PLANNING COMMISSION
Regular Meeting

Agenda

Thursday, January 10, 2019 at 7:00 PM
City Hall Council Chamber – 14177 Frederick Street

CALL TO ORDER

ROLL CALL

PLEDGE OF ALLEGIANCE

APPROVAL OF AGENDA

APPROVAL OF AGENDA

CONSENT CALENDAR

All matters listed under Consent Calendar are considered to be routine and all will be enacted by one roll call vote. There will be no discussion of these items unless Members of the Planning Commission request specific items be removed from the Consent Calendar for separate action.

1. APPROVAL OF MINUTES

Planning Commission – Regular Meeting – December 13, 2018 7:00 PM

PUBLIC COMMENTS PROCEDURE

Any person wishing to address the Commission on any matter, either under the Public Comments section of the Agenda or scheduled items or public hearings, must fill out a "Request to Speak" form available at the door. The completed form must be submitted to the Secretary prior to the Agenda item being called by the Chairperson. In speaking to the Commission, member of the public may be limited to three minutes per person, except for the applicant for entitlement. The Commission may establish an overall time limit for comments on a particular Agenda item. Members of the public must direct their questions to the Chairperson of the Commission and not to other members of the Commission, the applicant, the Staff, or the audience.

Upon request, this agenda will be made available in appropriate alternative formats to persons with disabilities, in compliance with the Americans with Disabilities Act of 1990. Any person with a disability who requires a modification or accommodation in order to participate in a meeting should direct such request to Guy Pegan, ADA Coordinator, at 951.413.3120 at least 72 hours before the meeting. The 72-hour notification will enable the City to make reasonable arrangements to ensure accessibility to this meeting.

NON-PUBLIC HEARING ITEMS

PUBLIC HEARING ITEMS

1.	Case:	PEN18-0082 – Conditional Use Permit
	Applicant:	T&C International Health, Inc.
	Owner:	T&C International Health, Inc.
	Representative:	Steve L'Hommedieu
	Location:	North side of Alessandro Boulevard and approximately 300 east of Kitching Street
	Case Planner:	Jeff Bradshaw
	Council District:	3
	Proposal	CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED OF THREE ONE-STORY BUILDINGS TOTALING 68,750 SQUARE FEET WITH 116 BEDS ON A 4.55-ACRE SITE.

OTHER COMMISSION BUSINESS

STAFF COMMENTS

PLANNING COMMISSIONER COMMENTS

ADJOURNMENT

Planning Commission Regular Meeting, January 24, 2019 at 7:00 P.M., City of Moreno Valley, City Hall Council Chamber, 14177 Frederick Street, Moreno Valley, CA 92553.

OFFICIAL MINUTES OF THE
PLANNING COMMISSION
OF THE CITY OF MORENO VALLEY

REGULAR MEETING – 7:00 PM
December 13, 2018

CALL TO ORDER

This Regular Meeting of the Planning Commission of the City of Moreno Valley was called to order at 7:03 p.m., by Chair Barnes in the Council Chamber located at 14177 Frederick Street.

ROLL CALL

Planning Commission:	Jeffrey Barnes	Chair	Present
	Patricia Korzec	Vice Chair	Present
	Robert Harris	Commissioner	Present
	JoAnn Stephan	Commissioner	Present
	Jeffrey Sims	Commissioner	Present
	Ray L. Baker	Commissioner	Present
	Alvin Dejohnette	Commissioner	Present

PLEDGE OF ALLEGIANCE

The Pledge of Allegiance was led by Commissioner Sims.

APPROVAL OF AGENDA

APPROVAL OF AGENDA

Motion made by Commissioner Baker and seconded by Commissioner Alvin DeJohnette.

Vote: 7-0
Ayes: Vice Chair Korzec, Commissioners Harris, Stephan, Sims, Baker, Vice Chair Barnes and Commissioner DeJohnette
Action: **Approved**

STAFF PRESENT

Paul Early	City Attorney
Patty Nevins	Planning Official
Chris Ormsby	Senior Planner
Gabriel Diaz	Associate Planner
Eric Lewis	City Traffic Engineer
Michael Lloyd	Assistance City Engineer
Vince Giron	Associate Engineer
Doug Bloom	Assistant Fire Marshal
Ashley Aparicio	Planning Commission Secretary

CONSENT CALENDAR

APPROVAL OF MINUTES

Planning Commission - Regular Meeting – October 25, 2018 7:00 PM

Motion made by Commissioner Baker and seconded by Commissioner Harris.

Vote: 6-1
Ayes: Vice Chair Korzec, Commissioners Harris, Stephan, Baker, Vice Chair Barnes and Commissioner DeJohnette
Abstain: Commissioner Jeffrey Sims
Action: **Approved**

PUBLIC COMMENTS PROCEDURE

Rafael Brugueras

1. Wished the Commissioners a Merry Christmas and Happy New Year, as it has been a wonderful 2018 working alongside all of them and watching our City grow.

2. He has seen a lot of projects being built and states we are still waiting on those who committed to build so we can get those houses, apartments, jobs, streets, etc., and is thankful for the work that has been done.

3. He is deeply grateful for those who have served in the past and who have helped make Moreno Valley great today, because today Moreno Valley is brand new. There are many new developers looking to come to town. We have many new residents, 210,000 residents from the Mayor's reference at Snow Day.

4. He is deeply grateful for living in the City of Moreno Valley for 25 years under the M of Hope. Do not lose hope and for those who listen, you know what is coming and we need you to be involved, so stay involved because we need you to be.

NON-PUBLIC HEARING ITEMS

No Items for Discussion

PUBLIC HEARING ITEMS

1. Request for Continuance to the January 10, 2019 Planning Commission Meeting for a proposed Conditional Use Permit for a 116 Bed Moreno Valley Skilled Nursing Facility, located on the north side of Alessandro Boulevard and easterly of Kitching Street. (Report of: Planning Commission)

Motion made by Commissioner Stephan and seconded by Commissioner Sims to approve the request for continuance to the January 10, 2019 Planning Commission Meeting.

Vote: 7-0
Ayes: Vice Chair Korzec, Commissioners Harris, Stephan, Sims, Baker, Vice Chair Barnes and Commissioner DeJohnette
Action: **Approved**

2. CONDITIONAL USE PERMIT FOR A GAS STATION WITH 8 FUEL STATIONS, CAR WASH, AND CONVENIENCE STORE INCLUDING TYPE-20 ALCOHOL SALES FOR BEER AND WINE (Report of: Planning Commission)

A. Staff recommends that Planning Commission APPROVE Resolution Nos. 2018-54 and 2018-55, and thereby:

Resolution No. 2018-54

1. ADOPT the Mitigated Negative Declaration prepared for Conditional Use Permit PEN18-0016 pursuant to the California Environmental Quality Act (CEQA) Guidelines, and included as Exhibit A; and

2. ADOPT the Mitigated Monitoring and Reporting Program prepared for Conditional Use Permit PEN18-0016 pursuant to the California Environmental Quality Act (CEQA) Guidelines, and included as Exhibit B;

Resolution No. 2018-55

3. APPROVE Conditional Use Permit PEN18-0016, a request by Sater Oil International, LLC, for a 24-hour gas station operation with 8 fuel stations, convenience store, including type-20 alcohol sales for beer and wine, and a car wash, on a 1.31 acre property located at the northwest corner of Iris Avenue and Oliver Street, subject to the attached conditions of approval included as Exhibit A.

Public Hearing Opened: 7:42 p.m.

Public Comments

Raymond Talbut opposes the item.
Sylvia A Taylor opposes the item.
Josie Arias opposes the item.
Gabrielle Sibley opposes the item.
Gerardo Rios opposes the item.
Emily Engelsohall opposes the item.
Leonardo Gonzalez opposes the item.

Jose Morales opposes the item.
Rafael Brugueras supports the item.
Angelica Avina opposes the item.
Josie Robles opposes the item.
Alfred Lopez opposes the item.
Flennette Antoine opposes the item.
Charles Robinson opposes the item.

Public Hearing Closed: 8:26 p.m.

Motion made by Vice Chair Korzec and seconded by Commissioner Baker to approve Resolution Nos. 2018-54 and 2018-55.

Vote: 6-1
Ayes: Vice Chair Korzec, Commissioners Harris, Stephan, Sims, Baker and Vice Chair Barnes
Noes: Commissioner Alvin DeJohnette
Action: **Approved**

OTHER COMMISSION BUSINESS

No Items for Discussion

STAFF COMMENTS

Patty Nevins, Planning Official, gave an update for the following projects and stated that at the City Council meeting last Tuesday, December 18, 2018 the following items have been approved.

The Yum Yum Donuts projects on Perris and Cottonwood.
The Brodiaea Centerpointe Project on Frederick and Brodiaea
The Brodiaea Residential Project on Brodiaea and Quincy

PLANNING COMMISSIONER COMMENTS

No Items for Discussion

ADJOURNMENT

There being no further business to come before the Planning Commission, Chair Barnes adjourned the meeting at 8:47 PM.

Submitted by:

_____
Ashley Aparicio
Planning Commission Secretary

Approved by:

_____
Jeffrey Barnes
Chair

PLANNING COMMISSION

STAFF REPORT

Meeting Date: January 10, 2019

CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED OF THREE ONE-STORY BUILDINGS TOTALING 68,750 SQUARE FEET WITH 116 BEDS ON A 4.55-ACRE SITE

Case:	PEN18-0082 – Conditional Use Permit
Applicant:	T&C International Health, Inc.
Owner:	T&C International Health, Inc.
Representative:	Steve L'Hommedieu
Location:	North side of Alessandro Boulevard and approximately 300 east of Kitching Street
Case Planner:	Jeff Bradshaw
Council District:	3

SUMMARY

The applicant, T&S International Health, Inc., is seeking approval of a Conditional Use Permit to allow for the development of a skilled nursing facility located on the north side of Alessandro Boulevard and approximately 300 feet east of Kitching Street. The facility would include three one-story buildings that would accommodate administrative offices, kitchen and dining areas and common amenities as well as 88 rooms for a total of 116 beds.

The skilled nursing facility would fulfill an important community need by providing transitional care to seniors in a facility that can serve as a bridge between the hospital and living at home. This facility serves a different function when compared to longer term assisted living and/or memory care facilities by providing short term, transitional

therapy for community residents working with their physicians to return home after a hospital stay in order to minimize setbacks that could later result in readmission.

PROJECT DESCRIPTION

Project

On April 20, 2018, the applicant, T & C International Health, Inc. submitted a Conditional Use Permit application for the Moreno Valley Skilled Nursing Facility project. The 116-bed facility will include 56 beds in semi-private rooms and 60 beds in private rooms with 24-hour nursing care and daily activities such as physical therapy, meals, and bathing. The project site is located on the north side of Alessandro Boulevard and approximately 300 feet east of Kitching Street.

Each of the patient rooms will include a hospital grade bed and bathroom. Amenities will include a dining room with adjacent kitchen, a rehabilitation therapy gym, a salon, courtyards with sitting/reflection areas, and outdoor recreation areas.

The facility proposes three one-story buildings. Building 1 is located in the center and will house administrative offices and common amenities for the residents. Building 2 will provide 60 beds in private rooms. Building 3 will provide 56 beds in semi-private rooms, of which, 26 beds are for sub-acute care.

Site

The project site topography is relatively flat with little change in and slopes gently from south to north. There are no trees, rock outcroppings, or structures on the site. The site has been cleared routinely for weed abatement.

The project site is a single 4.54-acre parcel identified as Assessor's Parcel Number 479-230-018. The General Plan land use designation is Residential Office and the Zoning designation for the site is R10. The Municipal Code requires approval of a Conditional Use Permit for convalescent homes, assisted living, or skilled nursing facilities in the R10 zone.

Surrounding Area

The project is bounded on the north by a storm drain channel with existing single-family residences further to the north across Black Walnut Street; on the west by the Moreno Valley Christian Academy; and on the east by offices for the Moreno Valley Unified School District. Land uses to the south across Alessandro Boulevard include vacant land zoned for Office uses and a mobile home park.

The project as designed and conditioned will achieve the objectives of the City of Moreno Valley's General Plan and is compatible with existing and proposed land uses in the vicinity.

Access/Parking

The primary access to the proposed development will be from a driveway on Alessandro Boulevard near the center of the site's street frontage.

The project as designed satisfies all parking requirements of the City's Municipal Code including ADA accessible parking, customer parking, and employee parking and parking for fuel-efficient vehicles. The City's parking requirement for convalescent and nursing homes are one parking space per three beds plus employee parking. For this 116-bed facility, the total required parking would be 39 spaces. Based on operational needs at similar facilities operated by the applicant, the project is designed to include 112 parking spaces which exceeds both the parking demand estimated under both the Municipal Code (1 space per three beds) and the ITE parking manual.

The driveways and interior drive aisles within the site have been reviewed for adequate truck maneuvering and turnaround for delivery trucks and trash pick-up, and have been reviewed and approved by the Fire Prevention Bureau for fire truck access.

Design/Landscaping

The architectural design includes the use of enhanced roof treatments at the entrances of the facility and material and color changes. Material changes include stucco, wood siding, and stone on columns and at building entrances. The exterior finishes include a blend of stone treatments, glazing, and fascia.

This project, as designed and conditioned, conforms to all development standards of the R10 zone and the design guidelines for office uses as required within the City's Municipal Code.

The project has been designed to meet required landscaped standards and objectives set forth in the City's Municipal Code Chapter 9.17. The landscape elements of the project include the landscape setback areas along Alessandro Boulevard, parking lot landscape, street trees and landscape treatments around the perimeter of the site, buildings and outdoor recreation areas.

The project has been conditioned to provide a minimum six-foot tall tubular steel fence with pilasters in combination with a tree row and screening landscape along the northern property line. The intent is to secure the site but keep the site open and allow for visibility at the rear of the project for safety and aesthetic purposes.

REVIEW PROCESS

The project application was submitted on April 20, 2018. In accordance with established procedures, the project application materials were circulated for review to all appropriate City Departments and Divisions as well as applicable outside agencies (e.g. Utilities, ALUC, Tribes). The project was also reviewed through the Project Review Staff Committee (PRSC) in May 2018.

Revised plans were submitted in July 2018. After review of revised plans and subsequent submittals, along with completion of CEQA-required consultation with local Native American Tribal groups and the preparation of a Preliminary Water Quality Management Plan, the project was scheduled for a public hearing before the Planning Commission.

The skilled nursing facility is under the City's jurisdiction for entitlement and approval. Under the State law, the facility is also under the jurisdiction of the Office of Statewide Health Planning (OSHPD) for building plan check/permitting.

ENVIRONMENTAL

Planning staff has reviewed the project against the California Environmental Quality Act Guidelines in order to make a determination of an appropriate environmental clearance determination for the project. The project, as presented, is consistent with the site's General Plan designation of Residential Office, all applicable General Plan policies and the R10 zoning district regulations.

City of Moreno Valley Planning staff coordinated the preparation of the Mitigated Negative Declaration/Initial Study and related technical studies with EPD Solutions and based on a thorough analysis of potential environmental impacts determined that a Mitigated Negative Declaration for the project would be appropriate and consistent with the California Environmental Quality Act (CEQA). The Mitigated Negative Declaration represents the City's independent judgment and analysis. The proposed project will not have a significant effect on the environment with the implementation of mitigation measures identified. Studies prepared for this project included a focused circulation study, a cultural resource assessment, a paleontological assessment, a biological assessment, a preliminary hydrology study, a geotechnical study, an air quality study, a greenhouse gas analysis, a Phase 1 environmental assessment, a noise study and a Preliminary Water Quality Management Plan.

Mitigation measures have been required of the project to ensure compliance with City General Plan policies and other requirements related to Biological Resources, Noise, and Cultural Resources. A Mitigation Monitoring Program has been prepared to ensure implementation of the mitigation measures (see Attachment 4).

A 20-day public review period of the Initial Study and Mitigated Negative Declaration commenced on November 23, 2018 and concluded on December 12, 2018. The public Notice of Intent to adopt the Mitigated Negative Declaration was mailed to interested parties, public agencies as well as published in the local newspaper on November 23, 2018 and filed with the Riverside County Clerk consistent with requirements of the CEQA Guidelines.

NOTIFICATION

The public hearing notice for this project was published in the local newspaper on November 23, 2018 in anticipation of a December 13, 2018 hearing date. Public notices were sent to all property owners of record within 300 feet of the project site on November 29, 2018. The public hearing notice for this project was posted on the project site on November 29, 2018. At its December 13, 2018 meeting, the Planning Commission voted 7-0 to continue this item to the January 10, 2019 Planning Commission meeting in order to provide additional time for finalization of the Preliminary Water Quality Plan and associated conditions.

As of the date of report preparation, staff has received no phone calls or correspondence in response to the noticing for this project.

REVIEW AGENCY COMMENTS

Staff has coordinated with outside agencies and where applicable, conditions of approval have been included to address concerns from the responding agencies, including the Riverside County Airport Land Use Commission.

STAFF RECOMMENDATION

A. Staff recommends that the Planning Commission APPROVE Resolution No. 2019-01, and thereby:

   1. **CERTIFY** that the Mitigated Negative Declaration prepared for Conditional Use Permit PEN18-0082 on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act, that the Planning Commission reviewed and considered the information contained in the Mitigated Negative Declaration and that the document reflects the City's independent judgment and analysis; attached hereto as Exhibit A; and

   2. **APPROVE** the Mitigation Monitoring Program prepared for Conditional Use Permit PEN18-0082, attached hereto as Exhibit B.

B. Staff recommends that the Planning Commission **APPROVE** Resolution No. 2019-02, and thereby:

   1. **APPROVE** Conditional Use Permit PEN18-0082 based on the findings contained in this resolution, and subject to the conditions of approval included as Exhibit A.

Prepared by:
Jeffrey Bradshaw
Associate Planner

Approved by:
Patty Nevins
Planning Official

ATTACHMENTS

1. Public Hearing Notice
2. Radius Map
3. Resolution 2019-01 MND and MMRP
4. Exhibit A to Resolution 2019-01 - Mitigated Negative Declaration
5. Exhibit B to Resolution 2019-01 - Mitigation Monitoring Program
6. Resolution 2019-02 Conditional Use Permit
7. Exhibit A to Resolution 2019-02 - Conditions of Approval
8. Project Plans
9. Preliminary Grading Plan
10. Air Quality Report
11. Biological Resources Assessment
12. Cultural Resources Assessment
13. Paleontological Resources Assessment
14. Geotechnical Exploration
15. Greenhouse Gas Analysis
16. Phase I and Limited Phase II Environmental Site Assessment
17. Preliminary Hydrology & Hydraulic Study
18. Noise Impact Analysis
19. Focused Circulation Analysis
20. Preliminary Water Quality Management Plan

Notice of PUBLIC HEARING

This may affect your property. Please read.

Notice is hereby given that a Public Hearing will be held by the Planning Commission of the City of Moreno Valley on the following item(s):

CASES: PEN18-0082 – Conditional Use Permit

APPLICANT: William Chu

OWNER: Steve L'Hommedieu

REPRESENTATIVE: Thienes Engineering, Inc.

LOCATION: North side of Alessandro Boulevard and approximately 300 east of Kitching Street

PROPOSAL: The applicant is requesting approval of a Conditional Use Permit for a 116 bed, 68,750 square foot skilled nursing facility on 4.55 acres in the R10 zone. The project will include three single-story buildings with interior courtyards.

ENVIRONMENTAL DETERMINATION: Mitigated Negative Declaration

COUNCIL DISTRICT: 3

Any person interested in any listed proposal can contact the Community Development Department, Planning Division, at 14177 Frederick St., Moreno Valley, California, during normal business hours (7:30 a.m. to 5:30 p.m., Monday through Thursday and Fridays from 7:30 a.m. to 4:30 p.m.), or may telephone (951) 413-3206 for further information. The associated documents will be available for public inspection at the above address.

In the case of Public Hearing items, any person may also appear and be heard in support of or opposition to the project or recommendation of adoption of the Environmental Determination at the time of the Hearing.

The Planning Commission, at the Hearing or during deliberations, could approve changes or alternatives to the proposal.

If you challenge any of these items in court, you may be limited to raising only those items you or someone else raised at the Public Hearing described in this notice, or in written correspondence delivered to the Planning Commission at, or prior to, the Public Hearing.

LOCATION N ↑

PLANNING COMMISSION HEARING

City Council Chamber, City Hall
14177 Frederick Street
Moreno Valley, Calif. 92553

DATE AND TIME: December 13, 2018 at 7 PM
CONTACT PLANNER: Jeff Bradshaw
PHONE: (951) 413-3224

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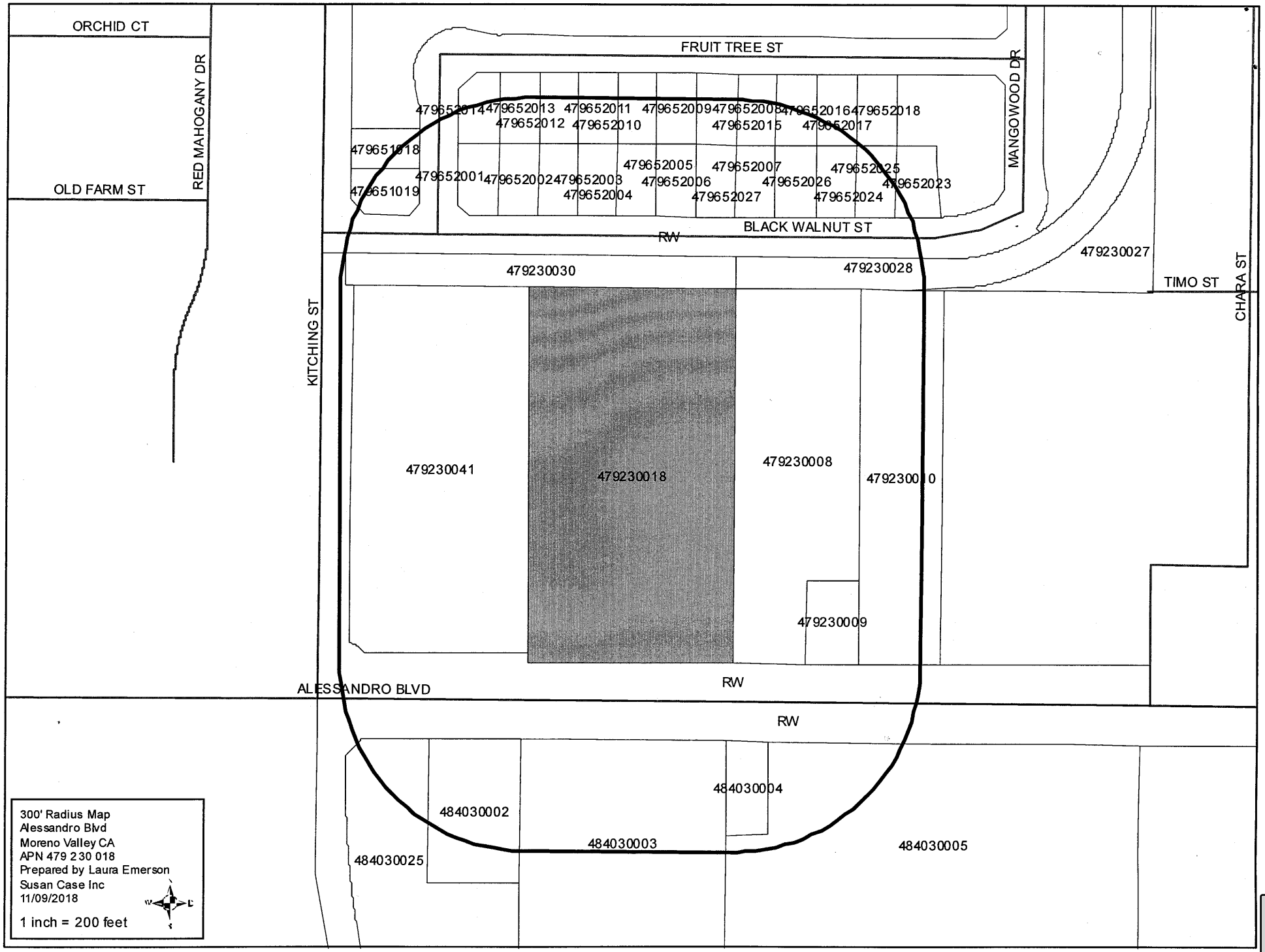
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300' Radius Map
Alessandro Blvd
Moreno Valley CA
APN 479 230 018
Prepared by Laura Emerson
Susan Case Inc
11/09/2018
1 inch = 200 feet

PLANNING COMMISSION RESOLUTION NO. 2019-01

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY CERTIFYING THE MITIGATED NEGATIVE DECLARATION AND APPROVING THE MITIGATION MONITORING AND REPORTING PROGRAM FOR THE MORENO VALLEY SKILLED NURSING FACILITY LOCATED ON THE NORTH SIDE OF ALESSANDRO BOULEVARD AND APPROXIMATELY 300 FEET EAST OF KITCHING STREET

WHEREAS, the applicant, William Chu, filed applications for the Moreno Valley Skilled Nursing Project ("Project"), which include Expanded Initial Study application, PEN18-0084, and Conditional Use Permit application, PEN18-0082. The Project shall not be approved unless the Final Mitigated Negative Declaration (PEN18-0084) is certified and approved; and

WHEREAS, the applications for the Project have been evaluated in accordance with established City of Moreno Valley (City) procedures, and with consideration of the General Plan and other applicable regulations; and

WHEREAS, an Initial Study, supporting technical studies, and Mitigated Negative Declaration for the Project were prepared, consistent with the California Environmental Quality Act (CEQA); and

WHEREAS, the City, in conducting its own independent analysis of the Final Mitigated Negative Declaration, determined that a Mitigated Negative Declaration is an appropriate environmental determination for the Project as there is substantial evidence that demonstrates the Project with mitigation would not result in any significant environmental impacts; and

WHEREAS, a Mitigation Monitoring and Reporting Program (MMRP) has been prepared in accordance with CEQA Guidelines, and is designed to ensure compliance with the identified mitigation measures outlined in the Final Mitigated Negative Declaration through Project implementation; and

WHEREAS, a 20-day public review period of the Initial Study and Mitigated Negative Declaration commenced on November 23, 2018 and concluded on December 12, 2018. The Notice of Intent to adopt the Mitigated Negative Declaration was mailed to interested parties, public agencies as well as published in the local newspaper on November 23, 2018 and filed with the Riverside County Clerk; and

WHEREAS, The City of Moreno Valley, Community Development Department, located at 14177 Frederick Street, Moreno Valley, California 92552 is the custodian of documents and other materials that constitute the record of proceedings upon which the decision to adopt the Mitigated Negative Declaration is based; and

WHEREAS, the Planning Commission of the City of Moreno Valley, at its December 13, 2018 meeting, continued consideration of the Project to its January 10, 2019 meeting; and

WHEREAS, the Planning Commission of the City of Moreno Valley considered the Project, including all environmental documentation, at a public hearing held on January 10, 2019; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred; and

WHEREAS, the Planning Commission considered the Initial Study prepared for the Project for the purpose of compliance with the California Environmental Quality Act (CEQA), and based on the Initial Study including all supporting technical evidence, it was determined that the project impacts are expected to be less than significant with mitigation, and approval of a Mitigated Negative Declaration is an appropriate environmental determination for the Project.

NOW, THEREFORE, THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY, CALIFORNIA, DOES HEREBY RESOLVE AS FOLLOWS:

A. This Planning Commission specifically finds that all of the facts set forth above in this Resolution are true and correct.

B. Based upon substantial evidence presented to this Planning Commission during the above-referenced meeting on January 10, 2019, including written and oral staff reports, and the record from the public hearing, this Planning Commission finds as follows:

1. Independent Judgment and Analysis - City staff coordinated the preparation of the Mitigated Negative Declaration/Initial Study and related technical studies with EPD Solutions for the Moreno Valley Skilled Nursing project. The documents were properly circulated for public review in accordance with the California Environmental Quality Act Guidelines. The Mitigated Negative Declaration/Initial Study has been completed along with the Mitigation Monitoring and Reporting Program (MMRP) to ensure compliance with all mitigation through project implementation. All environmental documents that comprise the Mitigated Negative Declaration, including all technical studies, were independently reviewed by the City. On the basis of the whole record, there is no substantial evidence that the Project as designed, conditioned and mitigated, will have a significant effect on the environment. The Mitigated Negative Declaration prepared and completed in accordance with the CEQA Guidelines reflects the independent judgment and analysis of the City.

BE IT FURTHER RESOLVED that the Planning Commission HEREBY APPROVES Resolution No. 2019-01, and:

1. CERTIFIES that the Mitigated Negative Declaration prepared for Conditional Use Permit PEN18-0082 on file with the Community Development Department, incorporated herein by this reference, has been completed in compliance with the California Environmental Quality Act, that the Planning Commission reviewed and considered the information contained in the Mitigated Negative Declaration and that the document reflects the City's independent judgment and analysis; attached hereto as Exhibit A and

2. APPROVES the Mitigation Monitoring Program prepared for Conditional Use Permit PEN18-0082, attached hereto as Exhibit B.

APPROVED AND ADOPTED this 10th day of January, 2019.

AYES:
NOES:
ABSTAIN:

_____
Jeffrey Barnes
Chair, Planning Commission

ATTEST:

_____
Patty Nevins, Planning Official
Secretary to the Planning Commission

APPROVED AS TO FORM:

_____
City Attorney

Exhibit A and Exhibit B

MORENO VALLEY SKILLED NURSING FACILITY

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

Lead Agency:

City of Moreno Valley
Community & Economic Development Department
Planning Division
14177 Frederick Street
Moreno Valley, California 92552
Jeff Bradshaw, Associate Planner, 951-413-3224

Project Applicant:

T&C International Health, Inc.
William Chu
P.O. Box 8070
Rowland Heights, CA 91748

CEQA Consultant:

ENVIRONMENT | PLANNING | DEVELOPMENT SOLUTIONS, INC.

2030 Main Street, Suite 1200
Irvine, CA 92614

November 13, 2018

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Appendices

Figures

Tables

1 INTRODUCTION

1.1 PURPOSE OF THE INITIAL STUDY

This Initial Study has been prepared in accordance with the following:

- California Environmental Quality Act (CEQA) of 1970 (Public Resources Code Sections 21000 et seq.);
- California Code of Regulations, Title 14, Division 6, Chapter 3 (State CEQA Guidelines, Sections 15000 et seq.); and

Pursuant to CEQA, this Initial Study has been prepared to analyze the potential for significant impacts on the environment resulting from implementation of the proposed residential development. As required by State CEQA Guidelines Section 15063, this Initial Study is a preliminary analysis prepared by the Lead Agency, the City of Moreno Valley, in consultation with other jurisdictional agencies, to determine if a Mitigated Negative Declaration or an Environmental Impact Report is required for the project.

This Initial Study informs City decision-makers, affected agencies, and the public of potentially significant environmental impacts associated with the implementation of the project. A "significant effect" or "significant impact" on the environment means "*a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project*" (Guidelines §15382).

Given the project's broad scope and level of detail, combined with previous analyses and current information about the site and environs, the City's intent is to adhere to the following CEQA principles:

- Provide meaningful early evaluation of site planning constraints, service and infrastructure requirements, and other local and regional environmental considerations. (Pub. Res. Code §21003.1)
- Encourage the applicant to incorporate environmental considerations into project conceptualization, design, and planning at the earliest feasible time. (State CEQA Guidelines §5004[b][3])
- Specify mitigation measures for reasonably foreseeable significant environmental effects, and commit the City and applicant to future measures containing performance standards to ensure their adequacy when detailed development plans and applications are submitted. (State CEQA Guidelines §15126.4)

Existing Plans, Programs, or Policies (PPPs)

Throughout the impact analysis in this IS/MND, reference is made to Existing Plans, Programs, or Policies (PPPs) that are currently in place which effectively reduce environmental impacts. Where applicable, PPPs are listed to show their effect in reducing potential environmental impacts. Where the application of these measures does not reduce an impact to below a level of significance, a project-specific mitigation measure is introduced. The City would include these PPPs along with

mitigation measures in the Mitigation Monitoring and Reporting Program (MMRP) for the project to ensure their implementation.

1.2 DOCUMENT ORGANIZATION

This IS/MND includes the flowing sections:

Section 1.0 Introduction

Provides information about CEQA and its requirements for environmental review and explains that an Initial Study/MND was prepared by the City of Moreno Valley to evaluate the proposed project's potential to impact the physical environment.

Section 2.0 Setting

Provides information about the proposed project's location.

Section 3.0 Project Description

Includes a description of the proposed project's physical features and construction and operational characteristics.

Section 4.0 Environmental Checklist

Includes the Environmental Checklist and evaluates the proposed project's potential to result in significant adverse effects to the physical environment.

Section 5.0 Document Preparers and Contributors

Provides information regarding the organizations responsible for preparation of this document.

2 PROJECT SETTING

2.1 PROJECT LOCATION

The 4.54-acre project (assessor parcel number 479-230-018-6) is located on the north side of Alessandro Boulevard, approximately 300 feet east of Kitching Street in the City of Moreno Valley. The project site is approximately 1.75 miles south of State Route (SR) 60 and 4 miles east of Interstate (I) 215. Additionally, the site is located in the southeast portion of Section 8, within Township 30 South, Range 30 West on the Sunnymead USGS 7.5-minute quadrangle map. The location of the project is shown in Figure 1.

Figure 1: Regional Location

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2.2 EXISTING LAND USES

The project site is located on vacant land. The site is surrounded by a chain link fencing on the north and west sides, and block walls on the east side, between the site and the existing Moreno Valley Unified School District (MVUSD) office. The south side of the project site is unfenced, however there are metal fence poles set in concrete along the southern border of the site. The site contains concrete and other rubble piles across the site. The site topography slopes gently down to the southwest, ranging from an elevation of 1,570 feet at a rubble pile along the north property line, to 1,563 feet in the southwest portion of the site.

The project site is located within a Residential 10 District (R10) zone and has a General Plan designation of Multi-family. According to a Parcel Report, the original description of the site was designated as medium density residential.

Pictures of the existing site are shown in Figure 2.

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Figure 2: Project Site Photos

Looking North from Alessandro Boulevard

Looking Northeast from Alessandro Boulevard, Excel Prep Charter School to the west

Looking east at Alessandro Boulevard

2.3 SURROUNDING LAND USES

The site is surrounded by single-family residential to the north, separated by a drainage channel. Immediately west the Excel Prep Charter school, a K-8 public charter school. To the east is the District headquarters for the Moreno Valley Unified School District. Vacant land and high density residential exist across Alessandro Boulevard to the south. The existing uses and designations for the project site and adjacent areas are listed in Table 1, below. An aerial photograph of the site, showing surrounding land uses, is provided in Figure 3.

Table 1: Existing Land Uses

	Existing Land Use	General Plan Designation	Zoning Designation
Project Site	Vacant/Undeveloped	Residential/Office	Residential (R10)
North	Residential	Residential (Max 5 du/ac)	Residential (R15)
East	Office	Residential (Max 5 du/ac) Residential / Office	Office (O)
South	Vacant	Residential/Office	Office (O)
West	School	Residential (Max 15 du/ac) Residential/Office	Office (O)

Source: City of Moreno Valley, Figure 2-2, Land Use Map, November 2, 2017, available at http://www.moreno-valley.ca.us/city_hall/general_plan.shtml; City of Moreno Valley, Moreno Valley Map Viewer, available at http://www.moreno-valley.ca.us/city_hall/city_maps.shtml

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Figure 3: Aerial Photograph

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2.4 PROJECT SITE BACKGROUND

As described in the Phase I Environmental Site Assessment by Leighton Consulting, Inc., historical aerial photographs show that in 1938 the majority of the project site and adjacent properties were fallow agricultural fields with residential and out buildings on the southeastern corner. By the early 1950s, residential structures remained, but the agricultural land was observed to be dry farmland. In the late 1970s, the eastern portion of the site was observed to contain several farm buildings, animal corrals and stockyards on the eastern adjacent property. As residential communities and the adjacent school began to be constructed in the 1970s and 1980s, the site remained vacant until present day (Phase I ESA, 2018).

3 PROJECT DESCRIPTION

3.1 PROJECT CHARACTERISTICS

The proposed project would construct a 68,750 square-foot Skilled Nursing Facility on a 4.54-acre site, comprised of three single story buildings with a total of 88 rooms and 116 beds. Each of the three buildings would serve a different purpose. Building 100 would serve Administration and back-of-house services such as food service/dining, laundry, storage and maintenance. Building 100 would also include facilities for physical and occupational therapy. Building 200 would include 60 private beds with courtyards and dining spaces. Building 300 would consist of 56 semi-private beds and would include a sub-acute area for residents needing a higher level of medical care. The majority of the lot coverage would be taken up by the proposed buildings. The project site plan is provided in Figure 4.

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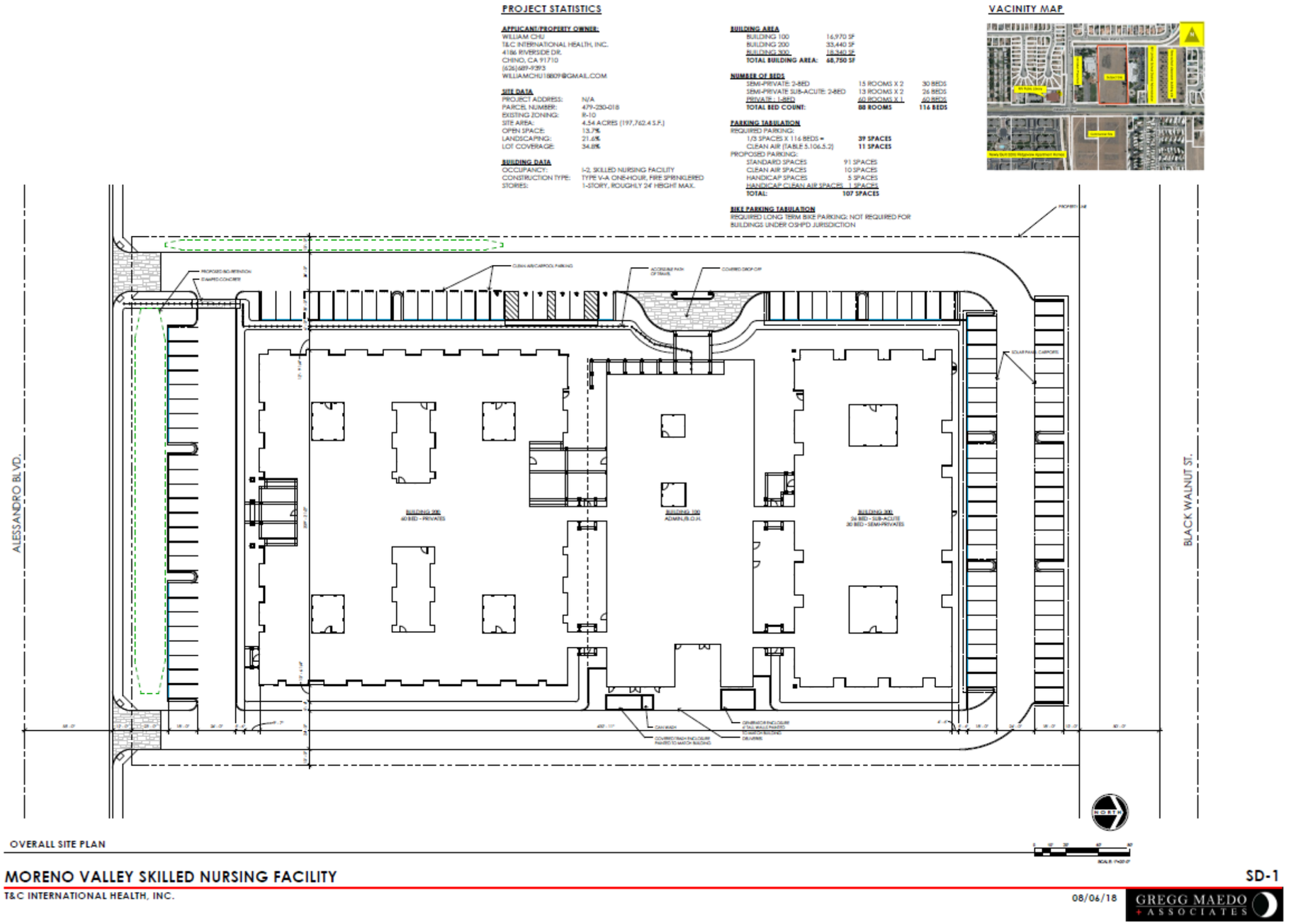
Figure 4: Project Site Plan



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A summary of the proposed skilled nursing facility is provided in Table 2.

Table 2: Proposed Buildings Area

Building Area (square feet)	
Building 100	16,970
Building 200	33,440
Building 300	18,340
Total	**68,750**

The skilled nursing facility would serve residents with three types of living situations: semi-private, consisting of two beds; semi-private sub-acute, consisting of two beds; and private with one bed. The facility would include 15 semi-private rooms, 13 semi-private sub-acute rooms, and 60 private rooms. In total, the proposed project would include 88 rooms and 116 beds.

The California Hospital Association defines subacute care as units which "provide a specialized level of care to medically fragile patients. Subacute patients are individuals who do not need acute care," like in a hospital, "but who are too ill to be cared for by most skilled-nursing facilities. Frequently, these individuals are ventilator-dependent or require frequent respiratory treatments. While subacute beds are licensed as skilled-nursing beds, they are reimbursed differently and are subject to additional staffing and patient criteria requirements".

The project would closely represent a convalescent home definition within the Municipal Code. According to the Moreno Valley Zoning Code, "'Convalescent home' means a facility licensed by the State Department of Public Health, the State Department of Social Welfare, or the county of Riverside, which provides bed and ambulatory care for patients with postoperative convalescent, chronically ill or dietary problems, and persons aged or infirm unable to care for themselves; but not including alcoholics, drug addicts, or persons with mental or contagious diseases or afflictions" (Municipal Code).

Access and Parking

Access would be provided by one full-access driveway and one right-in/right-out only driveway along Alessandro Boulevard. The driveways are located at the east and west project boundaries. The project would be required to provide 50 parking spaces (39 regular and 11 clean air spaces) according to the requirements of the City of Moreno Valley and the California Green Building code. The project would instead provide 91 standard parking spaces, 11 clean air spaces (one of which is handicap) and five regular handicap spaces for a total of 107 parking spaces, exceeding the site parking requirement by 59 spaces. The six handicap parking spaces will be located on the west side of Building 100, just south of the entrance. The clean air/carpool spaces will be located adjacent to the handicap spaces Solar panel carports would be located at the north end of the project site, adjacent to Building 300.

Signage and Landscaping

A monument feature including a planter bed would be installed at the southwestern entrance in the project site. The perimeter of the site will be planted with a hydroseed ground cover, flowering shrubs and evergreen trees. Courtyards throughout the project will be landscaped in various themes, such as Mediterranean, Fragrant, and Japanese.

Project Operations
The project would be maintained by an Administration department and Back of House area located in Building 100 that would provide the residents with amenities such as 24-hour nursing, food service, dining, therapy services and others necessary to care for the residents. The facility's entrance would be located on the west side of Building 100 and would feature a covered drop-off area. On the eastern side of Building 100 would be a generator enclosure, a building entrance for deliveries, a trash enclosure and can wash.

REFERENCES

California Hospital Association, Subacute Care, Available: https://www.calhospital.org/subacute-care

City of Moreno Valley, Municipal Code, Section 9.15.030, Definitions.

Figure 5: East and North Elevations

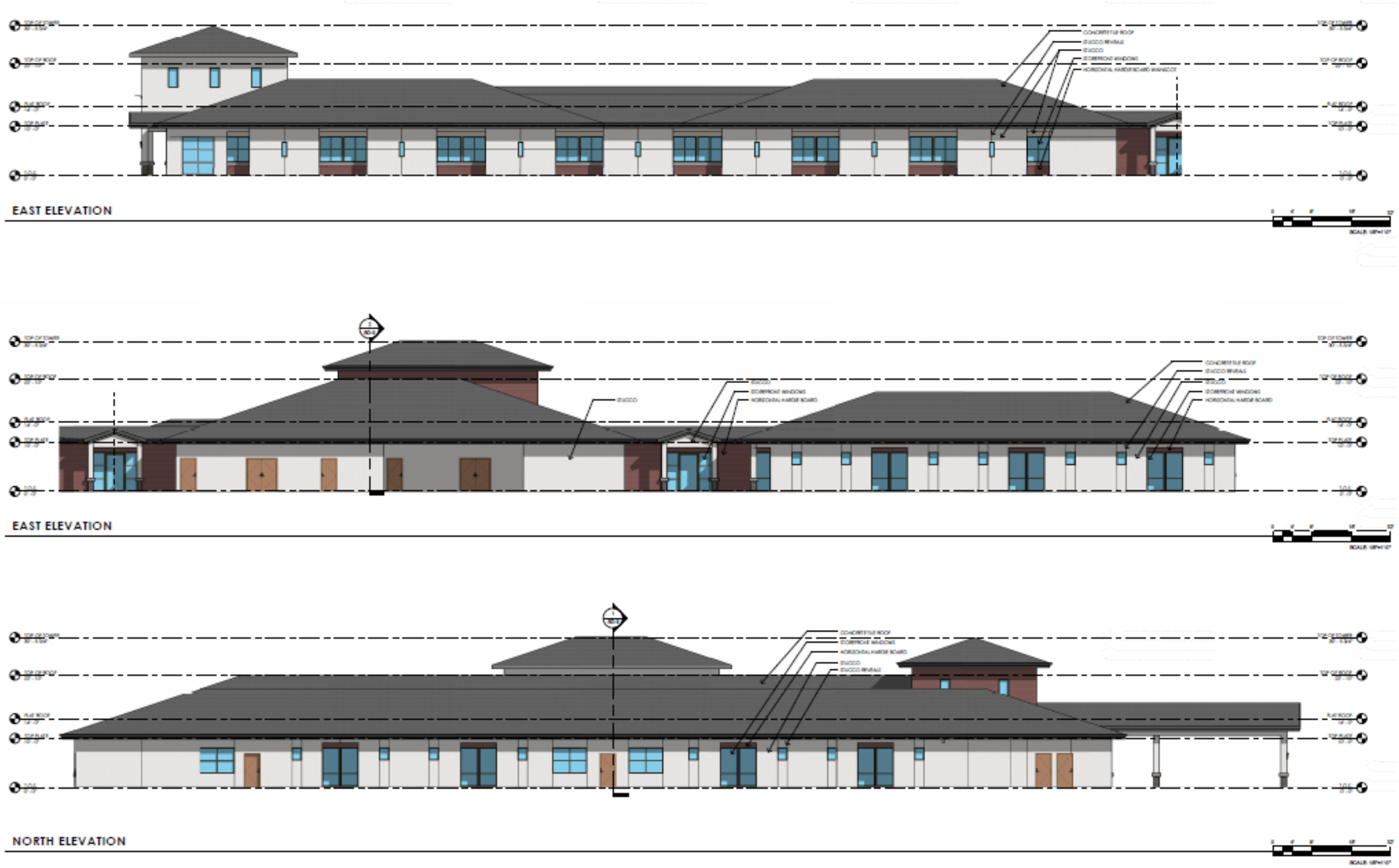

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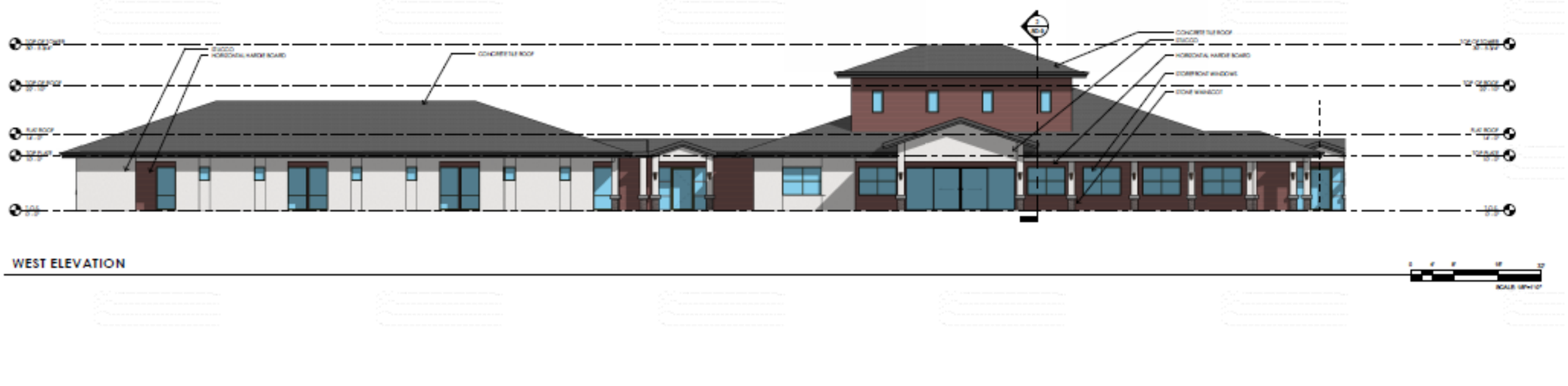
Figure 6: West and South Elevations



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3.1.1 CONSTRUCTION

Construction activities are expected to take approximately 18 months, and would include site preparation, grading, building construction, architectural coating, and paving. No demolition is required on the site as it is vacant land. The site designed as a balanced site with no import or export of soil. Water and sewer utilities would be provided by installation of onsite infrastructure that would connect to the existing lines within Alessandro Boulevard.

The project's anticipated Opening Year would be 2020. Below is an approximate schedule for the project construction.

Table 3: Construction Schedule

Phase Name	Estimated Duration
Site Preparation	5 days
Grading	1 month
Building Construction	13 months
Architectural Coating	3 months
Paving	2 weeks

Source: Air Quality Impact Analysis, Urban Crossroads 2018, See Appendix A.

3.2 DISCRETIONARY APPROVALS

CITY OF MORENO VALLEY

- Development Plan Review to permit the development of three single-story buildings with a total approximate square footage of 68,750 square feet.
- Conditional Use Permit (CUP) to permit a "convalescent home", as defined in Section 9.09.160, within the R10 zoning designation, according to Permitted Uses Table 9.02.020-1 of the Moreno Valley Zoning Code.

OTHER AGENCIES

This IS/MND would also provide environmental information to responsible agencies and other public agencies that may be required to grant approvals or coordinate with the City of Moreno Valley as part of project implementation. These agencies include, but are not limited to the following:

- Santa Ana Regional Water Quality Control Board

4 ENVIRONMENTAL CHECKLIST FORM

This section includes the completed environmental checklist form. The checklist form is used to assist in evaluating the potential environmental impacts of the proposed project. The checklist form identifies potential project effects as follows: 1) Potentially Significant Impact; 2) Less Than Significant With Mitigation Incorporation; 3) Less Than Significant Impact; and, 4) No Impact. Substantiation and clarification for each checklist response is provided in Section 5 (Environmental Evaluation). Included in the discussion for each topic are standard condition/regulations and mitigation measures, if necessary, that are recommended for implementation as part of the proposed project.

4.1 ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

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

Environmental Factors Potentially Affected

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

4.2 DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

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

Signature Date

Printed Name For

EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g. the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g. the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Potentially Significant Unless Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analysis," as described in (5) below, may be cross-referenced).

5) Earlier analysis may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063 (c)(3)(d). In this case, a brief discussion should identify the following:

   (a) Earlier Analysis Used. Identify and state where they are available for review.

   (b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   (c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated

or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g. general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

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

9) The analysis of each issue should identify: (a) the significance criteria or threshold used to evaluate each question; and (b) the mitigation measure identified, if any, to reduce the impact to less than significance.

4.3 ENVIRONMENTAL CHECKLIST QUESTIONS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
1. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings 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) Have a substantial adverse effect on a scenic vista?

No Impact. Scenic vistas consist of expansive, panoramic views of important, unique, or highly valued visual features that are seen from public viewing areas. This definition combines visual quality with information about view exposure to describe the level of interest or concern that viewers may have for the quality of a particular view or visual setting.

The project site is located within a developed area. The surrounding lots are developed with office uses, schools, and residential varying in density. The project site and surrounding area are generally level, without hills or topography changes. Photos of the project site are shown in previously referenced Figure 2. The Box Spring Mountains are located approximately 4 miles to the northwest; Moreno Peak is located approximately 2 miles to the northeast; the Russell Mountains are located approximately 3 miles to the southeast; the Badlands is approximately 7 miles to the west. According Moreno Valley General Plan Figure 7-2, *Major Scenic Resources*, the project site is not located in any view corridors of the aforementioned scenic resources.

Due to the limited topography, existing development, and mature landscaping that exists in the project vicinity, the only public views of the surrounding mountains are available to cars and pedestrians traveling east on Alessandro Boulevard. Views of the mountains from areas surrounding surrounding the project site are currently limited by urban development and landscaping. Development of project site would convert the site from a vacant lot to a skilled nursing facility with three one-story buildings. Development of the one-story skilled nursing facility would be similar to the existing development surrounding the project site, and would not hinder any scenic vistas or

panoramic views. The project elevations are shown in previously referenced Figures 5 and 6.

As a result, the proposed project would not result in an adverse effect on a scenic vista.

b) Substantially damage scenic resources, including, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. There are no designated state scenic highways in the City of Moreno Valley. The closest eligible State scenic highway is State Route (SR) 74 which travels east/west, approximately 12 miles to the south of the project site. The closest officially designated State scenic highway is SR 243 from Interstate 10 (I-10) south of the City of Banning limits (Caltrans 2018), which is located approximately 19 miles west of the project site and is not visible from the project site. Neither of the scenic highways are not visible from the project site, no impacts to state scenic highways would occur from implementation of the proposed project.

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

Less than Significant Impact. The project site is surrounded by developed areas that consist of roadways, residences, and commercial development. There are some vacant lots within the project vicinity. The project site was previously used as fallow agriculture fields with some rural residential structures onsite, is currently undeveloped vacant land. There are no significant visual features or scenic resources within the project site or surrounding area.

The project would construct a one-story skilled nursing facility. The proposed height and bulk of the facility's three buildings would be consistent to the adjacent school and office buildings immediately west and east of the site, respectively. To the north are single-family residential homes separated by a drainage channel. To the south is vacant land. The project would consist a variety of stucco colors including beige, black, and grey; grey concrete tile roofing; and Red Hardie board lap siding. This architectural design would be consistent with the surrounding structures.

Given the existing vacant and undeveloped visual character of the site, which is surrounding by office and school uses, development of the project would alter, but not substantially degrade the existing visual character or quality of the project site and its surroundings. As a result, impacts would less than significant.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Less than Significant Impact. The project site is undeveloped and has no existing source of nighttime lighting. However, the project site is surrounded by sources of nighttime lighting that includes street lights along Alessandro Boulevard, illumination from vehicle headlights, offsite exterior residential and office related lighting, and interior illumination passing through windows. Sensitive receptors relative to lighting and glare include residents, motorists, and pedestrians.

The proposed project would include installation of new lighting sources on the project site that would include exterior lighting for streetlights, security lighting, walkways lighting, interior lighting, which could be visible through windows to the outside and headlights from vehicles. However, the lighting from vehicle headlights are focused on a downward trajectory and would be intermittent and for a short period of time; therefore, impacts related to vehicle headlights would be less than significant.

In addition, the City's limits the potential for increased lighting on sensitive uses. Therefore, project compliance with Section 9.10.110 of the Municipal Code, required by operation of law, would limit lighting illumination and mandate to project downward to limit glare.

Glare can come from many different sources, some of which include direct sunlight, sunlight reflecting from cars or buildings, and bright outdoor or indoor lighting. Glare in the project vicinity is generated by building and vehicle windows reflecting light. However, there are no substantial buildings or structures near the project site that presently generate substantial glare since most of the buildings are one or two-story structures that are constructed of non-reflective materials and are not surfaced with a substantial number of windows adjacent to one another that would create a large reflective area.

As described above, the exterior of the proposed facility would be finished in a palette of dark-toned colors, and consist of stucco with tile roofing. Additionally, installation of outdoor lighting would be required to meet the requirements of the City's Municipal Code, which would reduce the potential to generate glare from new lighting fixtures. As a result, the project would not create a substantial source of glare, and impacts would be less than significant.

Existing Plans, Programs, or Policies

- Municipal Code Section 9.10.110

Mitigation Measures

No mitigation measures related to aesthetics are required.

REFERENCES

California Department of Transportation, California Scenic Highway Mapping System, available at http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/

City of Moreno Valley, General Plan, 2006.

City of Moreno Valley, Municipal Code, Section 9.10.110.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
2. AGRICULTURE AND FORESTRY 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 project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or 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?	☐	☐	☐	☒
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) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. The project site is identified by the California Department of Conservation Important Farmland Finder as "Urban and Built-Up Land" (CDC 2017). The project site is not designated as Prime, Unique, or Farmland of Statewide Importance. Thus, the proposed project would not result in impacts related to conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The project site has an existing zoning designation for residential. The project site is not zoned for agricultural use and is not subject to a Williamson Act contract. Thus, the proposed project would not result in impacts related to conflict with an existing agricultural zoning or Williamson Act contract, and impacts would not occur.

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))?

No Impact. No forest land exists on or adjacent to the project site. The project site has a zoning designation for residential and is not zoned for forest land or timberland uses. Thus, the proposed project would not result in impacts related to conflict with an existing forest land or timberland zoning, and impacts would not occur.

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

No Impact. No forest land exists on the project site. Thus, the proposed project would not result in the loss of forest land or conversion of forest land to non-forest use, and impacts would not occur.

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?

No Impact. As described in the responses above, the project area does not include farmland or forest land; thus, implementation of the proposed project would not 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. Impacts would not occur.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to agriculture and forestry that are applicable to the project.

Mitigation Measures

No mitigation measures related to agriculture and forestry are required.

REFERENCES

California Department of Conservation, Important Farmland Finder, Riverside, 2016. Accessed 9 July 2018. Available: https://maps.conservation.ca.gov/dlrp/ciff/

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
3. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is 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?	☐	☐	☒	☐

The following analysis is based on the Air Quality Impact Analysis prepared by Urban Crossroads, included as Appendix A.

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

Less than Significant Impact. The project site is located in the South Coast Air Basin (Basin), which is under the jurisdictional boundaries of the South Coast Air Quality Management District (SCAQMD). The SCAQMD and Southern California Association of Governments (SCAG) are responsible for preparing the Air Quality Management Plan (AQMP), which addresses federal and state Clean Air Act (CAA) requirements. The AQMP details goals, policies, and programs for improving air quality in the Basin. In preparation of the AQMP, SCAQMD and SCAG use land use designations contained in General Plan documents to forecast, inventory, and allocate regional emissions from land use and development-related sources. For purposes of analyzing consistency with the AQMP, if a proposed project would have a development density and vehicle trip generation that is substantially greater than what was anticipated in the General Plan, then the proposed project would conflict with the AQMP. On the other hand, if a project's trip generation is consistent with the General Plan, its emissions would be consistent with the assumptions in the AQMP, and the project would not conflict with SCAQMD's attainment plans. In addition, the SCAQMD considers projects consistent with the AQMP if the project would not result in an increase in the frequency or severity of existing air quality violations or cause a new violation.

The project site has a General Plan land use designation of Residential/Office. The project would not result in a General Plan amendment and therefore would be consistent with the AQMP. As substantiated by the Air Quality Impact Analysis in Appendix A, the construction of the project would not exceed the applicable SCAQMD regional or daily emissions thresholds. The project is therefore considered to be consistent with the AQMP. Therefore, a less than significant impact would occur and no mitigation is required.

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

Less than Significant Impact. As described in the previous response, the project site is within the SCAQMD. Thus, the methodologies from the SCAQMD CEQA Air Quality Handbook and SCAQMD thresholds are used in evaluating project impacts. The SCAQMD has established that impacts to air quality are significant if there is a potential to contribute or cause localized exceedances of the federal and/or state ambient air quality standards (NAAQS/CAAQS). Collectively, these are referred to as Localized Significance Thresholds (LSTs).

The significance of localized emissions impacts depends on whether ambient levels in the vicinity of any given project are above or below State standards. In the case of CO and NO2, if ambient levels are below the standards, a project is considered to have a significant impact if project emissions result in an exceedance of one or more of these standards. If ambient levels already exceed a state or federal standard, then project emissions are considered significant if they increase ambient concentrations by a measurable amount. This would apply to PM10 and PM2.5; both of which are non-attainment pollutants.

Construction
Project-related construction activities would include site preparation, grading, building construction, paving, architectural coating, and construction workers commuting. Construction is expected to commence in April 2019 through June 2020. The construction emissions were based on a worst-case scenario. In addition to onsite emissions are the offsite utility, infrastructure, and onsite ancillary improvements that may occur which would be associated to overall construction emissions. The SCAQMD Rules that are applicable during construction include, but are not limited to: Rule 1113 (Architectural Coatings); Rule 431.2 (Low Sulfur Fuel); Rule 403 (Fugitive Dust); and Rule 1186 / 1186.1 (Street Sweepers). The aforementioned SCAQMD Rules are included as PPP AQ-1.

Below in Table AQ-1 are the estimated maximum daily construction emissions without mitigation summarized.

Table AQ-1: Summary of Construction Emissions

Year	Emissions (pounds per day)					
	VOC	NO_X	CO	SO_X	PM_{10}	$PM_{2.5}$
2019	4.25	34.24	33.16	0.07	3.65	2.21
2020	9.16	20.27	20.73	0.05	2.61	1.35
Maximum Daily Emissions	**9.16**	**34.24**	**33.16**	**0.07**	**3.65**	**2.21**
SCAQMD Regional Thresholds	*75*	100	*550*	150	150	*55*

Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

As seen in the table above, the worst-case scenario for construction activities would not exceeded the SCAQMD AQMP's thresholds. Therefore, construction activities would result in a less than significant impact to SCAQMD's AQMP.

Operation

Operational emissions would be expected from area source emissions, energy source emissions, and mobile source emissions. Area source emissions include architectural coatings, consumer products, hearths/fireplaces, and landscape maintenance equipment. Energy source emissions include combustion emissions associated with natural gas and electricity. Mobile source emissions would include vehicles, in terms of the overall daily trip generation and the effect of the project on peak hour traffic volumes and traffic operations in the vicinity of the project. The estimated operation-source emissions are summarized on Table AQ-2.

Table AQ-2: Maximum Daily Operational Emission Summary

Operational Activities – Summer Scenario	**Emissions (pounds per day)**					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Area Source	1.78	0.08	7.30	0.00	0.04	0.04
Energy Source	0.04	0.33	0.14	0.00	0.03	0.03
Mobile	0.88	4.79	11.68	0.04	3.36	0.93
Total Maximum Daily Emissions	**2.70**	**5.20**	**19.12**	**0.04**	**3.43**	**1.00**
SCAQMD Regional Threshold	*55*	*55*	*550*	150	150	*55*
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Operational Activities – Winter Scenario	**Emissions (pounds per day)**					
	VOC	**NO_X**	**CO**	**SO_X**	**PM_{10}**	**$PM_{2.5}$**
Area Source	1.78	0.08	7.30	0.00	0.04	0.04
Energy Source	0.04	0.33	0.14	0.00	0.03	0.03
Mobile	0.88	4.79	11.68	0.04	3.36	0.93
Total Maximum Daily Emissions	**2.70**	**5.20**	**19.12**	**0.04**	**3.43**	**1.00**
SCAQMD Regional Threshold	*55*	*55*	*550*	150	150	*55*
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Under the assumed scenarios, emissions resulting from the project operations would not exceed the numerical thresholds established by the SCAQMD for any criteria pollutant. Therefore, a less than significant impact would occur and no mitigation is required.

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

Less than Significant Impact. The South Coast Air Basin (SCAB) is in a non-attainment status for federal ozone standards, federal carbon monoxide standards, and state and federal particulate matter standards. Any development in the SCAB, including the proposed project, could cumulatively contribute to these pollutant violations. Evaluation of cumulative air quality impacts of the proposed project has been completed pursuant to SCAQMD's cumulative air quality impact methodology, SCAQMD states that if an individual project results in air emissions of criteria pollutants (ROG, CO, NOx, SOx, PM_{10}, and $PM_{2.5}$) that exceed the SCAQMD's recommended daily thresholds for project-specific impacts, then it would also result in a cumulatively considerable net increase of the criteria pollutant(s) for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.

As described above in response, neither construction or operation of the proposed project would result in an exceedance of any SCAQMD's recommended daily thresholds. Therefore, the proposed project would not result in a cumulatively considerable net increase of any criteria pollutant, and impacts would be less than significant.

d) Expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. The SCAQMD recommends the evaluation of localized NO_2, CO, PM_{10}, and $PM_{2.5}$ construction-related impacts to sensitive receptors in the immediate vicinity of the project site. Sensitive receptors are structures that house persons (e.g., children, the elderly, persons with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise) or places where these groups gather to exercise. Such an evaluation is referred to as a localized significance threshold (LST) analysis. The impacts were analyzed pursuant to the SCAQMD's *Final Localized Significance Threshold Methodology* (SCAQMD 2008). According to the LST Methodology, "off-site mobile emissions from the project should not be included in the emissions compared to the LSTs" (SCAQMD 2008).

Localized Air Quality Thresholds

SCAQMD has developed Local Significance Thresholds (LSTs) that represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards, and thus would not cause or contribute to localized air quality impacts. LSTs are developed based on the ambient concentrations of NOx, CO, PM_{10}, and $PM_{2.5}$ pollutants for each of the 38 source receptor areas (SRAs) in the SCAB. The project site is located in SRA 24, Perris Valley.

The nearest sensitive receptors include Excel Prep Academy located approximately 10 meters to the west of the project site, and existing residential homes located approximately 33 meters to the north across Black Walnut Street.

Construction
Construction-source emissions analysis is determined by the grading phase of the project. The SCAQMD's screening look-up tables are utilized in determining impacts. It should be noted that the look-up tables identify thresholds at only 1 acre, 2 acres, and 5 acres. As previously noted, a 25-meter receptor distance is utilized to determine the LSTs for emissions of CO, NO2, PM10, and PM2.5. Localized impacts are measured at the nearest receptor location in the vicinity of the project. Table AQ-3 identifies the localized impacts at the nearest receptor location in the vicinity of the project (Urban Crossroads 2018).

Table AQ-3: Localized Significance Summary Construction

Onsite Grading Emissions	Emissions (pounds per day)			
	NOx	CO	PM10	PM2.5
Maximum Daily Emissions	21.34	9.39	3.48	2.17
SCAQMD Localized Threshold	118	602	4	3
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

Without mitigation, localized construction emissions would not exceed the applicable SCAQMD LSTs. Therefore, a less than significant impact would occur.

Operation
According to SCAQMD LST methodology, LSTs would apply to the operational phase of a proposed project, if the project includes stationary sources, or attracts mobile sources that may spend long period queuing and idling at the site (e.g., transfer facilities and warehouse buildings). The proposed project does not include such uses, and thus, due to the lack of significant stationary source emissions, no long-term localized significance threshold analysis is needed (Urban Crossroads 2018).

Hot Spots
Regarding potential "hot spots" of CO that could result from the project, the Air Quality Impact Analysis (Appendix A) describes that the proposed project would not generate enough traffic to generate a potential hotspot. As described in the AQMP, even if the daily traffic volume at any intersection was to reach 400,000 vehicles per day, it still would not likely exceed the most stringent 1-hour CO standard (20 ppm).

As detailed in Section 16, Transportation and Traffic, the project would generate 355 daily, 20 AM peak hour and 26 PM peak hour trips. According to Exhibit A of the City of Moreno Valley *Traffic Impact Analysis Preparation Guide*, projects that generate fewer than 100 vehicle trips during the peak hours are generally exempt from the requirement to prepare a traffic impact analysis. The worst case peak hour trip generation of the project is 41 PM peak hour trips, significantly fewer than 100 peak hour trips. Similarly, when project traffic is added, the highest potential daily trips would be much less than the volume of traffic required to generate a CO hot spot. Thus, impacts related to a CO hot spot would not occur from implementation of the proposed project.

e) Create objectionable odors affecting a substantial number of people?

Less Than Significant Impact. According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor issues include agricultural uses, wastewater treatment plants, food processing

plants, chemical plants, composting activities, refineries, landfills, dairies, and fiberglass molding operations. The project does not contain land uses typically associated with emitting objectionable odors. During construction, emissions from diesel equipment, use of volatile organic compounds from architectural coatings, and paving activities may generate some nuisance odors. However, these odors would be temporary and are not expected to affect a substantial number of people. The project would also be required to comply with SCAQMD Rule 402 to prevent occurrences of public nuisances. Therefore, impacts relating to both operational and construction activity odors would be less than significant.

Existing Plans, Programs, or Policies

The following PPPs are incorporated into the project and would reduce impacts related to air quality. These actions will be included in the project's mitigation monitoring and reporting program:

PPP AQ-1: The project is required to comply with the provisions of South Coast Air Quality Management District (SCAQMD) Rule 1113. Only "Low-Volatile Organic Compounds" paints (no more than 50 gram/liter of VOC) and/or High Pressure Low Volume (HPLV) applications shall be used.

PPP AQ-2: The project is required to comply with the provisions of the South Coast Air Quality Management District (SCAQMD) Rule 431.2 which limits the sulfur content in diesel and other liquid fuels for the purpose of both reducing the formation of sulfur oxides and particulates during combustion and to enable the use of add-on control devices for diesel fueled internal combustion engines.

PPP AQ-3: The project is required to comply with the provisions of South Coast Air Quality Management District (SCAQMD) Rule 403, which includes the following:

- All clearing, grading, earth-moving, or excavation activities shall cease when winds exceed 25 mph per SCAQMD guidelines in order to limit fugitive dust emissions.
- The contractor shall ensure that all disturbed unpaved roads and disturbed areas within the project are watered, with complete coverage of disturbed areas, at least 3 times daily during dry weather; preferably in the mid-morning, afternoon, and after work is done for the day.
- The contractor shall ensure that traffic speeds on unpaved roads and project site areas are reduced to 15 miles per hour or less.

PPP AQ-4: The project is required to comply with the provisions of South Coast Air Quality Management District (SCAQMD) Rule 1186/1186.1.

- Rule 1186 is to reduce the amount of particulate matter entrained in the ambient air as a result of vehicular travel on paved and unpaved public roads.
- Rule 1186.1 is to reduce air toxic and criteria pollutant emissions and requires certain public and private sweeper fleet operators to acquire and operate alternative-fuel or otherwise less-polluting sweepers when purchasing or leasing these vehicles for sweeping operations undertaken by or for governments or governmental agencies in the SCAQMD jurisdiction.

Mitigation Measures

No mitigation measures related to air quality are required.

REFERENCES

Air Quality Impact Analysis prepared by Urban Crossroads, June 6, 2018 (Urban Crossroads 2018).

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
4. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game[1] 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, regulations or by the California Department of Fish and Game or US 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) 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[1] or U.S. Fish and Wildlife Service?

[1] Effective January 1, 2013, the California Department of Fish and Game (DFG) became the California Department of Fish and Wildlife. See https://cdfgnews.wordpress.com/2012/12/31/department-name-change-effective-tomorrow/. The CEQA Guidelines Appendix G: Environmental Checklist Form has not been updated to reflect this new name.

Less than Significant Impact with Mitigation Incorporated. The project site is vacant and undeveloped and previously was the site of agricultural activities, therefore the site is highly disturbed. The Phase I Biological Resources Assessment prepared for the project site describes that there one vegetation community, annual brome grasslands, that was documented. The following plant species located onsite are: Non-native foxtail brome (Bromus rubens) with non-native barley (Horduem species). Other non-native species observed in the annual brome grasslands included field bindweed (Convolvulus arvensis), bur clover (Medicago polymorpha), London rocket (Sisymbrium irio), cheeseweed mallow (Malva parviflora), and red-stemmed filaree (Erodium cicutarium). Jimsonweed (Datura wrightii) and fiddleneck (Amsinckia species) were the only native species recorded for the site during the habitat assessment. Along the southern boundary of the site was a row of ornamental landscaping, which appeared to be olive trees (Olea species). No special-status plant communities occur on the site (MCC 2018).

Several wildlife species were observed: American pipit (Anthus rubescens), barn swallow (Hirundo rustica), cliff swallow (Petrochelidon pyrrhonota), European starling (Sturnus vulgaris), northern mockingbird (Mimus polyglottos), lesser goldfinch (Spinus psaltria), house finch (Haemorhous mexicanus), and western fence lizard (Sceloporus occidentalis) (MCC 2018). The Biological Resources Assessment found 46 special-status wildlife species documented in the site region; however, none of these species are expected to occur on the project site due to the lack of suitable habitat, disturbed conditions, the small size of the site, and that the project site is surrounding by existing development.

Suitable foraging habitat for burrowing owl (Athene cunicularia), a Species of Special Concern is present on the project site. However, the Biological Resources Assessment found that there were no suitable burrows onsite and no burrowing owl sign or burrowing owls were observed. Even though the site is not expected to support burrowing owl, a preconstruction burrowing owl survey will be completed a maximum of 30 days prior to the start of construction as stated in Mitigation Measure MM BIO-1 to reduce any potential impact during preconstruction activities.

The project site contains vegetation suitable for nesting birds. The project would be subject to the provisions outlined in the California Fish and Game Code 3503 and the Migratory Bird Treaty Act to protect native birds and their nests from direct taking. To the south, there is another vacant site across Alessandro Boulevard. A preconstruction nesting bird survey is required by Mitigation Measure MM BIO-2 for potential impacts to nesting birds. Therefore, impacts related to the nesting bird habitats would be reduced to a less than significant impact with MM BIO-2.

Thus, due to the lack of habitat and disturbed nature of the project site, impacts related to special status species would not occur from implementation of the proposed project.

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

No Impact. The project site consists of vacant land and was previously used for dry agricultural fields. To the north of the project site is a channelized storm drain. The soil on site, as described in the Biological Resources Assessment, are common to alluvial fans and terraces and are considered well-drained. The concrete-lined channel would be considered jurisdictional by the Army Corps of Engineers, California Department of Fish and Wildlife, and the Regional Water Quality Control

Board. In addition, the project does not contain any vernal pools, wetland habitats, creeks, or rivers. The project site does not contain any riparian habitat, jurisdictional streambed or wetland areas, or sensitive natural community identified by United State Fish and Wildlife Service or California Department of Fish and Wildlife (MCC 2018). Thus, impacts to riparian habitat or other sensitive natural community would not occur from implementation of the proposed project.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means?

No Impact. As described in the response above, the project site does not contain any drainages, creeks, rivers, or other wetland areas (MCC 2018). The project site does not contain any jurisdictional areas that would be subject to Section 404 of the Clean Water Act, and the proposed project does not involve any hydrological interruption on any existing water resources. Thus, impacts to federally protected wetlands as defined by Section 404 of the Clean Water Act would not occur from implementation of the proposed project.

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?

No Impact. The project site vacant and undeveloped, but is surrounded by roadways and developed land uses. Due to the existing conditions of the project site and the surrounding land uses, the project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors (MCC 2018). The Biological Resources Assessment also determines the project site is not used a wildlife nursery site.

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

No Impact. There are no local biological related policies or ordinances, such as a tree preservation policy or ordinance that is applicable to the proposed project. The project site is adjacent existing non-native ornamental trees that are on the right-of-way on Alessandro Boulevard and are not subject to any ordinances. The project site contains non-native grasses and shrubs, but there are no trees on the project site. Therefore, implementation of the proposed project would not conflict with local polices or ordinances protecting trees and no impact would occur.

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?

No Impact. The project site occurs within the Western Riverside County Multiple Species Habitat Conservation Plan. The site and the surrounding area is urbanized and does not support any sensitive habitat and/or species that are protected by an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan because it does not overlap or occur adjacent to any area conserved or targeted for conservation by the plan (MCC 2018). Development of the project site would not conflict with local, regional, or state resource preservation and/or conservation policies. Therefore, no significant impacts would occur as a result of project implementation.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to biological resources that are applicable to the project.

Mitigation Measures

MM BIO-1: A preconstruction burrowing owl survey shall be completed a maximum of 30 days prior to the start of construction. All areas of the site shall be included, as well as a visual survey of the undeveloped property to the south. The results shall be provided as a letter report. If burrowing owls are observed within the site, additional coordination with California Department of Fish and Wildlife would be required. No burrowing owls may be harmed, and no burrows may be collapsed during displacement between February 1 and August 31 to avoid the nesting season.

MM BIO-2: To avoid take of nesting birds, vegetation removal and initial ground disturbance should occur outside the nesting bird breeding season (February 1 through August 31). If project activities occur during the nesting season, a nesting bird survey should be conducted by a qualified biologist at a maximum of one (1) week prior to start of construction activities. If active nests of protected native species are located, construction work should be delayed until after the nesting season or until the young are no longer dependent upon the nest site. Construction near an active nest should be conducted at the discretion of a biological monitor utilizing appropriate buffers and other methods to minimize potential impacts.

REFERENCES

Phase I Biological Resources Assessment prepared by Material Culture Consulting, May 2018 (MCC 2018). See Appendix B.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
5. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §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) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

No Impact. The project site is vacant and undeveloped and does not contain any historic resources (MCC 2018). The site has been previously used as an agricultural field and has been vacant since the construction of the adjacent charter school and school district building. No historic resources are located adjacent to the site. Therefore, implementation of the proposed project would not cause a substantial adverse change in the significance of a historical resource, and impacts would not occur.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Less than Significant Impact. As described in the previous response, the project site is vacant and undeveloped. The records search identified that there are no known archaeological or historical architectural resources within the project site. As described in the Cultural Resources Assessment, California Historic Resources Inventory System records search identified a total of fourteen cultural resources investigations that have been previously conducted within a one-mile radius buffer of the project area, and none of the studies intersected with the project site (MCC 2018) Of the fourteen studies, a total of eleven previously recorded cultural resources were identified within a one-mile buffer and no previously recorded resources within the project site boundaries (MCC 2018). In addition, the intensive modification and disturbance of the project site has eradicated any potential of near-surface resources (MCC 2018). As a result, it is unlikely that cultural resources would be encountered during the course of project development (MCC 2018); thus, impacts would be less than significant.

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

Less than Significant Impact with Mitigation Incorporated. A records search of the project site, as described in the Phase I Paleontological Resource Assessment, found that there is no indication of any fossils that have been found directly within the project area, nor within one mile of the project site (MCC 2018). A field survey found the project site have been disturbed by prior agricultural activities (MCC 2018). In addition, research noted at the Western Science Center that significant fossils have been found within similar alluvial mapped units within five to ten miles from the project site. Therefore, the project would have the potential to impact a unique paleontological resource or site or unique geologic feature. As a result, Mitigation Measure CUL-1is included to provide a paleontological resource monitoring plan with procedures to follow for monitoring of excavations below 4 feet, any fossil discovery, and requires a curation agreement with an appropriate, accredited institution. With implementation of Mitigation Measure CUL-1, impacts related to paleontological resources would be less than significant.

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

Less than Significant Impact. The project site was previously used for agricultural activities and is not located adjacent to any known cemeteries. It is possible, though, that construction activities could unearth previously unknown human remains. However, compliance with California Health and Safety Code Section 7050.5, as required by operation of law, would ensure that human remains were treated with dignity and as specified by law, which would reduce the impact to a less than significant level.

As specified by California Health and Safety Code Section 7050.5, if human remains are found on the project site during construction or during archaeological work, the County Coroner's office shall be immediately notified and no further excavation or disturbance of the discovery or any nearby area reasonably suspected to overlie adjacent remains shall occur until the Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code 5097.98. The Coroner would determine within two working days of being notified, if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) within 24 hours. The NAHC would make a determination as to the Most Likely Descendent. Compliance with the existing California Health and Safety Code regulations, would reduce impacts related to human remains to a less than significant level.

Existing Plans, Programs, or Policies

State Health and Safety Code Section 7050.5
Public Resources Code Section 5097.98

Mitigation Measure

MM CUL-1: A trained and qualified paleontological monitor shall perform full-time monitoring of any excavations greater than 4 feet in depth. The monitor will have the ability to redirect construction activities to ensure avoidance of significant impacts to paleontological resources. The paleontologist shall re-evaluate the necessity for paleontological monitoring after 50% or greater of the excavations have been completed. Any potentially significant fossils observed shall be collected and recorded in conjunction with best management practices and Society for Vertebrate Paleontology (SVP) professional standards. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations. A report documenting the results of any monitoring, including any salvage activities

and the significance of any fossils, will be prepared and submitted to the appropriate City personnel.

REFERENCES

Phase 1 Cultural Resources Assessment, prepared by Material Culture Consulting, May 2018 (MCC 2018). See Appendix C.

Phase I Paleontological Resource Assessment, prepared by Material Culture Consulting, May 2018 (MCC 2018). See Appendix D.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
6. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
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, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

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

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

No Impact. The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act requires the State Geologist to establish regulatory zones, known as "Alquist-Priolo (AP) Earthquake Fault Zones," around the surface traces of active faults and to issue appropriate maps. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (typically 50 feet).

The project site is not located within a designated Alquist-Priolo Earthquake Fault Zone (Leighton, 2018). There are no active or potentially active faults known to cross or project into this project site. The closest active faults to the project site are the San Jacinto Fault, located 4.5 to the southwest, and 14.5 miles to the northeast is the San Andreas Fault. Thus, impacts related to rupture of a known earthquake fault would not occur.

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

ii. Strong seismic ground shaking?

Less Than Significant Impact. The project site is located in a seismically active region, as is all of southern California. The project site could be subject to seismically related strong ground shaking. Groundshaking is a major cause of structural damage from earthquakes. The amount of motion expected at a building site can vary from none to forceful depending upon the distance to the fault, the magnitude of the earthquake, and the local geology. Greater movement can be expected at sites located closer to an earthquake epicenter, that consist of poorly consolidated material such as alluvium located near the source, and in response to an earthquake of great magnitude.

The Geotechnical Exploration that was prepared for the project states that the site is likely to be subject to strong seismic ground shaking during the life of the project due to the numerous fault in the region, and states that the seismic design of the proposed structures should be implemented in accordance with the applicable provisions stipulated in the California Building Code (CBC) (Leighton 2018).

As described above, the closest active faults to the project site are the San Jacinto Fault, located 4.5 to the southwest, and 14.5 miles to the northeast is the San Andreas Fault.

The proposed project would add development, employees, and residents within the project site. Therefore, project implementation could subject people and structures to hazards from ground shaking. However, CBC includes provisions to reduce impacts caused by major structural failures or loss of life resulting from earthquakes or other geologic hazards. For example, Chapter 16 of the CBC contains requirements for design and construction of structures to resist loads, including earthquake loads. The CBC provides procedures for earthquake resistant structural design that include considerations for onsite soil conditions, occupancy, and the configuration of the structure including the structural system and height. The City of Moreno Valley has adopted the 2016 edition of the CBC as Chapter 8.20 of the Municipal Code, which includes provisions to reduce impacts caused by potential major structural failures or loss of life resulting from earthquakes or other geologic hazards.

The Geotechnical Exploration prepared for the project includes this information, in addition to recommendations for site grading, construction, foundation design, slab design, infiltration basin

design, and pavement design that are based on the CBC regulations and identified specifically for the proposed project based on site conditions. These CBC-related and geologist and/or civil engineer specifications for the proposed project are required to be incorporated into grading plans and specifications as a condition of project approval, as included as PPP GEO-1. Thus, the project would be required to adhere to the provisions of the CBC as specified for the project, which are reviewed by the City for appropriate inclusion, as part of the building plan check and development review process. Overall, compliance with the requirements of the CBC and the City municipal code for structural safety, as included as PPP GEO-1, would reduce hazards from strong seismic groundshaking to a less than significant level.

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

iii. Seismic-related ground failure, including liquefaction?

Less Than Significant Impact. The term "liquefaction" describes a phenomenon in which a saturated cohesionless soil loses strength and acquires a degree of mobility as a result of strong ground shaking during an earthquake. The factors known to influence liquefaction potential include soil type and depth, grain size, relative density, groundwater level, degree of saturation, and both the intensity and duration of ground shaking.

The Geotechnical Exploration describes that groundwater is between 18- to 19-feet below existing grade, and that onsite soils consist predominantly of dark-reddish-brown clay sands and granitic outcrops. The site contains very dense/stiff soils at depths greater-than 10 feet. Based on clay context and density, the residual soil at depths greater-than 10 feet below the existing ground surface have low liquefaction potential (Leighton 2018). Thus, the likelihood of occurrence of seismically-induced liquefaction at the site was determined to be negligible (Leighton 2017). Furthermore, the project would be required to comply with the CBC requirements, as implemented by the City's Municipal Code, and by the plan check and permitting process. Thus, potential impacts related to liquefaction would be less than significant.

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

iv. Landslides?

No Impact. The project site is flat without steep slopes and is not located near substantial slopes or hillsides. The Geotechnical Exploration states seismically-induced landslides and other slope failures are common occurrences during or soon after earthquakes, but as shown in *Figure 6 of the study, Liquefaction Map*, this site and vicinity are relatively flat without slopes and seismically-induced landslide activity can be ruled out (Leighton 2018). Therefore, the project would not expose people or structures to slope instability or seismically induced landslides.

b) Result in soil erosion or the loss of topsoil?

Less Than Significant Impact.

Construction
Grading and excavation activities would expose and loosen topsoil, which could be eroded by wind or water. Thus, construction of the project has the potential to contribute to soil erosion and the loss of topsoil.

However, the City's Municipal Code Section 8.10, Stormwater/ Urban Runoff and Discharge Controls states that all significant development within the City, such as the proposed project, shall be undertaken in accordance with the Clean Water Act, the Porter-Cologne Water Quality Control Act and other National Pollutant Discharge Elimination System (NPDES) permits. The Project would be required to adhere to standard regulatory requirements, including, but not limited to, requirements imposed by the City of Moreno Valley's NPDES Municipal Stormwater Permit and a Project-specific Water Quality Management Plan (WQMP) that includes Best Management Practices (BMPs). Further, Section 8.21.170 of the City's Municipal Code outlines requirements for NPDES permits. Once a complete NPDES permit has been obtained from the State Water Quality Resource Control Board, the permit would require a stormwater pollution prevention plan (SWPPP) within the construction permit package. Adherence to a City approved SWPPP, which is included as PPP WQ-1 would be verified prior to the issuance of a demolition or grading permit would ensure that potential erosion associated with construction activities would be minimized, and impacts would be less than significant.

Operation

A draft Preliminary Project Specific Water Quality Management Plan was conducted by W&W Land Design Consultants, Inc. on April 18, 2018. Within the report, discussion reveals that the addition of the bioretention area on the site serves as erosion control for the site. Even within site design and landscape planning, erosion-prone soils can be minimized by installing energy dissipaters, such as riprap; and line onsite conveyance channels to decrease velocity; and landscape planting to allow for increased opportunities for stormwater infiltration. Further discussion on reducing the potential for stormwater to erode topsoil is available in Section 9, Hydrology and Water Quality of this IS/MND. Furthermore, implementation of the project requires a Water Quality Management Plan (WQMP), which is included as PPP WQ-2. The WQMP describes the operational BMPs that would be implemented to minimize or eliminate the potential for soil erosion or loss of topsoil during operation of the project. As a result, potential impacts related to substantial soil erosion or loss of topsoil would be less than significant.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, lateral spreading, subsidence, liquefaction or collapse?

Less Than Significant Impact. As described above, the seismically-induced landslide activity can be ruled out as a potential impact. Likewise, the site is considered to have low liquefaction susceptibility; the City of Moreno Valley General Plan EIR shows the site and vicinity as not being liquefiable.

Lateral spreading, a phenomenon associated with seismically-induced soil liquefaction, is a display of lateral displacement of soils due to inertial motion and lack of lateral support during or post liquefaction. It is typically exemplified by the formation of vertical cracks on the surface of liquefied soils, and usually takes place on gently sloping ground or level ground with nearby free surface such as drainage or stream channel. According to the Geotechnical Exploration, lateral spreading is highly unlikely to occur at the project site due to the lack of liquefaction potential within 10-feet of the surface and lack of significant topographic changes within the project's vicinity (Leighton 2018). Therefore, the potential for liquefaction onsite and offsite is limited, impacts related to lateral spreading would also be less than significant.

Subsidence is a general lowering of the ground surface over a large area that is generally attributed to lowering of the ground water levels within a groundwater basin. Localized or focal subsidence or settlement of the ground can occur as a result of earthquake motion in an area where

groundwater in a basin is lowered. In accordance with the Riverside Geologic Hazard Maps identified in the Geotechnical Exploration, the project site is located within an area susceptible to subsidence. However, the project site is located in the center of the valley and not near the edge and based on results of a subsurface evaluation and lack of evidence of differential subsidence and associated ground fissuring, the report considers the potential for differential subsidence and ground fissuring on the site to be very low (Leighton 2018). Therefore, impacts related to subsidence would be less than significant.

Seismically induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater). During a strong seismic event, seismically induced settlement can occur within loose to moderately dense sandy soil due to reduction in volume during and shortly after an earthquake event (Leighton 2018). Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. It is differential settlement that is damaging, not total settlement. Based on site-specific geomorphology, alluvium is dense and uniform across this generally level site. Shallow soils are recommended to be recompacted. Therefore, any dynamically-induced settlement should be negligible and uniform across this site, so potentially-damaging differential settlement should be relatively small (Leighton 2018).

The Geotechnical Exploration recommends that onsite soils providing foundations for buildings and pavement areas be overexcavated and recompacted from the upper five feet of compressible and collapsible (non-organic) soils (Leighton 2018), pursuant to the CBC compaction regulations. With implementation of the overexcavation requirements per the CBC, as included as PPP GEO-1, the potential for settlement or collapse of soils would be reduced to a less than significant level. Therefore, compliance with the requirements of the CBC as identified in the site geotechnical design recommendations that would be reviewed by the City for appropriate inclusion, as part of the permitting process, would reduce potential impacts related to ground collapse to a less than significant level.

d) Be located on expansive soil, as defined in in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Less Than Significant Impact. Expansive soils contain significant amounts of clay particles that swell when wet and shrink when dry. Foundations constructed on expansive soils are subjected to forces caused by the swelling and shrinkage of the soils and could result in heaving and cracking of buildings and foundations.

A sample of soil was found to have an Expansion Index of 30, which is low but still considered expansive (Leighton 2018).

The Geotechnical Exploration describes that overexcavation and recompaction of the upper 5-feet of expansive, compressible and collapsible soils would be required within building pads, with these clays and sands blended as much as possible (Leighton 2018). Conventional spread footings founded on newly compacted fill are expected to be able to support one- to two-story structure on the site without any extraordinary geotechnical or structural remediation/mitigation (Leighton 2018). In addition, foundations for the project would be required to comply with the CBC requirements, as implemented by the City's Municipal Code, and by the plan check and permitting process. Thus, impacts related to expansive soils would be less than significant.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

No Impact. The proposed project would tie into existing sewers and would not use septic tanks or alternative wastewater disposal systems. As a result, impacts related to septic tanks or alternative waste water disposal systems would not occur from implementation of the proposed project.

Existing Plans, Programs, or Policies

The following PPPs are incorporated into the project and would reduce impacts related to geology and soils. These actions will be included in the project's mitigation monitoring and reporting program:

PPP GEO-1: The project shall comply with the California Building Standards Code as included in the City's Municipal Code and the Geotechnical Exploration, prepared by Leighton Consulting, April 2018.

PPP WQ-1: Stormwater Pollution Prevention Plan, provided in Section 9, Hydrology and Water Quality.

PPP WQ-2: Water Quality Management Plan, provided in Section 9, Hydrology and Water Quality.

Mitigation Measures

No mitigation measures related to geology and soils are required.

REFERENCES

City of Moreno Valley, General Plan Final EIR, Section 5.6 Geology and Soils. July 2006. Available at http://www.moreno-valley.ca.us/city_hall/general-plan/06gpfinal/ieir/5_6-geo-soils.pdf.

Final-Design Geotechnical Exploration Proposed Skilled Nursing Facility 25622 Alessandro Boulevard, Moreno Valley, Riverside County, California APN 479-230-018-6, prepared by Leighton Consulting, Inc., April 5, 2017 (Leighton 2018). See Appendix E.

Draft Project Specific Water Quality Management Plan, prepared by W&W Land Design Consultants, Inc., April 18, 2018 (WQMP 2018). See Appendix I.

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

The discussion below is based on the Greenhouse Gas Analysis prepared by Urban Crossroads, June 6, 2018, which is included as Appendix F.

Thresholds of Significance

The City of Moreno Valley has not established local CEQA significance thresholds for greenhouse gas (GHG) emissions, as allowed by Section 15064.7 of the CEQA guidelines. The City utilizes the SCAQMD's numeric significance thresholds that are based on capture of approximately 90 percent of emissions from development. A screening threshold of 3,000 metric tons carbon dioxide equivalent (MTCO2e) per year is used to determine if additional analysis is required for small projects. This approach has been adopted by the SCAQMD where it is the lead agency and is also widely used by cities in the South Coast Air Basin. As such, this threshold is utilized herein to determine if emissions of greenhouse gases from this project would be significant.

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

Less than Significant Impact. Construction activities produce combustion emissions from various sources, such as site excavation, grading, utility engines, heavy-duty construction vehicles onsite, equipment hauling materials to and from the site, asphalt paving, and motor vehicles transporting the construction crew. Exhaust emissions from onsite construction activities would vary daily as construction activity levels change.

