependent upon the remaining resources on-site. The northern parcel, because of its larger size and lesser level of disturbance, provides some greater opportunities for special status wildlife than the project site.

Focused surveys for listed wildlife species were not conducted on either the proposed project site or the parcel to the north as the seasonal timing of the site investigation was not conducive to the greatest activity level for these species. Thus, the lack of observation of special-status animal species known to occur in the region cannot be regarded as definitive evidence that they do not utilize the project site or northern parcel. Special-status wildlife species that were observed on-site, or that have been determined to have a high or moderate potential to occur are discussed in detail below.

Special-Status Wildlife Species Observed

Yellow Warbler (*Dendroica petechial brewsteri*)—*CDFW Species of Special Concern* — This small yellow bird is a migrant that commonly nests in Southern California. It is most commonly associated with riparian scrub and riparian woodlands. A single yellow warbler was observed within one of the willow thickets on the northern parcel. The other willow thickets on the northern parcel are also suitable for this species to utilize. It is unknown if they nest here, but because the habitat is suitable it is assumed they would. One edge of one willow thicket occurs on the project site, which is also suitable for nesting, but its proximity to existing development may make it less desirable for birds to nest in when there are less disturbed areas nearby.

Special-Status Species with a High Potential for Occurrence

Globose dune beetle (*Coelus globosus*) – *CDFW Special Animal* — This beetle is rarely seen as it spends much of its time below the surface. They are known to inhabit coastal dune and foredune habitats. Though disturbed, the project site supports some suitable habitat, though the northern parcel provides a greater area and less disturbed habitat. Because suitable habitat is present and because they have been recorded in the region this species is considered to have a high potential for occurrence on both the project site and the northern parcel.

Silvery legless lizard (*Anniella pulchra pulchr*a) — *CDFW Species of Special Concern* — Silvery legless lizards occur primarily in areas with sandy or loose loamy soils. They are most commonly found in sparsely vegetated beaches, stabilized dunes, chaparral, and riparian woodlands. They spend most of their lives beneath the surface soils and are often found under logs, rocks, debris, and leaf litter. Soil moisture is critical for their survival. Disturbed areas from agriculture, mining, and other human uses are less suitable for this species. As such, based on the size of the site and its disturbance level, the proposed project site provides fewer opportunities for legless lizards than the northern parcel. The northern parcel is also more suitable since there is expected to be more soil moisture in association with the lower-lying willow thicket areas. Based on this understanding silvery legless lizard has a low potential to occur on the project site and a moderate to high potential to occur in the less disturbed portions of the northern parcel.

Special-Status Species with a Moderate Potential for Occurrence

Coastal whiptail (*Aspidoscelis tigris stejnegeri*) – *CDFW Special Animal* – This relatively long (to 13 inches) and slender lizard occurs in a variety of habitats, primarily hot and arid area with sparse vegetation within chaparral, woodlands and riparian areas. They are known for their rapid movements and prefer open areas where they have plenty of space to run from predators. Because of the relatively small size of the project site and its proximity to existing development, coastal whiptails are considered to have a low potential for occurrence on the project site. Though still not ideal (i.e., no typical scrub, woodland or riparian habitats), the northern parcel supports a greater area and less disturbed habitat so this species has a moderate potential for occurrence there.

Coast horned lizard (*Phrynosoma blainvillii*)— *CDFW Species of Special Concern* – Despite their name, coast horned lizards occur in suitable habitats from the coast to the mountains where they can be found in a variety of scrub and woodland habitats, and sometimes open grasslands. They require loose soils to burrow into for thermoregulation. They are insectivorous with their primary prey species being harvester ants (*Pogonomyrmex* spp.). There were no harvester ants observed on the project site and horned lizards tend to avoid developed and disturbed areas so horned lizard has a low potential for occurrence on the

project site. The northern parcel provides a less disturbed sandy habitat, but no harvester ants were observed there either. However, since the northern parcel is someone more suitable for horned lizards, they are considered to have a moderate potential for occurrence on that site.

Cooper's hawk (*Accipiter cooperii*)—*CDFW Watch List* – CDFW is primarily interested in locations of active nests of this species. It nests in open forests, groves, trees along rivers, and less frequently in low scrub of treeless areas. The wooded area is often near the edge of a field or water. The nearest suitable nesting habitat is within the trees along the adjacent Southern California Edison Canal, but they probably forage on-site periodically for smaller birds, their primary prey. They are known to nest in the region of the project, but since nesting habitat on-site is limited, their potential for occurrence as a forager on the subject parcel is low due to the smaller size and level of disturbance, but on the northern parcel it is considered moderate.