In addition, operation of the proposed skilled nursing facility would result in area and indirect sources of operational GHG emissions from vehicle trips, electricity and natural gas consumption, water transport (the energy used to pump water), and solid waste generation. GHG emissions from electricity consumed from the proposed development would be generated off-site by the electricity provider and is assumed to be generated by fuel combustion. GHG emissions from water transport are also indirect emissions resulting from the energy required to transport water from its source.

The estimated operational GHG emissions that would be generated from implementation of the proposed project are shown in Table GHG-1. Additionally, in accordance with SCAQMD's recommendation, the project's construction-related GHG emissions are amortized over 30 years and added to the operational emissions estimate in order to determine the project's total annual

GHG emissions. As shown on Table GHG-1, the project would result in approximately 877.10 MTCO2e per year and would not exceed the threshold of 3,000 MTCO2e per year. Thus, project-related GHG emissions would be less than significant.

Table GHG-1: Annual Greenhouse Gas Emissions Generated by the Project

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Construction emissions amortized over 30 years	26.00	0.00	0.00	26.09
Area	1.49	0.00	0.00	1.52
Energy	202.54	0.01	0.00	203.43
Mobile Sources	560.45	0.03	0.00	561.16
Waste	16.30	0.96	0.00	40.38
Water Usage	38.40	0.19	0.00	44.52
Total CO_2E (All Sources)	**877.10**			
SCAQMD Threshold	3,000			
Threshold Exceeded?	No			

Source: Urban Crossroads, 2018.

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

No Impact. The proposed project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. The project would comply with regulations imposed by the City, the State, and the SCAQMD that reduce GHG emissions.

The project would be consistent with the 2008 California Air Resources Board (CARB) Scoping Plan. The 2008 CARB Scoping Plan identifies reduction measures to achieve goals set forth by the Global Warming Solutions Act of 2006 (AB 32), such as low carbon fuel standard, advanced clean car standards, and cap-and-trade, which have been adopted over the last five years and implementation activities are ongoing.

Similarly, the project would be consistent and would not interfere with Senate Bill 32 (SB 32) and the 2017 CARB Scoping Plan. SB 32 requires the State to reduce statewide GHG emissions to 40% below 1990 levels by 2030, a reduction target set by Executive Order (EO) B-30-15. The law builds upon AB 32 goal of 1990 levels by 2020 and the goal set by EO S-3-15, which sets a statewide GHG reduction target of 80% below 1990 levels by 2050. The 2017 Scoping Plan builds on the 2008 Scoping Plan in order to achieve the 40 percent reduction form 1990 levels by 2030.

The City of Moreno Valley adopted a Climate Action Plan (CAP) in October 2012. The measures identified in the CAP represent the City's action to achieve GHG reduction targets of AB 32 for target year 2020. Local measures included in the CAP include:

- R2-T1: Land Use Based Trips and VMT Reduction Policies. Encourage the development of Transit Priority Projects along High Quality Transit Corridors identified in the SCAG Sustainable Communities Plan, to allow a reduction in vehicle miles traveled.
- R2-T3: Employment-Based Trip Reductions. Require a Transportation Demand Management (TDM) program for new development to reduce automobile travel by encouraging ride-sharing, carpooling, and alternative modes of transportation.
- R2-E1: New Construction Residential Energy Efficiency Requirements. Require energy efficient design for all new residential buildings to be 10% beyond the current Title 24 standards. (Reach Code)

- R2-E2: New Construction Residential Renewable Energy. Facilitate the use of renewable energy (such as solar (photovoltaic) panels or small wind turbines) for new residential developments. Alternative approach would be the purchase of renewable energy resources offsite.
- R2-E5: New Construction Commercial Energy Efficiency Requirements. Require energy efficient design for all new commercial buildings to be 10% beyond the current Title 24 standards. (Reach Code)
- R3-E1: Energy Efficient Development, and Renewable Energy Deployment Facilitation and Streamlining. Updating of codes and zoning requirements and guidelines to further implement green building practices. This could include incentives for energy efficient projects.
- R3-L2: Heat Island Plan. Develop measures that address "heat islands." Potential measures include using strategically placed shade trees, using paving materials with a Solar Reflective Index of at least 29, an open grid pavement system, or covered parking.
- R2-W1: Water Use Reduction Initiative. Consider adopting a per capita water use reduction goal which mandates the reduction of water use of 20 percent per capita with requirements applicable to new development and with cooperative support of the water agencies.

The project would not conflict with these local strategies. The project would be consistent with state and regional strategies. The project would also be subject to California Building Code requirements where new buildings must achieve the 2016 Building and Energy Efficiency Standards and the 2016 California Green Building Standards requirements. In addition, as described in the previous response, the proposed project would not result in GHG emissions that would exceed the threshold of 3,000 MTCO2e per year, which is the SCAQMD's numeric significance threshold. Therefore, the project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to greenhouse gas emissions that are applicable to the project.

Mitigation Measures

No mitigation measures related to greenhouse gas emissions are required.

REFERENCES

Greenhouse Gas Analysis prepared by Urban Crossroads, June 6, 2018 (GHG 2018). See Appendix F.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
8. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
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) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than Significant Impact. A hazardous material is defined as any material that, due to its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous wastes, and any material that a business or the local implementing agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released.

As described in the Phase I Environmental Site Assessment (ESA), the project site has been vacant and only used for dry farming in the past, except for a few structures now demolished. (Leighton 2018). A limited Phase II ESA was conducted and the results found the presence of polychlorinated biphenyls, organochlorine pesticides, polynuclear aromatic hydrocarbons, metals, volatile organic compounds, and semi-volatile organic compounds were not detected in the soil samples at concentrations that pose a threat to human health and/or the environment.

Proposed construction activities would involve transport, use, and disposal of hazardous materials such as paints, solvents, oils, grease, and caulking. In addition, hazardous materials may be needed for fueling or operating construction equipment on the site. These types of materials are not acutely hazardous, and all storage, handling, use, and disposal of these materials are regulated by federal and state requirements, which the project construction activities are required to strictly adhere to. These regulations include: the federal Occupational Safety and Health Act and Hazardous Materials Transportation Act; Title 8 of the California Code of Regulations (CalOSHA), and the state Unified Hazardous Waste and Hazardous Materials Management Regulatory Program. As a result, hazardous material impacts related to construction activities would be less than significant.

Operation of the project includes activities similar to a residential development, which would use hazardous materials typical of household uses such as : solvents, cleaning agents, paints, pesticides, batteries, and aerosol cans. Although patients and employees of the project would utilize common types of hazardous materials, normal routine use of these products as indicated by product safety labeling in compliance with federal and state regulations would not result in a significant hazard to patients or workers in the vicinity of the project. Therefore, operation of the proposed project would not result in a significant hazard to the public or to the environment through the routine transport, use, or disposal of hazardous waste during operation of the proposed project. Impacts would be less than significant.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than Significant Impact. The Phase I ESA and the limited Phase II ESA determined that there is no evidence of releases of hazardous substances and there appears to be little potential for on-site contamination on the site (Leighton 2018). Therefore, potential impacts are less than significant.

c) Emit hazardous emissions or handle hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Less than Significant Impact. The project site is bordered by the Excel Prep Academy, a public charter school for grades K-12. As described in response a), construction and operation of the proposed project would involve the use, storage and disposal of small amounts of hazardous

materials on the project site. These hazardous materials would be limited and used and disposed of in compliance with federal, state, and local regulations, which would reduce the potential of accidental release into the environment near the school. In addition, the proposed skilled nursing facility would not involve the use or handling of acutely hazardous materials.

Furthermore, the emissions that would be generated from construction and operation of the proposed project were evaluated in the air quality analysis presented in Section 3, and the emissions generated from the proposed project would not cause or contribute to an exceedance of the federal or state air quality standards. Thus, the proposed project would not emit hazardous or handle acutely hazardous materials, substances, or waste near the school, and impacts would be less than significant.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Less than Significant Impact. The Phase I ESA (Leighton 2018) prepared for the project conducted a database search to determine if the project site or any nearby properties are identified as having hazardous materials. The Phase I record search determined that the project site is not located on or nearby a site which is included on a list of hazardous materials sites. As a result, impacts would be less than significant.

e) For a project 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?

Less than Significant Impact. The project is not located within an airport land use plan or within two miles of an airport. The closest airport to the project site is the March Air Reserve Base, which is approximately 2.97 miles west of the project site. March Air Reserve Base, the March Inland Port Airport Authority and the City of Moreno Valley have developed the Air Installation Compatible Use Zone program. The program is intended to provide information concerning aircraft accident hazards to communities surrounding Air Force installations and to prevent incompatible development in the areas affected by aircraft operations. In addition, there are mapped areas of relative potential for crashes; Accident Potential Zone I and II (Moreno Valley General Plan FEIR). The project site is not located in either of the accident potential zones. Therefore, the proposed project would result in a less than significant impact related to airport safety hazards 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?

No Impact. There are no private airstrips located within the vicinity of the project site. Therefore, the development of the project would not result in a safety hazard related to airstrips for people residing or working in the project area.

g) Impair implementation of an adopted emergency response plan or emergency evacuation plan?

Less Than Significant Impact. The City of Moreno Valley Police Department oversees emergency response in the City. The proposed project would implement the construction and operation of a

skilled nursing facility that would be permitted and approved in compliance with existing safety regulations, such as the California Building Code and Fire Code as included in the City's Municipal Code to ensure that it would not conflict with implementation of an emergency evacuation.

The proposed construction activities, including equipment and supply staging and storage, would occur within the project site and would not restrict access of emergency vehicles to the project site or adjacent areas, and impacts related to interference with an adopted emergency response or evacuation plan during construction activities would be less than significant.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

No Impact. The project site is not located within a fire hazard area (Moreno Valley General Plan FEIR). The project would be required to adhere to the Uniform Fire Code, and would be reviewed by the Fire Department during the project permitting process to ensure that the project plans meet the fire protection requirements. Because the project site is not mixed with wildlands and is surrounded by developed lands, it would not expose people or structures to a significant risk of loss, injury, or death from wildfires. Therefore, impacts related to exposure of people or structures to a significant risk of loss, injury or death involving wildland fires would not occur.

Project Design Features & Standard Conditions/Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to hazards and hazardous materials that are applicable to the project.

Mitigation Measures

No mitigation measures related to hazards and hazardous materials are required.

REFERENCES

City of Moreno Valley, General Plan Final Program Environmental Impact Report, Section 5.5 Hazards. July 2006. Available: http://www.moreno-valley.ca.us/city_hall/general-plan/06gpfinal/ieir/5_5-hazards.pdf

Phase I and Limited Phase II Environmental Site Assessment, January 31, 2018. Prepared by Leighton Consulting, Inc. (Leighton 2018).

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
9. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐
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 through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
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?	☐	☐	☒	☐

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) Violate any water quality standards or waste discharge requirements?

Less than Significant Impact.

Construction
Construction of the project would require grading and excavation of soils, which would loosen sediment, and then have the potential to mix with surface water runoff and degrade water quality. Additionally, construction would require the use of heavy equipment and construction-related chemicals, such as concrete, cement, asphalt, fuels, oils, antifreeze, transmission fluid, grease, solvents and paints. These potentially harmful materials could be accidentally spilled or improperly disposed of during construction and, if mixed with surface water runoff, could wash into and pollute waters.

These types of water quality impacts during construction of the project would be prevented through implementation of a stormwater pollution prevention plan (SWPPP). Construction of the project would disturb more than one acre of soil; therefore, the proposed project would be required to obtain coverage under the NPDES General Permit for Discharges of Storm Water Associated with Construction Activity. Construction activity subject to this permit includes clearing, grading, and ground disturbances such as trenching, stockpiling, or excavation. The Construction General Permit requires implementation of a SWPPP that is required to identify all potential sources of pollution that are reasonably expected to affect the quality of storm water discharges from the construction site. The SWPPP would generally contain a site map showing the construction perimeter, proposed buildings, stormwater collection and discharge points, general pre- and post-construction topography, drainage patterns across the site, and adjacent roadways. The SWPPP would also include construction BMPs such as:

- Silt fencing, fiber rolls, or gravel bags
- Street sweeping and vacuuming
- Storm drain inlet protection
- Stabilized construction entrance/exit
- Vehicle and equipment maintenance, cleaning, and fueling
- Hydroseeding
- Material delivery and storage
- Stockpile management
- Spill prevention and control
- Solid waste management
- Concrete waste management

Adherence to the existing requirements and implementation of the appropriate BMPs as ensured through the City's construction permitting process are included as PPP WQ-1, which would ensure that the project would not violate any water quality standards or waste discharge requirements, potential water quality degradation associated with construction activities would be minimized, and impacts would be less than significant.

Operation
The project would introduce new skilled nursing facility to the project site, which would introduce the potential for pollutants such as, chemicals from household cleaners, nutrients from fertilizer, pesticides and sediments from landscaping, trash and debris, and oil and grease from vehicles. These pollutants could potentially discharge into surface waters and result in degradation of water quality. Thus, the project would be required to comply with existing regulations that limit the potential for pollutants to discharge from the site.

The Sunnymead Drainage Area Management Plan (DAMP), which is included in the City's Municipal Code as Section 16.20.040, is the primary water pollutant control regulation for development projects. The DAMP requires implementation of Water Quality Management Plans (WQMPs) based on the anticipated pollutants that could result from the project. A preliminary WQMP has been provided in this IS/MND (see Appendix I).

The potential pollutants guide which BMPs are incorporated into the project, including the Low Impact Development (LID) features, pollutant source control features, and pollutant treatment control features. In addition, the DAMP requires the project to infiltrate, evapotranspire, or biotreat/biofilter the 85th percentile 24-hour storm event. A new onsite storm water system would be installed to collect runoff from the proposed development, which would filter and discharge it into the existing offsite storm drain that is southwest of the project site. In addition, biotreatment devices such as bio-retention would be installed to capture and filter runoff from the project area. The biotreatment devices would remove pollutants (i.e., sediments, nutrients, heavy metals, oxygen demanding substances, oil and grease, bacteria, and pesticides).

With implementation of the operational BMPs from the WQMP, pursuant to the DAMP and City Municipal Code, is included as PPP WQ-2; which would be verified during the permitting process for the proposed project, potential pollutants would be reduced to the maximum extent feasible, and development of the proposed project would not violate any water quality standards or waste discharge requirements, and impacts would be less than significant.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Less than Significant Impact. The project is within the service boundaries of, and would be served by, the Eastern Municipal Water District. The Water District operates several groundwater wells within the San Jacinto Groundwater Basin. The Basin is managed by the Water District, which regulates the amount of groundwater pumped from the Basin and sets the Basin Production Percentage for all pumpers. The project would not result in the need for groundwater supplies. In addition, the project does not propose to extract groundwater. Thus, the proposed project would not result in the lowering of the local groundwater table, and impacts would be less than significant.

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?

Less than Significant Impact. The project site does not contain, nor is adjacent to, a stream, river, creek, or other flowing water body. The project site is south of a storm drain, but it is out of the site's boundaries and it is channelized by concrete. Thus, impacts related to alteration of the course of a stream or river would not occur.

Construction

Construction of the project would require grading and excavation of soils, which would loosen sediment and could result in erosion or siltation. However, as described in response a), construction of the proposed project requires City approval of a SWPPP prepared by a Qualified SWPPP Developer, as included by PPP WQ-1. The SWPPP is required for plan check and approval by the City's Public Works Department, prior to provision of permits for the project, and would include construction BMPs to reduce erosion or siltation. Typical BMPs for erosion or siltation, include: use of silt fencing, fiber rolls, gravel bags, stabilized construction driveway, and stockpile management (as described in the previous above). Adherence to the existing requirements and implementation of the required BMPs per the permitting process would ensure that erosion and siltation associated with construction activities would be minimized, and impacts would be less than significant.

Operations

The project area is currently undeveloped and largely pervious. After development of the project, the site would have a total of 195,665 square feet, or 4.5 acres of impervious surfaces on the project site, approximately the total project site (WQMP 2018). Pervious areas onsite would be landscape and the bio-retention areas. Thus, implementation of the project would not generate soils that could erode. In addition, the proposed drainage infrastructure would slow and retain stormwater, which would also limit the potential for erosion or siltation. The project proposes to filter stormwater through the infrastructure of the onsite storm drain system and through biotreatment devices such as bio-retention that would be installed to capture and filter runoff from the project area. As described in previous response a), the DAMP requires the project to implement a WQMP (as included by PPP WQ-2) to infiltrate, evapotranspire, or biotreat/biofilter the 85th percentile 24-hour storm event, and the project would achieve this by the use of the biotreatment devices, such as the proposed bio-retention that have been incorporated into the site plan to meet the drainage needs of the proposed project. As a result, stormwater runoff and the potential for erosion and siltation would not increase with implementation of the proposed project. Therefore, the proposed project would not alter the existing drainage pattern in the project area and would not result in substantial erosion or siltation on- or off-site. Impacts would be less than significant.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Less than Significant Impact. As described in the previous response, the project site does not contain, nor is adjacent to, a stream, river, creek, or other flowing water body. Thus, impacts related to alteration of the course of a stream or river would not occur. In addition, the proposed project would be required to implement a SWPPP (included as PPP WQ-1) during construction that would implement BMPs, such as the use of silt fencing, fiber rolls, and gravel bags, that would ensure that runoff would not substantially increase during construction, and flooding on or off-site would not occur.

Also, as described above, the project would implement an operational WQMP (as included by PPP WQ-2) that would install an onsite storm drain system and biotreatment devices such as catch basin

planters and tree box filters that would infiltrate, evapotranspire, or biotreat/biofilter the 85th percentile 24-hour storm event. Thus, operation of the proposed project would not substantially increase stormwater runoff, and flooding on or off-site would not occur.

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?

Less than Significant Impact. As described in the previous responses, the proposed project would be required to implement a SWPPP (included as PPP WQ-1) during construction that would implement BMPs, such as the use of silt fencing, fiber rolls, and gravel bags, that would ensure that runoff would not substantially increase during construction, and that pollutants would not discharge from the project site, which would reduce potential impacts to drainage systems and water quality to a less than significant level.

Also, the project would implement an operational WQMP (included as PPP WQ-2) that would install an onsite storm drain system and biotreatment devices such as biofiltration planters as part of the project, that would infiltrate, evapotranspire, or biotreat/biofilter the 85th percentile 24-hour storm event. Thus, operation of the proposed project would not substantially increase stormwater runoff, and pollutants would be filtered onsite. Impacts related to drainage systems and polluted runoff would be less than significant with implementation of the existing requirements, which would be verified during the permitting process.

f) Otherwise substantially degrade water quality?

Less than Significant Impact. As described in the previous responses, the proposed project would be required to implement a SWPPP during construction (as included by PPP WQ-1) that would implement BMPs to limit the potential of pollutants to discharge from the project site. Similarly, a WQMP would be required to be implemented pursuant to the requirements of the DAMP (as included by PPP WQ-2), which would reduce the potential for pollutants to discharge from the project site. Overall, potential impacts related to the substantial degradation of water quality would be less than significant with implementation of the existing regulations that are verified during the City's permitting process.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

No Impact. The Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) for the project area (06065C0765G) identifies that the project site is not located within a 100-year flood zone. The concrete channelized storm drain to the immediate north of the project site is identified as Zone A, or having no determined base flood elevations. However, the project is not within the same Zone A, therefore no impact would occur.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Less than Significant Impact. Similarly, as described in the response above, the project site is not located within a 100-year flood hazard area. Thus, the proposed project would not place structures within a flood hazard area that would impede or redirect flood flows, and impacts would not occur.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

No Impact. Project implementation would not expose either people or structures to flood hazards as a result of the failure of a dam or levee. The site is not subject to inundation as a result of the failure of a dam or levee because no such structure is located near the subject property that would adversely affect the site in the event of a failure. Therefore, no flooding or inundation impacts would result from implementation of the project.

j) Inundation by seiche, tsunami, or mudflow

No Impact. A seiche is a surface wave created when an inland body of water is shaken, usually by earthquake activity. The site also is not subject to flooding hazards associated with a seiche because the nearest large body of surface water is located within the master planned Moreno Valley Ranch Community, which is a small lake that is located 2.23 miles south of the site and is too far away from the project site to result in effects related to a seiche.

The Pacific Ocean is located more than 44 miles southwest of the project site; consequently, there is no potential for the project site to be inundated by a tsunami. In addition, the project site is flat and not located near any steep hillsides; therefore, there is no potential for the site to be adversely affected by mudflow. Thus, implementation of the proposed project would not expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow. No impact would occur.

Existing Plans, Programs, or Policies

The following PPPs are incorporated into the project and would reduce impacts related to water quality. These actions will be included in the project's mitigation monitoring and reporting program:

PPP WQ-1: Prior to grading permit issuance, the project developer shall have a Stormwater Pollution Prevention Plan (SWPPP) prepared by a QSD (Qualified SWPPP Developer) pursuant to the Orange County Drainage Area Management Plan (DAMP). The SWPPP shall incorporate all necessary Best Management Practices (BMPs) and other DAMP requirements to comply with the National Pollutant Discharge Elimination System (NPDES) regulations to limit the potential of polluted runoff during construction activities. Project contractors shall be required to ensure compliance with the SWPPP and permit periodic inspection of the construction site by City of Moreno Valley staff or its designee to confirm compliance.

PPP WQ-2: Prior to grading permit issuance, the project developer shall have a Water Quality Management Plan (WQMP) approved by the City for implementation. The project shall comply with the City's Municipal Code Chapter 8.10, the Sunnymead Drainage Area Management Plan (DAMP), and the Regional Water Quality Control Board (RWQCB) requirements in effect at the time permitting to control discharges of sediments and pollutants during operation of the project.

Mitigation Measures

No mitigation measures related to hydrology and water quality are required.

REFERENCES

Federal Emergency Management Agency Flood Map Service Center. Accessed: https://msc.fema.gov.

Preliminary Hydrology & Hydraulic Study, Prepared by W&W Land Design Consultants, April 16, 2018, See Appendix H.

Draft Project Specific Water Quality Management Plan (WQMP 2018). Prepared by W&W Land Design Consultant, Inc. April 18, 2018. See Appendix I.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
10. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to 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 any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

a) Physically divide an established community?

No Impact. The physical division of an established community could occur if a major road (expressway or freeway, for example) were built through an existing community or neighborhood, or if a major development was built which was inconsistent with the land uses in the community such that it divided the community. The environmental effects caused by such a facility or land use could include lack of, or disruption of, access to services, schools, or shopping areas. It might also include the creation of blighted buildings or areas due to the division of the community.

The proposed project site is vacant and surrounded by developed land uses that include single-family residential, office, and roadways. The skilled nursing facility project is consistent with the existing land uses surrounding the project site. The project would create two driveways on Alessandro Boulevard. These driveways would not change any existing street systems or divide any developed areas. Overall, implementation of the proposed project would not physically divide an established community, and impacts would not occur.

b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect?

Less than Significant Impact. The project site has an existing General Plan land use designation of Residential/Office and zoned within Residential 10 (R10) District. The proposed project would not need to change the zoning or amend the General Plan. However, as outlined in the Zoning Code under Permitted Uses, Table 9.02.020-1, a conditional use permit is required for a "convalescent home" within the R10 zoning. Therefore, the project does not conflict with any applicable land use plan, policy, or regulation; no impact would occur.

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

No Impact. The project site and surrounding area is relatively urbanized with the exception of the vacant land across Alessandro Boulevard. However, still, the project site does not support any sensitive habitat and/or species that are protected by an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan (MCC 2018).

The project site occurs within the Western Riverside County Multiple Species Habitat Conservation Plan. However, the City of Moreno Valley, as the lead agency, is not a signatory to the Habitat Conservation Plan, as discussed in the Phase I Biological Resources Assessment (MCC 2018)0. The site does not overlap or occur adjacent to any area conserved or targeted for conservation by the Habitat Conservation Plan. Therefore, development of the site would no impact any conservation goals of the Habitat Conservation Plan. Development of the project site would not conflict with local, regional, or state resource preservation and/or conservation policies. Therefore, impacts would not occur.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to land use and planning that are applicable to the project.

Mitigation Measures

No mitigation measures related to land use and planning are required.

REFERENCES

City of Moreno Valley, General Plan, Adopted Land Use Map, November 2017. Available at http://www.moreno-valley.ca.us/city_hall/general_plan.shtml.

City of Moreno Valley, Municipal Code, Section 9.02.020 Permitted uses. Available at http://qcode.us/codes/morenovalley/view.php?topic=9-9_02-9_02_020&frames=on.

City of Moreno Valley, Zoning Map, November 2017, Available at http://www.moreno-valley.ca.us/cdd/pdfs/ZoningMap.pdf.

Phase I Biological Resources Assessment, Moreno Valley Skilled Nursing Facility Project, City of Moreno Valley, Riverside County, California, May 30, 2018. Prepared by Material Culture Consulting (MCC 2018). See Appendix B.

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

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The project site is located in Mineral Resource Zone 3 (MRZ-3), according to the Mineral Land Classification Map provided by the California Department of Conservation. The MRZ-3 zone within the Significant Mineral Aggregate Resource Area (SMARA) Study Area is defined as areas containing mineral deposits which the significance cannot be evaluated from available data.

The project site was previously used for dry farming activities. A drill hole is located within the project's vicinity, northeast of the intersection of Kitching Street and Alessandro Boulevard. However, the drill hole is not located on the project site, nor does the project's current or proposed activities involve mineral extraction. Therefore, development of the site as a skilled nursing facility would not result in the loss of availability of a known mineral resource that would be of value to the region, and impacts would not occur.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on the general plan, specific plan or other land use plan?

No Impact. As described in the previous response, the area in which the project is located is not identified has having significant data on mineral deposits. The Moreno Valley General Plan indicates that the Jack Rabbit Canyon Quarry is the only recently active sand and gravel quarry on record, and it is outside of City limits, but within the City's sphere of influence. Therefore, implementation of the project would not result in the loss of locally important mineral resources, and impacts would not occur.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to mineral resources that are applicable to the project.

Mitigation Measures

No mitigation measures related to mineral resources are required.

REFERENCES

City of Moreno Valley, General Plan, Conservation Element, Section 7.8 Mineral Resources.

Mineral Land Classification Map, Aggregate Resources Only, San Bernardino P-C Region, Sunnymead Quadrangle, Special Report 143, Plate 7.14.

State of California Department of Conservation. Division of Mines and Geology. Special Report 143, Mineral Land Classification of the Greater Los Angeles Area, Part IV Classification of Sand and Gravel Resource Areas, San Bernardino Production-Consumption Region, 1984. Accessed: https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=mlc

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
12. NOISE. Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☒	☐	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☒	☐	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
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 levels?	☐	☐	☐	☒

City of Moreno Valley Municipal Code

Chapter 11.80 of the City's Municipal Code establishes the permissible noise level that may be received at nearby sensitive uses (e.g., residential). For noise-sensitive residential properties 200 feet from the source, the exterior noise level shall not exceed 60 dBA during daytime hours (8:00 a.m. to 10:00 p.m.) and shall not exceed 55 dBA during the nighttime hours (10:01 p.m. to 7:59 a.m.) (Municipal Code, Chapter 11.80).

Construction noise standards from the source land use (e.g., residential) are limited with the permitted hours of general activity from 7:00 a.m. to 8:00 p.m. on any day, grading is limited to 7:00 a.m. to 6:00 p.m. Monday to Friday; 8:00 a.m. to 4:00 p.m. on weekends and holidays. The construction noise level standards for residential is 60 dBA.

Noise Thresholds

The Noise Impact Analysis utilized the City's Municipal Code criteria, the Federal Interagency Committee on Noise, and Caltrans construction noise analysis protocols as noise thresholds for the

proposed project. Noise impacts are considered significant if any of the conditions listed in Table N-1 result from the project.

Table N-1: Noise Significance Criteria

Analysis Scenario	Noise Condition(s)	Significance Criteria	
		Daytime	Nighttime
Off-Site Traffic Noise	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL project increase	
	if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL project increase	
	if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL project increase	
On-Site Traffic Noise	Residential Exterior Noise Level Criteria		70 dBA CNEL
	Residential Interior Noise Level Standard		45 dBA CNEL
Operational Noise	At 200 feet from the property line of the source[2]	60 dBA L_{eq}	55 dBA L_{eq}
	At residential land use	60 dBA L_{eq}	55 dBA L_{eq}
	if ambient is < 60 dBA L_{eq}	≥ 5 dBA project increase	
	if ambient is 60 - 65 dBA L_{eq}	≥ 3 dBA project increase	
	if ambient is > 65 dBA L_{eq}	≥ 1.5 dBA project increase	
	Vibration Level Threshold	80 VdB	n/a
Construction Noise & Vibration	At residential land use	60 dBA	n/a
	At any land use	90 dBA	n/a
	Vibration Level Threshold	80 VdB	n/a

Source: Noise Impact Analysis, Urban Crossroads, 2018. See Appendix J

Sensitive Receptors

Sensitive receptors near the project site include existing residences and the Excel Prep Academy and Moreno Valley Unified School District. The closest sensitive receiver locations are immediately adjacent to the west and approximately 10 feet east of the site boundary. As shown in Figure N-1, The closest sensitive receptors to the project site are listed below:

- L1: Location L1 is represents the north of the Project site on Black Walnut Street near existing residential homes and the Excel Prep Academy. L1 is approximately 70 feet away from the project site.
- L2: Location L2 represents the noise levels west of the Project site on Alessandro Boulevard near the Moreno Valley Library and existing residential homes. L2 is located approximately 420 feet to the west of the project site.
- L3: Location L3 represents the noise levels near the southwestern Project site boundaries adjacent to the Excel Prep Academy on Alessandro Boulevard. L3 is located 0 feet from the project site, on the boundary to the west.
- L4: Location L4 represents the noise levels near the eastern Project site boundary adjacent to Moreno Valley Unified School District and Allstate office uses. L4 is located approximately 10 feet to the east of the project site.
- L5: Location L5 represents the noise levels southwest of the Project site on Kitching Street near an existing residential apartment community. L5 is located approximately 470 feet to the southwest of the project site.

Figure N-1: Existing Conditions Receiver Locations

Existing Ambient Noise Levels

To identify the existing ambient noise levels in the project area, noise level measurements were taken on and adjacent to the project site on July 11, 2018 for a 24-hour period. As shown on Table N-3, noise levels in the project area range from 57.4 to 73.6 Community Noise Equivalent Level (CNEL).

Table N-3: Existing Ambient Noise Levels

Location	Distance to Project Boundary (Feet)	Description	Energy Average Hourly Noise Level (dBA L_{eq})		CNEL
			Daytime	Nighttime	
L1	70	Located north of the project site on Black Walnut Street near existing residential homes and the Excel Prep Academy	54.6	49.6	57.4
L2	420	Located west of the project site on Alessandro Boulevard near the Moreno Valley Library and existing residential homes	69.3	65.8	73.0
L3	0	Located near the southwestern project site boundaries adjacent to the Excel Prep Academy on Alessandro Boulevard	69.3	66.9	73.6
L4	10	Located near the eastern project site boundary adjacent to Moreno Valley Unified School District and Allstate office uses	55.7	52.7	59.4
L5	470	Located southwest of the project site on Kitching Street near an existing residential apartment community	69.6	65.9	73.1

Source: Noise Impact Analysis, Urban Crossroads, 2018. See Appendix J

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?

Less than Significant Impact.

Onsite Exterior Noise Conditions

The Noise Impact Analysis calculated the exterior noise levels for the proposed facility. The results of the noise study found the closest outdoor common area to Alessandro Boulevard are shown to approach 56.1 dBA CNEL and represent normally acceptable exterior noise levels for nursing home land use. This is due to the project's design features of shielding outdoor common areas from substantial noise exposure. Therefore, no exterior noise mitigation is required. Furthermore, from the project's façade, the exterior noise exposure would approach 66.0 dBA CNEL and represent a conditionally acceptable nursing home land use.

Onsite Interior Noise Conditions

To determine if the interior noise levels within the proposed buildings would comply with the City of Moreno Valley 45 dBA CNEL interior noise standards for residential land use. Due to the onsite exterior noise level estimated to be at 66 dBA CNEL, the project's buildings are required to have a noise reduction of up to 21 dBA and a window-closed condition requiring a means of mechanical ventilation (e.g., air conditioning). To meet the City of Moreno Valley 45 dBA CNEL interior noise standards the following onsite standard construction measures are required:

- Windows/Glass Doors: All units require windows and sliding glass doors that have well-fitted, well-weather-stripped assemblies, and minimum sound transmission class (STC) ratings of 27.

- Exterior Doors (Non-Glass): All exterior doors shall be well weather-stripped and have well-sealed perimeter gaps to achieve minimum STC ratings of 27.
- Exterior Walls: At any penetrations of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar to form an airtight seal.
- Roof: Roof sheathing of wood construction shall be per manufacturer's specification or caulked plywood of at least one-half inch thick. Ceilings shall be per manufacturer's specification or well-sealed gypsum board of at least one-half inch thick. Insulation with at least a rating of R-19 shall be used in the attic space.
- Ventilation: Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use and still receive circulated air. A forced air circulation system (e.g. air conditioning) or active ventilation system (e.g. fresh air supply) shall be provided which satisfies the requirements of the Uniform Building Code.

With the aforementioned standards incorporated, the project would satisfy the 45 dBA CNEL interior noise level standard with standard building construction.

Operational Noise

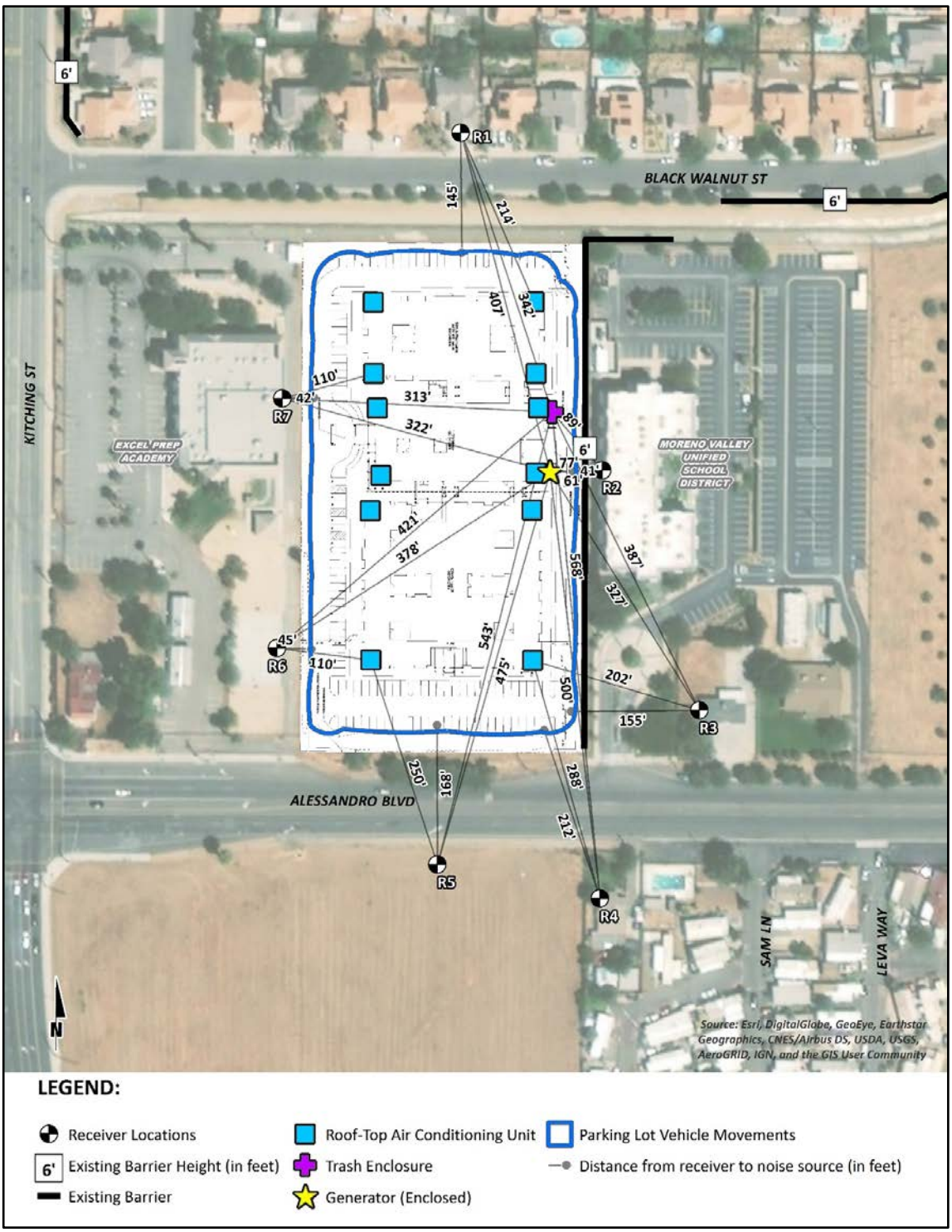
The project would generate noise from roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements. Based on the results from the Noise Impact Analysis, the project-related stationary-source noise levels would satisfy the City of Moreno Valley noise level standards at 200 feet from the property line of the noise source (project site) and at all nearby receiver locations. Table N-4 shows that the combined operational noise from the project related activities would not exceed the City's Municipal Code exterior noise level standards at the sensitive receptors. Therefore, the project generated operational noise would be less than significant.

Table N-4: Operational Noise Levels at Sensitive Receptors

Receiver Location	Land Use	Noise Levels by Noise Source (dBA L_{eq})				Combined Operational Noise Levels (dBA L_{eq})	Thresholds Exceeded?	
		Roof-Top Air Conditioning Units	Trash Enclosure Activity	Generator	Parking Lot Vehicle Movements		Daytime (60 dBA L_{eq})	Nighttime (55 dBA L_{eq})
R1	Residential	42.7	28.1	39.7	34.8	45.0	No	No
R2	Office	45.7	42.3	58.0	37.5	58.4	No	n/a
R3	Office	35.3	29.6	43.7	28.8	44.5	No	n/a
R4	Residential	40.1	31.4	44.9	30.3	46.4	No	No
R5	Future Residential	41.3	23.7	38.2	33.8	43.6	No	No
R6	School	48.5	23.7	37.6	42.4	49.7	No	n/a
R7	School	48.5	25.9	39.0	42.9	49.9	No	n/a

Source: Noise Impact Analysis, Urban Crossroads, 2018. See Appendix J.

Figure N-2: Operational Noise Source Locations



b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant Impact with Mitigation Incorporated. Construction activity included in the project can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. The City of Moreno Valley does not have a threshold for groundborne vibration, thus Federal Transit Administration (FTA) thresholds were used. It is expected that ground-borne vibration from project construction activities would cause only intermittent, localized intrusion from the following:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to buildings, the vibration is usually short-term and is not of sufficient magnitude to cause building damage.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

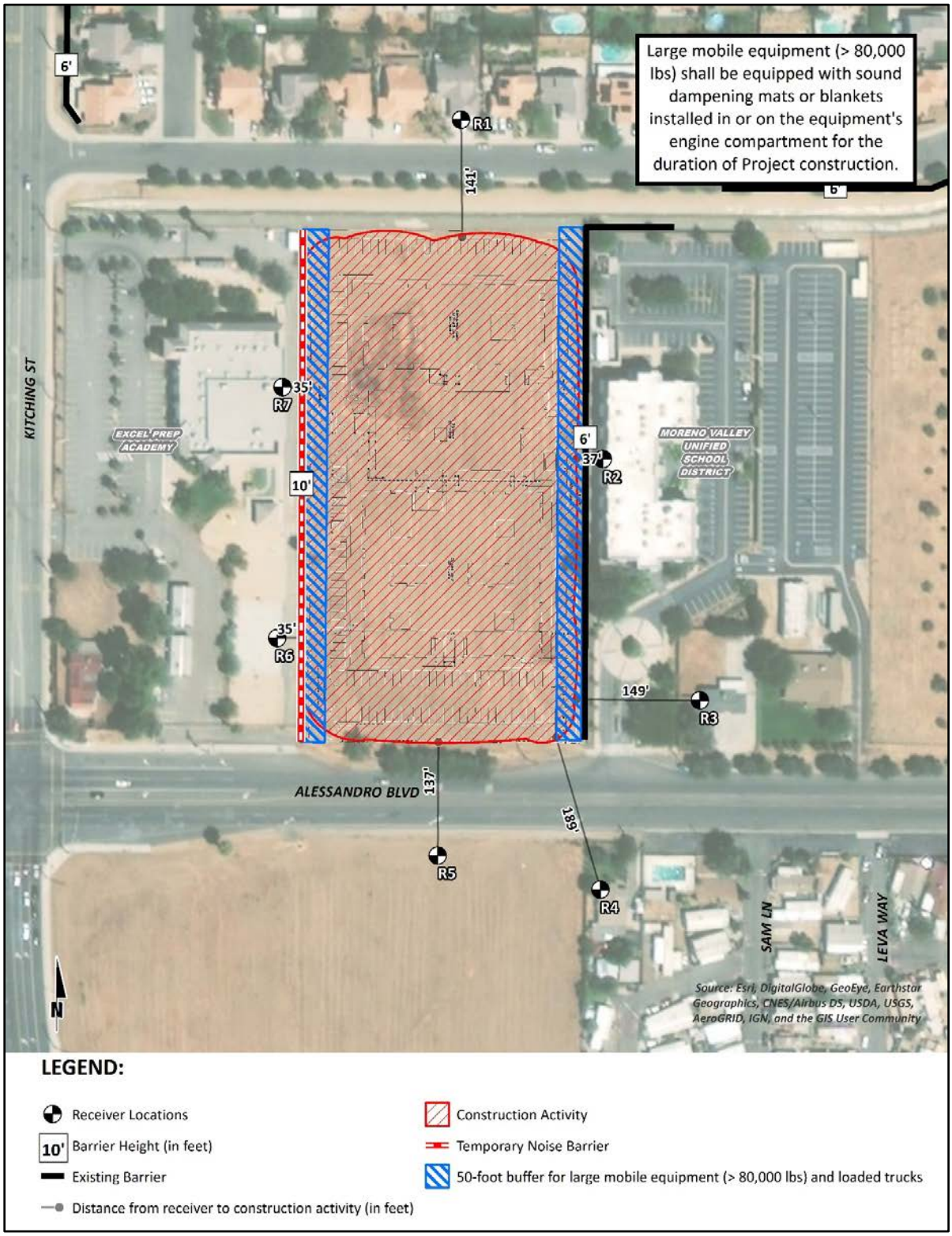
Construction Equipment Vibration: The ground-borne vibration levels from the project's construction activities were estimated by data published by the FTA. The Noise Impact Analysis identified that construction vibration levels would have the potential to generate low levels of groundborne vibration within the project site from construction activities such as grading. Table N-5 demonstrates the project related vibration levels at the nearby receiver locations. Based on the reference vibration levels provided by FTA, a large bulldozer represents the peak source vibration with a reference level of 87 VdB at 25 feet. At distances ranging from 35 to 189 feet from primary project construction activities, construction vibration levels are expected to range from 60.6 to 82.6 VdB, as shown on Table N-5. Using the construction vibration assessment methods provided by the FTA, project construction vibration levels would exceed the FTA 80 VdB threshold at three of the seven sensitive receiver locations, R2, and R6 and R7, and would be a potentially significant impact without mitigation.

Table N-5: Unmitigated Construction Equipment Vibration Levels

Receiver Location	Receiver Vibration Levels (VdB)					Highest Vibration Level (VdB)	Threshold Exceeded?
	Distance to Construction Activity (Feet)	Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer		
R1	141	35.5	56.5	63.5	64.5	64.5	No
R2	37	52.9	73.9	80.9	81.9	81.9	Yes
R3	149	34.7	55.7	62.7	63.7	63.7	No
R4	189	31.6	52.6	59.6	60.6	60.6	No
R5	137	35.8	56.8	63.8	64.8	64.8	No
R6	35	53.6	74.6	81.6	82.6	82.6	Yes
R7	35	53.6	74.6	81.6	82.6	82.6	Yes

Source: Noise Impact Analysis, Urban Crossroads, 2018. See Appendix J

Figure N-3: Construction Buffer Zone and Receiver Locations



As a result, Mitigation Measure N-1 is included which would require a 50-foot buffer zone for large construction equipment (e.g. dozers, graders, scrapers, etc.) from the impacted receiver locations R2, and R6 and R7 (as shown on Figure N-3) where vibration could exceed thresholds. Within the 50-foot buffer zone, only smaller mobile equipment would be allowed. With implementation of Mitigation Measure N-1, vibration levels would be reduced to 78.0 VdB, as shown on Table N-6, which is below the FTA 80 VdB threshold, and impacts would be reduced to a less than significant level.

Further, vibration levels at sensitive receptors would not be sustained during the entire construction period but would occur only during the times that heavy construction equipment is operating adjacent to the project site perimeter near the sensitive receptor, and within the City's allowable construction hours.

Table N-6: Mitigated Construction Equipment Vibration Levels

Receiver Location[1]	Construction Equipment Vibration Levels (VdB)[2]					Highest Vibration Level (VdB)	Threshold Exceeded?[3]
	Distance to Construction Activity (Feet)	Small Bulldozer	Jack-hammer	Loaded Trucks	Large Bulldozer		
R2	50	49.0	70.0	77.0	78.0	78.0	No
R6	50	49.0	70.0	77.0	78.0	78.0	No
R7	50	49.0	70.0	77.0	78.0	78.0	No

Source: Urban Crossroads, 2017.
[1] Noise receiver location are shown on Exhibit 11-A
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-4
[3] Does the peak vibration exceed the FTA maximum acceptable vibration standard of 80 VdB?

Operational Vibration
The project would not generate any operational vibration. Therefore, no impact would occur.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Less than Significant Impact.

Traffic Noise
As described in Section 16, Transportation and Traffic, the project would generate 355 daily trips (20 a.m. peak hour trips and 26 p.m. peak hour trips), which is fewer than the 100 peak hour trips per day threshold which would require the preparation of a traffic impact analysis based on the City's traffic study guidelines. Based on the traffic count data taken on September 17, 2017, the existing PM peak hour traffic volume on Alessandro Boulevard east of Heacock Street is 1,383, which would increase under future year without project conditions as additional development takes place in the project study area (Urban Crossroads, 2018). Project traffic represents three percent increase to the existing roadway volumes, which is below a barely perceptible noise level increase of 3 dBA CNEL at nearby sensitive land uses adjacent to study area roadways. Due to the low traffic volumes generated by the project, the off-site traffic noise levels generated by the project are considered to be less than significant.

Project Operational Noise
As described previously, implementation of the skilled nursing home use would generate noise related to roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements. To identify the increase in ambient noise that would be generated by

operation of the project, the estimated operational noise levels were combined with the existing ambient noise levels measurements, listed in Table N-3.

As indicated on Tables N-7 and N-8, the project is estimated to generate an increase in ambient noise during the daytime hours of up to 4.6 dBA L_{50} and during the nighttime hours of up to 1.3 dBA L_{50}, which is below a barely perceptible noise level increase of 3 dBA CNEL; the increases at the sensitive receiver locations would be less than significant.

Table N-7: Daytime Operational Related Noise Increases

Receiver Location	Total Project Operational Noise Level (dBA L_{50})	Measurement Location	Reference Ambient Noise Levels (dBA L_{50})	Combined Project and Ambient (dBA L_{50})	Project Contribution (dBA L_{50})	Threshold Exceeded?
R1	45.0	L1	54.6	55.1	0.5	No
R2	58.4	L4	55.7	60.3	4.6	No
R3	44.5	L4	55.7	56.0	0.3	No
R4	46.4	L4	55.7	56.2	0.5	No
R5	43.6	L3	69.3	69.3	0.0	No
R6	49.7	L3	69.3	69.3	0.0	No
R7	49.9	L1	54.6	55.9	1.3	No

Source: Noise Impact Analysis, Urban Crossroads, 2018. See Appendix J

Table N-8: Nighttime Operational Related Noise Increases

Receiver Location	Total Project Operational Noise Level (dBA L_{50})	Measurement Location	Reference Ambient Noise Levels (dBA L_{50})	Combined Project and Ambient (dBA L_{50})	Project Contribution (dBA L_{50})	Threshold Exceeded?
R1	45.0	L1	49.6	50.9	1.3	No
R2	-	-	-	-	-	-
R3	-	-	-	-	-	-
R4	46.4	L4	52.7	53.6	0.9	No
R5	43.6	L3	66.9	66.9	0.0	No
R6	-	-	-	-	-	-
R7	-	-	-	-	-	-

Source: Noise Impact Analysis, Urban Crossroads, 2018. See Appendix J

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Less than Significant Impact with Mitigation Incorporated. Construction activities are expected to commence in 2019 and will last through 2020, approximately 18 months, and would include site preparation, grading, building construction, paving, architectural coating. Construction of the project would require use of heavy equipment that would increase noise levels in the immediate project area. The noise from construction activity would fluctuate depending on the particular type, number, and duration of use of construction equipment.

The Noise Impact Analysis prepared for the project determined that highest project-related construction noise levels would range from 58.9 to 76.6 dBA Leq at sensitive receptors. As shown in Table N-10, the project-related construction noise would result in temporary and periodic noise

level increases between 1.9 to 16.6 dBA Leq at sensitive receiver locations with the exception of a 6.1 dBA Leq decrease at R3. As shown on Table N-10, the unmitigated project construction noise levels exceed the 60 dBA Leq noise-sensitive (i.e., residential, school) and 65 dBA Leq non-noise-sensitive (i.e., office) City of Moreno Valley Municipal Code construction noise level thresholds at noise-sensitive receiver locations R1, and R4 to R7, and at non-noise-sensitive receiver location R2. Therefore, the unmitigated project-related construction noise level impacts at R1, R2, and R4 to R7 are considered a potentially significant temporary noise impact. As a result, Mitigation Measure N-2 is included, which requires a minimum 10-foot high temporary noise barrier at the western project site boundary with existing sensitive receivers (the Excel Prep Academy), engine compartment sound dampening mats or blankets for large mobile equipment (greater than 80,000 pounds). In addition, 50-foot buffer for large mobile equipment (greater than 80,000 pounds) and loaded trucks] is required under Mitigation Measure N-2, as shown on Figure N-3.

Table N-9: Construction Related Increases in Noise Levels at Sensitive Receptors

Receiver Location	Distance to Receiver (Feet)	Land Use	Construction Noise Levels (dBA Leq)						Threshold	Project Contribution	Threshold Exceeded?
			Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Construction Noise Level			
R1	141	Residential	50.2	64.5	59.2	62.6	53.3	64.5	60	4.5	Yes
R2	37	Office	56.6	70.9	65.6	69.0	59.7	70.9	65	5.9	Yes
R3	149	Office	44.6	58.9	53.6	57.0	47.7	58.9	65	-6.1	No
R4	189	Residential	47.6	61.9	56.6	60.1	50.7	61.9	60	1.9	Yes
R5	137	Future Residential	50.4	64.7	59.4	62.8	53.5	64.7	60	4.7	Yes
R6	35	School	62.3	76.6	71.3	74.7	65.4	76.6	60	16.6	Yes
R7	35	School	62.3	76.6	71.3	74.7	65.4	76.6	60	16.6	Yes

Source: Adapted from Noise Impact Analysis, Urban Crossroads, 2018. See Appendix J.

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Table N-10: Mitigated Construction Noise Levels at Sensitive Receptors

Receiver Location	Distance to Receiver (Feet)	Land Use	Threshold	Highest Construction Noise Levels	Thresholds Exceeded?	Attenuation from Mitigation Measures			Mitigated Construction Noise Levels (Highest)	Threshold Exceeded?
						Engine Mats/Blankets	Temporary Noise Barriers	50-Foot Buffer		
R1	141	Residential	60	64.5	Yes	-5.0	-	-	59.5	No
R2	37	Office	65	70.9	Yes	-5.0	-	-2.6	63.3	No
R3	149	Office	65	58.9	No	-5.0	-	-	53.9	No
R4	189	Residential	60	61.9	Yes	-5.0	-	-	56.9	No
R5	137	Future Residential	60	61.9	Yes	-5.0	-	-	59.7	No
R6	35	School	60	64.7	Yes	-5.0	-8.7	-3.1	59.8	No
R7	35	School	60	76.6	Yes	-5.0	-8.7	-3.1	59.8	No

Source: Noise Impact Analysis, Urban Crossroads, 2018. See Appendix J.

As shown in Table N-11, the temporary construction noise mitigation measures would reduce the construction noise levels at the potentially impacted receiver locations to range from 53.9 to 63.3 dBA Leq and satisfy the thresholds for noise-sensitive and non-noise-sensitive receiver locations. Therefore, the noise impact due to the project construction is considered a less than significant impact with mitigation.

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?

No Impact. The project is not located within an airport land use plan or within two miles of an airport. The closest airport to the project site is the March Air Reserve Base, which is approximately 3.4 miles southwest of the project site. Therefore, the project would not result in airport related noise impacts to people residing or working within the project site.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. There are no private airstrips located within the vicinity of the project site. Therefore, the development of the project would not expose people residing or working in the project site to excessive noise related to airstrips, and impacts would not occur.

Existing Plans, Programs, or Policies

- Per Municipal Code Section 11.80, operational noise level limits of 60 dBA Leq during the daytime (8:00 a.m. to 10:00 p.m.) hours and 55 dBA Leq during the nighttime (10:01 p.m. to 7:59 a.m.) hours shall apply to the operational noise from the project.

Mitigation Measures

MM N-1: Large loaded trucks and mobile equipment (greater than or equal to 80,000 pounds) shall not be used within 50 feet of the western and eastern boundaries of the project site to limit construction noise and vibration effect (if those uses are occupied at the time of project construction). Instead, smaller, rubber-tired mobile equipment (less than 80,000 pounds) or equivalent alternative equipment shall be used within this area during project construction.

MM N-2: The following measures shall be implemented to reduce noise impacts:

1. **Temporary Noise Barriers:** Install a minimum 10-foot high temporary construction noise barrier at the project's western site boundary (adjacent to Excel Prep Academy, if site is operational as a school). The noise control barriers must have a solid face from top to bottom. The noise control barrier must meet the minimum height and be constructed as follows:
    a. The temporary noise barrier shall provide a minimum transmission loss of 20 dBA. The noise barrier shall be constructed using an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts. Example photos are provided in Appendix J;
    b. The noise barrier must be maintained, and any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired;
    c. The noise control barrier and associated elements shall be completely removed, and the site appropriately restored upon the conclusion of the construction activity.

2. **Engine Mats/Blankets:** Install sound dampening mats or blankets which are capable of a minimum 5 dBA noise reduction to the engine compartments of all large mobile equipment (greater than or equal to 80,000 pounds). The dampening materials must be capable of the minimum 5 dBA noise reduction and can be made of commercially-available sound dampening materials, including but not limited to polyurethane foam and vinyl sheeting.

3. **Mufflers:** During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.

4. **Equipment Staging:** The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center).

5. **Delivery Routes:** The contractor shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

REFERENCES

Noise Impact Analysis, 2017. Prepared by Urban Crossroads. See Appendix J.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
13. POPULATION AND HOUSING. Would the project:				
a) Induce substantial population growth in an area, either directly (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) Induce substantial population growth in an area, either directly or indirectly?

Less than Significant Impact. The U.S. Census Bureau data provides that in 2016 there were 54,711 housing units within the City of Moreno Valley. As shown in Table P-1, the City of Moreno Valley is anticipated to grow by 54,539 residents (an increase of 27 percent) and 73,000 housing units (an increase of 33.4 percent) between 2016 and 2040.

Table P-1: City of Moreno Valley SCAG Projected Population and Housing

	Population	Housing
Estimate 2016[1]	202,061	54,711
2040 SCAG Projections[2]	256,600	73,000
Increase	54,539 (27%)	18,289 (33.4%)

Source:
[1]Census American Factfinder, 2017 Population Estimate (as of July 1, 2017)
[2]SCAG 2016 Growth Forecast by Jurisdiction.

Typically to determine population growth, analysis for this section would use the City's existing average household size of 3.74 persons per household (Housing Element) and apply it to the 88 dwelling units for the proposed project. Under this analysis, the project would generate approximately 329 new residents. This would consist of 0.48 percent of the anticipated housing growth and 0.6 percent of the anticipated population growth between 2016 and 2040. Even under this analysis, the increase in population would not considered a substantial direct increase because it is within the anticipated growth rate.

However, the project is not a typical residential development. As a skilled nursing facility, the project would host temporary residents in need of a range of health care options from private rooms to semi-private and sub-acute rooms. As described in Section 3, *Project Description*, the project would hold approximately 116 beds throughout 88 rooms combined. The 88 rooms would not represent dwelling units for this project. Therefore, the average household size would not be representative

in the 88 rooms within the facility. In fact, the facility would need to be licensed under the State Department of Public Health, the State Department of Social Welfare, and/or the County of Riverside, thereby maintaining the number of beds per room. Thus, the actual projected population growth would be based on the 116 beds, or 0.21 percent of the anticipated population growth between 2016 and 2040. In addition to the less than significant impact on population growth, typically, skilled nursing facilities serve the communities they are in. As such, the patient population would represent an even lower impact to the area population.

In addition to the skilled nursing facility's patient population, the project would generate a temporary day-time population. The project would create 60 additional jobs on the project site. The small number of additional jobs within the area would not induce a substantial population growth.

In addition, indirect growth is related to the expansion of infrastructure, such as water, sewer or street systems that would serve areas beyond the proposed development. The project would be served by existing infrastructure that the project would connect to. Therefore, the project would not result in inducement of substantial population growth, either directly or indirectly, and impacts would be less than significant.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

No Impact. As described above, the project site is vacant and undeveloped land and does not contain any housing on the project site. The proposed project would construct a skilled nursing facility onsite, and would not displace any existing housing or necessitate the construction of housing elsewhere. Thus, impacts would not occur.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

No Impact. As described above, the project site is vacant, and no people currently reside onsite. The proposed project would provide a new skilled nursing facility; it would not displace any people and would not necessitate the construction of housing elsewhere. Thus, impacts would not occur.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to population and housing that are applicable to the project.

Mitigation Measures

No mitigation measures related to population and housing are required.

REFERENCES

City of Moreno Valley, General Plan, 2014-2021 Housing Element.

SCAG 2016 Growth Forecast by Jurisdiction. Accessed: www.scag.ca.gov/Documents/2016DraftGrowthForecastByJurisdiction.pdf

SCAG, Local Profiles Report 2017, Profile of the City of Moreno Valley. Accessed: https://www.scag.ca.gov/Documents/MorenoValley.pdf

U.S. Census Bureau. American Factfinder. Accessed: https://factfinder.census.gov/

U.S. Census Bureau. American Community Survey 5-Year Estimates, Occupancy Characteristics. Accessed: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

U.S. Census Bureau. American Community Survey 5-Year Estimates, Selected Housing Characteristics. Accessed: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF

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

a) Result in substantial adverse physical impacts associated with the provision of 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:

Fire protection?
Police protection?
Schools?
Parks?
Other public facilities?

Fire Protection

Less Than Significant Impact. The Moreno Valley Fire Department provides fire protection to the City of Moreno Valley. The City's Fire Department is the primary response agency to fires, emergency medical service, hazardous materials incidents, traffic accidents, terrorist acts, catastrophic weather events, and technical rescues. Additionally, the City's Office of Emergency Management is located within the Fire Department allowing for a well-coordinated response to both natural and man-made disasters. The Moreno Valley Fire Department is part of the CALFIRE/Riverside County Fire Department's regional, integrated, cooperative fire protection organization. There are three existing Fire Stations within approximately two miles from the project site. Station 99 (Morrison Park) is 1.8 miles from the project site at 13400 Morrison Street; Fire Station 2 (Sunnymead) is 1.76 miles from the project site at 24935 Hemlock Avenue; and Fire

Station 65 (Kennedy Park) is 1.0 miles from the project site at 15111 Indian Avenue (City of Moreno Valley).

The project is a 116-bed skilled nursing facility that would add new r structures and residents within an area already served by the City's Fire Department and within close proximity to three stations. Due to the small increase in residents that would occur from implementation of the project, a limited incremental increase in demand for fire protection and emergency medical services would occur.

Implementation of the project would be required to adhere to the California Fire Code, which is included in the City's Municipal Code per Chapter 8.36 and would be reviewed by the Fire Department during the project permitting process to ensure that the project plans meet the fire protection requirements.

The project site would be adequately served by the three fire stations that currently serve the project area. Due to the limited increase in residents and the existing location of Moreno Valley Fire Department facilities, the proposed project would not result in the need for, new or physically altered fire department facilities, and substantial adverse physical impacts associated with the provision of new or expanded facilities would not occur. Therefore, impacts related to fire protection services would be less than significant.

Police Protection

Less Than Significant Impact. The Moreno Valley Police Department provides policing services under contract with the Riverside County Sheriff's Office throughout the City from its headquarters at 22850 Calle San Juan De Los Lagos, which is approximately 2.72 miles from the project site. The County Sheriff contract with the City provides complete law enforcement to the City's residents. It is referred to as both the Moreno Valley Station and the Moreno Valley Police Department.

The proposed project would develop a skilled nursing facility within an area that is already served by the Police Department. The project would result in an onsite population that would create the need for police services. Calls for police service during project construction may include: theft of building materials and construction equipment, malicious mischief, graffiti, and vandalism. Operation of the proposed facility could generate a typical range of police service calls, such as vehicle burglaries, thefts, and disturbances. To reduce the potential for these types of crimes, security concerns are addressed in the project design by providing low-intensity security lighting for the purposes of wayfinding, safety, and building structure security.

Although an incremental increase could result from implementation of the project, the need for law enforcement services from the proposed project would not be significant when compared to the current service levels of the Moreno Valley Police Department and the nature of the proposed project. The additional 116 residents and 60 employees that are anticipated to be generated from full occupancy of the proposed project would not require the construction or expansion of the Police Department facilities. Overall the proposed project would not result in the need for, new or physically altered police protection facilities, and substantial adverse physical impacts associated with the provision of new or expanded facilities would not occur.

Schools

No Impact. The project site is located within the Moreno Valley Unified School District, which operates and maintains 43 schools, including 23 elementary schools (K-5), 6 middle schools (7-8), 5 high schools (9-12), and 9 specialized schools. The site is currently located within the attendance

area boundaries of Butterfield Elementary School, Mountain View Middle School, and Valley View High School.

The project would develop a skilled nursing facility, occupied by temporary residents, and would not generate any new school-aged children who would attend schools within Moreno Valley Unified School District. Nonetheless, the project is required to pay development impact fees, including Senate Bill 50 (SB 50) fees, which would provide funding for the financing of new school facilities. These fees are collected by school districts at the time of issuance of building permits. Therefore, the project would not result in the need for, new or physically altered school facilities, and would not occur.

Parks

Less Than Significant Impact. The City operates and maintains four parks within the project's vicinity: Woodland Park, approximately 0.64 miles to the south; Weston Park, approximately 0.84 miles to the northeast; Sunnymead Park, approximately 1.44 miles to the northwest; and Bayside Park, approximately1.18 miles to the west.

Due to the nature of the proposed project, even at capacity, the 116 residents would use the onsite recreational amenities because none of the public parks are within walking distance, particularly for medically fragile skilled nursing residents. Some of the 60 employees may occasionally utilize nearby parks during lunch or after work, but this limited use would not be substantial enough to cause physical deterioration. Therefore, the proposed project would not result in the need for new or physically altered parks, and substantial adverse physical would not occur.

Other Services

Less Than Significant Impact. The proposed project may result in an occasional use of libraries, senior centers, and other public facilities by employees, and temporary residents who are not too medically fragile. However, the projected increase of 116 new residents and 60 employees onsite would not result in a substantial increase in the demand for these services, such that construction of new or expanded facilities would be required. Therefore, the proposed project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, and impacts would be less than significant.

Existing Plans, Programs, or Policies

None.

Mitigation Measures

No mitigation measures related to public services are required.

REFERENCES

City of Moreno Valley Fire Department Website. Accessed: http://www.moreno-valley.ca.us/city_hall/departments/fire/index-fire.shtml

City of Moreno Valley Police Department Website. Accessed: http://www.moreno-valley.ca.us/city_hall/departments/police/index-police.shtml

City of Moreno Valley, Municipal Code, Chapter 8.36 California Fire Code.

Moreno Valley Sheriff's Station, Riverside County Sheriff. Available: http://www.riversidesheriff.org/stations/moval.asp

Moreno Valley Unified School District, Strategic Plan. Accessed: https://1.cdn.edl.io/JDk0rvYte7bA0KmfXmls5dZz1NQ9UzTwN9YmTiqW4Z1Yucx2.pdf

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
15. RECREATION.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐
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) Increase the use of existing neighborhood and regional parks or other recreational facilities such that physical deterioration of the facility would be accelerated?

Less Than Significant Impact. As described in response to Impact 14, Public Services, the proposed project would result in a generation of up to 116 temporary residents and 60 employees, which would create a minimal increase in demand on the existing recreation facilities. The project would not create a substantial increase in 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. Thus, impacts would be less than significant.

b) Require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Less Than Significant Impact. As described in the previous response, the proposed project would not result in a substantial population growth that would require the construction or expansion of recreational facilities. The proposed project does include onsite recreational spaces such as various courtyards and lounges throughout the facility. Therefore, the proposed project would not require the construction or expansion of other recreational facilities that might have an adverse physical effect on the environment. As a result, impacts related to recreation are less than significant.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to recreation that are applicable to the project.

Mitigation Measures

No mitigation measures related to recreation are required.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
16. TRANSPORTATION/TRAFFIC. Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
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 or incompatible uses?	☐	☐	☒	☐
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?

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?

Traffic Thresholds and Standards

The City of Moreno Valley General Plan Figure 9-2 – LOS Standards, prescribes a LOS standard of LOS C for all intersections in the City, except for intersections adjacent to freeway on/off ramps, intersections adjacent to employment generating land uses, and intersections on the City Boundary. The study area is adjacent to residential land uses and some employment generating land uses (Moreno Valley Unified School District, Excel Charter School, Moreno Valley Library). However, since these are also residential serving uses, a LOS standard of LOS C has been used in the analysis. An impact would occur if the project causes an intersection to deteriorate from acceptable LOS (LOS C or better) to an unacceptable LOS (LOS D, E or F).

Traffic Study Area and Baseline Conditions

The focused circulation analysis provides a focused evaluation of the operation of the project driveways, and the adjacent intersection of Kitching Street/Alessandro Boulevard. Traffic counts at the intersection of Alessandro Boulevard/Kitching Street were collected on Thursday May 10, 2018, which was a typical weekday when schools were in session. Existing traffic volumes were increased by 2 percent per year to opening year 2020 to forecast Opening Year traffic volumes. The intersection of Kitching Street/Alessandro Boulevard currently operates and is forecast to operate at a satisfactory LOS C during the weekday a.m. and p.m. peak hours in both the Existing and Opening Year conditions.

Project Impacts

Less than Significant Impact. The project trip generation was prepared using trip rates from the Institute of Transportation Engineers (ITE) *Trip Generation*, 10th Edition (2017). *Trip Generation* provides trip rates based on square footage and number of beds. The Trip generation has been analyzed using both rates to determine the worst-case trip generation of the project. Table T-1 presents the trip generation estimate for the proposed project.

As shown in Table T-1, the worst-case trip generation is calculated using square feet. The project is forecast to generate 457 daily trips including 38 trips during the AM peak hour and 41 trips during the PM peak hour.

Table T-1: Project Trip Generation

			AM Peak Hour			PM Peak Hour		
Land Use	**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates								
Nursing Home (TSF)[1]	per TSF	6.640	0.429	0.121	0.550	0.242	0.348	0.590
Nursing Home (Beds)[1]	per Bed	3.060	0.122	0.048	0.170	0.073	0.147	0.220
Project Trip Generation								
Tripgen per TSF	68.750 TSF	457	30	8	38	17	24	41
Tripgen per Beds	116 Beds	355	14	6	20	9	17	26

TSF = Thousand Square Feet

[1] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 10th Edition,* 2017. Land Use Code 620 - Nursing Home.

With Project Conditions:

Alessandro Boulevard is classified as a Divided Major Arterial adjacent to the project. As such, Alessandro Boulevard adjacent to the project is planned to be widened from its existing two-lane cross section to a 6-lane roadway with a center median. When the widening project is implemented, it is likely that left-turn access to the site will be restricted. To account for the future construction of the median, project traffic has been evaluated for two scenarios: 1) with left-turn access at the east driveway and; 2) without left-turn access at the east driveway. As shown in Table T-3, with the addition of project traffic, all study intersections would continue to operate at satisfactory LOS C or better during the weekday a.m. and p.m. peak hours. With the restriction of left-turn access, conditions at Alessandro Boulevard/Kitching Street would be substantially the same as in the without project condition. Levels of service at the project driveways would improve slightly without left-turn access, however it is important to note that even with the allowance of left-turns into and out of the project, the project driveways would operate with satisfactory LOS C or better. The project traffic impacts would be less than significant in all analyzed conditions.

Table T-3: Without and With Project AM and PM Peak Hour Levels of Service

Intersection	Existing				Existing plus Project (with Left-Turn Access)				Existing plus Project (No Left-Turn Access)			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. Kitching St/Alessandro Blvd	27.9	C	25.2	C	28.0	C	25.3	C	28.0	C	25.3	C
2. West Driveway/Alessandro Blvd	-	-	-	-	15.7	C	13.1	B	15.8	C	13.3	B
3. East Driveway/Alessandro Blvd	-	-	-	-	22.7	C	23.0	C	16.0	C	13.3	B
Intersection	**Opening Year**				**Opening Year plus Project (with Left-Turn Access)**				**Opening Year plus Project (No Left-Turn Access)**			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. Kitching St/Alessandro Blvd	28.9	C	25.6	C	29.0	C	25.7	C	29.0	C	25.7	C
2. West Driveway/Alessandro Blvd	-	-	-	-	16.3	C	13.5	B	16.4	C	13.6	B
3. East Driveway/Alessandro Blvd	-	-	-	-	24.1	C	24.5	C	16.6	C	13.6	B

[1] Delay (in secconds)
[2] Level of Service
Source: EPD Solutions, Inc., 2018.

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c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

No Impact. The proposed project is not located near an airport. The closest airports to the project site are the March Air Reserve Base, located approximately 3.25 miles southwest of the project, Flabob Airport located approximately 12 miles northeast of the project, and the Riverside Municipal Airport, located approximately 13.2 miles west/northwest of the project site. In addition, the project would develop the site with single-story structures that would not extend into navigable airspace. Therefore, the proposed project would not result in a change in air traffic patterns, and impacts would not occur.

d) Substantially increase hazards due to a design feature or incompatible uses?

Less than Significant Impact. The proposed project proposes a skilled nursing facility, and does not include any incompatible uses, such as farm equipment. The project would also not increase any hazards related to a design feature. Access to the parking lot will be provided via two unsignalized driveways on Alessandro Boulevard. The driveways are located adjacent to the eastern and western property line of the project. Currently, a two-way left-turn lane on Alessandro Boulevard allows for left-turns into and out of the project from the eastern-most driveway. Left-turn access to the western-most driveway is currently prohibited by the roadway striping, due to its close proximity to the westbound left-turn lane at Kitching Street. The driveways and internal drive aisles would be approximately 24 feet wide, which would be adequate for passenger car and delivery truck ingress/egress. All driveways and internal circulation has been designed to meet the City's design standards and would provide adequate turning space for passenger cars, fire trucks, and delivery trucks.

Additionally, the project does not include any visual obstructions that would block sight distance at the driveways or that would prohibit full access in, and out of, the project area. Thus, motorists entering and exiting the project site would be able to do so comfortably, safely, and without undue congestion. As such, project access and circulation would be adequate, and project impacts related to hazardous design features would be less than significant.

e) Result in inadequate emergency access?

No Impact. The proposed project would be a skilled nursing facility that would be permitted and approved in compliance with existing safety regulations, such as the California Building Code and Fire Code (as integrated into the City's Municipal Code) to ensure that it would not result in inadequate emergency access.

The proposed construction activities, including equipment and supply staging and storage, would occur within the project site and would not restrict access of emergency vehicles to the project site or adjacent areas. During construction, Kitching Street and Alessandro Boulevard would remain open to ensure adequate emergency access to the project area and vicinity. Thus, impacts related to inadequate emergency access during construction activities would not occur.

As described above, operation of the proposed project would also not result in inadequate emergency access. Direct access to the project site would be provided from Alessandro Boulevard. The driveways and on-site circulation constructed by the project would be evaluated through the

City's permitting procedures to meet the City's design standards that provides adequate turning space for passenger cars, fire trucks, and delivery trucks. The project is also required to provide fire suppression facilities (e.g., hydrants and sprinklers). The Moreno Valley Fire Department would review the development plans as part of the permitting procedures to ensure adequate emergency access pursuant to the requirements in Section 503 of the California Fire Code (Title 24, California Code of Regulations, Part 9). Additionally, the project will undergo review through the Office of Statewide Health Planning and Development (OSHPD) and would comply with all applicable standards. As a result, impacts related to inadequate emergency access would not occur.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

No Impact. Existing transit service in the City is provided by Riverside Transit Agency. A bus stop is located on Alessandro Boulevard, adjacent to the project site and is served by Riverside Transit Agency Route 20. Route 20 provides service 7 days a week between Riverside Plaza in the City of Riverside and Moreno Valley College.

Sidewalks are present intermittently along Alessandro Boulevard east of Kitching Street. There is currently no sidewalk adjacent to the project, however a sidewalk will be built as part of the project improvements and internal walkways would be provided from the project buildings to the sidewalk on Alessandro Boulevard. Development of the proposed skilled nursing project is not expected to significantly increase pedestrian, bicycle and/or transit trips, since the resident patients would not be able to travel on their own and the number of employees, compared to similar sized workplaces, would be low. Therefore, the proposed project would not result in conflicts related to public transit, bicycle, or pedestrian facilities, and impacts would not occur.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to transportation and traffic that are applicable to the project.

Mitigation Measures

No mitigation measures related to transportation and traffic are required.

REFERENCES

Focused Circulation Analysis, prepared by EPD Solutions, 2018 (EPD 2018)

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

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

No Impact. The project site is vacant and undeveloped and does not contain any historic resources and there are no no previously recorded resources within the project site boundaries (MCC 2018). The site was formerly used as agricultural fields. In addition, the project site is adjacent to single-family housing tracts, office space, a school, and roadways. A Sacred Lands File search was requested from the Native American Heritage Commission (NAHC) on April 18, 2018. The Commission responded on April 20, 2018, stating that there are no known sacred lands within one mile of the Project Area. Therefore, implementation of the proposed project would not cause a substantial adverse change in the significance of a tribal cultural resource, and impacts would not occur.

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Less Than Significant.

As part of the Phase I Cultural Recourses Assessment, letters were sent to 39 Native American tribes or individuals requesting further information related to cultural resources or heritage sites within or adjacent to the project site. MCC communicated with nine tribal representatives; only the Morongo Band of Mission Indians stated that they considered the overall vicinity to be a traditional use area. While additional information about the proposed project was requested, no evidence was provided about the project site and potential cultural resources onsite by any of the 39 tribes contacted.

Assembly Bill 52

Chapter 532, Statutes of 2014 (i.e., Assembly Bill [AB] 52), requires that Lead Agencies evaluate a project's potential to impact "tribal cultural resources." Such resources include "[s]ites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are eligible for inclusion in the California Register of Historical Resources or included in a local register of historical resources." AB 52 also gives Lead Agencies the discretion to determine, supported by substantial evidence, whether a resource qualifies as a "tribal cultural resource." Also, per AB 52 (specifically PRC 21080.3.1), Native American consultation is required upon request by a California Native American tribe that has previously requested that the City provide it with notice of such projects. Pursuant to the requirements of AB 52, the City sent informational letters about the proposed project and requests for consultation to each of the seven tribes on the City's list. No tribal cultural resources were identified as part of the process and significant impacts to tribal cultural resources would not be anticipated. The City of Moreno Valley incorporates standard conditions of approval related to inadvertent discovery of tribal cultural resources and archeological resources during earthmoving activities and provides for preservation of any identified resources. Therefore, impacts would be less than significant without mitigation.

Existing Plans, Programs, or Policies

PPP CUL-1: Human Remains, provided previously in Section 5, Cultural Resources.

Mitigation Measure

No mitigation measures related to tribal cultural resources are required.

REFERENCES

Phase 1 Cultural Resources Assessment, prepared by Material Culture Consulting, May 2018 (MCC 2018).

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
18. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
c) Require or result in the construction of new 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 project 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 project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☒	☐
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

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

Less than Significant Impact. The project would install onsite sewer lines that would connect to the existing sewer line in Alessandro Boulevard. The wastewater generated by the project would be conveyed by the Eastern Municipal Water District which is required to operate all its treatment facilities in accordance with the waste treatment and discharge standards and requirements set forth by the Santa Ana Regional Water Quality Control Board (RWQCB). Requirements include compliance with a National Pollutant Discharge Elimination System (NPDES) permit (Permit CA0110604). Waste discharge requirements for the facility in this permit are based on all

applicable state and federal regulations, policies and guidance, and include limitations on effluent discharge and receiving water. In general, effluent discharge requirements include specifications for adequate disinfection treatment and limitations on radioactivity, pollutant concentrations, sediments, pH, temperature, and toxicity.

The project would not install or utilize septic systems or alternative wastewater treatment systems. The land use proposed by the project are not anticipated to discharge wastewater that contains harmful levels of toxins that are regulated by the RWQCB (such as large quantities of pesticides, herbicides, oil, grease, and other chemicals that are more typical in industrial uses) and all effluent would comply with the wastewater treatment standards of the RWQCB. Therefore, the proposed project would result in less than significant impacts related to the wastewater treatment requirements of the RWQCB, and no mitigation measures are required.

b) Require or result in the construction of new water or wastewater treatment facilities, or expansion of existing facilities, the construction of which could cause significant environmental effects?

Less than Significant Impact.

Water
The project is an infill development project and water lines currently exist in the Alessandro Boulevard right-of-way. The project would install new onsite water lines that would convey water supplies from the existing line in Alessandro Boulevard to the proposed facility. The project site would continue to receive water supplies through the existing water lines and would not require expansion to serve the proposed project. Therefore, although construction of the onsite water lines would be required to support the new development, no extensions or expansions to the water pipelines supplying the project site would be required. The necessary installation of the onsite water supply lines is included as part of the proposed project and would not result in any physical environmental effects beyond those identified in other sections of this IS/MND. Therefore, the proposed project would not result in the construction of new water facilities or expansion of existing facilities, the construction of which could cause significant environmental effects, and impacts would be less than significant. No mitigation measures are required.

Wastewater
As described above, the project would install onsite sewer lines that would connect to the existing sewer in Alessandro Boulevard. Wastewater would be conveyed by existing trunk sewer lines to the Moreno Valley Regional Water Reclamation Facility. Although construction of the onsite wastewater conveyance lines would be included to provide future connections to nearby sewers, no extensions or expansions to the sewer system serving the project area would be required. The necessary installation of onsite sewer lines is included as part of the proposed project and would not result in any physical environmental effects beyond those identified in other sections of this IS/MND. Therefore, the proposed project would not result in the construction of new wastewater facilities or expansion of existing facilities, the construction of which could cause significant environmental effects, and impacts would be less than significant. No mitigation measures are required.

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?

Less than Significant Impact. The project includes development of onsite storm water drainage features that include a new onsite storm water system would be installed to collect runoff from the proposed development, which would filter and discharge it into the existing offsite 36-inch storm drain that is southwest of the project site towards Alessandro Boulevard. The Sunnymead DAMP requires the project to infiltrate, evapotranspire, or biotreat/biofilter the 85th percentile 24-hour storm event. The drainage system would slow and filter runoff and biotreatment devices such as bio-retention planters would also be installed to capture and filter runoff. Due to the appropriate sizing of the onsite drainage features, operation of the project would not substantially increase stormwater runoff, and the project would not require or result in the construction of new off-site storm water drainage facilities or expansion of existing offsite facilities, the construction of which could cause significant environmental effects. The required installation of onsite drainage features is included as part of the project and would not result in any physical environmental effects beyond those identified in other sections of this IS/MND. Overall, impacts related to stormwater drainage facilities would be less than significant, and no mitigation measures are required.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Less than Significant Impact. The project site is located within the service boundary of Eastern Municipal Water District (EMWD), which serves water supplies for the areas surrounding the project site. EMWD obtains its water supply for the City of Moreno Valley service area from local groundwater and imported water obtained from the Municipal Water District of Southern California (MWD).

Water supplies are recorded every five years due to the Urban Water Management Planning Act, which requires water suppliers who provide water for municipal purposes to adopt and submit an Urban Water Management Plan (UWMP) to the California Department of Water Resources. The EMWD 2015 UWMP provides water demand projections through 2040 that are based on population data from 2014 American Community Survey data at the Census tract level and California Department of Finance growth estimates and average water use rates.
The EMWD 2015 UWMP is based on projected land use designations. The project does not introduce a new land use designation. Therefore, the water supply demand for the Moreno Valley service area is consistent with the analyzed land use designation within the UWMP. Projections are made from existing (2015) to future (2040) water demand acre-feet per year. Furthermore, the UWMP has demonstrated EMWD has sufficient water supplies for single dry year, multiple dry year, and drought conditions. As mentioned above, EMWD is member agency of MWD. Based on the information provided in MWD's 2015 UWMP, MWD also has sufficient supply capabilities to meet the expected demands of its member agencies from 2020 through 2040 under normal, historic single-dry and historic multiple-dry year conditions. Therefore, the EMWD would have sufficient water supplies available to serve the project from existing entitlements, and new or expanded entitlements would not be needed as a result of the proposed project. Impacts related to water supplies would be less than significant, and no mitigation measures are required.

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

Less than Significant Impact. As described previously, the project would install onsite sewer lines that would connect an existing eight-inch sewer line in Alessandro Boulevard, and wastewater flows would be conveyed through pipelines to the Moreno Valley Regional Water Reclamation Facility.

The treatment facility typically processes 10.6 million gallons per day (mgd), but has a current capacity for 16 mdg and an ultimate capacity of 41mgd. The project would generate wastewater during operation. Based on the previous responses on the EMWD 2015 UWMP, the project would not involve a change in land use and therefore, development of the project would not result in a determination by the wastewater treatment provider which serves or may serve the project that it does not have adequate capacity to serve the project's projected demand in addition to the provider's existing commitments, and impacts would be less than significant. No mitigation measures are required.

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

Less than Significant Impact. The Riverside County Department of Waste Resources operates six active landfills serving the Riverside County region, that include: Badlands Sanitary Landfill, Lamb Canyon Sanitary Landfill, Oasis Sanitary Landfill, Desert Center Landfill, Blythe Sanitary Landfill, Mecca Landfill II, and El Sobrante Landfill. All six landfills are Waste Discharge Requirement Class III landfills that accept only non-hazardous municipal solid waste for disposal; no hazardous or liquid waste is accepted.

Table U-1: Landfill Capacity

Facility Name	Permitted Operation End Year	Permitted Solid Waste (tons/day)	Remaining Capacity (cubic yards)
Badlands Sanitary Landfill	2022	4,800	15,748,799
Lamb Canyon Sanitary Landfill	2029	5,500	19,242,950
Oasis Sanitary Landfill	2055	400	433,779
Desert Center Landfill	2087	60	35,714
Blythe Sanitary Landfill	2047	400	3,834,470
Mecca Landfill II	2098	400	6,371
El Sobrante Landfill	2045	16,054	145,530,000

Source: CalRecycle, Solid Waste Information System (SWIS) Facility/Site Listing, Web. Available at: http://www.calrecycle.ca.gov/SWFacilities/Directory/SearchList/List?COUNTY=Riverside&OPSTATUS=Active&REGSTATUS=Permitted

Development of the proposed project would result in additional solid waste generation from the operation of the skilled nursing facility. Based on solid waste generation rates for "nursing/retirement home" obtained from CalRecycle, one facility is expected to generate 5 pounds per person per day of solid waste (CalRecycle 2018). Thus, 116 beds would estimate 116 persons to generate 580 pounds of solid waste per day. As solid waste services are provided weekly by Waste Management this totals a weekly disposal of 4,060 pounds (or 2.03 tons) of solid waste.

Based on the current state recycling requirements, which require diversion of 50 percent of solid waste away from landfills, the proposed project would result in 2,030 pounds (1.01 tons) of solid waste per week being disposed of in landfills. In 2020, state regulations per AB 341 will become effective, which will require diversion of 75 percent of solid waste from landfills. Thus, it is anticipated that solid waste landfill disposal from operation of the proposed project in 2020 would be reduced to approximately 1,015 pounds (0.51 tons) per week. As described above, all seven landfills that could serve the project site have sufficient permitted capacity to accommodate the project's solid waste disposal needs, and impacts related to landfill capacity would be less than significant. No mitigation measures are required.

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

No Impact. The proposed project would be required to comply with applicable federal, state, and local regulations regarding the proper disposal of solid waste generated onsite, including AB 939, AB 341, and the California Green Building Code (24 CCR Part 11) as each relates to solid waste and recycling. Impacts related to compliance with federal, state, and local statutes and regulations related to solid waste would not occur from implementation of the proposed project, and no mitigation measures are required.

Existing Plans, Programs, or Policies

There are no impact reducing Plans, Programs, or Policies related to utilities and service systems that are applicable to the project.

Mitigation Measures

No mitigation measures related to utilities and service systems are required.

REFERENCES

CalReycle Institutional Sector Generation Rates. Accessed: https://www2.calrecycle.ca.gov/WasteCharacterization/General/Rates.

Calrecycle Solid Waste Information System Database: Accessed: http://www.calrecycle.ca.gov/swfacilities/directory/search.aspx

Eastern Municipal Water District 2015 Urban Water Management Plan (UWMP 2015). Prepared by RMC. June 2016. Accessed: https://www.emwd.org/home/showdocument?id=1506

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

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

Less than Significant Impact with Mitigation Incorporated. The project site is vacant and undeveloped. As described in Section 4, Biological Resources, the project site has the potential to result in a significant impact to a habitat of burrowing owls. Thus, MM BIO-1 is included to reduce any potential impact during preconstruction activities. In addition, the project site contains vegetation suitable for nesting birds. The project would be subject to the provisions outlined in state and federal regulations to protect native birds and their nests from direct taking. As mentioned previously, there is another vacant site to the south across Alessandro Boulevard. As such, MM BIO-2 was included to reduce potential impacts to nesting birds. Overall, the project site does not provide suitable habitat for special-status wildlife species and there no special-status plant communities on the site.

As described in Section 5, Cultural Resources, the project site does not contain any historic or archaeological resources; however, the potential exists for subsurface paleontological resources to be located within the project site. Therefore, Mitigation Measure MM CUL-1 is included to ensure that any inadvertent discovery of resources during ground-disturbing activities would be less than significant. With implementation of Mitigation Measure TCR-1, impacts to Tribal Cultural Resources would be less than significant.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Less than Significant Impact. Cumulative impacts are defined as two or more individual effects that, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the development when added to the impacts of other closely related past, present, and reasonably foreseeable or probable future developments. Cumulative impacts can result from individually minor, but collectively significant, developments taking place over a period. The CEQA Guidelines, Section 15130 (a) and (b), states:

(a) Cumulative impacts shall be discussed when the project's incremental effect is cumulatively considerable.

(b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided of the effects attributable to the project. The discussion should be guided by the standards of practicality and reasonableness.

Less than Significant Impact. The project consists of providing infill skilled nursing facility on an existing undeveloped parcel within a suburban area. The proposed development is consistent with the adjacent school, office, and residential uses, zoning, and General Plan land use designations.

As described above, all of the potential impacts related to implementation of the project would be less than significant or reduced to a less than significant level with implementation of mitigation measures related to biological resources, cultural resources, and noise. In addition, the cumulative effect of the proposed project due to the small scale and infill nature of the proposed project. Furthermore, the project would develop an area that has been previously disturbed. Thus, impacts to environmental resources or issue areas would not be cumulatively considerable; and cumulative impacts would be less than significant.

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

Less than Significant Impact with Mitigation Incorporated. The project would result in the construction and operation of a skilled nursing facility on a vacant and undeveloped site. The project would not consist of any use or any activities that would result in a substantial negative affect any persons in the vicinity. All resource topics associated with the proposed project have been analyzed in accordance with CEQA and the State CEQA Guidelines and were found to pose no impacts, less than significant impacts, or less than significant impacts with mitigation, as previously detailed. Consequently, the project would not result in any environmental effects that would cause substantial adverse effects on human beings directly or indirectly, with implementation of the mitigation measures that have been previously detailed.

Existing Plans, Programs, or Policies

Refer to the previously listed PPPs related to aesthetics, air quality, cultural resources, geology and soils, hydrology and water quality, noise, public services, and tribal cultural resources. These PPPs are existing plans, programs, or policies which effectively reduce potential environmental impacts.

Mitigation Measures

Refer to the previously listed mitigation measures related to biological resources, cultural resources and noise. These Mitigation Measures effectively reduce environmental impacts to less than significant.

5 DOCUMENT PREPARERS AND CONTRIBUTORS

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Moreno Valley Skilled Nursing Facility Project

PEN18-0082

Mitigation Monitoring and Reporting Program

Introduction

This Mitigation Monitoring and Reporting Program has been prepared for the use in implementing mitigation for the Mitigated Negative Declaration (MND) for the Moreno Valley Skilled Nursing Facility Project (PEN18-0082). The program has been prepared in compliance with State law and the MND prepared for the project.

The California Environmental Quality Act (CEQA) requires adoption of a reporting or monitoring program for those measures places on a project to mitigated or avoid adverse effects on the environment (Public Resources Code Section 21081.6). The law states that the reporting or monitoring program shall be designed to ensure compliance during project implementation.

The monitoring program contains the following elements:

1. The mitigation measures are recorded with the action and procedure necessary to ensure compliance. In some instances, one action may be used to verify implementation of several mitigation measures.

2. A procedure for compliance and verification has been outlined for each action necessary. This procedure designates who will take action, what action will be taken and when, and to whom and when compliance will be reported.

3. The program has been designed to be flexible. As monitoring progresses, changes to compliance procedures may be necessary based upon recommendations by those responsible for the program. As changes are made, new monitoring compliance procedures are records will be developed and incorporated into the program.

Mitigation Monitoring and Responsibilities

As the Lead Agency, the City of Moreno Valley is responsible for ensuring full compliance with the mitigation measures adopted for the proposed project. The City will monitor and report on all mitigation activities. Mitigation measures will be implemented at different stages of development throughout the project. In this regards, the responsibilities for implementation have been assigned to the Applicant, Contractor, or a combination thereof. If during the course of project implementation, any of the mitigation measures identified herein cannot be successfully implemented, the City shall be immediately informed, and the City will then inform any affected responsible agencies. The City, in conjunction with any affected responsible agencies, will then determine if modification to the project is required and/or whether alternative mitigation is appropriate.

Mitigation Monitoring and Reporting Program Checklist

Project: Moreno Valley Skilled Nursing Facility (PEN18-0082)

Applicant: T & C International Health, Inc., 4186 Riverside Drive, Chino, CA 91710

Date: December 20, 2018

Mitigation Measure No./ Implementation Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
Biological Resources						
BIO-1: A preconstruction burrowing owl survey shall be completed a maximum of 30 days prior to the start of construction. All areas of the site shall be included, as well as a visual survey of the undeveloped property to the south. The results shall be provided as a letter report. If burrowing owls are observed within the site, additional coordination with California Department of Fish and Wildlife would be required. No burrowing owls may be harmed, and no burrows may be collapsed during displacement between February 1 and August 31 to avoid the nesting season.	City of Moreno Valley	Prior to construction	Prior to Grading Permit Issuance	Review of construction documents and on-site inspection		Withhold Grading Permit
BIO-2: To avoid take of nesting birds, vegetation removal and initial ground disturbance should occur outside the nesting bird breeding season (February 1 through August 31). If project activities occur during the nesting season, a nesting bird survey should be conducted by a qualified biologist at a maximum of one (1) week prior to start	City of Moreno Valley	Prior to and ongoing during construction	Prior to issuance of Grading Permit	Review of construction documents and on-site inspection		Withhold Grading Permit

Mitigation Measure No./ Implementation Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
of construction activities. If active nests of protected native species are located, construction work should be delayed until after the nesting season or until the young are no longer dependent upon the nest site. Construction near an active nest should be conducted at the discretion of a biological monitor utilizing appropriate buffers and other methods to minimize potential impacts.						
Cultural Resources						
CUL-1: A trained and qualified paleontological monitor shall perform full-time monitoring of any excavations greater than 4 feet in depth. The monitor will have the ability to redirect construction activities to ensure avoidance of significant impacts to paleontological resources. The paleontologist shall re-evaluate the necessity for paleontological monitoring after 50% or greater of the excavations have been completed. Any potentially significant fossils observed shall be collected and recorded in conjunction with best management practices and Society for Vertebrate Paleontology (SVP) professional standards. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations. A report documenting the results of any monitoring, including any salvage activities and the	City of Moreno Valley	Ongoing during construction	Prior to Issuance of Grading Permit	Review of construction documents and on-site inspection		Withhold Grading Permit

Mitigation Measure No./ Implementation Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
significance of any fossils, will be prepared and submitted to the appropriate City personnel.						
Noise						
N-1: Large loaded trucks and mobile equipment (greater than or equal to 80,000 pounds) shall not be used within 50 feet of the western and eastern boundaries of the project site to limit construction noise and vibration effect (if those uses are occupied at the time of project construction). Instead, smaller, rubber-tired mobile equipment (less than 80,000 pounds) or equivalent alternative equipment shall be used within this area during project construction.	City of Moreno Valley	Ongoing during construction	Prior to Issuance of Grading Permit and Building Permit	Review of construction documents and on-site inspection		Withhold grading permit or building permit
N-2: The following measures shall be implemented to reduce noise impacts: 1. **Temporary Noise Barriers:** Install a minimum 10-foot high temporary construction noise barrier at the project's western site boundary (adjacent to Excel Prep Academy, if site is operational as a school). The noise control barriers must have a solid face from top to bottom. The noise control barrier must meet the minimum height and be constructed as follows:	City of Moreno Valley	Ongoing during construction	Prior to Issuance of Grading Permit and Building Permit	Review of construction documents and on-site inspection		Withhold grading permit or building permit

Mitigation Measure No./ Implementation Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
a. The temporary noise barrier shall provide a minimum transmission loss of 20 dBA. The noise barrier shall be constructed using an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts. Example photos are provided in Appendix J; b. The noise barrier must be maintained, and any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired; c. The noise control barrier and associated elements shall be completely removed, and the site appropriately restored						

Mitigation Measure No./ Implementation Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
upon the conclusion of the construction activity. 2. **Engine Mats/Blankets:** Install sound dampening mats or blankets which are capable of a minimum 5 dBA noise reduction to the engine compartments of all large mobile equipment (greater than or equal to 80,000 pounds). The dampening materials must be capable of the minimum 5 dBA noise reduction and can be made of commercially-available sound dampening materials, including but not limited to polyurethane foam and vinyl sheeting. 3. **Mufflers:** During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.						

Mitigation Measure No./ Implementation Action	Responsible for Monitoring	Monitoring Frequency	Timing of Verification	Method of Verification	Verified Date/Initials	Sanctions for Non-Compliance
4. **Equipment Staging:** The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center). 5. **Delivery Routes:** The contractor shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.						

PLANNING COMMISSION RESOLUTION NO. 2019-02

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF MORENO VALLEY APPROVING CONDITIONAL USE PERMIT APPLICATION PEN18-0082 FOR DEVELOPMENT OF A 68,750 SQUARE FOOT, 116 BED, ONE-STORY SKILLED NURSING FACILITY ON 4.55 ACRES IDENTIFIED AS ASSESSOR'S PARCEL NUMBER 479-230-018 AND LOCATED ON THE NORTH SIDE OF ALESSANDRO BOULEVARD, APPROXIMATELY 300 FEET EAST OF KITCHING STREET

WHEREAS, William Chu, has filed an application for the approval of Conditional Use Permit, PEN18-0082, for development of a skilled nursing on 4.55 acres as described in the title above; and

WHEREAS, the application has been evaluated in accordance with established City of Moreno Valley (City) procedures, and with consideration of the General Plan and other applicable regulations; and

WHEREAS, the City has reviewed this project and determined that it is consistent with the site's General Plan designation of Office, all applicable General Plan policies and the Office zoning district subject to approval of a conditional use permit;

WHEREAS, City staff coordinated the preparation of a Mitigated Negative Declaration/Initial Study and related technical studies with EPD Solutions for the Moreno Valley Skilled Nursing project consistent with the California Environmental Quality Act (CEQA) and based on a thorough analysis of potential environmental impacts. The Mitigated Negative Declaration represents the City's independent judgment and analysis; and

WHEREAS, upon completion of a thorough development review process the project was appropriately agendized and noticed for a public hearing before the Planning Commission of the City of Moreno Valley (Planning Commission); and

WHEREAS, the public hearing notice for this project was published in the local newspaper on November 23, 2018 in anticipation of consideration at the December 13, 2018 Planning Commission meeting. Public notice was sent to all property owners of record within 300 feet of the project site on November 29, 2018. The public hearing notice for this project was also posted on the project site on November 29, 2018. At the December 13, 2018 meeting, the Planning Commission voted 7-0 to continue the item to the January 10, 2019 meeting in order to allow for additional time for finalization of the Preliminary Water Quality Management Plan and associated conditions;

WHEREAS**,** on January 10, 2019, the Planning Commission held a public hearing to consider the application; and

WHEREAS, all legal prerequisites to the adoption of this Resolution have occurred; and

WHEREAS, pursuant to Government Code Section 66020(d)(1), NOTICE IS HEREBY GIVEN that this project is subject to certain fees, dedications, reservations and other exactions as provided herein.

NOW, THEREFORE, BE IT RESOLVED, it is hereby found, determined and resolved by the Planning Commission as follows:

A. This Planning Commission hereby specifically finds that all of the facts set forth above in this Resolution are true and correct.

B. Based upon substantial evidence presented to this Planning Commission during the above-referenced meeting on January 10, 2019, including written and oral staff reports, public testimony and the record from the public hearing, this Planning Commission hereby specifically finds as follows:

1. Conformance with General Plan Policies – The proposed use is consistent with the General Plan, and its goals, objectives, policies and programs.

   FACT: The General Plan Land Use designation for the project site is Residential Office. General Plan Policy 2.4.6 states that the primary purpose of areas designated Residential Office is to provide areas for the establishment of office-based working environments or residential developments of up to 15 dwelling units per acre. The zoning regulations shall identify the particular uses and type of residential development permitted on each parcel of land.

   The project site is located within the R10 zone which is a multiple family zone that allows for skilled nursing as a land use, subject to approval of a Conditional Use Permit. The proposed skilled nursing facility would be consistent with the intent of General Plan Policy 2.4.6.

   The proposed transitional care facility will provide 116 rooms of skilled medical care on a 4.55-acre site located near the Riverside County Regional Medical Center and the Kaiser Permanente Hospital and Medical Office Building located approximately two miles to three miles to the southeast.

   The project as designed and conditioned will achieve the objectives of the City of Moreno Valley's General Plan. The proposed project is consistent with the General Plan and does not conflict with the goals, objectives, policies, and programs established within the Plan.

2. Conformance with Zoning Regulations – The proposed use complies with all applicable zoning and other regulations.

   FACT: The project site is currently zoned R10 which requires approval of a Conditional Use Permit for an assisted living or skilled nursing use.

Conditional Use Permit PEN18-0082 proposes a 68,750 square foot, 116 room, one-story, skilled nursing facility.

The project is designed in accordance with the provisions of Chapter 9.04 Commercial Districts and Chapter 9.16.150 Design Guidelines of the City's Municipal Code. The project as designed and conditioned would comply with all applicable zoning and other regulations.

3. Health, Safety and Welfare – The proposed use will not be detrimental to the public health, safety or welfare or materially injurious to properties or improvements in the vicinity.

FACT: The proposed Conditional Use Permit as designed and conditioned will provide acceptable levels of protection from natural and man-made hazards to life, health, and property consistent with General Plan Goal 9.6.1. The project site is located approximately one and one half miles from Fire Station No. 99 located to the northwest at Morrison Park. Therefore, adequate emergency services can be provided to the site consistent with General Plan Goal 9.6.2.

The proposed project as designed and conditioned will result in a development that will minimize the potential for loss of life and protect residents, workers, and visitors to the City from physical injury and property damage due to seismic ground shaking and flooding as provided for in General Plan Objective 6.1 and General Plan Objective 6.2.

The project is bound to the north by a storm channel with single-family residences located further to the north, Moreno Valley Christian Academy to the west, Moreno Valley Unified School District administrative offices to the east and vacant Office zone land to the south.

The project has been designed consistent with the City's Municipal Code Section 9.04 - Commercial Districts, and will satisfy all City requirements related to light and noise. Planning staff prepared an Initial Study and Mitigated Negative Declaration in accordance with the provisions of the California Environmental Quality Act (CEQA) based on a thorough analysis of potential environmental impacts. The Mitigated Negative Declaration represents the City's independent judgment and analysis.

4. Location, Design and Operation – The location, design and operation of the proposed project will be compatible with existing and planned land uses in the vicinity.

FACT: The project site is located on vacant property in the R10 zone. Skilled nursing is allowed in this zone subject to approval of a Conditional Use Permit. The project is bounded to the north by a storm channel with single-family residences located further to the north on the north side of Black Walnut Street. Moreno Valley Christian Academy to the west, Moreno

Valley Unified School District administrative offices to the east, and vacant Office zone land to the south.

The project will be separated from the homes to the north by the width of the storm drain channel and Black Walnut Street. Additionally, the project has been conditioned to plant a tree row for screening purposes along the northern property line. The nearest building to the homes is set back from the north property line by 81 feet. The use at this location will be compatible with and complementary to surrounding land uses. The project is located near the Riverside County Regional Medical Center located approximately two miles to the southeast and the Fresenius Dialysis Center and Kaiser Permanente Hospital and Medical Office Building located approximately three miles to the southeast.

As designed and conditioned, the project is compatible with existing and proposed land uses in the vicinity.

FEES, DEDICATIONS, RESERVATIONS, AND OTHER EXACTIONS

1. FEES

Impact, mitigation and other fees are due and payable under currently applicable ordinances and resolutions. These fees may include but are not limited to: Development Impact Fee, Transportation Uniform Mitigation Fee (TUMF), Multi-species Habitat Conservation Plan (MSHCP) Mitigation Fee, Stephens Kangaroo Habitat Conservation fee, Underground Utilities in lieu Fee, Area Drainage Plan fee, Bridge and Thoroughfare Mitigation fee (Future) and Traffic Signal Mitigation fee. The final amount of fees payable is dependent upon information provided by the applicant and will be determined at the time the fees become due and payable.

Unless otherwise provided for by this Resolution, all impact fees shall be calculated and collected at the time and in the manner provided in Chapter 3.32 of the City of Moreno Valley Municipal Code or as so provided in the applicable ordinances and resolutions. The City expressly reserves the right to amend the fees and the fee calculations consistent with applicable law.

2. DEDICATIONS, RESERVATIONS, AND OTHER EXACTIONS

The adopted Conditions of Approval for PEN18-0082, incorporated herein by reference, may include dedications, reservations, and exactions pursuant to Government Code Section 66020 (d) (1).

3. CITY RIGHT TO MODIFY/ADJUST; PROTEST LIMITATIONS

The City expressly reserves the right to establish, modify or adjust any fee, dedication, reservation or other exaction to the extent permitted and as authorized by law.

Pursuant to Government Code Section 66020(d)(1), NOTICE IS FURTHER GIVEN that the 90-day period to protest the imposition of any impact fee, dedication, reservation, or other exaction described in this Resolution begins on the effective date of this Resolution and any such protest must be in a manner that complies with Section 66020(a) and failure to timely follow this procedure will bar any subsequent legal action to attack, review, set aside, void or annul imposition.

The right to protest the fees, dedications, reservations, or other exactions does not apply to planning, zoning, grading, or other similar application processing fees or service fees in connection with this project and it does not apply to any fees, dedication, reservations, or other exactions of which a notice has been given similar to this, nor does it revive challenges to any fees for which the applicable statute of limitations has previously expired.

BE IT FURTHER RESOLVED that the Planning Commission HEREBY APPROVES Resolution No. 2019-02, and thereby:

1. APPROVES Conditional Use Permit PEN18-0082 based on the findings contained in this resolution, and subject to the conditions of approval included as Exhibit A.

APPROVED this 10th day of January, 2019.

AYES:
NOES:
ABSTAIN:

_____
Jeffrey Barnes
Chair, Planning Commission

ATTEST:

_____
Patty Nevins, Planning Official
Secretary to the Planning Commission

APPROVED AS TO FORM:

_____
City Attorney

Exhibit A

CITY OF MORENO VALLEY
CONDITIONS OF APPROVAL
Conditional Use Permit (PEN18-0082)

EFFECTIVE DATE:
EXPIRATION DATE:

COMMUNITY DEVELOPMENT DEPARTMENT

Planning Division

1. Conditional Use Permit PEN18-0082 has been approved for development of a skilled nursing facility on a 4.54-acre site to include three one-story buildings that would accommodate administrative offices, kitchen and dining areas and common amenities as well as 88 rooms for a total 116 beds and 112 parking spaces.

2. The developer, or the developer's successor-in-interest, shall be responsible for maintaining any undeveloped portion of the site in a manner that provides for the control of weeds, erosion and dust. (MC 9.02.030)

3. This approval shall expire three years after the approval date of this project unless used or extended as provided for by the City of Moreno Valley Municipal Code; otherwise it shall become null and void and of no effect whatsoever. Use means the beginning of substantial construction contemplated by this approval within the three-year period, which is thereafter pursued to completion, or the beginning of substantial utilization contemplated by this approval. (MC 9.02.230)

4. All landscaped areas shall be maintained in a healthy and thriving condition, free from weeds, trash and debris. (MC 9.02.030)

5. The site shall be developed in accordance with the approved plans on file in the Community Development Department - Planning Division, the Municipal Code regulations, General Plan, and the conditions contained herein. Prior to any use of the project site or business activity being commenced thereon, all Conditions of Approval shall be completed to the satisfaction of the Planning Official. (MC 9.14.020)

6. Any signs indicated on the submitted plans are not included with this approval. Any signs, whether permanent (e.g. wall, monument) or temporary (e.g. banner, flag), require separate application and approval by the Planning Division. No signs are permitted in the public right of way. (MC 9.12)

7. All site plans, grading plans, landscape and irrigation plans, fence/wall plans, lighting plans and street improvement plans shall be coordinated for consistency

with this approval.

8. A change or modification to the land use or the approved site plans may require a separate approval. Prior to any change or modification, the property owner shall contact the City of Moreno Valley Community Development Department to determine if a separate approval is required.

Special Conditions

9. The following Mitigation Measures apply to this project:

Prior to the issuance of a grading permit, the Developer shall retain a professional archaeologist to conduct monitoring of all mass grading and trenching activities. The Project Archaeologist shall have the authority to temporarily redirect earthmoving activities in the event that suspected archaeological resources are unearthed during Project construction. The Project Archaeologist, in consultation with the Consulting Tribe(s), the contractor, and the City, shall develop a Cultural Resources Management Plan (CRMP) in consultation pursuant to the definition in AB52 to address the details, timing and responsibility of all archaeological and cultural activities that will occur on the project site. A consulting tribe is defined as a tribe that initiated the AB 52 tribal consultation process for the Project, has not opted out of the AB52 consultation process, and has completed AB 52 consultation with the City as provided for in Cal Pub Res Code Section 21080.3.2(b)(1) of AB52. Details in the Plan shall include:

a. Project grading and development scheduling;

b. The Project archeologist and the Consulting Tribes(s) as defined in CR-1 shall attend the pre-grading meeting with the City, the construction manager and any contractors and will conduct a mandatory Cultural Resources Worker Sensitivity Training to those in attendance. The Training will include a brief review of the cultural sensitivity of the Project and the surrounding area; what resources could potentially be identified during earthmoving activities; the requirements of the monitoring program; the protocols that apply in the event inadvertent discoveries of cultural resources are identified, including who to contact and appropriate avoidance measures until the find(s) can be properly evaluated; and any other appropriate protocols. All new construction personnel that will conduct earthwork or grading activities that begin work on the Pr

10. Prior to the issuance of a grading permit, the City of Moreno Valley shall secure agreements with the Pechanga Band of Luiseño Indians for tribal monitoring. The City is also required to provide a minimum of 30 days advance notice to the tribes of all mass grading and trenching activities. The Native American Tribal

Representatives shall have the authority to temporarily halt and redirect earth moving activities in the affected area in the event that suspected archaeological resources are unearthed. If the Native American Tribal Representatives suspect that an archaeological resource may have been unearthed, the Project Archaeologist or the Tribal Representatives shall immediately redirect grading operations in a 100-foot radius around the find to allow identification and evaluation of the suspected resource. In consultation with the Native American Tribal Representatives, the Project Archaeologist shall evaluate the suspected resource and make a determination of significance pursuant to California Public Resources Code Section 21083.2. (only applicable if tribes require monitoring)

11. In the event that Native American cultural resources are discovered during the course of grading (inadvertent discoveries), the following procedures shall be carried out for final disposition of the discoveries:

a) One or more of the following treatments, in order of preference, shall be employed with the tribes. Evidence of such shall be provided to the City of Moreno Valley Planning Department:

i. Preservation-In-Place of the cultural resources, if feasible. Preservation in place means avoiding the resources, leaving them in the place they were found with no development affecting the integrity of the resources.

ii. Onsite reburial of the discovered items as detailed in the treatment plan required pursuant to Mitigation Measure CR-1. This shall include measures and provisions to protect the future reburial area from any future impacts in perpetuity. Reburial shall not occur until all legally required cataloging and basic recordation have been completed. No recordation of sacred items is permitted without the written consent of all Consulting Native American Tribal Governments as defined in CR-1. The location for the future reburial area shall be identified on a confidential exhibit on file with the City, and concurred to by the Consulting Native American Tribal Governments prior to certification of the environmental document.

12. The City shall verify that the following note is included on the Grading Plan:

"If any suspected archaeological resources are discovered during ground-disturbing activities and the Project Archaeologist or Native American Tribal Representatives are not present, the construction supervisor is obligated to halt work in a 100-foot radius around the find and call the Project Archaeologist and the Tribal Representatives to the site to assess the significance of the find."

13. If potential historic or cultural resources are uncovered during excavation or construction activities at the project site, work in the affected area must cease immediately and a qualified person meeting the Secretary of the Interior's standards

(36 CFR 61), Tribal Representatives, and all site monitors per the Mitigation Measures, shall be consulted by the City to evaluate the find, and as appropriate recommend alternative measures to avoid, minimize or mitigate negative effects on the historic, or prehistoric resource. Determinations and recommendations by the consultant shall be immediately submitted to the Planning Division for consideration, and implemented as deemed appropriate by the Community Development Director, in consultation with the State Historic Preservation Officer (SHPO) and any and all Consulting Native American Tribes as defined in CR-1 before any further work commences in the affected area.

14. If human remains are discovered, no further disturbance shall occur in the affected area until the County Coroner has made necessary findings as to origin. If the County Coroner determines that the remains are potentially Native American, the California Native American Heritage Commission shall be notified within 24 hours of the published finding to be given a reasonable opportunity to identify the "most likely descendant". The "most likely descendant" shall then make recommendations, and engage in consultations concerning the treatment of the remains (California Public Resources Code 5097.98). (GP Objective 23.3, CEQA).

Prior to Grading Permit

15. Prior to issuance of any grading permit, all Conditions of Approval and Mitigation Measures shall be printed on the grading plans.

16. Prior to the issuance of grading permits, decorative (e.g. colored/scored concrete or as approved by the Planning Official) pedestrian pathways across circulation aisles/paths shall be provided throughout the development to connect the facilities with open space and/or parking and/or the public right-of-way. The pathways shall be shown on the precise grading plan. (GP Objective 46.8, DG)

17. Prior to approval of any grading permits, final median enhancement/landscape/irrigation plans shall be submitted to the Planning Division and Public Works Department - Special Districts for review and approval by each division. (GP - Circulation Master Plan) Timing of installation shall be determined by PW-Special Districts.

18. Prior to issuance of any grading permits, mitigation measures contained in the Mitigation Monitoring Program approved with this project shall be implemented as provided therein. A mitigation monitoring fee, as provided by City ordinance, shall be paid by the applicant within 30 days of project approval. No City permit or approval shall be issued until such fee is paid. (CEQA)

19. Prior to issuance of grading permits, the developer shall pay the applicable Stephens' Kangaroo Rat (SKR) Habitat Conservation Plan mitigation fee. (Ord)

20. Within thirty (30) days prior to any grading or other land disturbance, a pre-construction survey for Burrowing Owls shall be conducted pursuant to the established guidelines of Multiple Species Habitat Conservation Plan. The pre-construction survey shall be submitted to the Planning Division prior to any disturbance of the site and/or grading permit issuance.

21. Prior to the issuance of grading permits, the site plan and grading plans shall show decorative hardscape (e.g. colored concrete, stamped concrete, pavers or as approved by the Planning Official) consistent and compatible with the design, color and materials of the proposed development for all driveway ingress/egress locations of the project.

22. Prior to issuance of grading permits, the developer shall submit wall/fence plans to the Planning Division for review and approval as follows:

    A. A three-foot high decorative wall, solid hedge or berm shall be placed in any setback areas between a public right of way and a parking lot for screening.

    B. Any proposed retaining walls shall also be decorative in nature, while the combination of retaining and other walls on top shall not exceed the height requirement.

23. Prior to the issuance of grading permits, a temporary project identification sign shall be erected on the site in a secure and visible manner. The sign shall be conspicuously posted at the site and remain in place until occupancy of the project. The sign shall include the following:

    a. The name (if applicable) and address of the development.
    b. The developer's name, address, and a 24-hour emergency telephone number.

24. Prior to issuance of grading permits, the location of the trash enclosure shall be included on the plans.

25. Prior to approval of any grading permit, the tree plan shall be submitted to and approved by the Planning Division. The plan shall identify all mature trees (4 inch trunk diameter or larger) on the subject property and City right-of-way. Using the grading plan as a base, the plan shall indicate trees to be relocated, retained, and removed. Replacement trees shall be shown on the plan, be a minimum size of 24 inch box, and meet a ratio of three replacement trees for each mature tree removed or as approved by the Planning Official. (GP Objective 4.4, 4.5, DG)

Prior to Building Permit

26. Prior to issuance of any grading permit, all Conditions of Approval, Mitigation Measures and Airport Land Use Commission Conditions of Approval shall be printed on the building plans.

27. Prior to the issuance of building permits, proposed covered trash enclosures shall be included in the Planning review of the Fence and Wall plan or separate Planning submittal. The trash enclosure(s), including the roof materials, shall be compatible with the architecture, color and materials of the building(s) design. Trash enclosure areas shall include landscaping on three sides. Approved design plans shall be included in a Building submittal (Fence and Wall or building design plans). (GP Objective 43.6, DG)

28. Prior to issuance of any building permits, final landscaping and irrigation plans shall be submitted for review and approved by the Planning Division. After the third plan check review for landscape plans, an additional plan check fee shall apply. The plans shall be prepared in accordance with the City's Landscape Requirements and shall include:

A. A three (3) foot high decorative wall, solid hedge or berm shall be placed in any setback areas between a public right of way and a parking lot for screening.

B. Finger and end planters with required step outs and curbing shall be provided every 12 parking stalls as well as at the terminus of each aisle.

C. Drought tolerant landscape shall be used. Sod shall be limited to gathering areas or no sod shall be installed.

D. Street trees shall be provided every 40 feet on center in the right of way.

E. On-site trees shall be planted at an equivalent of one (1) tree per thirty (30) linear feet of the perimeter of a parking lot and per thirty linear feet of a building dimension for the portions of the building visible from a parking lot or right of way. Trees may be massed for pleasing aesthetic effects.

F. Enhanced landscaping shall be provided at all driveway entries and street corner locations The review of all utility boxes, transformers etc. shall be coordinated to provide adequate screening from public view.

G. Landscaping on three sides of any trash enclosure.

H. All site perimeter and parking lot landscape and irrigation shall be installed prior

to the release of certificate of any occupancy permits for the site.

I. A screening tree row shall be planted along the site's northern property line.

29. Prior to issuance of building permits, the Planning Division shall review and approve the location and method of enclosure or screening of transformer cabinets, commercial gas meters and back flow preventers as shown on the final working drawings. Location and screening shall comply with the following criteria: transformer cabinets and commercial gas meters shall not be located within required setbacks and shall be screened from public view either by architectural treatment or landscaping; multiple electrical meters shall be fully enclosed and incorporated into the overall architectural design of the building(s); back-flow preventers shall be screened by landscaping. (GP Objective 43.30)

30. Prior to issuance of a building permit, the developer/property owner or developer's successor-in-interest shall pay all applicable impact fees due at permit issuance, including but not limited to Multi-species Habitat Conservation Plan (MSHCP) mitigation fees. (Ord)

31. Prior to building final, the developer/owner or developer's/owner's successor-in-interest shall pay all applicable impact fees, including but not limited to Transportation Uniform Mitigation fees (TUMF), and the City's adopted Development Impact Fees. (Ord)

32. Prior to or at building plan check submittal, the elevation plans shall include decorative lighting sconces on all sides of the buildings of the complex facing a parking lot, courtyard or plaza, or public right of way or open space to provide up-lighting and shadowing on the structures. Include drawings of the sconce details for each building within the elevation plans, approved by the Planning Division prior to building permit issuance.

33. Prior to or at building plan check submittal, two copies of a detailed, on-site, computer generated, point-by-point comparison lighting plan, including exterior building, parking lot, and landscaping lighting, shall be submitted to the Planning Division for review and approval prior to the issuance of a building permit. The lighting plan shall be generated on the plot plan and shall be integrated with the final landscape plan. The plan shall indicate the manufacturer's specifications for light fixtures used, shall include style, illumination, location, height and method of shielding per the City's Municipal Code requirements. After the third plan check review for lighting plans, an additional plan check fee will apply. (MC 9.08.100, 9.16.280)

34. Prior to issuance of building permits, screening details shall be addressed on the building plans for roof top equipment submitted for Planning Division review and approval through the building plan check process. All equipment shall be

completely screened so as not to be visible from public view, and the screening shall be an integral part of the building.

Prior to Building Final or Occupancy

35. Prior to building final, all required landscaping and irrigation shall be installed per plan, certified by the Landscape Architect and inspected by the Planning Division. (MC 9.03.040, MC 9.17).

36. Prior to building final, Planning approved/stamped landscape plans shall be provided to the Community Development Department – Planning Division on a CD disk.

37. Prior to building final, all required and proposed fences and walls shall be constructed according to the approved plans on file in the Planning Division. (MC 9.080.070).

COMMUNITY DEVELOPMENT DEPARTMENT

Building Division

38. The proposed non-residential project shall comply with the latest Federal Law, Americans with Disabilities Act, and State Law, California Code of Regulations, Title 24, Chapter 11B for accessibility standards for the disabled including access to the site, exits, bathrooms, work spaces, etc.

39. Prior to submittal, all new development, including residential second units, are required to obtain a valid property address prior to permit application. Addresses can be obtained by contacting the Building Safety Division at 951.413.3350.

40. Contact the Building Safety Division for permit application submittal requirements.

41. Any construction within the city shall only be completed between the hour of seven a.m. to seven p.m. Monday through Friday, excluding holidays and from eight a.m. to four p.m. on Saturday, unless written approval is obtained from the city building official or city engineer (Municipal Code Section 8.14.040.E).

42. Building plans submitted shall be signed and sealed by a California licensed design professional as required by the State Business and Professions Code.

43. The proposed development is subject to the payment of applicable processing fees as required by the City's current Fee Ordinance at the time a building permit application is submitted or prior to the issuance of permits as determined by the City.

44. The proposed project will be subject to approval by the Eastern Municipal Water District and all applicable fees and charges shall be paid prior to permit issuance. Contact the water district at 951.928.3777 for specific details.

45. All new structures shall be designed in conformance to the latest design standards adopted by the State of California in the California Building Code, (CBC) Part 2, Title 24, California Code of Regulations including requirements for allowable area, occupancy separations, fire suppression systems, accessibility, etc. The current code edition is the 2016 CBC.

46. The proposed non-residential project shall comply with 2016 California Green Building Standards Code, Section 5.106.5.3, mandatory requirements for Electric Vehicle Charging Station (EVCS).

47. The proposed project's occupancy shall be classified by the Building Official and must comply with exiting, occupancy separation(s) and minimum plumbing fixture requirements. Minimum plumbing fixtures shall be provided per the 2016 California Plumbing Code, Table 422.1. The occupant load and occupancy classification shall be determined in accordance with the California Building Code.

48. Prior to permit issuance, every applicant shall submit a properly completed Waste Management Plan (WMP), as a portion of the building or demolition permit process. (MC 8.80.030)

ECONOMIC DEVELOPMENT DEPARTMENT (EDD)

49. New Moreno Valley businesses may work with the Economic Development Department to coordinate job recruitment fairs.

50. New Moreno Valley businesses may adopt a "First Source" approach to employee recruitment that gives notice of job openings to Moreno Valley residents for one week in advance of the public recruitment.

51. New Moreno Valley businesses are encouraged to hire local residents.

52. New Moreno Valley businesses are encouraged to provide a job fair flyer and/or web announcement to the City in advance of job recruitments, so that the City can assist in publicizing these events.

53. New Moreno Valley businesses may utilize the workforce recruitment services provided by the Moreno Valley Employment Resource Center ("ERC").

    The ERC offers no cost assistance to businesses recruiting and training potential employees. Complimentary services include:

- Job Announcements
- Applicant testing / pre-screening
- Interviewing
- Job Fair support
- Training space

FIRE DEPARTMENT

Fire Prevention Bureau

54. Prior to issuance of Certificate of Occupancy or Building Final, all commercial buildings shall display street numbers in a prominent location on the street side and rear access locations. The numerals shall be a minimum of twelve inches in height. (CFC 505.1, MVMC 8.36.060[I])

55. Prior to issuance of Certificate of Occupancy or Building Final, the applicant/developer shall install a fire alarm system monitored by an approved Underwriters Laboratory listed central station based on a requirement for monitoring the sprinkler system, occupancy or use. Fire alarm panel shall be accessible from exterior of building in an approved location. Plans shall be submitted to the Fire Prevention Bureau for approval prior to installation. (CFC Chapter 9 and MVMC 8.36.100)

56. Prior to issuance of Building Permits, the applicant/developer shall participate in the Fire Impact Mitigation Program. (Fee Resolution as adopted by City Council)

57. Prior to issuance of Certificate of Occupancy or Building Final, the applicant/developer shall install a fire sprinkler system based on square footage and type of construction, occupancy or use. Fire sprinkler plans shall be submitted to the Fire Prevention Bureau for approval prior to installation. (CFC Chapter 9, MVMC 8.36.100[D])

58. All Fire Department access roads or driveways shall not exceed 12 percent grade. (CFC 503.2.7 and MVMC 8.36.060[G])

59. The Fire Department emergency vehicular access road shall be (all weather surface) capable of sustaining an imposed load of 80,000 lbs. GVW, based on street standards approved by the Public Works Director and the Fire Prevention Bureau. The approved fire access road shall be in place during the time of construction. Temporary fire access roads shall be approved by the Fire Prevention Bureau. (CFC 501.4, and MV City Standard Engineering Plan 108d)

60. The angle of approach and departure for any means of Fire Department access

shall not exceed 1 ft drop in 20 ft (0.3 m drop in 6 m), and the design limitations of the fire apparatus of the Fire Department shall be subject to approval by the AHJ. (CFC 503 and MVMC 8.36.060)

61. Prior to construction, all locations where structures are to be built shall have an approved Fire Department access based on street standards approved by the Public Works Director and the Fire Prevention Bureau. (CFC 501.4)

62. Prior to issuance of Building Permits, the applicant/developer shall provide the Fire Prevention Bureau with an approved site plan for Fire Lanes and signage. (CFC 501.3)

63. Prior to issuance of Certificate of Occupancy or Building Final, "Blue Reflective Markers" shall be installed to identify fire hydrant locations in accordance with City specifications. (CFC 509.1 and MVLT 440A-0 through MVLT 440C-0)

64. Existing fire hydrants on public streets are allowed to be considered available. Existing fire hydrants on adjacent properties shall not be considered available unless fire apparatus access roads extend between properties and easements are established to prevent obstruction of such roads. (CFC 507, 501.3) a - After the local water company signs the plans, the originals shall be presented to the Fire Prevention Bureau for signatures. The required water system, including fire hydrants, shall be installed, made serviceable, and be accepted by the Moreno Valley Fire Department prior to beginning construction. They shall be maintained accessible.

65. Final fire and life safety conditions will be addressed when the Fire Prevention Bureau reviews building plans. These conditions will be based on occupancy, use, California Building Code (CBC), California Fire Code (CFC), and related codes, which are in effect at the time of building plan submittal.

66. The Fire Code Official is authorized to enforce the fire safety during construction requirements of Chapter 33. (CFC Chapter 33 & CBC Chapter 33)

67. Fire lanes and fire apparatus access roads shall have an unobstructed width of not less than twenty–four (24) feet and an unobstructed vertical clearance of not less the thirteen (13) feet six (6) inches. (CFC 503.2.1 and MVMC 8.36.060[E])

68. Prior to issuance of the building permit for development, independent paved access to the nearest paved road, maintained by the City shall be designed and constructed by the developer within the public right of way in accordance with City Standards. (MVMC 8.36.060, CFC 501.4)

69. Prior to issuance of a Certificate of Occupancy or Building Final, a "Knox Box Rapid Entry System" shall be provided. The Knox-Box shall be installed in an accessible

location approved by the Fire Code Official. All exterior security emergency access gates shall be electronically operated and be provided with Knox key switches for access by emergency personnel. (CFC 506.1)

70. The minimum number of fire hydrants required, as well as the location and spacing of fire hydrants, shall comply with the C.F.C., MVMC, and NFPA 24. Fire hydrants shall be located no closer than 40 feet to a building. A fire hydrant shall be located within 50 feet of the fire department connection for buildings protected with a fire sprinkler system. The size and number of outlets required for the approved fire hydrants are (6" x 4" x 2 ½" x 2 ½") (CFC 507.5.1, 507.5.7, Appendix C, NFPA 24-7.2.3, MVMC 912.2.1)

71. Fire Department access driveways over 150 feet in length shall have a turn-around as determined by the Fire Prevention Bureau capable of accommodating fire apparatus. (CFC 503 and MVMC 8.36.060, CFC 501.4)

72. During phased construction, dead end roadways and streets which have not been completed shall have a turn-around capable of accommodating fire apparatus. (CFC 503.1 and 503.2.5)

73. If construction is phased, each phase shall provide an approved emergency vehicular access way for fire protection prior to any building construction. (CFC 501.4)

74. Plans for private water mains supplying fire sprinkler systems and/or private fire hydrants shall be submitted to the Fire Prevention Bureau for approval. (CFC 105 and CFC 3312.1)

75. The Fire Prevention Bureau is required to set a minimum fire flow for the remodel or construction of all commercial buildings per CFC Appendix B and Table B105.1. The applicant/developer shall provide documentation to show there exists a water system capable of delivering said waterflow for 2 hour(s) duration at 20-PSI residual operating pressure. The required fire flow may be adjusted during the approval process to reflect changes in design, construction type, or automatic fire protection measures as approved by the Fire Prevention Bureau. Specific requirements for the project will be determined at time of submittal. (CFC 507.3, Appendix B)

76. Prior to construction, all traffic calming designs/devices must be approved by the Fire Marshal and City Engineer.

77. Prior to building construction, dead end roadways and streets which have not been completed shall have a turnaround capable of accommodating fire apparatus. (CFC 503.2.5)

78. Prior to issuance of Building Permits, the applicant/developer shall furnish one copy

of the water system plans to the Fire Prevention Bureau for review. Plans shall: a. Be signed by a registered civil engineer or a certified fire protection engineer; b. Contain a Fire Prevention Bureau approval signature block; and c. Conform to hydrant type, location, spacing of new and existing hydrants and minimum fire flow required as determined by the Fire Prevention Bureau. The required water system, including fire hydrants, shall be installed, made serviceable, and be accepted by the Moreno Valley Fire Department prior to beginning construction. They shall be maintained accessible.

PUBLIC WORKS DEPARTMENT

Land Development

79. Aggregate slurry, as defined in Section 203-5 of Standard Specifications for Public Works Construction, may be required just prior to the end of the one-year warranty period of the public streets at the discretion of the City Engineer. If slurry is required, a slurry mix design shall be submitted for review and approved by the City Engineer. The latex additive shall be Ultra Pave 70 (for anionic) or Ultra Pave 65 K (for cationic) or an approved equal per the geotechnical report. The latex shall be added at the emulsion plant after weighing the asphalt and before the addition of mixing water. The latex shall be added at a rate of two to two-and-one-half (2 to 2½) parts to one-hundred (100) parts of emulsion by volume. Any existing striping shall be removed prior to slurry application and replaced per City standards.

80. The developer shall comply with all applicable City ordinances and resolutions including the City's Municipal Code (MC) and if subdividing land, the Government Code (GC) of the State of California, specifically Sections 66410 through 66499.58, said sections also referred to as the Subdivision Map Act (SMA). [MC 9.14.010]

81. The final approved conditions of approval (COAs) and any applicable Mitigation Measures issued by the Planning Division shall be photographically or electronically placed on mylar sheets and included in the Grading and Street Improvement plans.

82. The developer shall monitor, supervise and control all construction related activities, so as to prevent these activities from causing a public nuisance, including but not limited to, insuring strict adherence to the following:
(a) Removal of dirt, debris, or other construction material deposited on any public street no later than the end of each working day.
(b) Observance of working hours as stipulated on permits issued by the Land Development Division.
(c) The construction site shall accommodate the parking of all motor vehicles used by persons working at or providing deliveries to the site.
(d) All dust control measures per South Coast Air Quality Management District

(SCAQMD) requirements during the grading operations.
Violation of any condition, restriction or prohibition set forth in these conditions shall subject the owner, applicant, developer or contractor(s) to remedy as noted in City Municipal Code 8.14.090. In addition, the City Engineer or Building Official may suspend all construction related activities for violation of any condition, restriction or prohibition set forth in these conditions until such time as it has been determined that all operations and activities are in conformance with these conditions.

83. If improvements associated with this project are not initiated within two (2) years of the date of approval of the Public Improvement Agreement (PIA), the City Engineer may require that the engineer's estimate for improvements associated with the project be modified to reflect current City construction costs in effect at the time of request for an extension of time for the PIA or issuance of a permit. [MC 9.14.210(B)(C)]

84. The developer shall protect downstream properties from damage caused by alteration of drainage patterns (i.e. concentration or diversion of flow, etc). Protection shall be provided by constructing adequate drainage facilities, including, but not limited to, modifying existing facilities or by securing a drainage easement. [MC 9.14.110]

85. The maintenance responsibility of the proposed storm drain line shall be clearly identified. Storm drain lines within private property will be privately maintained and those within public streets will be publicly maintained.

86. Any proposed private storm drain system shall connect to a storm drain manhole that shall be placed at the right-of-way line, to mark the beginning of the publicly maintained portion of the storm drain.

87. This project shall submit civil engineering design plans, reports and/or documents (prepared by a registered/licensed civil engineer) for review and approval by the City Engineer per the current submittal requirements, prior to the indicated threshold or as required by the City Engineer. The submittal consists of, but is not limited to, the following:

a. Rough grading w/ erosion control plan (prior to grading permit issuance);
b. Precise grading w/ erosion control plan (prior to building permit issuance);
c. Public improvement plan (e.g., street/storm drain w/ striping, RCFC storm drain, sewer/water, etc.) prior to encroachment permit issuance;
d. Final drainage study (prior to grading plan approval);
e. Final WQMP (prior to grading plan approval);
f. Legal documents (e.g., easement(s), dedication(s), vacation, etc.) prior to building permit issuance;
g. As-Built revision for all plans prior to Occupancy release;

88. Water quality best management practices (BMPs) designed to meet Water Quality

Management Plan (WQMP).shall not be used as a construction BMP. Water quality BMPs shall be maintained for the entire duration of the project construction and be used to treat runoff from those developed portions of the project. Water quality BMPs shall be protected from upstream construction related runoff by having proper best management practices in place and maintained. Water quality BMPs shall be graded per the approved design plans.

Prior to Grading Plan Approval

89. Resolution of all drainage issues shall be as approved by the City Engineer.

90. A final detailed drainage study (prepared by a registered/licensed civil engineer) shall be submitted for review and approved by the City Engineer. The study shall include, but not be limited to: existing and proposed hydrologic conditions as well as hydraulic calculations for all drainage control devices and storm drain lines. The study shall analyze 1, 3, 6 and 24-hour duration events for the 2, 5, 10 and 100-year storm events [MC 9.14.110(A.1)]. A digital (pdf) copy of the approved drainage study shall be submitted to the Land Development Division.

91. A final project-specific Water Quality Management Plan (WQMP) shall be submitted for review and approved by the City Engineer, which:

a. Addresses Site Design Best Management Practices (BMPs) such as minimizing impervious areas, maximizing permeability, minimizes directly connected impervious areas to the City's street and storm drain systems, and conserves natural areas;

b. Incorporates Source Control BMPs and provides a detailed description of their implementation;

c. Describes the long-term operation and maintenance requirements for BMPs requiring maintenance; and

d. Describes the mechanism for funding the long-term operation and maintenance of the BMPs.

A copy of the final WQMP template can be obtained on the City's Website or by contacting the Land Development Division. A digital (pdf) copy of the approved final project-specific Water Quality Management Plan (WQMP) shall be submitted to the Land Development Division.

92. The developer shall comply with the rules and regulations of FEMA and City Municipal Code 8.12 for development within a flood hazard area (defined as Zones A, AE and AH).

For developments required to submit a CLOMR(-F) / LOMR(-F), the following items (prepared by a licensed civil engineer or land surveyor) shall be submitted:

a. Prior to plan approval, a Floodplain Development Permit (application available at the City).

b. Prior to issuance of the first building permit, a Conditional Letter of Map

Revision (CLOMR) including Base Flood Elevation (BFE) shall be approved by the City Engineer and FEMA.

c. Prior to issuance of the certificate of occupancy, a Letter of Map Revision (LOMR) package with appropriate fees shall be submitted and approved by the City Engineer and FEMA.

d. Prior to 90% reduction of public improvement securities, a Letter of Map Revision (LOMR) approved by FEMA shall be submitted to the City.

93. The developer shall ensure compliance with the City Grading ordinance, these Conditions of Approval and the following criteria:

a. The project street and lot grading shall be designed in a manner that perpetuates the existing natural drainage patterns with respect to tributary drainage area and outlet points. Unless otherwise approved by the City Engineer, lot lines shall be located at the top of slopes.

b. Any grading that creates cut or fill slopes adjacent to the street shall provide erosion control, sight distance control, and slope easements as approved by the City Engineer.

c. All improvement plans are substantially complete and appropriate clearance letters are provided to the City.

d. A soils/geotechnical report (addressing the soil's stability and geological conditions of the site) shall be submitted to the Land Development Division for review. A digital (pdf) copy of the soils/geotechnical report shall be submitted to the Land Development Division.

94. Grading plans (prepared by a registered/licensed civil engineer) shall be submitted for review and approved by the City Engineer per the current submittal requirements.

95. The developer shall select Low Impact Development (LID) Best Management Practices (BMPs) designed per the latest version of the Water Quality Management Plan (WQMP) - a guidance document for the Santa Ana region of Riverside County.

96. The developer shall submit recorded slope easements from adjacent property owners in all areas where grading resulting in slopes is proposed to take place outside of the project boundaries. For all other offsite grading, written permission from adjacent property owners shall be submitted.

97. The developer shall pay all remaining plan check fees.

98. A Storm Water Pollution Prevention Plan (SWPPP) shall be prepared in conformance with the State's current Construction Activities Storm Water General Permit. A copy of the current SWPPP shall be kept at the project site and be available for review upon request.

99. Any proposed trash enclosure(s) shall be dual bin (1 for trash and 1 for recycables)

[MC 9.03.040 (G)]. The enclosure shall have a solid roof and appropriate drainage collection for water quality purposes. The architecture shall be approved by the Planning Division and any structural approvals shall be made by the Building & Safety Division.

100. For projects that will result in discharges of storm water associated with construction with a soil disturbance of one or more acres of land, the developer shall submit a Notice of Intent (NOI) and obtain a Waste Discharger's Identification number (WDID#) from the State Water Quality Control Board (SWQCB) which shall be noted on the grading plans.

101. Landscape & Irrigation plans (prepared by a registered/licensed civil engineer) for water quality BMPs shall be submitted for review and approved by the City Engineer per the current submittal requirements, if applicable.

102. Prior to precise grading plan approval, the grading plans shall clearly show that the parking lot conforms to City standards. The parking lot shall be 5% maximum, 1% minimum, 2% maximum at or near any disabled parking stall and travel way. Ramps, curb openings and travel paths shall all conform to current ADA standards as outlined in Department of Justice's "ADA Standards for Accessible Design", Excerpt from 28 CFR Part 36. (www.usdoj.gov) and as approved by the City's Building and Safety Division.

Prior to Grading Permit

103. A receipt showing payment of the Area Drainage Plan (ADP) fee to Riverside County Flood Control and Water Conservation District shall be submitted. [MC 9.14.100(O)]

104. A digital (pdf) copy of all approved grading plans shall be submitted to the Land Development Division.

105. Security, in the form of a cash deposit (preferable), or letter of credit shall be submitted as a guarantee of the implementation and maintenance of erosion control measures. At least twenty-five (25) percent of the required security shall be in the form of a cash deposit with the City. [MC 8.21.160(H)]

106. Security, in the form of a cash deposit (preferable), or letter of credit shall be submitted as a guarantee of the completion of the grading operations for the project. [MC 8.21.070]

107. The developer shall pay all applicable inspection fees.

108. Prior to the payment of the Transportation Uniform Mitigation Fee (TUMF), the

developer may enter into a TUMF Improvement Credit Agreement to secure credit for the construction of applicable improvements. If the developer fails to complete this agreement by the timing specified above, credits may not be given. The developer shall pay current TUMF fees adopted by the City Council. [Ord. 835 § 2.1, 2012] [MC 3.44.060]

Prior to Improvement Plan Approval

109. The developer is required to bring any existing access ramps adjacent to and fronting the project to current ADA (Americans with Disabilities Act) requirements. However, when work is required in an intersection that involves or impacts existing access ramps, all access ramps in that intersection shall be retrofitted to comply with current ADA requirements, unless otherwise approved by the City Engineer.

110. The developer shall submit clearances from all applicable agencies, and pay all applicable plan check fees.

111. The street improvement plans shall comply with current City policies, plans and applicable City standards (i.e. MVSI-160 series, etc.) throughout this project.

112. The design plan and profile shall be based upon a centerline, extending beyond the project boundaries a minimum distance of 300 feet at grade and matching existing curb and gutter flow lines on both sides of the project on the north side of the street with the final alignment approved by the City Engineer.

113. The hydrology study shall be designed to accept and properly convey all off-site drainage flowing onto or through the site. In the event that the City Engineer permits the use of streets for drainage purposes, the provisions of current City standards shall apply. Should the quantities exceed the street capacity or the use of streets be prohibited for drainage purposes, as in the case where one travel lane in each direction shall not be used for drainage conveyance for emergency vehicle access on streets classified as minor arterials and greater, the developer shall provide adequate facilities as approved by the City Engineer. [MC 9.14.110 A.2]

114. All public improvement plans (prepared by a licensed/registered civil engineer) shall be submitted for review and approved by the City Engineer per the current submittal requirements.

115. Any missing or deficient existing improvements along the project frontage within 100-feet shall be constructed or secured for construction. The City Engineer may require the ultimate structural section for pavement to half-street width plus 18 feet or provide core test results confirming that existing pavement section is per current City Standards; additional signing & striping to accommodate increased traffic imposed by the development, etc.

116. For non-subdivision projects, all street dedications shall be free of encumbrances, irrevocably offered to the public and shall continue in force until the City accepts or abandons such offers, unless otherwise approved by the City Engineer.

117. The plans shall indicate any restrictions on trench repair pavement cuts to reflect the City's moratorium on disturbing newly-constructed pavement less than three (3) years old and recently slurry sealed streets less than one (1) year old. Pavement cuts for trench repairs may be allowed for emergency repairs or as specifically approved by the City Engineer.

118. All dry and wet utilities shall be shown on the plans and any crossings shall be potholed to determine actual location and elevation. Any conflicts shall be identified and addressed on the plans. The pothole survey data shall be submitted to Land Development with the public improvement plans for reference purposes only. The developer is responsible to coordinate with all affected utility companies and bear all costs of any utility relocation.

119. Alessandro Blvd., Divided Major Arterial, City Standard MVSI-101A-0 (134-foot RW / 110-foot CC) shall be constructed to half-width plus 18' wide median and one additional 14 feet travel land south of the median/centerline, along the entire project's south frontage per City's Standards. Dedication of additional right of way along, north side of the street, north of centerline for a 67-feet street width, along the project's south property line, shall be shown on the improvement plans, and recorded per a separate recorded instrument. Improvements shall consist of, but not be limited to, pavement, base, redwood header, curb, gutter, sidewalk, driveway approaches, drainage structures, any necessary offsite improvement transition/joins to existing, streetlights, pedestrian ramps, raised median, removal/relocation and/or undergrounding of any power poles with overhead utility lines less than 115,000 volts, and dry and wet utilities.

120. Prior to final design plan approval, the plans shall clearly show all proposed storm drain improvements as follows: Moreno Area Master Drainage Plan storm drain Line M-16 shall be installed from the intersection of Kitching Street to the project site and along the project frontage within Alessandro Boulevard, connect into the existing Line M. The storm drain shall be sized per the Moreno Area Master Drainage Plan (45" RCP) or per a joint City and RCFC & WC approved final drainage study.

Prior to Encroachment Permit

121. A digital (pdf) copy of all approved improvement plans shall be submitted to the Land Development Division.

122. All applicable inspection fees shall be paid.

123. For non-subdivision projects, execution of a Public Improvement Agreement (PIA) and/or security (in the form of a cash deposit or other approved means) may be required as determined by the City Engineer. [MC 9.14.220]

124. Any work performed within public right-of-way requires an encroachment permit.

Prior to Building Permit

125. An engineered-fill certification, rough grade certification and compaction report shall be submitted for review and approved by the City Engineer. A digital (pdf) copy of the approved compaction report shall be submitted to the Land Development Division. All pads shall meet pad elevations per approved grading plans as noted by the setting of "blue-top" markers installed by a registered land surveyor or licensed civil engineer.

126. For non-subdivision projects, the developer shall enter into a Cooperative Agreement with the City and Riverside County Flood Control and Water Conservation District establishing the terms and conditions covering the inspection, operation and maintenance of Master Drainage Plan facilities required to be constructed as part of the project.

127. For non-subdivision projects, the developer shall guarantee the completion of all related public improvements required for this project by executing a Public Improvement Agreement (PIA) with the City and posting the required security. [MC 9.14.220]

128. For non-subdivision projects, the developer shall comply with the requirements of the City Engineer based on recommendations of the Riverside County Flood Control District regarding the construction of County Master Plan Facilities.

129. For Commercial/Industrial projects, the owner may have to secure coverage under the State's General Industrial Activities Storm Water Permit as issued by the State Water Resources Control Board.

130. For non-subdivision projects, all street dedications shall be free of encumbrances, irrevocably offered to the public and shall continue in force until the City accepts or abandons such offers, unless otherwise approved by the City Engineer.

131. A walk through with a Land Development Inspector shall be scheduled to inspect existing improvements within public right of way along project frontage. Any missing, damaged or substandard improvements including handicap access ramps that do not meet current City standards shall be required to be installed, replaced

and/or repaired. The applicant shall post security to cover the cost of the repairs and complete the repairs within the time allowed in the public improvement agreement used to secure the improvements.

132. Certification to the line, grade, flow test and system invert elevations for the water quality control BMPs shall be submitted for review and approved by the City Engineer.

Prior to Occupancy

133. All outstanding fees shall be paid.

134. All required as-built plans (prepared by a registered/licensed civil engineer) shall be submitted for review and approved by the City Engineer per the current submittal requirements.

135. The final/precise grade certification shall be submitted for review and approved by the City Engineer.

136. For commercial, industrial and multi-family projects, in compliance with Proposition 218, the developer shall agree to approve the City of Moreno Valley NPDES Regulatory Rate Schedule that is in place at the time of certificate of occupancy issuance. Under the current permit for storm water activities required as part of the National Pollutant Discharge Elimination System (NPDES) as mandated by the Federal Clean Water Act, this project is subject to the following requirements:

a. Select one of the following options to meet the financial responsibility to provide storm water utilities services for the required continuous operation, maintenance, monitoring system evaluations and enhancements, remediation and/or replacement, all in accordance with Resolution No. 2002-46.

i. Participate in the mail ballot proceeding in compliance with Proposition 218, for the Common Interest, Commercial, Industrial and Quasi-Public Use NPDES Regulatory Rate Schedule and pay all associated costs with the ballot process; or

ii. Establish an endowment to cover future City costs as specified in the Common Interest, Commercial, Industrial and Quasi-Public Use NPDES Regulatory Rate Schedule.

b. Notify the Special Districts Division of the intent to request building permits 90 days prior to their issuance and the financial option selected. The financial option selected shall be in place prior to the issuance of certificate of occupancy. [California Government Code & Municipal Code]

137. The developer shall complete all public improvements in conformance with current City standards, except as noted in the Special Conditions, including but not limited to the following:

a. Street improvements including, but not limited to: pavement, base, curb and/or gutter, cross gutters, spandrel, sidewalks, drive approaches, pedestrian ramps, street lights, signing, striping, under sidewalk drains, landscaping and irrigation, medians, pavement tapers/transitions and traffic control devices as appropriate.

b. Storm drain facilities including, but not limited to: storm drain pipe, storm drain laterals, open channels, catch basins and local depressions.

c. City-owned utilities.

d. Sewer and water systems including, but not limited to: sanitary sewer, potable water and recycled water.

e. Under grounding of all existing and proposed utilities adjacent to and on-site. [MC 9.14.130]

f. Relocation of overhead electrical utility lines including, but not limited to: electrical, cable and telephone.

138. For commercial, industrial and multi-family projects, a "Stormwater Treatment Device and Control Measure Access and Maintenance Covenant" shall be recorded to provide public notice of the maintenance requirements to be implemented per the approved final project-specific WQMP. A boilerplate copy of the "Stormwater Treatment Device and Control Measure Access and Maintenance Covenant" can be obtained by contacting the Land Development Division.

139. The applicant shall ensure the following, pursuant to Section XII. I. of the 2010 NPDES Permit:

a. Field verification that structural Site Design, Source Control and Treatment Control BMPs are designed, constructed and functional in accordance with the approved Final Water Quality Management Plan (WQMP).

b. Certification of best management practices (BMPs) from a state licensed civil engineer. An original WQMP BMP Certification shall be submitted for review and approved by the City Engineer.

140. The Developer shall comply with the following water quality related items:

a. Notify the Land Development Division prior to construction and installation of all structural BMPs so that an inspection can be performed.

b. Demonstrate that all structural BMPs described in the approved final project-specific WQMP have been constructed and installed in conformance with the approved plans and specifications;

c. Demonstrate that Developer is prepared to implement all non-structural BMPs described in the approved final project-specific WQMP; and

d. Demonstrate that an adequate number of copies of the approved final project-specific WQMP are available for future owners/occupants.

e. Clean and repair the water quality BMP's, including re-grading to approved civil drawing if necessary.

f. Obtain approval and complete installation of the irrigation and landscaping.

Special Districts Division

141. The Developer, or the Developer's successors or assignees shall be responsible for all parkway and/or median landscape maintenance for a period of one (1) year commencing from the time all items of work have been completed to the satisfaction of Special Districts staff as per the City of Moreno Valley Public Works Department Landscape Design Guidelines, or until such time as the District accepts maintenance responsibilities.

142. Parkway, median, slope and/or open space landscape areas maintained as part of the City of Moreno Valley Community Facilities District 2014-01 shall be required to have independent utility systems, including but not limited to water, electric, and telephone services. An independent irrigation controller and pedestal will also be required. Combining utility systems with existing or future landscape areas not associated with the City of Moreno Valley Community Facilities District (CFD) landscaping will not be permitted.

143. Inspection fees for the monitoring of landscape installation associated with the City of Moreno Valley maintained parkways/medians are due prior to the required pre-construction meeting. (MC 3.32.040)

144. Plans for parkway, median, slope, and/or open space landscape areas designated in the project's Conditions of Approval for incorporation into a City Coordinated landscape maintenance program, shall be prepared and submitted in accordance with the City of Moreno Valley Public Works Department Landscape Design Guidelines. The guidelines are available on the City's website at www.moval.org/sd or from the Special Districts Division (951.413.3480 or specialdistricts@moval.org).

145. The ongoing maintenance of any landscaping required to be installed behind the curb shall be the responsibility of the property owner.

146. Plan check fees for review of parkway/median landscape plans for improvements that shall be maintained by the City of Moreno Valley are due upon the first plan submittal. (MC 3.32.040)

Prior to Building Permit

147. This project has been identified to potentially be included in the formation of a Map Act Area of Benefit Special District for the construction of major thoroughfares and/or freeway improvements. The property owner(s) shall participate in such District and pay any special tax, assessment, or fee levied upon the project property

for such District. At the time of the public hearing to consider formation of the district, the property owner(s) will not protest the formation, but will retain the right to object any eventual assessment that is not equitable should the financial burden of the assessment not be reasonably proportionate to the benefit the affected property obtains from the improvements to be installed. The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org of its selected financial option when submitting an application for the first building permit to determine whether the development will be subjected to this condition. If subject to the condition, the special election requires a 90 day process in compliance with the provisions of Article 13C of the California Constitution. (Street & Highway Code, GP Objective 2.14.2, MC 9.14.100).

148. This project is conditioned for a proposed district to provide a funding source for the operation and maintenance of public improvements and/or services associated with new development in that territory. The Developer shall satisfy this condition with one of the options outlined below.

a. Participate in a special election for maintenance/services and pay all associated costs of the election process and formation, if any. Financing may be structured through a Community Facilities District, Landscape and Lighting Maintenance District, or other financing structure as determined by the City; or

b. Establish an endowment fund to cover the future maintenance and/or service costs.

The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org when submitting the application for building permit issuance. If the first building permit is pulled prior to formation of the district, this condition will not apply. If the district has been or is in the process of being formed the Developer must inform the Special Districts Division of its selected financing option (a. or b. above). The option for participating in a special election requires 90 days to complete the special election process. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution.

The financial option selected shall be in place prior to the issuance of the first certificate of occupancy for the project.

149. This project is conditioned to provide a funding source for the following special financing program(s):

b. Landscape Maintenance Services for parkway, open space, and/or median landscaping.

The Developer's responsibility is to provide a funding source for the capital

improvements and the continued maintenance. The Developer shall satisfy this condition with one of the options below.

i. Participate in a special election (mail ballot proceeding) and pay all associated costs of the special election and formation, if any. Financing may be structured through a Community Services District zone, Community Facilities District, Landscape and Lighting Maintenance District, or other financing structure as determined by the City; or

ii. Establish a Property Owner's Association (POA) or Home Owner's Association (HOA) which will be responsible for any and all operation and maintenance costs

The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org of its selected financial option when submitting the application for building permit issuance. The option for participating in a special election requires approximately 90 days to complete the special election process. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution.

The financial option selected shall be in place prior to the issuance of the first certificate of occupancy for the project and prior to acceptance of any improvements.

150. Commercial (BP) If Land Development, a Division of the Public Works Department, requires this project to supply a funding source necessary to provide for, but not limited to, stormwater utilities services for the continuous operation, remediation and/or replacement, monitoring, systems evaluations and enhancement of on-site facilities and performing annual inspections of the affected areas to ensure compliance with state mandated stormwater regulations, a funding source needs to be established. The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org of its selected financial option for the National Pollution Discharge Elimination System (NPDES) program when submitting the application for the first building permit issuance (see Land Development's related condition). Participating in a special election the process requires a 90 day period prior to the City's issuance of a building permit. This allows adequate time to be in compliance with the provisions of Article 13D of the California Constitution. (California Health and Safety Code Sections 5473 through 5473.8 (Ord. 708 Section 3.1, 2006) & City of Moreno Valley Municipal Code Title 3, Section 3.50.050.)

151. This project has been identified to be included in the formation of a Community Facilities District (Mello-Roos) for Public Safety services, including but not limited to Police, Fire Protection, Paramedic Services, Park Rangers, and Animal Control services. The property owner(s) shall not protest the formation; however, they retain

the right to object to the rate and method of maximum special tax. In compliance with Proposition 218, the property owner shall agree to approve the mail ballot proceeding (special election) for either formation of the CFD or annexation into an existing district. The Developer must notify the Special Districts Division at 951.413.3480 or at specialdistricts@moval.org when submitting the application for building permit issuance to determine the requirement for participation. If the first building permit is pulled prior to formation of the district, this condition will not apply. If the condition applies, the special election will require a minimum of 90 days prior to issuance of the first building permit. This allows adequate time to be in compliance with the provisions of Article 13C of the California Constitution. (California Government Code Section 53313 et. seq.)

Prior to Building Final or Occupancy

152. Parkway, open space, and/or median landscaping specified in the project's Conditions of Approval shall be constructed in compliance with the approved landscape plans and completed prior to the issuance of the first Certificate of Occupancy/Building Final for this project.

153. Landscape and irrigation plans for parkway, median, slope, and/or open space landscape areas designated to be maintained by the City shall be placed on compact disk (CD) in pdf format. The CD shall include "As Built" plans, revisions, and changes. The CD will become the property of the City of Moreno Valley and the Moreno Valley Community Services District.

Transportation Engineering Division

154. Conditions of approval may be modified or added if a phasing plan is submitted for this development.

155. All proposed on-site traffic signing and striping should be accordance with the latest California Manual on Uniform Traffic Control Devices (CAMUTCD).

156. Alessandro Boulevard is designated as a 6-Lane Divided Arterial (134'RW/110'CC) per City Standard Plan No. MVSI-101A-0. Per the General Plan, a raised landscaped median is planned along the project frontage on Alessandro Boulevard and will restrict left-turn in/out movements at the project driveways on Alessandro Boulevard. Any other improvements undertaken by this project shall be consistent with the City's standards for this facility or as approved by the City Engineer.

157. Communication conduits shall be required on the north side of Alessandro Boulevard along the project frontage per City Standard Plan No. MVSI-186-0.

158. The driveways shall conform to City of Moreno Valley Standard No. MVSI-112C-0 for Commercial Driveway Approaches. Access at both project driveways on Alessandro Boulevard shall be right-turn in/out only.

159. If the project driveways are to be gated in the future, the following shall be required:

a) A 60' storage lane in front of the gate for entering vehicles.
b) A turnaround area in front of the gate for vehicles;
c) A separate pedestrian entry.

160. Prior to final approval of the landscape plans and construction plans for any type of fencing or monument sign, the project plans shall demonstrate that sight distance at the project driveway conforms to City Standard Plan No. MVSI-164A-0 through MVSI-164C-0. Trees, plants, shrubs, fencing, and monument signing shall not be located in an area that obstructs the drivers' line-of-sight.

161. Prior to the final approval of the street improvement plans, a signing and striping plan shall be prepared for the section of Alessandro Boulevard, from Kitching Street to Lasselle Street. The signing and striping plans shall be prepared per the latest edition of the California Manual on Uniform Traffic Control Devices (CAMUTCD) and current City of Moreno Valley Standard Plans, by a qualified registered civil or traffic engineer.

162. Prior to issuance of an encroachment permit for work within the public right-of-way, construction traffic control plans prepared by a registered Civil or Traffic Engineer shall be required for plan approval by the City Traffic Engineer.

Prior to Building Final or Occupancy

163. Prior to issuance of Certificate of Occupancy, all signing and striping shall be installed per current City Standards and the approved plans.

PROJECT STATISTICS

APPLICANT/PROPERTY OWNER:
WILLIAM CHU
T&C INTERNATIONAL HEALTH, INC.
P.O. BOX 8070
ROWLAND HEIGHTS, CA 91748
(626)689-9393
WILLIAMCHU18809@GMAIL.COM

SITE DATA

PROJECT ADDRESS:	N/A
PARCEL NUMBER:	479-230-018
EXISTING ZONING:	R-10
SITE AREA:	4.55 ACRES (198,538 S.F.)
OPEN SPACE:	13.7%
LANDSCAPING:	21.6%
LOT COVERAGE:	34.8%

BUILDING DATA

OCCUPANCY:	I-2, SKILLED NURSING FACILITY
CONSTRUCTION TYPE:	TYPE V-A ONE-HOUR, FIRE SPRINKLERED
STORIES:	1-STORY, ROUGHLY 24' HEIGHT MAX.

BUILDING AREA

BUILDING 100	16,970 SF
BUILDING 200	33,440 SF
BUILDING 300	18,340 SF
TOTAL BUILDING AREA:	**68,750 SF**

NUMBER OF BEDS

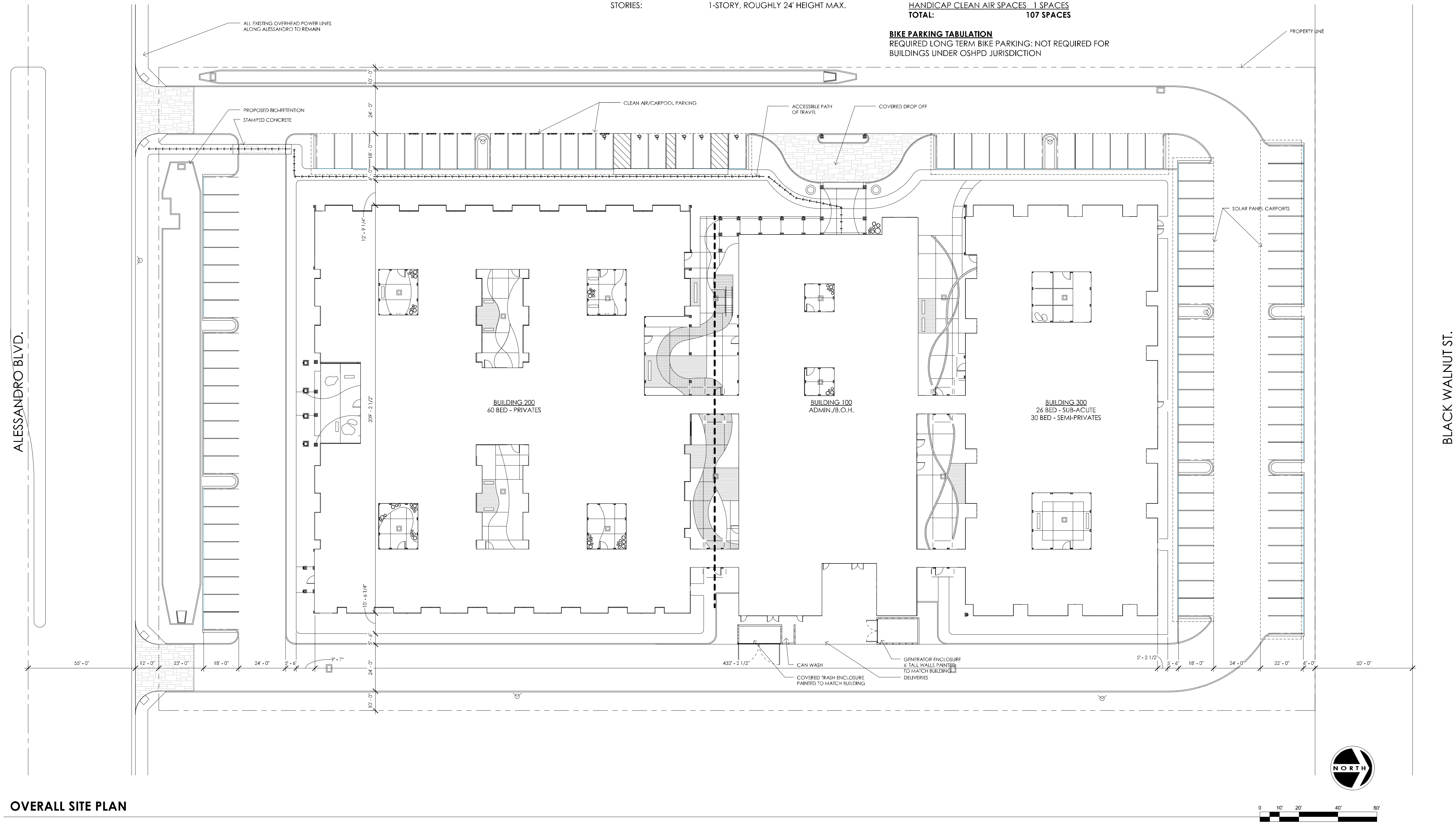
SEMI-PRIVATE: 2-BED	15 ROOMS X 2	30 BEDS
SEMI-PRIVATE SUB-ACUTE: 2-BED	13 ROOMS X 2	26 BEDS
PRIVATE : 1-BED	60 ROOMS X 1	60 BEDS
TOTAL BED COUNT:	**88 ROOMS**	**116 BEDS**

PARKING TABULATION

REQUIRED PARKING:	
1/3 SPACES X 116 BEDS =	**39 SPACES**
CLEAN AIR (TABLE 5.106.5.2)	**11 SPACES**
PROPOSED PARKING:	
STANDARD SPACES	91 SPACES
CLEAN AIR SPACES	10 SPACES
HANDICAP SPACES	5 SPACES
HANDICAP CLEAN AIR SPACES	1 SPACES
TOTAL:	**107 SPACES**

BIKE PARKING TABULATION
REQUIRED LONG TERM BIKE PARKING: NOT REQUIRED FOR BUILDINGS UNDER OSHPD JURISDICTION

VACINITY MAP



OVERALL SITE PLAN

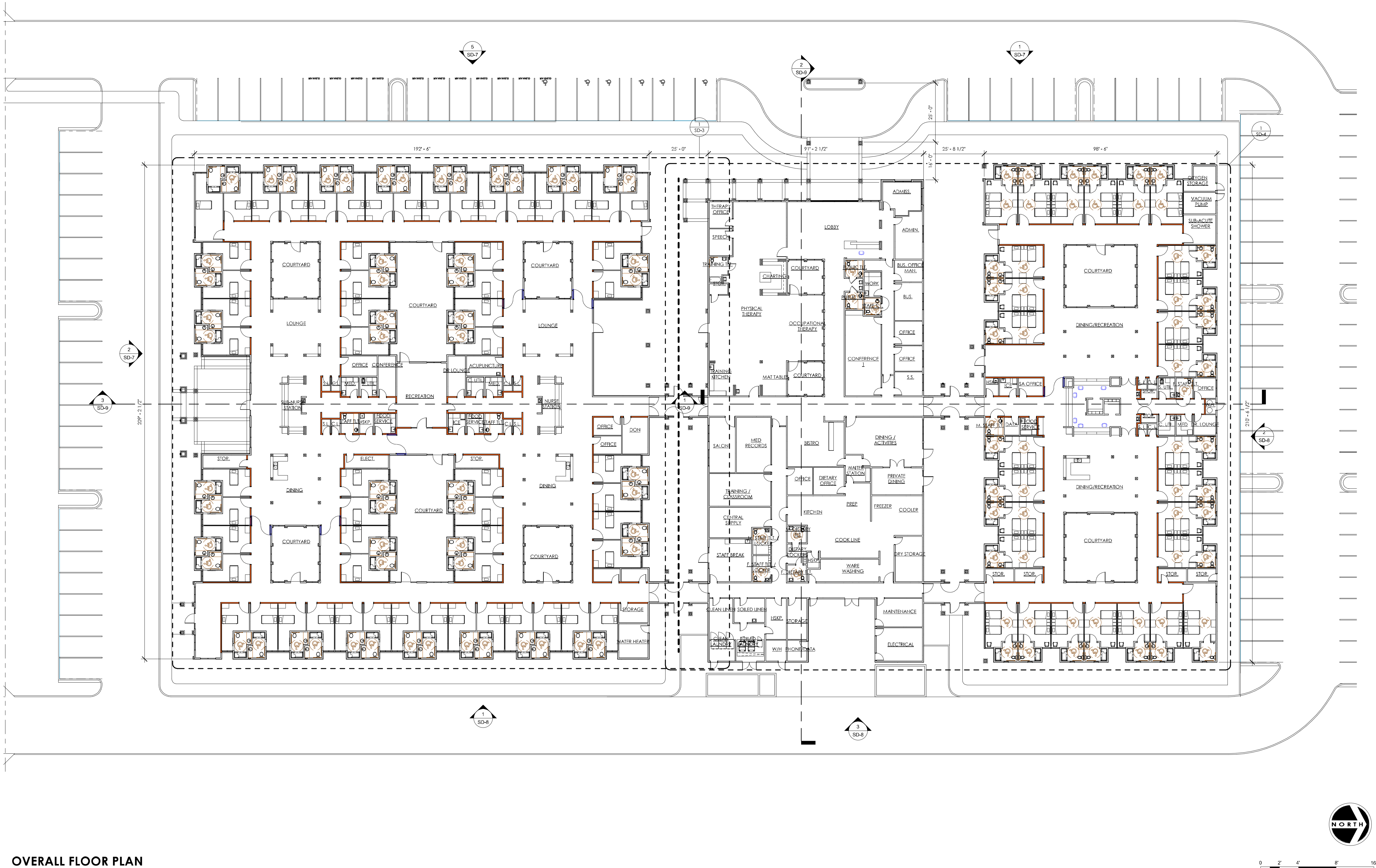
MORENO VALLEY SKILLED NURSING FACILITY

SD-1

T&C INTERNATIONAL HEALTH, INC.

11/28/18

GREGG MAEDO + ASSOCIATES



OVERALL FLOOR PLAN

MORENO VALLEY SKILLED NURSING FACILITY

T&C INTERNATIONAL HEALTH, INC.

SD-2

08/06/18

GREGG MAEDO + ASSOCIATES

ENLARGED FLOOR PLAN - BUILDING 200

MORENO VALLEY SKILLED NURSING FACILITY

T&C INTERNATIONAL HEALTH, INC.

SD-3

08/06/18

GREGG MAEDO + ASSOCIATES

ENLARGED FLOOR PLAN - BUILDING 100/300

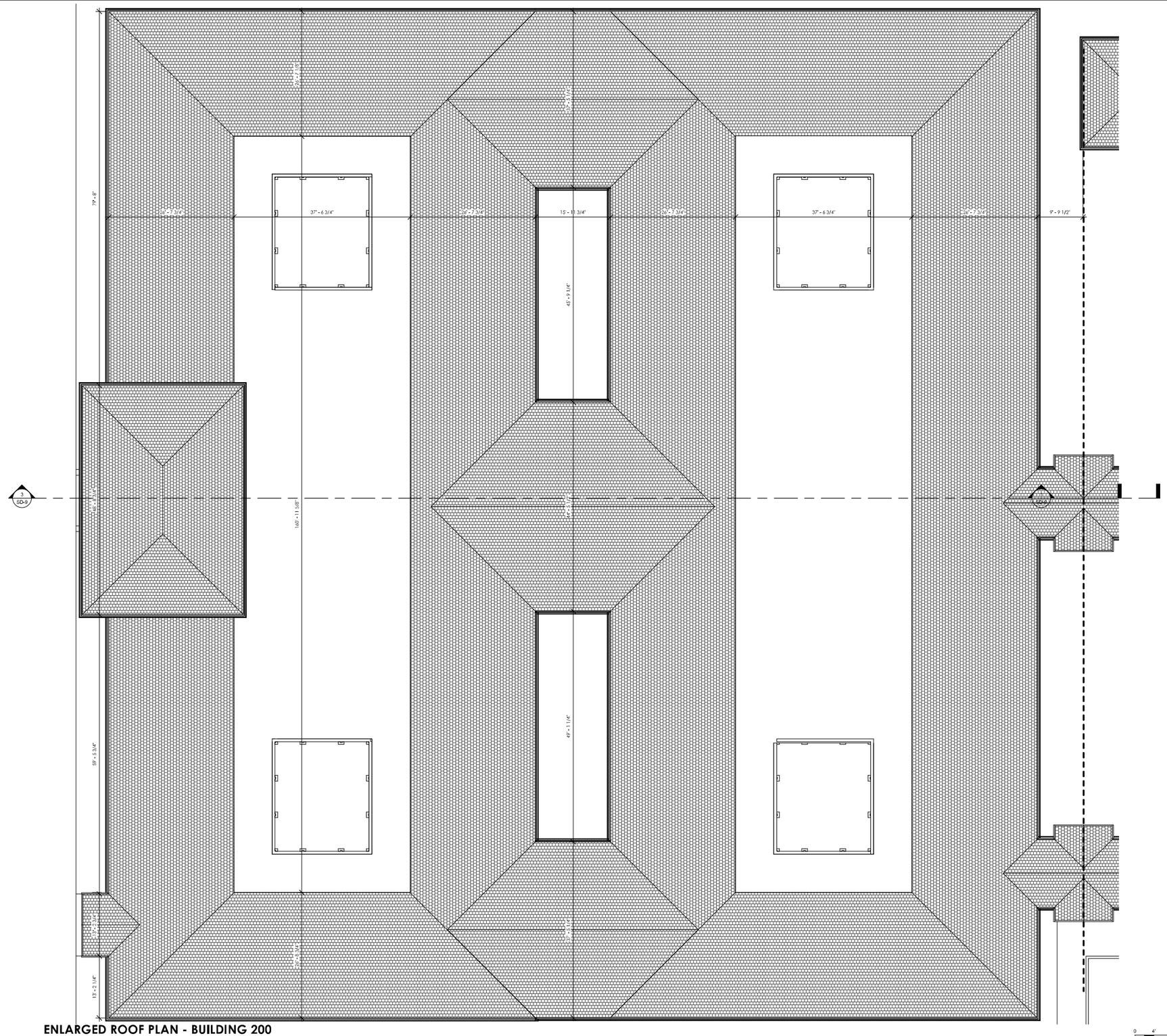
MORENO VALLEY SKILLED NURSING FACILITY

T&C INTERNATIONAL HEALTH, INC.

SD-4

08/06/18

GREGG MAEDG + ASSOCIATE



ENLARGED ROOF PLAN - BUILDING 200

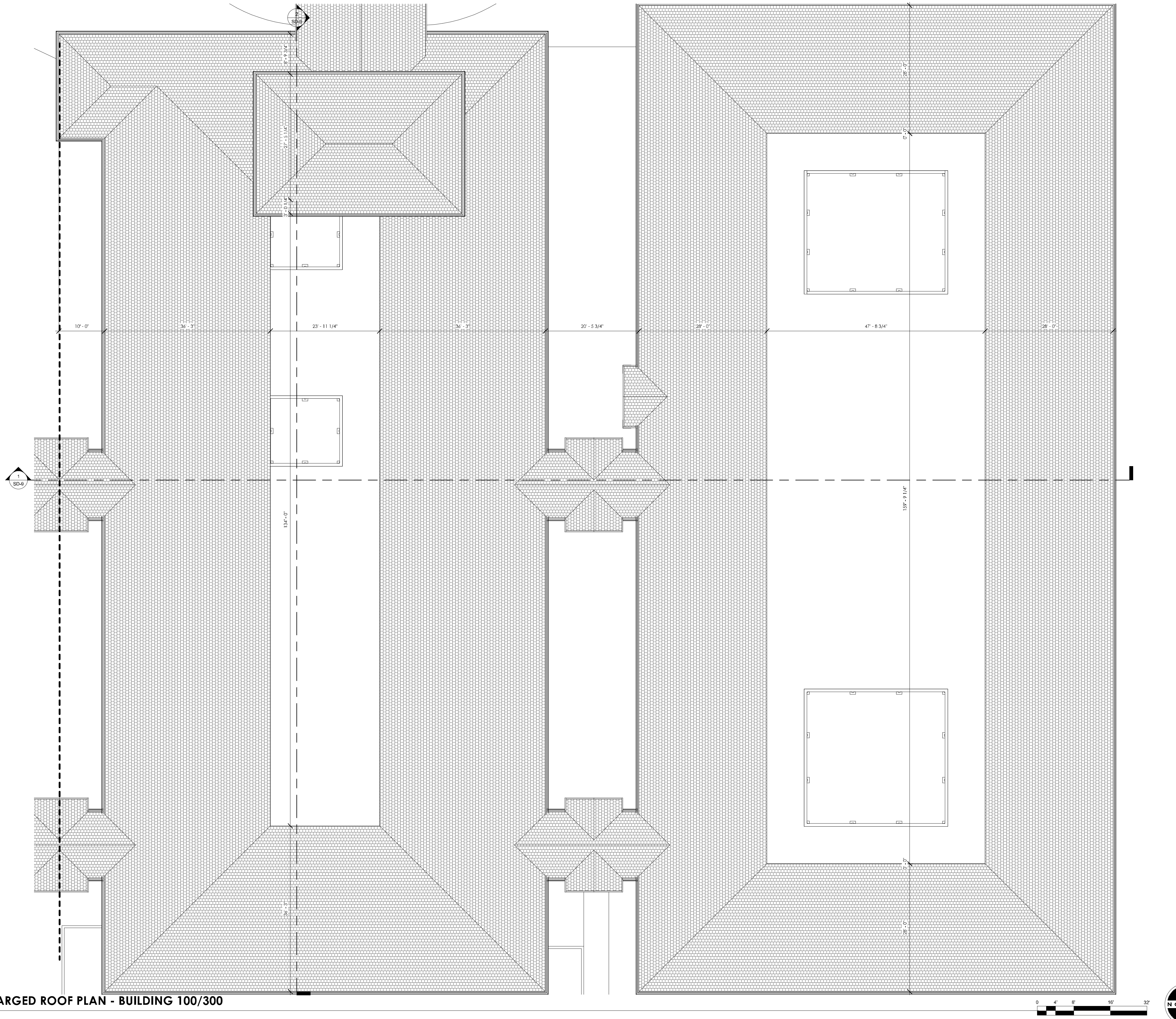
MORENO VALLEY SKILLED NURSING FACILITY

T&C INTERNATIONAL HEALTH, INC.

SD-5

08/06/18

GREGG MAEDG + ASSOCIATE



ENLARGED ROOF PLAN - BUILDING 100/300

MORENO VALLEY SKILLED NURSING FACILITY

T&C INTERNATIONAL HEALTH, INC.

SD-6

08/06/18

GREGG MAEDO + ASSOCIATES

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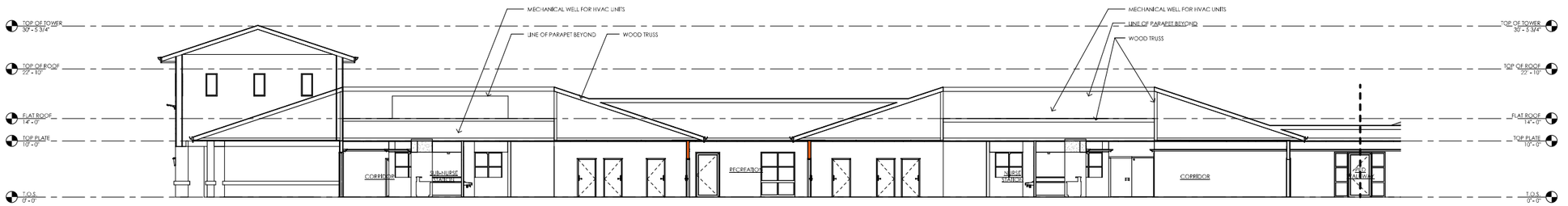
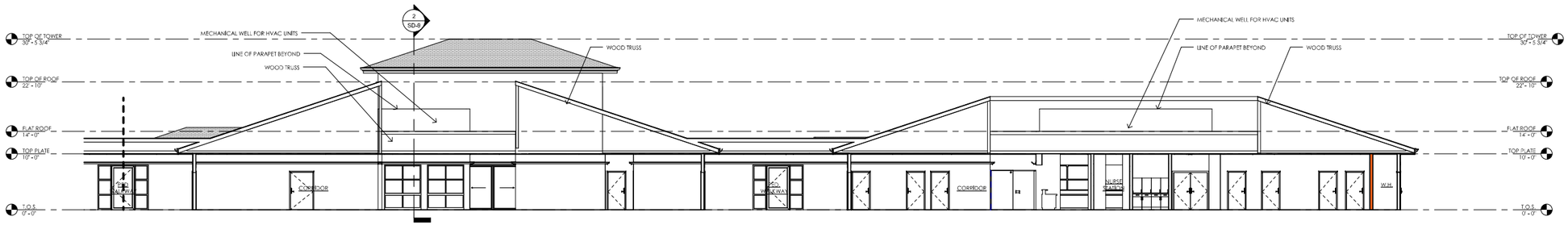
8/14/2018 9:41:13 AM



NORTH/SOUTH BUILDING 200 SECTION

0 4' 8' 16' 32'
SCALE: 1/8"=1'-0"



NORTH/SOUTH BUILDING 100/300 SECTION

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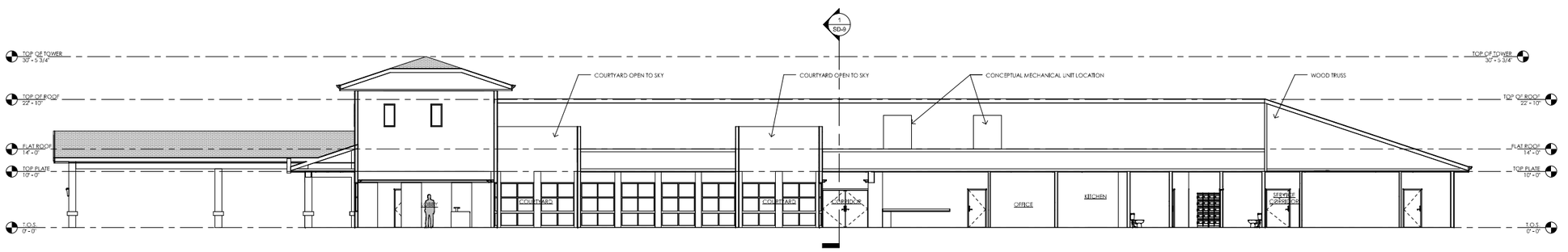
SCALE: 1/8"=1'-0"



EAST/WEST BUILDING 100 SECTION

0 4' 8' 16' 32'
SCALE: 1/8"=1'-0"

MORENO VALLEY SKILLED NURSING FACILITY

T&C INTERNATIONAL HEALTH, INC.

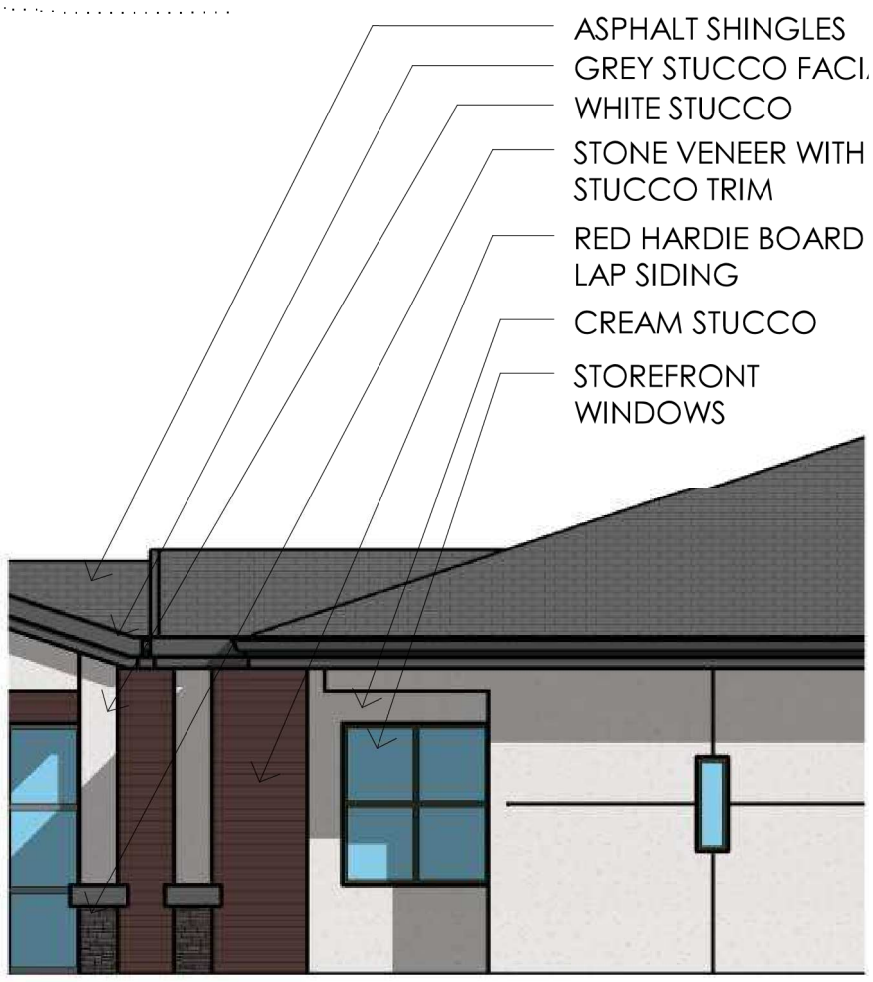
SD-9

08/06/18

GREGG MAEDG + ASSOCIATE

GREY CONCRETE TILE ROOFING

VARIOUS STUCCO COLORS



DARK BRONZE CLEAR ANNODIZED STOREFRONT WINDOWS AND DOORS

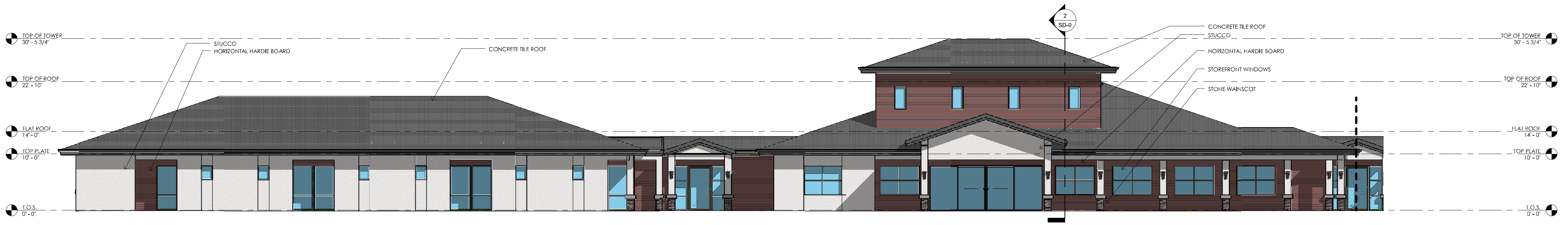
RED HARDIE BOARD LAP SIDING

STONE VENEER

COLOR BOARD

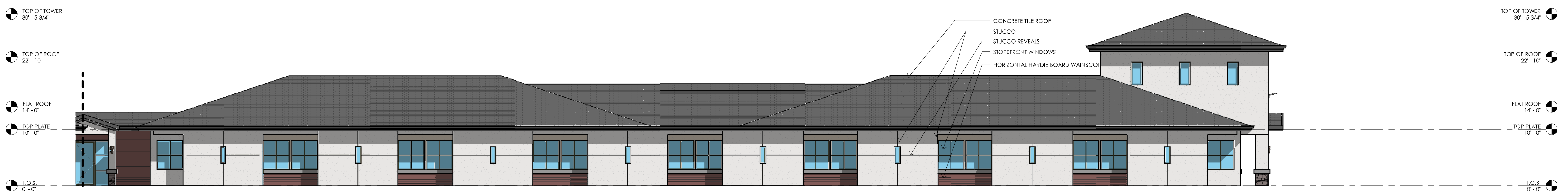
MORENO VALLEY SKILLED NURSING FACILITY **SD-1**

T&C INTERNATIONAL HEALTH, INC. 07/19/18 GREGG MAEDO + ASSOCIATES



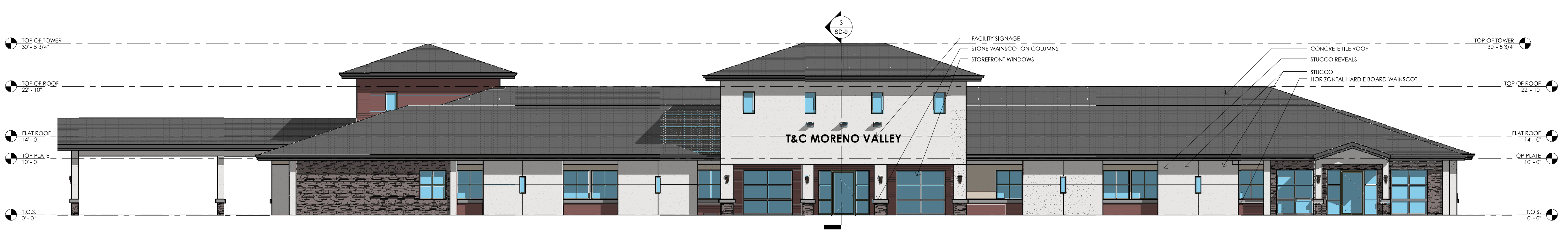
WEST ELEVATION

SCALE: 1/8"=1'-0"



WEST ELEVATION

SCALE: 1/8"=1'-0"



SOUTH ELEVATION

SCALE: 1/8"=1'-0"

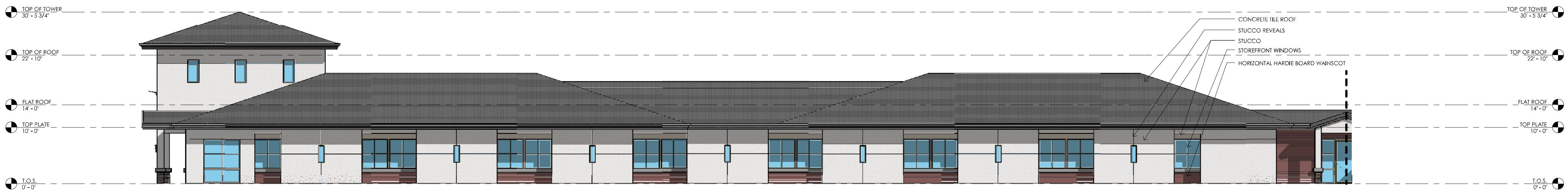
MORENO VALLEY SKILLED NURSING FACILITY

T&C INTERNATIONAL HEALTH, INC.