White-tailed kite (*Elanus leucurus*); *California Fully Protected Species* – White-tailed kites utilize a variety of habitats, but are generally associated with riparian woodlands situated near open grassland and/or agricultural fields. This species is a yearlong resident in coastal and valley lowlands, where they nest in trees. White-tailed kites are known to occur in the vicinity of the project area. There are no suitable nesting trees on either parcel, but the habitat adjacent to the nearby canal provides some nesting opportunities. Due to the disturbance history, relatively small area, and proximity to existing development, foraging opportunities are limited as habitat for small mammals (their primary prey) is considerably reduced. Therefore, their potential for occurrence is low on the project site. The northern parcel provides somewhat better foraging habitat. Therefore, this species has a moderate potential for occurrence on that parcel.

California horned lark (*Eremophila alpestris actia*)—*CDFW Watch List* – Horned larks are ground nesting birds, most commonly occurring in grasslands, disturbed areas, agriculture fields, and beaches. The proposed project site provides very limited space and is adjacent to existing development so occurrence of horned larks is considered low. The northern parcel provides a greater amount of somewhat less disturbed area, but the proximity of development may also dissuade this species from occurring there. However, since there is some limited suitable habitat, California horned larks have a moderate potential to occur on the northern parcel.

Least Bell's vireo (*Vireo bellii pusillus*); *Federally listed Endangered Species, State-listed Endangered Species* – Least Bell's vireo most commonly occurs in riparian scrub adjacent to water, but has also been recorded in riparian scrub in river beds when they are dry, such at the Santa Clara River. The project site does not support any typical habitat for this species so occurrence potential is considered low. However, the willow thickets on the northern parcel do provide some marginally suitable nesting opportunities.

Therefore, least Bell's vireo is considered to have a moderate potential for occurrence on the northern parcel.

2.5 Sensitive Resource Area

The City of Oxnard Zoning Map identifies the proposed development site as R2C or coastal multiple family housing. The majority of the northern parcel is zoned as a Resource Protection area with a portion in the northwest designated as Coastal Commercial Visitor Serving. The Oxnard Coastal Land Use Plan designates the northern parcel as a Sensitive Resource Area and identifies it as the Northern Dunes Area. This designation is equivalent to Environmentally Sensitive Habitat Area (ESHA) as defined in the Coastal Act. ESHA means any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments.[11] The Oxnard Local Coastal Program requires the protection of ESHA, such as the sand dune habitat found on the open space parcel to the north of the project site, against any significant disruption of habitat values. Section 30240b (incorporated into the City of Oxnard certified LUP) of the Coastal Act requires that development adjacent to ESHA is sited and designed to prevent impacts that would significantly degrade ESHA and to be compatible with the continuance of the habitat areas.[12] The Oxnard Land Use Plan requires a buffer of 100 feet to be provided adjacent to resource protection areas. The buffer may be reduced to a minimum of 50 feet only if an applicant can demonstrate the large buffer is unnecessary to protect the resources of the habitat area.

2.6 Jurisdictional Resources

The willow thickets on the northern parcel indicate there may be wetlands associated with them as willows require wet areas to thrive. The proposed project site would encroach slightly into one of the thickets that separate the two parcels. A jurisdictional delineation would be required to determine whether or not disturbance of the willow stands requires permits under federal and state regulations that govern streambeds and wetlands. Wetland indicators are often difficult to detect in sandy soil, but if present the willow swales would qualify as "adjacent wetlands" under federal jurisdiction despite their apparent isolation from the canal to the east: "Wetlands separated from other waters of the US by man-made dikes or barriers, natural river berms, beach dunes, and the like are adjacent."[13] The same reasoning, based on hydrologic connectivity, would apply to delineation of state jurisdiction.

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11 Public Resources Code. Division 20. California Coastal Act. 2014. Definitions. Section 30107.5 Environmentally Sensitive Area.

12 Public Resources Code. Division 20. California Coastal Act. 2014. Section 30240 Environmentally Sensitive Habitat Areas; adjacent development. Article 5, Land Resources.