SD-7

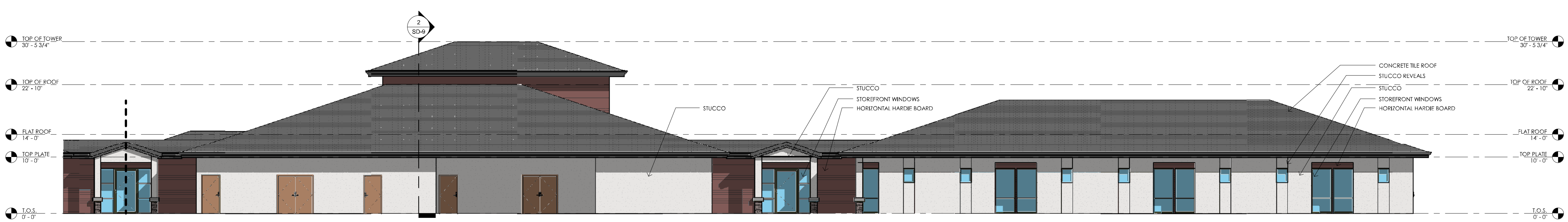
08/06/18

GREGG MAEDO + ASSOCIATES



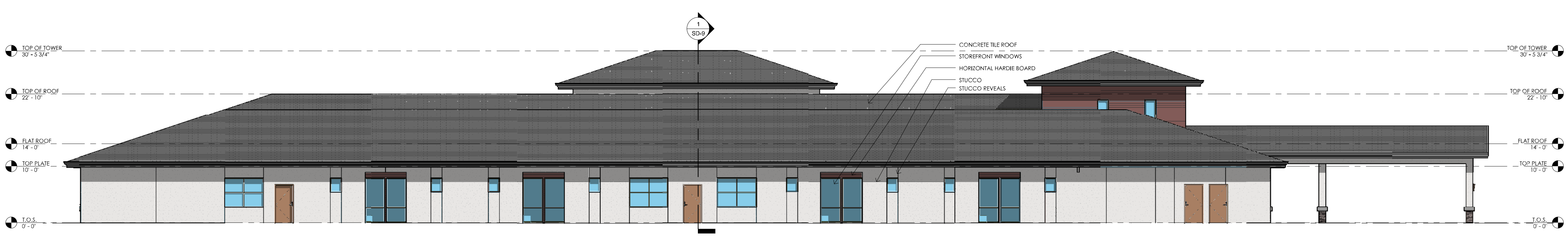
EAST ELEVATION

0 4' 8' 16' 32'
SCALE: 1/8"=1'-0"



EAST ELEVATION

0 4' 8' 16' 32'
SCALE: 1/8"=1'-0"



NORTH ELEVATION

0 4' 8' 16' 32'
SCALE: 1/8"=1'-0"

MORENO VALLEY SKILLED NURSING FACILITY

T&C INTERNATIONAL HEALTH, INC.

SD-8

08/06/18

GREGG MAEDO + ASSOCIATES

CONCEPTUAL GRADING & DRAINAGE PLAN

DETAILS & CROSS SECTIONS

IN CITY OF MORENO VALLEY, RIVERSIDE

SKILLED NURSING FACILITY

LEGAL DESCRIPTION:

THE LAND REFERRED TO IS SITUATED IN THE COUNTY OF RIVERSIDE, CITY OF MORENO VALLEY, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

THE EAST 1/2 OF LOT 5, IN BLOCK 102, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP NO. 1 OF LANDS OF BEAR VALLEY AND ALLESSANDRO DEVELOPMENT COMPANY, ON FILE IN BOOK 11, PAGE 10 OF MAPS, SAN BERNARDINO COUNTY RECORDS.

APN: 479-230-018-6

BENCHMARK:

RIVERSIDE BM# M-79 ELEVATION: 1563.112
405 FEET SOUTH AND 43 FEET EAST OF PERRIS BOULEVARD AND ALESSANDRO BOULEVARD INTERSECTION. 5 FEET NORTH OF POWER POLE # 24828, A BRASS CAP IN CONCRETE POST 4" ABOVE GROUND AND STAMPED M-79 RESET 1972.

BASIS OF BEARING:

BEARINGS ARE BASSES ON ALESSANDRO BOULEVARD HAVE A BEARING OF EAST , PER PARCEL MAP NO.5387 PM 14/7

SHEET INDEX

EASEMENT PLOTTED

PER TITLE REPORT BY OLD REPUBLIC TITLE COMPANY
DATED ON NOVEMBER 2, 2017
ORDER NUMBER: 2607163229-56

4. AN EASEMENT AFFECTING THAT PORTION OF SAID LAND AND FOR THE PURPOSES STATED HEREIN AND INCIDENTAL PURPOSES AS PROVIDED IN THE FOLLOWING

GRANTED TO : EASTERN MUNICIPAL WATER DISTRICT
FOR : CONDUITS, TOGETHER WITH RIGHT OF INGRESS AND EGRESS
RECORDED : MARCH 4, 1955 IN BOOK 1702 OF OFFICIAL RECORDS, PAGE 467, 552 AND 559, RESPECTIVELY. NOT PLOTTABLE.

AFFECTS : AS DESCRIBED THEREIN

GENERAL NOTES

PROJECT ADDRESS:	NORTH SIDE OF ALESSANDRA BLVD. AND CHARA STREET, CITY OF MORENO VALLEY
ASSESSORS PARCEL NUMBER:	479-230-018
EXISTING ZONE:	R-10
OCCUPANCY:	I-2, SKILLED NURSING FACILITY
DEVELOPMENT AREA:	GROSS AREA: 198,538 SF, 4.558 AC NET AREA: 196,003 SF, 4.500 AC
DATE MAP PREPARED:	MARCH, 2018
NUMBERED LOTS:	ONE (1) LOT COMMERCIAL
EXISTING TREES:	THERE ARE NO EXISTING TREES ON SITE, THERE ARE NO INDIGENOUS NATIVE OAK TREES ON SITE AS SHOWN
CONTOUR INTERVAL:	CONTOUR INTERVAL: 1 FEET

VICINITY MAP

N.T.S.

OWNER/DEVELOPER:

T AND C INTERNATIONAL HEALTH, INC
P.O. BOX 8070
ROWLAND HEIGHTS, CA 91748
CONTACT: STEVE L'HOMMEDIEU, WILLIAM CHU
(314) 502-3479, 626-689-9393
EMAIL: SLHOMMEDIEU@ARCO1.COM
WILLIAMCHU18809@GMAIL.COM

ENGINEER:

WINSTON LIU, PE
W&W LAND DESIGN CONSULTANTS
2335 W. FOOTHILL BLVD., SUITE #1
UPLAND, CA 91786
PHONE (909) 608-7118
FAX (909) 946-1137
EMAIL: WINSTONLIU@WWLDC.COM

UTILITY & SERVICE AGENCIES:

WATER/SEWER
EASTERN MUNICIPAL/WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CA 92572-8300
(951) 928-3777

ELECTRIC
SOUTHERN CALIFORNIA EDISON
(800) 684-8123

TELEPHONE
VERIZON TELEPHONE

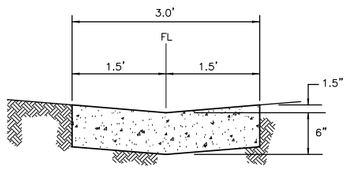
GAS
THE GAS COMPANY
(800) 427-2200

LEGEND:

	PROPERTY BOUNDARY
	LOT LINE
	CENTERLINE
	OFFSITE R/W
	EASEMENT LINE
-SD-	STORM DRAIN
-S-	SEWER LINE
-W-	WATER LINE
TC	TOP OF CURB
FL	FLOWLINE
BW	BACK OF WALK
HP	HIGH POINT
PE	PAD ELEVATION
FF	FINISH FLOOR
FS	FINISH SURFACE
GB	GRADE BREAK
BSL	BUILDING SETBACK LINE
FG	PROPOSED FINISH GROUND
NG	EXISTING NATURAL GROUND
TF	TOP OF BLOCK WALL FOOTING
TG	TOP OF GRATE
SW	SEWER
WA	WATER
INV	INVERT
EDF	EDGE OF DEEPENED FOOTING
BTM	BOTTOM
C/F	CUT FILL TRANSITION LINE
	PROPOSED DRAINAGE PATTERN
	EXISTING DRAINAGE PATTERN
	PROPOSED AC PAVEMENT
	PROPOSED BIO RETENTION

EARTHWORK QUANTITIES	
EXCAVATION (CUT)	6,860 CY
FILL	+5,540 CY
SHRINKAGE (18%) +	+1,000 CY
NET EXPORT	320 CY

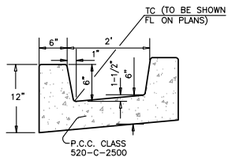
EARTHWORK QUANTITIES SHOWN ON THIS PLAN ARE APPROXIMATE ESTIMATES SHOWN FOR AGENCY FEE PURPOSES ONLY, AND ARE BASED UPON THE PLAN ELEVATIONS SHOWN AND THE GROUND ELEVATIONS WHICH EXISTED AT THE TIME OF THE TOPOGRAPHIC SURVEY.



3' RIBBON GUTTER DETAIL

NOT TO SCALE

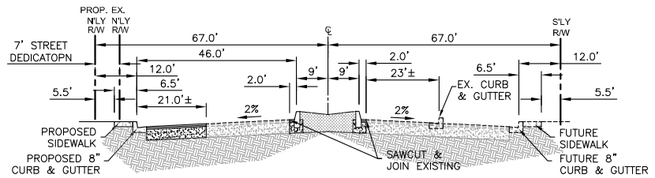
1. CONCRETE SHALL BE CLASS 520-C-2500 PER SECTION 201 S.S.P.W.C. CURING COMPOUND SHALL BE TYPE 1-D.
2. ALL EXPOSED CORNERS SHALL 1/2" RADIUS.



"U" CHANNEL DETAIL

NOT TO SCALE

SUBGRADE PREPARATION TO BE DONE PER SOIL ENGINEER'S RECOMMENDATION.



ALESSANDRO BLVD

DIVIDER MAJOR ARTERIAL-SECTION CITY STD. NO, MVSI-101A-0

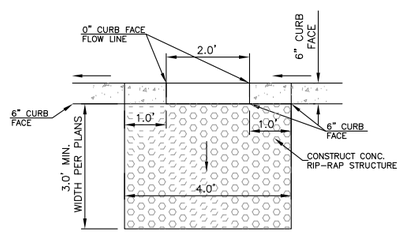
N.T.S. T.I.=10.0

FLOOD ZONE

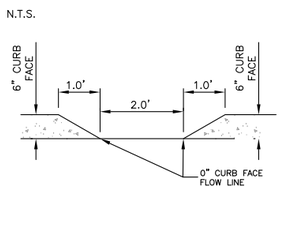
ACCORDING TO THE CITY OF MORENO VALLEY AND BASED UPON THE NATIONAL INSURANCE PROGRAM MAPS THIS SITE LIES WITHIN FLOOD ZONE X SHADED, COMMUNITY PANEL NO. 06505C0765G DATED AUGUST 08, 2008 AND PUBLISHED BY THE FEDERAL INSURANCE ADMINISTRATION.

NOTE:

THE OWNER(S) OF PARCEL 1 HEREBY DEDICATES TO CITY OF MORENO VALLEY, A MUNICIPAL CORPORATION, A PERPETUAL NO-EXCLUSIVE EASEMENT FOR PUBLIC UTILITY PURPOSES INCLUDING INGRESS AND EGRESS FOR THE PURPOSE OF CONSTRUCTING, OPERATING, MAINTAINING AND REPARING MUNICIPAL SERVICE FACILITIES AND READING METERS OVER, UNDER, UPON, ACROSS AND WITHIN ALL COMMON AREAS OF THE REAL PROPERTY.



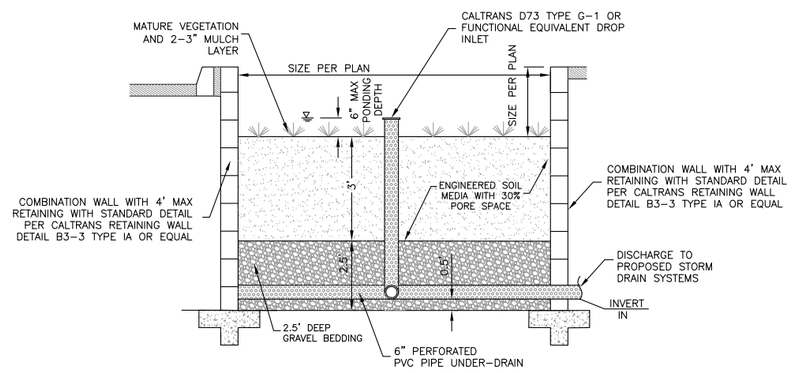
PLAN VIEW



ELEVATION VIEW

0" CURB DETAIL FOR DRAINAGE

NOT TO SCALE



BIORETENTION WITH UNDERDRAIN

NOT TO SCALE

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

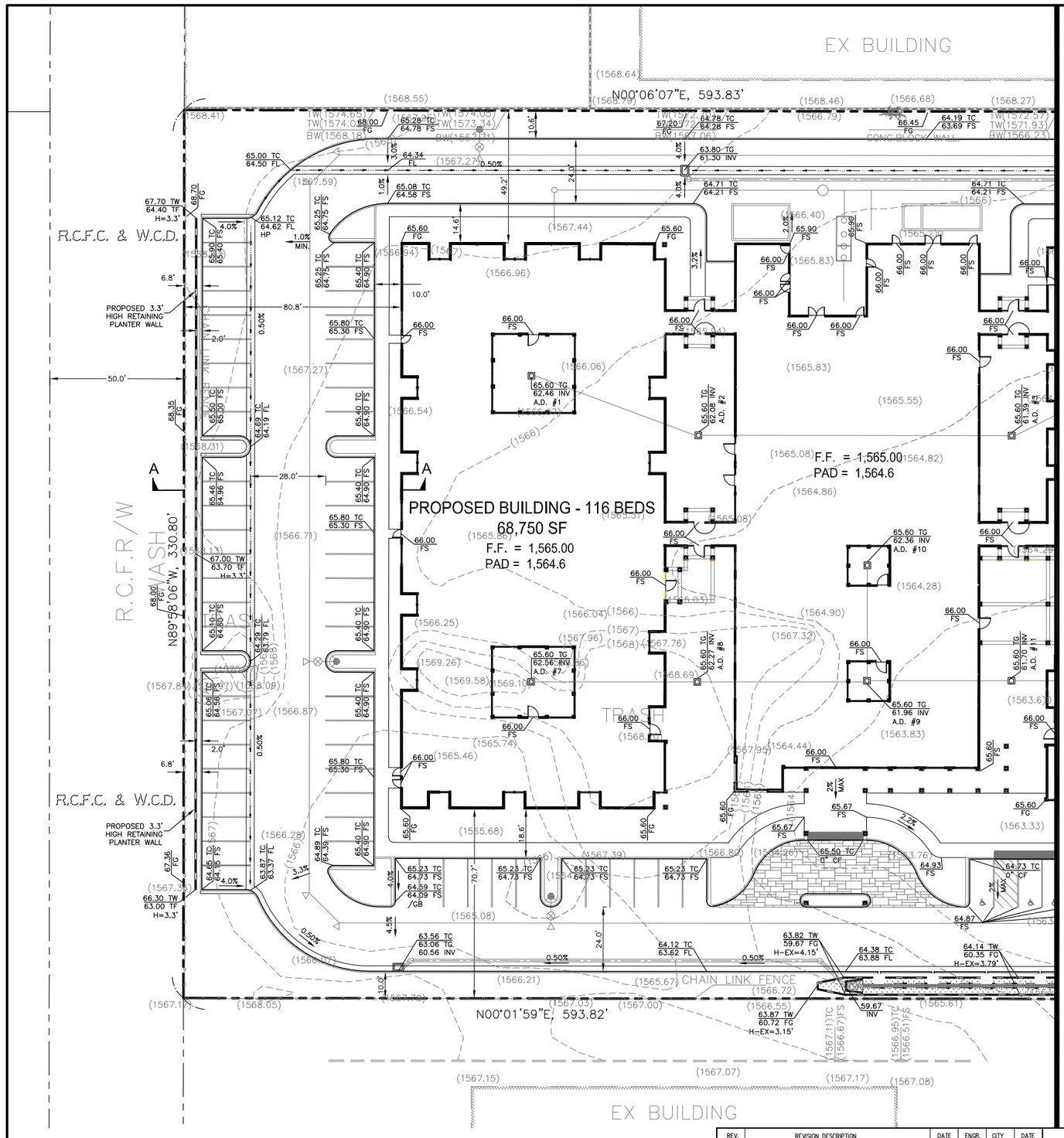
REGISTERED PROFESSIONAL ENGINEER — WEIDONG LIU — No. 66242 Exp. 06-30-20 — CIVIL — STATE OF CALIFORNIA

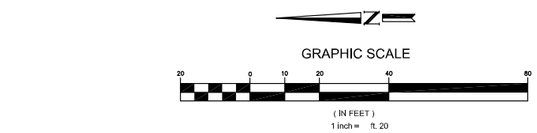
CITY OF MORENO VALLEY, CALIFORNIA
CONCEPTUAL GRADING & DRAINAGE PLAN
SKILLED NURSING FACILITY
NORTH CORNER SIDE OF ALESSANDRA BLVD.
TITLE SHEET WITH DETAILS & CROSS SECTIONS

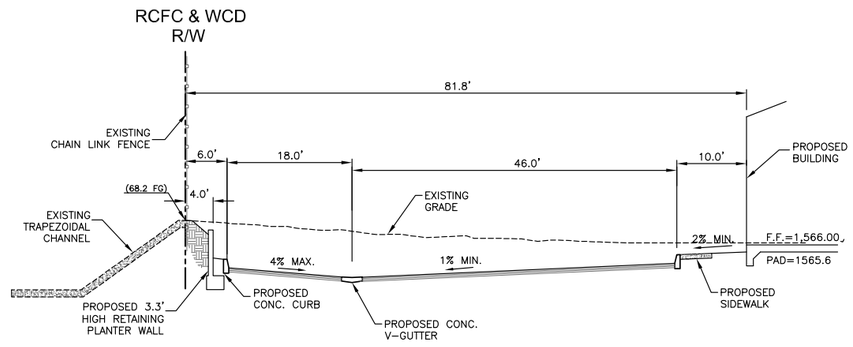
DRAWN BY: WW STAFF	SCALE: AS SHOWN	
DESIGNED BY: WW STAFF	DATE: 03/15/2018	
CHECKED BY: W.L.	APPROVED BY: CITY ENGINEER R.C.E.	

CONCEPTUAL GRADING & DRAINAGE PLAN

IN CITY OF MORENO VALLEY, RIVERSIDE
SKILLED NURSING FACILITY







SECTION A-A
N.T.S.

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

REGISTERED PROFESSIONAL ENGINEER — REGINONG LIU — No. 66242 Exp. 06-30-20 — CIVIL — STATE OF CALIFORNIA

CITY OF MORENO VALLEY, CALIFORNIA
CONCEPTUAL GRADING & DRAINAGE PLAN

DRAWN BY: WW STAFF	SKILLED NURSING FACILITY NORTH CORNER SIDE OF ALESSANDRA BLVD.	SCALE: AS SHOWN
DESIGNED BY: WW STAFF	CONCEPTUAL GRADING & DRAINAGE PLAN	DATE: 03/15/2018
CHECKED BY: W.L.	APPROVED BY: CITY ENGINEER R.C.E.	

Attachment: Preliminary Grading Plan (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED

CONCEPTUAL GRADING & DRAINAGE PLAN

IN CITY OF MORENO VALLEY, RIVERSIDE

SKILLED NURSING FACILITY

MATCH LINE - SEE SHEET 2

DISPOSITION NOTE:
THIS PROJECT IS CONDITIONED TO UNDERGROUND ALL OVERHEAD UTILITY LINES AND ELECTRICAL LINES LESS THAN 115KV FRONTING OR WITHIN THE PROJECT SITE.

N00°06'07"E, 593.83'

PROPOSED BUILDING - 116 BEDS
68,750 SF
F.F. = 1,565.00
PAD = 1,564.6

N89°58'06"W, 254.42'

N00°01'59"E, 593.82'

EXISTING WATER METER VAULT TO BE ABANDONED & REMOVED

EXISTING POWER POLE, PULL BOX & STREET LIGHTING TO BE REMOVED

7.0' STREET DEDICATION

EXISTING RIGHT-OF-WAY

PROPOSED RIGHT-OF-WAY

LIMITED USE AREA PER CITY STD. MVSI-164-0

EXISTING OVERHEAD POWER LINES TO BE UNDERGROUND

JOIN EXISTING

PROPOSED BIO-RETENTION #1

PROPOSED BIO-RETENTION #2

0" CURB SLOT @20' INTERVAL TO ALLOW DRAINAGE DRAIN THROUGH)

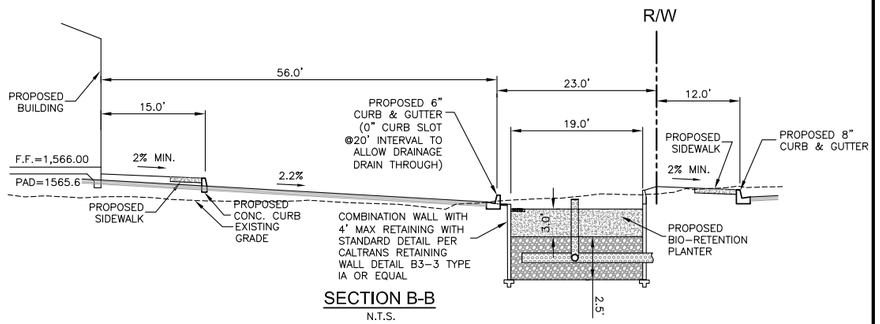
LINE OF SIGHT 660' SIGHT DISTANCE

DISPOSITION NOTE:
THIS PROJECT IS CONDITIONED TO UNDERGROUND ALL OVERHEAD UTILITY LINES AND ELECTRICAL LINES LESS THAN 115KV FRONTING OR WITHIN THE PROJECT SITE.

LINE TABLE

LINE	BEARING	LENGTH
L1	N89°58'06"W	5.65'
L2	N44°58'01"W	5.66'
L3	N89°58'06"W	24.00'
L4	N45°01'59"E	5.66'
L5	N89°58'06"W	6.01'

GRAPHIC SCALE
20 0 10 20 40 80
(IN FEET)
1 inch = ft. 20



SECTION B-B
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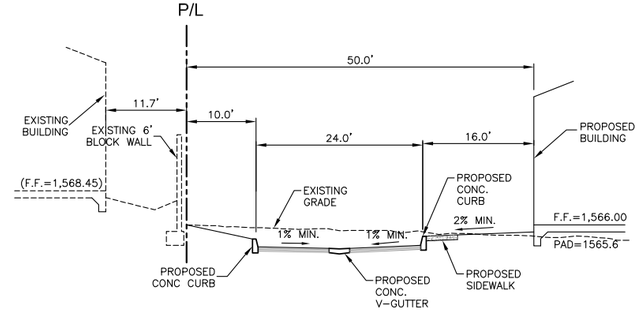
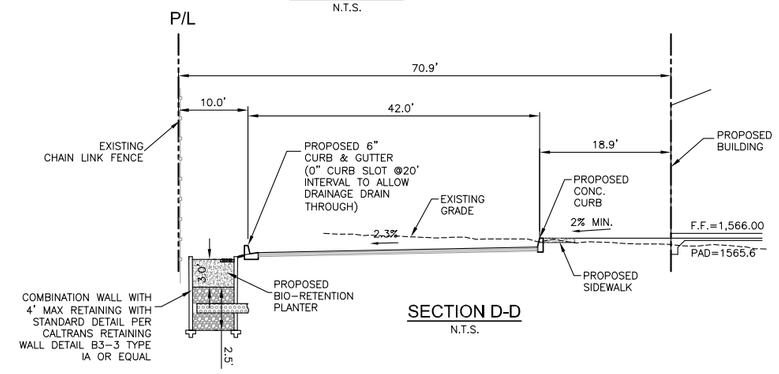


SECTION C-C
N.T.S.



SECTION D-D
N.T.S.

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

REGISTERED PROFESSIONAL ENGINEER — REIGONG LIU — No. 66242 — Exp. 06-30-20 — CIVIL — STATE OF CALIFORNIA

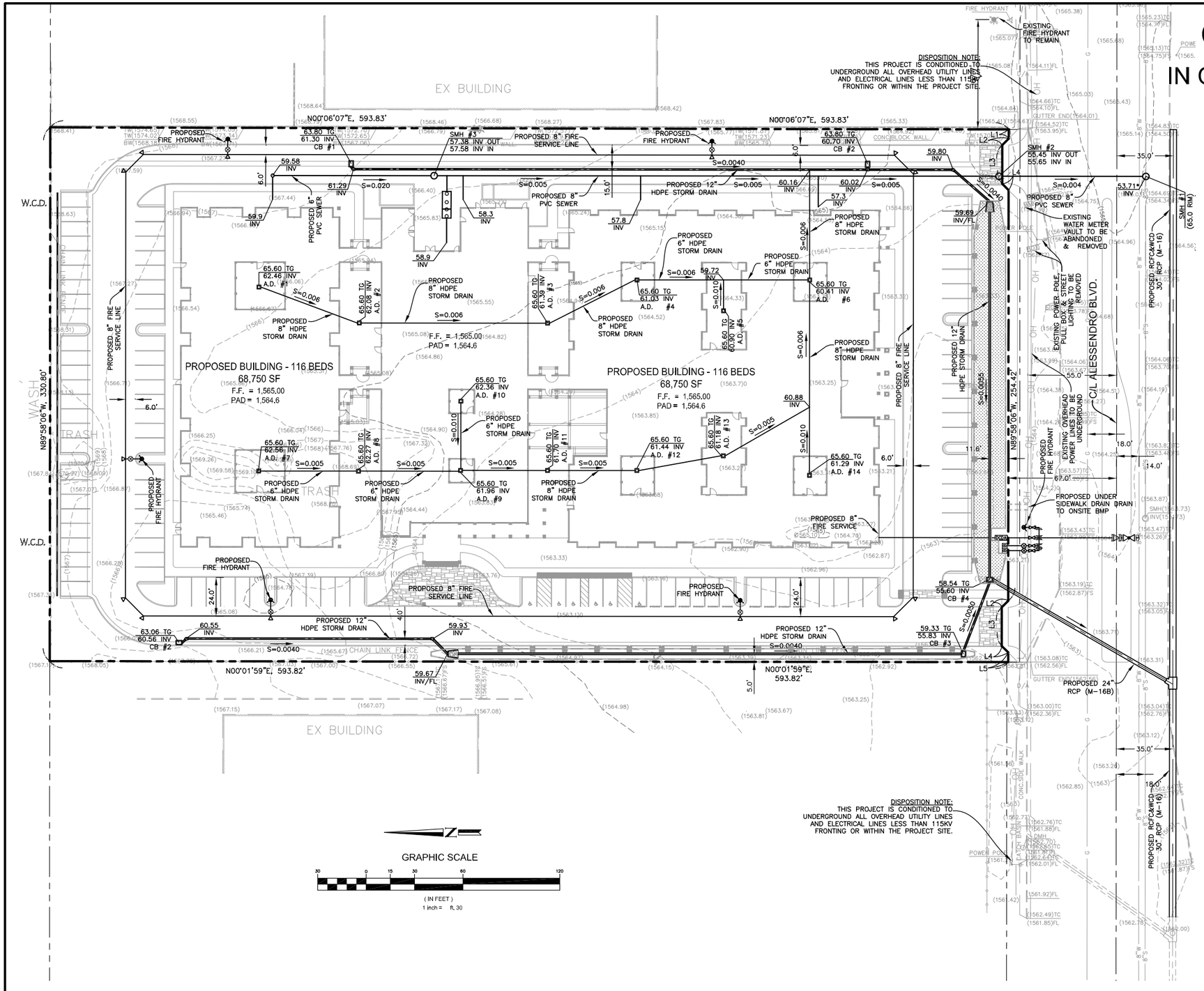
CITY OF MORENO VALLEY, CALIFORNIA
CONCEPTUAL GRADING & DRAINAGE PLAN

DRAWN BY: WW STAFF	SKILLED NURSING FACILITY NORTH CORNER SIDE OF ALESSANDRA BLVD.	SCALE: AS SHOWN
DESIGNED BY: WW STAFF	CONCEPTUAL GRADING & DRAINAGE PLAN	DATE: 03/15/2018
CHECKED BY: W.L.	APPROVED BY: CITY ENGINEER R.C.E.	

Attachment: Preliminary Grading Plan (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED

CONCEPTUAL UTILITY PLAN

IN CITY OF MORENO VALLEY, RIVERSIDE
SKILLED NURSING FACILITY



DISPOSITION NOTE:
THIS PROJECT IS CONDITIONED TO UNDERGROUND ALL OVERHEAD UTILITY LINES AND ELECTRICAL LINES LESS THAN 115KV FRONTING OR WITHIN THE PROJECT SITE.

DISPOSITION NOTE:
THIS PROJECT IS CONDITIONED TO UNDERGROUND ALL OVERHEAD UTILITY LINES AND ELECTRICAL LINES LESS THAN 115KV FRONTING OR WITHIN THE PROJECT SITE.

LEGEND

- PROPERTY BOUNDARY
- LOT LINE
- CENTERLINE
- OFFSITE R/W
- EASEMENT LINE
- SD — STORM DRAIN
- S — SEWER LINE
- W — WATER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WATER
- PROPOSED SEWER
- EXISTING FIRE HYDRANT
- WV — WATER VALVE
- PP — POWER POLE
- WM — WATER METER
- PB — PULL-BOX
- CO — SEWER CLEAN-OUT
- EXISTING STREET SIGNAL
- PARKING LIGHT
- IRR. WM — IRRIGATION WATER METER
- DDC — DOUBLE DETECTOR CHECK VAVLE
- SMH — SEWER MANHOLE
- CB — CATCH BASIN
- FDC — FIRE DETECTOR CHECK VAVLE

UTILITY & SERVICE AGENCIES:

WATER/SEWER
EASTERN MUNICIPAL/WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CA 92572-8300
(951) 928-3777

ELECTRIC
SOUTHERN CALIFORNIA EDISON
(800) 684-8123

TELEPHONE
VERIZON TELEPHONE

GAS
THE GAS COMPANY
(800) 427-2200

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

REGISTERED PROFESSIONAL ENGINEER — REJIONG LIU — No. 66242 Exp. 06-30-20 — CIVIL — STATE OF CALIFORNIA

CITY OF MORENO VALLEY, CALIFORNIA
CONCEPTUAL GRADING & DRAINAGE PLAN

DRAWN BY: WW STAFF	SKILLED NURSING FACILITY NORTH CORNER SIDE OF ALESSANDRA BLVD.	SCALE: AS SHOWN
DESIGNED BY: WW STAFF	**CONCEPTUAL UTILITY PLAN**	DATE: 03/15/2018
CHECKED BY: W.L.	APPROVED BY: CITY ENGINEER R.C.E.	

Attachment: Preliminary Grading Plan (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED

Moreno Valley Skilled Nursing Facility

AIR QUALITY IMPACT ANALYSIS

CITY OF MORENO VALLEY

PREPARED BY:

Haseeb Qureshi
hqureshi@urbanxroads.com
(949) 336-5987

Kevin Bolland
kbolland@urbanxroads.com
(949) 336-5994

JUNE 6, 2018

TABLE OF CONTENTS

APPENDICES

LIST OF EXHIBITS

LIST OF TABLES

LIST OF ABBREVIATED TERMS

(1)	Reference
µg/m3	Microgram per Cubic Meter
AADT	Annual Average Daily Trips
AQIA	Air Quality Impact Analysis
AQMD	Air Quality Management District
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
BACM	Best Available Control Measures
CAA	Federal Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
DPM	Diesel Particulate Matter
EPA	Environmental Protection Agency
LST	Localized Significance Threshold
NAAQS	National Ambient Air Quality Standards
NO2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
Pb	Lead
PM10	Particulate Matter 10 microns in diameter or less
PM2.5	Particulate Matter 2.5 microns in diameter or less
PPM	Parts Per Million
Project	Moreno Valley Skilled Nursing Facility
ROG	Reactive Organic Gases
SCAB	South Coast Air Basin
SCAQMD	South Coast Air Quality Management District
SIPs	State Implementation Plans
SRA	Source Receptor Area
TAC	Toxic Air Contaminant
TIA	Traffic Impact Analysis

TOG	Total Organic Gases
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VPH	Vehicles Per Hour

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EXECUTIVE SUMMARY

ES-1 CONSTRUCTION-SOURCE EMISSIONS

REGIONAL IMPACTS

For regional emissions, the Project would not exceed the numerical thresholds of significance established by the South Coast Air Quality Management District (SCAQMD). It should be noted that impacts without mitigation take credit for reductions achieved through standard regulatory requirements (Rule 403 and Rule 1113). Project construction-source emissions would not exceed the applicable SCAQMD thresholds of significance. Therefore, a less than significant impact would occur.

Localized Impacts

The Project would not exceed the SCAQMD's localized significance thresholds. Thus, a less than significant impact would occur for Project localized construction-source emissions.

Project construction-source emissions would not conflict with the applicable Air Quality Management Plan (AQMP).

ODORS

Established requirements addressing construction equipment operations, and construction material use, storage, and disposal requirements act to minimize odor impacts that may result from construction activities. Moreover, construction-source odor emissions would be temporary, short-term, and intermittent in nature and would not result in persistent impacts that would affect substantial numbers of people. Potential construction-source odor impacts are therefore considered less-than-significant.

The results of this Moreno Valley Skilled Nursing Facility Air Quality Impact Analysis are summarized in table ES-1.

ES-2 OPERATIONAL-SOURCE EMISSIONS

REGIONAL IMPACTS

For regional emissions, the Project would not exceed the numerical thresholds of significance established by the SCAQMD. Thus a less than significant impact would occur for Project-related operational-source emissions and no mitigation is required.

LOCALIZED IMPACTS

Due to lack of significant stationary source emissions, no long-term localized significance threshold analysis is needed. Therefore, sensitive receptors would not be adversely affected during Project construction, nor as the result of Project operations. The proposed Project would not result in a significant CO "hotspot" as a result of Project related traffic during ongoing operations, nor would the Project result in a significant adverse health impact as discussed in

Section 3.8, thus a less than significant impact to sensitive receptors during operational activity is expected.

ODORS

Substantial odor-generating sources include land uses such as agricultural activities, feedlots, wastewater treatment facilities, landfills or various heavy industrial uses. The Project does not propose any such uses or activities that would result in potentially significant operational-source odor impacts. Potential sources of operational odors generated by the Project would include disposal of miscellaneous residential refuse. Moreover, SCAQMD Rule 402 acts to prevent occurrences of odor nuisances (1) . Consistent with City requirements, all Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with solid waste regulations. Potential operational-source odor impacts are therefore considered less-than-significant.

The results of this Moreno Valley Skilled Nursing Facility Air Quality Impact Analysis are summarized below:

TABLE ES-1: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Construction Emissions	3.4	*Less Than Significant*	*n/a*
Operational Emissions	3.5	*Less Than Significant*	*n/a*
CO "Hot Spot" Analysis	3.8	*Less Than Significant*	*n/a*
Air Quality Management Plan	3.9	*Less Than Significant*	*n/a*
Sensitive Receptors	3.10	*Less Than Significant*	*n/a*
Odors	3.11	*Less Than Significant*	*n/a*
Cumulative Impacts	3.12	*Less Than Significant*	*n/a*

1 INTRODUCTION

This report presents the results of the air quality impact analysis (AQIA) prepared by Urban Crossroads, Inc., for the Moreno Valley Skilled Nursing Facility (referred to as "Project").

The purpose of this AQIA is to evaluate the potential impacts to air quality associated with construction and operation of the proposed Project and recommend measures to mitigate impacts considered potentially significant in comparison to established air district thresholds.

1.1 SITE LOCATION

The proposed Project site is located on the north side of Allessandro Boulevard, west of Kitching Street (APN 479230018) in the City of Moreno Valley.

1.2 PROJECT DESCRIPTION

The Project proposes the development of an 88 dwelling unit assisted living facility on a 4.54-acre parcel, as shown on Exhibit 1-A. For the purposes of this AQIA, it is assumed that the Project will be constructed and at full occupancy in 2020.

1.3 STANDARD REGULATORY REQUIREMENTS/BEST AVAILABLE CONTROL MEASURES (BACMS)

Measures listed below (or equivalent language) shall appear on all Project grading plans, construction specifications and bid documents, and the City shall ensure such language is incorporated prior to issuance of any development permits.

SCAQMD Rules that are currently applicable during construction activity for this Project include but are not limited to: Rule 1113 (Architectural Coatings) (2); Rule 431.2 (Low Sulfur Fuel); Rule 403 (Fugitive Dust) (3); and Rule 1186 / 1186.1 (Street Sweepers) (4). It should be noted that BACMs are not mitigation as they are standard regulatory requirements.

BACM AQ-1

All applicable measures shall be incorporated into Project plans and specifications as implementation of Rule 403, which include but are not limited to (3):

- All clearing, grading, earth-moving, or excavation activities shall cease when winds exceed 25 mph per SCAQMD guidelines in order to limit fugitive dust emissions.
- The contractor shall ensure that all disturbed unpaved roads and disturbed areas within the Project are watered at least three (3) times daily during dry weather. Watering, with complete coverage of disturbed areas, shall occur at least three times a day, preferably in the mid-morning, afternoon, and after work is done for the day.
- The contractor shall ensure that traffic speeds on unpaved roads and Project site areas are reduced to 15 miles per hour or less.

BACM AQ-2

The following measures shall be incorporated into Project plans and specifications as implementation of Rule 1113 (5):

- In order to limit the VOC content of architectural coatings used in the SCAB, architectural coatings shall be no more than a low VOC default level of 50 g/L unless otherwise specified in the SCAQMD Table of Standards (pg. 32-33).

1.4 Construction-Source Mitigation Measures

Construction-source emissions will be less than significant. Therefore, no mitigation measures are required.

1.5 Operational-Source Mitigation Measures

Operational-source emissions will be less than significant. Therefore, no mitigation measures are required.

EXHIBIT 1-A: SITE PLAN

PROJECT STATISTICS

APPLICANT/PROPERTY OWNER:
WILLIAM CHU
T&C INTERNATIONAL HEALTH, INC.
4186 RIVERSIDE DR.
CHINO, CA 91710
(626)689-9393

SITE DATA

PROJECT ADDRESS:	N/A
PARCEL NUMBER:	479-230-018
EXISTING ZONING:	R-10
SITE AREA:	4.54 ACRES (197,762.4 S.F.)
OPEN SPACE:	13.7%
LANDSCAPING:	21.6%
LOT COVERAGE:	34.8%

BUILDING DATA

OCCUPANCY:	I-2, SKILLED NURSING FACILITY
CONSTRUCTION TYPE:	TYPE V-A, ONE-HOUR, FIRE SPRINKLERED
STORIES:	1-STORY, ROUGHLY 24' HEIGHT MAX.

BUILDING AREA

BUILDING 100	16,970 SF
BUILDING 200	33,440 SF
BUILDING 300	18,340 SF
TOTAL BUILDING AREA:	68,750 SF

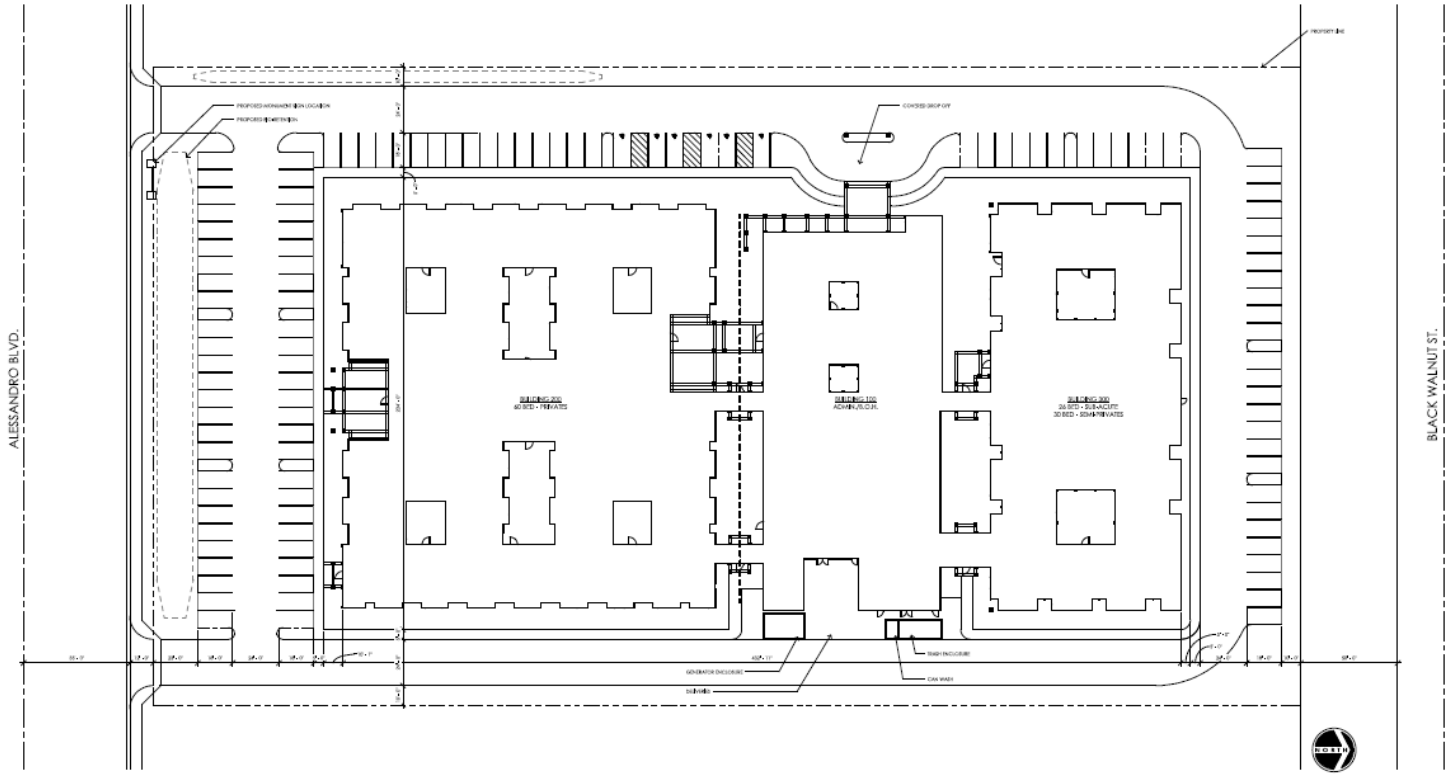
NUMBER OF BEDS

SEMI-PRIVATE: 2-BED	15 ROOMS X 2	30 BEDS
SEMI-PRIVATE SUB-ACUTE: 2-BED	13 ROOMS X 2	26 BEDS
PRIVATE: 1-BED	60 ROOMS X 1	60 BEDS
TOTAL BED COUNT:	88 ROOMS	116 BEDS

PARKING TABULATION

REQUIRED PARKING:	
1/3 SPACES X 116 BEDS =	39 SPACES
PROPOSED PARKING:	
STANDARD SPACES	106 SPACES
HANDICAP SPACES	6 SPACES
TOTAL:	112 SPACES

VACINITY MAP



OVERALL SITE PLAN

MORENO VALLEY SKILLED NURSING FACILITY
T&C INTERNATIONAL HEALTH, INC.

SD-1
04/16/18
GREGG MAEDO + ASSOCIATES

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2 AIR QUALITY SETTING

This section provides an overview of the existing air quality conditions in the Project area and region.

2.1 SOUTH COAST AIR BASIN

The Project site is located in the South Coast Air Basin (SCAB) within the jurisdiction of SCAQMD (6). The SCAQMD was created by the 1977 Lewis-Presley Air Quality Management Act, which merged four county air pollution control bodies into one regional district. Under the Act, the SCAQMD is responsible for bringing air quality in areas under its jurisdiction into conformity with federal and state air quality standards. As discussed above, the Project site is located within the South Coast Air Basin, a 6,745-square mile subregion of the SCAQMD, which includes portions of Los Angeles, Riverside, and San Bernardino Counties, and all of Orange County. The larger South Coast district boundary includes 10,743 square miles.

The SCAB is bound by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Los Angeles County portion of the Mojave Desert Air Basin is bound by the San Gabriel Mountains to the south and west, the Los Angeles / Kern County border to the north, and the Los Angeles / San Bernardino County border to the east. The Riverside County portion of the Salton Sea Air Basin is bound by the San Jacinto Mountains in the west and spans eastward up to the Palo Verde Valley.

2.2 REGIONAL CLIMATE

The regional climate has a substantial influence on air quality in the SCAB. In addition, the temperature, wind, humidity, precipitation, and amount of sunshine influence the air quality.

The annual average temperatures throughout the SCAB vary from the low to middle 60s (degrees Fahrenheit). Due to a decreased marine influence, the eastern portion of the SCAB shows greater variability in average annual minimum and maximum temperatures. January is the coldest month throughout the SCAB, with average minimum temperatures of 47°F in downtown Los Angeles and 36°F in San Bernardino. All portions of the SCAB have recorded maximum temperatures above 100°F.

Although the climate of the SCAB can be characterized as semi-arid, the air near the land surface is quite moist on most days because of the presence of a marine layer. This shallow layer of sea air is an important modifier of SCAB climate. Humidity restricts visibility in the SCAB, and the conversion of sulfur dioxide to sulfates is heightened in air with high relative humidity. The marine layer provides an environment for that conversion process, especially during the spring and summer months. The annual average relative humidity within the SCAB is 71 percent along the coast and 59 percent inland. Since the ocean effect is dominant, periods of heavy early morning fog are frequent and low stratus clouds are a characteristic feature. These effects decrease with distance from the coast.

More than 90 percent of the SCAB's rainfall occurs from November through April. The annual average rainfall varies from approximately nine inches in Riverside to fourteen inches in downtown Los Angeles. Monthly and yearly rainfall totals are extremely variable. Summer rainfall usually consists of widely scattered thunderstorms near the coast and slightly heavier shower activity in the eastern portion of the SCAB with frequency being higher near the coast.

Due to its generally clear weather, about three-quarters of available sunshine is received in the SCAB. The remaining one-quarter is absorbed by clouds. The ultraviolet portion of this abundant radiation is a key factor in photochemical reactions. On the shortest day of the year there are approximately 10 hours of possible sunshine, and on the longest day of the year there are approximately 14 1/2 hours of possible sunshine.

The importance of wind to air pollution is considerable. The direction and speed of the wind determines the horizontal dispersion and transport of the air pollutants. During the late autumn to early spring rainy season, the SCAB is subjected to wind flows associated with the traveling storms moving through the region from the northwest. This period also brings five to ten periods of strong, dry offshore winds, locally termed "Santa Anas" each year. During the dry season, which coincides with the months of maximum photochemical smog concentrations, the wind flow is bimodal, typified by a daytime onshore sea breeze and a nighttime offshore drainage wind. Summer wind flows are created by the pressure differences between the relatively cold ocean and the unevenly heated and cooled land surfaces that modify the general northwesterly wind circulation over southern California. Nighttime drainage begins with the radiational cooling of the mountain slopes. Heavy, cool air descends the slopes and flows through the mountain passes and canyons as it follows the lowering terrain toward the ocean. Another characteristic wind regime in the SCAB is the "Catalina Eddy," a low level cyclonic (counterclockwise) flow centered over Santa Catalina Island which results in an offshore flow to the southwest. On most spring and summer days, some indication of an eddy is apparent in coastal sections.

In the SCAB, there are two distinct temperature inversion structures that control vertical mixing of air pollution. During the summer, warm high-pressure descending (subsiding) air is undercut by a shallow layer of cool marine air. The boundary between these two layers of air is a persistent marine subsidence/inversion. This boundary prevents vertical mixing which effectively acts as an impervious lid to pollutants over the entire SCAB. The mixing height for the inversion structure is normally situated 1,000 to 1,500 feet above mean sea level.

A second inversion-type forms in conjunction with the drainage of cool air off the surrounding mountains at night followed by the seaward drift of this pool of cool air. The top of this layer forms a sharp boundary with the warmer air aloft and creates nocturnal radiation inversions. These inversions occur primarily in the winter, when nights are longer and onshore flow is weakest. They are typically only a few hundred feet above mean sea level. These inversions effectively trap pollutants, such as NOX and CO from vehicles, as the pool of cool air drifts seaward. Winter is therefore a period of high levels of primary pollutants along the coastline.

2.3 WIND PATTERNS AND PROJECT LOCATION

The distinctive climate of the Project area and the SCAB is determined by its terrain and geographical location. The Basin is located in a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean in the southwest quadrant with high mountains forming the remainder of the perimeter.

Wind patterns across the south coastal region are characterized by westerly and southwesterly on-shore winds during the day and easterly or northeasterly breezes at night. Winds are characteristically light although the speed is somewhat greater during the dry summer months than during the rainy winter season.

2.4 BACKGROUND AIR QUALITY

Criteria pollutants are pollutants that are regulated through the development of human health based and/or environmentally based criteria for setting permissible levels. Criteria pollutants, their typical sources, and effects are identified below:

- Carbon Monoxide (CO): Is a colorless, odorless gas produced by the incomplete combustion of carbon-containing fuels, such as gasoline or wood. CO concentrations tend to be the highest during the winter morning, when little to no wind and surface-based inversions trap the pollutant at ground levels. Because CO is emitted directly from internal combustion engines, unlike ozone, motor vehicles operating at slow speeds are the primary source of CO in the Basin. The highest ambient CO concentrations are generally found near congested transportation corridors and intersections.
- Sulfur Dioxide (SO2): Is a colorless, extremely irritating gas or liquid. It enters the atmosphere as a pollutant mainly as a result of burning high sulfur-content fuel oils and coal and from chemical processes occurring at chemical plants and refineries. When SO2 oxidizes in the atmosphere, it forms sulfates (SO4). Collectively, these pollutants are referred to as sulfur oxides (SOX).
- Nitrogen Oxides (Oxides of Nitrogen, or NOx): Nitrogen oxides (NOx) consist of nitric oxide (NO), nitrogen dioxide (NO2) and nitrous oxide (N2O) and are formed when nitrogen (N2) combines with oxygen (O2). Their lifespan in the atmosphere ranges from one to seven days for nitric oxide and nitrogen dioxide, to 170 years for nitrous oxide. Nitrogen oxides are typically created during combustion processes, and are major contributors to smog formation and acid deposition. NO2 is a criteria air pollutant, and may result in numerous adverse health effects; it absorbs blue light, resulting in a brownish-red cast to the atmosphere and reduced visibility. Of the seven types of nitrogen oxide compounds, NO2 is the most abundant in the atmosphere. As ambient concentrations of NO2 are related to traffic density, commuters in heavy traffic may be exposed to higher concentrations of NO2 than those indicated by regional monitors.
- Ozone (O3): Is a highly reactive and unstable gas that is formed when volatile organic compounds (VOCs) and nitrogen oxides (NOX), both byproducts of internal combustion engine exhaust, undergo slow photochemical reactions in the presence of sunlight. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable to the formation of this pollutant.
- PM10 (Particulate Matter less than 10 microns): A major air pollutant consisting of tiny solid or liquid particles of soot, dust, smoke, fumes, and aerosols. The size of the particles (10 microns or

smaller, about 0.0004 inches or less) allows them to easily enter the lungs where they may be deposited, resulting in adverse health effects. PM10 also causes visibility reduction and is a criteria air pollutant.

- PM2.5 (Particulate Matter less than 2.5 microns): A similar air pollutant consisting of tiny solid or liquid particles which are 2.5 microns or smaller (which is often referred to as fine particles). These particles are formed in the atmosphere from primary gaseous emissions that include sulfates formed from SO2 release from power plants and industrial facilities and nitrates that are formed from NOX release from power plants, automobiles and other types of combustion sources. The chemical composition of fine particles highly depends on location, time of year, and weather conditions. PM2.5 is a criteria air pollutant.
- Volatile Organic Compounds (VOC): Volatile organic compounds are hydrocarbon compounds (any compound containing various combinations of hydrogen and carbon atoms) that exist in the ambient air. VOCs contribute to the formation of smog through atmospheric photochemical reactions and/or may be toxic. Compounds of carbon (also known as organic compounds) have different levels of reactivity; that is, they do not react at the same speed or do not form ozone to the same extent when exposed to photochemical processes. VOCs often have an odor, and some examples include gasoline, alcohol, and the solvents used in paints. Exceptions to the VOC designation include: carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate. VOCs are a criteria pollutant since they are a precursor to O3, which is a criteria pollutant. The SCAQMD uses the terms VOC and ROG (see below) interchangeably.
- Reactive Organic Gases (ROG): Similar to VOC, Reactive Organic Gases (ROG) are also precursors in forming ozone. Smog is formed when ROG and nitrogen oxides react in the presence of sunlight. ROGs are a criteria pollutant since they are a precursor to O3, which is a criteria pollutant. The SCAQMD uses the terms ROG and VOC (see previous) interchangeably.
- Lead (Pb): Lead is a heavy metal that is highly persistent in the environment. In the past, the primary source of lead in the air was emissions from vehicles burning leaded gasoline. As a result of the removal of lead from gasoline, there have been no violations at any of the SCAQMD's regular air monitoring stations since 1982. Currently, emissions of lead are largely limited to stationary sources such as lead smelters. It should be noted that the Project is not anticipated to generate a quantifiable amount of lead emissions. Lead is a criteria air pollutant.

Health Effects of Air Pollutants

Ozone

Individuals exercising outdoors, children, and people with preexisting lung disease, such as asthma and chronic pulmonary lung disease, are considered to be the most susceptible sub-groups for ozone effects. Short-term exposure (lasting for a few hours) to ozone at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Elevated ozone levels are associated with increased school absences. In recent years, a correlation between elevated ambient ozone levels and increases in daily hospital admission rates, as well as mortality, has also been reported. An increased risk for asthma has been found in children who participate in multiple sports and live in communities with high ozone levels.

Ozone exposure under exercising conditions is known to increase the severity of the responses described above. Animal studies suggest that exposure to a combination of pollutants that includes ozone may be more toxic than exposure to ozone alone. Although lung volume and resistance changes observed after a single exposure diminish with repeated exposures, biochemical and cellular changes appear to persist, which can lead to subsequent lung structural changes.

Carbon Monoxide

Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of decreased oxygen supply to the heart. Inhaled CO has no direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport and competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, conditions with an increased demand for oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include fetuses, patients with diseases involving heart and blood vessels, and patients with chronic hypoxemia (oxygen deficiency) as seen at high altitudes.

Reduction in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO, resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels; these include pre-term births and heart abnormalities.

Particulate Matter

A consistent correlation between elevated ambient fine particulate matter (PM10 and PM2.5) levels and an increase in mortality rates, respiratory infections, number and severity of asthma attacks and the number of hospital admissions has been observed in different parts of the United States and various areas around the world. In recent years, some studies have reported an association between long-term exposure to air pollution dominated by fine particles and increased mortality, reduction in life-span, and an increased mortality from lung cancer.

Daily fluctuations in PM2.5 concentration levels have also been related to hospital admissions for acute respiratory conditions in children, to school and kindergarten absences, to a decrease in respiratory lung volumes in normal children, and to increased medication use in children and adults with asthma. Recent studies show lung function growth in children is reduced with long-term exposure to particulate matter.

The elderly, people with pre-existing respiratory or cardiovascular disease, and children appear to be more susceptible to the effects of high levels of PM10 and PM2.5.

Nitrogen Dioxide

Population-based studies suggest that an increase in acute respiratory illness, including infections and respiratory symptoms in children (not infants), is associated with long-term exposure to NO2 at levels found in homes with gas stoves, which are higher than ambient levels found in Southern California. Increase in resistance to air flow and airway contraction is observed after short-term

exposure to NO2 in healthy subjects. Larger decreases in lung functions are observed in individuals with asthma or chronic obstructive pulmonary disease (e.g., chronic bronchitis, emphysema) than in healthy individuals, indicating a greater susceptibility of these sub-groups.

In animals, exposure to levels of NO2 considerably higher than ambient concentrations results in increased susceptibility to infections, possibly due to the observed changes in cells involved in maintaining immune functions. The severity of lung tissue damage associated with high levels of ozone exposure increases when animals are exposed to a combination of ozone and NO2.

Sulfur Dioxide

A few minutes of exposure to low levels of SO2 can result in airway constriction in some asthmatics, all of whom are sensitive to its effects. In asthmatics, increase in resistance to air flow, as well as reduction in breathing capacity leading to severe breathing difficulties, are observed after acute exposure to SO2. In contrast, healthy individuals do not exhibit similar acute responses even after exposure to higher concentrations of SO2.

Animal studies suggest that despite SO2 being a respiratory irritant, it does not cause substantial lung injury at ambient concentrations. However, very high levels of exposure can cause lung edema (fluid accumulation), lung tissue damage, and sloughing off of cells lining the respiratory tract.

Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient SO2 levels. In these studies, efforts to separate the effects of SO2 from those of fine particles have not been successful. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.

Lead

Fetuses, infants, and children are more sensitive than others to the adverse effects of Pb exposure. Exposure to low levels of Pb can adversely affect the development and function of the central nervous system, leading to learning disorders, distractibility, inability to follow simple commands, and lower intelligence quotient. In adults, increased Pb levels are associated with increased blood pressure.

Pb poisoning can cause anemia, lethargy, seizures, and death; although it appears that there are no direct effects of Pb on the respiratory system. Pb can be stored in the bone from early age environmental exposure, and elevated blood Pb levels can occur due to breakdown of bone tissue during pregnancy, hyperthyroidism (increased secretion of hormones from the thyroid gland) and osteoporosis (breakdown of bony tissue). Fetuses and breast-fed babies can be exposed to higher levels of Pb because of previous environmental Pb exposure of their mothers.

Odors

The science of odor as a health concern is still new. Merely identifying the hundreds of VOCs that cause odors poses a big challenge. Offensive odors can potentially affect human health in several ways. First, odorant compounds can irritate the eye, nose, and throat, which can reduce respiratory volume. Second, studies have shown that the VOCs that cause odors can stimulate

sensory nerves to cause neurochemical changes that might influence health, for instance, by compromising the immune system. Finally, unpleasant odors can trigger memories or attitudes linked to unpleasant odors, causing cognitive and emotional effects such as stress.

2.5 EXISTING AIR QUALITY

Existing air quality is measured at established SCAQMD air quality monitoring stations. Monitored air quality is evaluated and in the context of ambient air quality standards. These standards are the levels of air quality that are considered safe, with an adequate margin of safety, to protect the public health and welfare. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) currently in effect, as well health effects of each pollutant regulated under these standards are shown in Table 2-1 (7).

The determination of whether a region's air quality is healthful or unhealthful is determined by comparing contaminant levels in ambient air samples to the state and federal standards presented in Table 2-1. The air quality in a region is considered to be in attainment by the state if the measured ambient air pollutant levels for O3, CO (except 8-hour Lake Tahoe), SO2, NO2, PM10, PM2.5, and visible reducing particles are not to be exceeded at any time in any consecutive three-year period; all other values are not to be equaled or exceeded. The air quality in a region is considered to be in attainment by federal standards if the measured ambient air pollutant levels for O3, PM10, PM2.5, and those based on annual averages or arithmetic mean are not exceeded more than once per year. The O3 standard is attained when the fourth highest eight-hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of says per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

TABLE 2-1: AMBIENT AIR QUALITY STANDARDS (1 OF 2)

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

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TABLE 2-1: AMBIENT AIR QUALITY STANDARDS (1 OF 2)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.
8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

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2.6 REGIONAL AIR QUALITY

The SCAQMD monitors levels of various criteria pollutants at 38 permanent monitoring stations and 5 single-pollutant source Lead (Pb) air monitoring sites throughout the air district (8). In 2015, the federal and state ambient air quality standards (NAAQS and CAAQS) were exceeded on one or more days for ozone, PM10, and PM2.5 at most monitoring locations (9). No areas of the SCAB exceeded federal or state standards for NO2, SO2, CO, sulfates or lead. See Table 2-2, for attainment designations for the SCAB (10) (11). Appendix 2.1 provides geographic representation of the state and federal attainment status for applicable criteria pollutants within the SCAB.

TABLE 2-2: ATTAINMENT STATUS OF CRITERIA POLLUTANTS IN THE SOUTH COAST AIR BASIN (SCAB)

Criteria Pollutant	State Designation	Federal Designation
Ozone - 1hour standard	Nonattainment	Nonattainment ("extreme")
Ozone - 8 hour standard	Nonattainment	Nonattainment ("extreme")
PM_{10}	Nonattainment	Attainment (Maintenance)
$PM_{2.5}$	Nonattainment	Nonattainment ("serious")
Carbon Monoxide	Attainment	Attainment (Maintenance)
Nitrogen Dioxide	Attainment	Unclassifiable/Attainment
Sulfur Dioxide	Attainment	Unclassifiable/Attainment
Lead[1]	Attainment	Nonattainment (Partial)

Source: State/Federal designations were taken from http://www.arb.ca.gov/desig/adm/adm.htm
Note: See Appendix 2.1 for a detailed map of State/National Area Designations within the South Coast Air Basin
* Part of a maintenance plan. The Federal Clean Air Act requires maintenance plans for areas that have been redesignated as attainment areas.

2.7 LOCAL AIR QUALITY

Relative to the Project site, the nearest long-term air quality monitoring site for Ozone (O_3) and Particulate Matter ≤ 10 Microns (PM_{10}) is the South Coast Air Quality Management District Perris monitoring station (SRA 24), located approximately 8.8 miles south of the Project site (12). The nearest long-term air quality monitoring site in relation to the project for Carbon Monoxide (CO), and Nitrogen Dioxide (NO_2) is carried out by the South Coast Air Quality Management District (SCAQMD) at the Lake Elsinore monitoring station (SRA 25) located approximately 17.5 miles southwest of the project site. Data for Particulate Matter ≤ 2.5 Microns ($PM_{2.5}$) was obtained from the Metropolitan Riverside County 2 monitoring station (SRA 23), located approximately 13 miles northwest of the project site. It should be noted that the Lake Elsinore and Metropolitan Riverside County 2 monitoring stations were utilized in lieu of the Perris monitoring station only where data was not available from the nearest monitoring site.

The most recent three (3) years of data available is shown on Table 2-3, and identifies the number of days ambient air quality standards were exceeded for the study area, which is was considered

[1] The Federal nonattainment designation for lead is only applicable towards the Los Angeles County portion of the SCAB.

to be representative of the local air quality at the Project site (13). Additionally, data for SO2 has been omitted as attainment is regularly met in the South Coast Air Basin and few monitoring stations measure SO2 concentrations. It should be noted that the table below is provided for informational purposes.

TABLE 2-3: PROJECT AREA AIR QUALITY MONITORING SUMMARY 2014-2016

POLLUTANT	STANDARD	YEAR		
		2014	2015	2016
Ozone (O_3)				
Maximum 1-Hour Concentration (ppm)		0.117	0.124	0.131
Maximum 8-Hour Concentration (ppm)		0.094	0.102	0.098
Number of Days Exceeding State 1-Hour Standard	> 0.09 ppm	16	25	23
Number of Days Exceeding State 8-Hour Standard	> 0.07 ppm	63	50	56
Number of Days Exceeding Federal 8-Hour Standard	> 0.07 ppm	38	31	55
Number of Days Exceeding Health Advisory	≥ 0.15 ppm	0	0	0
Carbon Monoxide (CO)				
Maximum 1-Hour Concentration (ppm)		2.0	0.8	1.2
Maximum 8-Hour Concentration (ppm)		1.4	0.6	0.6
Number of Days Exceeding State 1-Hour Standard	> 20 ppm	0	0	0
Number of Days Exceeding Federal / State 8-Hour Standard	> 9.0 ppm	0	0	0
Number of Days Exceeding Federal 1-Hour Standard	> 35 ppm	0	0	0
Nitrogen Dioxide (NO_2)				
Maximum 1-Hour Concentration (ppm)		0.045	0.047	0.051
Annual Arithmetic Mean Concentration (ppm)		0.008	0.009	0.02
Number of Days Exceeding State 1-Hour Standard	> 0.18 ppm	0	0	0
Particulate Matter ≤ 10 Microns (PM_{10})				
Maximum 24-Hour Concentration (µg/m^3)		87	74	76
Annual Arithmetic Mean (µg/m^3)		35.1	30.3	32.2
Number of Samples		60	57	57
Number of Samples Exceeding State Standard	> 50 µg/m^3	6	3	5
Number of Samples Exceeding Federal Standard	> 150 µg/m^3	0	0	0
Particulate Matter ≤ 2.5 Microns ($PM_{2.5}$)				
Maximum 24-Hour Concentration (µg/m^3)		30.9	--	45.64
Annual Arithmetic Mean (µg/m^3)		16.5	--	14.02
Number of Samples Exceeding Federal 24-Hour Standard	> 35 µg/m^3	0	--	6

-- = data not available from SCAQMD or ARB
Source: SCAQMD's Air Quality Data Tables and ARB's iADAM Top 4 Summary

2.7 REGULATORY BACKGROUND

2.7.1 FEDERAL REGULATIONS

The U.S. EPA is responsible for setting and enforcing the NAAQS for O3, CO, NOx, SO2, PM10, PM2.5, and lead (14). The U.S. EPA has jurisdiction over emissions sources that are under the authority of the federal government including aircraft, locomotives, and emissions sources outside state waters (Outer Continental Shelf). The U.S. EPA also establishes emission standards for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission requirements of the CARB.

The Federal Clean Air Act (CAA) was first enacted in 1955, and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, and 1990). The CAA establishes the federal air quality standards, the NAAQS, and specifies future dates for achieving compliance (15). The CAA also mandates that states submit and implement State Implementation Plans (SIPs) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met.

The 1990 amendments to the CAA that identify specific emission reduction goals for areas not meeting the NAAQS require a demonstration of reasonable further progress toward attainment and incorporate additional sanctions for failure to attain or to meet interim milestones. The sections of the CAA most directly applicable to the development of the Project site include Title I (Non-Attainment Provisions) and Title II (Mobile Source Provisions). Title I provisions were established with the goal of attaining the NAAQS for the following criteria pollutants O3, NO2, SO2, PM10, CO, PM2.5, and lead. The NAAQS were amended in July 1997 to include an additional standard for O3 and to adopt a NAAQS for PM2.5. Table 2-1 (previously presented) provides the NAAQS within the basin.

Mobile source emissions are regulated in accordance with Title II provisions. These provisions require the use of cleaner burning gasoline and other cleaner burning fuels such as methanol and natural gas. Automobile manufacturers are also required to reduce tailpipe emissions of hydrocarbons and nitrogen oxides (NOx). NOx is a collective term that includes all forms of nitrogen oxides (NO, NO2, NO3) which are emitted as byproducts of the combustion process.

2.7.2 CALIFORNIA REGULATIONS

The CARB, which became part of the California EPA in 1991, is responsible for ensuring implementation of the California Clean Air Act (AB 2595), responding to the federal CAA, and for regulating emissions from consumer products and motor vehicles. The California CAA mandates achievement of the maximum degree of emissions reductions possible from vehicular and other mobile sources in order to attain the state ambient air quality standards by the earliest practical date. The CARB established the CAAQS for all pollutants for which the federal government has NAAQS and, in addition, establishes standards for sulfates, visibility, hydrogen sulfide, and vinyl chloride. However, at this time, hydrogen sulfide and vinyl chloride are not measured at any monitoring stations in the SCAB because they are not considered to be a regional air quality problem. Generally, the CAAQS are more stringent than the NAAQS (16) (14).

Local air quality management districts, such as the SCAQMD, regulate air emissions from commercial and light industrial facilities. All air pollution control districts have been formally designated as attainment or non-attainment for each CAAQS.

Non-attainment areas are required to prepare air quality management plans that include specified emission reduction strategies in an effort to meet clean air goals. These plans are required to include:

- Application of Best Available Retrofit Control Technology to existing sources;
- Developing control programs for area sources (e.g., architectural coatings and solvents) and indirect sources (e.g. motor vehicle use generated by residential and commercial development);
- A District permitting system designed to allow no net increase in emissions from any new or modified permitted sources of emissions;
- Implementing reasonably available transportation control measures and assuring a substantial reduction in growth rate of vehicle trips and miles traveled;
- Significant use of low emissions vehicles by fleet operators;
- Sufficient control strategies to achieve a five percent or more annual reduction in emissions or 15 percent or more in a period of three years for ROGs, NOx, CO and PM10. However, air basins may use alternative emission reduction strategy that achieves a reduction of less than five percent per year under certain circumstances.

2.7.3 Air Quality Management Planning

Currently, the NAAQS and CAAQS are exceeded in most parts of the SCAB. In response, the SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the state and federal ambient air quality standards (17). AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy. A detailed discussion on the AQMP and Project consistency with the AQMP is provided in Section 3.9.

2.8 Existing Project Site Air Quality Conditions

Existing air quality conditions at the Project site would generally reflect ambient monitored conditions as presented previously at Table 2-3.

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3 PROJECT AIR QUALITY IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will violate an air quality standard or contribute to an existing or projected air quality violation. Additionally, the Project has been evaluated to determine if it will result in a cumulatively considerable net increase of a criteria pollutant for which the SCAB is non-attainment under an applicable federal or state ambient air quality standard. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The criteria used to determine the significance of potential Project-related air quality impacts are taken from the Initial Study Checklist in Appendix G of the State CEQA Guidelines (14 California Code of Regulations §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to air quality if it would (18):

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute to an existing or projected air quality violation.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions, which exceed quantitative thresholds for ozone precursors).
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.

The SCAQMD has also developed regional and localized significance thresholds for other regulated pollutants, as summarized at Table 3-1 (19). The SCAQMD's CEQA Air Quality Significance Thresholds (March 2015) indicate that any projects in the SCAB with daily emissions that exceed any of the indicated thresholds should be considered as having an individually and cumulatively significant air quality impact.

TABLE 3-1: MAXIMUM DAILY EMISSIONS THRESHOLDS (1 OF 2)

Pollutant	Construction	Operations
Regional Thresholds		
NOx	100 lbs/day	55 lbs/day
VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
Sox	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day

TABLE 3-1: MAXIMUM DAILY EMISSIONS THRESHOLDS (2 OF 2)

Pollutant	Construction	Operations
Localized Thresholds		
NOx	118 lbs/day (grading)	n/a
CO	602 lbs/day (grading)	n/a
PM10	4 lbs/day (grading)	n/a
PM2.5	3 lb/day (grading)	n/a

3.3 PROJECT-RELATED SOURCES OF POTENTIAL IMPACT

Land uses such as the Project affect air quality through construction-source and operational-source emissions.

On October 17, 2017, the SCAQMD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model™ (CalEEMod™) v2016.3.2. The purpose of this model is to calculate construction-source and operational-source criteria pollutant (NO_x, VOC, PM_{10}, $PM_{2.5}$, SO_x, and CO) and greenhouse gas (GHG) emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (20). Accordingly, the latest version of CalEEMod™ has been used for this Project to determine construction and operational air quality emissions. Output from the model runs for both construction and operational activity are provided in Appendix 3.1.

3.4 CONSTRUCTION EMISSIONS

Construction activities associated with the Project will result in emissions of CO, VOCs, NOx, SOx, PM10, and PM2.5. Construction related emissions are expected from the following construction activities:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating
- Construction Workers Commuting

Construction is expected to commence in April of 2019 and will last through June of 2020. Construction duration by phase is shown on Table 3-2. The duration of construction activity was estimated based on CalEEMod model defaults, past project experience, and a 2020 opening year. It should be noted that residential developments typically construct several residential units at a time rather than constructing all units simultaneously. As a conservative measure, the duration of architectural coatings has been doubled to reflect the elongated schedule resulting from building the residential developments in batches. The construction schedule utilized in the

analysis, shown in Table 3-2, represents a "worst-case" analysis scenario should construction occur any time after the respective dates since emission factors for construction decrease as time passes and the analysis year increases due to emission regulations becoming more stringent.[2] The detailed summary of construction equipment, shown on Table 3-3, was estimated based on CalEEMod model defaults and past project experience. The site specific construction fleet may vary due to specific project needs at the time of construction. The duration of construction activity and associated equipment both represent a reasonable approximation of the expected construction fleet as required per CEQA guidelines. Please refer to specific detailed modeling inputs/outputs contained in Appendix 3.2 of this analysis.

Dust is typically a major concern during demolition and rough grading activities. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive emissions". Fugitive dust emissions rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). The CalEEMod model was utilized to calculate fugitive dust emissions resulting from this phase of activity. It is our understanding the Project will not require a demolition phase or the import or export of soil.

Construction emissions for construction worker vehicles traveling to and from the Project site, as well as vendor trips (construction materials delivered to the Project site) were estimated based on information CalEEMod model defaults.

TABLE 3-2: CONSTRUCTION DURATION

Phase Name	Start Date	End Date	Days
Site Preparation	4/8/2019	4/12/2019	5
Grading	4/13/2019	5/12/2019	30
Building Construction	5/13/2019	6/5/2020	390
Paving	12/1/2019	12/15/2019	15
Architectural Coating	1/1/2020	3/30/2020	90

[2] As shown in the California Emissions Estimator Model (CalEEMod) User's Guide Version 2016.3.2, Table 3.4 "OFFROAD Equipment Emission Factors" as the analysis year increases, emission factors for the same equipment pieces decrease due to the natural turnover of older equipment being replaced by newer less polluting equipment and new regulatory requirements.

TABLE 3-3: CONSTRUCTION EQUIPMENT

Activity	Equipment	Number	Hours Per Day
Site Preparation	Tractors/Loaders/Backhoes	2	8
Grading	Excavators	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
Building Construction	Cranes	1	8
	Generator Sets	1	8
	Tractors/Loaders/Backhoes	2	8
	Welders	1	8
Paving	Paving Equipment	2	8
	Tractors/Loaders/Backhoes	1	8
	Rollers	1	8
	Pavers	1	8
Architectural Coating	Air Compressors	1	8

OFF-SITE UTILITY, INFRASTRUCTURE, AND ON-SITE IMPROVEMENTS

Construction emissions associated with off-site utility, infrastructure, and on-site ancillary improvements may occur, however at this time, a specific schedule of activities is unknown. Notwithstanding, impacts associated with these potential activities are not expected to exceed the maximum daily emissions identified for other Project-related construction activities evaluated in this report. As such, no impacts beyond what has already been identified in this report are expected to occur.

3.4.1 CONSTRUCTION EMISSIONS SUMMARY

The SCAQMD Rules that are currently applicable during construction activity for this Project include but are not limited to: Rule 1113 (Architectural Coatings) (21); Rule 431.2 (Low Sulfur Fuel) (22); Rule 403 (Fugitive Dust) (23); and Rule 1186 / 1186.1 (Street Sweepers) (24).

The estimated maximum daily construction emissions without mitigation are summarized on Table 3-4. Detailed construction model outputs are presented in Appendix 3.1.

TABLE 3-4: EMISSIONS SUMMARY OF OVERALL CONSTRUCTION

Year	Emissions (pounds per day)					
	VOC	NOx	CO	SOx	PM10	PM2.5
2019	4.25	34.24	33.16	0.07	3.65	2.21
2020	9.16	20.27	20.73	0.05	2.61	1.35
Maximum Daily Emissions	**9.16**	**34.24**	**33.16**	**0.07**	**3.65**	**2.21**
SCAQMD Regional Threshold	75	100	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

3.5 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of VOCs, NOx, CO, SOx, PM10, and PM2.5. Operational emissions would be expected from the following primary sources:

- Area Source Emissions
- Energy Source Emissions
- Mobile Source Emissions

3.5.1 AREA SOURCE EMISSIONS

Architectural Coatings

Over a period of time the buildings that are part of this Project will be subject to emissions resulting from the evaporation of solvents contained in paints, varnishes, primers, and other surface coatings as part of Project maintenance. The emissions associated with architectural coatings were calculated using the CalEEMod.

Consumer Products

Consumer products include, but are not limited to detergents, cleaning compounds, polishes, personal care products, and lawn and garden products. Many of these products contain organic compounds which when released in the atmosphere can react to form ozone and other photochemically reactive pollutants. The emissions associated with use of consumer products were calculated based on defaults provided within the CalEEMod.

Hearths/Fireplaces

The emissions associated with use of hearths/fireplaces were calculated based on assumptions provided in the CalEEMod model. The Project is required to comply with SCAQMD Rule 445, which prohibits the use of wood burning stoves and fireplaces in new development. In order to account for the requirements of this Rule, the unmitigated CalEEMod model estimates were adjusted to remove wood burning stoves and fireplaces. As the project is required to comply with SCAQMD Rule 445, the removal of wood burning stoves and fireplaces is not considered

"mitigation" although it must be identified as such in CalEEMod in order to treat the case appropriately.

Landscape Maintenance Equipment

Landscape maintenance equipment would generate emissions from fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, shedders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the Project. The emissions associated with landscape maintenance equipment were calculated based on assumptions provided in the CalEEMod.

3.5.2 Energy Source Emissions

Combustion Emissions Associated with Natural Gas and Electricity

Electricity and natural gas are used by almost every project. Criteria pollutant emissions are emitted through the generation of electricity and consumption of natural gas. However, because electrical generating facilities for the Project area are located either outside the region (state) or offset through the use of pollution credits (RECLAIM) for generation within the SCAB, criteria pollutant emissions from offsite generation of electricity is generally excluded from the evaluation of significance and only natural gas use is considered. The emissions associated with natural gas use were calculated using the CalEEMod.

3.5.3 Mobile Source Emissions

Vehicles

Project operational (vehicular) impacts are dependent on both overall daily vehicle trip generation and the effect of the Project on peak hour traffic volumes and traffic operations in the vicinity of the Project. The Project related operational air quality impacts derive primarily from vehicle trips generated by the Project. The emissions associated with mobile source emissions were calculated using the CalEEMod. Trip characteristics available from the technical memorandum, *Trip Generation Analysis for Proposed Skilled Nursing Facility (EPD Solutions, 2018)* were utilized in this analysis (25).

Per the *Trip Generation Analysis for Proposed Skilled Nursing Facility,* when calculated using square feet, the project is forecast to generate 457 daily trips per day, including 38 trips during the AM peak hour and 41 trips during the PM peak hour (25). According to CalEEMod, trip rates for the nursing home land use is calculated using dwelling units. It should be noted that trip rates for the Project are calculated using ITE Land Use Code 620 (nursing home) which is based on trips per thousand square feet. As such, the trip rates input in CalEEMod were modified to reflect the total trips generated by the Project, based on the number of beds modeled in the analysis. This ensures that the total number of trips evaluated in this report is consistent with the trip generation evaluation.

3.5.4 OPERATIONAL EMISSIONS SUMMARY

The estimated operation-source emissions are summarized on Table 3-5. Detailed operation model outputs are presented in Appendix 3.1. Under the assumed scenarios, emissions resulting from the Project operations would not exceed the numerical thresholds established by the SCAQMD for any criteria pollutant. Therefore, a less than significant impact would occur and no mitigation is required.

TABLE 3-5: MAXIMUM DAILY OPERATIONAL EMISSIONS SUMMARY

Operational Activities – Summer Scenario	Emissions (pounds per day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source	1.78	0.08	7.30	0.00	0.04	0.04
Energy Source	0.04	0.33	0.14	0.00	0.03	0.03
Mobile	0.93	4.68	12.46	0.04	3.36	0.93
Total Maximum Daily Emissions	**2.75**	**5.09**	**19.9**	**0.04**	**3.43**	**1.00**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

Operational Activities – Winter Scenario	Emissions (pounds per day)					
	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Area Source	1.78	0.08	7.30	0.00	0.04	0.04
Energy Source	0.04	0.33	0.14	0.00	0.03	0.03
Mobile	0.88	4.79	11.68	0.04	3.36	0.93
Total Maximum Daily Emissions	**2.70**	**5.20**	**19.12**	**0.04**	**3.43**	**1.00**
SCAQMD Regional Threshold	55	55	550	150	150	55
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

3.6 LOCALIZED SIGNIFICANCE - CONSTRUCTION ACTIVITY

BACKGROUND ON LOCALIZED SIGNIFICANCE THRESHOLD (LST) DEVELOPMENT

The analysis makes use of methodology included in the SCAQMD *Final Localized Significance Threshold Methodology* (Methodology) (19). The SCAQMD has established that impacts to air quality are significant if there is a potential to contribute or cause localized exceedances of the federal and/or state ambient air quality standards (NAAQS/CAAQS). Collectively, these are referred to as Localized Significance Thresholds (LSTs).

The significance of localized emissions impacts depends on whether ambient levels in the vicinity of any given project are above or below State standards. In the case of CO and NO2, if ambient levels are below the standards, a project is considered to have a significant impact if project emissions result in an exceedance of one or more of these standards. If ambient levels already exceed a state or federal standard, then project emissions are considered significant if they increase ambient concentrations by a measurable amount. This would apply to PM10 and PM2.5; both of which are non-attainment pollutants.

The SCAQMD established LSTs in response to the SCAQMD Governing Board's Environmental Justice Initiative I-4. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality

standard at the nearest residence or sensitive receptor. The SCAQMD states that lead agencies can use the LSTs as another indicator of significance in its air quality impact analyses.

LSTs were developed in response to environmental justice and health concerns raised by the public regarding exposure of individuals to criteria pollutants in local communities. To address the issue of localized significance, the SCAQMD adopted LSTs that show whether a project would cause or contribute to localized air quality impacts and thereby cause or contribute to potential localized adverse health effects. The analysis makes use of methodology included in the SCAQMD *Final Localized Significance Threshold Methodology* (LST Methodology) (25).

EMISSIONS CONSIDERED

SCAQMD's Methodology clearly states that "off-site mobile emissions from the Project should NOT be included in the emissions compared to LSTs (26)." Therefore, for purposes of the construction LST analysis only emissions included in the CalEEMod "on-site" emissions outputs were considered.

APPLICABILITY OF LSTS FOR THE PROJECT

For this Project, the appropriate Source Receptor Area (SRA) for the LST is the Perris Valley monitoring station (SRA 24). LSTs apply to carbon monoxide (CO), nitrogen dioxide (NO2), particulate matter ≤ 10 microns (PM10), and particulate matter ≤ 2.5 microns (PM2.5). The SCAQMD produced look-up tables for projects less than or equal to 5 acres in size.

In order to determine the appropriate methodology for determining localized impacts that could occur as a result of Project-related construction, the following process is undertaken:

- The CalEEMod model is utilized to determine the maximum daily on-site emissions that will occur during construction activity.
- The SCAQMD's Fact Sheet for Applying CalEEMod to Localized Significance Thresholds (21) is used to determine the maximum site acreage that is actively disturbed based on the construction equipment fleet and equipment hours as estimated in CalEEMod.
- If the total acreage disturbed is less than or equal to five acres per day, then the SCAQMD's screening look-up tables are utilized to determine if a Project has the potential to result in a significant impact (the SCAQMD recommends that Projects exceeding the screening look-up tables undergo dispersion modeling to determine actual impacts). The look-up tables establish a maximum daily emissions threshold in pounds per day that can be compared to CalEEMod outputs.

MAXIMUM DAILY DISTURBED-ACREAGE

Table 3-6 is used to determine the maximum daily disturbed-acreage for purposes of modeling localized emissions. As shown, the proposed Project could actively disturb approximately one acre per day during the grading phase of construction.

TABLE 3-6: MAXIMUM DAILY DISTURBED-ACREAGE

Construction Phase	Equipment Type	Equipment Quantity	Acres graded per 8-hour day	Operating Hours per Day	Acres graded per day
Grading	Rubber Tired Dozers	1	0.5	8	0.5
	Crawler Tractors	0	0.5	8	0
	Graders	1	0.5	8	0.5
	Scrapers	0	1	8	0
Total acres graded per day during Grading					1

Sensitive Receptors

Some people are especially sensitive to air pollution and are given special consideration when evaluating air quality impacts from projects. These groups of people include children, the elderly, persons with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Structures that house these persons or places where they gather to exercise are defined as "sensitive receptors".

The nearest sensitive receptors include an exam prep academy located approximately 10 meters to the west of the project site, and existing residential homes located approximately 33 meters to the north across Black Walnut Street. Notwithstanding, the *Methodology* explicitly states that "*It is possible that a project may have receptors closer than 25 meters. Projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters* (27)." Accordingly, LSTs for receptors at 25 meters are utilized in this analysis and provide for a conservative i.e. "health protective" standard of care.

CONSTRUCTION-SOURCE EMISSIONS LST ANALYSIS

Since the total acreage disturbed is one acre per day for the grading phase, the SCAQMD's screening look-up tables are utilized in determining impacts. It should be noted that the look-up tables identify thresholds at only 1 acre, 2 acres, and 5 acres. As previously noted, a 25-meter receptor distance is utilized to determine the LSTs for emissions of CO, NO2, PM10, and PM2.5.

Table 3-7 identifies the localized impacts at the nearest receptor location in the vicinity of the Project. Without mitigation, localized construction emissions would not exceed the applicable SCAQMD LSTs. Therefore, a less than significant impact would occur. Outputs from the model runs for construction LSTs are provided in Appendix 3.2.

TABLE 3-7: LOCALIZED SIGNIFICANCE SUMMARY CONSTRUCTION

On-Site Grading Emissions	Emissions (pounds per day)			
	NO_x	CO	PM_{10}	$PM_{2.5}$
Maximum Daily Emissions	21.34	9.39	3.48	2.17
SCAQMD Localized Threshold	118	602	4	3
Threshold Exceeded?	**NO**	**NO**	**NO**	**NO**

3.7 LOCALIZED SIGNIFICANCE – LONG-TERM OPERATIONAL ACTIVITY

The proposed project involves the construction and operation of an 88 dwelling unit assisted living facility. According to SCAQMD LST methodology, LSTs would apply to the operational phase of a proposed project, if the project includes stationary sources, or attracts mobile sources that may spend long periods queuing and idling at the site (e.g., transfer facilities and warehouse buildings). The proposed project does not include such uses, and thus, due to the lack of significant stationary source emissions, no long-term localized significance threshold analysis is needed.

3.8 CO "HOT SPOT" ANALYSIS

As discussed below, the Project would not result in potentially adverse CO concentrations or "hot spots." Further, detailed modeling of Project-specific carbon monoxide (CO) "hot spots" is not needed to reach this conclusion.

An adverse CO concentration, known as a "hot spot", would occur if an exceedance of the state one-hour standard of 20 ppm or the eight-hour standard of 9 ppm were to occur. At the time of the 1993 Handbook, the SCAB was designated nonattainment under the California AAQS and National AAQS for CO (28).

It has long been recognized that CO hotspots are caused by vehicular emissions, primarily when idling at congested intersections. In response, vehicle emissions standards have become increasingly stringent in the last twenty years. Currently, the allowable CO emissions standard in California is a maximum of 3.4 grams/mile for passenger cars (there are requirements for certain vehicles that are more stringent). With the turnover of older vehicles, introduction of cleaner fuels, and implementation of increasingly sophisticated and efficient emissions control technologies, CO concentration in the SCAB is now designated as attainment, as previously noted in Table 2-2. Also, CO concentrations in the Project vicinity have steadily declined, as indicated by historical emissions data presented previously at Table 2-3.

To establish a more accurate record of baseline CO concentrations affecting the SCAB, a CO "hot spot" analysis was conducted in 2003 for four busy intersections in Los Angeles at the peak morning and afternoon time periods. This "hot spot" analysis did not predict any violation of CO standards, as shown on Table 3-8.

Based on the SCAQMD's 2003 AQMP and the 1992 Federal Attainment Plan for Carbon Monoxide (1992 CO Plan), peak carbon monoxide concentrations in the SCAB were a result of unusual

meteorological and topographical conditions and not a result of traffic volumes and congestion at a particular intersection. As evidence of this, for example, 9.3 ppm 8-hr CO concentration measured at the Long Beach Blvd. and Imperial Hwy. intersection (highest CO generating intersection within the "hot spot" analysis), only 0.7 ppm was attributable to the traffic volumes and congestion at this intersection; the remaining 8.6 ppm were due to the ambient air measurements at the time the 2003 AQMP was prepared (28). In contrast, the ambient 8-hr CO concentration within the Project study area is estimated at 1.4 ppm—1.6 ppm (please refer to previous Table 2-3). Therefore, even if the traffic volumes for the proposed Project were double or even triple of the traffic volumes generated at the Long Beach Blvd. and Imperial Hwy. intersection, coupled with the on-going improvements in ambient air quality, the Project would not be capable of resulting in a CO "hot spot" at any study area intersections.

Similar considerations are also employed by other Air Districts when evaluating potential CO concentration impacts. More specifically, the Bay Area Air Quality Management District (BAAQMD) concludes that under existing and future vehicle emission rates, a given project would have to increase traffic volumes at a single intersection by more than 44,000 vehicles per hour—or 24,000 vehicles per hour where vertical and/or horizontal air does not mix—in order to generate a significant CO impact (29).

Traffic volumes generating the CO concentrations for the "hot spot" analysis, shown on Table 3-9. The busiest intersection evaluated was that at Wilshire Blvd. and Veteran Ave., which has a daily traffic volume of approximately 100,000 vehicles per day. The 2003 AQMP estimated that the 1-hour concentration for this intersection was 4.6 ppm; this indicates that, should the daily traffic volume increase four times to 400,000 vehicles per day, CO concentrations (4.6 ppm x 4= 18.4 ppm) would still not likely exceed the most stringent 1-hour CO standard (20.0 ppm).[3] At buildout of the Project, the highest daily traffic volumes generated at the roadways within the vicinity of the Project are expected to generate less than the highest daily traffic volumes generated at the busiest intersection in the CO "hot spot" analysis. As such, the Project would not likely exceed the most stringent 1-hour CO standard.

The proposed Project considered herein would not produce the volume of traffic required to generate a CO "hot spot" either in the context of the 2003 Los Angeles hot spot study, or based on representative BAAQMD CO threshold considerations. Therefore, CO "hot spots" are not an environmental impact of concern for the proposed Project. Localized air quality impacts related to mobile-source emissions would therefore be less than significant.

3 Based on the ratio of the CO standard (20.0 ppm) and the modeled value (4.6 ppm).

TABLE 3-8: CO MODEL RESULTS

Intersection Location	Carbon Monoxide Concentrations (ppm)		
	Morning 1-hour	Afternoon 1-hour	8-hour
Wilshire-Veteran	4.6	3.5	4.2
Sunset-Highland	4	4.5	3.9
La Cienega-Century	3.7	3.1	5.8
Long Beach-Imperial	3	3.1	9.3

Source: 2003 AQMP
Notes: ppm: parts per million. Federal 1-hour standard is 35 ppm and the deferral 8-hour standard is 9.0 ppm.

TABLE 3-9: TRAFFIC VOLUMES

Intersection Location	Peak Traffic Volumes (vph)				
	Northbound (AM/PM)	Southbound (AM/PM)	Eastbound (AM/PM)	Westbound (AM/PM)	Total (AM/PM)
Wilshire-Veteran	560/933	721/1,400	4,954/2,069	1,830/3,317	8,062/7,719
Sunset-Highland	1,551/2,238	2,304/1,832	1,417/1,764	1,342/1,540	6,614/5,374
La Cienega-Century	821/1,674	1,384/2,029	2,540/2,243	1,890/2,728	6,634/8,674
Long Beach-Imperial	756/1,150	479/944	1,217/2,020	1,760/1,400	4,212/5,514

Source: 2003 AQMP
Notes: vph-vehicles per hour

3.9 AIR QUALITY MANAGEMENT PLANNING

The Project site is located within the SCAB, which is characterized by relatively poor air quality. The SCAQMD has jurisdiction over an approximately 10,743 square-mile area consisting of the four-county Basin and the Los Angeles County and Riverside County portions of what use to be referred to as the Southeast Desert Air Basin. In these areas, the SCAQMD is principally responsible for air pollution control, and works directly with the Southern California Association of Governments (SCAG), county transportation commissions, local governments, as well as state and federal agencies to reduce emissions from stationary, mobile, and indirect sources to meet state and federal ambient air quality standards.

Currently, these state and federal air quality standards are exceeded in most parts of the Basin. In response, the SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the state and federal ambient air quality standards. AQMPs are updated regularly in order to more effectively reduce emissions, accommodate growth, and to minimize any negative fiscal impacts of air pollution control on the economy.

In March 2017, the AQMD released the Final 2016 AQMP. The 2016 AQMP continues to evaluate current integrated strategies and control measures to meet the NAAQS, as well as, explore new and innovative methods to reach its goals. Some of these approaches include utilizing incentive programs, recognizing existing co-benefit programs from other sectors, and developing a strategy with fair-share reductions at the federal, state, and local levels (17). Similar to the 2012 AQMP, the 2016 AQMP incorporates scientific and technological information and planning assumptions, including the 2016 RTP/SCS and updated emission inventory methodologies for various source

categories (30). The Project's consistency with the AQMP will be determined using the 2016 AQMP is discussed below:

Criteria for determining consistency with the AQMP are defined in Chapter 12, Section 12.2 and Section 12.3 of the SCAQMD's CEQA Air Quality Handbook (1993) (31). These indicators are as follows:

- Consistency Criterion No. 1: The proposed Project will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

Construction Impacts

Consistency Criterion No. 1 refers to violations of the CAAQS and NAAQS. CAAQS and NAAQS violations would occur LSTs were exceeded. As evaluated as part of the Project LST analysis (previously presented), the Project's localized construction-source emissions would not exceed applicable LSTs.

Operational Impacts

The Project regional analysis demonstrates that Project operational-source emissions would not exceed applicable thresholds, and would therefore not result in or cause violations of the CAAQS and NAAQS.

On the basis of the preceding discussion, the Project is determined to be consistent with the first criterion.

- Consistency Criterion No. 2: The Project will not exceed the assumptions in the AQMP based on the years of Project build-out phase.

Overview

The 2016 AQMP demonstrates that the applicable ambient air quality standards can be achieved within the timeframes required under federal law. Growth projections from local general plans adopted by cities in the district are provided to the Southern California Association of Governments (SCAG), which develops regional growth forecasts, which are then used to develop future air quality forecasts for the AQMP. Development consistent with the growth projections in the City of Moreno Valley General Plan (referred to as the "General Plan") is considered to be consistent with the AQMP.

Construction Impacts

Peak day emissions generated by construction activities are largely independent of land use assignments, but rather are a function of development scope and maximum area of disturbance. Irrespective of the site's land use designation, development of the site to its maximum potential would likely occur, with disturbance of the entire site occurring during construction activities.

Operational Impacts

A project would conflict with the AQMP if it will exceed the assumptions in the AQMP or increments based on the year of project buildout and phase. The AQMP indicates that key assumptions to use in this analysis are population number and location and a regional housing needs assessment. The parcel-based land use and growth assumptions and inputs used in the Regional Transportation Model run by the Southern California Association of Governments that generated the mobile inventory used by the SCAQMD for the AQMP are not available.

The Project proposes to construct an 88 dwelling unit assisted living facility. The City's General Plan Land Use Designation for the site indicate the project site is identified as residential which is consistent with the proposed Project. Additionally, the proposed development would not exceed regional or localized emissions thresholds.

On the basis of the preceding discussion, the Project is determined to be consistent with the second criterion.

AQMP Consistency Conclusion

The Project would not result in or cause NAAQS or CAAQS violations. The proposed Project is consistent with the land use and growth intensities reflected in the adopted General Plan. Furthermore, the Project would not exceed any applicable regional or local thresholds. As such, the Project is therefore considered to be consistent with the AQMP.

3.10 Potential Impacts to Sensitive Receptors

The potential impact of Project-generated air pollutant emissions at sensitive receptors has also been considered. Sensitive receptors can include uses such as long term health care facilities, rehabilitation centers, and retirement homes. Residences, schools, playgrounds, child care centers, and athletic facilities can also be considered as sensitive receptors.

According to SCAQMD LST methodology, LSTs would apply to the operational phase of a proposed project, if the project includes stationary sources, or attracts mobile sources that may spend long periods queuing and idling at the site (e.g., transfer facilities and warehouse buildings). The proposed project does not include stationary sources, or attracts mobile sources that may spend long periods queuing and idling at the site. Thus, due to the lack of significant stationary source emissions, no long-term localized significance threshold analysis is needed. Therefore, sensitive receptors would not be adversely affected during Project construction, nor as the result of Project operations.

The proposed Project would not result in a CO "hotspot" as a result of Project related traffic during ongoing operations, nor would the Project result in a significant adverse health impact as discussed in Section 3.8.

3.11 Odors

The potential for the Project to generate objectionable odors has also been considered. Land uses generally associated with odor complaints include:

- Agricultural uses (livestock and farming)
- Wastewater treatment plants
- Food processing plants
- Chemical plants
- Composting operations
- Refineries
- Landfills
- Dairies
- Fiberglass molding facilities

The Project does not contain land uses typically associated with emitting objectionable odors. Potential odor sources associated with the proposed Project may result from construction equipment exhaust and the application of asphalt and architectural coatings during construction activities and the temporary storage of typical solid waste (refuse) associated with the proposed Project's (long-term operational) uses. Standard construction requirements would minimize odor impacts from construction. The construction odor emissions would be temporary, short-term, and intermittent in nature and would cease upon completion of the respective phase of construction and is thus considered less than significant. It is expected that Project-generated refuse would be stored in covered containers and removed at regular intervals in compliance with the City's solid waste regulations. The proposed Project would also be required to comply with SCAQMD Rule 402 to prevent occurrences of public nuisances. Therefore, odors associated with the proposed Project construction and operations would be less than significant and no mitigation is required.

3.12 CUMULATIVE IMPACTS

The Project area is designated as a non-attainment area for ozone, PM_{10}, $PM_{2.5}$, and lead.

The AQMD has published a report on how to address cumulative impacts from air pollution: *White Paper on Potential Control Strategies to Address Cumulative Impacts from Air Pollution* (32). In this report the AQMD clearly states (Page D-3):

"…the AQMD uses the same significance thresholds for project specific and cumulative impacts for all environmental topics analyzed in an Environmental Assessment or EIR. The only case where the significance thresholds for project specific and cumulative impacts differ is the Hazard Index (HI) significance threshold for toxic air contaminant (TAC) emissions. The project specific (project increment) significance threshold is HI > 1.0 while the cumulative (facility-wide) is HI > 3.0. It should be noted that the HI is only one of three TAC emission significance thresholds considered (when applicable) in a CEQA analysis. The other two are the maximum individual cancer risk (MICR) and the cancer burden, both of which use the same significance thresholds (MICR of 10 in 1 million and cancer burden of 0.5) for project specific and cumulative impacts.

Projects that exceed the project-specific significance thresholds are considered by the SCAQMD to be cumulatively considerable. This is the reason project-specific and cumulative significance

thresholds are the same. Conversely, projects that do not exceed the project-specific thresholds are generally not considered to be cumulatively significant."

Therefore, this analysis assumes that individual projects that do not generate operational or construction emissions that exceed the SCAQMD's recommended daily thresholds for project-specific impacts would also not cause a cumulatively considerable increase in emissions for those pollutants for which the Basin is in nonattainment, and, therefore, would not be considered to have a significant, adverse air quality impact. Alternatively, individual project-related construction and operational emissions that exceed SCAQMD thresholds for project-specific impacts would be considered cumulatively considerable.

Construction Impacts

The Project-specific evaluation of emissions presented in the preceding analysis demonstrates that Project construction-source air pollutant emissions would not result in exceedances of regional thresholds. Therefore, Project construction-source emissions would be considered less than significant on a project-specific and cumulative basis.

Operational Impacts

The Project-specific evaluation of emissions presented in the preceding analysis demonstrates that Project operational-source air pollutant emissions would not result in exceedances of regional thresholds. Therefore, Project operational-source emissions would be considered less than significant on a project-specific and cumulative basis.

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5 CERTIFICATION

The contents of this air study report represent an accurate depiction of the environmental impacts associated with the proposed Moreno Valley Skilled Nursing Facility Project. The information contained in this air quality impact assessment report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5987.

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EDUCATION

Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

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APPENDIX 2.1:

STATE/FEDERAL ATTAINMENT STATUS OF CRITERIA POLLUTANTS

TABLE 2-3

National Ambient Air Quality Standards (NAAQS) Attainment Status - South Coast Air Basin

Criteria Pollutant	Averaging Time	Designation[a]	Attainment Date[b]
Ozone (O_3)	(1979) **1-Hour** (0.12 ppm)[c]	Nonattainment ("extreme")	2/26/2023 (revised deadline)
	(2015) **8-Hour** (0.070 ppm)[d]	Pending – Expect Nonattainment ("extreme")	Pending (beyond 2032)
	(2008) **8-Hour** (0.075 ppm)[d]	Nonattainment ("extreme")	7/20/2032
	(1997) **8-Hour** (0.08 ppm)[d]	Nonattainment ("extreme")	6/15/2024
PM2.5[e]	(2006) **24-Hour** (35 µg/m³)	Nonattainment ("serious")	12/31/2019
	(2012) **Annual** (12.0 µg/m³)	Nonattainment ("moderate")	12/31/2021
	(1997) **Annual** (15.0 µg/m³)	Attainment (final determination pending)	4/5/2015 (attained 2013)
PM10[f]	(1987) **24-hour** (150 µg/m³)	Attainment (Maintenance)	7/26/2013 (attained)
Lead (Pb)[g]	(2008) **3-Months Rolling** (0.15 µg/m³)	Nonattainment (Partial) (Attainment determination to be requested)	12/31/2015
CO	(1971) **1-Hour** (35 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
	(1971) **8-Hour** (9 ppm)	Attainment (Maintenance)	6/11/2007 (attained)
NO_2[h]	(2010) **1-Hour** (100 ppb)	Unclassifiable/Attainment	N/A (attained)
	(1971) **Annual** (0.053 ppm)	Attainment (Maintenance)	9/22/1998 (attained)
SO_2[i]	(2010) **1-Hour** (75 ppb)	Designations Pending (expect Unclassifiable/Attainment)	N/A (attained)
	(1971) **24-Hour** (0.14 ppm) (1971) **Annual** (0.03 ppm)	Unclassifiable/Attainment	3/19/1979 (attained)

a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for an attainment demonstration

c) The 1979 1-hour ozone NAAQS (0.12 ppm) was revoked, effective 6/15/05 ; however, the Basin has not attained this standard and therefore has some continuing obligations with respect to the revoked standard; original attainment date was 11/15/2010; the revised attainment date is 2/6/23

d) The 2008 8-hour ozone NAAQS (0.075 ppm) was revised to 0.070 ppm, effective 12/28/15 with classifications and implementation goals to be finalized by 10/1/17; the 1997 8-hour ozone NAAQS (0.08 ppm) was revoked in the 2008 ozone NAAQS implementation rule, effective 4/6/15; there are continuing obligations under the revoked 1997 and revised 2008 ozone NAAQS until they are attained

e) The attainment deadline for the 2006 24-hour PM2.5 NAAQS was 12/31/15 for the former "moderate" classification; U.S.EPA approved reclassification to "serious," effective 2/12/16 with an attainment deadline of 12/31/2019; the 2012 (proposal year) annual PM2.5 NAAQS was revised on 1/15/13, effective 3/18/13, from 15 to 12 µg/m³; new annual designations were final 1/15/15, effective 4/15/15; on July 25, 2016 U.S. EPA finalized a determination that the Basin attained the 1997 annual (15.0 µg/m³) and 24-hour PM2.5 (65 µg/m³) NAAQS, effective August 24, 2016

f) The annual PM10 NAAQS was revoked, effective 12/18/06; the 24-hour PM10 NAAQS deadline was 12/31/2006; the Basin's Attainment Re-designation Request and PM10 Maintenance Plan was approved by U.S. EPA on 6/26/13, effective 7/26/13

g) Partial Nonattainment designation – Los Angeles County portion of the Basin only for near-source monitors; expect to remain in attainment based on current monitoring data; attainment re-designation request pending

h) New 1-hour NO_2 NAAQS became effective 8/2/10, with attainment designations 1/20/12; annual NO_2 NAAQS retained

i) The 1971 annual and 24-hour SO2 NAAQS were revoked, effective 8/23/10; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO2 1-hour NAAQS; final area designations expected by 12/31/20 due to new source-specific monitoring requirements; Basin expected to be in attainment due to ongoing clean data

TABLE 2-4

National Ambient Air Quality Standards (NAAQS) Attainment Status
Coachella Valley Portion of the Salton Sea Air Basin

Criteria Pollutant	Averaging Time	Designation[a]	Attainment Date[b]
Ozone (O_3)	(1979) **1-Hour** (0.12 ppm)[c]	Attainment	11/15/2007 (attained 12/31/2013)
	(2015) **8-Hour** (0.070 ppm)[d]	Pending – Expect Nonattainment (Severe)	Pending
	(2008) **8-Hour** (0.075 ppm)[d]	Nonattainment (Severe-15)	7/20/2027
	(1997) **8-Hour** (0.08 ppm)[d]	Nonattainment (Severe-15)	6/15/2019
PM2.5[e]	(2006) **24-Hour** (35 µg/m^3)	Unclassifiable/Attainment	N/A (attained)
	(2012) **Annual** (12.0 µg/m^3)	Unclassifiable/Attainment	N/A (attained)
	(1997) **Annual** (15.0 µg/m^3)	Unclassifiable/Attainment	N/A (attained)
PM10[f]	(1987) **24-hour** (150 µg/m^3)	Nonattainment ("serious")	12/31/2006
Lead (Pb)	(2008) **3-Months Rolling** (0.15 µg/m^3)	Unclassifiable/Attainment	Unclassifiable/ Attainment
CO	(1971) **1-Hour** (35 ppm)	Unclassifiable/Attainment	N/A (attained)
	(1971) **8-Hour** (9 ppm)	Unclassifiable/Attainment	N/A (attained)
NO_2[g]	(2010) **1-Hour** (100 ppb)	Unclassifiable/Attainment	N/A (attained)
	(1971) **Annual** (0.053 ppm)	Unclassifiable/Attainment	N/A (attained)
SO_2[h]	(2010) **1-Hour** (75 ppb)	Designations Pending	N/A
	(1971) **24-Hour** (0.14 ppm) (1971) **Annual** (0.03 ppm)	Unclassifiable/Attainment	Unclassifiable/ Attainment

a) U.S. EPA often only declares Nonattainment areas; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable

b) A design value below the NAAQS for data through the full year or smog season prior to the attainment date is typically required for an attainment demonstration

c) The 1979 1-hour ozone NAAQS (0.12 ppm) was revoked, effective 6/15/05; the Southeast Desert Modified Air Quality Management Area, including the Coachella Valley, had not timely attained this standard by the 11/15/07 "severe-17" deadline, based on 2005-2007 data; on 8/25/14, U.S. EPA proposed a clean data finding based on 2011–2013 data and a determination of attainment for the former 1-hour ozone NAAQS for the Southeast Desert nonattainment area; this rule was finalized by U.S. EPA on 4/15/15, effective 5/15/15, that included preliminary 2014 data

d) The 2008 8-hour ozone NAAQS (0.075 ppm) was revised to 0.070 ppm, effective 12/28/15 with classifications and implementation goals to be finalized by 10/1/17; the 1997 8-hour ozone NAAQS (0.08 ppm) was revoked in the 2008 ozone NAAQS implementation rule, effective 4/6/15; there are continuing obligations under the 1997 and 2008 ozone NAAQS until they are attained

e) The annual PM2.5 standard was revised on 1/15/13, effective 3/18/13, from 15 to 12 µg/m^3

f) The annual PM10 standard was revoked, effective 12/18/06; the 24-hour PM10 NAAQS attainment deadline was 12/31/2006; the Coachella Valley Attainment Re-designation Request and PM10 Maintenance Plan was postponed by U.S. EPA pending additional monitoring and analysis in the southeastern Coachella Valley

g) New 1-hour NO_2 NAAQS became effective 8/2/10; attainment designations 1/20/12; annual NO_2 NAAQS retained

h) The 1971 Annual and 24-hour SO_2 NAAQS were revoked, effective 8/23/10; however, these 1971 standards will remain in effect until one year after U.S. EPA promulgates area designations for the 2010 SO_2 1-hour standard; final area designations expected by 12/31/2020 with SSAB expected to be designated Unclassifiable/Attainment

The current status of CAAQS attainment for the pollutants with State standards is presented in Table 2-5 for the Basin and the Riverside County portion of the SSAB (Coachella Valley).

TABLE 2-5

California Ambient Air Quality Standards (CAAQS) Attainment Status
South Coast Air Basin and Coachella Valley portion of Salton Sea Air Basin

Pollutant	Averaging Time and Level[b]	Designation[a]	
		South Coast Air Basin	Coachella Valley
Ozone (O_3)	**1-Hour** (0.09 ppm)[c]	Nonattainment	Nonattainment
	8-Hour (0.070 ppm)[d]	Nonattainment	Nonattainment
PM2.5	**Annual** (12.0 µg/m^3)	Nonattainment	Attainment
PM10	**24-Hour** (50 µg/m^3)	Nonattainment	Nonattainment
	Annual (20 µg/m^3)	Nonattainment	Nonattainment
Lead (Pb)	**30-Day Average** (1.5 µg/m^3)	Attainment	Attainment
CO	**1-Hour** (20 ppm)	Attainment	Attainment
	8-Hour (9.0 ppm)	Attainment	Attainment
NO_2	**1-Hour** (0.18 ppm)	Attainment	Attainment
	Annual (0.030 ppm)	Attainment	Attainment
SO_2	**1-Hour** (0.25 ppm)	Attainment	Attainment
	24-Hour (0.04 ppm)	Attainment	Attainment
Sulfates	**24-Hour** (25 µg/m^3)	Attainment	Attainment
H_2S[c]	**1-Hour** (0.03 ppm)	Unclassified	Unclassified [c)]

a) CA State designations shown were updated by CARB in 2016, based on the 2013–2015 3-year period; stated designations are based on a 3-year data period after consideration of outliers and exceptional events; Source: http://www.arb.ca.gov/desig/statedesig.htm#current

b) CA State standards, or CAAQS, for ozone, CO, SO_2, NO_2, PM10 and PM2.5 are values not to be exceeded; lead, sulfates, and H_2S standards are values not to be equaled or exceeded; CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations

c) SCAQMD began monitoring H_2S in the southeastern Coachella Valley in November 2013 due to odor events related to the Salton Sea; three full years of data are not yet available for a State designation, but nonattainment is anticipated for the H_2S CAAQS in at least part of the Coachella Valley

The 1979 federal 1-hour ozone standard (0.12 ppm) was revoked by the U.S. EPA and replaced by the 8-hour average ozone standard (0.08 ppm), effective June 15, 2005. However, the Basin and the former Southeast Desert Modified Air Quality Management Area (which included the Coachella Valley) had not attained the 1-hour federal ozone NAAQS by the attainment dates in 2010 and 2007, respectively, and, therefore, had continuing obligations under the former standard. On August 25, 2014, U.S. EPA

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APPENDIX 3.1:

CALEEMOD EMISSIONS MODEL OUTPUTS

Moreno Valley Skilled Nursing Facility

South Coast AQMD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.60	Acre	1.60	69,696.00	0
Parking Lot	112.00	Space	1.36	44,800.00	0
Congregate Care (Assisted Living)	88.00	Dwelling Unit	1.58	68,750.00	252

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage based on provided site plan

Construction Phase - Construction schedule based on provided information

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information

Grading - Site is balanced. No import or export

Vehicle Trips - Trip rates based on ITE 10th Edition, Land Use Code 620- Nursing Home and calculated to reflect per dwelling unit instead of per TSF

Woodstoves - No woostoves or fireplaces

Construction Off-road Equipment Mitigation - Watering 3x/day

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	18.00	90.00
tblConstructionPhase	NumDays	230.00	390.00
tblConstructionPhase	NumDays	8.00	30.00
tblConstructionPhase	NumDays	18.00	15.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00

tblFireplaces	NumberGas	74.80	0.00
tblFireplaces	NumberNoFireplace	8.80	0.00
tblFireplaces	NumberWood	4.40	0.00
tblLandUse	LandUseSquareFeet	88,000.00	68,750.00
tblLandUse	LotAcreage	1.01	1.36
tblLandUse	LotAcreage	5.50	1.58
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	WorkerTripNumber	5.00	18.00
tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblVehicleTrips	ST_TR	2.20	1.81
tblVehicleTrips	SU_TR	2.44	1.88
tblVehicleTrips	WD_TR	2.74	5.19
tblWoodstoves	NumberCatalytic	4.40	0.00
tblWoodstoves	NumberNoncatalytic	4.40	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00

tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.1854	34.1910	33.1553	0.0651	6.7200	1.7525	7.6505	3.4120	1.6391	4.2680	0.0000	6,436.3636	6,436.3636	1.2132	0.0000	6,466.6925
2020	9.1022	20.2396	20.7261	0.0476	1.6658	0.9454	2.6112	0.4459	0.9048	1.3506	0.0000	4,656.6339	4,656.6339	0.5621	0.0000	4,670.6860
Maximum	**9.1022**	**34.1910**	**33.1553**	**0.0651**	**6.7200**	**1.7525**	**7.6505**	**3.4120**	**1.6391**	**4.2680**	**0.0000**	**6,436.3636**	**6,436.3636**	**1.2132**	**0.0000**	**6,466.6925**

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					
2019	4.1854	34.1910	33.1553	0.0651	2.7231	1.7525	3.6536	1.3578	1.6391	2.2139	0.0000	6,436.3636	6,436.3636	1.2132	0.0000	6,466.6925
2020	9.1022	20.2396	20.7261	0.0476	1.6658	0.9454	2.6112	0.4459	0.9048	1.3506	0.0000	4,656.6339	4,656.6339	0.5621	0.0000	4,670.6860
Maximum	**9.1022**	**34.1910**	**33.1553**	**0.0651**	**2.7231**	**1.7525**	**3.6536**	**1.3578**	**1.6391**	**2.2139**	**0.0000**	**6,436.3636**	**6,436.3636**	**1.2132**	**0.0000**	**6,466.6925**

	ROG	NOx	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	47.66	0.00	38.95	53.25	0.00	36.56	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	1.7843	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401	0.0000	13.0975	13.0975	0.0128	0.0000	13.4178
Energy	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
Mobile	0.9255	4.6771	12.4607	0.0426	3.3185	0.0416	3.3601	0.8880	0.0391	0.9270		4,331.5629	4,331.5629	0.2143		4,336.9192
Total	**2.7483**	**5.0901**	**19.8965**	**0.0451**	**3.3185**	**0.1083**	**3.4268**	**0.8880**	**0.1057**	**0.9937**	**0.0000**	**4,764.2829**	**4,764.2829**	**0.2351**	**7.6900e-003**	**4,772.4532**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.7843	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401	0.0000	13.0975	13.0975	0.0128	0.0000	13.4178
Energy	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
Mobile	0.9255	4.6771	12.4607	0.0426	3.3185	0.0416	3.3601	0.8880	0.0391	0.9270		4,331.5629	4,331.5629	0.2143		4,336.9192
Total	**2.7483**	**5.0901**	**19.8965**	**0.0451**	**3.3185**	**0.1083**	**3.4268**	**0.8880**	**0.1057**	**0.9937**	**0.0000**	**4,764.2829**	**4,764.2829**	**0.2351**	**7.6900e-003**	**4,772.4532**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/8/2019	4/12/2019	7	5	
2	Grading	Grading	4/13/2019	5/12/2019	7	30	
3	Building Construction	Building Construction	5/13/2019	6/5/2020	7	390	
4	Paving	Paving	12/1/2019	12/15/2019	7	15	
5	Architectural Coating	Architectural Coating	1/1/2020	3/30/2020	7	90	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 15

Acres of Paving: 2.96

Residential Indoor: 178,200; Residential Outdoor: 59,400; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 6,870 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	0	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	111.00	28.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	22.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4656	4.6747	4.6054	6.2100e-003		0.3121	0.3121		0.2871	0.2871		615.0837	615.0837	0.1946		619.9489
Total	**0.4656**	**4.6747**	**4.6054**	**6.2100e-003**	**0.0000**	**0.3121**	**0.3121**	**0.0000**	**0.2871**	**0.2871**		**615.0837**	**615.0837**	**0.1946**		**619.9489**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	**0.0882**	**0.0613**	**0.8088**	**2.1400e-003**	**0.2012**	**1.5700e-003**	**0.2028**	**0.0534**	**1.4400e-003**	**0.0548**		**212.5780**	**212.5780**	**6.6500e-003**		**212.7442**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4656	4.6747	4.6054	6.2100e-003		0.3121	0.3121		0.2871	0.2871	0.0000	615.0837	615.0837	0.1946		619.9489
Total	**0.4656**	**4.6747**	**4.6054**	**6.2100e-003**	**0.0000**	**0.3121**	**0.3121**	**0.0000**	**0.2871**	**0.2871**	**0.0000**	**615.0837**	**615.0837**	**0.1946**		**619.9489**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0882	0.0613	0.8088	2.1400e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		212.5780	212.5780	6.6500e-003		212.7442
Total	**0.0882**	**0.0613**	**0.8088**	**2.1400e-003**	**0.2012**	**1.5700e-003**	**0.2028**	**0.0534**	**1.4400e-003**	**0.0548**		**212.5780**	**212.5780**	**6.6500e-003**		**212.7442**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	1.8820	21.3359	9.3854	0.0203		0.9292	0.9292		0.8549	0.8549		2,014.1812	2,014.1812	0.6373		2,030.1128
Total	**1.8820**	**21.3359**	**9.3854**	**0.0203**	**6.5523**	**0.9292**	**7.4816**	**3.3675**	**0.8549**	**4.2224**		**2,014.1812**	**2,014.1812**	**0.6373**		**2,030.1128**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.0511	0.6740	1.7800e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		177.1484	177.1484	5.5400e-003		177.2869
Total	**0.0735**	**0.0511**	**0.6740**	**1.7800e-003**	**0.1677**	**1.3000e-003**	**0.1690**	**0.0445**	**1.2000e-003**	**0.0457**		**177.1484**	**177.1484**	**5.5400e-003**		**177.2869**

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					2.5554	0.0000	2.5554	1.3133	0.0000	1.3133			0.0000			0.0000
Off-Road	1.8820	21.3359	9.3854	0.0203		0.9292	0.9292		0.8549	0.8549	0.0000	2,014.1812	2,014.1812	0.6373		2,030.1128
Total	**1.8820**	**21.3359**	**9.3854**	**0.0203**	**2.5554**	**0.9292**	**3.4846**	**1.3133**	**0.8549**	**2.1682**	**0.0000**	**2,014.1812**	**2,014.1812**	**0.6373**		**2,030.1128**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0735	0.0511	0.6740	1.7800e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		177.1484	177.1484	5.5400e-003		177.2869
Total	**0.0735**	**0.0511**	**0.6740**	**1.7800e-003**	**0.1677**	**1.3000e-003**	**0.1690**	**0.0445**	**1.2000e-003**	**0.0457**		**177.1484**	**177.1484**	**5.5400e-003**		**177.2869**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7988	16.0839	12.4287	0.0211		0.8922	0.8922		0.8469	0.8469		2,016.8066	2,016.8066	0.4495		2,028.0436
Total	**1.7988**	**16.0839**	**12.4287**	**0.0211**		**0.8922**	**0.8922**		**0.8469**	**0.8469**		**2,016.8066**	**2,016.8066**	**0.4495**		**2,028.0436**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1080	3.2039	0.7745	7.2600e-003	0.1792	0.0212	0.2004	0.0516	0.0203	0.0719		773.4152	773.4152	0.0512		774.6945
Worker	0.5436	0.3783	4.9876	0.0132	1.2407	9.6600e-003	1.2504	0.3290	8.9000e-003	0.3379		1,310.8978	1,310.8978	0.0410		1,311.9228
Total	**0.6516**	**3.5822**	**5.7621**	**0.0204**	**1.4199**	**0.0309**	**1.4508**	**0.3806**	**0.0292**	**0.4098**		**2,084.3130**	**2,084.3130**	**0.0922**		**2,086.6173**

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	1.7988	16.0839	12.4287	0.0211		0.8922	0.8922		0.8469	0.8469	0.0000	2,016.8066	2,016.8066	0.4495		2,028.0436
Total	**1.7988**	**16.0839**	**12.4287**	**0.0211**		**0.8922**	**0.8922**		**0.8469**	**0.8469**	**0.0000**	**2,016.8066**	**2,016.8066**	**0.4495**		**2,028.0436**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1080	3.2039	0.7745	7.2600e-003	0.1792	0.0212	0.2004	0.0516	0.0203	0.0719		773.4152	773.4152	0.0512		774.6945
Worker	0.5436	0.3783	4.9876	0.0132	1.2407	9.6600e-003	1.2504	0.3290	8.9000e-003	0.3379		1,310.8978	1,310.8978	0.0410		1,311.9228
Total	**0.6516**	**3.5822**	**5.7621**	**0.0204**	**1.4199**	**0.0309**	**1.4508**	**0.3806**	**0.0292**	**0.4098**		**2,084.3130**	**2,084.3130**	**0.0922**		**2,086.6173**

3.4 Building Construction - 2020

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	1.6135	14.6518	12.1473	0.0211		0.7716	0.7716		0.7326	0.7326		1,990.8389	1,990.8389	0.4410		2,001.8645
Total	**1.6135**	**14.6518**	**12.1473**	**0.0211**		**0.7716**	**0.7716**		**0.7326**	**0.7326**		**1,990.8389**	**1,990.8389**	**0.4410**		**2,001.8645**

3.4 Building Construction - 2020

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	0.0920	2.9382	0.6996	7.2000e-003	0.1792	0.0146	0.1938	0.0516	0.0139	0.0655		768.4557	768.4557	0.0483		769.6619
Worker	0.5022	0.3376	4.5379	0.0128	1.2407	9.4100e-003	1.2501	0.3290	8.6700e-003	0.3377		1,270.3034	1,270.3034	0.0365		1,271.2164
Total	**0.5942**	**3.2758**	**5.2375**	**0.0200**	**1.4199**	**0.0240**	**1.4439**	**0.3806**	**0.0226**	**0.4032**		**2,038.7591**	**2,038.7591**	**0.0848**		**2,040.8783**

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	1.6135	14.6518	12.1473	0.0211		0.7716	0.7716		0.7326	0.7326	0.0000	1,990.8389	1,990.8389	0.4410		2,001.8645
Total	**1.6135**	**14.6518**	**12.1473**	**0.0211**		**0.7716**	**0.7716**		**0.7326**	**0.7326**	**0.0000**	**1,990.8389**	**1,990.8389**	**0.4410**		**2,001.8645**

3.4 Building Construction - 2020

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	0.0920	2.9382	0.6996	7.2000e-003	0.1792	0.0146	0.1938	0.0516	0.0139	0.0655		768.4557	768.4557	0.0483		769.6619
Worker	0.5022	0.3376	4.5379	0.0128	1.2407	9.4100e-003	1.2501	0.3290	8.6700e-003	0.3377		1,270.3034	1,270.3034	0.0365		1,271.2164
Total	**0.5942**	**3.2758**	**5.2375**	**0.0200**	**1.4199**	**0.0240**	**1.4439**	**0.3806**	**0.0226**	**0.4032**		**2,038.7591**	**2,038.7591**	**0.0848**		**2,040.8783**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3995	14.4568	14.0658	0.0212		0.8276	0.8276		0.7614	0.7614		2,099.0462	2,099.0462	0.6641		2,115.6491
Paving	0.2376					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6371**	**14.4568**	**14.0658**	**0.0212**		**0.8276**	**0.8276**		**0.7614**	**0.7614**		**2,099.0462**	**2,099.0462**	**0.6641**		**2,115.6491**

3.5 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0980	0.0682	0.8987	2.3700e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		236.1978	236.1978	7.3900e-003		236.3825
Total	**0.0980**	**0.0682**	**0.8987**	**2.3700e-003**	**0.2236**	**1.7400e-003**	**0.2253**	**0.0593**	**1.6000e-003**	**0.0609**		**236.1978**	**236.1978**	**7.3900e-003**		**236.3825**

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	1.3995	14.4568	14.0658	0.0212		0.8276	0.8276		0.7614	0.7614	0.0000	2,099.0462	2,099.0462	0.6641		2,115.6490
Paving	0.2376					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6371**	**14.4568**	**14.0658**	**0.0212**		**0.8276**	**0.8276**		**0.7614**	**0.7614**	**0.0000**	**2,099.0462**	**2,099.0462**	**0.6641**		**2,115.6490**

3.5 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0980	0.0682	0.8987	2.3700e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		236.1978	236.1978	7.3900e-003		236.3825
Total	**0.0980**	**0.0682**	**0.8987**	**2.3700e-003**	**0.2236**	**1.7400e-003**	**0.2253**	**0.0593**	**1.6000e-003**	**0.0609**		**236.1978**	**236.1978**	**7.3900e-003**		**236.3825**

3.6 Architectural Coating - 2020

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	6.4720					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479		375.2641	375.2641	0.0291		375.9904
Total	**6.7949**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**		**375.2641**	**375.2641**	**0.0291**		**375.9904**

3.6 Architectural Coating - 2020

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	0.0995	0.0669	0.8994	2.5300e-003	0.2459	1.8700e-003	0.2478	0.0652	1.7200e-003	0.0669		251.7718	251.7718	7.2400e-003		251.9528
Total	**0.0995**	**0.0669**	**0.8994**	**2.5300e-003**	**0.2459**	**1.8700e-003**	**0.2478**	**0.0652**	**1.7200e-003**	**0.0669**		**251.7718**	**251.7718**	**7.2400e-003**		**251.9528**

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	6.4720					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479	0.0000	375.2641	375.2641	0.0291		375.9904
Total	**6.7949**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**	**0.0000**	**375.2641**	**375.2641**	**0.0291**		**375.9904**

3.6 Architectural Coating - 2020

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	0.0995	0.0669	0.8994	2.5300e-003	0.2459	1.8700e-003	0.2478	0.0652	1.7200e-003	0.0669		251.7718	251.7718	7.2400e-003		251.9528
Total	**0.0995**	**0.0669**	**0.8994**	**2.5300e-003**	**0.2459**	**1.8700e-003**	**0.2478**	**0.0652**	**1.7200e-003**	**0.0669**		**251.7718**	**251.7718**	**7.2400e-003**		**251.9528**

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	0.9255	4.6771	12.4607	0.0426	3.3185	0.0416	3.3601	0.8880	0.0391	0.9270		4,331.5629	4,331.5629	0.2143		4,336.9192
Unmitigated	0.9255	4.6771	12.4607	0.0426	3.3185	0.0416	3.3601	0.8880	0.0391	0.9270		4,331.5629	4,331.5629	0.2143		4,336.9192

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	456.72	159.28	165.44	1,273,289	1,273,289
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	456.72	159.28	165.44	1,273,289	1,273,289

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
Congregate Care (Assisted	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Other Non-Asphalt Surfaces	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
NaturalGas Unmitigated	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162

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					
Congregate Care (Assisted Living)	3566.79	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
Other Non-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
Parking Lot	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
Total		**0.0385**	**0.3287**	**0.1399**	**2.1000e-003**		**0.0266**	**0.0266**		**0.0266**	**0.0266**		**419.6226**	**419.6226**	**8.0400e-003**	**7.6900e-003**	**422.1162**

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					
Congregate Care (Assisted Living)	3.56679	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
Other Non-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
Parking Lot	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
Total		**0.0385**	**0.3287**	**0.1399**	**2.1000e-003**		**0.0266**	**0.0266**		**0.0266**	**0.0266**		**419.6226**	**419.6226**	**8.0400e-003**	**7.6900e-003**	**422.1162**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.7843	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401	0.0000	13.0975	13.0975	0.0128	0.0000	13.4178
Unmitigated	1.7843	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401	0.0000	13.0975	13.0975	0.0128	0.0000	13.4178

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	0.1596					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.4018					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	0.2229	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401		13.0975	13.0975	0.0128		13.4178
Total	**1.7843**	**0.0844**	**7.2959**	**3.8000e-004**		**0.0401**	**0.0401**		**0.0401**	**0.0401**	**0.0000**	**13.0975**	**13.0975**	**0.0128**	**0.0000**	**13.4178**

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	0.1596					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.4018					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	0.2229	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401		13.0975	13.0975	0.0128		13.4178
Total	**1.7843**	**0.0844**	**7.2959**	**3.8000e-004**		**0.0401**	**0.0401**		**0.0401**	**0.0401**	**0.0000**	**13.0975**	**13.0975**	**0.0128**	**0.0000**	**13.4178**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Moreno Valley Skilled Nursing Facility

South Coast AQMD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.60	Acre	1.60	69,696.00	0
Parking Lot	112.00	Space	1.36	44,800.00	0
Congregate Care (Assisted Living)	88.00	Dwelling Unit	1.58	68,750.00	252

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage based on provided site plan

Construction Phase - Construction schedule based on provided information

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information

Grading - Site is balanced. No import or export

Vehicle Trips - Trip rates based on ITE 10th Edition, Land Use Code 620- Nursing Home and calculated to reflect per dwelling unit instead of per TSF

Woodstoves - No woostoves or fireplaces

Construction Off-road Equipment Mitigation - Watering 3x/day

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	18.00	90.00
tblConstructionPhase	NumDays	230.00	390.00
tblConstructionPhase	NumDays	8.00	30.00
tblConstructionPhase	NumDays	18.00	15.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00

tblFireplaces	NumberGas	74.80	0.00
tblFireplaces	NumberNoFireplace	8.80	0.00
tblFireplaces	NumberWood	4.40	0.00
tblLandUse	LandUseSquareFeet	88,000.00	68,750.00
tblLandUse	LotAcreage	1.01	1.36
tblLandUse	LotAcreage	5.50	1.58
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	WorkerTripNumber	5.00	18.00
tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblVehicleTrips	ST_TR	2.20	1.81
tblVehicleTrips	SU_TR	2.44	1.88
tblVehicleTrips	WD_TR	2.74	5.19
tblWoodstoves	NumberCatalytic	4.40	0.00
tblWoodstoves	NumberNoncatalytic	4.40	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00

tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2019	4.2472	34.2358	32.6676	0.0639	6.7200	1.7528	7.6505	3.4120	1.6394	4.2680	0.0000	6,314.2373	6,314.2373	1.2138	0.0000	6,344.5823
2020	9.1611	20.2749	20.2648	0.0464	1.6658	0.9456	2.6114	0.4459	0.9050	1.3508	0.0000	4,535.9243	4,535.9243	0.5627	0.0000	4,549.9923
Maximum	**9.1611**	**34.2358**	**32.6676**	**0.0639**	**6.7200**	**1.7528**	**7.6505**	**3.4120**	**1.6394**	**4.2680**	**0.0000**	**6,314.2373**	**6,314.2373**	**1.2138**	**0.0000**	**6,344.5823**

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					
2019	4.2472	34.2358	32.6676	0.0639	2.7231	1.7528	3.6536	1.3578	1.6394	2.2139	0.0000	6,314.2373	6,314.2373	1.2138	0.0000	6,344.5823
2020	9.1611	20.2749	20.2648	0.0464	1.6658	0.9456	2.6114	0.4459	0.9050	1.3508	0.0000	4,535.9243	4,535.9243	0.5627	0.0000	4,549.9923
Maximum	**9.1611**	**34.2358**	**32.6676**	**0.0639**	**2.7231**	**1.7528**	**3.6536**	**1.3578**	**1.6394**	**2.2139**	**0.0000**	**6,314.2373**	**6,314.2373**	**1.2138**	**0.0000**	**6,344.5823**

	ROG	NOx	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	47.66	0.00	38.95	53.25	0.00	36.56	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	1.7843	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401	0.0000	13.0975	13.0975	0.0128	0.0000	13.4178
Energy	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
Mobile	0.8822	4.7867	11.6672	0.0403	3.3185	0.0418	3.3603	0.8880	0.0393	0.9272		4,100.6980	4,100.6980	0.2135		4,106.0360
Total	**2.7050**	**5.1997**	**19.1030**	**0.0428**	**3.3185**	**0.1085**	**3.4270**	**0.8880**	**0.1060**	**0.9939**	**0.0000**	**4,533.4180**	**4,533.4180**	**0.2344**	**7.6900e-003**	**4,541.5700**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	1.7843	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401	0.0000	13.0975	13.0975	0.0128	0.0000	13.4178
Energy	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
Mobile	0.8822	4.7867	11.6672	0.0403	3.3185	0.0418	3.3603	0.8880	0.0393	0.9272		4,100.6980	4,100.6980	0.2135		4,106.0360
Total	**2.7050**	**5.1997**	**19.1030**	**0.0428**	**3.3185**	**0.1085**	**3.4270**	**0.8880**	**0.1060**	**0.9939**	**0.0000**	**4,533.4180**	**4,533.4180**	**0.2344**	**7.6900e-003**	**4,541.5700**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/8/2019	4/12/2019	7	5	
2	Grading	Grading	4/13/2019	5/12/2019	7	30	
3	Building Construction	Building Construction	5/13/2019	6/5/2020	7	390	
4	Paving	Paving	12/1/2019	12/15/2019	7	15	
5	Architectural Coating	Architectural Coating	1/1/2020	3/30/2020	7	90	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 15

Acres of Paving: 2.96

Residential Indoor: 178,200; Residential Outdoor: 59,400; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 6,870 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	0	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	111.00	28.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	22.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4656	4.6747	4.6054	6.2100e-003		0.3121	0.3121		0.2871	0.2871		615.0837	615.0837	0.1946		619.9489
Total	**0.4656**	**4.6747**	**4.6054**	**6.2100e-003**	**0.0000**	**0.3121**	**0.3121**	**0.0000**	**0.2871**	**0.2871**		**615.0837**	**615.0837**	**0.1946**		**619.9489**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	**0.0960**	**0.0672**	**0.7297**	**2.0000e-003**	**0.2012**	**1.5700e-003**	**0.2028**	**0.0534**	**1.4400e-003**	**0.0548**		**198.8380**	**198.8380**	**6.2100e-003**		**198.9933**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000			0.0000			0.0000
Off-Road	0.4656	4.6747	4.6054	6.2100e-003		0.3121	0.3121		0.2871	0.2871	0.0000	615.0837	615.0837	0.1946		619.9489
Total	**0.4656**	**4.6747**	**4.6054**	**6.2100e-003**	**0.0000**	**0.3121**	**0.3121**	**0.0000**	**0.2871**	**0.2871**	**0.0000**	**615.0837**	**615.0837**	**0.1946**		**619.9489**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0960	0.0672	0.7297	2.0000e-003	0.2012	1.5700e-003	0.2028	0.0534	1.4400e-003	0.0548		198.8380	198.8380	6.2100e-003		198.9933
Total	**0.0960**	**0.0672**	**0.7297**	**2.0000e-003**	**0.2012**	**1.5700e-003**	**0.2028**	**0.0534**	**1.4400e-003**	**0.0548**		**198.8380**	**198.8380**	**6.2100e-003**		**198.9933**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					6.5523	0.0000	6.5523	3.3675	0.0000	3.3675			0.0000			0.0000
Off-Road	1.8820	21.3359	9.3854	0.0203		0.9292	0.9292		0.8549	0.8549		2,014.1812	2,014.1812	0.6373		2,030.1128
Total	**1.8820**	**21.3359**	**9.3854**	**0.0203**	**6.5523**	**0.9292**	**7.4816**	**3.3675**	**0.8549**	**4.2224**		**2,014.1812**	**2,014.1812**	**0.6373**		**2,030.1128**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6081	1.6600e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		165.6984	165.6984	5.1800e-003		165.8278
Total	**0.0800**	**0.0560**	**0.6081**	**1.6600e-003**	**0.1677**	**1.3000e-003**	**0.1690**	**0.0445**	**1.2000e-003**	**0.0457**		**165.6984**	**165.6984**	**5.1800e-003**		**165.8278**

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					2.5554	0.0000	2.5554	1.3133	0.0000	1.3133			0.0000			0.0000
Off-Road	1.8820	21.3359	9.3854	0.0203		0.9292	0.9292		0.8549	0.8549	0.0000	2,014.1812	2,014.1812	0.6373		2,030.1128
Total	**1.8820**	**21.3359**	**9.3854**	**0.0203**	**2.5554**	**0.9292**	**3.4846**	**1.3133**	**0.8549**	**2.1682**	**0.0000**	**2,014.1812**	**2,014.1812**	**0.6373**		**2,030.1128**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0800	0.0560	0.6081	1.6600e-003	0.1677	1.3000e-003	0.1690	0.0445	1.2000e-003	0.0457		165.6984	165.6984	5.1800e-003		165.8278
Total	**0.0800**	**0.0560**	**0.6081**	**1.6600e-003**	**0.1677**	**1.3000e-003**	**0.1690**	**0.0445**	**1.2000e-003**	**0.0457**		**165.6984**	**165.6984**	**5.1800e-003**		**165.8278**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.7988	16.0839	12.4287	0.0211		0.8922	0.8922		0.8469	0.8469		2,016.8066	2,016.8066	0.4495		2,028.0436
Total	**1.7988**	**16.0839**	**12.4287**	**0.0211**		**0.8922**	**0.8922**		**0.8469**	**0.8469**		**2,016.8066**	**2,016.8066**	**0.4495**		**2,028.0436**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1128	3.2061	0.8626	7.0500e-003	0.1792	0.0216	0.2008	0.0516	0.0206	0.0722		751.2856	751.2856	0.0550		752.6603
Worker	0.5919	0.4143	4.4998	0.0123	1.2407	9.6600e-003	1.2504	0.3290	8.9000e-003	0.3379		1,226.1679	1,226.1679	0.0383		1,227.1256
Total	**0.7047**	**3.6205**	**5.3623**	**0.0194**	**1.4199**	**0.0312**	**1.4511**	**0.3806**	**0.0295**	**0.4102**		**1,977.4534**	**1,977.4534**	**0.0933**		**1,979.7859**

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	1.7988	16.0839	12.4287	0.0211		0.8922	0.8922		0.8469	0.8469	0.0000	2,016.8066	2,016.8066	0.4495		2,028.0436
Total	**1.7988**	**16.0839**	**12.4287**	**0.0211**		**0.8922**	**0.8922**		**0.8469**	**0.8469**	**0.0000**	**2,016.8066**	**2,016.8066**	**0.4495**		**2,028.0436**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1128	3.2061	0.8626	7.0500e-003	0.1792	0.0216	0.2008	0.0516	0.0206	0.0722		751.2856	751.2856	0.0550		752.6603
Worker	0.5919	0.4143	4.4998	0.0123	1.2407	9.6600e-003	1.2504	0.3290	8.9000e-003	0.3379		1,226.1679	1,226.1679	0.0383		1,227.1256
Total	**0.7047**	**3.6205**	**5.3623**	**0.0194**	**1.4199**	**0.0312**	**1.4511**	**0.3806**	**0.0295**	**0.4102**		**1,977.4534**	**1,977.4534**	**0.0933**		**1,979.7859**

3.4 Building Construction - 2020

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	1.6135	14.6518	12.1473	0.0211		0.7716	0.7716		0.7326	0.7326		1,990.8389	1,990.8389	0.4410		2,001.8645
Total	**1.6135**	**14.6518**	**12.1473**	**0.0211**		**0.7716**	**0.7716**		**0.7326**	**0.7326**		**1,990.8389**	**1,990.8389**	**0.4410**		**2,001.8645**

3.4 Building Construction - 2020

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	0.0963	2.9351	0.7800	7.0000e-003	0.1792	0.0148	0.1940	0.0516	0.0141	0.0657		746.2359	746.2359	0.0518		747.5313
Worker	0.5477	0.3696	4.0858	0.0119	1.2407	9.4100e-003	1.2501	0.3290	8.6700e-003	0.3377		1,188.1051	1,188.1051	0.0341		1,188.9569
Total	**0.6441**	**3.3048**	**4.8658**	**0.0189**	**1.4199**	**0.0242**	**1.4441**	**0.3806**	**0.0228**	**0.4034**		**1,934.3410**	**1,934.3410**	**0.0859**		**1,936.4882**

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	1.6135	14.6518	12.1473	0.0211		0.7716	0.7716		0.7326	0.7326	0.0000	1,990.8389	1,990.8389	0.4410		2,001.8645
Total	**1.6135**	**14.6518**	**12.1473**	**0.0211**		**0.7716**	**0.7716**		**0.7326**	**0.7326**	**0.0000**	**1,990.8389**	**1,990.8389**	**0.4410**		**2,001.8645**

3.4 Building Construction - 2020

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	0.0963	2.9351	0.7800	7.0000e-003	0.1792	0.0148	0.1940	0.0516	0.0141	0.0657		746.2359	746.2359	0.0518		747.5313
Worker	0.5477	0.3696	4.0858	0.0119	1.2407	9.4100e-003	1.2501	0.3290	8.6700e-003	0.3377		1,188.1051	1,188.1051	0.0341		1,188.9569
Total	**0.6441**	**3.3048**	**4.8658**	**0.0189**	**1.4199**	**0.0242**	**1.4441**	**0.3806**	**0.0228**	**0.4034**		**1,934.3410**	**1,934.3410**	**0.0859**		**1,936.4882**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.3995	14.4568	14.0658	0.0212		0.8276	0.8276		0.7614	0.7614		2,099.0462	2,099.0462	0.6641		2,115.6491
Paving	0.2376					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6371**	**14.4568**	**14.0658**	**0.0212**		**0.8276**	**0.8276**		**0.7614**	**0.7614**		**2,099.0462**	**2,099.0462**	**0.6641**		**2,115.6491**

3.5 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1067	0.0747	0.8108	2.2200e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		220.9312	220.9312	6.9000e-003		221.1037
Total	**0.1067**	**0.0747**	**0.8108**	**2.2200e-003**	**0.2236**	**1.7400e-003**	**0.2253**	**0.0593**	**1.6000e-003**	**0.0609**		**220.9312**	**220.9312**	**6.9000e-003**		**221.1037**

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	1.3995	14.4568	14.0658	0.0212		0.8276	0.8276		0.7614	0.7614	0.0000	2,099.0462	2,099.0462	0.6641		2,115.6490
Paving	0.2376					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.6371**	**14.4568**	**14.0658**	**0.0212**		**0.8276**	**0.8276**		**0.7614**	**0.7614**	**0.0000**	**2,099.0462**	**2,099.0462**	**0.6641**		**2,115.6490**

3.5 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1067	0.0747	0.8108	2.2200e-003	0.2236	1.7400e-003	0.2253	0.0593	1.6000e-003	0.0609		220.9312	220.9312	6.9000e-003		221.1037
Total	**0.1067**	**0.0747**	**0.8108**	**2.2200e-003**	**0.2236**	**1.7400e-003**	**0.2253**	**0.0593**	**1.6000e-003**	**0.0609**		**220.9312**	**220.9312**	**6.9000e-003**		**221.1037**

3.6 Architectural Coating - 2020

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	6.4720					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479		375.2641	375.2641	0.0291		375.9904
Total	**6.7949**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**		**375.2641**	**375.2641**	**0.0291**		**375.9904**

3.6 Architectural Coating - 2020

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	0.1086	0.0733	0.8098	2.3600e-003	0.2459	1.8700e-003	0.2478	0.0652	1.7200e-003	0.0669		235.4803	235.4803	6.7500e-003		235.6491
Total	**0.1086**	**0.0733**	**0.8098**	**2.3600e-003**	**0.2459**	**1.8700e-003**	**0.2478**	**0.0652**	**1.7200e-003**	**0.0669**		**235.4803**	**235.4803**	**6.7500e-003**		**235.6491**

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	6.4720					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.3229	2.2451	2.4419	3.9600e-003		0.1479	0.1479		0.1479	0.1479	0.0000	375.2641	375.2641	0.0291		375.9904
Total	**6.7949**	**2.2451**	**2.4419**	**3.9600e-003**		**0.1479**	**0.1479**		**0.1479**	**0.1479**	**0.0000**	**375.2641**	**375.2641**	**0.0291**		**375.9904**

3.6 Architectural Coating - 2020

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	0.1086	0.0733	0.8098	2.3600e-003	0.2459	1.8700e-003	0.2478	0.0652	1.7200e-003	0.0669		235.4803	235.4803	6.7500e-003		235.6491
Total	**0.1086**	**0.0733**	**0.8098**	**2.3600e-003**	**0.2459**	**1.8700e-003**	**0.2478**	**0.0652**	**1.7200e-003**	**0.0669**		**235.4803**	**235.4803**	**6.7500e-003**		**235.6491**

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	0.8822	4.7867	11.6672	0.0403	3.3185	0.0418	3.3603	0.8880	0.0393	0.9272		4,100.6980	4,100.6980	0.2135		4,106.0360
Unmitigated	0.8822	4.7867	11.6672	0.0403	3.3185	0.0418	3.3603	0.8880	0.0393	0.9272		4,100.6980	4,100.6980	0.2135		4,106.0360

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	456.72	159.28	165.44	1,273,289	1,273,289
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	456.72	159.28	165.44	1,273,289	1,273,289

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
Congregate Care (Assisted	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Other Non-Asphalt Surfaces	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
NaturalGas Unmitigated	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162

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					
Congregate Care (Assisted Living)	3566.79	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
Other Non-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
Parking Lot	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
Total		**0.0385**	**0.3287**	**0.1399**	**2.1000e-003**		**0.0266**	**0.0266**		**0.0266**	**0.0266**		**419.6226**	**419.6226**	**8.0400e-003**	**7.6900e-003**	**422.1162**

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					
Congregate Care (Assisted Living)	3.56679	0.0385	0.3287	0.1399	2.1000e-003		0.0266	0.0266		0.0266	0.0266		419.6226	419.6226	8.0400e-003	7.6900e-003	422.1162
Other Non-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
Parking Lot	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
Total		**0.0385**	**0.3287**	**0.1399**	**2.1000e-003**		**0.0266**	**0.0266**		**0.0266**	**0.0266**		**419.6226**	**419.6226**	**8.0400e-003**	**7.6900e-003**	**422.1162**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.7843	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401	0.0000	13.0975	13.0975	0.0128	0.0000	13.4178
Unmitigated	1.7843	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401	0.0000	13.0975	13.0975	0.0128	0.0000	13.4178

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	0.1596					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.4018					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	0.2229	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401		13.0975	13.0975	0.0128		13.4178
Total	**1.7843**	**0.0844**	**7.2959**	**3.8000e-004**		**0.0401**	**0.0401**		**0.0401**	**0.0401**	**0.0000**	**13.0975**	**13.0975**	**0.0128**	**0.0000**	**13.4178**

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	0.1596					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	1.4018					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	0.2229	0.0844	7.2959	3.8000e-004		0.0401	0.0401		0.0401	0.0401		13.0975	13.0975	0.0128		13.4178
Total	**1.7843**	**0.0844**	**7.2959**	**3.8000e-004**		**0.0401**	**0.0401**		**0.0401**	**0.0401**	**0.0000**	**13.0975**	**13.0975**	**0.0128**	**0.0000**	**13.4178**

7.0 Water Detail

7.1 Mitigation Measures Water

8.0 Waste Detail

8.1 Mitigation Measures Waste

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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May 2018

MATERIAL CULTURE
CONSULTING

Submitted to:

Rafik Albert, Senior Associate

E|P|D Solutions, Inc. Irvine,

California

Prepared on Behalf of:

T & C International Health, Inc.

Chino Hills, CA 31709

CULTURAL RESOURCES ASSESSMENT

Phase I Biological Resources Assessment: Moreno Valley Skilled Nursing Facility Project

City of Moreno Valley, Riverside County, California

Material Culture Consulting™

Date: **May 30, 2018**

Attention: **Rafik Albert**
E|P|D Solutions, Inc.
2030 Main Street, Suite 1200
Irvine, CA 92614
Submitted via email to Rafik@epdsolutions.com

MATERIAL CULTURE
CONSULTING

Subject: **Biological Report for the Moreno Valley Skilled Nursing Facility Project, Moreno Valley, Riverside County, California**

Dear Mr. Albert:

Material Culture Consulting, Inc. (MCC) presents the following biological letter report which summarizes the findings in support of the proposed Moreno Valley Skilled Nursing Facility Project (Project), Moreno Valley, Riverside County, California (Figure 1).

INTRODUCTION

The purpose of this letter report is to (1) describe the conditions of biological resources within the project in terms of vegetation, flora, wildlife, and wildlife habitats; (2) quantify potential direct and indirect impacts to biological resources that will result from the project; (3) discuss those impacts in terms of biological significance; (4) specify measures to mitigate any impacts that would occur to special-status biological resources; and (5) provide recommendations for additional focused biological studies.

Project Location

The Project is located near 25632 Alessandro Boulevard, Moreno Valley, California . Specifically, the proposed Project is located in the southeast portion of Section 8, within Township 3 South, Range 3 West on the Sunnymead USGS 7.5-minute quadrangle (San Bernardino Base Meridian) (see Figure 2). The Project Area encompasses parcel number:479-230-018, a lot which is currently vacant, located east of present-day Excel Prep Academy and west of the Moreno Valley Unified School District Administration Office. The Project Area is bounded by Alessandro Boulevard to the south and Black Walnut Street to the north and situated just east of Kitching Street (Figure 3). The Perris Reservoir and Upland Game Hunting Area are located approximately 7 miles south-southeast of the Project Area.

Project Description

The proposed Project includes the construction of three single-story wood framed buildings that will be divided into 88 resident units with 116 beds and all amenities including 24-hour nursing, food service, dining, therapy services, as well as additional services necessary to care for the residents. The building is classified as a I-2 occupancy and construction type V-A under the California Building Code. All three separate buildings will total approximately 69,0000 square footage on parcel number 479-230-018. Underground utilities proposed include a sewer line, a water line, and storm drainage infrastructure.

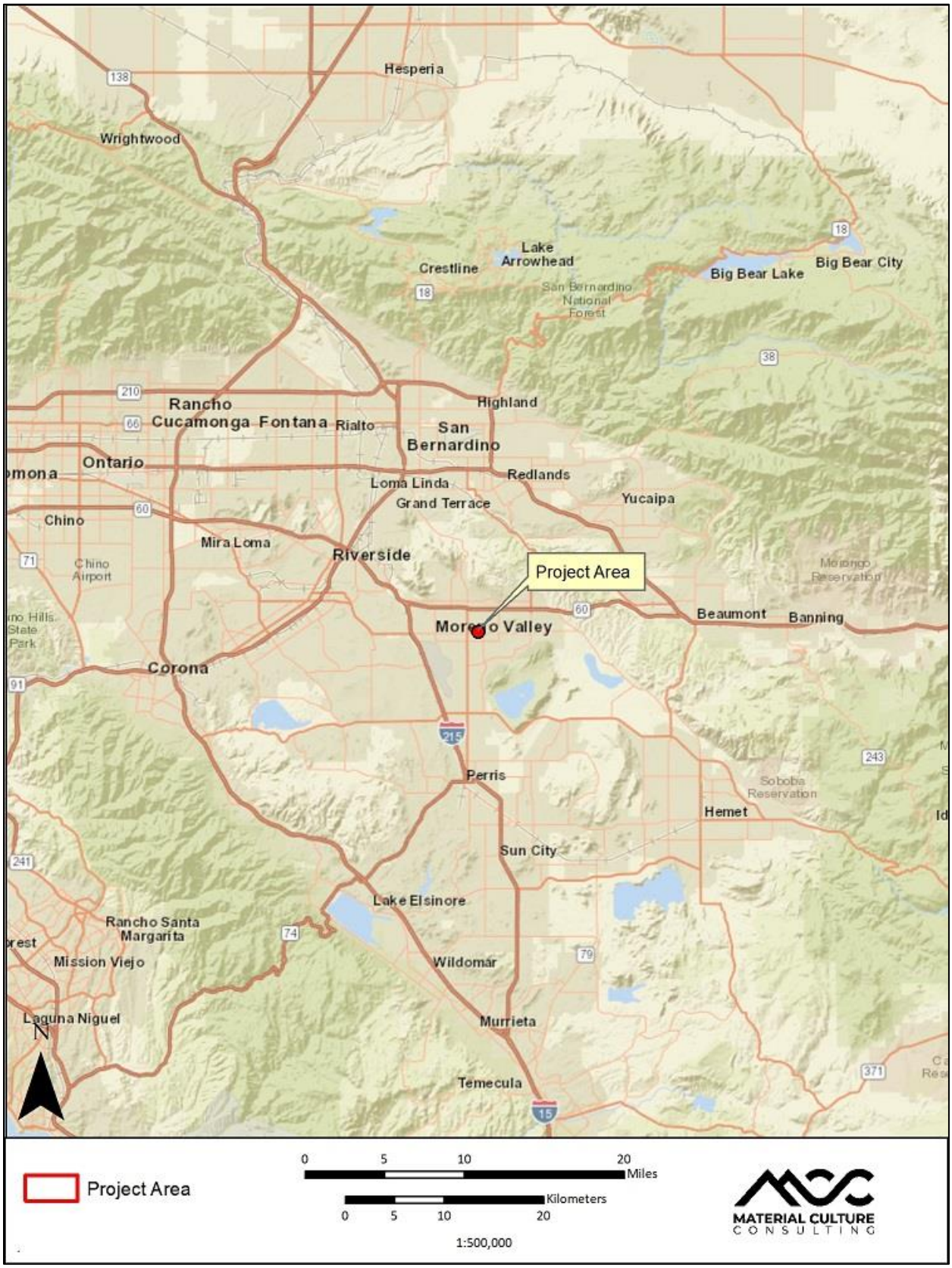

Figure 1. Project Vicinity (1:500,000 Regional Map)

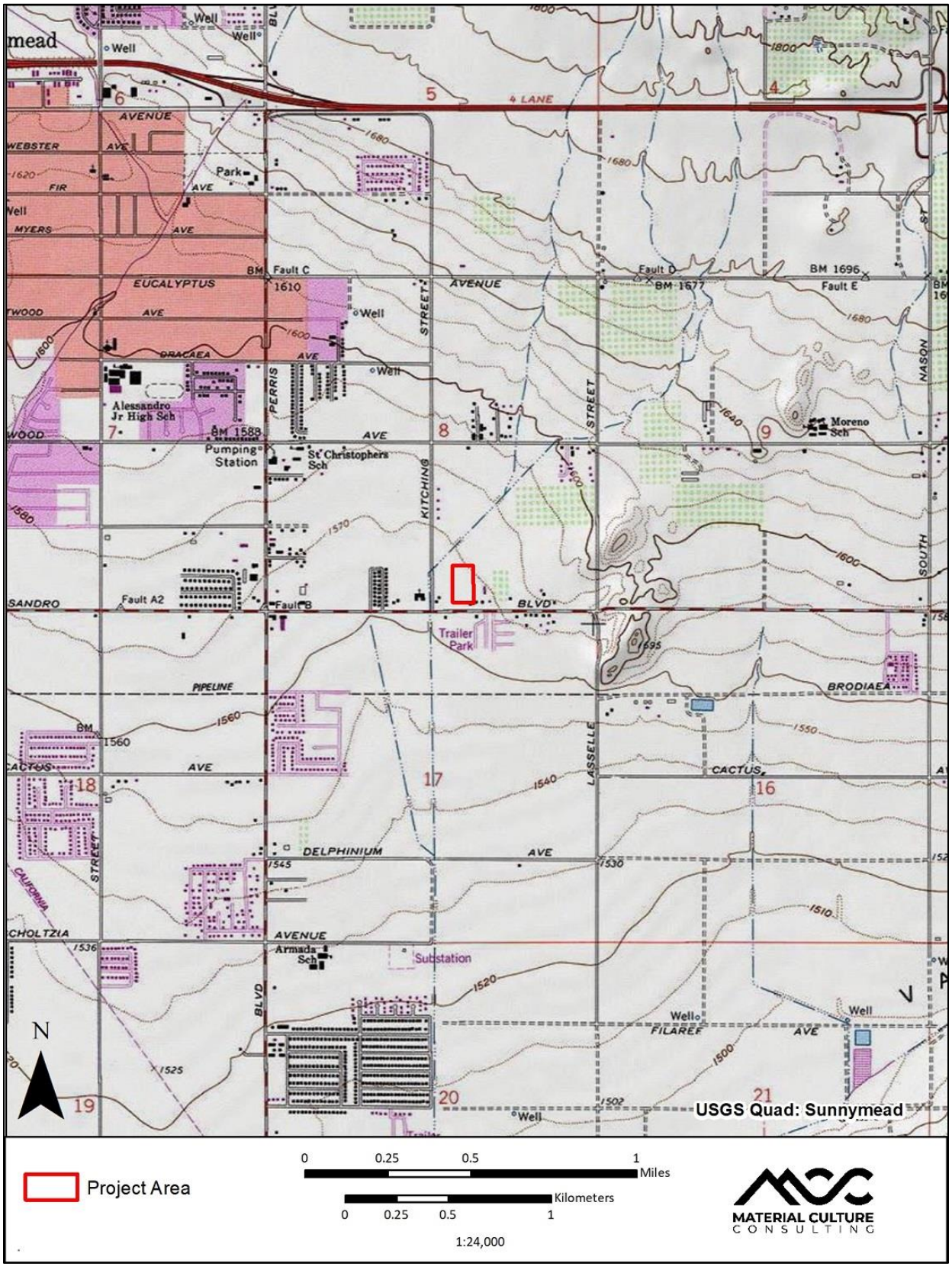

Figure 2. Project Location (1:24,000 Topographic Quadrangle)

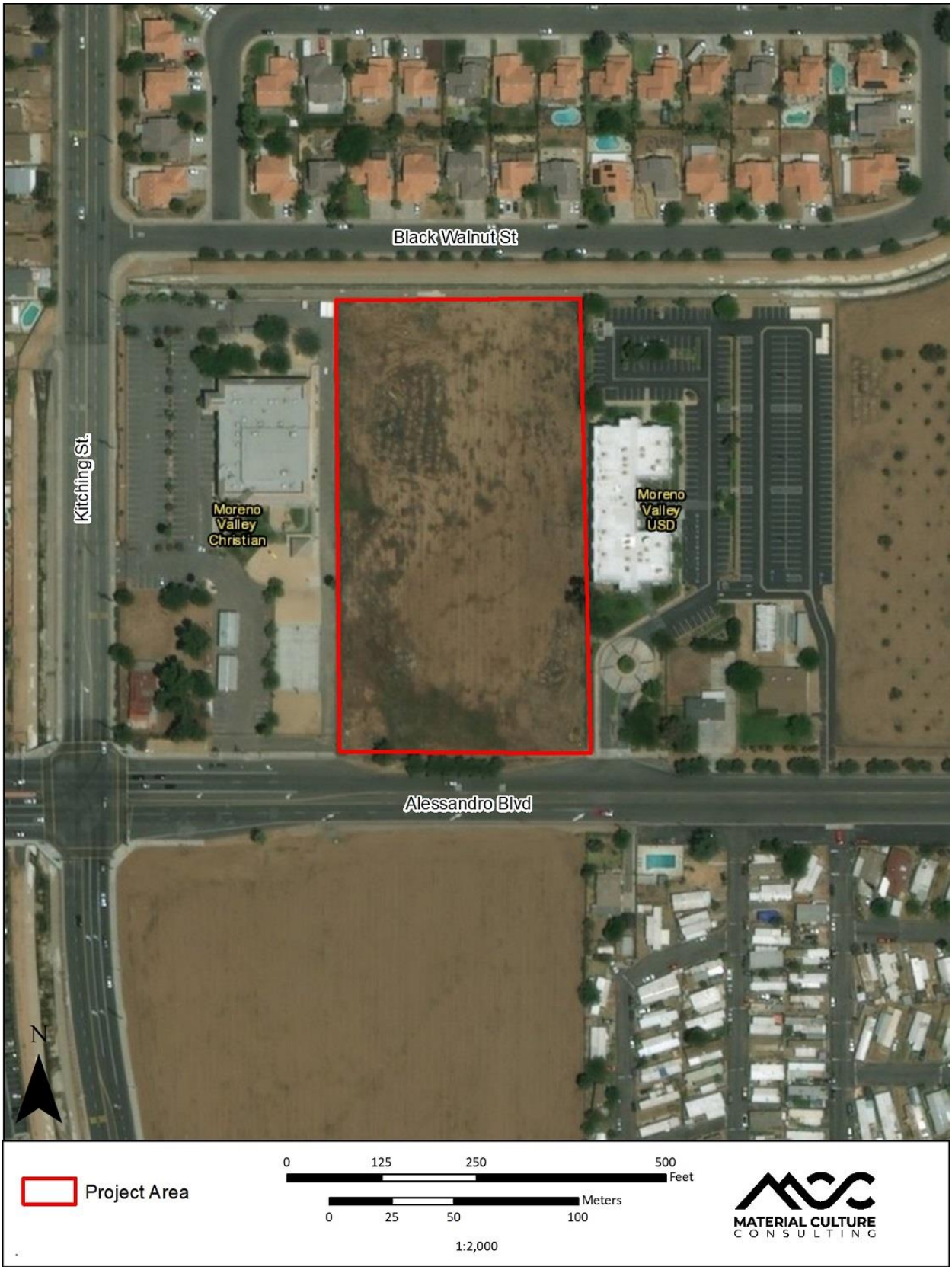

Figure 3. Project Area (1:2,000 Aerial Photograph)

METHODS

Data regarding biological resources present in the project and surroundings were obtained through a review of pertinent literature and field reconnaissance; both are described in detail in this section.

Definitions

The biological study area (BSA) for this project is defined as the full extent of the parcel that includes the Project (Figures 1-3).

Special-status biological resources are defined as follows:

- Special-status vegetation communities are those communities identified as high priority for inventory in the List of Vegetation Alliances and Associations (California Department of Fish and Game [CDFG] 2010) by a state rarity ranking of S1, S2, or S3.

Special-status plant species are those plant species that are:

- Classified as endangered, threatened or rare by the California Fish and Game Commission (state listed) and/or classified as endangered or threatened by the U.S. Fish and Wildlife Service (federally listed), or candidates for future listing;
- Considered by the California Native Plant Society (CNPS) to be "rare, threatened, or endangered in California" (California Rare Plant Rank [CRPR] 1, 2, 3, and 4);
- Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context such as within a county or region or is so designated in local or regional plans, policies, or ordinances;
- Species with a state rarity ranking of S1, S2, or S3.

Special-status wildlife species are those wildlife species that are:

- Listed as threatened or endangered or candidates for future listing as threatened or endangered under the Federal Endangered Species Act or California Endangered Species Act;
- Designated as a species of concern by California Department of Fish and Wildlife (CDFW); and
- Fully protected species protected under California Fish and Game Code Sections 3511, 4700, 5050, and 5515

Literature Review

Special-status biological resources present or potentially present in the BSA and surrounding areas were identified through a literature search. The following sources were used during the literature review process.

- U.S. Department of Agriculture (USDA) (2018) web soil survey was queried for soils types.
- U.S. Fish and Wildlife Service (USFWS) Critical Habitat within the project (USFWS 2018).
- California Natural Diversity Database (CNDDB) (2018) was queried to compile a list of potentially occurring flora and fauna within the Sunnymead and surrounding eight USGS 7.5-minute quadrangles: San Bernardino South, Redlands, Yucaipa, El Casco, Lakeview, Perris, Steele Peak, and Riverside East.
- CNPS Inventory of Rare, Threatened, and Endangered Plants of California, 8th online edition (CNPS 2018), was searched to compose a list of potentially occurring flora in the Sunnymead and surrounding eight USGS quadrangles as listed above.

Field Survey

On April 12, 2018, Senior Biologist Mikael Romich conducted vegetation mapping and a wildlife habitat assessment within the BSA from 1145 to 1245. Weather conditions during the survey were considered good, with partly cloudy skies, light winds, and temperature of 62 degrees Fahrenheit.

Vegetation Community and Land Cover Mapping

Vegetation communities and land uses within the BSA were mapped in the field directly onto a 300-foot-scale (1 inch = 300 feet), aerial photograph–based field map of the project. Following completion of the fieldwork, all vegetation polygons were digitized using Google Earth (imagery dated April 29, 2017) and converted to ArcGIS. Once in ArcGIS, the acreage of each vegetation community and land cover present on site was determined and overlap with project elements was calculated. Vegetation community classifications used in this report follow the Manual of California, second edition (Sawyer et al. 2009).

RESULTS / EXISTING CONDITIONS

Land Use

The project occurs generally in a developed area that includes residential, office buildings, and schools. Developed parcels occur to the north, east, and west of the site. To the south is a heavily disturbed undeveloped parcel, but with additional developed areas further to the south. To the north of the site is an existing storm drain. The site has been regularly disturbed with disking activities since at least 2002 (based on Google aerial review). In addition, some small piles of soils and rubble placed in the northwestern portion of the site have been there since at least 2002.

Topography and Soils

The BSA was relatively flat2,365 feet above mean sea level (amsl).

Two soil types are mapped within the BSA (Figure 4): Greenfield sandy loam, 0 to 2 percent slopes and Ramona very fine sandy loam, 0 to 8 percent slopes. These soils are common to alluvial fans and terraces and are considered well-drained.

Vegetation Communities and Land Covers

A total of one (1) vegetation community was documented within the BSA (Figure 5): annual brome grasslands. Appendix A shows representative photographs of this vegetation community. No special-status plant communities occur on the site.

Annual Brome Grasslands
Annual brome grasslands have been mapped for the BSA due to the presence of non-native foxtail brome (Bromus rubens) with non-native barley (Horduem species) (Figure 5). Other non-native species observed in the annual brome grasslands included field bindweed (Convolvulus arvensis), bur clover (Medicago polymorpha), London rocket (Sisymbrium irio), cheeseweed mallow (Malva parviflora), and red-stemmed filaree (Erodium cicutarium). Jimsonweed (Datura wrightii) and fiddleneck (Amsinckia species) were the only native species recorded for the site during the habitat assessment. Along the southern boundary of the site was a row of ornamental landscaping, which appeared to be olive trees (Olea species).

Wildlife Species Observed

In addition to the plant species noted in the sections above, several wildlife species were observed on the BSA: American pipit (Anthus rubescens), barn swallow (Hirundo rustica), cliff swallow (Petrochelidon pyrrhonota), European starling (Sturnus vulgaris), northern mockingbird (Mimus polyglottos), lesser goldfinch (Spinus psaltria), house finch (Haemorhous mexicanus), and western fence lizard (Sceloporus occidentalis).

Special-Status Species Plants

The literature review found 46 special-status plant species documented in the Project region; however, none of these species are expected to occur on the BSA due to a lack of suitable habitat or soils, and the high level of disturbance (see Appendix B).

Special-Status Species Wildlife

The literature review found 46 special-status wildlife species documented in the site region; however, none of these species are expected to occur on the BSA due to a lack of suitable habitat, disturbed conditions, the small size of the site, and that it is surrounded ultimately on all sides by existing development (see Appendix C).

Suitable foraging habitat for burrowing owl (Athene cunicularia), a Species of Special Concern (SSC), is present in the BSA. However, no suitable burrows were observed within the BSA. The rubble pile observed does provide some low-quality opportunities for use as cover, but no burrowing owl sign or burrowing owls were observed. In addition, no active California ground squirrel (Otospermophilus beecheyi) colonies were observed. Finally, the site is nearly surrounded by existing development. Overall, this species is not expected to occur on the BSA.

Jurisdictional Waters Assessment

The BSA overlaps relatively flat ground and no natural features were observed that would be considered a jurisdictional water by ACOE, CDFW, and RWQCB. The site is absent of federally protected wetlands as defined by Section 404 of the Clean Water Act. Figure 5 shows the location of a concrete-lined channel that occurs north of the site and would be considered jurisdictional by ACOE, CDFW, and RWQCB.

Nesting Birds

California Fish and Game Code 3503 (CFGC) and the Migratory Bird Treaty Act (MBTA) protect native birds and their nests from direct take. The project site contains vegetation suitable for nesting birds.

Critical Habitat

No designated critical habitat occurs within the BSA

Wildlife Movement

The site does not occur with any known wildlife corridors. It is surrounded ultimately on all sides by development and could not be for movement by any native resident or migratory fish or wildlife species. In addition, the site is not used as a wildlife nursery site.

Local Policies or Ordinances

The City of Moreno Valley does not have any ordinances that protect oak trees or other tree species that may have biological or heritage value.

Habitat Conservation Plans

Western Riverside County Multiple Species Habitat Conservation Plan
The site occurs within the Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) (Figure 6). However, the lead agency is not a signatory to the MSHCP. The site does not overlap or occur adjacent to any area conserved or targeted for conservation by the MSHCP. Therefore, development of the site would not impact any conservation goals of the MSHCP.

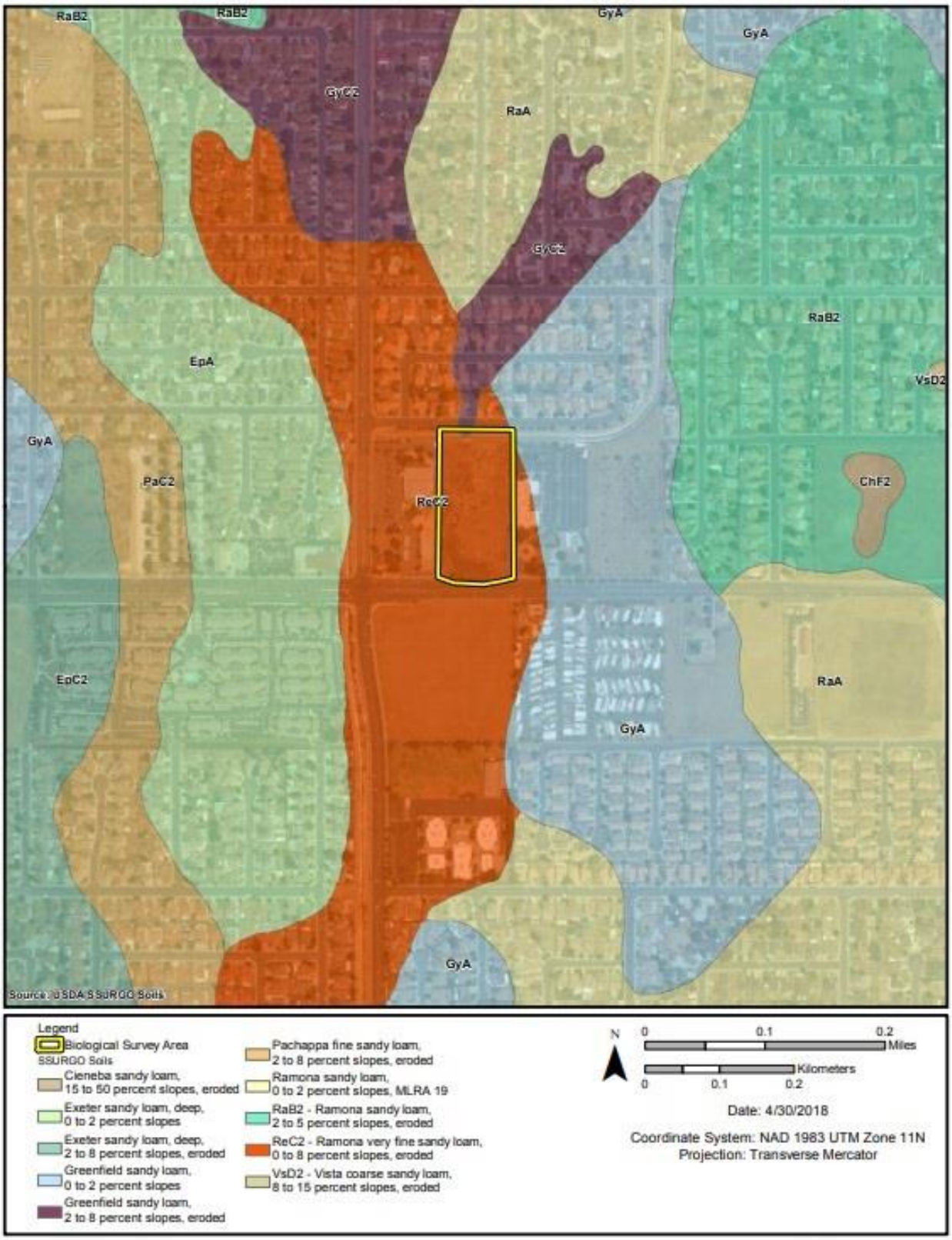

Figure 4. Soils within Project Vicinity

Figure 5. Vegetation Communities within the Project Area

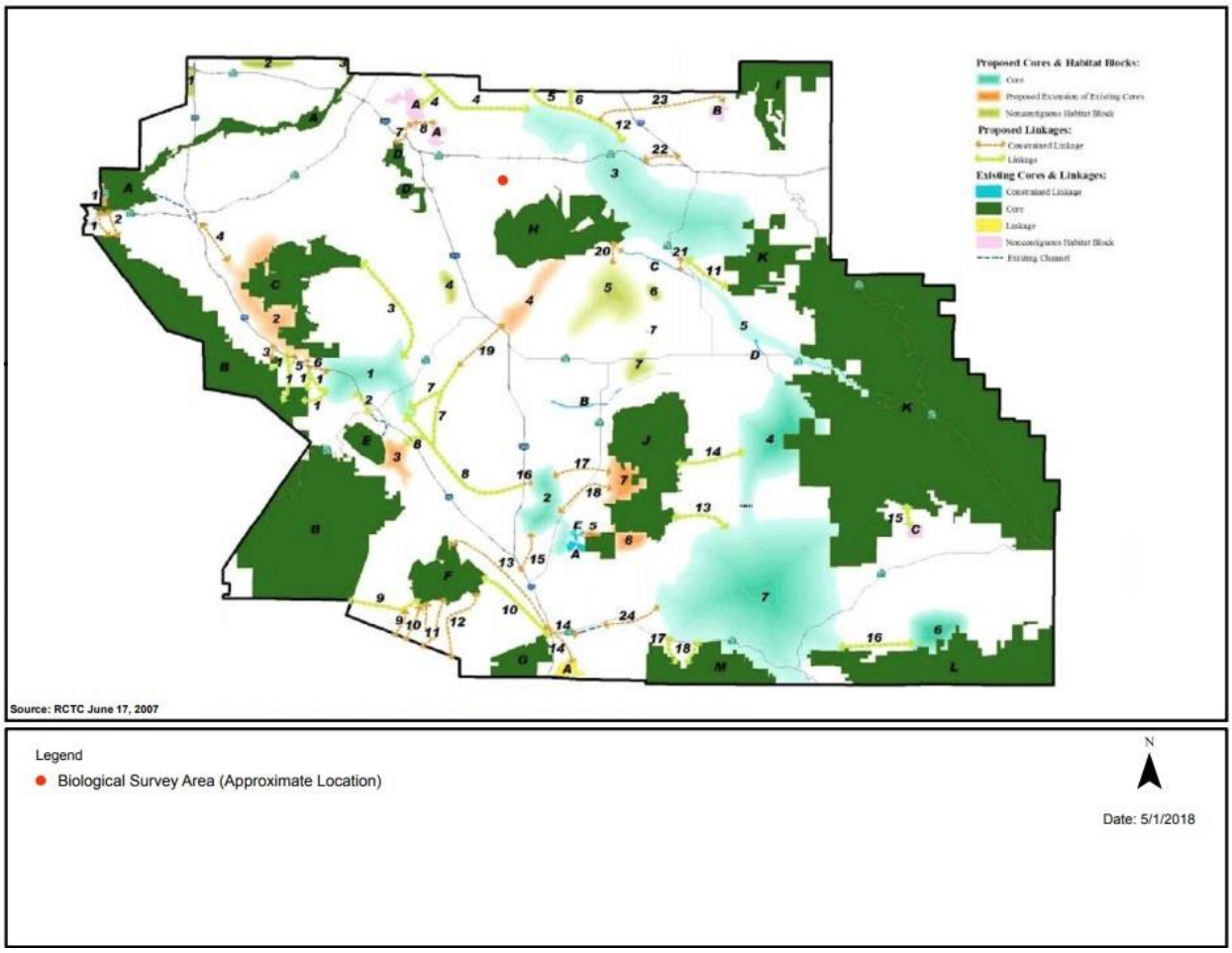

Figure 6. Mapped Conservation Areas within the Multiple Species Habitat Conservation Plan (MSHCP)

RECOMMENDATIONS/PROPOSED MITIGATION MEASURES

This section discusses recommendations so that the project may be adequately analyzed under CEQA for potential significant impacts to biological resources. It also provides several mitigation measures that can be incorporated into the CEQA analysis. The site has been highly disturbed and is surrounded ultimately on all sides by existing urban development. It is not expected to support any special-status biological resources. Development of the site, with implementation of the measures described above, would have less than significant impacts to special-status biological resources described in this report.

Preconstruction Burrowing Owl Survey

Currently, the site is not expected to support burrowing owl. To ensure conditions on the BSA do not change prior to implementation of any proposed project, a preconstruction burrowing owl survey shall be complete a maximum of 30 days prior to the start of construction. All areas of the site shall be included, as well as a visual survey of the undeveloped property to the south. The results shall be provided as a letter report. If burrowing owls are observed within the site, additional coordination with CDFW would be required. No burrowing owls may be harmed, and no burrows may be collapsed during displacement between February 1 and August 31 to avoid the nesting season.

Nesting Birds

The project could adversely affect native nesting birds if construction-related activities destroys or otherwise harms the nest. The loss of a nest due to construction activities would be a violation of the MBTA and Fish and Game code. Implementation of the following recommended measure would help assure avoidance and/or minimization of potential impacts to nesting birds and raptors.

To avoid take of nesting birds, vegetation removal and initial ground disturbance should occur outside the nesting bird breeding season (February through August). If project activities occur during the nesting season, a nesting bird survey should be conducted by a qualified biologist at a maximum of one (1) week prior to start of construction activities. If active nests of protected native species are located, construction work should be delayed until after the nesting season or until the young are no longer dependent upon the nest site. Construction near an active nest should be conducted at the discretion of a biological monitor utilizing appropriate buffers and other methods to minimize potential impacts.

CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present data and information required for this biological evaluation, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: May 30, 2018

Signed: _____

Mikael Romich, Senior Biologist

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Appendix A

Site Photographs

Figure 1. Northerly view of the non-native grasslands from the south-central portion of the site.

Figure 2. Westerly view of the non-native grasslands from the northeast portion of the site.

Figure 3. Easterly view of the non-native grasslands from the southwest portion of the site.

Figure 4. View of concrete drainage channel that is outside the site but abuts it on the north side.

Appendix B

Plant Species Evaluated

Scientific Name	Common Name	Federal	State	CRPR	General habitat	Micro habitat
Abronia villosa var. aurita	chaparral sand-verbena	None	None	1B.1	Chaparral, coastal scrub, desert dunes.	Sandy areas. -60-1570 m.
Allium munzii	Munz's onion	Endangered	Threatened	1B.1	Chaparral, coastal scrub, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland.	Heavy clay soils; grows in grasslands & openings within shrublands or woodlands. 375-1040 m.
Arenaria paludicola	marsh sandwort	Endangered	Endangered	1B.1	Marshes and swamps.	Growing up through dense mats of Typha, Juncus, Scirpus, etc. in freshwater marsh. Sandy soil. 3-170 m.
Astragalus hornii var. hornii	Horn's milk-vetch	None	None	1B.1	Meadows and seeps, playas.	Lake margins, alkaline sites. 75-350 m.
Astragalus pachypus var. jaegeri	Jaeger's milk-vetch	None	None	1B.1	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland.	Dry ridges and valleys and open sandy slopes; often in grassland and oak-chaparral. 365-915 m.
Atriplex coronata var. notatior	San Jacinto Valley crownscale	Endangered	None	1B.1	Playas, valley and foothill grassland, vernal pools.	Alkaline areas in the San Jacinto River Valley. 35-460 m.
Atriplex parishii	Parish's brittlescale	None	None	1B.1	Vernal pools, chenopod scrub, playas.	Usually on drying alkali flats with fine soils. 5-1420 m.
Atriplex serenana var. davidsonii	Davidson's saltscale	None	None	1B.2	Coastal bluff scrub, coastal scrub.	Alkaline soil. 0-460 m.
Berberis nevinii	Nevin's barberry	Endangered	Endangered	1B.1	Chaparral, cismontane woodland, coastal scrub, riparian scrub.	On steep, N-facing slopes or in low grade sandy washes. 290-1575 m.
Brodiaea filifolia	thread-leaved brodiaea	Threatened	Endangered	1B.1	Chaparral (openings), cismontane woodland, coastal scrub, playas, valley and foothill grassland, vernal pools.	Usually associated with annual grassland and vernal pools; often surrounded by shrubland habitats. Occurs in openings on clay soils. 15-1030 m.
Calochortus plummerae	Plummer's mariposa-lily	None	None	4.2	Coastal scrub, chaparral, valley and foothill grassland, cismontane woodland, lower montane coniferous forest.	Occurs on rocky and sandy sites, usually of granitic or alluvial material. Can be very common after fire. 60-2500 m.
Carex comosa	bristly sedge	None	None	2B.1	Marshes and swamps, coastal prairie, valley and foothill grassland.	Lake margins, wet places; site below sea level is on a Delta island. -5-1620 m.
Caulanthus simulans	Payson's jewelflower	None	None	4.2	Chaparral, coastal scrub.	Frequently in burned areas, or in disturbed sites such as streambeds; also on rocky, steep slopes. Sandy, granitic soils. 90-2200 m.
Centromadia pungens ssp. laevis	smooth tarplant	None	None	1B.1	Valley and foothill grassland, chenopod scrub, meadows and seeps, playas, riparian woodland.	Alkali meadow, alkali scrub; also in disturbed places. 5-1170 m.
Chloropyron maritimum ssp. maritimum	salt marsh bird's-beak	Endangered	Endangered	1B.2	Marshes and swamps, coastal dunes.	Limited to the higher zones of salt marsh habitat. 0-10 m.

Scientific Name	Common Name	Federal	State	CRPR	General habitat	Micro habitat
Chorizanthe parryi var. parryi	Parry's spineflower	None	None	1B.1	Coastal scrub, chaparral, cismontane woodland, valley and foothill grassland.	Dry slopes and flats; sometimes at interface of 2 vegetation types, such as chaparral and oak woodland. Dry, sandy soils. 90-1220 m.
Chorizanthe polygonoides var. longispina	long-spined spineflower	None	None	1B.2	Chaparral, coastal scrub, meadows and seeps, valley and foothill grassland, vernal pools.	Gabbroic clay. 30-1540 m.
Chorizanthe xanti var. leucotheca	white-bracted spineflower	None	None	1B.2	Mojavean desert scrub, pinyon and juniper woodland, coastal scrub (alluvial fans).	Sandy or gravelly places. 365-1830 m.
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	None	None	2B.2	Marshes and swamps (freshwater).	Freshwater marsh. 15-280 m.
Dodecahema leptoceras	slender-horned spineflower	Endangered	Endangered	1B.1	Chaparral, cismontane woodland, coastal scrub (alluvial fan sage scrub).	Flood deposited terraces and washes; associates include Encelia, Dalea, Lepidospartum, etc. Sandy soils. 200-765 m.
Eriastrum densifolium ssp. sanctorum	Santa Ana River woollystar	Endangered	Endangered	1B.1	Coastal scrub, chaparral.	In sandy soils on river floodplains or terraced fluvial deposits. 180-705 m.
Galium californicum ssp. primum	Alvin Meadow bedstraw	None	None	1B.2	Chaparral, lower montane coniferous forest.	Grows in shade of trees and shrubs at the lower edge of the pine belt, in pine forest-chaparral ecotone. Granitic, sandy soils. 1460-1830 m.
Harpagonella palmeri	Palmer's grapplinghook	None	None	4.2	Chaparral, coastal scrub, valley and foothill grassland.	Clay soils; open grassy areas within shrubland. 20-955 m.
Helianthus nuttallii ssp. parishii	Los Angeles sunflower	None	None	1A	Marshes and swamps (coastal salt and freshwater).	35-1525 m.
Horkelia cuneata var. puberula	mesa horkelia	None	None	1B.1	Chaparral, cismontane woodland, coastal scrub.	Sandy or gravelly sites. 15-1645 m.
Imperata brevifolia	California satintail	None	None	2B.1	Coastal scrub, chaparral, riparian scrub, mojavean desert scrub, meadows and seeps (alkali), riparian scrub.	Mesic sites, alkali seeps, riparian areas. 3-1495 m.
Lasthenia glabrata ssp. coulteri	Coulter's goldfields	None	None	1B.1	Coastal salt marshes, playas, vernal pools.	Usually found on alkaline soils in playas, sinks, and grasslands. 1-1375 m.
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	None	None	4.3	Chaparral, coastal scrub.	Dry soils, shrubland. 4-1435 m.
Lycium parishii	Parish's desert-thorn	None	None	2B.3	Coastal scrub, Sonoran desert scrub.	135-1000 m.
Malacothamnus parishii	Parish's bush-mallow	None	None	1A	Chaparral, coastal sage scrub.	In a wash. 305-455 m.
Monardella macrantha ssp. hallii	Hall's monardella	None	None	1B.3	Broadleafed upland forest, chaparral, lower montane coniferous forest, cismontane woodland, valley and foothill grassland.	Dry slopes and ridges in openings. 700-1770 m.

Scientific Name	Common Name	Federal	State	CRPR	General habitat	Micro habitat
Monardella pringlei	Pringle's monardella	None	None	1A	Coastal scrub.	Sandy hills. 300-400 m.
Myosurus minimus ssp. apus	little mousetail	None	None	3.1	Vernal pools, valley and foothill grassland.	Alkaline soils. 20-640 m.
Nama stenocarpa	mud nama	None	None	2B.2	Marshes and swamps.	Lake shores, river banks, intermittently wet areas. 5-500 m.
Nasturtium gambelii	Gambel's water cress	Endangered	Threatened	1B.1	Marshes and swamps.	Freshwater and brackish marshes at the margins of lakes and along streams, in or just above the water level. 5-330 m.
Navarretia fossalis	spreading navarretia	Threatened	None	1B.1	Vernal pools, chenopod scrub, marshes and swamps, playas.	San Diego hardpan and San Diego claypan vernal pools; in swales & vernal pools, often surrouded by other habitat types. 15-850 m.
Ribes divaricatum var. parishii	Parish's gooseberry	None	None	1A	Riparian woodland.	Salix swales in riparian habitats. 65-300 m.
Senecio aphanactis	chaparral ragwort	None	None	2B.2	Chaparral, cismontane woodland, coastal scrub.	Drying alkaline flats. 20-855 m.
Sidalcea hickmanii ssp. parishii	Parish's checkerbloom	None	Rare	1B.2	Chaparral, cismontane woodland, lower montane coniferous forest.	Disturbed burned or cleared areas on dry, rocky slopes, in fuel breaks & fire roads along the mountain summits. 1095-2135 m.
Sidalcea neomexicana	salt spring checkerbloom	None	None	2B.2	Playas, chaparral, coastal scrub, lower montane coniferous forest, Mojavean desert scrub.	Alkali springs and marshes. 3-2380 m.
Sphenopholis obtusata	prairie wedge grass	None	None	2B.2	Cismontane woodland, meadows and seeps.	Open moist sites, along rivers and springs, alkaline desert seeps. 15-2625 m.
Streptanthus campestris	southern jewelflower	None	None	1B.3	Chaparral, lower montane coniferous forest, pinyon and juniper woodland.	Open, rocky areas. 605-2590 m.
Symphyotrichum defoliatum	San Bernardino aster	None	None	1B.2	Meadows and seeps, cismontane woodland, coastal scrub, lower montane coniferous forest, marshes and swamps, valley and foothill grassland.	Vernally mesic grassland or near ditches, streams and springs; disturbed areas. 2-2040 m.
Texosporium sancti-jacobi	woven-spored lichen	None	None	3	Chaparral.	Open sites; in California with Adenostoma fasciculatum, Eriogonum, Selaginella. At Pinnacles, on small mammal pellets. 290-660 m.
Tortula californica	California screw moss	None	None	1B.2	Chenopod scrub, valley and foothill grassland.	Moss growing on sandy soil. 10-1460 m.
Trichocoronis wrightii var. wrightii	Wright's trichocoronis	None	None	2B.1	Marshes and swamps, riparian forest, meadows and seeps, vernal pools.	Mud flats of vernal lakes, drying river beds, alkali meadows. 5-435 m.