13 US Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook, 2007, page 20

Delineation Criteria

California Department of Fish and Wildlife

At the state level, CDFW has jurisdictional authority over resources associated with rivers, streams, and lakes.[14] The California Code of Regulations define a stream as "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish and other aquatic life including watercourses having a surface or subsurface flow that supports or has supported riparian vegetation."[15] CDFW jurisdiction typically extends between the top of each bank or to the outer edge of contiguous riparian vegetation, whichever is greater.

US Army Corps of Engineers

At the federal level, the USACE regulates placement of "dredge" and "fill" in waters of the US including adjacent wetlands under the authority of Section 404 of the Clean Water Act.[16] The Code of Federal Regulations defines "waters of the US" as intrastate lakes, rivers, streams, mudflats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, play lakes, or natural ponds. Wetlands are defined as "areas that are inundated or saturated by surface water 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." Assessment of federal jurisdiction is based on two main factors: (1) nexus or connectivity of "traditionally navigable waters" or "relatively permanent waters" and (2) presence of "ordinary high water marks."

Regional Water Quality Control Board

Federal authority over water quality under Section 401 of the Federal Clean Water Act is typically delegated to Regional Water Quality Control Boards (RWQCBs) unless a project encompasses more than one region, in which case the State Water Resources Control Board may assert regulatory authority. This project falls under the authority of the Los Angeles Regional Water Quality Control Board. Section 401 of the Clean Water Act requires that "any applicant for a federal permit for activities that involve a discharge to Waters of the US, shall provide the federal permitting agency a certification from the state in which the discharge is proposed that states that the discharge will comply with the applicable provisions under the Federal Clean Water Act."

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14 Fish and Game Code §§ 1600-1616

15 California Code of Regulations (C.C.R.), Title 14 § 1.72

16 Clean Water Act of 1972 § 404. See also 33 USC. § 1341

In addition to Section 401 of the Federal Clean Water Act, the RWQCB exerts authority of "Waters of the State" and water quality by means of state law. "Waters of the State" are broadly defined by sections of the California Water Code, known as the Porter-Cologne Water Quality Control Act, as "any surface water or ground water, including saline waters, within the boundaries of the state."[17]

2.7 Habitat Connectivity

As used in this document, habitat connectivity is an umbrella term referring to all of the factors relating to integration of habitats within an ecosystem. Wildlife corridors and habitat linkages are features that promote habitat connectivity. Wildlife corridors are typically discrete linear features within a landscape that are constrained by development or other non-habitat areas. Habitat linkages are networks of corridors and larger natural open space areas that encompass an adequate diversity and acreage of useable habitats to provide long-term resilience of ecosystems against the detrimental effects of habitat fragmentation, which creates isolated "islands" of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open-space areas, various studies have concluded that many wildlife and plant species would not likely persist over time in fragmented or isolated habitat areas because they prohibit the movement of new individuals and genetic information among areas where they may be periodically displaced by natural or human-caused disturbances such as disease, fire, flood, etc.

Habitat linkages mitigate the effects of this fragmentation by:

- allowing plant and animal species to disperse between remaining habitat areas, thereby permitting at-risk populations to maintain sustainable levels of genetic variability;
- providing escape routes from fire, predators, and human disturbances, thus reducing the risk of catastrophic events (such as fire or disease) causing population or local species extinction; and
- serving as travel routes for individual animals as they move within their home ranges in search of food, water, mates, and other needs.

South Coast Missing Linkages is an inter-agency effort to identify and conserve the highest priority linkages in the South Coast Ecoregion. Partners in the effort include South Coast Wildlands, National Park Service, US Forest Service, California State Parks, The Wildlands Conservancy, The Resources Agency, California State Parks Foundation, The Nature Conservancy, Santa Monica Mountains Conservancy, Resources Legacy Foundation, Conservation Biology Institute, San Diego State University Field Stations Program, Environment Now, Mountain Lion Foundation, and the Zoological Society of San Diego's Conservation and Research for Endangered Species, among others. The South Coast Missing Linkages project has developed a comprehensive plan for a regional network that would maintain and

17 California Water Code § 13050€

restore critical habitat linkages between existing open space reserves. Adjacent and outlying open spaces are also important in maintaining connections between open spaces. The nearest identified linkage to the subject project site is the San Gabriel – Castaic Connection. The project site and adjacent off-site parcels do not lie within the linkage design for this connection.

Neither the project site nor the northern parcel is identified as part of any important connectivity link. Additionally, as described, the parcels are surrounded by existing or approved development, major thoroughfares, and the Southern California Edison Canal. Further, the northern parcel is completely fenced. The resulting condition is that use of the site by local wildlife that travel from one area to another on the ground are not likely to be impeded by development of the proposed project site or the northern parcel.

APPENDIX A

Plant Species Observed

Appendix A
Plant Species Recorded On the Project Site

Latin Name	Common Name
PTERIDOPHYTES	**FERNS AND FERN ALLIES**
Equisetacea	**Horsetail Family**
Equisetum sp.	Horsetail
DICOTS	**FLOWERING PLANTS**
Aizoacea	**Fig-Marigold Family**
Carpobrotus sp.*	Sea fig
Anacardiaceae	**Sumac Family**
Rhus integrifolia (Nutt.) Brewer & S. Watson	Lemonadeberry
Asteraceae	**Sunflower Family**
Baccharis pilularis DC.	coyote brush
Baccharis salicifolia (Ruiz Lopez & Pavon) Pers.	mule fat
Ericameria ericoides (Less) Jepson	Mock heather
*Heterotheca grandiflora*Nutt.	telegraph weed
Dudleya sp.	Dudleya
Euphorbiaceae	**Spurge Family**
Croton californicus Muell.	California croton
Fabaceae	**Legume Family**
Acmispon glaber (Vogel) Brouillet	deerweed, California broom
Geraniaceae	**Geranium Family**
Erodium cicutarium (L.) L'Her.*	red-stem filaree
Hydrophyllaceae	**Water-Leaf Family**
Phacelia sp.	Unidentified phacelia
Nyctaginaceae	**Four-O'Clock Family**
Abronia sp.	Sand verbena
Onagraceae	**Evening Primrose Family**
Camissonia cheiranthifolia (Sprengel)Raim	Beach evening primrose
MONOCOTS	**GRASSES AND ALLIES**
Cyperaceae	**Sedge Family**
Cyperus sp.	Sedge
Poaceae	**Grass Family**
Avena sp.*	Wild oat
Bromus sp*	Brome

Notes:
1. This list is based on observations during a winter survey (January 2014). It is subject to revision based on a complete floristic survey scheduled for spring and summer of 2014.
2. Asterisk (*) indicates species not native to California.

Appendix A
Plant Species Recorded from the Northern Parcel

Latin Name	Common Name
PTERIDOPHYTES	**FERNS AND FERN ALLIES**
Equisetacea	**Horsetail Family**
Equisetum sp.	Horsetail
DICOTS	**FLOWERING PLANTS**
Aizoaceae	**Fig-Marigold Family**
Carpobrotus sp.*	Sea fig
Anacardiaceae	**Sumac Family**
Rhus integrifolia (Nutt.) Brewer & S. Watson	Lemonadeberry
Toxicodendron diversilobum (Torrey & A. Gray) E. Greene	poison oak
Asteraceae	**Sunflower Family**
Ambrosia chamissonis (Less.) E. Greene	Beach bur
Baccharis pilularis DC.	coyote brush
Ericameria ericoides (Less.) Jepson	Mock heather
*Heterotheca grandiflora*Nutt.	telegraph weed
Lessingia filaginifolia (Hook. & Arn.) M.A. Lane	California-aster
Pseudognaphalium californicum (DC.) Anderb.	Ladies' tobacco
Euphorbiaceae	**Spurge Family**
Croton californicus Muell.	California croton
Fabaceae	**Legume Family**
Acmispon glaber (Vogel) Brouillet	deerweed, California broom
Geraniaceae	**Geranium Family**
Erodium cicutarium (L.) L'Her.*	red-stem filaree
Hydrophyllaceae	**Water-Leaf Family**
Phacelia sp.	Unidentified phacelia
Nyctaginaceae	**Four-O'Clock Family**
Abronia sp.	Sand verbena
Onagraceae	**Evening Primrose Family**
Camissonia cheiranthifolia (Sprengel)Raim	Beach evening primrose
Polygonaceae	**Buckwheat Family**
Eriogonum parvifolium (Smith.)	Seacliff buckwheat
MONOCOTS	**GRASSES AND ALLIES**
Cyperaceae	**Sedge Family**
Cyperus sp.	Sedge
Poaceae	**Grass Family**
Avena sp.*	Wild oat
Bromus sp*	Brome

Notes:
1. This list is based on observations during a winter survey (January 2014). It is subject to revision based on a complete floristic survey scheduled for spring and summer of 2014.
2. Asterisk (*) indicates species not native to California.