Appendix C

Wildlife Species Evaluated

Scientific Name	Common Name	Federal	State	Other	General habitat	Micro Habitat
Agelaius tricolor	tricolored blackbird	None	Threatened	SSC	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California.	Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.
Anniella stebbinsi	southern California legless lizard	None	None	SSC	Generally south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County.	Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.
Antrozous pallidus	pallid bat	None	None	SSC	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.
Aquila chrysaetos	golden eagle	None	None	FP, SSC	Rolling foothills, mountain areas, sage-juniper flats, and desert.	Cliff-walled canyons provide nesting habitat in most parts of range; also, large trees in open areas.
Arizona elegans occidentalis	California glossy snake	None	None	SSC	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California.	Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.
Asio otus	long-eared owl	None	None	SSC	Riparian bottomlands grown to tall willows and cottonwoods; also, belts of live oak paralleling stream courses.	Require adjacent open land, productive of mice and the presence of old nests of crows, hawks, or magpies for breeding.
Aspidoscelis tigris stejnegeri	coastal whiptail	None	None	SSC	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland & riparian areas.	Ground may be firm soil, sandy, or rocky.
Athene cunicularia	burrowing owl	None	None	SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.
Buteo swainsoni	Swainson's hawk	None	Threatened	--	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees.	Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.
Campylorhynchus brunneicapillus sandiegensis	coastal cactus wren	None	None	SSC	Southern California coastal sage scrub.	Wrens require tall opuntia cactus for nesting and roosting.
Catostomus santaanae	Santa Ana sucker	Threatened	None	--	Endemic to Los Angeles Basin south coastal streams.	Habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.
Chaetodipus fallax fallax	northwestern San Diego pocket mouse	None	None	SSC	Coastal scrub, chaparral, grasslands, sagebrush, etc. in western San Diego County.	Sandy, herbaceous areas, usually in association with rocks or coarse gravel.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Threatened	Endangered	--	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.
Coleonyx variegatus abbotti	San Diego banded gecko	None	None	SSC	Coastal & cismontane Southern California.	Found in granite or rocky outcrops in coastal scrub and chaparral habitats.

Scientific Name	Common Name	Federal	State	Other	General habitat	Micro Habitat
Crotalus ruber	red-diamond rattlesnake	None	None	SSC	Chaparral, woodland, grassland, & desert areas from coastal San Diego County to the eastern slopes of the mountains.	Occurs in rocky areas and dense vegetation. Needs rodent burrows, cracks in rocks or surface cover objects.
Dipodomys merriami parvus	San Bernardino kangaroo rat	Endangered	None	SSC	Alluvial scrub vegetation on sandy loam substrates characteristic of alluvial fans and flood plains.	Needs early to intermediate seral stages.
Dipodomys stephensi	Stephens' kangaroo rat	Endangered	Threatened	--	Primarily annual & perennial grasslands, but also occurs in coastal scrub & sagebrush with sparse canopy cover.	Prefers buckwheat, chamise, brome grass and filaree. Will burrow into firm soil.
Elanus leucurus	white-tailed kite	None	None	FP	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.
Empidonax traillii extimus	southwestern willow flycatcher	Endangered	Endangered	--	Riparian woodlands in Southern California.	
Emys marmorata	western pond turtle	None	None	SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.
Eumops perotis californicus	western mastiff bat	None	None	SSC	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral, etc.	Roosts in crevices in cliff faces, high buildings, trees and tunnels.
Euphydryas editha quino	quino checkerspot butterfly	Endangered	None	--	Sunny openings within chaparral & coastal sage shrublands in parts of Riverside & San Diego counties.	Hills and mesas near the coast. Need high densities of food plants Plantago erecta, P. insularis, and Orthocarpus purpurescens.
Gila orcuttii	arroyo chub	None	None	SSC	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mojave & San Diego river basins.	Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.
Haliaeetus leucocephalus	bald eagle	Delisted	Endangered	FP	Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water.	Nests in large, old-growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.
Icteria virens	yellow-breasted chat	None	None	SSC	Summer resident; inhabits riparian thickets of willow and other brushy tangles near watercourses.	Nests in low, dense riparian, consisting of willow, blackberry, wild grape; forages and nests within 10 ft of ground.
Lanius ludovicianus	loggerhead shrike	None	None	SSC	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub & washes.	Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.
Lasiurus xanthinus	western yellow bat	None	None	SSC	Found in valley foothill riparian, desert riparian, desert wash, and palm oasis habitats.	Roosts in trees, particularly palms. Forages over water and among trees.
Laterallus jamaicensis coturniculus	California black rail	None	Threatened	FP	Inhabits freshwater marshes, wet meadows and shallow margins of saltwater marshes bordering larger bays.	Needs water depths of about 1 inch that do not fluctuate during the year and dense vegetation for nesting habitat.

Scientific Name	Common Name	Federal	State	Other	General habitat	Micro Habitat
Leptonycteris yerbabuenae	lesser long-nosed bat	Endangered	None	--	Arid regions such as desert grasslands and shrub land. Suitable day roosts (caves & mines) and suitable concentrations of food plants (columnar cacti & agaves) are critical resources. No maternity roosts known from California; may only be vagrant.	Caves and mines are used as day roosts. Caves, mines, rock crevices, trees and shrubs, and abandoned buildings are used as night roosts for digesting meals. Nectar, pollen, and fruit eating bat; primarily feeding on agaves, saguaro, and organ pipe cactus.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None	None	SSC	Intermediate canopy stages of shrub habitats & open shrub / herbaceous & tree / herbaceous edges.	Coastal sage scrub habitats in Southern California.
Neotoma lepida intermedia	San Diego desert woodrat	None	None	SSC	Coastal scrub of Southern California from San Diego County to San Luis Obispo County.	Moderate to dense canopies preferred. They are particularly abundant in rock outcrops, rocky cliffs, and slopes.
Nyctinomops femorosaccus	pocketed free-tailed bat	None	None	SSC	Variety of arid areas in Southern California; pine-juniper woodlands, desert scrub, palm oasis, desert wash, desert riparian, etc.	Rocky areas with high cliffs.
Onychomys torridus ramona	southern grasshopper mouse	None	None	SSC	Desert areas, especially scrub habitats with friable soils for digging. Prefers low to moderate shrub cover.	Feeds almost exclusively on arthropods, especially scorpions and orthopteran insects.
Perognathus longimembris brevinasus	Los Angeles pocket mouse	None	None	SSC	Lower elevation grasslands and coastal sage communities in and around the Los Angeles Basin.	Open ground with fine, sandy soils. May not dig extensive burrows, hiding under weeds and dead leaves instead.
Phrynosoma blainvillii	coast horned lizard	None	None	SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes.	Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.
Polioptila californica californica	coastal California gnatcatcher	Threatened	None	SSC	Obligate, permanent resident of coastal sage scrub below 2500 ft in Southern California.	Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.
Rana muscosa	southern mountain yellow-legged frog	Endangered	Endangered	--	Federal listing refers to populations in the San Gabriel, San Jacinto and San Bernardino mountains (southern DPS). Northern DPS was determined to warrant listing as endangered, Apr 2014, effective Jun 30, 2014.	Always encountered within a few feet of water. Tadpoles may require 2 - 4 yrs to complete their aquatic development.
Rhaphiomidas terminatus abdominalis	Delhi Sands flower-loving fly	Endangered	None	--	Found only in areas of the Delhi Sands formation in southwestern San Bernardino & northwestern Riverside counties.	Requires fine, sandy soils, often with wholly or partly consolidated dunes & sparse vegetation. Oviposition req. shade.
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	None	None	SSC	Headwaters of the Santa Ana and San Gabriel rivers. May be extirpated from the Los Angeles River system.	Requires permanent flowing streams with summer water temps of 17-20 C. Usually inhabits shallow cobble and gravel riffles.
Salvadora hexalepis virgultea	coast patch-nosed snake	None	None	SSC	Brushy or shrubby vegetation in coastal Southern California.	Require small mammal burrows for refuge and overwintering sites.

Scientific Name	Common Name	Federal	State	Other	General habitat	Micro Habitat
Setophaga petechia	yellow warbler	None	None	SSC	Riparian plant associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada.	Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.
Spea hammondii	western spadefoot	None	None	SSC	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands.	Vernal pools are essential for breeding and egg-laying.
Taxidea taxus	American badger	None	None	SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.
Thamnophis hammondii	two-striped gartersnake	None	None	SSC	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation.	Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.
Vireo bellii pusillus	least Bell's vireo	Endangered	Endangered	--	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft.	Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.
Xanthocephalus xanthocephalus	yellow-headed blackbird	None	None	SSC	Nests in freshwater emergent wetlands with dense vegetation and deep water. Often along borders of lakes or ponds.	Nests only where large insects such as Odonata are abundant, nesting timed with maximum emergence of aquatic insects.

May 2018

MATERIAL CULTURE
CONSULTING

Submitted to:

Rafik Albert, Senior Associate

E|P|D Solutions, Inc. Irvine,

California

Prepared on Behalf of:

T & C International Health, Inc.

Chino Hills, CA 31709

CULTURAL RESOURCES ASSESSMENT

Phase I Cultural Resources Assessment: Moreno Valley Skilled Nursing Facility Project

City of Moreno Valley, Riverside County, California

MATERIAL CULTURE
CONSULTING

PHASE 1 CULTURAL RESOURCES ASSESSMENT: MORENO VALLEY SKILLED NURSING FACILITY PROJECT CITY OF MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA

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Sonia Sifuentes, M.Sc., Registered Professional Archaeologist

May 2018

MCC Project Number: 20180401
Type of Study: Cultural resources assessment
Cultural Resources within Area of Potential Impact: None
USGS 7.5-minute Quadrangle: Sunnymead, Section 8 of Township 30 S, Range 30 W
APN(s): 479-230-018
Survey Area: Approx. 4.54
Date of Fieldwork: April 19, 2018
Key Words: Archaeology, CEQA, Phase I Survey, Negative Cultural Result, Riverside County

MANAGEMENT SUMMARY

T & C International Health, Inc. proposes to construct the new Moreno Valley Skilled Nursing Facility in the City of Moreno Valley, Riverside County, California. Material Culture Consulting, Inc. (MCC) was retained by E|P|D Solutions, Inc. to conduct a Phase I cultural resource investigation of the Project Area. These assessments were conducted in accordance with the California Environmental Quality Act (CEQA), and included cultural records searches, a search of the Sacred Lands File by the Native American Heritage Commission (NAHC), outreach efforts with 39 Native American tribal representatives, background research, and a pedestrian field survey.

The records searches and SLF search did not identify any previously known cultural resources within the Project Area. The cultural resources search identified fourteen cultural resources investigations which have been previously conducted within a 1-mile radius buffer around the Project Area, with none of these studies located within the Project Area. A total of eleven previously recorded cultural resources lie within a 1-mile buffer of the Project Area, with none located within the Project Area. A review of historical aerial photographs and maps indicated that prior to the 1980s, the Project Area was occasionally used as an agricultural field and has been a vacant lot since the construction of a school and the Moreno Valley Unified School District Administration Office on either side of the Project Area.

The pedestrian survey of the Project Area was conducted on April 19, 2018 by Judy Cardoza, MCC Archaeologist and cross-trained Paleontologist. During the course of fieldwork, survey conditions were good and ground visibility was fair (approximately 50%) throughout the 4.54-acre Project Area due to overgrowth of foxtails, grasses and other weeds. No cultural resources were identified during the survey.

Based on the above findings, the probability of encountering cultural resources within the Project Area is considered low. MCC recommends no further mitigation measures are needed for the duration of the Project. While we do not recommend additional mitigation, we do recommend setting a plan in place to expediently address inadvertent discoveries and human remains, should these be encountered during construction activities.

A copy of this report will be permanently filed with the EIC at University of California Riverside, Riverside. All notes, photographs, correspondence and other materials related to this Project are located at MCC, Inc located in Pomona, California.

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INTRODUCTION

T & C International Health, Inc. proposes to construct the new Moreno Valley Skilled Nursing Facility in the City of Moreno Valley, Riverside County, California. The facility will provide long-term care, short-term care rehabilitation, and sub-acute services for residents. Material Culture Consulting, Inc. (MCC) was retained by E|P|D Solutions, Inc. to conduct a Phase I cultural investigation of the Project in accordance with the California Environmental Quality Act (CEQA). This assessment was conducted pursuant to all applicable State of California regulations regarding cultural resources, as well as guidelines established by the City of Moreno Valley and the County of Riverside. According to these regulations and guidelines, if development of a Project has the potential to result in significant impacts to cultural resources, a plan must be developed to mitigate those impacts to a level which is less than a significant. This assessment documents the potential for encountering cultural resources during development of this Project and provides recommendations on how to mitigate impacts to those resources.

PROJECT LOCATION AND DESCRIPTION

The proposed Project Area is located approximately 150 feet (ft) northeast of the intersection of Alessandro Boulevard and Kitching Street in the City of Moreno Valley, Riverside County, California (Figures 1 and 2). The Project Area encompasses a lot which is currently vacant, located east of present-day Excel Prep Academy and west of the Moreno Valley Unified School District Administration Office (Figure 3). Specifically, the proposed Project is located in the southeast portion of Section 8, within Township 30 South, Range 30 West on the Sunnymead USGS 7.5-minute quadrangle (San Bernardino Base Meridian) (Figure 2). The proposed Project includes the construction of three single-story wood framed buildings that will be divided into 88 resident units with 116 beds and all amenities including 24-hour nursing, food service, dining, therapy services, as well as additional services necessary to care for the residents. The building is classified as a I-2 occupancy and construction type V-A under the California Building Code. All three separate buildings will total approximately 69,0000 square footage on parcel number 479-230-018. Underground utilities proposed include a sewer line, a water line, and storm drainage infrastructure.

PROJECT PERSONNEL

Tria Belcourt, M.A., RPA, President of Material Culture Consulting Inc., served as the Project Manager and Principal Archaeologist for the study. Ms. Belcourt coordinated the records searches and performed editorial review of this report. Belcourt is a Registered Professional Archaeologist (RPA) with a M.A. in Anthropology from the University of Florida, a B.A. in Anthropology from the University of California at Los Angeles with over twelve years of experience in California archaeology (See Appendix A). Judy Cardoza, B.A., Material Culture qualified archaeologist, conducted the cultural resource records search and pedestrian survey. Sonia Sifuentes, M.Sc, RPA, provided authorship of this report. Julia Carvajal, B.S., provided technical peer review and created the maps for the report.

ENVIRONMENTAL SETTING

Riverside County is situated within the Peninsular Range Geologic Province and the City of Moreno Valley is situated at a geographical crossroad: to the east lies the San Gorgonio Pass that leads to the Coachella Valley; to the south is Lake Perris and the San Jacinto Mountains; to the north is the San Bernardino Mountains and Valley; and to the west lies the rest of Riverside leading into Los Angeles and Orange regions. The Project Area is located 2.5 miles south of the downtown area of the City of Moreno Valley, bounded by Alessandro Boulevard to the south and Black Walnut Street to the north and situated just east of Kitching Street. The Perris Reservoir and Upland Game Hunting Area are located approximately 7 miles south-southeast of the Project Area. The Project is located

within a heavily developed residential area on a flat vacant lot, with elevations within the Project Area averaging 476 meters (m) (1564 ft) above mean sea level (AMSL). The climate of the area is characterized as Mediterranean with mild winters and dry summers. Vegetation within the Project Area is limited to foxtails, some various wildflowers and weeds. One walnut tree is located along the southern limits.

The geology of the area falls within the Santa Ana River flood plain, which is located approximately 10 miles northwest of the Project Area. The Santa Ana River extends from the upper reaches of the San Bernardino Mountains into the valley floor. The geological units within the vicinity are mapped entirely as Quaternary alluvium and marine deposits dating from the Pliocene to Holocene period (Jennings et al. 1977).

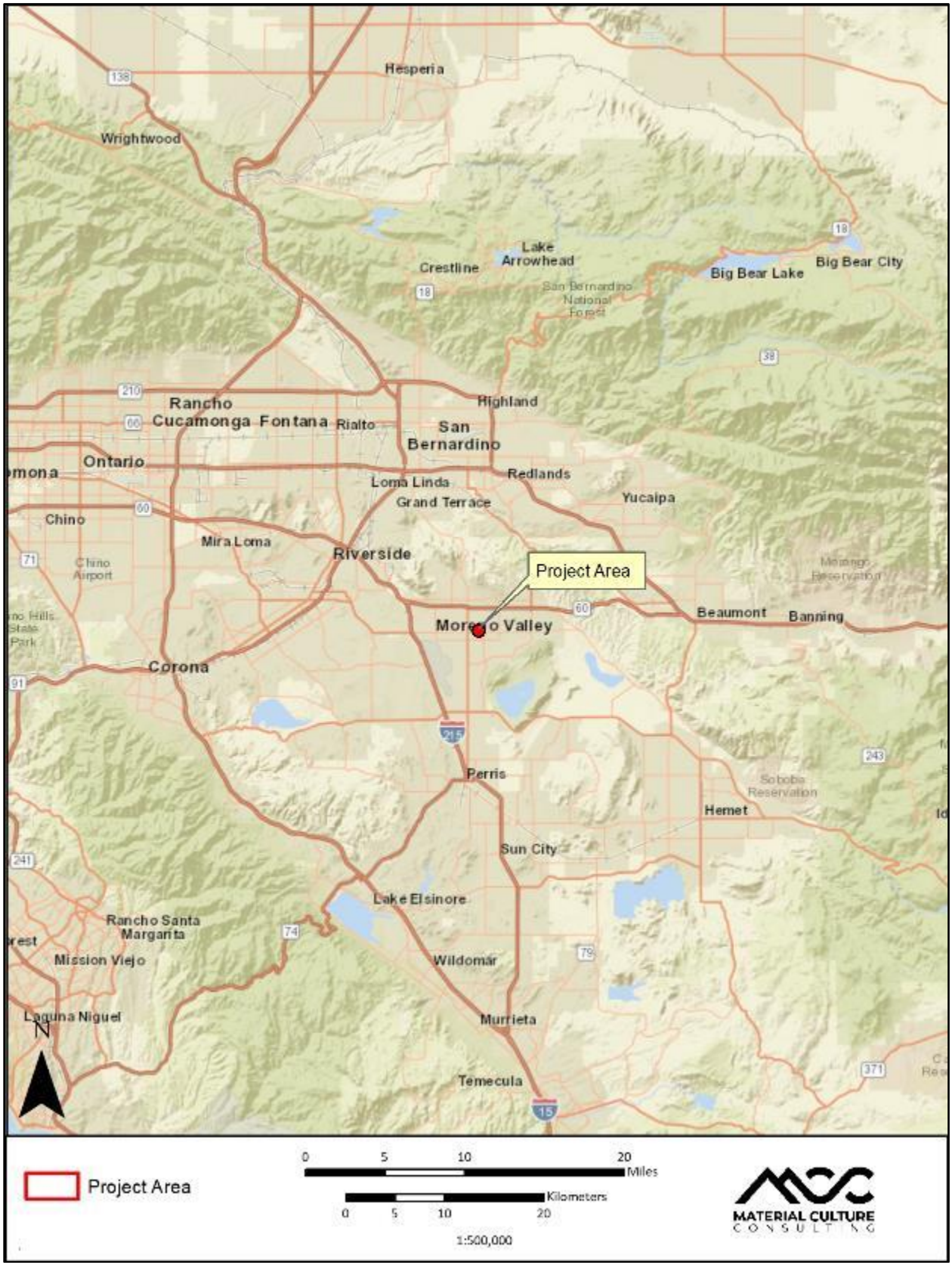

Figure 1. Moreno Valley Skilled Nursing Facility Project Location (1:500,000)

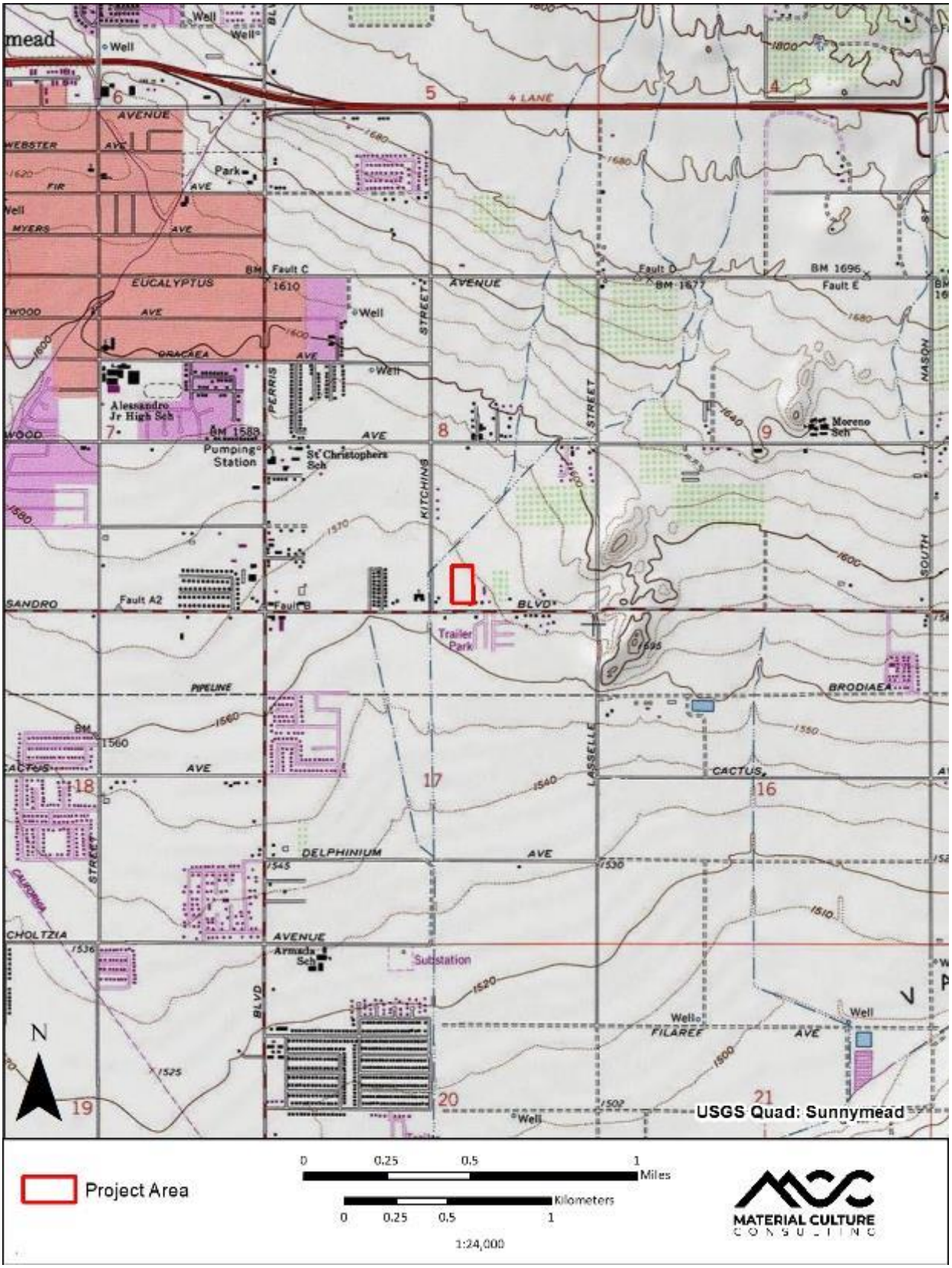

Figure 2. Moreno Valley Skilled Nursing Facility Project Area (1:24,000, as depicted on Sunnymead USGS 7.5 Minute Quadrangle)

Figure 3. Moreno Valley Skilled Nursing Facility Project Area (1:2,000, as depicted on aerial photograph)

PREHISTORIC CONTEXT

There is no specific model of early human occupation offered within the Moreno Valley region. The earliest sites known in the area are attributed to the San Dieguito culture, which consists of a hunting culture with a flaked stone tool industry (Warren 1967). The material culture related to this time included scrapers, hammer stones, large flaked cores, drills, and choppers, which were used to process food and raw materials. These types of early sites are more likely to be found along ancient lake terraces. Most evidence of this early occupation is located further south-southwest and currently there is no evidence of human occupation within the Moreno Valley region prior to about 2,300 years ago (P&D Consultants 2006).

Around 8,000 years ago, subsistence patterns changed, resulting in a material complex consisting of an abundance of milling stones (for grinding food items) with a decrease in the number of flaked stone tools. The material culture from this time period includes large, bifacially worked dart points and grinding stones, handstones and metates. Archaeologists initially designated this period as the "Millingstone Horizon" (Wallace 1955). Later, the Millingstone Horizon was redefined as a cultural tradition named the Encinitas Tradition (Warren 1967) with various regional expressions including Topanga and La Jolla. Use of this classification system by archaeologists has varied as some adopted a generalized Encinitas Tradition without regional variations, while others continued to use Millingstone Horizon, and still others used Middle Holocene (the geologic time period) to indicate this observed pattern (Sutton and Gardner 2010:1-2). Recently, this generalized terminology was criticized by Sutton and Gardner (2010) as suppressing the identification of cultural, spatial, and temporal variation, as well as the movement of peoples throughout space and time. It is these factors that are believed to be critical to an understanding of prehistoric cultural adaptation and change in this portion of southern California (Sutton and Gardner 2010:1-2).

The Encinitas Tradition characteristics include abundant metates and manos, crudely-made core and flake tools, bone tools, shell ornaments, and very few projectile points, indicating a subsistence pattern focused on hunting and gathering a variety of floral resources. Faunal remains vary by location but include marine mammals, fish, and shellfish, as well as terrestrial animals, reptiles, and birds (Sutton and Gardner 2010:7). The Encinitas Tradition has been redefined to have four patterns (Sutton and Gardner 2010: 8-25). These include the Topanga Pattern in coastal Los Angeles and Orange counties, the La Jolla Pattern in coastal San Diego County, and the Sayles or Pauma cultures in inland San Diego County extending into western Riverside County, where the project is located. At approximately 3,500 years ago, Pauma groups in the general Project vicinity adopted new cultural traits which transformed the archaeological site characteristics - including mortar and pestle technology. This indicated the development of food storage, largely acorns, which could be processed and saved for the leaner, cooler months of the year.

At approximately 1,500 years before present, bow and arrow technology started to emerge in the archaeological record, which also indicates new settlement patterns and subsistence systems. The local population retained the subsistence methods of the past, but incorporated new materials into their day to day existence, as evidenced by the archaeological record. The Palomar Tradition is attributed to this time, and is comprised of larger two patterns: the Peninsular Pattern in the inland areas of the northern Peninsular Ranges (e.g., San Jacinto and Santa Rosa mountains) and the northern Coachella Valley (Sutton 2010), and the San Luis Rey pattern of the western Riverside region. Archaeological sites from this time period are characterized by soapstone bowls, arrowhead projectile points, pottery vessels, rock paintings, and evidence of cremation sites. The shift in material culture assemblages is largely attributed to the emergence of Shoshonean (Takic-speaking) people who entered California from the east. Recent investigations at the Eastside Reservoir project refines the chronology for the past 1500 years into four stages: Saratoga Springs (1500-750 BP), Late Prehistoric (750-410 BP), Protohistoric (410-180 BP), and Historic

(post-180 BP). This research shows a large number of semi-residential sites during the Medieval Climatic Anomaly at the end of the Saratoga Springs period which ended by the Late Prehistoric period (Applied Earthworks 2001). The increased use of the area suggests that the area may have had a more favorable environment than in surrounding regions.

ETHNOGRAPHIC CONTEXT

The Project Area has historically been situated between two Native American territories: the Luiseño people and the Cahuilla people. Migration of Shoshone peoples from the Great Basin into the desert and coastal Southern California regions occurred approximately 1000 to 600 years B.P. Both the Cahuilla and Luiseño ethnographic groups derived from this migration.

Cahuilla

The Cahuilla territory was bounded by the San Bernardino Mountains to the north, the Orocopia Mountains to the east, the Santa Ana River/the San Jacinto Plain and the eastern portion of Palomar Mountains to the west, and Borrego Springs and the Chocolate Mountains to the south (Bean 1978). The Project Area falls within the western region of the tribe's traditional territory, denoted by the San Gorgonio Pass. The Cahuilla existed within the most geographically diverse region, having exploited more than 500 native and non-native plants (Bean and Saubel 1972). The Cahuilla spoke a language that belongs to the Cupan group of the Takic subfamily of the Uto-Aztecan language family, a language family that includes the Shoshonean groups of the Great Basin (Bean and Shipek 1978).

The prehistoric Cahuilla occupation is characterized by structures within permanent villages that ranged from small brush shelters to dome-shaped or rectangular dwellings. Villages were situated near water sources, in the canyons near springs, or on alluvial fans at man-made walk-in wells (Bean 1972). There appears to be slight difference in subsistence tools between the Desert, Pass, or Mountain Cahuilla groups. The Desert Cahuilla used deep, wooden mortars with a long pestle whereas San Gorgonio Pass Cahuilla utilized shallower mortars with basketry rims (Kroeber 1908: 40, 43). Cahuilla granaries were usually raised on pole platforms two to four feet high, which resembled birds' nests, and were used to store mesquite (Kroeber 1908: 42).

In comparison with other Southern California tribes, the Cahuilla appear to have had a lower population density and a less rigid social structure. The Cahuilla are patrilineal, with closely related patrilineages that share an assumed common ancestor which is important socially and ceremonially (Hudlow 2007). A ceremonial leader, also in the Cahuilla language referred to as a "*net",* directed subsistence activities, settled conflicts, represented the clan regionally and was responsible for correct performances of ceremonies, with the official role of the chief passed from father to eldest son (Hudlow 2007).

Initial contact with European explorers with the Cahuilla most likely occurred during the expedition of Juan Bautista de Anza in 1777 (Napton and Greathouse 1982). The presence of the San Gabriel Mission in the early 1800s led to more contact via baptisms (Napton and Greathouse 1982). It also led to the Native Americans moving away from traditional habitation sites to separate themselves from the influence of the Mission (Brumgardt 1977). The Cahuilla traditions may have been relatively stable until mission secularization in 1834, due to the policy of the Catholic Mission fathers, or padres, to maintain imported European traditional style settlement and economic patterns (Bean and Shipek 1978). After 1877, when the United States government established Indian reservations in the region and religious missionaries began conversion of the Native American populations in the region, traditional cultural practices were prohibited. Presently, the Cahuilla reside in nine separate reservations in Southern California, located in Imperial, Riverside and San Diego counties (Bean 1978).

Luiseño

The Spanish name Luiseño was used to identify Native Americans who were associated with the Mission San Luis Rey, with no known native term for their culture. Extensive research gives detailed accounts of the Luiseño (DuBois 1908, Sparkman 1908, Kroeber 1925, White 1963, and Bean and Shipek 1978). At the time of these ethnographies,

the Luiseño maintained a sophisticated political organization structure, and their lands extended from western San Jacinto to the Pacific Ocean along several major waterways, including Temecula, Santa Margarita, and San Luis Rey Rivers (Bean and Shipek 1978). Neighboring tribes included the Cahuilla to the east, the Serrano to the north, and the Gabrielino to the west. Each of these groups are part of the same Uto-Aztecan linguistic group and are Takic-speakers. The boundaries for territories fluctuate as new information evolves in ethnographic research, so there is a likelihood that there was quite a bit of overlap between groups over time as well.

The Luiseño organized themselves according to family groups or lineages, rather than forming exogamous moieties. Each lineage occupied land that they held in common, and they lived socially and politically separately from others (Bean and Shipek 1978). They typically resided in villages near reliable water sources and maintained special purpose camps close to the main villages. In the springtime, families would replenish food supplies by gathering local fruit, seeds, bulbs and roots. In the fall, families would move into the upland areas to gather acorns, prickly pear, toyon berries, and yucca. The Luiseño territory contained several species of oak that produced edible acorns. Acorns were stored and processed as needed by breaking the shell, grinding the meat into a powder, and leaching the tannic acid from the nut by using water. A porridge was made from the leached nuts and cooked with water using hot stones in baskets. The Luiseño used a wide variety of tools, including manos and metates, bone and shell fish hooks, stone and shell ornaments, bone awls, wooden throwing sticks, hammer stones, handstones, pestles, mortars, and drills, which are evident in late Prehistoric archaeological sites. Presently, there are six federally recognized Luiseño tribes with associated reservations within Southern California.

HISTORIC CONTEXT

In 1769, Spanish settlers began to enter and colonize Alta California. Once the first European exploration of California occurred, the region underwent immense change. As early as 1827, Anglo-Americans were migrating into Southern California. In the decades to come, California would be taken by the United States with the close of the Mexican-American War and subsequent events such as the Civil War and California Gold Rush would continue to shape the history of California.

Spanish Period (1769 to 1821) to Mexican Period (1821 to 1848)
The Spanish period began in 1769 with Captain Gaspar de Portolá's land expedition, and ended in 1821 with Mexican Independence. During the Spanish Period, the influence of San Luis Rey Mission (1798) was apparent throughout the surrounding regions, with much of the area used for cattle grazing. At its peak, the Mission controlled multiple ranches and claimed control over what is now western Riverside County and northern San Diego County. However, after control of the area shifted to Mexico, secularization began throughout the area and the missions and their associated ranches began to decline. The Mexican government proceeded to push settlements of Mexican populations from the south by deeding large grants to individuals who promised to employ settlers. Small villages were established on some ranchos, while small towns appeared in areas between ranchos. However, the area that is now known as Moreno Valley remained largely uninhabited.

American Period (1848 to present)
The Gold Rush of 1849 would see tremendous influx of Americans and Europeans flooding into Southern California. The passing of the Homestead Act of 1862 increased the influx of settlers within the region. Eventually, Riverside County was settled by homesteaders and farmers, and quickly became a diversified agricultural area with citrus, grain, grapes, poultry, and swine being the leading commodities. This influx of settlers led to population pressures and increased conflicts with the local indigenous groups. The passage of the Act for the Governance and Protection of Indians in 1850 further degraded the position of the Luiseño and Cahuilla. By 1877, The Cahuilla were moved to reservations in a checkerboard pattern throughout the Palm Springs and Coachella Valleys in Riverside County (Napton and Greathouse 1982) which broke up reservation land into discontinuous patchwork pieces, restricting access by the tribe to sacred lands and traditional gathering places. The Moreno Valley area remained unclaimed public land until 1870, when a large tract of over 13,400 acres were purchased from the U.S. government in a single transaction (Tang and Hogan 2013).

Historical Context of the Project Region

Development of the City of Moreno Valley began during the late 19th century. In 1883, Frank E. Brown ventured from Redlands into the Moreno Valley region and secured a large acreage that were platted into ten acre tracts (Ellis 1912). This attracted settlers and farmers into the region and the Town of Moreno was established in Brown's honor in 1890 (Ellis 1912; P&D Consultants 2006). However, due to water conflicts and litigations that ultimate went in favor of the City of Redlands, a period of drought forced the failure of most farmers in the area and lead to an exodus from the Town of Moreno to other closer locations like Riverside, dubbing the area and town "The Valley/Town on Wheels" (Ellis 1912; Ghori 2014; City of Moreno Valley 2018).

In 1918, the construction of a military training airfield in the area brought in new community growth. Located 3.21 miles southwest of the Project Area, it was originally called the Alessandro Aviation Field, with its official name changed to March Air Field in honor of an Army pilot who had died during a training crash (Ghori 2014). First encompassing 640 acres of land, March Air Field grew to encompass more than 7,000 acres, with the base supporting 85,000 troops at its height of activity (City of Moreno Valley 2018). In 1996, March was realigned as an Air Reserves Base and is still currently active.

From the late 1950s to the late 1980s, the Riverside International Raceway operated within Moreno Valley. Established by Rudy Cleye, it was considered a dangerous track and circuit changes occurred in 1969 (Racing Circuits 2018). It hosted many prominent races, including NASCAR championships (Ghori 2014). By 1989, the land the track was on was sold to create housing and a shopping mall, located 4.5 miles northwest of the Project Area (Racing Circuits 2018). By 1984, the communities of Edgemont, Sunnymead, and Moreno voted to incorporate after prior failed efforts, and the City of Moreno Valley was established (City of Moreno 2018).

RESEARCH DESIGN

The objectives of an archaeological assessment are to locate, interpret, and evaluate the indications of past human activities within the study area. The indicators of such activities are represented by cultural resources, and can consist of many different types of materials – stone tools, historic neighborhoods, historic-era can scatters, village sites, food waste, tool manufacturing waste, trails, stone alignments, petroglyphs, hearths, or human skeletal remains. All of these types of resources are known to exist within the general project region. The scope of this study is to identify and evaluate the significance of observable cultural resources, should they exist within the project area.

LEGAL COMPLIANCE BASIS

This project is subject to both state and local regulations, including CEQA and the City of Moreno Valley General Plan. CEQA declares that it is state policy to "take all action necessary to provide the people of this state with... historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered. CEQA includes historic and archaeological resources as integral features of the environment. The level of consideration may vary with the importance of the resource.

The Moreno Valley General Plan's Objective 7.6 is to "identify and preserve Moreno Valley's unique historical and archaeological resources for future generations" (City of Moreno Valley 2006). Five policies aim to promote this objective, including Policy 7.6.2, "implement appropriate mitigation measures to conserve cultural resources that are uncovered during excavation and construction activities" (City of Moreno Valley 2006).

RESEARCH THEMES WITHIN THE PROJECT AREA

Riverside County has a rich prehistoric and historic cultural heritage. However, based on previous research, minimal cultural resources are known to exist within the Project Area and nearby region. Of the known resources, prehistoric sites appear to occur along intermittent drainages, and are often associated with boulder outcrops. Food processing sites, consisting of bedrock grinding and milling features, and ground stone implement fragments are found within the region. The closest known sites of this type are located along the foothills and canyons to the south, indicating that some areas may have been used more frequently or for longer periods. Petroglyph sites are known to exist in the general region but have not been encountered in the vicinity of the project area.

Future archaeological research within the general project area has the potential to address research questions regarding settlement patterns, site structure, subsistence strategies, trade and distribution networks and tool technologies. Questions for the Project have been selected to contribute to the context and understanding of the prehistory and history of California. Based on the literature review, research questions fall into several prehistoric and historic domains. The prehistoric research domains are Chronology and Cultural Affiliation, Subsistence and Site Function, and Toolstone Procurement and Use. Historic research domains focus primarily on the topics of Community Development. Defining research questions also helps focus the documentation of resources during survey so that artifacts, features and other remains that can contribute to an understanding of regional history and prehistory are carefully noted.

Chronology and Cultural Affiliation
At prehistoric sites throughout Western Riverside County, chronometric data generally derive from time-sensitive artifacts (e.g., projectile points, beads, and ceramics), physically dateable artifacts (e.g., obsidian), and organic remains (dateable through chronometric assay). Time-sensitive and dateable artifacts can occur in surface and subsurface contexts, the former sometimes being less reliable than the latter in terms of dating archaeological components. Dateable organic remains (e.g., bone, shell, fiber, loose charcoal) can be acquired from midden deposits or, in the best examples, from buried features like hearths. In any case, sites that have dateable items or

remains can be placed at least tentatively within an existing temporal framework, be it local or regional, and used to compare and contrast temporal adaptive patterns in human behavior. For the most part, sites that can be dated have greater overall data potential than undated sites because they can be placed in time and can help refine our understanding of long-and short-term changes in prehistoric human adaptation.

Given the importance of chronological data to all archaeological interpretation, it will be critical to document the presence of any time-sensitive artifacts within the project area. Sites that can contribute valuable chronological data may be recommended eligible for listing on CRHR under Criterion (4), research potential.

Subsistence-Settlement Patterns
Subsistence is one of the most basic of human needs having a direct effect on human behavior. Prehistoric subsistence procurement activities consist of any number of variables including: site location in relation to land form, water supply, and raw materials; site size; site function; and duration of occupation. Material culture, such as lithic and ground stone tools, ceramics, and faunal and botanical remains, provide data representative of subsistence-related activities and strategies.

The Project Area is within a larger settlement area used by the Cahuilla, Luiseño and several other overlapping cultures, which are known in the area near Moreno Valley. Information on the nature and intensity of prehistoric use of the project area, including the types of sites present, their density, and environmental context, will contribute to a more complete picture of settlement and subsistence patterns in this part of California. Combined with chronological information (above), this information can also assist in determining adaptive changes over time. Sites that can offer valuable data concerning prehistoric subsistence-settlement patterns may be recommended eligible for listing on CRHR under Criterion (4), research potential.

Tool-Stone Procurement and Use
Basic patterns in lithic materials use can be useful for reconstructing the approximate geographic extent of past settlement and trade systems. Sites that can offer valuable information concerning patterns of prehistoric toolstone procurement and use may be recommended eligible for listing on CRHR under Criterion (4), research potential, particularly if they are accompanied by chronological data that can be used to place stone-working behaviors in time.

Historic Research Domains
Historic archaeological sites can offer important data concerning any number of historic themes, and may be recommended eligible for listing on CRHR under Criterion (4), research potential. They might also be eligible under Criterion (1) if they can be linked to certain historical events that were important in California's past, Criterion (2) if they are found associated with persons important in history, or under Criterion (3) if they contain structural features that are distinctive of a particular historic period or demonstrate an exceptional aesthetic quality. For the purposes of this project, we plan to focus historic period research on the theme of community development and built environments. The historic research domains will specifically address the historic-era built environment within the City of Moreno Valley, as it is felt that this topic is important to our understanding of the history in Western Riverside County.

SIGNIFICANCE EVALUATIONS

The criteria for listing resources on the California Register of Historic Resources (CRHR) were expressly developed to be in accordance with previously established criteria developed for listing on the National Register of Historic Places, and require similar protection to what National Historic Preservation Act Section 106 mandates for historic properties. According to Public Resources Code (PRC) Section 5024.1(c) (1-4), a resource is considered historically significant if it meets at least one of the following criteria:

1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States;
2. Associated with the lives of persons important to local, California or national history;

3. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values; or
4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a historical resource's physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource's period of significance. Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance. Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register, if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data. Note that California Historical Landmarks with numbers 770 or higher are automatically included in the CRHR.

Sites with the potential to yield artifacts and other data that can address research questions may be evaluated as eligible for CRHR listing per Criterion (4). Some prehistoric sites may be evaluated as CRHR-eligible under Criterion (1) if they relate to culturally significant events or (mythological) persons (Criterion 2), or represent high artistic forms (e.g., rock art), per Criterion (3).

Under CEQA, if an archaeological site is not a significant "historical resource" but meets the definition of a "unique archaeological resource" as defined in PRC Section 21083.2, then it should be treated in accordance with the provisions of that section. A unique archaeological resource is defined in PRC Section 21083.2(g) as follows:
An archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Resources that neither meet any of these criteria for listing on the NRHP or CRHR nor qualify as a "unique archaeological resource" under CEQA PRC Section 21083.2 are viewed as not significant. Under CEQA, "A non-unique archaeological resource need be given no further consideration, other than the simple recording of its existence by the lead agency if it so elects" [PRC Section 21083.2(h)].

Impacts to historical resources that alter the characteristics that qualify the historical resource for listing on the CRHR are considered to be a significant effect (under CEQA). The impacts to a historical resource are considered significant, if the Project activities physically destroy or damage all or part of a resource, change the character of the use of the resource or physical feature within the setting of the resource which contribute to its significance, or introduce visual, atmospheric, or audible elements that diminish the integrity of significant features of the resource. If it can be demonstrated that a Project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts to be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (Section 21083.2 (a), (b), and (c)).

METHODS

CALIFORNIA HISTORIC RESOURCES INVENTORY SYSTEM AND CULTURAL BACKGROUND RESEARCH

On April 19, 2018, Judy Cardoza, B.S., MCC Archaeologist, conducted a search of the California Historical Resource Information System (CHRIS) at the Eastern Information Center (EIC), located at the University of California, Riverside, Riverside County. The search covered any previously recorded cultural resources and investigations within a 1-mile radius of the Project Area within Riverside County. The CHRIS search also included a review of the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), the California Points of Historical Interest list, the California Historical Landmarks list, the Archaeological Determinations of Eligibility list, and the California State Inventory of Historic Resources.

NATIVE AMERICAN OUTREACH AND BACKGROUND RESEARCH

A Sacred Lands File search was requested by MCC from the Native American Heritage Commission (NAHC) on April 18, 2018. The Commission responded on April 20, 2018, stating that there are no known sacred lands within one mile of the Project Area. The NAHC requested that 39 Native American tribes or individuals be contacted for further information regarding the Project Area and vicinity. MCC subsequently sent letters on April 20, 2018 to the 39 Native American contacts, requesting any information related to cultural resources or heritage sites within or adjacent to the Project Area. Additional attempts at contact by letter, email, or phone call were made on May 1, 2018 and April 20, 2018.

FIELD SURVEY

The survey stage is important in a project's environmental assessment phase to verify the exact location of each identified cultural or paleontological resource, the condition or integrity of the resource, and the proximity of the resource to areas of cultural resources sensitivity. Judy Cardoza, MCC Archaeologist, conducted the survey of the proposed Project Area on April 19, 2018. The survey consisted of walking in parallel transects spaced at approximately 15-meter intervals over the Project parcel, while closely inspecting the ground surface. All undeveloped ground surface areas within the ground disturbance portion of the Project Area were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools or fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, soil depressions and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic-era debris (e.g., metal, glass, ceramics). Existing ground disturbances (e.g. cutbanks, ditches, animal burrows, etc.) were visually inspected. Representative photographs were taken of the entire Project Area.

RESULTS

CALIFORNIA HISTORIC RESOURCES INVENTORY SYSTEM AND CULTURAL BACKGROUND RESEARCH

The CHRIS records search identified a total of fourteen cultural resources investigation that have been previously conducted within a 1-mile radius buffer around the Project Area, with no studies intersecting the Project Area (see Table 1). The records search identified a total of eleven previously recorded cultural resources within a 1-mile buffer and no previously recorded resources within the Project Area boundaries (see Table 2). Six of these resources are prehistoric bedrock milling features, three of these resources are historic single-family residences, and the remaining two are historic wells/cisterns with additional associated features. Of these resources, two historic sites, P-33-007276 and P-33-015454, are located within a .25-mile range of the Project Area. A review of historical aerial photographs and maps indicated that prior to the 1980s, the Project Area was occasionally used as an agricultural field and has been a vacant lot since the construction of a school and the Moreno Valley Unified School District Administration Office on either side of the Project Area. (See Table 3 and Figures 4-5).

Table 1. Previous Conducted Resources Studies within 1-mile Buffer of Project Area

CHRIS Report Number	Authors	Year	Title of Study	Affiliation	Distance from Project Area
RI-00182	Richard A. Weaver	1975	Environmental Impact Evaluation: Archaeology of Brodiaea Avenue, Pl 984, Water Systems Addition, Riverside County, California	Archaeological Research Unit, U.C. Riverside	Within ¼ mile
RI-01665	Wirth Associates	1983	Devers-Serrano-Villa Park Transmission System Supplement to The Cultural Resources Technical Report - Public Review Document and Confidential Appendices	Wirth Associates	Within ½ mile
RI-02171	McCarthy, Daniel F.	1987	Cultural Resources Inventory for The City of Moreno Valley, Riverside County, California	Archaeological Research Unit, U.C. Riverside	Within 1 mile
RI-05795	Kyle, Carolyn E.	2004	Cultural Resource Assessment for AT&T Wireless Facility 950-031-029a Located At 24899 Alessandro Boulevard, City of Moreno Valley, Riverside County, California	Kyle Consulting	Within 1 mile
RI-06269	Alexandrowicz, John Stephen	2006	An Historical Resources Identification of Alessandro Pointe Project, Tract 34681, 25817 Alessandro Boulevard, City of Moreno Valley, Riverside County, California	Archaeological Consulting Services	Within ¼ mile
RI-07645	Rosenberg, Seth A. and Smith, Brian F.	2005	An Archaeological Survey for The Alessandro Plaza Project, City of Moreno Valley, County of Riverside, California	Brian F. Smith and Associates	Within ½ mile
RI-08688	Bonner, Wayne H.	2011	Letter Report: Cultural Resources Records Search and Site Visit Results For T-Mobile USA Candidate IE24226-A	Michael Brandman Associates	Within 1 mile
RI-08802	Tang, Bai "Tom", Hogan, Michael, Encarnacion, Deirdre, and Ballester, Daniel	2012	Phase I Archaeological Assessment: Moreno Master Drainage Plan Revision	CRM Tech	Within 1 mile
RI-08944	Tang, Bai "Tom" and Hogan, Michael	2013	Historical/Archeological Resources Survey Report, Assessor's Parcel No. 486-280-043, City of Moreno Valley, Riverside County, California	CRM Tech	Within ½ mile
RI-08945	Tang, Bai "Tom" and Hogan, Michael	2013	Historical/Archaeological Resources Survey Report, Desilting Basin Site, Boulder Ridge Family Apartments Project, City of Moreno Valley, Riverside County, California	CRM Tech	Within ½ mile

CHRIS Report Number	Authors	Year	Title of Study	Affiliation	Distance from Project Area
RI-09901	Stropes, Tracy A. and Smith, Brian F.	2016	Phase I Cultural Resources Survey for The TTM 37060 Project, City of Moreno Valley, County of Riverside	Brian F. Smith and Associates, Inc.	Within 1 mile
RI-10018	Belcourt, Tria	2016	Re: Letter Report for Cultural and Paleontological Records Searches For The Bordiaea Site, Located In The City of Moreno Valley, Riverside County, California	Material Culture Consulting	Within 1 mile
RI-10095	Dooley, Colleen	2002	Cingular Wireless Cultural Resource Assessment	The Alaris Group, LLC	Within ½ mile
RI-10150	Brunzell, David	2016	Cultural Resources Assessment The Alessandro Apartments Project City of Moreno Valley, Riverside County, California	BCR Consulting LLC	Within ½ mile

Table 2. Previous Recorded Resources within 1-mile Buffer of Project Area

Primary Number	Trinomial	Age	Attributes	NRHP/CRHR	Distance from Project Area
P-33-000857	CA-RIV-000857	Prehistoric	AP04 (Bedrock milling feature)	Unknown	Within ½ mile
P-33-003159	CA-RIV-003159	Prehistoric	AP04 (Bedrock milling feature)	Unknown	Within ½ mile
P-33-003223	CA-RIV-003223	Prehistoric	AP04 (Bedrock milling feature)	Ineligible for NRHP	Within 1 mile
P-33-003224	CA-RIV-003224	Prehistoric	AP04 (Bedrock milling feature)	Unknown	Within 1 mile
P-33-003249	CA-RIV-003249/H	Historic	AH01 (Unknown); AH05 (Wells/cisterns); AH06 (Water conveyance system)	Unknown	Within ½ mile
P-33-003341	CA-RIV-003341	Prehistoric	AP04 (Bedrock milling feature)	Unknown	Within ½ mile
P-33-003342	CA-RIV-003342	Prehistoric	AP04 (Bedrock milling feature)	Unknown	Within ½ mile
P-33-007276		Historic	HP02 (Single family property)	Unknown	Within 1 mile
P-33-007279		Historic	HP02 (Single family property)	Unknown	Within ¼ mile
P-33-007280		Historic	HP02 (Single family property)	Unknown	Within 1 mile
P-33-015454	CA-RIV-008149	Historic	AH02 (Foundations/structure pads); AH04 (Privies/dumps/ trash scatter); AH05 (Wells/cisterns)	Unknown	Within ¼ mile

Table 3. Additional Sources Consulted

Source	Results
National Register of Historic Places (1979-2002 & supplements)	Negative
Historical United States Geological Survey topographic maps (USGS 2012)	Negative- agricultural field and vacant lot since the construction of a school and the Moreno Valley Unified School District Administration Office
Historical United States Department of Agriculture aerial photos	Negative- agricultural field and vacant lot since the construction of a school and the Moreno Valley Unified School District Administration Office
California Register of Historical Resources (1992-2010)	Negative
California Inventory of Historic Resources (1976-2010)	Negative
California Historical Landmarks (1995 & supplements to 2010)	Negative
California Points of Historical Interest (1992 to 2010)	Negative
Local Historical Register Listings	Negative
Bureau of Land Management General Land Office Records	Negative

Figure 4. Project Area pre-development (as depicted on 1966 aerial photograph)

Figure 5. Project Area with surrounding residential development (as depicted on 2012 aerial photograph)

NATIVE AMERICAN OUTREACH AND BACKGROUND RESEARCH

On April 30, 2018, MCC received an email from Jessica Mauck, Cultural Resource Analyst for San Manuel Band of Mission Indians (SMBMI). Ms. Mauck stated that the proposed Project Area is located just outside of Serrano ancestral territory and SMBMI will not be requesting consulting party status or elect to participate with any further development of the Project.

On May 2, 2018, MCC received a letter via email from Victoria Martin, Tribal Secretary for the Augustine Band of Cahuilla Mission Indians. Ms. Martin stated that at this time, the Tribe is unaware of specific cultural resources that may be affected by the proposed Project. The Tribe encourages contact with other tribes and individuals and they encourage that a monitor who is qualified in Native American cultural resources identification be contracted and present onsite full-time during the pre-construction and construction phase of the Project. The Augustine Band also requests to be notified of any new cultural resource discoveries during the development of the project

On May 3, 2018, MCC received a letter via USPS dated May 1, 2018, from Ray Teran, Resource Management for Viejas Band of Kumeyaay Indians. Mr. Teran stated that the Tribe had reviewed the proposed Project and at this time, have determined that the Project site has little cultural significance or ties to Viejas. They suggested to contact the tribe(s) closest to the cultural resources and requested to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains in order to reevaluate their participation in the government-to-government consultation process.

On May 7, 2018, MCC received a letter via email from Katie Croft, Cultural Resources Manager for Agua Caliente Band of Cahuilla Indians (ACBCI). Ms. Croft stated that the proposed Project Area is not located within the boundaries of the ACBCI Reservation but does lie within the Tribe's Traditional Use Area. The Tribe defers to Soboba and concludes their consultation efforts.

On May 9, 2018, MCC received a letter via email from Raymond Huaute, Tribal Historic Preservation Officer for the Morongo Band of Mission Indians (MBMI). Mr. Huaute stated that the Project is located within the Tribe's aboriginal territory, or in an area considered to be a traditional use area, or one in which the Tribe has cultural ties. MBMI requested a thorough records search be conducted by contacting one of the CHRIS Archaeological Information Centers and a copy of the search results be provided to the tribe. The Tribe also requested tribal monitor participation during the initial pedestrian field survey of the Phase I Study of the Project and a copy of the results of that study. Mr. Huaute also stated that in the event the pedestrian survey had already been conducted, MBMI requests a copy of the Phase I study be provided to the tribe as soon as it can be made available.

On May 17, 2018, Sonia Sifuentes spoke with Bobby Ray Esparza, Cultural Coordinator for Cahuilla Band of Mission Indians, who requested to have tribal monitors on site during any ground disturbing activities.

On May 17, 2018, Ms. Sifuentes also spoke with the Secretary for the Ewiiaapaayp Tribal Office, who stated that the Tribe has no comments or concerns for the Project.

On May 17, 2018, Ms. Sifuentes also spoke with Jacob Norte, Environmental Director of Los Coyotes Band of Mission Indians, who deferred to the tribes who are closer to the Project.

On May 17, 2018, MCC received a letter via email from Destiny Colocho, Cultural Resources Manager ~~od~~ of Rincon Band of Mission Indians. In this letter, Ms. Colocho stated no knowledge of resources within the Project Area, and that no consultation would be requested.

As of May 25, 2018, no other additional groups or individuals have responded with information about the Project Area. All written NAHC and Native American correspondence materials and our communication log are provided as Appendix B.

FIELD SURVEY

During the course of fieldwork, survey conditions were good with average ground visibility (50%) throughout most of the 4.54-acre Project Area. Overgrowth of foxtail grasses and other weeds covered most of the Project Area, with one walnut tree observed along the southern limits and two bushes along the eastern wall. Soils consisted of coarse sand/gravel matrix of metavolcanics pebble types. Modern concrete foundation berm within the northwestern portion of the Project Area was observed, as well as modern concrete drainage within the eastern and southwestern portion of the Project Area were observed. Modern refuse was observed throughout the Project Area. No cultural resources were observed during the survey. Representative photos of the area are found below (Figures 6-9).

Figure 6. Project Overview from Southwest corner (View North)

Figure 7. Project Overview from Northwest corner (View Southeast)

Figure 8. Project Overview from Southeast corner (View Northwest)

Figure 9. Berms of concrete found within Project Area (View North)

CONCLUSIONS AND RECOMMENDATIONS

The Phase I cultural resource assessment of the Project Area included a CHRIS records search, NAHC outreach, background research, and a field pedestrian survey. The records search results indicated no previously recorded resources within the Project Area. The two closest cultural resources, P-33-007276 and P-33-015454, are historic resources located within .25-miles of the Project Area. The intensive modification and disturbance associated with prior agricultural activities, as well as the construction of nearby residential buildings, structures, and roadways, and grading and surface modification of the Project Area, has eradicated any near-surface record of prehistoric, ethnohistoric, or historic-era behavioral activities that may have otherwise been preserved as archaeological sites, deposits or features.

Based on the results of the cultural resources search and survey, the proposed Project Area is considered to have a low sensitivity for presence of prehistoric or historical archaeological deposits or features. MCC recommends that **No Mitigation is Needed**. While we do not recommend additional mitigation, MCC does recommend setting a plan in place to expediently address inadvertent discoveries and human remains (as described below), should these be encountered during construction.

Inadvertent Discoveries

Despite actions taken to ensure that all cultural resources are located prior to construction, including record searches and field surveys, there still remains the possibility that undiscovered, buried archaeological resources might be encountered during construction. In the event that these resources are inadvertently discovered during ground-disturbing activities, work must be halted within 50 feet of the find until it can be evaluated by a qualified archaeologist. Construction activities could continue in other areas. If the discovery proves to be significant, additional work, such as data recovery excavation or fossil recovery, may be warranted and would be discussed in consultation with the appropriate regulatory agency(ies).

Human Remains

Procedures of conduct following the discovery of human remains on non-federal lands have been mandated by California Health and Safety Code §7050.5, PRC §5097.98 and the California Code of Regulations (CCR) §15064.5(e). According to the provisions in CEQA, should human remains be encountered, all work in the immediate vicinity of the burial must cease, and any necessary steps to insure the integrity of the immediate area must be taken. The Riverside County Coroner will be immediately notified. The Coroner must then determine whether the remains are Native American. If the Coroner determines the remains are Native American, the Coroner has 24 hours to notify the NAHC, who will, in turn, notify the person they identify as the most likely descendent (MLD) of any human remains. Further actions will be determined, in part, by the desires of the MLD. The MLD has 48 hours to make recommendations regarding the disposition of the remains following notification from the NAHC of the discovery. If the MLD does not make recommendations within 48 hours, the owner shall, with appropriate dignity, reinter the remains in an area of the property secure from further disturbance. Alternatively, if the owner does not accept the MLD's recommendations, the owner or the descendent may request mediation by the NAHC.

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: May 17, 2018

Signed: _____

Printed Name: Tria Belcourt, M.A., RPA, Qualified Riverside County Archaeologist
President and Principal Archaeologist, Material Culture Consulting, Inc.

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Appendix A:
Qualifications

Tria Belcourt, M.A., RPA
President and Principal Environmental Specialist

MATERIAL CULTURE
CONSULTING

Tria Belcourt oversees and is responsible for the entire work process at Material Culture Consulting. She is responsible for planning, supervising, and overseeing field projects, including responsibility for the professional quality of evaluations and recommendations. Tria has primary accountability for the technical completeness and competence of work conducted by her staff. She is responsible for development of work plans and/or research designs, for performance of crew chiefs, for selection standards and limitations on work assignments of crew members, for analysis and interpretation of field data, for integration of fieldwork results into comparative regional perspectives, and for preparation of reports. Tria's advanced academic training and more than twelve years of professional archaeological experience has included rigorous training and application of anthropological and archaeological theory and methods, and in recording, collecting, handling, analyzing, evaluating, and reporting cultural property data, relative to the type and scope of work proposed.

Tria has been an archaeological project manager and principal investigator for over six years, leading and managing several complex compliance projects throughout the State of California and in Southern Nevada, which have involved each step of cultural resource compliance and management. Prior to this, she spent six years as a field technician and crew chief on projects throughout California and the Southeastern United States. Her experience includes conducting background research, field survey, resource testing and formal NRHP/CRHR evaluation, data recovery plan development and implementation. She has prepared hundreds of technical reports for all of the above to state and federal standards, including following BLM standards for GIS spatial data management and technical reporting – ranging from simple clearance forms, to letter reports, to extensive data recovery reports. She was the lead preparer of the Fort Irwin Integrated Cultural Resource Management Plan (2009-2013) and has also prepared several cultural resource management plans for state regulated projects. She has overseen and conducted archaeological monitoring and management of unanticipated discovery of resources, including Native American human remains on federal lands (and repatriation of the remains), and reported the results and outcomes of cultural resource monitoring efforts in lengthy technical reports. Finally, Tria regularly provides third party and QA/QC review of cultural resource technical documents, due to her keen understanding of state and federal regulations and laws governing the management of cultural resources throughout the state of California.

Education

2014 Graduate Certificate in Environmental Management of Military Lands, Colorado State University
2010 Professional Certification in CEQA/NEPA, ICF International Corporation
2009 M.A. in Anthropology, University of Florida Gainesville, Florida
Professional Certification in GIS
2006 B.A. in Anthropology, Magna Cum Laude, University of California, Los Angeles, California

Affiliations/Certifications/Training

- American Rock Art Research Association (ARARA)
- Archaeological Institute of America (AIA)

- Eastern States Archaeological Federation (ESAF)
- Midwest Archaeological Conference, Inc. (MAC)
- Ohio Archaeological Council (OAC)
- Society for American Archaeology (SAA)
- Public Education Committee Member 2015-current
- Society for Historical Archaeology (SHA)
- Society for California Archaeology (SCA)
- Workshop in Current Archaeological Prospection Advances for Non- Destructive Investigations in the 21st Century (2003)
- GPS Technology Course, Ball State University (2004)
- GLHS/MAST Nautical Archaeology Workshop and Training, National Museum of the Great Lakes,

Utility Sector Experience

Pacific Gas and Electric Company (PG&E), NERC Alert Program – Archaeological Principal Investigator; throughout California; 2015 – Present. Belcourt provides oversight of all task orders and project management of on-call task orders involving cultural resource desktop reviews, records searches and field reviews for the PG&E NERC Alert program: tracking and reporting efforts, maintaining project schedule, and timely submittal of data to prime contractor (ARCADIS).

Southern California Edison (SCE), On-Call and Emergency Projects – Archaeological Principal Investigator and Project Manager; throughout California, 2013 – Present. Belcourt provides oversight of all task orders and project management of on-call task orders involving cultural resource desktop reviews, records searches and field reviews for deteriorated poles, system upgrades, initial studies to support capital projects, and monitoring support to replace facilities due to natural disasters. This high-volume program includes preparing and submitting budgets, managing support staff and overseeing work, tracking and reporting efforts, maintaining project schedules, and preparing technical reports and GIS datasets for submittal to prime contractor (SWCA).

Southern California Edison (SCE), Small Capital Projects – Archaeological Principal Investigator and Project Manager; throughout California, 2014 – Present. Belcourt provides oversight of all task orders and project management of task orders involving cultural resources for this contract with ICF. This includes preparing and submitting budgets, managing support staff and overseeing work, tracking and reporting efforts, maintaining project schedule, and preparing technical reports and GIS datasets for submittal to prime contractor.

Southern California Edison (SCE), Coolwater Lugo Transmission Project — Environmental Project Manager; San Bernardino County, California; 2014 – 2015. Belcourt provided oversight of all project management on CWLTP: tracking and reporting efforts of subconsultants (Pacific Legacy, Paleo Solutions and Urbana Preservation and Planning), maintaining project schedule and timely submittal of project deliverables to agency reviewers. Served as communication facilitator between SCE and BLM/CPUC agency reviewers. Provided final review of the Cultural Resources Technical Report (which included over 1,000 cultural resources) and the Historic Built Environment Report - prior to draft submittal to BLM.

SCE, Eldorado Ivanpah Transmission Project – In-house Consultant for Archaeology; San Bernardino County, California and Clark County, Nevada; 2010-2012. Belcourt provided complex regulatory oversight and project management regarding cultural and paleontological resource management. She developed cultural resource specific compliance training to inform and guide construction activities and

major capital project teams. She also developed and implemented internal cultural resource management programs based on the mitigation measures in the FEIR/EIS. Tria coordinated with BLM archaeologists on discovery and management of previously unknown cultural resources discovered during construction, and managed the treatment of these resources and reporting. She provided environmental analyses, technical reports, and clearance documentation for over 20 project modifications during construction without delay to project. Developed the cultural resources geodatabase for EITP and coordinated regularly with the project GIS team.

Silver State South Substation, In-house Consultant for Archaeology; Southern California Edison, Clark County, NV; 2010-2012. Provided regulatory oversight and project management regarding cultural and paleontological resource management during project licensing and scoping. Identified potential impacts to cultural and paleontological resources, developing appropriate mitigation measures in preparation for and projecting alternative conclusions.

Tehachapi Renewable Transmission Project, Multiple Roles; Southern California Edison, Segments 1-3 and Segments 6-11, Kern, Los Angeles and Orange County, CA; 2009 - Present. Tria provided service to this project over seven years in multiple roles – archaeological field monitor, project coordinator, in-house consultant at SCE, and principal investigator. She provided regulatory oversight and project management regarding cultural and paleontological resource management for all segments of TRTP. Developed and implemented internal cultural resource management programs based on the mitigation measures in the Final Environmental Impact Report/Environmental Impact Statement (FEIR/EIS) for TRTP, and for the existing Special Use Permits and Record of Decision for TRTP, issued by the Angeles National Forest (ANF). Oversaw preparation of the Historic Properties Treatment Plans, fieldwork and technical report preparation for two large-scale Phase III Data Recovery excavations on Angeles National Forest. Coordinated with ANF archaeologists on discovery and management of previously unknown cultural resources identified during construction. Provided cultural resources analyses and clearance documentation, including technical reports, for over 100 project modifications during construction without delay to project. Finally, Tria was responsible for maintaining the geospatial data for the project within the SCE cultural resources geodatabase TRTP and coordinated with the project GIS team.

Desert Tortoise Habitat Conservation Plan Area, Principal Investigator; Cadiz Inc., San Bernardino County, CA; 2013. Oversaw records search to identify the extent of previous cultural resources surveys and all previously recorded prehistoric and historic resources within the 7,500-acre Desert Tortoise Habitat Conservation Plan (HCP) area (Project Area) located on lands administered by the BLM Needles Field Office in unincorporated San Bernardino County, California.

Selected Publications

Belcourt, T.

2014- 2016 *Southern California Edison – TRTP Segments 6 and 11C - Cultural Resources Monitoring Report*, Prepared Monthly (October 2014-March 2016) for Angeles National Forest (ANF) and SCE. On file at ANF and SCE Irwindale.

2013 *Cultural and Paleontoloical Resource Assessment for the Ames/Reche Groundwater Storage and Recovery Program, Winters Road Flow Control and Recharge Facility, Mojave Water Agency, Landers, San Bernardino County, California.* Prepared by Cogstone Resource Management, Inc. On file at Mojave Water Agency.

2014 *Cultural and Paleontological Monitoring Compliance Report for Street and Storm Drain Improvements, Jackson Avenue Bridge at Warm Springs Creek, City of Murrieta, Riverside County.* Prepared by Cogstone Resource Management, Inc. On file at City of Murrietta Planning Department.

2014 *Cultural and Paleontological Resource Assessment for the OC-44 Pipeline Rehabilitation and*

Replacement Project, Mesa Water District, Newport Beach, Orange County, California. Prepared by Cogstone Resource Management, Inc. On file at Mesa Water District.

2015 *Archaeological Monitoring and Survey Report, Southern California Edison Dead Tree Removal*
near Pine Flat, Tulare County, California. Submitted to SCE and on file at SCE Irwindale.

2015 *Class III Cultural Resources Survey of the Pacific Gas & Electric Company (PG&E) Kerckhoff #1-Kerckhoff #2 115kV and Kerckhoff-Clovis-Sanger 115kV Projects, located on Lands Administered by the Bureau of Land Management (BLM), Bakersfield Field Office, within Fresno County, California*. Prepared on behalf of PG&E and submitted to BLM Bakersfield Office. On file at PG&E, Fresno.

2015 *Class III Cultural Resources Survey of the SCE Shoshone Emergency Response Location, on Lands Administered by the Bureau of Land Management (BLM), Barstow Field Office, within Inyo County, California*. Prepared on behalf of SCE and submitted to BLM Barstow Field Office. On file at SCE Irwindale.

2015 *Cultural Resources Assessment of Effect for Southern California Edison TD835602: Deteriorated Pole Replacement, Sequoia National Park, Three Rivers Area, Tulare County, California.* Prepared on behalf of SCE for Sequoia National Park. On file at SCE Irwindale.

2015 *Cultural Resources Impact Assessment for Southern California Edison TD1037389: Line Extension – Soda Springs 12 kV, Tulare County, California.* Prepared for SCE. On file at SCE Irwindale.

2015 *Cultural Resources Inventory for Southern California Edison's Replacement of Nine Deteriorated Power Structures (TD993840, TD994158, and TD1029116), near Kramer Junction, on Lands Administered by the Bureau of Land Management Barstow Field Office, San Bernardino County, California.* Prepared on behalf of SCE and submitted to BLM Barstow Field Office. On file at SCE Irwindale.

2015 *Cultural Resources Monitoring for Southern California Edison IO328390: Replace Pole and Upgrade Overhead Switch – Dinkey Creek 4kV (TD721303). Sierra National Forest, High Sierra District, Fresno County, California.* Prepared on behalf of SCE for Sierra National Forest. On file at SCE Irwindale.

2015 *Cultural Resources Survey in Support of a Request for Final Engineering Concurrence for Tehachapi Renewable Transmission Project Segment 8 T/L West (Phase IV) – Erosion Repair Associated with Structure M43-T3, unincorporated Los Angeles County, California*. Submitted to SCE and CPUC. On file at SCE Irwindale.

2015 *Cultural Resources Survey in Support of a Temporary Work Change Request for Wire Setup Sites, Distribution Pole Work Area, and Access Road near Structure M57-T2 for Segment 8, Tehachapi Renewable Transmission Project, unincorporated Los Angeles County, California*. Submitted to SCE and CPUC. On file at SCE Irwindale.

2015 *Results of Faunal Analysis for the Los Angeles Metropolitan Transportation Authority (Metro) Division 13 Bus Maintenance and Operation Facility Construction Project, City of Los Angeles, Los Angeles County, California.* Submitted to Metro. On file at Resource Sciences and Planning, LLC, Monrovia.

2016 *Archaeological Monitoring Compliance Report, Pacific Gas & Electric Company NERC Alert Program, Helms-Gregg 230kV Grading Project, Sierra National Forest, Fresno County, California.* Prepared on behalf of PG&E and submitted to Sierra National Forest. On file at PG&E, Fresno.

2016 *Archaeological Resource Assessment, SCE Infrastructure Replacement- Pickle Meadows 12kV, Toiyabe National Forest, Bridgeport, Inyo County, California.* Prepared on behalf of SCE and submitted to Toiyabe National Forest. On file at SCE, Irwindale.

2016 *Cultural Resources Assessment: 84 Lumber Company Project, City of Lancaster, Los Angeles County, California*. Prepared on behalf of 84 Lumber Company for City of Lancaster. On file at Material Culture Consulting, Claremont.

2016 *Cultural Resources Assessment of Effect for Southern California Edison TD1029531: Deteriorated Pole Replacement on Lands Administered by Bureau of Land Management, Ridgecrest Field Office, near Mojave, Kern County, California.* Prepared on behalf of SCE. On file at SCE Irwindale.

2016 *Cultural and Paleontological Resources Records Searches and Field Survey, Tandis Homes Residential Development, City of Menifee, Riverside County, California*. Prepared for City of Menifee. On file at Material Culture Consulting Claremont.

2016 *Class III Cultural Resources Survey of the Southern California Edison Company Replacement of Thirteen Deteriorated Poles Near Lockhart and Flamingo Heights, on Lands Administered by the Bureau of Land Management, Barstow Field Office, within San Bernardino County, California.* Prepared on behalf of SCE and submitted to BLM Barstow Field Office. On file at SCE Irwindale.

2016 *Phase I Cultural and Paleontological Assessment: Tandis Homes 21 Lot Residential Development Project City of Menifee, Riverside County, California.* Prepared on behalf of Ridgemoor Investments, LLC for City of Menifee Planning Department. On file at Material Culture Consulting, Claremont.

Belcourt, T. and S. Gust

2014 *Class III Cultural Resource Investigations for Bodie Hills Desert Restoration Projects, Bureau of Land Management, Bishop Field Office, Mono County, CA - FY13-14.* Prepared by Cogstone Resource Management, Inc. for BLM Bishop Field Office. On file at BLM Bishop Field Office.

2015 *Class III Cultural Resource Investigations for Bodie Hills Desert Restoration Projects, Bureau of Land Management, Bishop Field Office, Mono County, CA - FY14-15.* Prepared by Cogstone Resource Management, Inc. for BLM Bishop Field Office. On file at BLM Bishop Field Office.

Belcourt, T., T. Jackson, M.Kay and R. Moritz

2016 *Class III Cultural Resources Inventory for the Southern California Edison Company Kelly Cutover Project (FWA 680-16-07), Volume I – Archaeological Resources, San Bernardino County, California*. Submitted to BLM Barstow Field Office, On file at Resource Sciences and Planning, LLC, Monrovia.

Belcourt, T. and M. Kay

2016 *Southern California Edison Company Replacement of Three Deteriorated Poles Near Fort Irwin, on Lands Administered by the Bureau of Land Management, Barstow Field Office, San Bernardino County, California.* Prepared on behalf of SCE and submitted to BLM Barstow. On file at Resource Sciences and Planning, LLC Monrovia.

Belcourt, T., M. Kay, and R. Moritz

2016 *Cultural Resources Assesment of the State of California Department of General Services and Department of State Hospitals, Metropolitan Hospital, Norwalk, Los Angeles County, CA.* Prepared for DGS/DSH. On file at Resource Sciences and Planning, LLC, Monrovia.

Belcourt, T. and J. Kelly

2016 *Cultural and Paleontological Resources Assessment: Village 605 Environmental Impact Report Addendum, City of Los Alamitos, Orange County, California.* Prepared for City of Los Alamitos on behalf of Katella Property Owner, LLC by Material Culture Consulting, on file at Material Culture Consulting, Claremont.

Belcourt, T., K. Scott and S. Gust

2013 *Paleontological and Archaeological Assessment of the Bloomington Affordable Housing Project, San Bernardino County, California*. Prepared by Cogstone Resource Management, Inc., On file at Cogstone Resource Management, Inc., Orange.

Belcourt, T., M. Valasik, and S. Gust

2013 *Class III Cultural Resource Investigation for the Cadiz Solar Array Desert Tortoise Habitat*

Conservation Plan Area, on Lands Managed by BLM Needles Field Office, San Bernardino County, CA. Prepared by Cogstone Resource Management on behalf of Cadiz, Inc.

Daly, P. and T. Belcourt

2016 *Class III Cultural Resources Inventory for the Southern California Edison Company Kelly Cutover Project (FWA 680-16-07), Volume II – Historic Built Environment Resources, San Bernardino County, California*. Submitted to BLM Barstow Field Office, On file at Resource Sciences and Planning, LLC, Monrovia.

Technical Report QA/QC and Third-Party Review (representative selection)

Lamb, Meghan

2016 *Archaeological Resources Monitoring Report: Lot 19 Tustin Legacy (Tustin Air Base) Project, City of Tustin, Orange County, California.* Prepared by Paleo Solutions, Inc., and submitted to City of Tustin, California. On file at Paleo Solutions, Monrovia.

Kelly, J. and G. Aron

2015 *Final Paleontological Monitoring Report: Tehachapi Renewable Transmission Project, Segment 6, Los Angeles County, California*. Prepared for SCE by Paleo Solutions, Inc., and submitted to ANF and CPUC. On file at SCE Irwindale.

Kelly, J. and G. Aron

2015 *Final Paleontological Monitoring Report: Tehachapi Renewable Transmission Project, Segment 7, Los Angeles County, California*. Prepared for SCE by Paleo Solutions, Inc., and submitted to ANF and CPUC. On file at SCE Irwindale.

Kelly, J. and G. Aron

2015 *Final Paleontological Monitoring Report: Tehachapi Renewable Transmission Project, Segment 8, Los Angeles County, California*. Prepared for SCE by Paleo Solutions, Inc., and submitted to ANF and CPUC. On file at SCE Irwindale.

Kelly, J. and G. Aron

2015 *Final Paleontological Monitoring Report: Tehachapi Renewable Transmission Project, Segment 11, Los Angeles County, California*. Prepared for SCE by Paleo Solutions, Inc., and submitted to ANF and CPUC. On file at SCE Irwindale.

Tinsley-Becker, W.

2015 *Cultural Resources Inventory for the SCE Coolwater-Lugo Transmission Project, San Bernardino County, California, Volume 1: Historic-Era Built Environment Survey Report.* Submitted to BLM Barstow Field Office, On file at Resource Sciences and Planning, LLC, Monrovia.

Pacific Legacy, Inc.

2015 *Cultural Resources Inventory for the SCE Coolwater-Lugo Transmission Project, San Bernardino County, California, Volume 2: Archaeological Resources.* Submitted to BLM Barstow Field Office, On file at Pacific Legacy, Inc., Berkeley.

Webster, B.

2016 *Archaeological Monitoring Report: OCTA San Juan Capistrano Rail Side Passing Project, City of San Juan Capistrano, Orange County, California*. Prepared for Earth Mechanics, Inc. by Paleo Solutions, Inc. On file at Paleo Solutions, Monrovia.

Webster, B. and M. Kay

2016 *Archaeological Survey Report for the Southern California Edison Company Replacement of Five Deteriorated Power Poles on an Unnamed Circuit (TD 979272), Topanga State Park, Los Angeles County, California.* Prepared by Paleo Solutions, Inc., on behalf of SCE.

2015 *Archaeological Survey Report for the Southern California Edison Company Replacement of One Deteriorated Power Pole on an Unnamed Circuit (TD 1020522), Topanga State Park, Los Angeles County, California.* Prepared by Paleo Solutions, Inc., on behalf of SCE.

2015 *Archaeological Survey Report for the Southern California Edison Company Replacement of Two Deteriorated Power Poles on the Vicasa 16kv Circuit (TD 1039350), Topanga State Park, Los Angeles County, California.* Prepared by Paleo Solutions, Inc., on behalf of SCE.

Appendix B:
NAHC and Native American Correspondence

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
(916) 373-3710

April 20, 2018

Tria Belcourt
Material Culture Consulting, Inc.

Sent by E-mail: tria@materialcultureconsulting.com

RE: Proposed Moreno Valley Skilled Nursing Solar Project, City of Moreno Valley; Sunnymead USGS Quadrangle, Riverside County, California

Dear Ms. Belcourt:

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.

Attached is a list of tribes culturally affiliated to the project area. 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

Gayle Totton, M.A., PhD.
Associate Governmental Program Analyst
(916) 373-3714

Native American Heritage Commission
Native American Contact List
Riverside County
4/20/2018

Agua Caliente Band of Cahuilla Indians
Patricia Garcia-Plotkin, Director
5401 Dinah Shore Drive — Cahuilla, Luiseno
Palm Springs, CA, 92264
Phone: (760) 699 - 6907
Fax: (760) 699-6924
ACBCI-THPO@aguacaliente.net

Agua Caliente Band of Cahuilla Indians
Jeff Grubbe, Chairperson
5401 Dinah Shore Drive — Cahuilla, Luiseno
Palm Springs, CA, 92264
Phone: (760) 699 - 6800
Fax: (760) 699-6919

Augustine Band of Cahuilla Mission Indians
Amanda Vance, Chairperson
P.O. Box 846 — Cahuilla
Coachella, CA, 92236
Phone: (760) 398 - 4722
Fax: (760) 369-7161
hhaines@augustinetribe.com

Cabazon Band of Mission Indians
Doug Welmas, Chairperson
84-245 Indio Springs Parkway — Cahuilla
Indio, CA, 92203
Phone: (760) 342 - 2593
Fax: (760) 347-7880
jstapp@cabazonindians-nsn.gov

Cahuilla Band of Indians
Daniel Salgado, Chairperson
52701 U.S. Highway 371 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 5549
Fax: (951) 763-2808
Chairman@cahuilla.net

Campo Band of Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1 — Kumeyaay
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov

Ewiiaapaayp Tribal Office
Michael Garcia, Vice Chairperson
4054 Willows Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net

Ewiiaapaayp Tribal Office
Robert Pinto, Chairperson
4054 Willows Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612 — Kumeyaay
Jamul, CA, 91935
Phone: (619) 669 - 4785
Fax: (619) 669-4817
mohusky@jiv-nsn.gov

La Jolla Band of Luiseno Indians
Thomas Rodriguez, Chairperson
22000 Highway 76 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 3771

La Posta Band of Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

La Posta Band of Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Kumeyaay
Boulevard, CA, 91905
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LP13bools@aol.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 Moreno Valley Skilled Nursing Solar Project, Riverside County.

Native American Heritage Commission
Native American Contact List
Riverside County
4/20/2018

Los Coyotes Band of Mission Indians
John Perada, Environmental Director
P. O. Box 189 — Cahuilla
Warner Springs, CA, 92086
Phone: (760) 782 - 0712
Fax: (760) 782-2730

Los Coyotes Band of Mission Indians
Shane Chapparosa, Chairperson
P.O. Box 189 — Cahuilla
Warner Springs, CA, 92086-0189
Phone: (760) 782 - 0711
Fax: (760) 782-0712
Chapparosa@msn.com

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Kumeyaay
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

Morongo Band of Mission Indians
Robert Martin, Chairperson
12700 Pumarra Rroad — Cahuilla, Serrano
Banning, CA, 92220
Phone: (951) 849 - 8807
Fax: (951) 922-8146
dtorres@morongo-nsn.gov

Morongo Band of Mission Indians
Denisa Torres, Cultural Resources Manager
12700 Pumarra Rroad — Cahuilla, Serrano
Banning, CA, 92220
Phone: (951) 849 - 8807
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dtorres@morongo-nsn.gov

Pala Band of Mission Indians
Shasta Gaughen, Tribal Historic Preservation Officer
PMB 50, 35008 Pala Temecula Rd. — Cupeno, Luiseno
Pala, CA, 92059
Phone: (760) 891 - 3515
Fax: (760) 742-3189
sgaughen@palatribe.com

Pauma Band of Luiseno Indians - Pauma & Yuima Reservation
Temet Aguilar, Chairperson
P.O. Box 369 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 1289
Fax: (760) 742-3422
bennaecalac@aol.com

Pechanga Band of Mission Indians
Paul Macarro, Cultural Resources Coordinator
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6306
Fax: (951) 506-9491
pmacarro@pechanga-nsn.gov

Pechanga Band of Mission Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6000
Fax: (951) 695-1778
epreston@pechanga-nsn.gov

Ramona Band of Cahuilla Mission Indians
Joseph Hamilton, Chairperson
P.O. Box 391670 — Cahuilla
Anza, CA, 92539
Phone: (951) 763 - 4105
Fax: (951) 763-4325
admin@ramonatribe.com

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This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Moreno Valley Skilled Nursing Solar Project, Riverside County.

Native American Heritage Commission
Native American Contact List
Riverside County
4/20/2018

Ramona Band of Cahuilla Mission Indians
John Gomez, Environmental Coordinator
P. O. Box 391670 — Cahuilla
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jgomez@ramonatribe.com

Rincon Band of Mission Indians
Jim McPherson, Tribal Historic Preservation Officer
1 West Tribal Road — Luiseno
Valley Center, CA, 92082
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Fax: (760) 749-5144
vwhipple@rincontribe.org

Rincon Band of Mission Indians
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bomazzetti@aol.com

San Fernando Band of Mission Indians
Donna Yocum, Chairperson
P.O. Box 221838 — Kitanemuk
Newhall, CA, 91322 — Serrano
Phone: (503) 539 - 0933 — Tataviam
Fax: (503) 574-3308
ddyocum@comcast.net

San Manuel Band of Mission Indians
Lee Clauss, Director of Cultural Resources
26569 Community Center Drive — Serrano
Highland, CA, 92346
Phone: (909) 864 - 8933
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lclauss@sanmanuel-nsn.gov

San Pasqual Band of Mission Indians
John Flores, Environmental Coordinator
P. O. Box 365 — Kumeyaay
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Fax: (760) 749-3876
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San Pasqual Band of Mission Indians
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allenl@sanpasqualtribe.org

Santa Rosa Band of Mission Indians
Steven Estrada, Chairperson
P.O. Box 391820 — Cahuilla
Anza, CA, 92539
Phone: (951) 659 - 2700
Fax: (951) 659-2228
mflaxbeard@santarosacahuilla-nsn.gov

Serrano Nation of Mission Indians
Goldie Walker, Chairperson
P.O. Box 343 — Serrano
Patton, CA, 92369
Phone: (909) 528 - 9027

Soboba Band of Luiseno Indians
Carrie Garcia, Cultural Resources Manager
P. O. Box 487 — Cahuilla
San Jacinto, CA, 92583 — Luiseno
Phone: (951) 654 - 2765
Fax: (951) 654-4198
carrieg@soboba-nsn.gov

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This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Moreno Valley Skilled Nursing Solar Project, Riverside County.

Native American Heritage Commission
Native American Contact List
Riverside County
4/20/2018

Soboba Band of Luiseno Indians
Scott Cozart, Chairperson
P. O. Box 487 — Cahuilla
San Jacinto, CA, 92583 — Luiseno
Phone: (951) 654 - 2765
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Soboba Band of Luiseno Indians
Joseph Ontiveros, Cultural Resource Department
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Phone: (951) 663 - 5279
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Sycuan Band of the Kumeyaay Nation
Cody J. Martinez, Chairperson
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 445 - 2613
Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Sycuan Band of the Kumeyaay Nation
Lisa Haws, Cultural Resources Manager
1 Kwaaypaay Court — Kumeyaay
El Cajon, CA, 92019
Phone: (619) 312 - 1935
lhaws@sycuan-nsn.gov

Torres-Martinez Desert Cahuilla Indians
Michael Mirelez, Cultural Resource Coordinator
P.O. Box 1160 — Cahuilla
Thermal, CA, 92274
Phone: (760) 399 - 0022
Fax: (760) 397-8146
mmirelez@tmdci.org

Viejas Band of Kumeyaay Indians
Robert Welch, Chairperson
1 Viejas Grade Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

Viejas Band of Kumeyaay Indians
Julie Hagen,
1 Viejas Grade Road — Kumeyaay
Alpine, CA, 91901
Phone: (619) 445 - 3810
Fax: (619) 445-5337
jhagen@viejas-nsn.gov

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This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Moreno Valley Skilled Nursing Solar Project, Riverside County.

April 20, 2018

EXAMPLE LETTER

MATERIAL CULTURE CONSULTING

RE: Proposed Moreno Valley Skilled Nursing Facility Project, City of Moreno Valley; Sunnymead USGS Quadrangle, Riverside County, California.

Greetings,

T&C International Health is proposing to develop the new Moreno Valley Skilled Nursing Facility Project in City of Moreno Valley, Riverside County, California (see attached map). Material Culture Consulting, Inc. is conducting the cultural resources review of the Project to support preparation of the environmental documents. As part of our background research, we would like to request your input on potential cultural resources within the Project Area. This request is not part of any formal local, state, or federal consultation process.

Our firm contacted the Native American Heritage Commission (NAHC) on April 18, 2018 to request review of the Sacred Lands File and for a list of tribes with traditional lands and/or cultural places within the area. The NAHC responded on April 20, 2018, stating that the Sacred Lands File review resulted in negative results, and provided your contact information as part of the list. We understand that negative results do not preclude the existence of cultural resources, and that a tribe may be the only source of information regarding the existence of a tribal cultural resource, which is why we are contacting you.

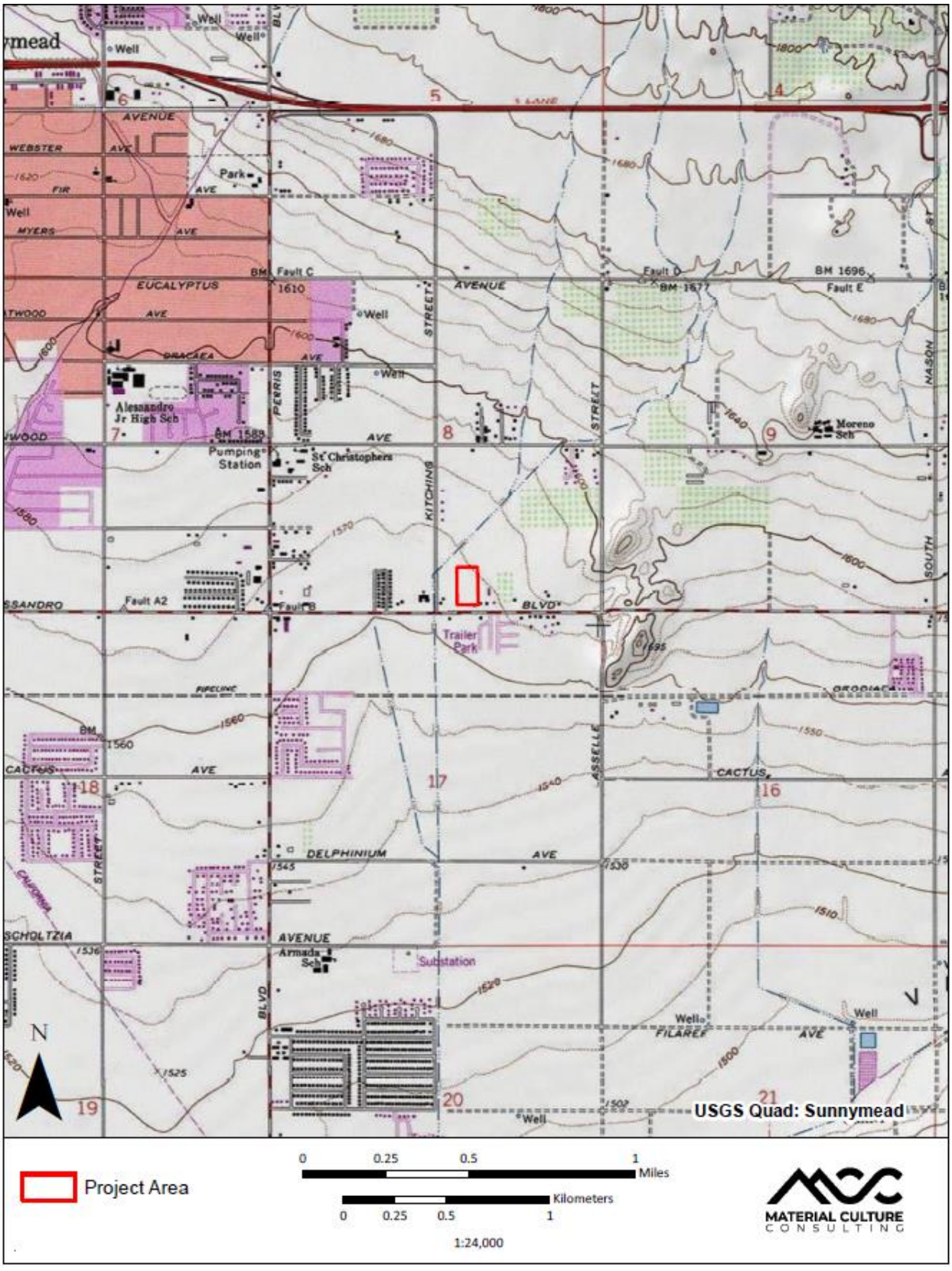
Project Location and Description

The proposed project is located north on Alessandro Blvd., approximately 150-ft east of the intersection of Kitching St. (see attached map). The Project Area includes one parcel that encompasses a total of approximately 4.54 acres and is located within Section 8 of Township 30 South and Range 30 West (San Bernardino Base Meridian).

Please respond at your earliest convenience if you wish to share any knowledge of cultural resources within or adjacent to the Project Area. Any information, concerns, or recommendations regarding cultural resources within the Project Area can be shared with me via telephone, email, or via standard mail. Thank you very much for your assistance.

Kindest regards,

Tria Belcourt, M.A., RPA
President and Principal Archaeologist
626-205-8279
tria@materialcultureconsulting.com



Map of Proposed Moreno Valley Skilled Nursing Solar Project, as depicted on Sunnymead USGS 7.5-minute Quadrangle.

Gmail by Google

Tria Belcourt <tria@materialcultureconsulting.com>

Moreno V alley Skilled Nursing Facility Solar Project

Jessica Mauck <JMauck@sanmanuel-nsn.gov> Mon, Apr 30, 2018 at 12:55 PM
To: Tria Belcourt <tria@materialcultureconsulting.com>

Hello Tria,

Thank you for contacting the San Manuel Band of Mission Indians (SMBMI) regarding the above referenced project. SMBMI appreciates the opportunity to review the project documentation, which was received by our Cultural Resources Management Department on 30 April 2018. The proposed project area is located just outside of Serrano ancestral territory and, as such, SMBMI will not request consulting party status or elect to participate in the scoping, development, and/or review of documents created pursuant to these legal and regulatory mandates.

Regards,

Jessica Mauck
CULTURAL RESOURCES ANALYST
O: (909) 864-8933 x3249
M: (909) 725-9054
26569 Community Center Drive, Highland California 92346
SAN MANUEL BAND OF MISSION INDIANS

VIEJAS
TRIBAL GOVERNMENT

P.O Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

May 1, 2018

Tria Belcourt
President and Principal Archaeologist
Material Culture Consulting, Inc.
342 Cucamonga Avenue
Claremont, CA 91711

Re: Moreno Valley Skilled Nursing Facility Solar

Dear Ms. Belcourt,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site has little cultural significance or ties to Viejas. We further recommend that you contact the tribe(s) closest to the cultural resources. We, however, request to be informed of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains in order for us to reevaluate our participation in the government-to-government consultation process.

Please do not hesitate to contact me if you have further questions. Please call Ernest Pingleton at 619-659-2314 or me at 619-659-2312, or email, epingleton@viejas-nsn.gov or rteran@viejas-nsn.gov. Thank you.

Sincerely,

Ray Teran, Resource Management
VIEJAS BAND OF KUMEYAAY INDIANS

AGUA CALIENTE BAND OF CAHUILLA INDIANS
TRIBAL HISTORIC PRESERVATION

03-024-2018-007

May 07, 2018

[VIA EMAIL TO:tria@materialcultureconsulting.com]
Material Culture Consulting
Mrs. Tria Belcourt
342 Cucamonga Avenue
Claremont, CA 91711

Re: Proposed Moreno Valley Skilled nursing Facility Solar Project, City of Moreno Valley; Sunnymead USGS Quadrangle, Riverside County, California

Dear Mrs. Tria Belcourt,

The Agua Caliente Band of Cahuilla Indians (ACBCI) appreciates your efforts to include the Tribal Historic Preservation Office (THPO) in the Moreno Valley Skilled Nirsing Facility Solar project. The project area is not located within the boundaries of the ACBCI Reservation. However, it is within the Tribe's Traditional Use Area. For this reason, the ACBCI THPO requests the following:

*At this time ACBCI defers to Soboba. This letter shall conclude our consultation efforts.

Again, the Agua Caliente appreciates your interest in our cultural heritage. If you have questions or require additional information, please call me at (760)699-6829. You may also email me at ACBCI-THPO@aguacaliente.net.

Cordially,

Katie Croft

Katie Croft
Cultural Resources Manager
Tribal Historic Preservation Office
AGUA CALIENTE BAND
OF CAHUILLA INDIANS

5401 DINAH SHORE DRIVE, PALM SPRINGS, CA 92264
T 760/699/6800 F 760/699/6924 WWW.AGUACALIENTE-NSN.GOV

MORONGO BAND OF MISSION INDIANS
TRIBAL HISTORIC PRESERVATION OFFICE
12700 PUMARRA RD BANNING, CA 92220
OFFICE 951-755-5025 FAX 951-572-6004

Date: 5/9/2018

Re:
Skilled Nursing Facility Solar Project – Moreno Valley

Dear,
Tria Belcort
President and Principal Archaeologist
Material Culture Consulting

Thank you for contacting the Morongo Band of Mission Indians (MBMI) Cultural Heritage Department regarding the above referenced project(s). After conducting a preliminary review of the project, the tribe would like to respectfully issue the following comments and/or requests:

☐ The project is located outside of the Tribe's aboriginal territory and is not within an area considered to be a traditional use area or one in which the Tribe has cultural ties. We recommend contacting the appropriate tribe(s) who may have cultural affiliations to the project area. We have no further comments at this time.

☒ The project is located within the Tribe's aboriginal territory or in an area considered to be a traditional use area or one in which the Tribe has cultural ties. In order to further evaluate the project for potential impacts to tribal cultural resources, we would like to formally request the following:

- ☒ A thorough records search be conducted by contacting one of the California Historical Resources Information System (CHRIS) Archaeological Information Centers and a copy of the search results be provided to the tribe.
- ☒ Tribal monitor participation during the initial pedestrian field survey of the Phase I Study of the project and a copy of the results of that study. In the event the pedestrian survey has already been conducted, MBMI requests a copy of the Phase I study be provided to the tribe as soon as it can be made available.
- ☐ MBMI Tribal Cultural Resource Monitor(s) be present during all required ground disturbing activities pertaining to the project.

☐ The project is located with the current boundaries of the Morongo Indian Reservation. Please contact the Morongo Cultural Heritage Department for further details.

Please be aware that this letter is merely intended to notify your office that the tribe has received your letter requesting tribal consultation for the above mentioned project and is requesting to engage in consultation. Specific details regarding the tribe's involvement in the project must be discussed on a project by project basis during the tribal consultation process with the lead agency. This letter does not constitute "meaningful" tribal consultation nor does it conclude the consultation process. Under federal and state law, "meaningful" consultation is understood to be an ongoing government-to-government process and may involve requests for additional information, phone conferences and/or face-to-face meetings. If you have any further questions or concerns regarding this letter, please contact the Morongo Cultural Heritage office at (951) 755-5139.

Please include this response in your report to your client.

Sincerely,

Raymond Huaute
Tribal Historic Preservation Officer
Morongo Band of Mission Indians
Email: rhuaute@morongo-nsn.gov
Phone: (951) 755-5025

RINCON BAND OF LUISEÑO INDIANS

Cultural Resources Department

1 W. Tribal Road · Valley Center, California 92082 ·
(760) 297-2635 Fax:(760) 692-1498

May 17, 2018

Tria Belcourt
President and Principal Archaeologist
Material Culture Consulting Inc.
2701-B North Towne Avenue
Pomona, CA 91767

Re: Moreno Valley Skilled Nursing Facility Solar Project

Dear Ms. Belcourt:

This letter is written on behalf of the Rincon Band of Luiseño Indians. We have received your notification regarding the Moreno Valley Skilled Nursing Facility Solar Project and we thank you for the opportunity to consult on this project. The identified location is within the Territory of the Luiseño people, and is also within Rincon's specific area of Historic interest.

Embedded in the Luiseño territory are Rincon's history, culture and identity. Rincon has no knowledge of any known cultural resources within the proposed project area. Therefore, no consultation is requested.

If you have additional questions or concerns please do not hesitate to contact our office at your convenience at (760) 297-2635.

Thank you for the opportunity to protect and preserve our cultural assets.

Sincerely,

Destiny Colocho
Director
Rincon Cultural Resources

May 16, 2018

Attn: Tria Belcourt, President, Principal Archaeologist
Material Culture Consulting, Inc.
342 Cucamonga Avenue
Claremont, CA 91711

RE: Proposed Moreno Valley Skilled Nursing Facility Solar Project – north of Alessandro Boulevard, approximately 150 feet east of the intersection of Kitching Street – City of Moreno Valley, Riverside County, CA

The Soboba Band of Luiseño Indians appreciates your observance of Tribal Cultural Resources and their preservation in your project. The information provided to us on said project has been assessed through our Cultural Resource Department, where it was concluded that although it is outside the existing reservation, the project area does fall within the bounds of our Tribal Traditional Use Areas. This project location is in proximity to known sites, is a shared use area that was used in ongoing trade between the tribes, and is considered to be culturally sensitive by the people of Soboba.

Soboba Band of Luiseño Indians is requesting the following:

1. To initiate a consultation with the project proponents and lead agency.

2. The transfer of information to the Soboba Band of Luiseno Indians regarding the progress of this project should be done as soon as new developments occur.

3. Soboba Band of Luiseño Indians continues to act as a consulting tribal entity for this project.

4. Working in and around traditional use areas intensifies the possibility of encountering cultural resources during the construction/excavation phase. For this reason the Soboba Band of Luiseño Indians requests that Native American Monitor(s) from the Soboba Band of Luiseño Indians Cultural Resource Department to be present during any ground disturbing proceedings. Including surveys and archaeological testing.

5. Request that proper procedures be taken and requests of the tribe be honored (Please see the attachment)

Multiple areas of potential impact were identified during an in-house database search. Specifics to be discussed in consultation with the lead agency.

Sincerely,

Joseph Ontiveros, Tribal Historic Preservation Officer
Soboba Band of Luiseño Indians
P.O. Box 487
San Jacinto, CA 92581
Phone (951) 654-5544 ext. 4137
Cell (951) 663-5279
jontiveros@soboba-nsn.gov

Cultural Items (Artifacts). Ceremonial items and items of cultural patrimony reflect traditional religious beliefs and practices of the Soboba Band. The Developer should agree to return all Native American ceremonial items and items of cultural patrimony that may be found on the project site to the Soboba Band for appropriate treatment. In addition, the Soboba Band requests the return of all other cultural items (artifacts) that are recovered during the course of archaeological investigations. Where appropriate and agreed upon in advance, Developer's archeologist may conduct analyses of certain artifact classes if required by CEQA, Section 106 of NHPA, the mitigation measures or conditions of approval for the Project. This may include but is not limited or restricted to include shell, bone, ceramic, stone or other artifacts.

The Developer should waive any and all claims to ownership of Native American ceremonial and cultural artifacts that may be found on the Project site. Upon completion of authorized and mandatory archeological analysis, the Developer should return said artifacts to the Soboba Band within a reasonable time period agreed to by the Parties and not to exceed (30) days from the initial recovery of the items.

Treatment and Disposition of Remains.

A. The Soboba Band shall be allowed, under California Public Resources Code § 5097.98 (a), to (1) inspect the site of the discovery and (2) make determinations as to how the human remains and grave goods shall be treated and disposed of with appropriate dignity.

B. The Soboba Band, as MLD, shall complete its inspection within twenty-four (24) hours of receiving notification from either the Developer or the NAHC, as required by California Public Resources Code § 5097.98 (a). The Parties agree to discuss in good faith what constitutes "appropriate dignity" as that term is used in the applicable statutes.

C. Reburial of human remains shall be accomplished in compliance with the California Public Resources Code § 5097.98 (a) and (b). The Soboba Band, as the MLD in consultation with the Developer, shall make the final discretionary determination regarding the appropriate disposition and treatment of human remains.

D. All parties are aware that the Soboba Band may wish to rebury the human remains and associated ceremonial and cultural items (artifacts) on or near, the site of their discovery, in an area that shall not be subject to future subsurface disturbances. The Developer should accommodate on-site reburial in a location mutually agreed upon by the Parties.

E. The term "human remains" encompasses more than human bones because the Soboba Band's traditions periodically necessitated the ceremonial burning of human remains. Grave goods are those artifacts associated with any human remains. These items, and other funerary remnants and their ashes are to be treated in the same manner as human bone fragments or bones that remain intact

Coordination with County Coroner's Office. The Lead Agencies and the Developer should immediately contact both the Coroner and the Soboba Band in the event that any human remains are discovered during implementation of the Project. If the Coroner recognizes the human remains to be those of a Native American, or has reason to believe that they are those of a Native American, the Coroner shall ensure that notification is provided to the NAHC within twenty-four (24) hours of the determination, as required by California Health and Safety Code § 7050.5 (c).

Non-Disclosure of Location Reburials. It is understood by all parties that unless otherwise required by law, the site of any reburial of Native American human remains or cultural artifacts shall not be disclosed and shall not be governed by public disclosure requirements of the California Public Records Act. The Coroner, parties, and Lead Agencies, will be asked to withhold public disclosure information related to such reburial, pursuant to the specific exemption set forth in California Government Code § 6254 (r). Ceremonial items and items of cultural patrimony reflect traditional religious beliefs and practices of the Soboba Band. The Developer agrees to return all Native American ceremonial items and items of cultural patrimony that may be found on the project site to the Soboba Band for appropriate treatment. In addition, the Soboba Band requests the return of all other cultural items (artifacts) that are recovered during the course of archaeological investigations. Where appropriate and agreed upon in advance, Developer's archeologist may conduct analyses of certain artifact classes if required by CEQA, Section 106 of NHPA, the mitigation measures or conditions of approval for the Project. This may include but is not limited or restricted to include shell, bone, ceramic, stone or other artifacts.

Confidentiality: The entirety of the contents of this letter shall remain confidential between Soboba and Material Culture Consulting, Inc. No part of the contents of this letter may be shared, copied, or utilized in any way with any other individual, entity, municipality, or tribe, whatsoever, without the expressed written permission of the Soboba Band of Luiseño Indians.

Forefront Moreno Valley Skilled Nursing Solar Project
CEQA Due Diligence Native American Contact Log
May 2018

Name/Affiliation	Date and Method of 1st Contact	Date of 1st Follow Up Attempt	Date of 2nd Follow-Up Attempt	Results	MCC Response
Patricia Garcia-Plotkin, Director Agua Caliente Band of Cahuilla Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	On May 7, 2018- Received email with attached letter from Katie Croft, Cultural Resources Manager:. The ACBCI THPO defers to Soboba.	MCC thanked Ms. Croft for the Tribe's response and will include all correspondence and request within the report.
Jeff Grubbe, Chairperson Agua Caliente Band of Cahuilla Indians	Mailed letter- April 20, 2018	May 1, 2018- via phone	Not necessary	See response above	See above.
Doug Welmas, Chairperson Cabazon Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Daniel Salgado, Chairperson Cahuilla Band of Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone	Via phone from Bobby Ray Esparza, Cultural Coordinator- Tribe requests to have tribal monitor(s) onsite during any ground-disturbing activities.	MCC thanked Mr. Esparza for the Tribe's response and will include correspondence and request within the report.
Ralph Goff, Chairperson Campo Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Erica Pinto, Chairperson Jamul Indian Village	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Thomas Rodriguez, Chairperson La Jolla Band of Luiseno	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A

Amanda Vance, Chairperson Augustine Band of Cahuilla Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	Received letter via USPS dated May 2, 2018 from Victoria Martin, Tribal Secretary: The Tribe encourages full-time Native American monitoring during the pre-construction and construction phase of the Project. The Tribe requests to be notified of any new cultural resource discoveries during the development of the Project.	N/A
Michael Garcia, Vice Chairperson Ewiiaapaayp Tribal Office	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone	Secretary for Tribe stated via phone that the Tribe has no comments or concerns for the proposed Project.	MCC thanked the Tribe and stated their response will be included in the report.
Robert Pinto, Chairperson Ewiiaapaayp Tribal Office	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone	See above response.	See above.
Javaughn Miller, Tribal Administrator La Posta Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Gwendolyn Parada, Chairperson La Posta Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
John Perada, Environmental Director Los Coyotes Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via phone	May 17, 2018- via phone	Phone response from Jacob Norte, Environmental Director. Tribe defers to closer tribes.	MCC thanked the Tribe and stated their response will be included in the report.
Shane Chapparosa, Chairperson Los Coyotes Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	See above response.	See above.
Angela Elliot Santos, Chairperson Manzanita band of Kumeyaay Nation	Mailed letter- April 20, 2018	May 1, 2018- via phone	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A

Shasta Gaughen, Tribal Historic Preservation Officer Pala Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Temet Aguilar, Chairperson Pauma Band of Luiseno Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Robert Martin, Chairperson Morongo Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	May 9, 2018: emailed letter response from Raymond Huaute, THPO: MBMI requested a copy of the records search. Also requested a tribal monitoring during the field survey or a copy of the Phase I results.	MCC thanked the Tribe for their response and will include all correspondence and requests within the report.
Denisa Torres, Cultural Resources Manager Morongo Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	See above response.	See above.
Paul Macarro, Cultural Resource Coordinator Pechanga Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone	As of May 25, 2018, no response	N/A
Mark Macarro, Chairperson Pechanga Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	As of May 25, 2018, no response	N/A
Joseph Hamilton, Chairperson Ramona Band of Cahuilla Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
John Gomez, Environmental Coordinator Ramona Band of Cahuilla Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Jim McPerson, Tribal Historic Preservation Officer Rincon Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	May 17, 2018: Received email with attached letter from Destiny Colocho, Cultural Resources Manager No knowledge of	MCC thanked the Tribe and stated that their response would be included in the report.

				resources in the project area, no consultation requested.	
Bo Mazzetti, Chairperson Rincon Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	See above response.	See above.
Donna Yocum, Chairperson San Fernando Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone	May 17 via phone: Tribe defers to a more local tribal entity	MCC thanked the Tribe and stated their response will be included in the report.
Lee Clauss, Director of Cultural Resources San Manuel Band of Mission Indians	Mailed letter- April 20, 2018	Not necessary	Not necessary	April 30, 2018- Via email: Project located outside Serrano ancestral territory- Jessica Mauck, Cultural Resource Analyst	MCC thanked the Tribe for their response and will include all correspondence and requests within the report.
John Flores, Environmental Coordinator San Pasqual Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Allen E. Lawson, Chairperson San Pasqual Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Steven Estrada, Chairperson Santa Rosa Band of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Goldie Walker, Chairperson Serrano Nation of Mission Indians	Mailed letter- April 20, 2018	May 1, 2018- via phone	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Cody J. Martinez, Chairperson Sycuan Band of the Kumeyaay Nation	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A
Lisa Haws, Cultural Resources Manager Sycuan Band of Kumeyaay Nation	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone- message left	As of May 25, 2018, no response	N/A

Michael Mirelez, Cultural Resource Coordinator Torres-Martinez Desert Cahuilla Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	May 17, 2018- via phone	May 17, 2018 via phone: Tribe defers to Soboba tribe for consultation.	MCC thanked the Tribe and stated their response will be included in the report.
Carrie Garcia, Cultural Resources Manager Soboba Band of Luiseno Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	See response below.	See below.
Scott Cozart, Chairperson Soboba Band of Luiseno Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	See response below.	See below.
Joseph Ontiveros, Cultural Resource Department Soboba Band of Luiseno Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	Letter received via email on May 16, 2018- Tribe requests consultation with the Project proponents and lead agency; information regarding the Project as soon as new developments occur; the Tribe act as a consulting tribal entity for the Project; Native American monitor(s) from Soboba's Cultural Resource Dept be present during any ground disturbing proceedings, including surveys and archaeological testing; and all proper procedures be taken and request of the Tribe be honored.	
Robert Welch, Chairperson Viejas Band of Kumeyaay Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	Letter received via USPS dated May 1, 2018 from Ray Teran, Resource Management for Viejas Band of Kumeyaay Indians: he Project site has little cultural significance or ties to Viejas, for us to contact the tribe(s) closest to the cultural resources, and	N/A

				requests to be informed of any new developments such as inadvertent discovery of cultural artifacts, crenation sites, or human.	
Julie Hagen, Viejas Band of Kumeyaay Indians	Mailed letter- April 20, 2018	May 1, 2018- via email	Not necessary	See above response	See above.

May 2018

MATERIAL CULTURE
CONSULTING

Submitted to:

Rafik Albert, Senior Associate

E|P|D Solutions, Inc.

Irvine, California

Prepared on Behalf of:

T & C International Health, Inc.

Chino Hills, CA 31709

PALEONTOLOGICAL RESOURCES ASSESSMENT

Phase I Paleontological Resources Assessment: Moreno Valley Skilled Nursing Facility Project

City of Moreno Valley, Riverside County, California

MATERIAL CULTURE
CONSULTING

PHASE 1 PALEONTOLOGICAL RESOURCES ASSESSMENT: MORENO VALLEY SKILLED NURSING FACILITY PROJECT CITY OF MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA

Prepared on Behalf of:
T & C International Health, Inc
1961 Scenic Ridge Drive
Chino Hills, CA 31709

Prepared for:
EPD Solutions, Inc.
2030 Main St., Ste. 1200
Irvine, CA 92614

Principal Investigators/Authors:
Jennifer Kelly, M.Sc, Geologist
Sonia Sifuentes, M.Sc.

May 2018

MCC Project Number: 20180401
Type of Study: Paleontological resources assessment
Known Paleontological Resources within Area of Potential Impact: None
U.S.G.S. 7.5-minute Quadrangle: Sunnymead, Section 8 of Township 30 S, Range 30 W
APN(s): 479-230-018
Survey Area: Approx. 4.54
Date of Fieldwork: April 19, 2018
Keywords: Paleontology, CEQA, Phase I Survey, Riverside County, Negative Survey, High B Sensitivity, Quaternary alluvium and marine deposits, Pliocene, Holocene

MANAGEMENT SUMMARY

T & C International Health, Inc. proposes to construct the new Moreno Valley Skilled Nursing Facility (Project) in the City of Moreno Valley (City), Riverside County, California. Material Culture Consulting, Inc. (MCC) was retained by E|P|D Solutions, Inc. to conduct a Phase I paleontological resource investigation of the Project Area. These assessments were conducted in accordance with the California Environmental Quality Act (CEQA) and included a locality search at the Western Science Center, an examination of geological maps and paleontological literature, and a pedestrian field survey.

No significant paleontological resources were identified directly within the Project Area during the locality search or the field survey. The geologic unit mapped underlying the Project Area is Quaternary alluvium and marine deposits ranging from the Pliocene to Holocene period. The Riverside County Land Information System (RCLIS) GIS data reveals the Project lies within an area designated as High B sensitivity. High B sensitivity indicates that excavation has the potential to impact paleontological resources in this area at a depth below 4 feet. Because excavation during the course of the Project will reach paleontologically sensitive deposits, there is a potential for the Project to impact paleontological resources. To mitigate potential significant impacts to nonrenewable paleontological resources, as required by State regulations, Material Culture Consulting recommends the following procedures:

- A trained and qualified paleontological monitor should perform full-time monitoring of any excavations on the Project that have the potential to impact paleontological resources (e.g. excavations deeper than 4 feet). The monitor will have the ability to redirect construction activities to ensure avoidance of significant impacts to paleontological resources.
- The Project Paleontologist may re-evaluate the necessity for paleontological monitoring after 50% or greater of the excavations have been completed.
- Any potentially significant fossils observed shall be collected and recorded in conjunction with best management practices and the Society for Vertebrate Paleontology (SVP) professional standards.
- Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.
- A report documenting the results of the monitoring, including any salvage activities and the significance of any fossils will be prepared and submitted to the appropriate City personnel.

All notes, photographs, correspondence and other materials related to this Project are located at Material Culture Consulting, Inc., located in Pomona, California.

CONTENTS

LIST OF FIGURES

APPENDICES

INTRODUCTION AND SETTING

Material Culture Consulting, Inc. (MCC) was retained by E|P|D Solutions, Inc. to conduct the Phase I paleontological resource investigation of the Moreno Valley Skilled Nursing Facility Project (Project), proposed by T & C International Health, Inc. This paleontological resource assessment was conducted in compliance with the California Environmental Quality Act (CEQA), Public Resources Code (13 PRC) 2100, (14 CAC) 15000, Appendix G, Section J, (PRC) 2100-21177, Appendix G, (PRC) 5097.5. This study included a locality records search and field survey to determine whether the proposed Project could present a significant impact to paleontological resources.

PROJECT LOCATION AND DESCRIPTION

The proposed Project Area is located approximately 150 feet (ft) northeast of the intersection of Alessandro Boulevard and Kitching Street in the City of Moreno Valley (City), Riverside County, California (Figures 1 and 2). The Project Area encompasses a currently vacant lot, located east of present-day Excel Prep Academy and west of the Moreno Valley Unified School District Administration Office (Figure 3). Specifically, the proposed Project is in the southeast portion of Section 8, within Township 30 South, Range 30 West on the Sunnymead USGS 7.5-minute quadrangle (San Bernardino Base Meridian) (Figure 2). The proposed Project includes the construction of three single-story wood framed buildings that will be divided into 88 resident units with 116 beds and all amenities including 24-hour nursing, food service, dining, therapy services, as well as additional services necessary to care for the residents. The building is classified as a I-2 occupancy and construction type V-A under the California Building Code. All three separate buildings will total approximately 69,0000 square footage on APN 479-230-018. Underground utilities proposed include sewer line and water line, as well as storm drainages.

PROJECT PERSONNEL

Jennifer Kelly, M.S., a Qualified Riverside County Paleontologist, served as the Principal Investigator for the study. Ms. Kelly conducted the paleontological resource literature and map reviews, oversaw the field study, and prepared this report. Ms. Kelly has a M.Sc. in Geology from California State University, Long Beach. Ms. Kelly has over ten years of experience in environmental and paleontological compliance in California (See Appendix A).

Sonia Sifuentes, M.A., RPA, co-authored this report with Ms. Kelly. Ms. Sifuentes has a M.Sc in Archaeology of the North from University of Aberdeen, Scotland, a B.A. in Anthropology from University of Southern California, and over ten years of experience as an archaeologist in Southern California, including completion of several projects in Riverside County. Ms. Sifuentes also has two years of professional experience working as a cross-trained paleontologist in Southern California.

Judy Cardoza, MCC Archaeologist and Paleontologist, conducted the pedestrian survey on April 19, 2018.

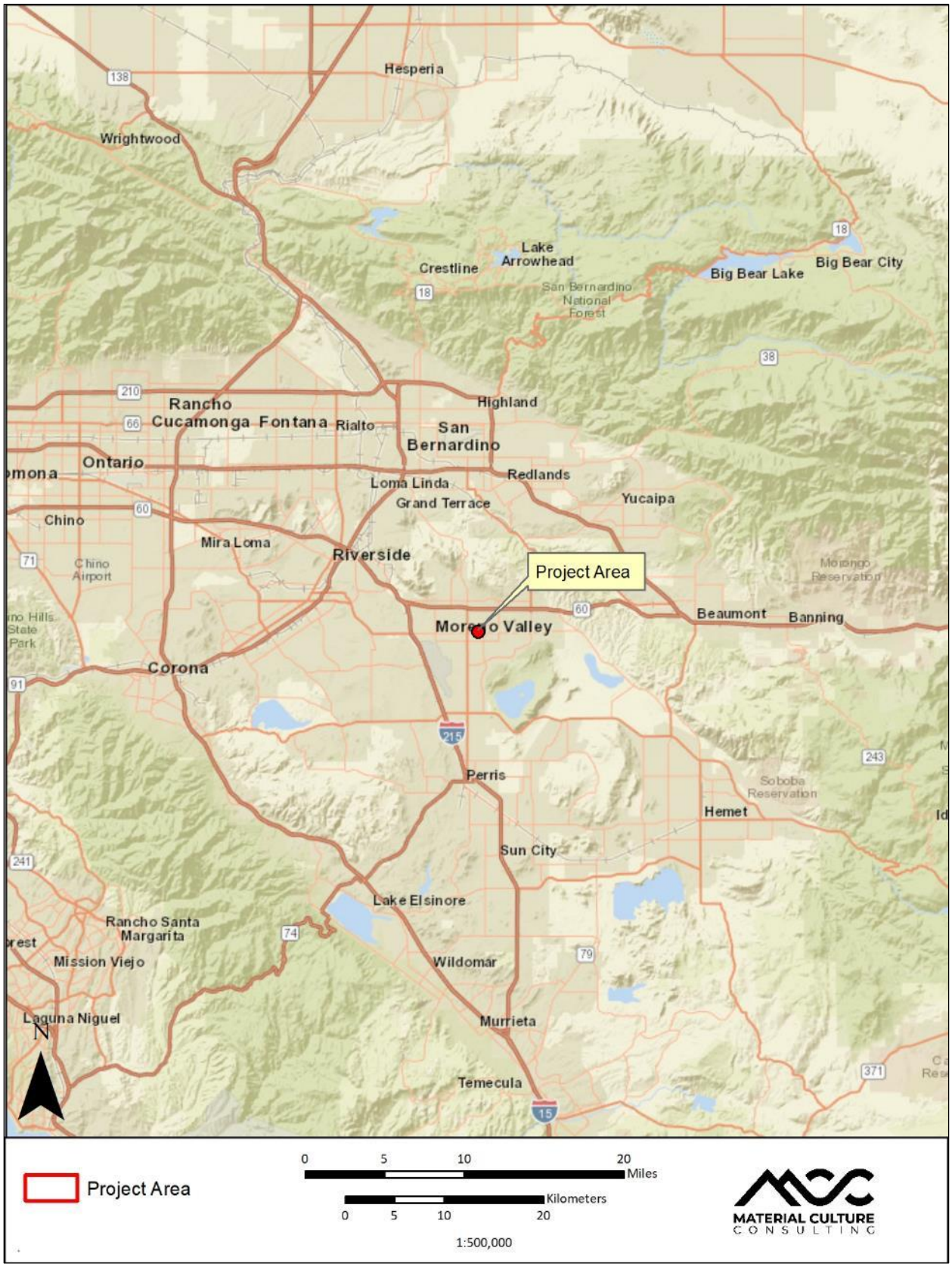


Figure 1. Project Vicinity (1:500,000)

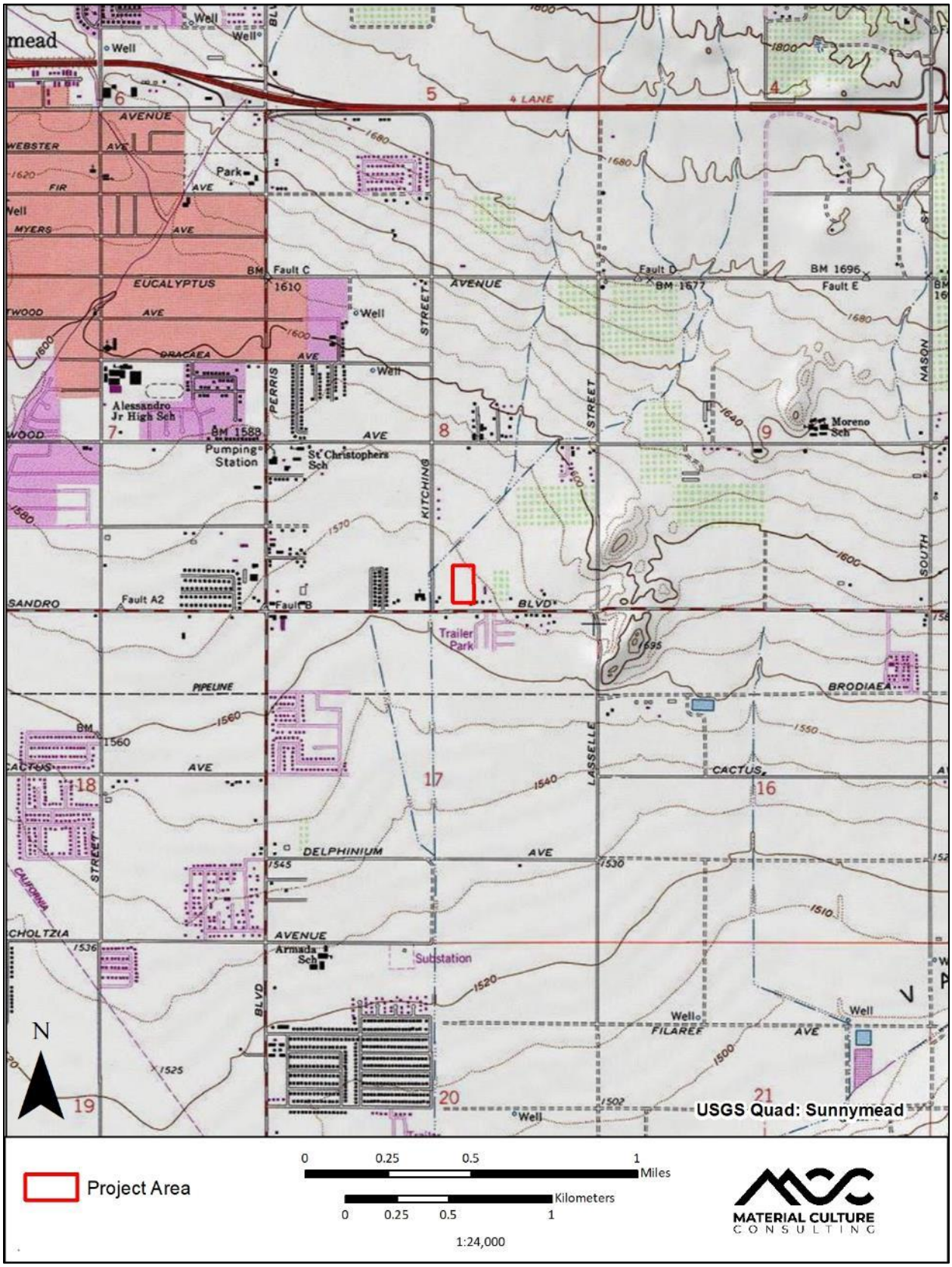


Figure 2. Project Location (as depicted on Sunnymead USGS 7.5 Minute Quadrangle, 1:24,000).

Figure 3. Project Area (as depicted on aerial photograph, 1:2,000)

ENVIRONMENTAL SETTING

The City of Moreno Valley is within northwestern Riverside County. To the east lies the San Gorgonio Pass that leads to the Coachella Valley; to the south is Lake Perris and the San Jacinto Mountains; to the north is the San Bernardino Mountains and Valley; and to the west are the Greater Los Angeles and Orange County regions. The Project Area is located 2.5 miles south of the downtown area of the City of Moreno Valley, bounded by Alessandro Boulevard to the south and Black Walnut Street to the north, and is situated east of Kitching Street. The Perris Reservoir and Upland Game Hunting Area are located approximately 7 miles south-southeast of the Project Area. The Project is located within a heavily developed residential area on a flat vacant lot, with elevations within the Project Area averaging 476 meters (m) (1564 ft) above mean sea level (AMSL). The climate of the area is characterized as Mediterranean, with mild winters and dry summers. Vegetation within the Project Area is limited to foxtails, some various wildflowers and weeds. One walnut tree is located along the southern limits.

GEOLOGICAL CONTEXT

The Project Area lies within the Sunnymead USGS 7.5 minute quadrangle, which lies within the geomorphic province known as the Peninsular Ranges Province, near the northern end and western side of the Perris Block. The Perris Block is a structurally stable, internally cohesive mass of crustal rocks bounded on the east by the San Jacinto fault zone, bounded on the west by the Elsinore and Chino fault zones, and on the north by the Cucamonga fault zone (Norris and Webb, 1976; Morton and Matti, 1989), and on the south by a series of sedimentary basins (Morton and Matti 1989). The Project Area is mapped as young alluvial fan deposits by Morton and Matti (1997, Figure 4). Jennings et al. map the geologic units underlying the Project Area as Quaternary alluvium and marine deposits dating from the Pliocene to Holocene period (1977).

Young alluvial fan deposits (Qyf) The entirety of the Project is mapped as young alluvial fan deposits with arenaceous to boulder gravel grain size (Morton and Miller 1997, Figure 4). These are derived from lithically diverse sedimentary units, consisting of mostly sand and gravel-sand (Morton and Miller 1997).

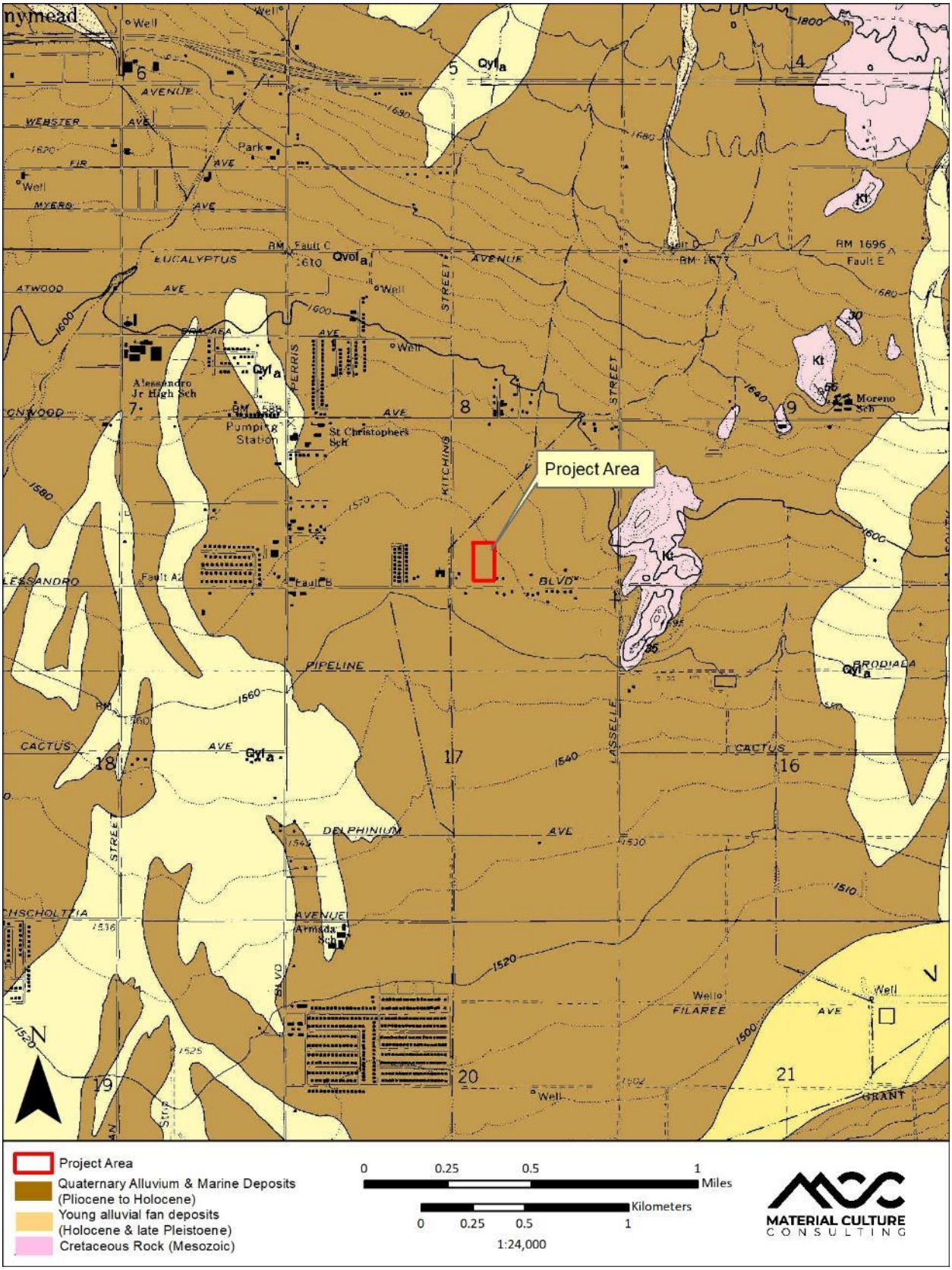


Figure 4. Geological Map of the Project Area (Morton and Matti 1997)

RESEARCH DESIGN

The paleontological resources assessment was conducted according to CEQA, Public Resources Code (13 PRC) 2100, (14 CAC) 15000, Appendix G, Section J, (PRC) 2100-21177, Appendix G, (PRC) 5097.5. The paleontological resources assessment was conducted to evaluate the potential existence of resources that would require a preparation of a monitoring plan and monitoring activities, in order to reduce impacts to a less than significant level. Guidelines set forth by Riverside County (Riverside County General Plan 2015) were consulted to ensure that all local and state requirements were met.

The *Riverside County General Plan* defines what significant impact on paleontological resources consists of, and requires the filing of a Paleontological Resource Impact Mitigation Plan (PRIMP) with the County Geologist if the sediments the Project lies within are of High sensitivity. It also requires that a final report be submitted to the Riverside County Planning Department (County Geologist) documenting the findings of the monitoring and mitigation work (Riverside County General Plan 2015). *Riverside County General Plan* recommendations are based on the SVP Guidelines (SVP 1991, 1996).

The current Multipurpose Open Space Element of the *Riverside County General Plan* provides the following requirements for paleontologically sensitive areas within the County:

- OS 19.6 Whenever existing information indicates that a site proposed for development has high paleontological sensitivity as shown on Figure OS-8, a paleontological resource impact mitigation program (PRIMP) shall be filed with the County Geologist prior to site grading. The PRIMP shall specify the steps to be taken to mitigate impacts to paleontological resources.

- OS 19.7 Whenever existing information indicates that a site proposed for development has low paleontological sensitivity as shown on Figure OS-8, no direct mitigation is required unless a fossil is encountered during site development. Should a fossil be encountered, the County Geologist shall be notified and a paleontologist shall be retained by the Project proponent. The paleontologist shall document the extent and potential significance of the paleontological resources on the site and establish appropriate mitigation measures for further site development.

- OS 19.8 Whenever existing information indicates that a site proposed for development has undetermined paleontological sensitivity as shown on Figure OS-8, a report shall be filed with the County Geologist documenting the extent and potential significance of the paleontological resources on site and identifying mitigation measures for the fossil and for impacts to significant paleontological resources prior to approval of that department.

- OS 19.9 Whenever paleontological resources are found, the County Geologist shall direct them to a facility within Riverside County for their curation, including the Western Science Center in the City of Hemet.

Prior versions of the General Plan required monitoring of High A and High B sensitivities; however, more recent language has been adopted with only the requirement for a PRIMP to be filed with the County Geologist addressing monitoring needs and requirements (OS 19.6).

The *Moreno Valley General Plan* (2006), provides the following requirement for paleontological sensitive areas within the City of Moreno Valley:

Objective 9.7.3 (Conservation Element Programs)

- 7-6 In areas where archaeological or paleontological resources are known or reasonably expected to exist, based upon the citywide survey conducted by the UCR Archaeological Research Unit, incorporate the recommendation and determinations of that report to reduce potential impacts to levels of insignificance.

METHODS

LITERATURE AND MAP REVIEW AND LOCALITY SEARCH

The purpose of the literature review is to determine which geologic units are present within the Project Area and whether fossils have been recovered from those geologic units elsewhere in the region. As geologic units may extend over large geographic areas and contain similar lithologies and fossils, the literature review also includes areas well beyond the Project Area. The literature review included an examination of geologic maps of the Project Area and a review of relevant geological and paleontological literature. The results of this literature review include an overview of the geology of the Project Areas and a discussion of the paleontological sensitivity (or potential) of the geologic units within the Project Area. The County of Riverside also provides a paleontological resource sensitivity map for the entire county (RCLIS). This map was consulted by MCC staff on May 11, 2018.

The purpose of a locality search is to establish the status and extent of previously recorded paleontological resources within and adjacent to the study area for a given Project. On May 1, 2018, a locality search was conducted by the Western Science Center, in Hemet, California (See Appendix B). This search identified any vertebrate localities in the Western Science Center's records that exist near the Project Area in the same or similar deposits.

PALEONTOLOGICAL RESOURCES SURVEY METHODS

The purpose of a field survey is to note the sediments in the Project Area, relocate any known paleontological localities, and identify any unrecorded paleontological resources exposed on the surface of the Project Area. The survey stage is important in a Project's environmental assessment phase to verify the exact location of each identified paleontological resource, the condition or integrity of the resource, and provides invaluable information on the type of sediment present within the Project Area. In this way, impacts to existing, unrecorded paleontological material may be mitigated prior to the beginning of ground-disturbing activities and portions of the Project Area that are more likely to contain paleontological resources may be identified. The results of the field survey also contribute to the assessment of paleontological sensitivity. On April 19, 2018, MCC Archaeologist and Paleontologist, Judy Cardoza, conducted a pedestrian survey of the Project Area. This work was directly supervised by Jennifer Kelly, M.S., a Riverside County Qualified Paleontologist and MCC Principal Investigator for Paleontology. Special attention was paid to any graded areas and rodent burrows that offered a better view of the underlying sediment.

RESULTS

The record search results from the Western Science Center (Radford 2018, Appendix B) do not indicate any fossils have been found directly within the Project Area, nor within 1 mile of the Project. However, there are numerous fossil localities within 5 and 10 miles that presented significant paleontological finds within similar alluvial mapped units (Radford 2018). These localities include the Aldi Distribution Center Project in Moreno Valley and the El Casco Project in San Timoteo Canyon. Both collections include thousands of Pleistocene fossil specimens (Radford 2018). The RCLIS map indicates that the Project Area has a high potential (High B) to produce paleontological resources during ground disturbing activities (Figure 5).

During fieldwork, survey conditions were fair with average ground visibility (50%) throughout most of the 4.54-acre Project Area. Overgrowth of foxtail grasses and other weeds covered most of the Project Area, and one walnut tree was observed along the southern limits of the Project Area. The entire Project Area has been disturbed by prior agricultural activities. Concrete berms and drainages of unknown age were observed within the Project boundaries. A visual observation of the sediment aligns with the geologic mapping of Quaternary alluvial sediments with metavolcanic pebble types (Figures 6 through 9). This geologic unit has been designated by the RCLIS as High B sensitivity for its high potential to produce paleontological resources.

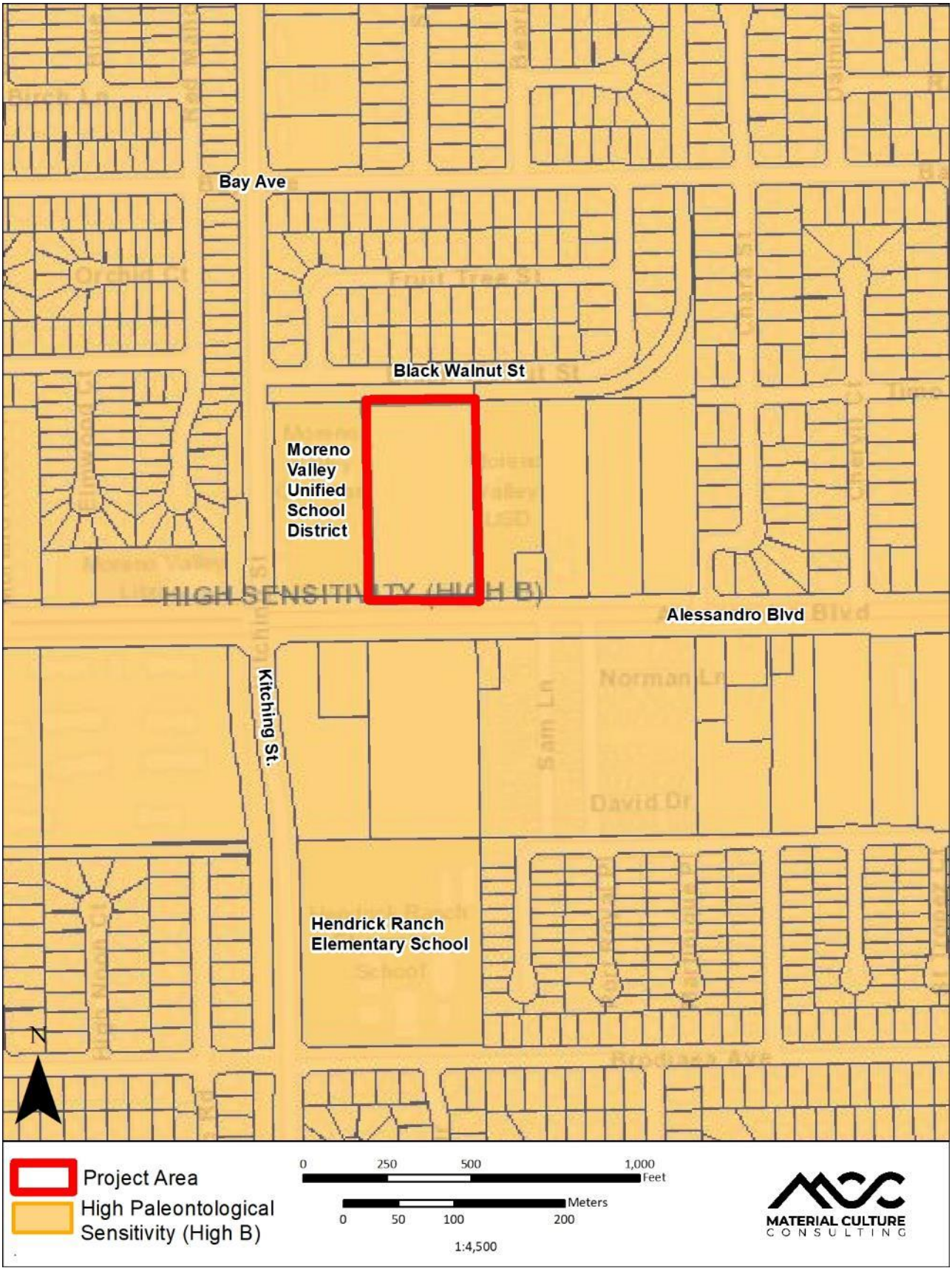


Figure 5. Paleontological Sensitivity (from RCLIS, orange indicates High B Sensitivity)

Figure 6. Project Overview from Southwest corner (View North)

Figure 7. Project Overview from Northwest corner (View Southeast)

Figure 8. Project Overview from Southeast corner (View Northwest)

Figure 9. Representative photo of sediments within Project Area (View North)

SUMMARY AND RECOMMENDATIONS

MCC conducted a Phase I paleontological resource assessment of the Project Area that included a fossil locality records search and an intensive pedestrian survey covering all 4.54 acres. No significant paleontological resources were identified within the direct Project Area during the locality search or field survey. However, the Western Science Center notes that significant fossils have been found within similar alluvial mapped units within 5 to 10 miles from the Project, and therefore recommends a monitoring plan be created in order to ensure that no impacts to potentially significant paleontological resources occur.

RECOMMENDED MITIGATION

To mitigate potential significant impacts to nonrenewable paleontological resources, as required by local and State regulations, MCC recommends the following procedures:

- A trained and qualified paleontological monitor should perform full-time monitoring of any excavations on the Project that have the potential to impact paleontological resources. The County of Riverside generally recommends that areas designated with High B sensitivity be monitored for excavations greater than 4 feet in depth. The monitor will have the ability to redirect construction activities to ensure avoidance of significant impacts to paleontological resources.

- The Project paleontologist may re-evaluate the necessity for paleontological monitoring after 50% or greater of the excavations have been completed.

- Any potentially significant fossils observed shall be collected and recorded in conjunction with best management practices and SVP professional standards.

- Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

- A report documenting the results of any monitoring, including any salvage activities and the significance of any fossils, will be prepared and submitted to the appropriate City and County personnel.

CERTIFICATION: I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief.

Date: May 24, 2018

Signature: _____

Name: Jennifer Kelly, MSc., Geology
Riverside County Qualified Paleontologist

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Appendix A:
Qualifications

Jennifer Kelly, M.Sc.
Senior Paleontologist and Principal Investigator

MATERIAL CULTURE
CONSULTING

Jennifer Kelly has experience in all aspects of paleontology. She has extensive experience with monitoring, salvage, fieldwork, project management, and report writing, as well as volunteer experience from the La Brea Tar Pits/Page Museum and the Cooper Center of Orange County (Paleontology department) and field experience as a Staff Geologist for Leighton Geotechnical. Her expertise is Geology, and she has her M.S. in Geological Sciences, emphasis in Geochemistry.

Jennifer has taught lab courses in paleontology and general geology, and also assisted with field mapping classes. Jennifer is HAZWOPER 40-hour certified and a registered Orange County paleontologist. She has co-authored more than 60 paleontological compliance documents, including PRMPs, EIR, EIS, PEA, final monitoring reports, survey reports, and other compliance documents, in compliance with NEPA, CEQA, Caltrans and city and county laws, ordinances, regulations, and statutes.

Education

2012 M.Sc. in Geology, California State University, Long Beach, California
2005 B.S., Geology (preliminary work for entry to M.S. Geology Program), California State University, Long Beach
2004 B.A., Theater Arts, California State University, Long Beach

Certifications and Training

- 40 Hour Certification for HAZWOPER training under 29 CFR 1910. 120, CA (2013 – 2014)
- Orange County Certified Paleontologist
- San Diego County Certified Paleontologist

Utility Sector Experience

Assistant PM/Research Specialist, Tehachapi Renewable Transmission Project (TRTP), Southern California Edison (SCE), Kern County, Los Angeles County, San Bernardino County. Kelly conducted and led surveys along this project's right of way. She additionally was in charge of scheduling monitoring crews during grading in areas of paleontological sensitivity, managing and reviewing log sheets, and tracking data that is incorporated to final reports. Ms. Kelly played a valuable role with scheduling for the project's needs. She has monitored, surveyed, and reported on all paleontological facets of this project as the Lead Paleontological Monitor for segment 3B and 4-11. She has co-authored more than 10 of the compliance reports for this project. She has also performed monitoring on every segment of this Project.

Assistant PM/Research Specialist, SCE, Valley South Subtransmission Line Project, Riverside County, California. Kelly assisted with scheduling and oversight for coordination of all surveying, preparation of compliance and environmental documentation for this project, including three proposed alternatives,

and co-wrote the final PEA and survey reports, utilizing CEQA and Riverside County paleontological guidelines.

Assistant PM/Research Specialist, SCE, San Joaquin Cross Valley Loop Project, Tulare County, California. Kelly assisted with coordination of all surveying, preparation of compliance and environmental documentation for this project, and co-authored the final Paleontological Monitoring Plan for this project.

Assistant PM/Research Specialist, SCE, Devore Substation Project, San Bernardino County, California. Kelly assisted with preparation of compliance and environmental documentation including a paleontological inventory and geological map research for this project.

Assistant PM/Research Specialist, SCE, Horsetown Substation Project, Riverside County, California. Kelly assisted with preparation of compliance and environmental documentation including a paleontological inventory and geological map research for this project.

Paleontological Field Technician, El Casco System-Transmission Line, SCE, throughout Riverside County. Kelly performed paleontological monitoring. Her duties included salvaging small and large fossils, screen washing and sorting fossils. She aided in the processing of microfossils collected from bulk sampling of fossil bearing sediment, and documenting stratigraphic locations of fossil bearing units. This project was in compliance with both CEQA and the CPUC.

Assistant PM/Research Specialist, ***South of Kramer Project, SCE, Hesperia to Barstow, San Bernardino, County***. Kelly assisted in overseeing portions of project management and compliance surveying, which included surveying from Hesperia to Barstow, CA for a Proponent's Environmental Assessment (PEA). All portions of the Proposed Project were located within San Bernardino County, California. This project is still active and survey results are being finalized. Kelly co-authored the final survey report for this Project. A BLM Permit was authorized for the survey.

Assistant PM/Research Specialist, ***OC Access Road Grading, SCE, Orange and Riverside County.*** Kelly assisted in documentation for the cultural resources portion, which include information regarding the location and condition of archaeological and paleontological sites recorded at or near the access roads, and recommends impact avoidance measures for future years in implementing the Protocol for 73 known archaeological sites. This required extensive coordination with Orange County Fire Authority grading department, SCE's Operations and Maintenance (O&M), and Orange County Parks. Trimble units were used for the documentation before and after grading of access roads. Communication played a key role when strategizing which locations were being graded where and when. The company came in under budget because of Kelly's efficiency and ability to coordinate and schedule.

Assistant PM/Research Specialist, West of Devers Transmission Line Project, SCE, Riverside County, California. Kelly assisted with all project management and paleontological related services. This included proper BLM authorization and permitting to conduct surveying and a research design for field reconnaissance related to PEA, EIS/EIR documentation for the proposed transmission line. She assisted with managing documentation with laws relating to paleontological resources, among which are CEQA and NEPA compliance.

Assistant PM/Research Specialist, Grid Reliability and Maintenance for Seawolf, Thresher, and Argonaut 12 kV Distribution Lines, SCE, City of Temecula, Riverside County, California.
Kelly assisted with preparation of compliance and environmental documentation including co-authoring the final paleontological report for this project in Riverside County. This report was prepared under CEQA and Riverside County guidelines.

Assistant PM/Research Specialist, Pacific Gas and Electric (PG&E), Line 300A/MP 147.7 and 180.8 Projects, San Bernardino County, California. Kelly assisted in the preparation of mitigation recommendations and a paleontological inventory report for this project. She also assisted with and scheduled planned surveys on BLM and United States Marine Corps lands.

Assistant PM/Research Specialist, PG&E, Jefferson to Stanford No. 2 60 kV Feasibility Project, San Mateo County, California. Kelly assisted with the preparation of the paleontological resources review and paleontological inventory report (PIR) and Proponent's Environmental Assessment (PEA) for this project. Several potential routes were assessed for this project, and the feasibility and paleontological potential was determined for this project. The report and PIR were prepared according to CEQA guidelines.

Assistant PM/Research Specialist, PG&E, Line 107/131 Projects, Alameda County, California. Kelly assisted with preparation of mitigation recommendations and a paleontological inventory report for this project. She also assisted with and scheduled planned surveys of proposed pipeline locations.

Assistant PM/Research Specialist, Laguna Niguel Reliability Project, SDG&E, Laguna Niguel, Orange County. Kelly performed initial research for this Project and co-authored the final report on the monitoring efforts for this project in the Capistrano Formation.

Assistant PM/Research Specialist, ***Camp Pendleton Project, SDG&E, throughout San Diego and Orange Counties.*** Kelly provided on-call paleontological services for this project. She was a key facet in report production and research which enabled her firm to perform all survey and monitoring work required on Camp Pendleton for CEQA/NEPA check list assessments requested from SDG&E. Kelly was cleared from the Department of Defense in order to conduct work on the base. Site assessments and monitoring include all work related to: future location of power poles and towers, water control features, trenching and subsurface excavations, access roads, grading impacts to develop substations and other facilities, work pads, staging yards, and gas pipelines.

Assistant PM/Research Specialist, SDG&E Wind Interconnection Project (WIP), San Diego County, California. Kelly co-authored the paleontological mitigation portion of the Environmental Impact Report (EIR) for this project, utilizing both San Diego County and CEQA guidelines for paleontological resources.

Assistant PM/Research Specialist, LADWP-Scattergood Project, County of Los Angeles.
Kelly provided on-call paleontological support for this project. She assisted with all project aspects associated to paleontology. She co-authored a paleontological mitigation monitoring plan and assisted in scheduling the monitoring the Scattergood Olympic Line 1 Project, completed the final mitigation document for trench exploration, and performed extensive monitoring for the project.

Transportation Sector Experience

Assistant PM/Research Specialist, Paleontological Mitigation Plans (PMP) for Caltrans Cherry/Citrus Ave I-10 interchange Project — PCR/Caltrans, San Bernardino, California. Kelly conducted all aspects of surveying, and literature searches for both projects.

Water Sector Experience

Assistant PM/Research Specialist, Cadiz Ground Water Project, ESA, San Bernardino County, California. Kelly conducted all research and data collection for the Cadiz Groundwater Conservation and

Storage Project for completion of a DEIR section on paleontological resources. The project included the pipeline corridor but not the Well Field Area and Spreading Basins. Based on the results of the analysis, mitigation measures were developed and are designed to reduce potential adverse impacts to paleontological resources as a result of proposed Project construction to a less than significant level. Only one Project alternative was analyzed for impacts on paleontological resources. The paleontological analysis for the Cadiz Project is a requirement of the California Environmental Quality Act (CEQA).

Private Development Sector Experience

Assistant PM/Research Specialist, Holy Sepulchre Cemetery Expansion Project, Diocese of Orange, Santa Ana, Orange County, California. Kelly assisted with scheduling monitoring for this project, performed all project-related research, and was the co-author for the final report. The project consisted of grading and leveling several new areas for expansion of the Holy Sepulchre Cemetery, including portions that lie in paleontologically sensitive rock formations with the potential to produce fossils.

Assistant PM/Research Specialist, UC Irvine Alumni Center Project, Irvine, Orange County, California. Kelly performed all monitoring scheduling and coordination duties, as well as research and writing for the final report and the initial monitoring guidelines. This project was a high-visibility construction project for a new alumni center on the grounds of UC Irvine, in a paleontologically sensitive area.

Assistant PM/Research Specialist, Peters Canyon County Park Restrooms Project, Orange County, California. Kelly performed all paleontological monitoring scheduling and coordination duties, as well as research and writing for the final paleontological resources letter report. This project involved the leveling of a pad and significant trenching through paleontologically sensitive soils in order to install a new restroom at the northern end of this park.

Assistant PM/Research Specialist, UHS Temecula Medical Center, Tuner Construction, Temecula, Riverside County, California. Kelly was in charge of day to day scheduling, conducted occasional monitoring duties and part of the writing process for the final report.

Renewable Energy Sector Experience

Assistant PM/Research Specialist, Ocotillo Wind Express Project, ASPEN, Imperial County, California. Kelly was responsible for managing and collecting all field forms and data that was electronically mailed daily, and incorporating these forms in the final DEIR/EIS Report. She conducted all technical research and compiled both geological and compliance documentation into the final report that was then incorporated into the EIR/EIS.

Assistant PM/Research Specialist, Manzana Wind Express Project, Kern County, California. Kelly assisted in writing the Paleontological Mitigation Monitoring Resource Plan, which allowed her to develop a key role in presenting environmental training programs to construction workers and other environmental compliance monitors. She co-authored the final paleontological monitoring report. The Project's construction consisted of the installation of 107 to 300 wind energy turbines, aligned along approximately 26 rows, on the 6,275-acre proposed site. The Manzana Wind Energy Project site was found to have the potential for scientifically significant paleontological resources that could be impacted by construction-related ground disturbance. She co-authored the final paleontological mitigation report in compliance with CEQA and Kern County guidelines.

Assistant PM/Research Specialist, Pacific Wind Express Project, Kern County, California. Kelly assisted

in writing the Paleontological Mitigation Monitoring Resource Plan, which allowed her to develop a key role in presenting environmental training programs to construction workers and other environmental compliance monitors. She co-authored the final paleontological mitigation report.

Appendix B:
Western Science Center
Records Search Results

WESTERN SCIENCE CENTER

May 1, 2018

Material Culture Consulting, Inc.
Sonia Sifuentes, M.Sc., RPA
2701-B North Towne Ave.
Pomona, CA 91767

Dear Ms. Sifuentes,

This letter presents the results of a record search conducted for the Skilled Nursing Facility Solar Project in the city of Moreno Valley in Riverside County, California. The project site is located east of Kitching Street, north of Alessandro Boulevard, in section 8 on the Sunnymead, CA USGS 7.5 minute quadrangle.

The geologic units underlying this project are mapped entirely as Quaternary alluvium and marine deposits dating from the Pliocene to Holocene period (Jennings, Strand & Rogers, 1977). Alluvium units dating from the Pliocene and Pleistocene are considered to be of high paleontological sensitivity. The Western Science Center does not have localities within the project area or within a 1 mile radius, but does have numerous fossil localities within 5 and 10 miles that presented significant paleontological finds within similar alluvial mapped units including those associated with the Aldi Distribution Center Project in Moreno Valley and the El Casco Project in San Timoteo Canyon. Combined, these collections resulted in thousands of Pleistocene fossil specimens.

Any fossils recovered from the project area would be scientifically significant. Excavation activity associated with development of the project area would impact the paleontologically sensitive Pleistocene units and it is the recommendation of the Western Science Center that a paleontological resource mitigation program be put in place to monitor, salvage, and curate any recovered fossils associated with the current study area.

If you have any questions, or would like further information about the Aldi Distribution Center Project or El Casco Project Collections, please feel free to contact me at dradford@westerncentermuseum.org.

Sincerely,

Darla Radford
Collections Manager

2345 Searl Parkway ♦ Hemet, CA 92543 ♦ phone 951.791.0033 ♦ fax 951.791.0032 ♦ WesternScienceCenter.org

FINAL-DESIGN GEOTECHNICAL EXPLORATION
PROPOSED SKILLED NURSING FACILITY
25622 ALESSANDRO BOULEVARD
MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA
APN 479-230-018-6

Prepared for:

T & C INTERNATIONAL HEALTHCARE, INC.
1961 Scenic Ridge Drive
Chino Hills, CA 91709-1004

Project No. 11888.001

April 5, 2018

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Thursday, April 05, 2018

Project No. 11888.001

T & C International Healthcare, Inc.
1961 Scenic Ridge Drive
Chino Hills, CA 91709-1004

Attention: Mr. Zanwei Chen
President

Subject: Final Design-Phase Geotechnical Exploration
Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California
APN 479-230-018-6

In accordance with our December 28, 2017 proposal authorized on January 3, 2018, Leighton Consulting, Inc. is pleased to present results of our final-design geotechnical exploration for a proposed skilled nursing facility to be constructed at this undeveloped rectangular parcel located north of Alessandro Boulevard easterly of Kitching Street in Moreno Valley, Riverside County, California. This report completely replaces our February 14, 2018 report for this project based on review of the conceptual grading plan.

This site is relatively flat, so there are no slope stability issues. Also, this site is **not** located within a currently designated Alquist-Priolo Earthquake Fault Zone. However, as is the case for most of Southern California, strong ground shaking has and will occur at this site. Groundwater was encountered in three of our deeper borings at depths of 18- to 19-feet below existing grade on January 15, 2018. Encountered site soils consisted predominantly of dark-reddish-brown silty sands to clayey sands to the maximum depths explored in borings (26½ feet). We also pushed seven Cone Penetrometer Tests (CPTs) across the site, with the deepest hitting tip refusal (640 tons-per-square-foot) at a depth of 39 feet. These CPTs predominantly showed "very dense/stiff soils" at depths greater-than (>) 10 feet. Granitic outcrops are located approximately 2,000-feet due east of this site, so it is hypothesized that this very dense reddish-brown clayey sand is likely a residual soil, or at least older alluvium at depths greater-than 2½- to 5-feet below the existing disked ground surface. These deposits are also likely Pleistocene age. Based on age, density and clay content, this residual

soil at depths greater-than (>) 10 feet below the existing ground surface have **low** liquefaction potential.

There were concrete and other rubble piles across this site. This rubble cannot be used in compacted fill without pulverizing and removing organic or otherwise unsuitable material. These rubble piles should either be completely disposed of off-site, or pulverized and screened for use in new engineered compacted fill. A shallow bulk soil sample was also found to have an Expansion Index (EI) of 30, which is low but still considered expansive. Some shallow sands on site were collapsible (moisture sensitive) and compressible. Generally, throughout this site, much of the area was recently disked for weed control. Although not specifically encountered, there is a potential for encountering buried manure in past agricultural areas in Moreno Valley. Therefore, organic soils (>2% organic content), if encountered, should not be used within engineered fill for structure support.

Overexcavation and recompaction of the upper 5-feet of expansive, compressible and collapsible (non-organic) soils is recommended within building pads, with these clays and sands blended as much as possible. Conventional spread footings founded on newly compacted fill are expected to be able to support one- to two-story structures on this site without any extraordinary geotechnical or structural remediation/mitigation.

We appreciate the opportunity to be of additional service to T & C. If you have any questions or if we can be of further service, then please contact us at your convenience at (951) 296-0530 or ***866-LEIGHTON***; specifically at the phone extensions and/or e-mail addresses listed below.

Respectfully submitted,

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1.0 INTRODUCTION

1.1 Site Location and Description

As depicted on Figure 1, *Vicinity Map*, this undeveloped rectangular parcel is Riverside County APN 479-230-018-6, fronted north of Alessandro Boulevard easterly of Kitching Street in Moreno Valley, Riverside County, California. Shown in more detail on Figure 2, *Exploration Location Map*, this site is a 4.54-acre rectangular parcel with plan dimension of roughly 600-feet north-south by 330-feet along Alessandro Boulevard; which is relatively flat and undeveloped. Site topography slopes gently down to the southwest, ranging from elevation 1570 feet at a "trash" (rubble) pile along the north property line, to elevation 1,563 feet in the southwestern portion of the site; as 7 feet of topographic relief across this site including rubble piles. There is a concrete-lined stormwater channel along the north property line, which appears to limit site access to solely Alessandro Boulevard on the south. There too is a short row of trees and overhead power lines along Alessandro Boulevard. The Moreno Valley Unified School District's administration building is located east of this site, and there is a charter school campus to the west.

1.2 Proposed Skilled Nursing Center

We understand that this site is to be developed as a skilled nursing facility as depicted on Gregg Maedo Architects' December 22, 2017 Sheet SD-1 titled "*Moreno Valley Skilled Nursing Facility*," prepared for T&C International Health, Inc. (reproduced as the base map for Figure 2). Three single-story Type V-A skilled nursing buildings, with rectangular footprints, are proposed with connecting hallways. Structure footprint areas are tabulated below:

Table 1. Proposed Skilled Nursing Buildings

Building	Footprint (square feet)
Building 100: Administration	16,970
Building 200: 60 private beds	33,440
Building 300: 56 sub-acute care/semi-private beds	18,340
TOTAL SKILLED NURSING:	**68,750**

*For an OSHPD 1 or 4 building in accordance with Section 1803A.3.1 of the 2016 CBC.

These buildings will have concrete slabs-on-grade, and will consist of wood and/or cold-formed-steel stud construction. Column and wall loads were

unavailable at the time we prepared this report, but column loads are not expected to exceed 100-kips since no large open interior spaces are proposed.

In addition to these three buildings, there will be asphalt pavements constructed around the site perimeter for fire lanes, driveways and parking for 113 autos. Conventional asphalt paving will be for auto parking and occasional three-axle trash trucks. Based on the March 15, 2018 "*Conceptual Grading & Drainage Plan*" by W&W Land Design Consultants, Inc., finish floor (FF) elevation for all three buildings will be at 1,566 feet (NAVD88). Finish grades will be within 4 feet of existing grades (excluding rubble pile removal).

1.3 Purpose and Scope of Exploration

Purpose of our exploration was to: (1) evaluate geologic and geotechnical conditions at this proposed skilled nursing facility site, (2) identify significant geotechnical or geologic issues that would impact this proposed building, and (3) provide geotechnical recommendations for design and construction of this proposed skilled nursing facility. This report completely replaces our February 14, 2018 report for this project based on review of the conceptual grading plan. In accordance with our December 28, 2017 proposal authorized on January 3, 2018, scope of our exploration included the following:

- **Research**: We reviewed readily available geotechnical literature, reports and aerial photographs relevant to this site. Pertinent geotechnical documents are referenced at the end of this report text.

- **Field Exploration**: First, on January 15, 2018, ten hollow-stem-auger borings were drilled, logged and sampled to depths of 5- to 26½-feet across this site. After sampling and logging, all borings were immediately backfilled with soil cuttings, except for Borings P-1, P-2 and P-3, where infiltration tests were performed. Then, on January 22, 2018, seven Cone Penetrometer Tests (CPT-1 through CPT-7) were pushed to depths ranging from 25- to 39-feet (tip refusal). Approximate boring and CPT locations are depicted on Figure 2, *Exploration Location Map*. A description of our field exploration, boring logs and CPT soundings are presented in Appendix A, *Field Exploration*.

- **Geotechnical Laboratory Testing**: Geotechnical laboratory tests were conducted on selected relatively undisturbed and bulk soil samples obtained from our borings. This laboratory testing program was designed to evaluate engineering characteristics of site soils. A description of test procedures and results are presented in Appendix B, *Geotechnical Laboratory Testing*.

- **Engineering and Geologic Analysis**: Data obtained from field explorations and geotechnical laboratory testing was evaluated and analyzed to develop geotechnical conclusions and provide recommendations in accordance with the California Geological Survey (CGS) Note 48 (October 2013 version). Our subsurface interpretations are provided on Figures 3a and 3b, *Geotechnical Cross Sections A-A' and B-B'*. Liquefaction calculations are presented in Appendix C, *Liquefaction Analysis*.

- **Report Preparation**: Results of our geologic hazards review and geotechnical exploration have been summarized in this report, presenting our findings, conclusions and preliminary geotechnical design recommendations.

This report does not address the potential for encountering hazardous materials in site soils nor groundwater. Important information about limitations of geotechnical reports in general, is presented in Appendix D, *GBA's Important Information About This Geotechnical-Engineering Report*.

2.0 FINDINGS

2.1 Regional Geologic Setting

This site is located within the Peninsular Ranges Geomorphic Province of California, which is characterized by northwest trending elongated mountain ranges and valleys. The Peninsular Ranges Geomorphic Province is divided into three major fault-bounded tectonic blocks, which consist of (from west to east): Santa Ana, Perris and San Jacinto Blocks. This site is situated near the north-eastern portion of the relatively stable Perris Block.

The Perris Block is approximately 20 miles by 50 miles in extent, bounded by the San Jacinto Fault Zone to the east, the poorly defined boundary of the Temecula Basin to the southeast, the Elsinore Fault Zone to the southwest, and the Cucamonga Fault Zone to the northwest. The Perris Block has had a complex tectonic history in response to movement on the Elsinore and San Jacinto Fault Zones. Thin sedimentary and volcanic materials locally mantle the crystalline bedrock. Alluvial and colluvial deposits fill the lower valley areas.

USGS (2006) regionally mapped geologic units at and around this site, including very old alluvial-fan deposits (early Pleistocene aged) with granitic outcrops 2,000 feet to the east at Lasselle Street; as depicted on Figure 4, *Regional Geology Map*. Dense reddish-brown silty and clayey sands at this site are

postulated to be residual soils associated with granitic outcrops in the area; if not older indurated alluvium.

2.2 Subsurface Soil Conditions

Based on results of our research and subsurface exploration, and as depicted on Figures 3a and 3b in cross-section view, site soils encountered to the depths explored (39 feet) consist of the following:

- **Rubble Fill (Afu)**: In January 2018, there was dumped rubble on this site including large demolished concrete slabs. These rubble piles were roughly mapped on Figure 2 as isolated areas of "Afu." Otherwise, fill soils were not specifically encountered or identified in our subsurface explorations. A photo of one of these rubble piles is shown below:

Typical rubble pile on site, January 2018.

- **Native Soils (Qvof)**: At depths greater-than (>) 2½- to 5-feet below the existing disked ground surface, older alluvial fan deposits (and possibly residual soils from granitic outcrop in-situ weathering) was encountered in all ten of our borings and all seven CPTs to the depths explored (39 feet). There was some variation in silt and clay content, with percent fines ranging from 44- to 64-percent. In-situ densities within the depth range from 5- to 24-feet ranged from 107- to 127-pounds-per-cubic-foot (pcf). Tip refusal (640 tons-per-square-foot; tsf) was reached at a depth of 39 feet in our deepest CPT and tip resistance in excess of 160 tsf (equivalent N-value ≥30) was measured at depths greater-than (>) 24-feet. A shallow bulk soil sample was found to have an Expansion Index (EI) of 30, which is considered as low expansion potential. Other shallow sands on site were collapsible (moisture sensitive) and compressible. Generally, throughout this site, much of the area was previously used for agriculture and currently disked for weed control. Although not specifically encountered in our borings, there is a

potential for encountering buried manure in past agricultural areas in Moreno Valley. Collapse measured in consolidations tests was as follows:

Table 2. Collapse Test Results

Boring	Sample Depth (feet)	Soil Description	Collapse (percent)*
LB-2	2½	SILTY SAND (SM)	**-4.72**
	5		-2.38
LB-3	10	SILTY SAND (SM)	-1.63
LB-4	2½	SILTY SAND (SM)	**-5.03**
	5		**-7.22**
LB-6	5	SILTY SAND (SM)	-1.18

*negative indicates collapse, while positive indicates swell

More detailed descriptions of subsurface soils encountered are presented on our boring logs in Appendix A.

2.3 Groundwater

Groundwater was locally encountered in our three deeper borings drilled on January 15, 2018 as follows:

Table 3. Encountered Depth to Groundwater

Boring	Surface Elevation* (feet)	Groundwater Depth (feet)	Groundwater Elevation (feet)
LB-1	1,564	18	1,546
LB-2	1,565	18½	1,546½
LB-3	1,566	17½	1,548½

*Based on the February 2, 2018 site topographic survey by W&W Land Design Consultants, Inc.

Significant seasonal and climatic groundwater level fluctuation is likely. However, note that there is a stormwater channel along the north (upstream) property line. Since no deep excavations are proposed for this project, groundwater is not expected to pose a constraint to the project as currently planned.

2.4 Faulting and Seismicity

Seismic hazards in Southern California could include fault rupture and strong ground shaking. There are no active or potentially active faults known to cross or project into this project site, and this site is not located within a currently-designated Alquist-Priolo Earthquake Fault Zone (Bryant and Hart, 2007) or Riverside County Fault Hazard Zone (Riverside, 2018). Therefore, potential for surface fault rupture at the site is considered very low. However, several active

and potentially active faults are mapped within close proximity to this site. Figure 5, *Regional Fault and Historical Seismicity Map*, depicts proximity of known active and potentially active faults within the region. As is the case for most of Southern California, strong ground shaking has and will occur at this site.

2.4.1 Faulting: As regionally mapped on Figure 5, closest active fault is the San Jacinto Fault to the northeast, and the San Andreas Fault, further to the northeast. Both are highly active faults with documented historic and Holocene strike-slip movement.

2.4.2 Seismicity (Ground Shaking): Principal seismic hazard that could affect the site is ground shaking resulting from an earthquake occurring along several major active or potentially active faults in southern California. Plotted on Figure 5, *Regional Fault and Historic Seismicity Map*, are epicenters of historic earthquakes (1769 through 2014) in and around Moreno Valley, color coded as a function of magnitude.

We are unaware of any earthquake damage reports specifically for this site and adjacent properties.

2.5 Secondary Seismic Hazards

In general, secondary seismic hazards for sites in the region could include soil liquefaction and earthquake-induced settlement. This site and vicinity are relatively flat, so slope instability and lateral spreading risk are **not** a site-specific concern. Potential for liquefaction and seismically-induced differential settlement are discussed below.

2.5.1 Liquefaction Potential: Liquefaction is the loss of soil strength due to a buildup of excess pore-water pressure during strong and long-duration ground shaking. Liquefaction is associated primarily with loose (low density), saturated, relatively uniform fine- to medium-grained, clean cohesionless soils. As shaking action of an earthquake progresses, soil granules are rearranged and the soil densifies within a short period. This rapid densification of soil results in a buildup of pore-water pressure. When the pore-water pressure approaches the total overburden pressure, soil shear strength reduces abruptly and temporarily behaves similar to a fluid. For liquefaction to occur there must be:

(1) loose, clean granular soils,
(2) shallow groundwater, **and**
(3) strong, long-duration ground shaking

Riverside County maps this site as having a “low” liquefaction susceptibility as presented on Figure 6, *Liquefaction Map*. However, the City of Moreno Valley

General Plan Environmental Impact Report shows this site and vicinity as not being liquefiable; see:

http://www.moreno-valley.ca.us/city_hall/general-plan/06gpfinal/ieir/5_6-geo-soils.pdf

Liquefaction calculations and assumptions are presented in Appendix C and summarized as follows:

- **Groundwater**: Free groundwater was encountered on the order of 18 feet below existing grade on January 15, 2018. We conservatively modeled groundwater rising to within 10 feet of the surface during a large local earthquake.
- **Peak Horizontal Ground Acceleration (PGA_M)**: From the United States Geological Survey (USGS) web-based seismic hazard maps for California, PGA_M was 0.649g.
- **Soils Below Groundwater**: Residual soils at depths of 24-feet or more below existing grade were very dense, with Cone Penetrometer Test (CPT) tip resistance in-excess-of (≥) 160 tsf (interpreted N>30) where pushed on January 22, 2018 at this site. Potentially liquefiable silty and clayey sands exist in thin strata between depths of 10- and 24-feet.
- **Geology**: USGS Open-File Report 01-450 maps this site as Pleistocene deposits ("Qvof"). Undisturbed Pleistocene deposits are deemed non-liquefiable.

Based on this model, there remains a potential for some thin sand strata to liquefy, but this does not result in significant surface manifestations nor settlement in excess of ½-inch.

2.5.2 Seismically-Induced Settlement: Seismically induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater). During a strong seismic event, seismically induced settlement can occur within loose to moderately dense sandy soil due to reduction in volume during and shortly after an earthquake event. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. It is differential settlement that is damaging, not total settlement.

Based on site-specific geomorphology, alluvium is dense and uniform across this generally level site. Shallow soils are recommended to be recompacted. Therefore, any dynamically-induced settlement should be negligible and uniform across this site, so potentially-damaging differential settlement should be relatively small.

2.5.3 Lateral Spreading: Lateral spreading is highly unlikely to occur at this site due to the lack of liquefaction potential within 10-feet of the surface and lack of significant topographic changes at and around this site.

2.5.4 Slope Instability and Landslides: Seismically-induced landslides and other slope failures are common occurrences during or soon after earthquakes. However, as depicted on Figure 6, *Liquefaction Map*, this site and vicinity are relatively flat without slopes. Seismically-induced landslide activity can be **ruled out** for this site due to the lack of slopes.

2.5.5 Earthquake-Induced Seiches and Tsunamis: Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Tsunamis are predominately ocean waves generated by undersea large magnitude fault displacement or major ground movement.

Based on separation of the site from any body of water, seiche impact at this site is highly unlikely. Also, due to site elevation at 1,563-feet above mean sea level and the inland location of this site relative to the Pacific Ocean (see California Geological Survey, 2009) tsunami risks at this site is **nil**.

2.5.6 Earthquake-Induced Inundation: This inundation hazard is flooding caused by failure of dams or other water-retaining structures as a result of earthquakes. Perris Dam is the closest dam to this site, and was just improved to mitigate liquefaction-induced failure. More importantly, this dam is downstream from this site; and if failed, would flood the valley to the southwest away from this site. The probability of this dam or any other dam inundating this site is extremely low.

2.6 Valley Subsidence

As regionally mapped on Figure 7, *Subsidence Map*, in accordance with County of Riverside Geologic Hazard Maps (Riverside, 2003), the site is located within an area susceptible to subsidence. However, this site is near the center of the valley rather than at the edge. Also, based on results of our subsurface evaluation and lack of evidence of differential subsidence and associated ground fissuring, we consider the potential for differential subsidence and ground fissuring on this site to be very low.

2.7 Storm-Induced Flood Hazard

As depicted on Figure 8, *Flood Hazard Zone Map*, this site is not located near or within a “100-year” or “500-year” flood zone as defined by the Federal Emergency Management Agency’s (FEMA’s) Flood Insurance Rate Map (FIRM).

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Findings and Conclusions Summary

This site is relatively flat, so there are **no** slope stability issues. Also, this site is **not** located within a currently designated Alquist-Priolo Earthquake Fault Zone or Riverside County Fault Hazard Zone. However, as is the case for most of Southern California, strong ground shaking has and will occur at this site. Free groundwater was encountered in three of our deeper borings at depths of 18- to 19-feet below existing grade on January 15, 2018, and encountered site soils did consist predominantly of dark-reddish-brown clayey sands to the maximum depths explored in borings (26½ feet). Granitic outcrops are located approximately 2,000-feet due east of this site, so it is hypothesized that this very dense reddish-brown clayey sand could be a residual soil, or at least older alluvium at depths greater-than 2½- to 5-feet below the existing disked surface. We also pushed seven Cone Penetrometer Tests (CPT) across the site, with the deepest hitting tip refusal (640 tons-per-square-foot) at a depth of 39 feet. These CPTs predominantly showed "very dense/stiff soils" at depths greater-than (>) 10 feet. Based on clay content and density, this residual soil at depths greater-than (>) 10 feet below the existing ground surface have low liquefaction potential.

3.2 Recommendations Summary

There were concrete and other rubble piles across this site. This rubble cannot be used in compacted fill without pulverizing and removing organic or otherwise unsuitable material. These rubble piles should either be completely disposed of off-site, or pulverized and screened for use in new engineered compacted fill. A shallow bulk soil sample was also found to have an Expansion Index (EI) of 30, which is low; yet still expansive. Other sands on site were collapsible (moisture sensitive) and compressible. Generally, throughout this site, much of the area was recently disked for weed control. There always is a potential for encountering buried manure in past agricultural areas in Moreno Valley. Therefore, organic soils (>2% organic content) should **not** be reused within engineered fill for structure support.

Clays and sands blended as much as possible. Overexcavation and recompaction of the upper **5-feet** of compressible and collapsible (non-organic) soils is recommended within building pads. This 5-foot overexcavation should be measured below either existing or finish grade, whichever is at a lower elevation. Conventional spread footings founded on newly compacted fill are expected to

be able to support one- to two-story structures on this site without any extraordinary geotechnical or structural remediation/mitigation.

Detailed geotechnical recommendations for this proposed skilled nursing facility are presented in the following subsections.

3.3 Earthwork

Project earthwork is expected to include complete removal of existing rubble fill piles and complete overexcavation and recompaction of undocumented fill and native soils below proposed new building footprints as described in the following subsections. We assume ground floor finish floor (FF) elevation at 1,566 feet (NAVD88). Therefore, overexcavation should extend down to or below elevation 1,561-feet at the north end and 1,558-feet at the south end. More detailed earthwork recommendations are presented in the following subsections:

3.3.1 Earthwork Observation and Testing: Leighton Consulting, Inc. should observe and test all grading and earthwork, to check that the site is properly prepared, the selected fill materials are satisfactory, and that placement and compaction of fills has been performed in accordance with our recommendations and the project specifications. Sufficient notification to us prior to earthwork is essential. A bulk sample of any imported soil or aggregate material should be submitted to the Leighton Consulting, Inc. geotechnical laboratory at least two working days in advance of earth material placement and compaction. Project plans and specifications should incorporate recommendations contained in the text of this report.

Variations in site conditions are possible and may be encountered during construction. To confirm correlation between soil data obtained during our field and laboratory testing and actual subsurface conditions encountered during construction, and to observe conformance with approved plans and specifications, it is essential that we be retained to perform continuous or intermittent review during earthwork, excavation and foundation construction phases. Therefore, conclusions and recommendations presented in this report are contingent upon us performing construction observation services.

3.3.2 Surface Drainage: Water should not be allowed to pond or accumulate anywhere except in detention basins set back at least 25 feet from structures. Pad drainage should be designed to collect and direct surface water away from structures to approved drainage facilities. Hardscape drains should be installed and drain to storm water disposal systems. Drainage patterns and drainpipes approved at the time of fine grading should be maintained throughout the life of proposed structures. Irrigation and/or infiltration should not be allowed for at least 5 feet and 25 feet, respectively, measured

horizontally around the proposed skilled nursing facility building (spread footing) perimeter.

3.3.3 **Site Preparation:** Based on encountered site conditions, we recommend that after removal of rubble and vegetation, all fill and native soils should then be excavated from proposed building footprints, down at least 2 feet below the bottoms of proposed footings or at least **5 feet** below existing grade or finish grade, whichever is deeper; or deeper if required to excavate existing fill soils from within proposed building footprints. This overexcavation bottom should extend horizontally either the thickness of fill below spread-footings or at least 5-feet horizontally beyond the outside edges of proposed perimeter footings, whichever is greater, encompassing the whole new building footprints. Any underground obstructions encountered should be removed. Efforts should be made to locate any existing utility lines. Those lines should be removed or rerouted where interfering with proposed construction. Trees to be removed should be grubbed out and the whole root ball removed.

Areas outside proposed-building footprint limits, planned for asphalt and/or concrete pavement, should be over-excavated to a minimum depth of 24-inches below existing or finish grade, or 18-inches below proposed pavement sections; whichever is deeper.

Resulting removal excavation bottom-surfaces should be observed by Leighton Consulting, Inc., prior to placement of any backfill or new construction. **It is essential that all existing fill soils be excavated from the proposed building footprints, regardless of depth.** After these over-excavations are completed, and prior to fill placement, exposed surfaces should be scarified to a minimum depth of 6 inches, moisture-conditioned to or slightly above optimum moisture content, and recompacted to a minimum 90 percent relative compaction as determined by ASTM D 1557 standard test method (modified Proctor compaction curve).

3.3.4 **Reuse of Concrete and Asphalt in Fill:** Pulverized demolition concrete free of rebar and other materials and demolished asphalt pavement can be pulverized to particles no-larger-than (≤) 3-inches, and mixed with site soils for use in compacted fill. Blended pulverized concrete and asphalt should be mixed with at least 25% soils by weight. Such materials must be free of and segregated from any hazardous materials and/or organic material of any kind.

3.3.5 **Fill Placement and Compaction:** Onsite soils **free of** organics, debris and oversized material (greater-than 3-inches in largest dimension) are suitable for use as compacted structural fill. However, any soil to be placed as fill, whether onsite or imported material, should be first viewed by Leighton Consulting, Inc., and then tested if and as necessary, prior to approval for use as compacted fill. All structural fill must be free of hazardous materials.

All fill soil should be placed in thin, loose lifts, moisture-conditioned, as necessary, to within 3 percent above optimum moisture content, and compacted to a minimum **90% relative compaction** as determined by ASTM D 1557 standard test method (modified Proctor compaction curve) within the building footprint. Aggregate base for pavement sections should be compacted to a minimum of 95% relative compaction.

3.3.6 Pipeline Backfilling: Pipeline trenches should be backfilled with compacted fill in accordance with this report, and applicable *Standard Specifications for Public Works Construction* (Greenbook), 2015 Edition standards. Backfill in and above the pipe zone should be as follows:

- **Pipe Zone**: Pipe bedding zone should be backfilled with Controlled Low Strength Material (CLSM) consisting of at least one sack of Portland cement per cubic-yard of sand, conforming to Section 201-6 of the 2015 Edition of the *Standard Specifications for Public Works Construction* (Greenbook). Imported clean/uniform sand with a Sand Equivalent (SE) greater-than-or-equal-to (≥) 30 can also be used in the pipe zone. CLSM or uniform sand bedding should be placed to 1-foot (0.3 m) over the top of the conduit, and vibrated. CLSM should **not** be jetted but sand should be flooded and jetted.

- **Over Pipe Zone**: Above the pipe zone, trenches can be backfilled with excavated on-site soils free of debris, organic and oversized material greater-than (>) 3-inches in largest dimension. As an option, the whole trench can be backfilled with one-sack CLSM same as presented above for the pipe bedding zone. Oversized rock (cobbles and/or boulders) should either be removed from any backfill, or pulverized for use in backfill only above the pipe zone. Gravel larger than ¾-inch in diameter should be mixed with at least 80-percent soil by weight passing the No. 4 sieve. Native soil backfill over the pipe-bedding zone should be placed in thin lifts, moisture conditioned, as necessary, and mechanically compacted using a minimum standard of 90% relative compaction (relative to the laboratory modified Proctor maximum **dry** density), relative to the ASTM D 1557 laboratory maximum dry density within the building footprint and hardscape areas, or 85% under landscape areas. Backfill above the pipe zone should **not** be flooded or jetted. In any case, backfill above the pipe zone (bedding) should be observed and tested by Leighton Consulting, Inc.

3.4 Infiltration Basin Design

Three small-scale infiltration tests were performed to estimate infiltration rate of onsite soils within the upper 5 feet of site alluvium. Based on our infiltration test results presented in Appendix A, for design purposes, we recommend a small-

scale infiltration rate of 0.05-inches-per-hour (very poor infiltration), based on results ranging from negligible infiltration to 0.09-inches-per-hour. We recommend that a correction factor/safety factor be applied to the infiltration rate in conformance with Riverside County guidelines, since monitoring of actual facility performance has shown that actual infiltration rates are lower than measured in small-scale tests. Infiltration basins are subject to siltation, which can result in reduced infiltration rates. This small-scale infiltration rate should be divided by a design factor of at least 2 for buried chambers and at least 3 for open basins; although the design/safety factor may be higher based on project-specific aspects. It should be noted that during periods of prolonged precipitation, underlying soils tend to become saturated to greater depths/extent. Therefore, infiltration rates tend to decrease with prolonged rainfall.

Some design considerations are presented in the following paragraphs:

- **Adjacent Structure Impact**: As infiltrating water can seep within soil strata partially-horizontally, it is important to consider impact that infiltration facilities can play on nearby subterranean structures, such as basement walls or open excavations, whether onsite or offsite, and whether existing or planned. Any such nearby features should be identified and evaluated as to whether infiltrating water can impact these facilities. Infiltration facilities should not be constructed adjacent to or under buildings. Setbacks should be discussed with Leighton Consulting, Inc. during the planning process, but a building setback of at least 25-feet horizontally is initially suggested.

- **Infiltration Basins Type and Geometry**: Further testing may be required depending on final design of infiltration facilities. Infiltration rates are anticipated to vary based on location and depth. Infiltration concepts should be discussed with Leighton Consulting, Inc. as infiltration plans are being developed. We should review all infiltration plans, including locations and depths of proposed facilities. Further testing may be required depending on infiltration facilities design details, particularly considering type, depth and location.

- **Siltation and Soil Changes**: These infiltration rates are for a clean, un-silted infiltration surface in native, sandy alluvial soil. These values may be reduced over time as silting of the basin or chamber occurs. Furthermore, if the basin or chamber bottom is allowed to be compacted by heavy equipment, this value is expected to be reduced. Infiltration of water through soil is highly dependent on such factors as grain size distribution of soil particles, gradation (uniform versus well graded), particle shape, fines content and density. Small changes in soil conditions, including density, can cause large differences in observed infiltration rates. Infiltration is not suitable in compacted fill. For

open basins and swales, vegetation within the basin bottoms and sides is expected to help reduce erosion and help maintain infiltration rates.

- **De-silting Weir/Facilities**: Periodic flow of water carrying sediments into the basin or chamber, plus deposition of fine wind-blown sediments and sediments from erosion of basin side walls, will eventually cause the basin bottom or chamber to accumulate a layer of silt, which has the potential to significantly reducing the overall infiltration rate of the basin or chamber. Therefore, we recommend that significant amounts of silt/sediment not be allowed to flow into the facility within stormwater, especially during construction of the project and prior to achieving a mature landscape onsite. We recommend that an easily maintained, robust silt/sediment removal system be installed to pretreat storm water before it enters the infiltration facility. Infiltration facilities should be constructed with spillways or other appropriate means that would prevent overfilling that could damage the facility or adjacent improvements.

- **Drainage/Infiltration Time Cycle**: In general, the rate of infiltration reduces as the head of water in the infiltration facility reduces, and it also reduces with prolonged periods of infiltration. As such, water typically infiltrates much faster near the beginning of and/or immediately after storm events than at times well after a storm when the water level in the facility has receded, since the infiltration rate is then slower due to both lower head and longer overall duration of infiltration. In open basins with compacted or silty bottoms, this could be problematic, in that even if the basin had already infiltrated significant amounts of storm water, the lower several inches or feet of water could remain in the basin for an extended period of time, creating prolonged open-water safety concern (such as potential for mosquitos and waterborne diseases, algae odor, etc.). In a buried/cover infiltration chamber, these conditions would be of less concern.

- **Design Contingencies and Optimizations**: Estimating infiltration rates, especially based on small-scale testing, is inexact and indefinite, and often involves known and unknown soil complexities, potentially resulting in a condition where actual infiltration rates of the completed facility are significantly less than the design rates. In open basins, this could create nuisance water in the basin. As such, enhancements may be needed after completion of the basin if prolonged or frequent standing water persists. A potential basin enhancement, if needed, might be to install infiltration trenches or borings in the basin bottom to capture and infiltrate low flows and to help speed infiltration during/after storms; specific recommendations, such as minimum trench/boring depth, would be developed based on conditions observed. Such a contingency should be anticipated for open basins.

- **Maintenance**: Infiltration facilities should be routinely monitored, especially before and during the rainy season, and corrective measures should be implemented if and as needed. Things to check for include removal of trash or dumping, proper infiltration, absence of accumulated silt, and that de-silting filters/features are clean and functioning. Pretreatment desilting features should be cleaned and maintained as recommended by the manufacturer or designer. Even with measures to prevent silt from flowing into the infiltration facility, accumulated silt may need to be removed.

3.5 Seismic Design Parameters

To accommodate effects of ground shaking produced by regional seismic events, seismic design can, at the discretion of the designing Structural Engineer, be performed in accordance with the 2016 Edition of the California Building Code (CBC). Table 2 (below), lists seismic design parameters based on the 2016 CBC methodology:

Table 4. 2016 CBC Site-Specific Seismic Parameters

2016 CBC Site-Specific Seismic Design Parameters	Value
Site Longitude (decimal degrees) West	-117.216
Site Latitude (decimal degrees) North	33.9184
Site Class Definition (2016 CBC 1613A.3.2 and ASCE 7-10)	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Figure 1613.3.1(1))	1.649
Mapped Spectral Response Acceleration at 1s Period, S_1 (Figure 1613.3.1(2))	**0.718**
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613A.3.3(1))	1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613A.3.3(2))	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16A-37)	1.649
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16A-38)	1.076
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16A-39)	1.100
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16A-40)	0.718
Seismic Design Category (1613A.3.5, S_1>0.75, Risk Category III)	**D**
Long Period (T_L, seconds)	8

3.6 Foundations

Based on our preliminary exploration and our experience in the region, conventional shallow spread footings/mats may be used to support the proposed one- to two-story buildings. Anticipated foundation loads were not available during preparation of this report. We assumed maximum column dead loads up to (≤) 100 kips and wall loads of 3 kips-per-lineal-foot for our preliminary foundation recommendations. Overexcavation and recompaction of footing subgrade soils should be performed as detailed in Section 3.3 of this report. Specific spread footing recommendations are presented below:

3.6.1 Minimum Embedment and Width: Based on our preliminary exploration, footings for this proposed building should have a minimum embedment of 18-inches below lowest adjacent exterior grade or interior finished grade; whichever is deeper/lower. Minimum footings widths should be at least 24-inches for isolated rectangular column footings or 12-inches for continuous bearing wall (strip) footings.

3.6.2 Allowable Bearing Capacity: A net allowable bearing capacity of 2,500 pounds-per-square-foot (psf) may be used for design of continuous wall footings or 3,000 pounds-per-square-foot (psf) may be used for design of isolated rectangular column footings. These values are based on the minimum embedment depth and width recommended in Section 3.6.1, above, and are governed by properly compacted fill settlement. These allowable bearing values may be increased by 300 psf per foot increase in embedment-depth and/or width to a maximum allowable bearing pressure of 4,000 psf, and are for total dead load and sustained live loads, which can be increased by one-third when considering short-duration wind or seismic loads. Footing reinforcement should be designed by the project Structural Engineer.

3.6.3 Lateral Load Resistance: Soil resistance available to withstand lateral loads on a shallow foundation is a function of the frictional resistance along the base of the footing and the passive resistance that may develop as the face of the structure tends to move into the soil. The frictional resistance between the base of the foundation and the subgrade soil may be computed using a coefficient of friction of 0.33. The passive resistance may be computed using an equivalent fluid pressure of 300 pounds-per-cubic-foot (pcf), assuming there is constant contact between the footing and undisturbed soil. These friction and passive values have already been reduced by a factor-of-safety of 1.5, and can be increased by one-third when considering short-duration wind or seismic loads. For spread footings and slabs-on-grade bearing on properly compacted fill over undisturbed native soils, full friction and passive resistance can be combined to resist lateral loads; although some lateral displacement is required to mobilize full passive resistance.

3.6.4 Uplift Load Resistance: If required to resist seismic uplift loads, properly compacted backfill soils over spread footings can be used, modeled with both dead weight and soil shear strength resisting short term dynamic uplift forces. Properly compacted backfill soils may be assumed to have a moist unit weight of 120 pounds-per-cubic-foot (pcf). A friction angle of 30° can be used to model properly compacted backfill soil's shear strengths. A factor-of-safety has not been applied to these values.

3.6.5 Settlement Estimates: The above recommended allowable bearing capacity is generally based on a total allowable, post-construction total settlement of 1 inch, for column loads and wall loads not exceeding 200 kips and 3 kips-per-

foot, respectively, for dead plus sustained live loads. Differential settlement due to static loading is generally estimated at ½ inch over a horizontal distance of 30 feet. Once developed by the Structural Engineer, we can review total dead and sustained live loads for each column including plan location and span distance, to evaluate if differential settlements between dissimilarly loaded columns will be tolerable. Excessive differential settlement can be mitigated with the use of reduced bearing pressures, deeper footing embedment, possibly changing overexcavation schemes and using imported base material under spread footings, or possibly other methods. Assuming all existing fill soils are properly recompacted below these buildings, dynamic differential settlement in dense sands is expected to be negligible.

3.7 Concrete Slab-On-Grade

Concrete slabs-on-grade should be designed by the structural engineer in accordance with 2016 CBC requirements. More stringent requirements may be required by the structural engineer and/or architect; however, slabs-on-grade should have the following minimum recommended components:

- **Subgrade:** Slab-on-grade subgrade soil should be moisture conditioned to or within 3% over optimum moisture content, to a minimum depth of 24 inches within building footprints, and compacted to 90% of the modified Proctor (ASTM D 1557) laboratory maximum density prior to placing either a moisture barrier, steel and/or concrete.

- **Moisture Barrier:** A moisture barrier consisting of at least 15-mil-thick Stego-wrap vapor barriers (see: http://www.stegoindustries.com/products/stego_wrap_vapor_barrier.php), or equivalent, should then be placed below slabs where moisture-sensitive floor coverings or equipment will be placed.

- **Reinforced Concrete**: A conventionally reinforced concrete slab-on-grade with a thickness of at least 4-inches should be placed in pedestrian areas without heavy loads. Reinforcing steel should be designed by the structural engineer, but as a minimum should be No. 4 rebar placed at 24-inches on-center, each direction (perpendicularly), mid-depth in the slab. A modulus of subgrade reaction (k) as a linear spring constant, of 150 pounds-per-square-inch per inch deflection (pci) can be used for design of heavily loaded slabs-on-grade, assuming a linear response up to deflections on the order of ¾-inch.

- **Slab-On-Grade Control Joints**: Slab-on-grade crack control joint locations and spacing should be designed by the project Structural Engineer (SE). However, consideration should be given to potential for differential-vertical-offset at control joints, due to structure settlement. Where possible, slabs-on-grade should be allowed to "float" on the subgrade to allow for differential vertical movement. Interior full-depth joints at wall and column interfaces are

suggested to allow the slab-on-grade to "float" unrestrained by vertical structural components. However, doweling is suggested at other joints in open areas of rooms to avoid trip hazards. We defer to the project Structural Engineer (SE) for joint and dowel design details.

Minor cracking of concrete after curing due to drying and shrinkage is normal and should be expected. However, cracking is often aggravated by a high water-to-cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low-slump concrete or low water/cement ratios can reduce the potential for shrinkage cracking.

3.8 Sulfate Attack and Ferrous Corrosion Protection

3.8.1 Sulfate Exposure: Sulfate ions in the soil can lower the soil resistivity and can be highly aggressive to Portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. A potentially high sulfate content could also cause corrosion of reinforcing steel in concrete. Section 1904A of the 2016 California Building Code (CBC) defers to the American Concrete Institute's (ACI's) ACI 318-14 for concrete durability requirements. Table 19.3.1.1 of ACI 318-14 lists "*Exposure categories and classes*," including sulfate exposure as follows:

Table 5. Sulfate Concentration and Exposure

Soluble Sulfate in Water (parts-per-million)	Water-Soluble Sulfate (SO_4) in soil (percentage by weight)	ACI 318-14 Sulfate Class
0-150	0.00 - 0.10	S0 (negligible)
150-1,500	0.10 - 0.20	S1 (moderate*)
1,500-10,000	0.20 - 2.00	S2 (severe)
>10,000	>2.00	S3 (very severe)

*or seawater

3.8.2 Ferrous Corrosivity: Many factors can modify corrosion potential of soil including soil moisture content, resistivity, permeability and pH, as well as chloride and sulfate concentration. In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor. Based on the findings of studies presented in ASTM STP 1013 titled "*Effects of Soil Characteristics on Corrosion*" (February 1989), the approximate relationship between soil resistivity and soil corrosiveness was developed as follows:

Table 6. Soil Resistivity and Soil Corrosivity

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very Severely Corrosive
900 to 2,300	Severely Corrosive
2,300 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
10,000 to >100,000	Very Mildly Corrosive

Acidity is an important factor of soil corrosivity. The lower the pH (the more acidic the environment), the higher the soil corrosivity will be with respect to buried metallic structures and utilities. As soil pH increases above 7 (the neutral value), the soil is increasingly more alkaline and less corrosive to buried steel structures, due to protective surface films, which form on steel in high pH environments. A pH between 5 and 8.5 is generally considered relatively passive from a corrosion standpoint. Chloride and sulfate ion concentrations, and pH appear to play secondary roles in modifying corrosion potential. High chloride levels tend to reduce soil resistivity and break down otherwise protective surface deposits, which can result in corrosion of buried steel or reinforced concrete structures.

3.8.3 **Corrosivity Test Results:** To evaluate corrosion potential of soils sampled from this site, we tested a bulk soil sample for soluble sulfate content, soluble chloride content, pH and resistivity. Results of these tests are summarized below:

Table 7. Results of Corrosivity Testing

Boring Number	Sample Depth (feet)	Sulfate (mg/kg)	Chloride (mg/kg)	pH	Minimum Resistivity (ohm-cm)
LB-4	0 to 5	**125**	**20**	7.7	**2,100**
LB-6	0 to 5	**141**	**43**	7.6	3,160

Note: mg/kg = milligrams per kilogram, or parts-per-million (ppm)

These results are discussed as follows:

- **Sulfate Exposure**: Based on our previous experience and Table 19.3.1.1 of ACI 318-14, in our opinion, sulfate exposure should be considered "negligible" with an Exposure Class S0 for native silty sands sampled at the site. Based on Table 19.3.2.1 of ACI 318-14, for this Exposure Category S0, there would be **no** restrictions on cement type ("cementitious material") nor water/cement ratio, and an f_c' (28-day compressive strength) of at least 2,500 pounds-per-square-inch (psi) is required at a minimum for structural concrete.

- **Ferrous Corrosivity**: As shown above, minimum soil resistivity of 2,100 ohm-centimeters was measured in one of our laboratory tests. In our opinion, based on resistivity correlation presented in Table 6, it appears for tested site soils that corrosion potential to buried steel may be characterized as "**severely corrosive**" at the site. Ferrous pipe buried in moist to wet site earth materials should be avoided by using high-density polyethylene (HDPE) or other non-ferrous pipe when possible. Or ferrous pipe can be protected by polyethylene bags, tap or coatings, di-electric fittings or other means to separate the pipe from on-site earth materials.

3.9 Pavement Section Design

Based on design procedures outlined in the current Caltrans *Highway Design Manual* and a design R-value of 29 for clayey sands, preliminary flexible pavement sections were calculated for the Traffic Indices (TIs) tabulated, and are listed below:

Table 8. Hot Mixed Asphalt (HMA) Pavement Sections

Assumed Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
4.0 (automobile parking)	3	4
5.0 (driveways and truck traffic)	3	6
6.0 (roadways and heavy truck traffic)	3½	8
7.0 (roadways and heavy truck traffic)	4	10
8.0 (roadways and heavy truck traffic)	5	11
9.0 (roadways and heavy truck traffic)	5½	13
10.0 (very heavy truck traffic)	6½	15

For fire truck (60,000-pound "apparatus") lanes, asphalt pavements designed for a TI=6.0 are recommended. However, note that undistributed apparatus outrigger loads could cause local asphalt pavement punching damage. When possible, outrigger loads should be distributed over asphalt pavements with planks and plywood. Otherwise, areas where outrigger loads are anticipated could be paved with 8-inch-thick concrete as described below.

Portland cement concrete pavement sections were calculated in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for three Traffic Indices (TIs) are presented below:

Table 9. Portland Cement Concrete Pavement Sections

Assumed Traffic Index	PC Concrete (inches)	Base Course (inches)
4.0 (automobile parking)	7	4
5.0 (driveways and truck traffic)	8	
6.0 (roadways and heavy truck traffic)	9	

We have assumed that this Portland cement concrete will have a compressive strength of at least 3,000 pounds-per-square-inch (psi). Prior to placement of aggregate base, subgrade soils should be scarified to a minimum depth of 8-inches, moisture-conditioned, as necessary, and recompacted to a minimum of 90 percent relative compaction, determined in accordance with ASTM D 1557 modified Proctor laboratory maximum density. Aggregate base should be placed in thin lifts; moisture conditioned, as necessary, and compacted to a minimum of 95 percent relative compaction. Field observation and periodic testing, as needed during placement of base course materials, should be undertaken to ensure that requirements of Caltrans' *Standard Specifications* (2015) and Special Provisions are fulfilled. Consideration should be given to reinforce concrete pavements where large outrigger point loads are anticipated.

Adequate drainage (both surface and subsurface) should be provided such that the subgrade soils and aggregate base materials are not allowed to become wet. All pavement construction should be performed in accordance with the Caltrans *Standard Specifications* (2015). Recommended structural pavement materials should conform to the specified provisions in the Caltrans *Standard Specifications* (2015) including grading and quality requirements, shown below:

- **Asphalt Concrete (Hot Mixed Asphalt)** for pavement should be Type A and should conform to Section 39 of the *Standard Specifications*. Asphalt concrete specimens should be tested for surface abrasion in accordance with CT-360.
- **Portland Cement Concrete (PCC)** pavement should conform to Section 40 of the *Standard Specifications*. PCC pavement materials (pavement, structures, minor concrete) should conform to Section 90 of the *Standard Specifications*.
- **Class II Aggregate Base (AB)** should conform to Section 26 of the *Standard Specifications*.

Traffic Indices (TIs) used in our pavement design are considered reasonable values for typical parking lot areas, and should provide a pavement life of

approximately 20 years with a normal amount of flexible pavement maintenance. Irrigation adjacent to pavements, without a deep curb or other cutoff to separate landscaping from the paving, may result in premature pavement failure. Traffic parameters used for design were selected based on engineering judgment and not on information furnished to us such as an equivalent wheel-load analysis or a traffic study.

4.0 CONSTRUCTION CONSIDERATIONS

4.1 Wet Clays

During wet months, site clays can be over optimum moisture content if not saturated right after heavy rain; and therefore, can be more difficult to properly compact to specified density. Disking, blending, cement and/or lime treatment may be considered by the earthwork contractor to facilitate compaction. However, additional sulfate testing will be required prior to treating/mixing soils with lime, to avoid an adverse sulfate heave reaction. Lime and/or cement treatment also require specialized equipment to blend plastic clay thoroughly with cement or lime, to be effective. Depending on the time of year and rainfall, pavement subgrades may also need to be stabilized with crushed rock and/or geogrids, to facilitate pavement subgrade and base compaction. Choice of means and methods to mitigate wet clay compaction difficulty will be at the discretion of the contractor based on weather at the time of earthwork, available materials and equipment, among other considerations specific to the contractor. However, any proposed cement and/or lime treatment must be reviewed and approved by Leighton Consulting, Inc. and the property owner prior to implementation.

4.2 Trench Excavations

Based on our field observations, caving of cohesionless and loose fill soils will likely be encountered in unshored trench excavations. To protect workers entering excavations, excavations should be performed in accordance with OSHA and Cal-OSHA requirements, and the current edition of the California Construction Safety Orders, see:

http://www.dir.ca.gov/title8/sb4a6.html

Contractors should be advised that sand and fill soils should be considered Type C soils as defined in the California Construction Safety Orders. As indicated in Table B-1 of Article 6, Section 1541.1, Appendix B, of the California Construction Safety Orders, excavations less-than (<) 20 feet deep within Type C soils should

be sloped back no steeper than 1½:1 (horizontal:vertical), where workers are to enter the excavation. This may be impractical near adjacent existing utilities and structures; so shoring may be required depending on trench locations. Stiff undisturbed native clays will stand steeper.

During construction, soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and Leighton Consulting, Inc. should be maintained to facilitate construction while providing safe excavations.

4.3 Temporary Shoring

Temporary cantilever shoring can be designed based on the active equivalent fluid pressure of 30 pounds-per-cubic-foot (pcf) in alluvium. If excavations are braced at the top and at specific depth intervals, then braced earth pressure may be approximated by a uniform rectangular soil pressure distribution. This uniform pressure expressed in pounds-per-square-foot (psf), may be assumed to be 20 multiplied by H for design, where H is equal to the depth of the excavation being shored, in feet. These recommendations are valid only for trenches not exceeding 15 feet in depth at this site.

4.4 Geotechnical Services During Construction

Our geotechnical recommendations provided in this report are based on information available at the time the report was prepared and may change as plans are developed. Additional geotechnical exploration, testing and/or analysis may be required based on final plans. Leighton Consulting, Inc. should review site grading, foundation and shoring (if any) plans when available, to comment further on geotechnical aspects of this project and check to see general conformance of final project plans to recommendations presented in this report.

Leighton Consulting, Inc. should be retained to provide geotechnical observation and testing during excavation and all phases of earthwork. Our conclusions and recommendations should be reviewed and verified by us during construction and revised accordingly if geotechnical conditions encountered vary from our findings and interpretations. Geotechnical observation and testing should be provided:

- During all excavation,
- During compaction of all fill materials,

- After excavation of all footings and prior to placement of concrete,
- During utility trench backfilling and compaction,
- During pavement subgrade and base preparation, and/or
- If and when any unusual geotechnical conditions are encountered.

5.0 LIMITATIONS

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil samples, tests, analyses, histories of occurrences, spaced subsurface explorations and limited information on historical events and observations. Such information is necessarily incomplete. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time. This exploration was performed with the understanding that this subject site is proposed for development as described in Section 1.2 of this report. Please also refer to Appendix C, GBA's *Important Information About This Geotechnical-Engineering Report*, presenting additional information and limitations regarding geotechnical engineering studies and reports.

Until reviewed and accepted by the California Geological Survey (CGS), this report may be subject to change. Changes may be required as part of the CGS review process. Leighton Consulting, Inc. assumes no risk or liability for consequential damages that may arise due to design work progressing before this report is reviewed and accepted by CGS.

This report was prepared for T & C International Healthcare, Inc. based on their needs, directions and requirements at the time of our exploration, in accordance with generally accepted geotechnical engineering practices at this time in California for skilled nursing facilities. This report is not authorized for use by, and is not to be relied upon by, any party except T & C International Healthcare, Inc. and their design and construction management team, with whom Leighton Consulting, Inc. has contracted for this work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton Consulting, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, and/or strict liability of Leighton Consulting, Inc.

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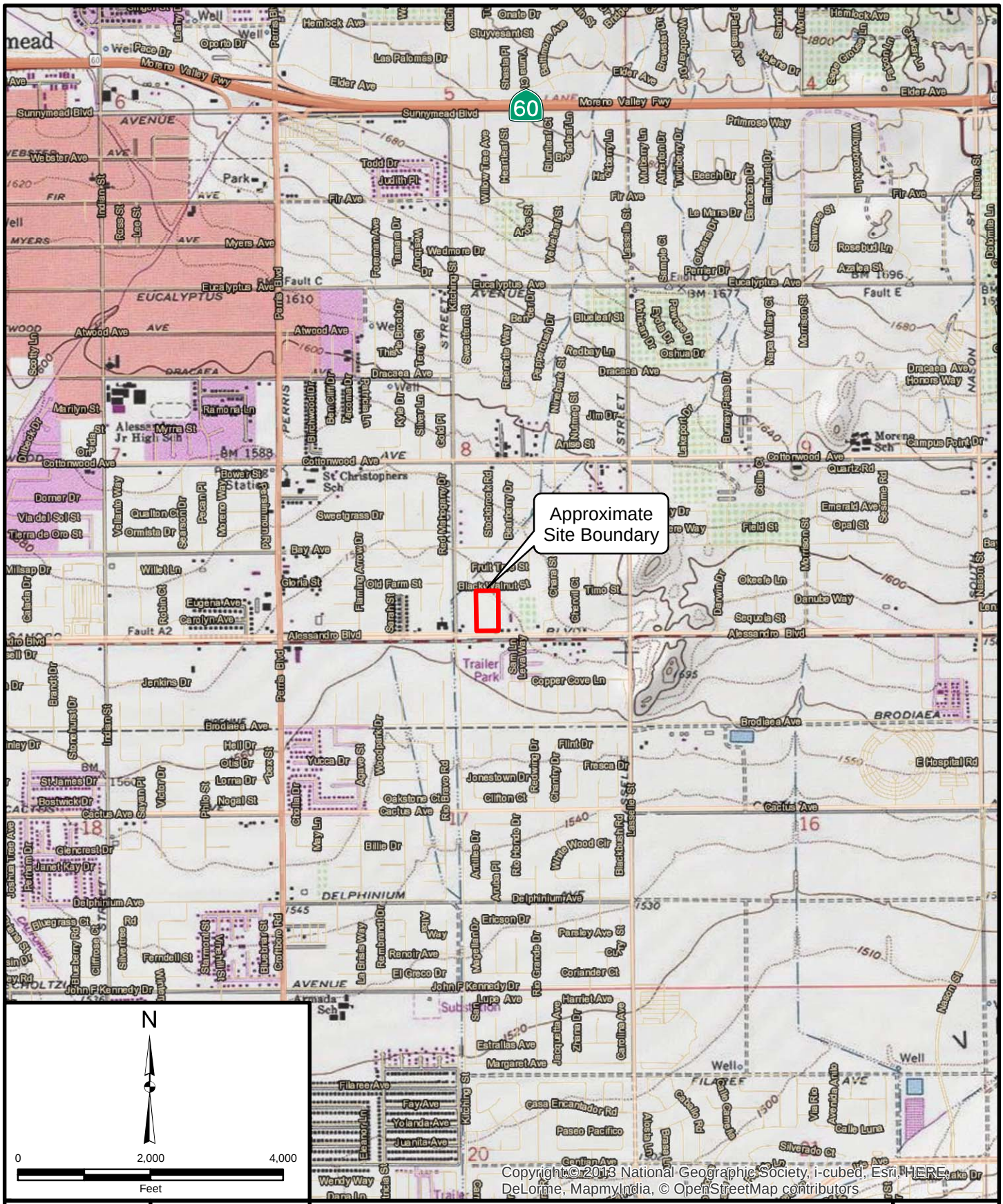


Project: 11888.001	Eng/Geol: SIS/RFR
Scale:1 " = 2,000 '	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton
Author: Leighton Geomatics (btran)

VICINITY MAP

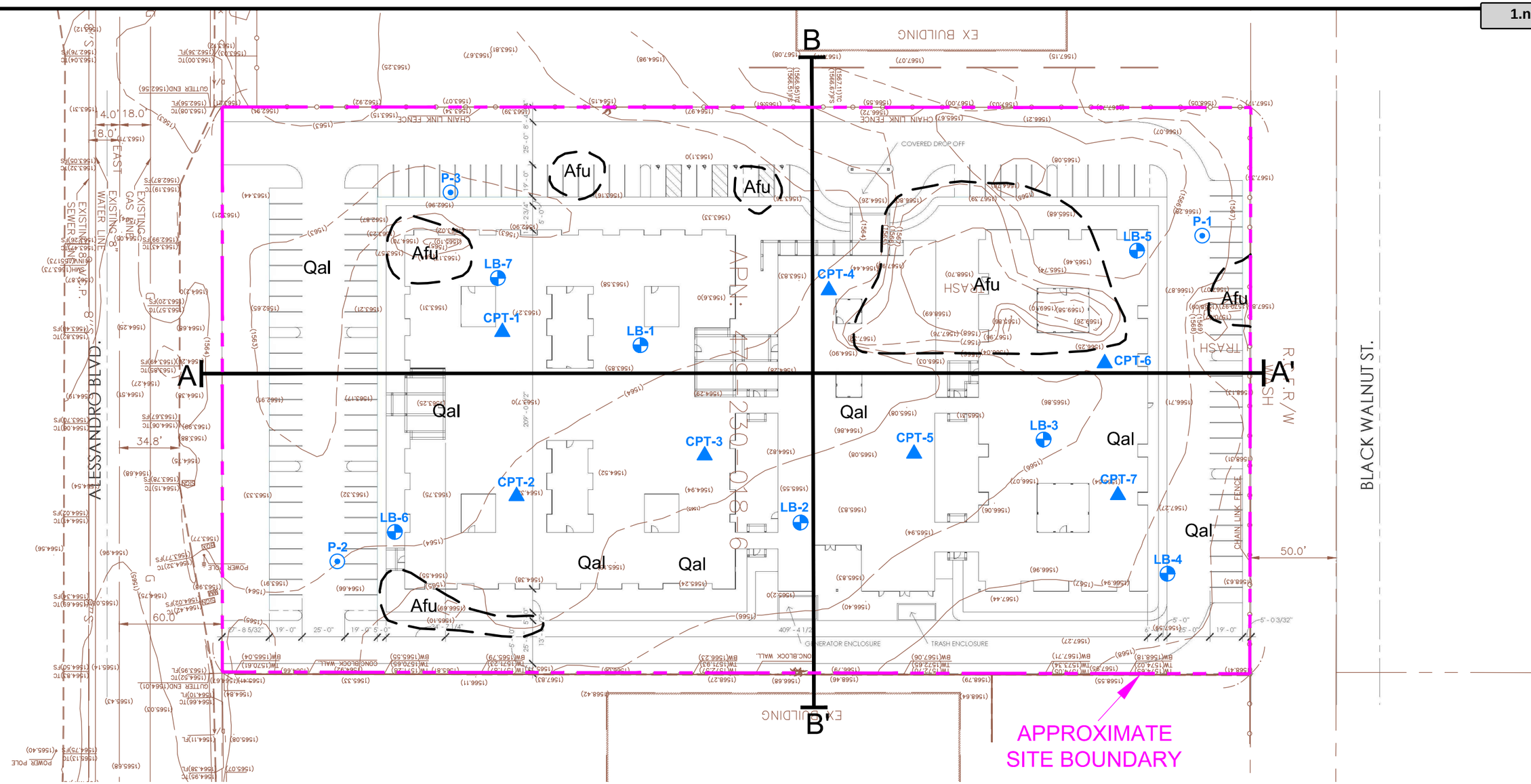
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 1

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F01_VM_2018-02-06.mxd on 2/5/2018 3:59:08 PM

Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED



LEGEND

LB-7 — Approximate Boring Location (LCI, 1/15/2018)	Afu — Artificial Fill Undocumented
CPT-7 — Approximate CPT Location (LCI, 1/22/2018)	Qal — Quaternary Alluvium
P-3 — Approximate Location of Percolation/Infiltration Test (LCI, 1/16/2018)	Approximate Geologic Contact
B — B' Approximate Cross Section Location (See Figures 3a and 3b)	

N

0 60 120

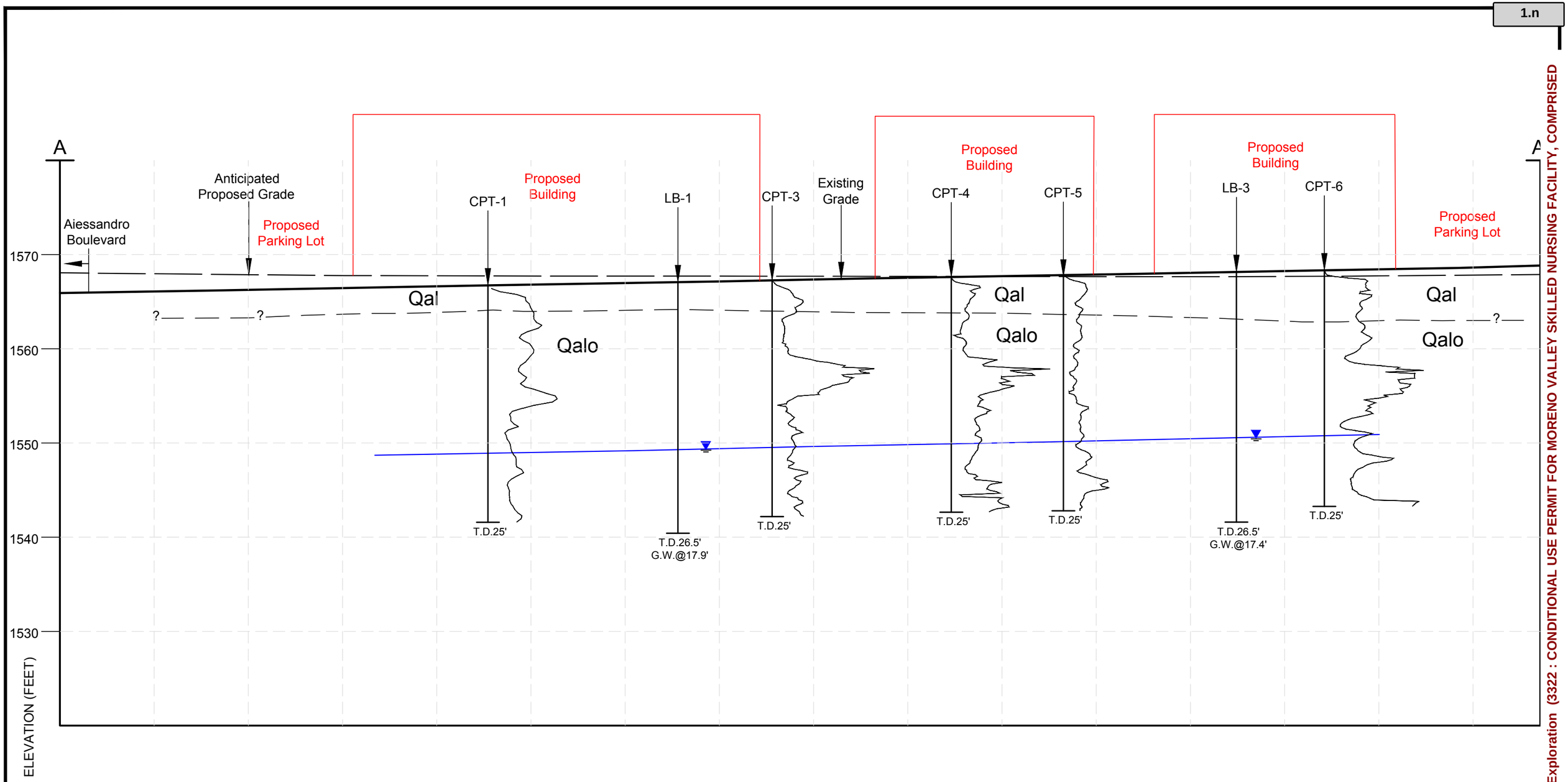
SCALE FEET

Proj: 11888.001	Eng/Geol: SIS/RFR
Scale: 1"=60'	Date: February 2018
Reference:	

EXPLORATION LOCATION MAP

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 2



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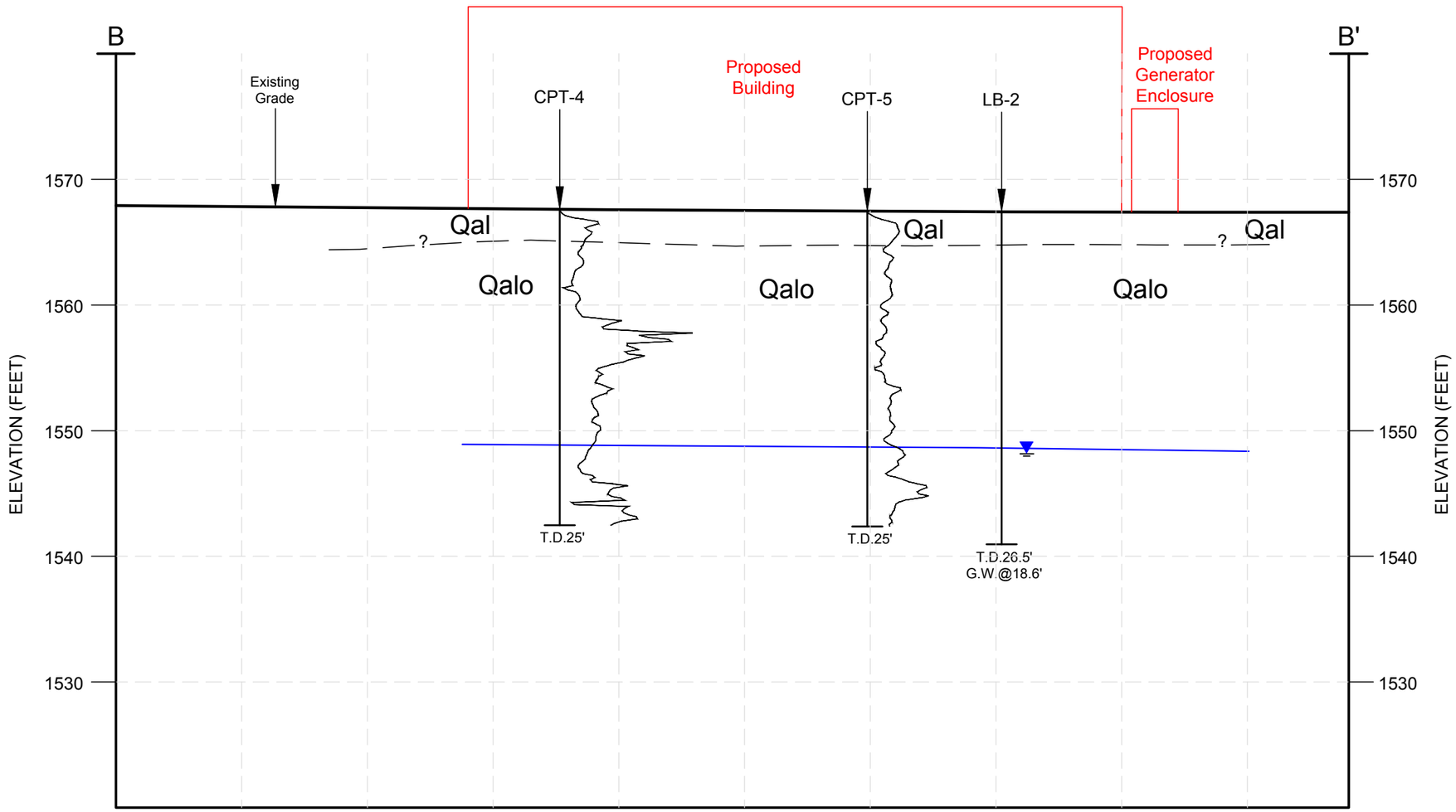
Reference:	

GEOTECHNICAL CROSS SECTION A-A'

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 3

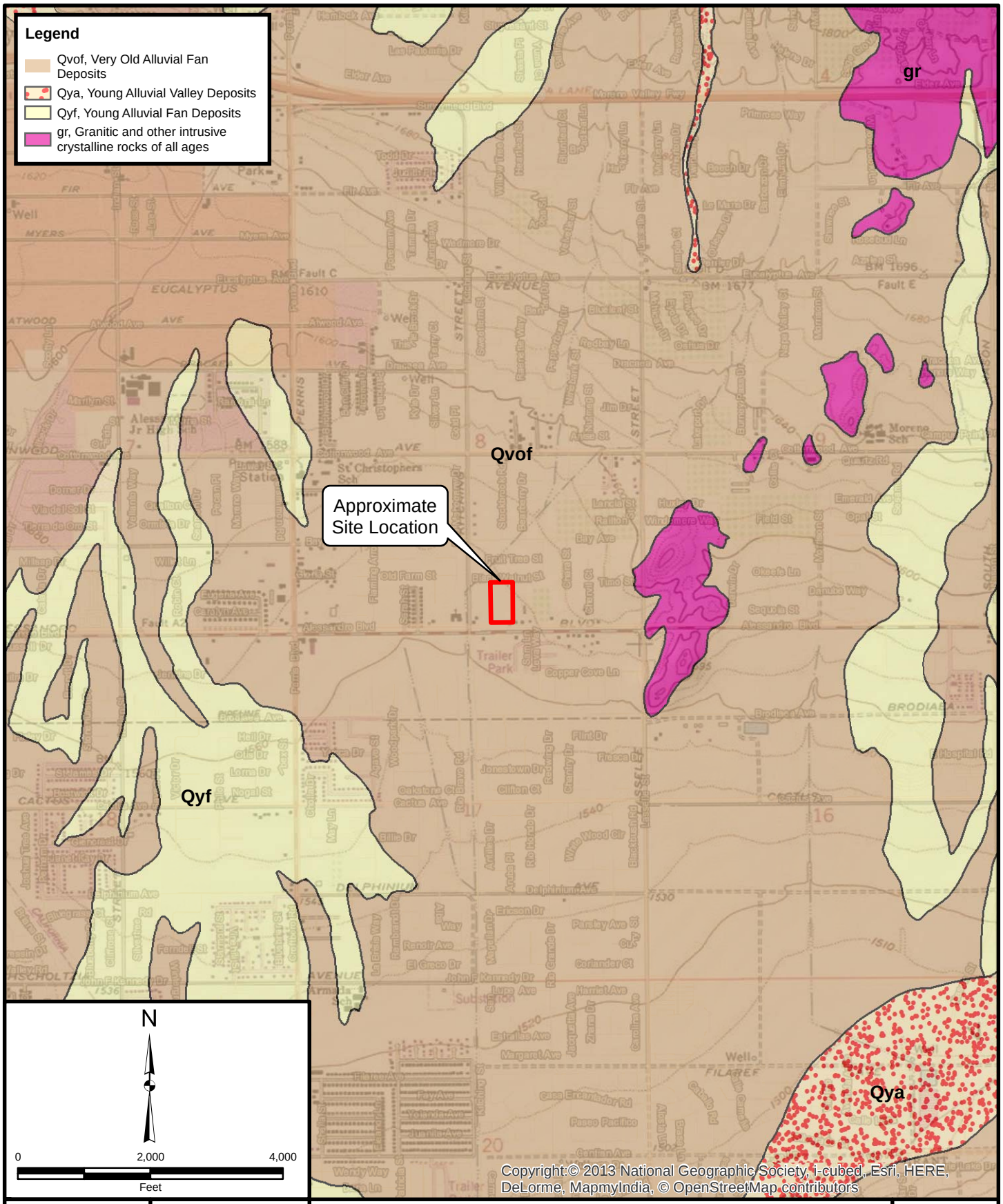


Proj: 11888.001	Eng/Geol: SIS/RFR
Scale: 1"=10'	Date: February 2018
Reference:	

GEOTECHNICAL CROSS SECTION B-B'

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 3



Project: 11888.001	Eng/Geol: SIS/RFR
Scale:1 " = 2,000 '	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, USGS
Author: Leighton Geomatics (btran)

REGIONAL GEOLOGY MAP

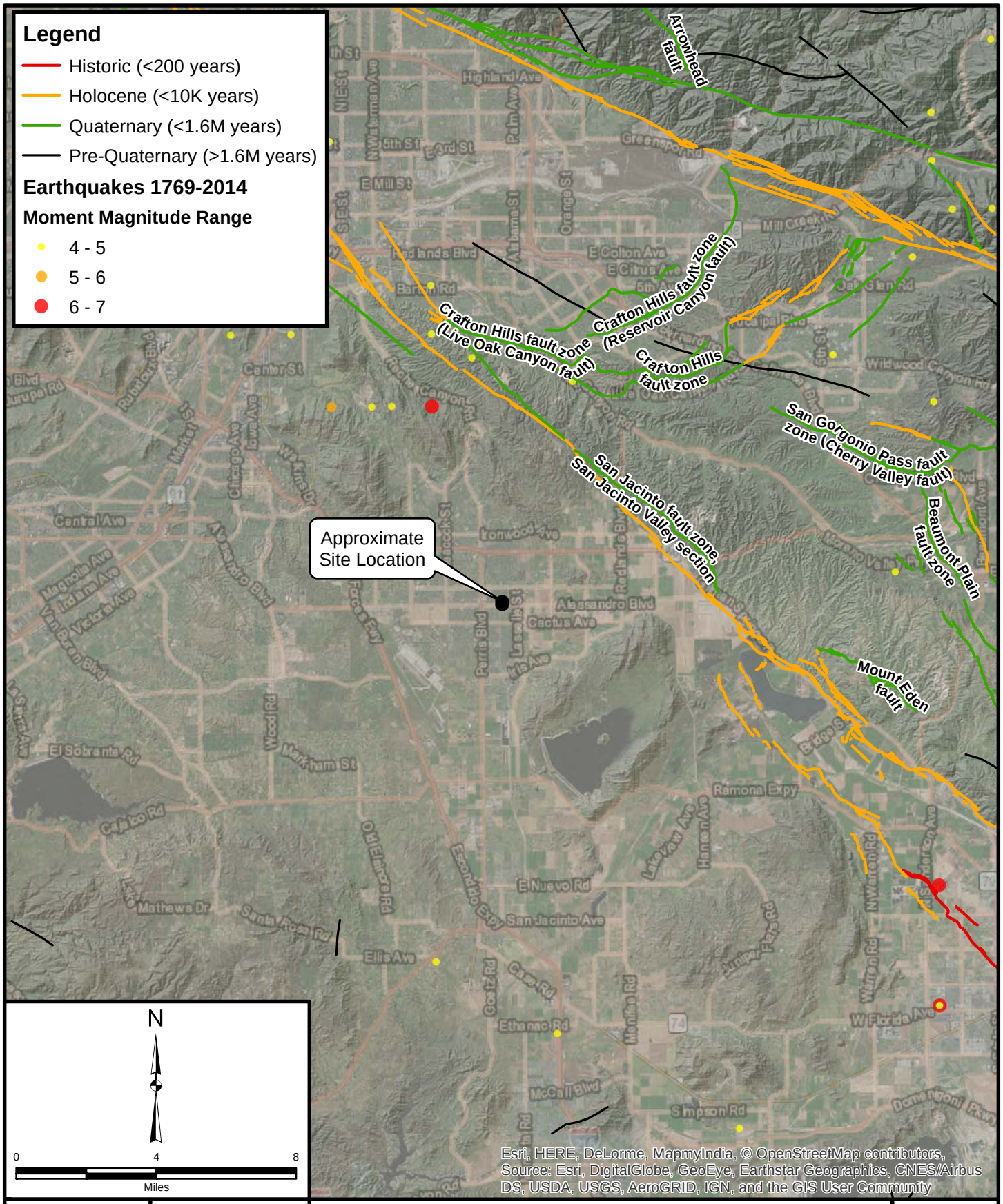
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 4

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F04_RGM_2018-02-06.mxd on 2/5/2018 4:00:06 PM

Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED



Project: 1188.001	Eng/Geol: SIS/RFR
Scale:1 " = 4 miles	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, CGS, Bryant 2010
Author: Leighton Geomatics (btran)

REGIONAL FAULT AND HISTORIC SEISMICITY MAP

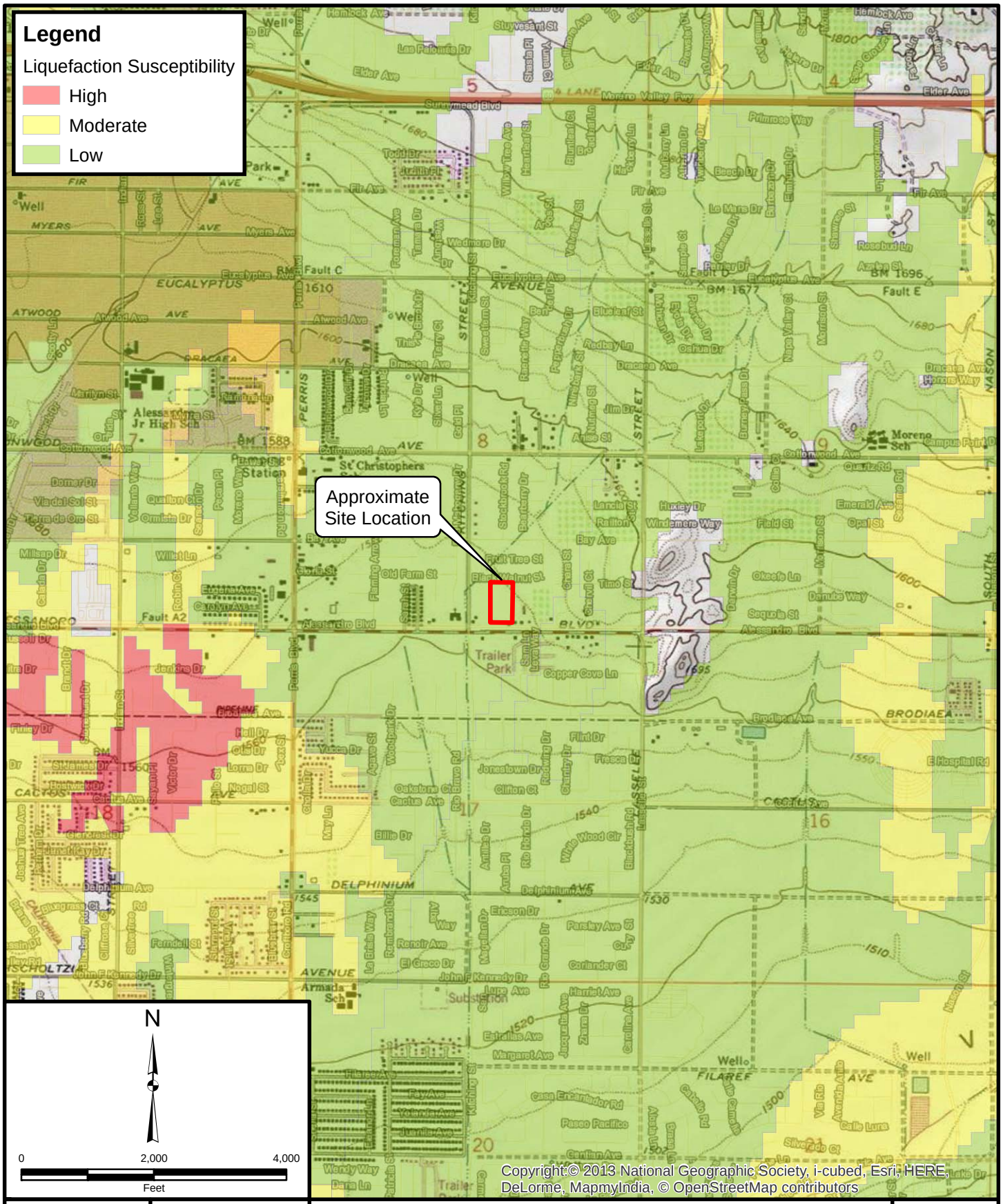
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 5

Leighton

Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F05_RF&HSM_2018-02-06.mxd on 2/5/2018 4:04:29 PM



Project: 11888.001	Eng/Geol: SIS/RFR
Scale:1 " = 2,000 '	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, CGS
Author: Leighton Geomatics (btran)

LIQUEFACTION MAP

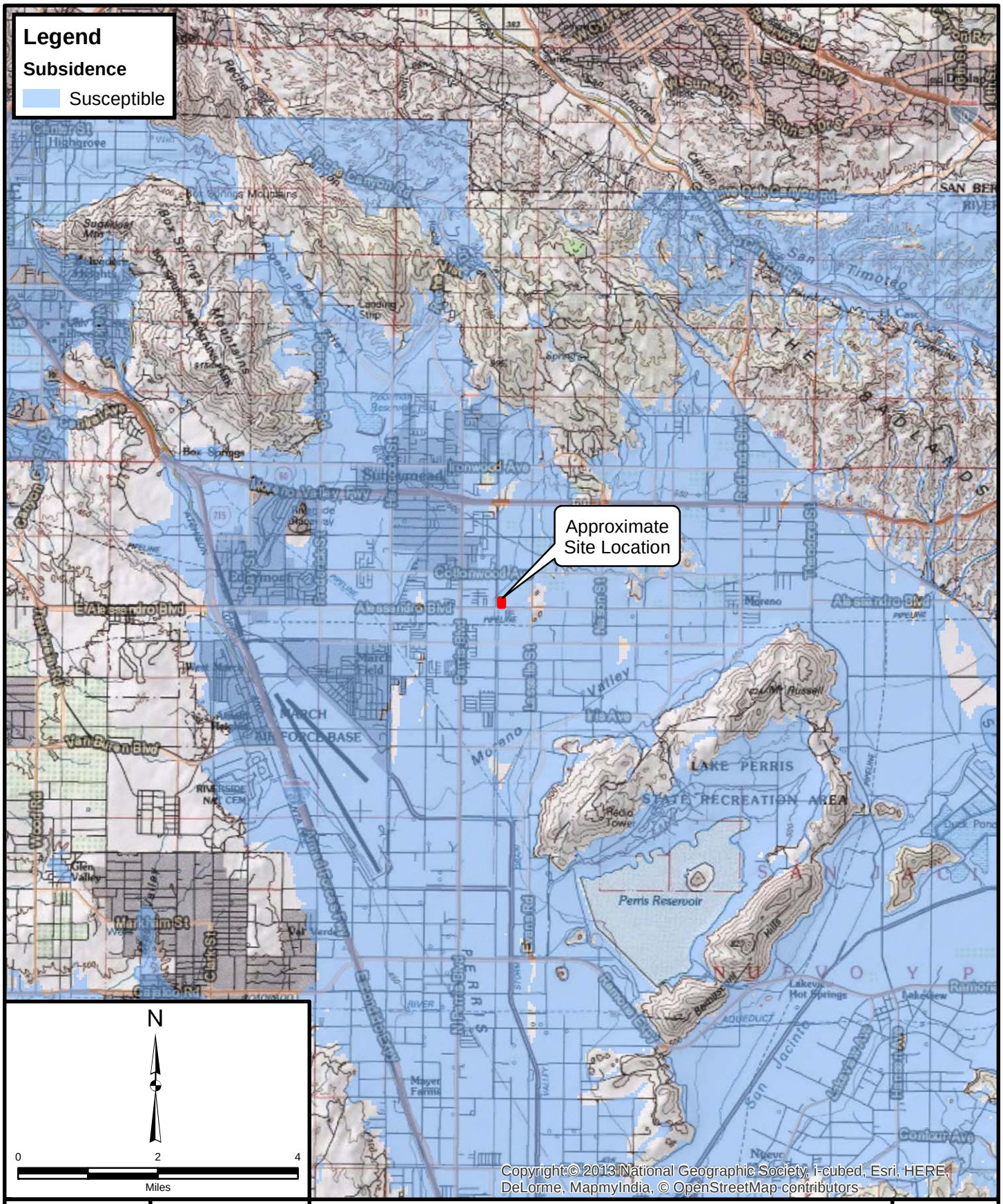
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 6

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F06_LM_2018-02-06.mxd on 2/6/2018 3:08:29 PM

Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED



Project: 11888.001	Eng/Geol: SIS/RFR
Scale:1 " = 2 miles	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, County of Riverside
Author: Leighton Geomatics (btran)

SUBSIDENCE MAP

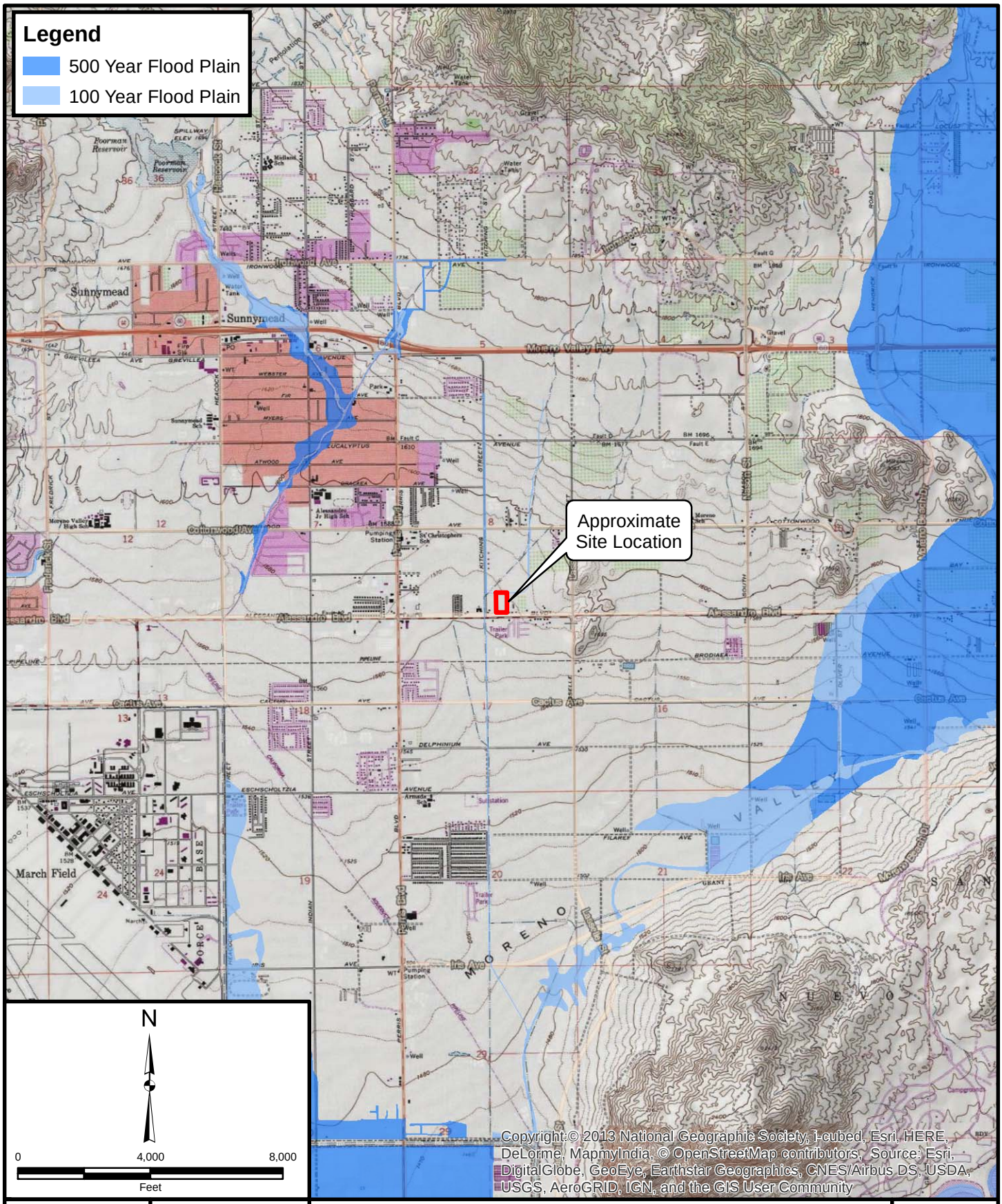
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 7

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F07_SM_2018-02-06.mxd on 2/6/2018 3:10:36 PM

Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED



Project: 11888.001	Eng/Geol: SIS/RFR
Scale:1 " = 4,000 '	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, CA DWR, FEMA
Author: Leighton Geomatics (btran)

FLOOD HAZARD ZONE MAP

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 8

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F08_FHM_2018-02-06.mxd on 2/5/2018 4:08:54 PM

Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED

APPENDIX A

FIELD EXPLORATION

Our field exploration consisted of a surface reconnaissance and a subsurface exploration program consisting of ten hollow-stem-auger borings, seven Cone Penetrometer Tests and three in-situ infiltration tests. These subsurface exploration locations are plotted on Figure 2, *Exploration Location Map*, and describe in more detail below:

Firm	Date	Exploration Type	Quantity
Leighton Consulting, Inc.	January 15, 2018	Hollow-stem borings	10
	January 22, 2018	CPTs	7

Hollow-Stem Borings: On January 15, 2018 a total of ten hollow-stem-auger borings were drilled, logged and sampled to depths ranging from approximately 5 feet to 26½ feet. Encountered soils were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D 2488). Relatively undisturbed California ring-lined soil samples were obtained at selected intervals within the hollow-stem borings. Standard Penetration Tests (SPTs) were also driven at selected intervals within the hollow-stem auger borings. Both drive samplers were driven with a 140-pound hammer falling 30-inches. Near surface bulk soil samples were collected from these borings. Boring logs are included as part of this appendix. Our borings were backfilled immediately after drilling, logging and sampling the same day, except for Borings P-1, P-2 and P-3, where infiltration tests were performed. Boring logs and infiltration test results are included in this appendix.

Cone Penetrometer Test (CPT): On January 22, 2018, seven Cone Penetrometer Tests (CPTs) were pushed 25- to 39-feet deep (refusal) at this site in general accordance with ASTM D 3441 Standard Test Method, using a truck-mounted electric cone penetrometer operated by GREGG Drilling & Testing, Inc.. Unlike soil borings, in which drive samples are typically driven at discrete depth intervals (e.g. 5-feet), CPTs provide a continuous analog record of soil properties with depth. CPT results are presented in this appendix.

Subsurface Variations and Limitations: These attached subsurface exploration logs and related information depict subsurface conditions only at the approximate locations indicated and at the particular date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these locations. Passage of time may result in altered subsurface conditions due to possible environmental changes. In addition, any stratification lines depicted on these logs represent an approximate boundary between soil types, but these transitions can be gradual.

GEOTECHNICAL BORING LOG LB-1

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1564'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				ML	**Quaternary Alluvium (Qal)**; SANDY SILT, brown, moist, fine to medium grained sand, MD = 131.5 @ 9.0%, EI = 30	MD, EI, SA
1560				R-1	20 35 50/5"	116	7	SM	**Older Alluvium (Qalo)**; SILTY SAND, dense, dark brown and dark reddish brown, moist, fine to coarse grained sand, few pinhole voids	
	5			R-2	15 20 30				SILTY SAND, dense, dark yellowish brown, moist, fine to medium grained sand, few pinhole voids	
1555				R-3	24 24 34			SC-SM	SILTY, CLAYEY SAND, dense, dark brown to dark reddish brown, moist, fine to medium grained sand	
	10			R-4	24 50	123	11	SM	SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1550										
	15			R-5	20 30 50				SILTY SAND, dense, dark reddish brown, moist, fine to coarse grained sand	
1545										
	20			R-6	10 20 24			SC	CLAYEY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand	
1540										
	25			R-7	20 27 45				CLAYEY SAND, dense, dark reddish brown, moist, fine to coarse grained sand	
1535									Drilled to 26.5' Sampled to 26.5' Groundwater at 18' Backfilled with Cuttings, Groundwater measured at 17.92' on 01/16/18	
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG LB-2

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1565'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
1565	0			B-1				SM	**Quaternary Alluvium (Qal)**; SILTY SAND, brown, moist, fine to coarse grained sand	
				R-1	12 17 17	121	5	SM	**Older Alluvium (Qalo)**; SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, few pinhole voids, CO = -4.72%	CO
1560	5			R-2	10 20 30	123	9		SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, CO = -2.38%	CO
1555	10			R-3	22 25 25			SC-SM	SILTY, CLAYEY SAND, dense, dark reddish brown, moist, fine to coarse grained sand	
1550	15			R-4	20 50/5"			SM	SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining	
1545	20			R-5	13 50				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining	
1540	25			R-6	12 20 28			SC	CLAYEY SAND, medium dense, dark reddish brown, moist to wet, fine to coarse grained sand	
1535	30								Drilled to 26.5' Sampled to 26.5' Groundwater at 19.3' Backfilled with cuttings, Groundwater measured at 18.58' on 01/16/18	

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-3

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1566'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
1565	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND, brown, moist, fine to coarse grained sand	
									SILTY SAND, reddish brown, moist, fine to medium grained sand	
1560	5			R-1 B-1	12 18 27	122	7	SM	**Older Alluvium (Qalo)**; SILTY SAND, medium dense, dark yellowish brown, moist, fine to medium grained sand, MD = 133.6 @ 8.4%	MD
				R-2	14 17 20	113	8		SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining	
1555	10			R-3	14 14 14	115	9		SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, CO = -1.63%	CO
1550	15			R-4	7 7 7	110	12	SC	CLAYEY SAND, loose, dark reddish brown, moist, fine to coarse grained sand	
1545	20			R-5	24 27 40			SM	SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining	
1540	25			R-6	50/3"				no recovery	
	30								Drilled to 25.25' Sampled to 25.25' Groundwater at 18.2' Backfilled with cuttings, Groundwater measured at 17.42' on 01/16/18	

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-4

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1567'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sandtrace gravel to 1"	CR
1565				R-1	10 9 7	107	8	SM	**Older Alluvium (Qalo)**; SILTY SAND, medim dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining, CO = -5.03%	CO
	5			R-2	8 10 15	117	8		SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, CO = -7.22%	CO
1560										
	10			R-3	8 16 20			SW-SM	Well-graded SAND with SILT, medium dense, dark reddish brown, moist, fine to coarse grained sand	
1555										
	15			R-4	30 50	120	9	SM	SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1550									Drilled to 16' Sampled to 16' Groundwater not encountered Backfilled with cuttings	
	20									
1545										
	25									
1540										
	30									

SAMPLE TYPES:

B	BULK SAMPLE
C	CORE SAMPLE
G	GRAB SAMPLE
R	RING SAMPLE
S	SPLIT SPOON SAMPLE
T	TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-5

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1566'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
1565	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND, brown, moist, fine to coarse grained sand	
				R-1	18 26 28	123	5	SM	**Older Alluvium (Qalo)**; SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1560	5			R-2	22 32 34				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1555	10			R-3	50/6"				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Iron Oxide and Manganese Oxide staining	
1550	15			R-4	14 38 50	120	14		SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Iron Oxide and Manganese Oxide staining	
									Drilled to 16.5' Sampled to 16.5' Groundwater not encountered Backfilled with cuttings	
1545	20									
1540	25									
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG LB-6

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1564'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel, few concrete debris, 44% -200	-200, CR
				R-1	6 8 12	116	9	SM	**Older Alluvium (Qalo)**; SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, CO = -1.18%	
1560	5			R-2	10 14 16	123	9		SILTY SAND, medium dense, dark brown, moist, fine to medium grained sand	CO
1555										
	10			R-3	18 36 36	127	12		SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1550										
	15			R-4	20 50				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
									Drilled to 16' Sampled to 16' Groundwater not encountered Backfilled with cuttings	
1545	20									
1540										
	25									
1535										
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-7

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1563'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel	
1560				R-1	20 25 33	115	6	SM	**Older Alluvium (Qalo)**; SILTY SAND, dense, dark brown, moist, fine to medium grained sand, few pinhole voids	
	5			R-2	15 22 23	113	8		SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, few pinhole voids	
1555										
	10			R-3	43 50/5"				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1550										
	15			R-4	8 12 24	125	10	SC-SM	SILTY, CLAYEY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand	
1545									Drilled to 16.5' Sampled to 16.5' Groundwater not encountered Backfilled with cuttings	
	20									
1540										
	25									
1535										
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG P-1

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1566'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
1565	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel	
				S-1	6 12 13			ML	**Older Alluvium (Qalo)**; SANDY SILT, hard, dark reddish brown, mosit, fine to medium grained sand	SA
1560	5								Drilled to 5' Sampled to 5' Groundwater not encountered Backfilled with cuttings	
1555	10									
1550	15									
1545	20									
1540	25									
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

GEOTECHNICAL BORING LOG P-2

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1564'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel	
1560	5			S-1	10 13 9			SM	**Older Alluvium (Qalo)**; SILTY SAND, medium dense, dark brown, moist, fine to medium grained sand	
									Drilled to 5' Sampled to 5' Groundwater not encountered Backfilled with cuttings	
1555	10									
1550	15									
1545	20									
1540	25									
1535	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG P-3

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1563'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
		N S							*This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.*	
1560	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel	
	5			S-1	4 4 4			CL	**Older Alluvium (Qalo)**; SANDY Lean CLAY, stiff, dark reddish brown, very fine to fine grained sand	
1555									Drilled to 5' Sampled to 5' Groundwater not encountered Backfilled with cuttings	
	10									
1550										
	15									
1545										
	20									
1540										
	25									
1535										
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

1/22/18

Leighton Consulting
Attn: Jeffrey T. DeLand

Subject: CPT Site Investigation
T&C Skilled Nursing Facility
Moreno Valley, California
GREGG Project Number: 18-509SH

Dear Mr. DeLand:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☐
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (562) 427-6899.

Sincerely,
GREGG Drilling & Testing, Inc.

Frank Stolfi
HRSC Division Manager, Gregg Drilling & Testing, Inc.

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
CPT-1	1/22/18	25	-	-	-
CPT-2	1/22/18	25	-	-	-
CPT-3	1/22/18	25	-	-	-
CPT-4	1/22/18	25	-	-	-
CPT-5	1/22/18	25	-	-	-
CPT-6	1/22/18	25	-	-	-
CPT-7	1/22/18	39	-	-	39.0

2726 Walnut Ave. • Signal Hill, California 90755 • (562) 427-6899 • FAX (562) 427-3314
www.greggdrilling.com

Bibliography

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DeGroot, D.J. and A.J. Lutenegger, "Reliability of Soil Gas Sampling and Characterization Techniques", International Site Characterization Conference - Atlanta, 1998.

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Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

Cone Penetration Testing Procedure (CPT)

Gregg Drilling carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT*.

The cone takes measurements of tip resistance (q_c), sleeve resistance (f_s), and penetration pore water pressure (u_2). Measurements are taken at either 2.5 or 5 cm intervals during penetration to provide a nearly continuous profile. CPT data reduction and basic interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are stored electronically for further analysis and reference. All CPT soundings are performed in accordance with revised ASTM standards (D 5778-12).

The 5mm thick porous plastic filter element is located directly behind the cone tip in the u_2 location. A new saturated filter element is used on each sounding to measure both penetration pore pressures as well as measurements during a dissipation test (*PPDT*). Prior to each test, the filter element is fully saturated with oil under vacuum pressure to improve accuracy.

When the sounding is completed, the test hole is backfilled according to client specifications. If grouting is used, the procedure generally consists of pushing a hollow tremie pipe with a "knock out" plug to the termination depth of the CPT hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.

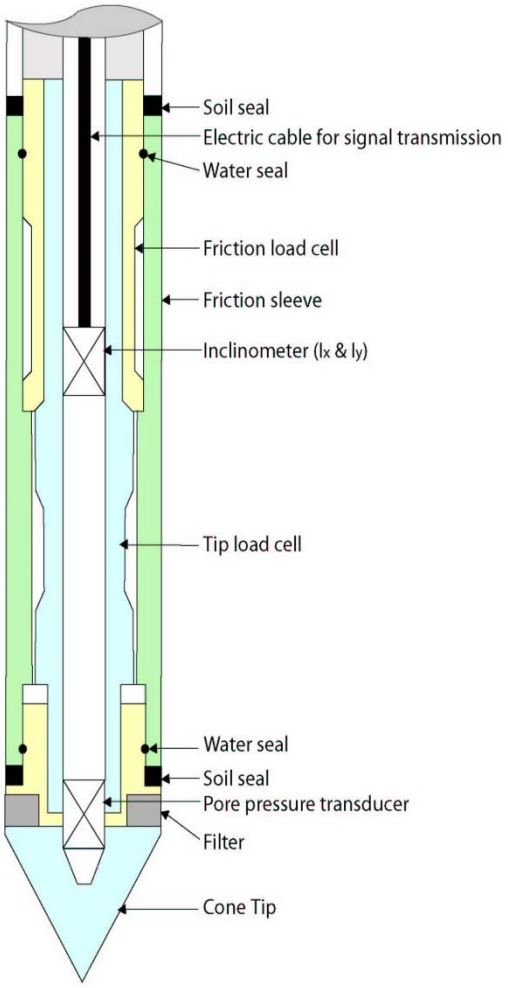


Figure CPT

Gregg 15cm^2 Standard Cone Specifications

Dimensions	
Cone base area	15 cm^2
Sleeve surface area	225 cm^2
Cone net area ratio	0.80
Specifications	
Cone load cell	
Full scale range	180 kN (20 tons)
Overload capacity	150%
Full scale tip stress	120 MPa (1,200 tsf)
Repeatability	120 kPa (1.2 tsf)
Sleeve load cell	
Full scale range	31 kN (3.5 tons)
Overload capacity	150%
Full scale sleeve stress	1,400 kPa (15 tsf)
Repeatability	1.4 kPa (0.015 tsf)
Pore pressure transducer	
Full scale range	7,000 kPa (1,000 psi)
Overload capacity	150%
Repeatability	7 kPa (1 psi)

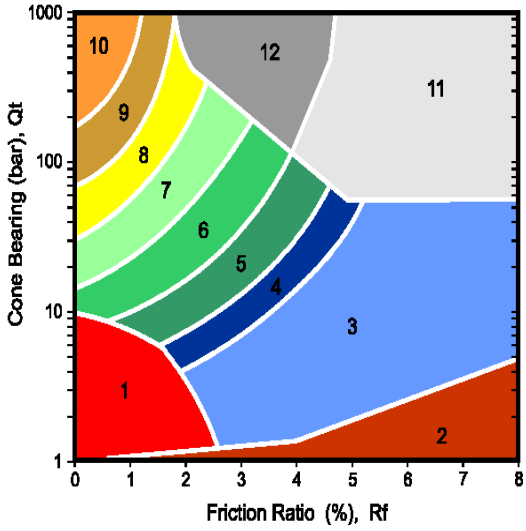
Note: The repeatability during field use will depend somewhat on ground conditions, abrasion, maintenance and zero load stability.

Cone Penetration Test Data & Interpretation

The Cone Penetration Test (CPT) data collected are presented in graphical and electronic form in the report. The plots include interpreted Soil Behavior Type (SBT) based on the charts described by Robertson (1990). Typical plots display SBT based on the non-normalized charts of Robertson et al (1986). For CPT soundings deeper than 30m, we recommend the use of the normalized charts of Robertson (1990) which can be displayed as SBTn, upon request. The report also includes spreadsheet output of computer calculations of basic interpretation in terms of SBT and SBTn and various geotechnical parameters using current published correlations based on the comprehensive review by Lunne, Robertson and Powell (1997), as well as recent updates by Professor Robertson (Guide to Cone Penetration Testing, 2015). The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg Drilling & Testing Inc. does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and does not assume any liability for use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software. Some interpretation methods require input of the groundwater level to calculate vertical effective stress. An estimate of the in-situ groundwater level has been made based on field observations and/or CPT results, but should be verified by the user.

A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Note that it is not always possible to clearly identify a soil type based solely on q_t, f_s, and u_2. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the correct soil behavior type.



ZONE		SBT
1		Sensitive, fine grained
2		Organic materials
3		Clay
4		Silty clay to clay
5		Clayey silt to silty clay
6		Sandy silt to clayey silt
7		Silty sand to sandy silt
8		Sand to silty sand
9		Sand
10		Gravely sand to sand
11		Very stiff fine grained*
12		Sand to clayey sand*

*over consolidated or cemented

Figure SBT (After Robertson et al., 1986) – Note: Colors may vary slightly compared to plots

Cone Penetration Test (CPT) Interpretation

Gregg uses a proprietary CPT interpretation and plotting software. The software takes the CPT data and performs basic interpretation in terms of soil behavior type (SBT) and various geotechnical parameters using current published empirical correlations based on the comprehensive review by Lunne, Robertson and Powell (1997). The interpretation is presented in tabular format using MS Excel. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software.

The following provides a summary of the methods used for the interpretation. Many of the empirical correlations to estimate geotechnical parameters have constants that have a range of values depending on soil type, geologic origin and other factors. The software uses 'default' values that have been selected to provide, in general, conservatively low estimates of the various geotechnical parameters.

Input:

1 Units for display (Imperial or metric) (atm. pressure, p_a = 0.96 tsf or 0.1 MPa)
2 Depth interval to average results (ft or m). Data are collected at either 0.02 or 0.05m and can be averaged every 1, 3 or 5 intervals.
3 Elevation of ground surface (ft or m)
4 Depth to water table, z_w (ft or m) – input required
5 Net area ratio for cone, a (default to 0.80)
6 Relative Density constant, C_{Dr} (default to 350)
7 Young's modulus number for sands, α (default to 5)
8 Small strain shear modulus number
  a. for sands, S_G (default to 180 for SBT_n 5, 6, 7)
  b. for clays, C_G (default to 50 for SBT_n 1, 2, 3 & 4)
9 Undrained shear strength cone factor for clays, N_{kt} (default to 15)
10 Over Consolidation ratio number, k_{ocr} (default to 0.3)
11 Unit weight of water, (default to γ_w = 62.4 lb/ft^3 or 9.81 kN/m^3)

Column

1 Depth, z, (m) – CPT data is collected in meters
2 Depth (ft)
3 Cone resistance, q_c (tsf or MPa)
4 Sleeve resistance, f_s (tsf or MPa)
5 Penetration pore pressure, u (psi or MPa), measured behind the cone (i.e. u_2)
6 Other – any additional data
7 Total cone resistance, q_t (tsf or MPa) $q_t = q_c + u(1-a)$

8	Friction Ratio, R_f (%)	$R_f = (f_s/q_t) \times 100\%$
9	Soil Behavior Type (non-normalized), SBT	see note
10	Unit weight, γ (pcf or kN/m^3)	based on SBT, see note
11	Total overburden stress, σ_v (tsf)	$\sigma_{vo} = \sigma z$
12	In-situ pore pressure, u_o (tsf)	$u_o = \gamma_w (z - z_w)$
13	Effective overburden stress, σ'_{vo} (tsf)	$\sigma'_{vo} = \sigma_{vo} - u_o$
14	Normalized cone resistance, Q_{t1}	$Q_{t1} = (q_t - \sigma_{vo}) / \sigma'_{vo}$
15	Normalized friction ratio, F_r (%)	$F_r = f_s / (q_t - \sigma_{vo}) \times 100\%$
16	Normalized Pore Pressure ratio, B_q	$B_q = u - u_o / (q_t - \sigma_{vo})$
17	Soil Behavior Type (normalized), SBT_n	see note
18	SBT_n Index, I_c	see note
19	Normalized Cone resistance, Q_{tn} (n varies with I_c)	see note
20	Estimated permeability, k_{SBT} (cm/sec or ft/sec)	see note
21	Equivalent SPT N_{60}, blows/ft	see note
22	Equivalent SPT $(N_1)_{60}$ blows/ft	see note
23	Estimated Relative Density, D_r, (%)	see note
24	Estimated Friction Angle, ϕ', (degrees)	see note
25	Estimated Young's modulus, E_s (tsf)	see note
26	Estimated small strain Shear modulus, Go (tsf)	see note
27	Estimated Undrained shear strength, s_u (tsf)	see note
28	Estimated Undrained strength ratio	s_u/σ_v'
29	Estimated Over Consolidation ratio, OCR	see note

Notes:

1 Soil Behavior Type (non-normalized), SBT (Lunne et al., 1997 and table below)

2 Unit weight, γ either constant at 119 pcf or based on Non-normalized SBT (Lunne et al., 1997 and table below)

3 Soil Behavior Type (Normalized), SBT_n Lunne et al. (1997)

4 SBT_n Index, I_c $I_c = ((3.47 - \log Q_{t1})^2 + (\log F_r + 1.22)^2)^{0.5}$

5 Normalized Cone resistance, Q_{tn} (n varies with Ic)

$Q_{tn} = ((q_t - \sigma_{vo})/pa)\ (pa/(\sigma'_{vo})^n$ and recalculate I_c, then iterate:

When $I_c < 1.64$, n = 0.5 (clean sand)
When $I_c > 3.30$, n = 1.0 (clays)
When $1.64 < I_c < 3.30$, $n = (I_c - 1.64)0.3 + 0.5$
Iterate until the change in n, $\Delta n < 0.01$

6 Estimated permeability, k_{SBT} based on Normalized SBT_n (Lunne et al., 1997 and table below)

7 Equivalent SPT N_{60}, blows/ft Lunne et al. (1997)

$$\frac{(q_t/p_a)}{N_{60}} = 8.5\left(1 - \frac{I_c}{4.6}\right)$$

8 Equivalent SPT $(N_1)_{60}$ blows/ft $(N_1)_{60} = N_{60}\, C_{N,}$
where $C_N = (pa/\sigma'_{vo})^{0.5}$

9 Relative Density, D_r, (%) $D_r^2 = Q_{tn} / C_{Dr}$
Only SBT_n 5, 6, 7 & 8 *Show 'N/A' in zones 1, 2, 3, 4 & 9*

10 Friction Angle, ϕ', (degrees) $\tan\phi' = \frac{1}{2.68}\left[\log\left(\frac{q_c}{\sigma'_{vo}}\right) + 0.29\right]$
Only SBT_n 5, 6, 7 & 8 *Show'N/A' in zones 1, 2, 3, 4 & 9*

11 Young's modulus, E_s $E_s = \alpha\, q_t$
Only SBT_n 5, 6, 7 & 8 *Show 'N/A' in zones 1, 2, 3, 4 & 9*

12 Small strain shear modulus, Go

a. $G_o = S_G\,(q_t\ \sigma'_{vo}\ pa)^{1/3}$ *For SBT_n 5, 6, 7*

b. $G_o = C_G\, q_t$ *For SBT_n 1, 2, 3& 4*

Show 'N/A' in zones 8 & 9

13 Undrained shear strength, s_u $s_u = (q_t - \sigma_{vo}) / N_{kt}$
Only SBT_n 1, 2, 3, 4 & 9 *Show 'N/A' in zones 5, 6, 7 & 8*

14 Over Consolidation ratio, OCR $OCR = k_{ocr}\, Q_{t1}$
Only SBT_n 1, 2, 3, 4 & 9 *Show 'N/A' in zones 5, 6, 7 & 8*

The following updated and simplified SBT descriptions have been used in the software:

SBT Zones		**SBT_n Zones**	
1	sensitive fine grained	1	sensitive fine grained
2	organic soil	2	organic soil
3	clay	3	clay
4	clay & silty clay	4	clay & silty clay
5	clay & silty clay		
6	sandy silt & clayey silt		

7	silty sand & sandy silt	5	silty sand & sandy silt
8	sand & silty sand	6	sand & silty sand
9	sand		
10	sand	7	sand
11	very dense/stiff soil*	8	very dense/stiff soil*
12	very dense/stiff soil*	9	very dense/stiff soil*

*heavily overconsolidated and/or cemented

Track when soils fall with zones of same description and print that description (i.e. if soils fall only within SBT zones 4 & 5, print 'clays & silty clays')

Estimated Permeability (see Lunne et al., 1997)

SBT_n	Permeability (ft/sec)	(m/sec)
1	$3x\ 10^{-8}$	$1x\ 10^{-8}$
2	$3x\ 10^{-7}$	$1x\ 10^{-7}$
3	$1x\ 10^{-9}$	$3x\ 10^{-10}$
4	$3x\ 10^{-8}$	$1x\ 10^{-8}$
5	$3x\ 10^{-6}$	$1x\ 10^{-6}$
6	$3x\ 10^{-4}$	$1x\ 10^{-4}$
7	$3x\ 10^{-2}$	$1x\ 10^{-2}$
8	$3x\ 10^{-6}$	$1x\ 10^{-6}$
9	$1x\ 10^{-8}$	$3x\ 10^{-9}$

Estimated Unit Weight (see Lunne et al., 1997)

SBT	Approximate Unit Weight (lb/ft^3)	(kN/m^3)
1	111.4	17.5
2	79.6	12.5
3	111.4	17.5
4	114.6	18.0
5	114.6	18.0
6	114.6	18.0
7	117.8	18.5
8	120.9	19.0
9	124.1	19.5
10	127.3	20.0
11	130.5	20.5
12	120.9	19.0

Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals can be used to measure equilibrium water pressure (at the time of the CPT). If conditions are hydrostatic, the equilibrium water pressure can be used to determine the approximate depth of the ground water table. A PPDT is conducted when penetration is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (*u)* with time is measured behind the tip of the cone and recorded.

Pore pressure dissipation data can be interpreted to provide estimates of:

- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permeability (k_h)

In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until it reaches equilibrium, *Figure PPDT*. This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1992 and Lunne et al. 1997.

A summary of the pore pressure dissipation tests are summarized in Table 1.

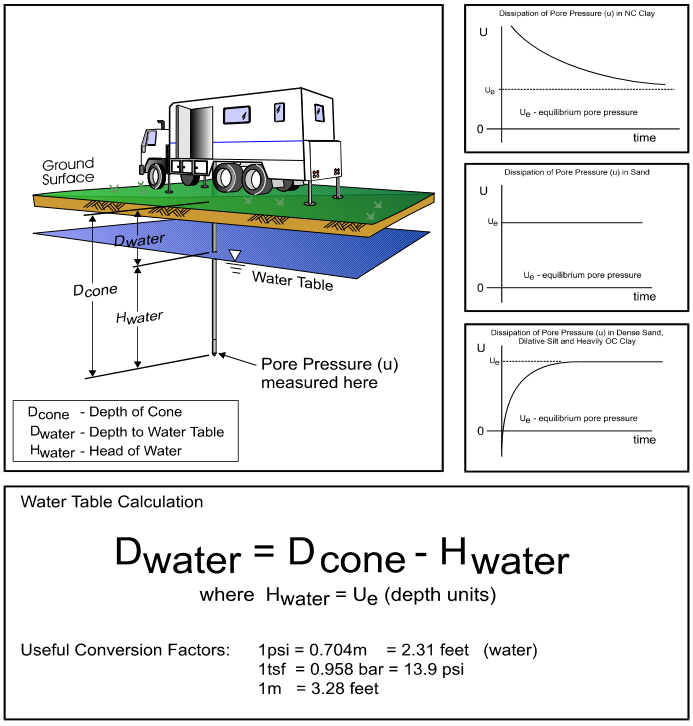


Figure PPDT

Seismic Cone Penetration Testing (SCPT)

Seismic Cone Penetration Testing (SCPT) can be conducted at various intervals during the Cone Penetration Test. Shear wave velocity (Vs) can then be calculated over a specified interval with depth. A small interval for seismic testing, such as 1-1.5m (3-5ft) allows for a detailed look at the shear wave profile with depth. Conversely, a larger interval such as 3-6m (10-20ft) allows for a more average shear wave velocity to be calculated. Gregg's cones have a horizontally active geophone located 0.2m (0.66ft) behind the tip.

To conduct the seismic shear wave test, the penetration of the cone is stopped and the rods are decoupled from the rig. An automatic hammer is triggered to send a shear wave into the soil. The distance from the source to the cone is calculated knowing the total depth of the cone and the horizontal offset distance between the source and the cone. To calculate an interval velocity, a minimum of two tests must be performed at two different depths. The arrival times between the two wave traces are compared to obtain the difference in time (Δt). The difference in depth is calculated (Δd) and velocity can be determined using the simple equation: v = Δd/Δt

Multiple wave traces can be recorded at the same depth to improve quality of the data.

A complete reference on seismic cone penetration tests is presented by Robertson et al. 1986 and Lunne et al. 1997.

A summary the shear wave velocities, arrival times and wave traces are provided with the report.

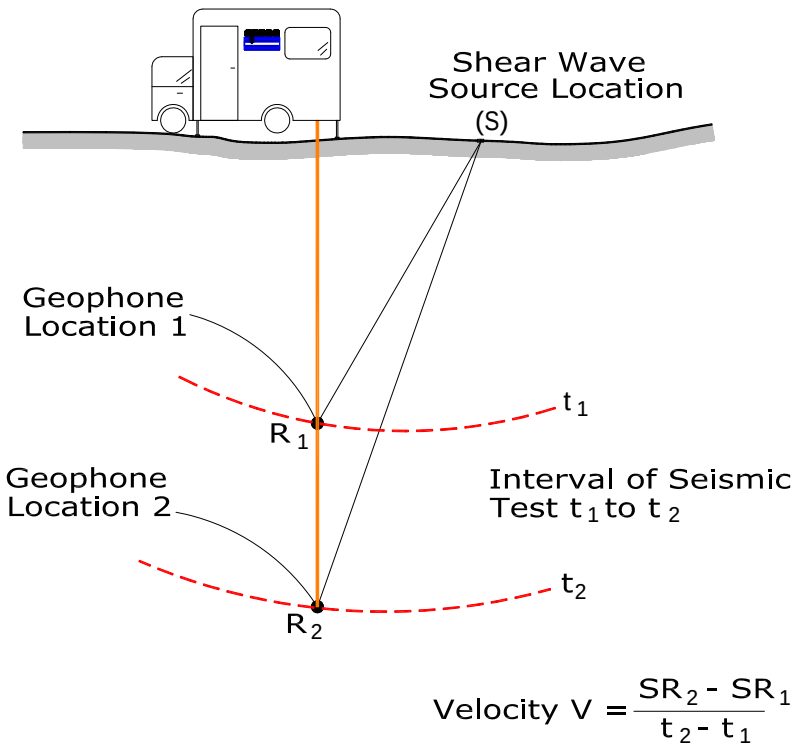


Figure SCPT

Groundwater Sampling

Gregg Drilling & Testing, Inc. conducts groundwater sampling using a sampler as shown in *Figure GWS*. The groundwater sampler has a retrievable stainless steel or disposable PVC screen with steel drop off tip. This allows for samples to be taken at multiple depth intervals within the same sounding location. In areas of slower water recharge, provisions may be made to set temporary PVC well screens during sampling to allow the pushing equipment to advance to the next sample location while the groundwater is allowed to infiltrate.

The groundwater sampler operates by advancing 44.5mm (1¾ inch) hollow push rods with the filter tip in a closed configuration to the base of the desired sampling interval. Once at the desired sample depth, the push rods are retracted; exposing the encased filter screen and allowing groundwater to infiltrate hydrostatically from the formation into the inlet screen. A small diameter bailer (approximately ½ or ¾ inch) is lowered through the push rods into the screen section for sample collection. The number of downhole trips with the bailer and time necessary to complete the sample collection at each depth interval is a function of sampling protocols, volume requirements, and the yield characteristics and storage capacity of the formation. Upon completion of sample collection, the push rods and sampler, with the exception of the PVC screen and steel drop off tip are retrieved to the ground surface, decontaminated and prepared for the next sampling event.

For a detailed reference on direct push groundwater sampling, refer to Zemo et. al., 1992.

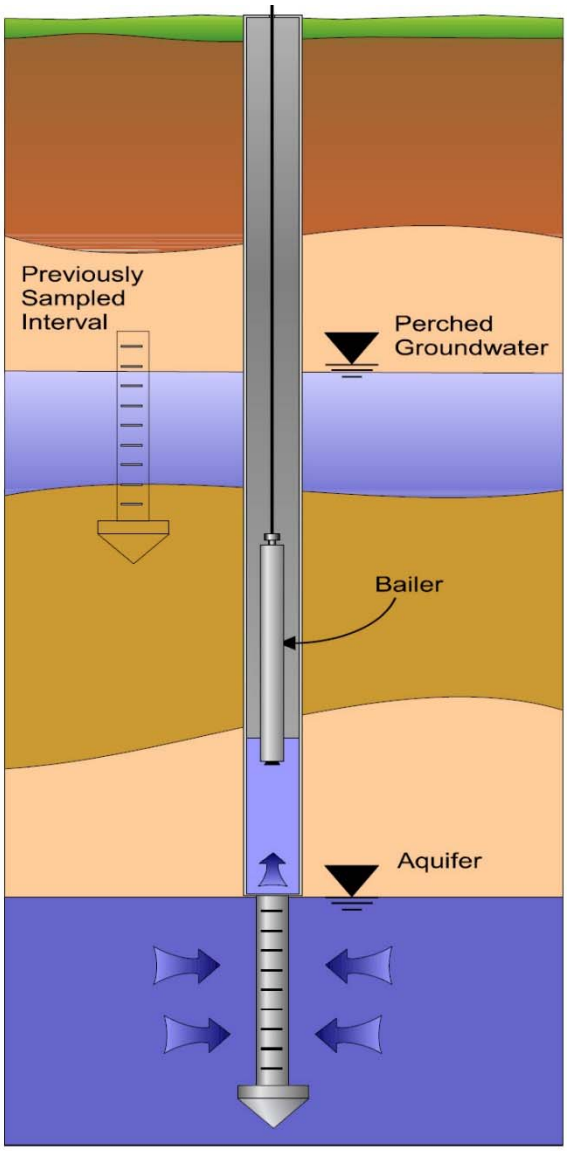


Figure GWS

Soil Sampling

Gregg Drilling & Testing, Inc. uses a piston-type push-in sampler to obtain small soil samples without generating any soil cuttings, *Figure SS*. Two different types of samplers (12 and 18 inch) are used depending on the soil type and density. The soil sampler is initially pushed in a "closed" position to the desired sampling interval using the CPT pushing equipment. Keeping the sampler closed minimizes the potential of cross contamination. The inner tip of the sampler is then retracted leaving a hollow soil sampler with inner 1¼" diameter sample tubes. The hollow sampler is then pushed in a locked "open" position to collect a soil sample. The filled sampler and push rods are then retrieved to the ground surface. Because the soil enters the sampler at a constant rate, the opportunity for 100% recovery is increased. For environmental analysis, the soil sample tube ends are sealed with Teflon and plastic caps. Often, a longer "split tube" can be used for geotechnical sampling.

For a detailed reference on direct push soil sampling, refer to Robertson et al, 1998.

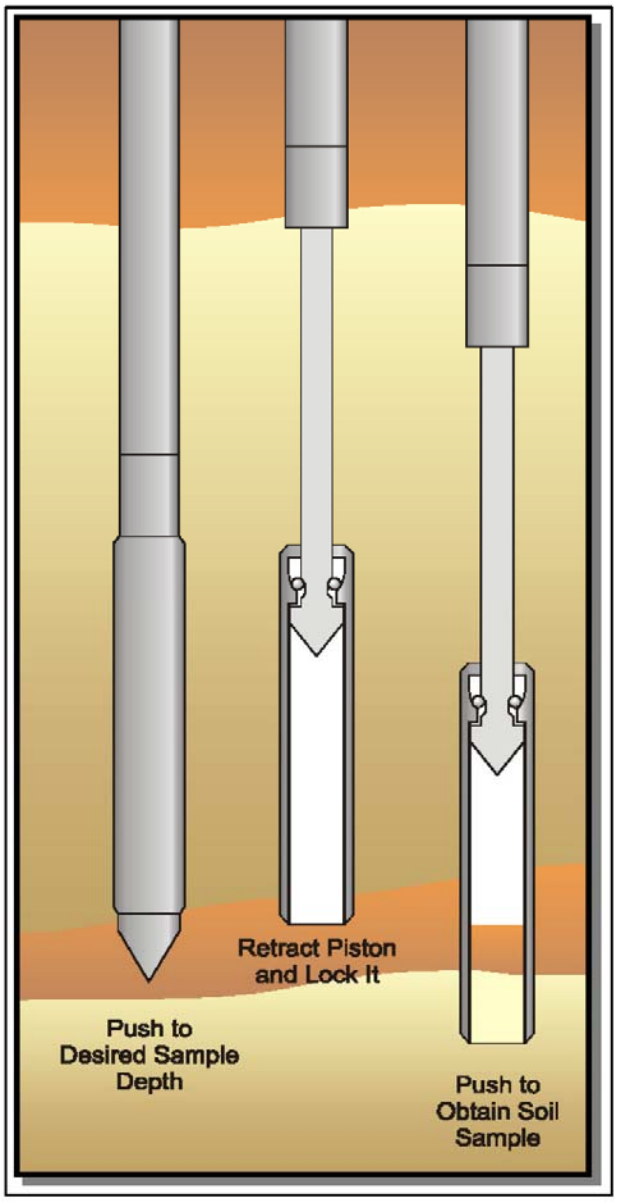


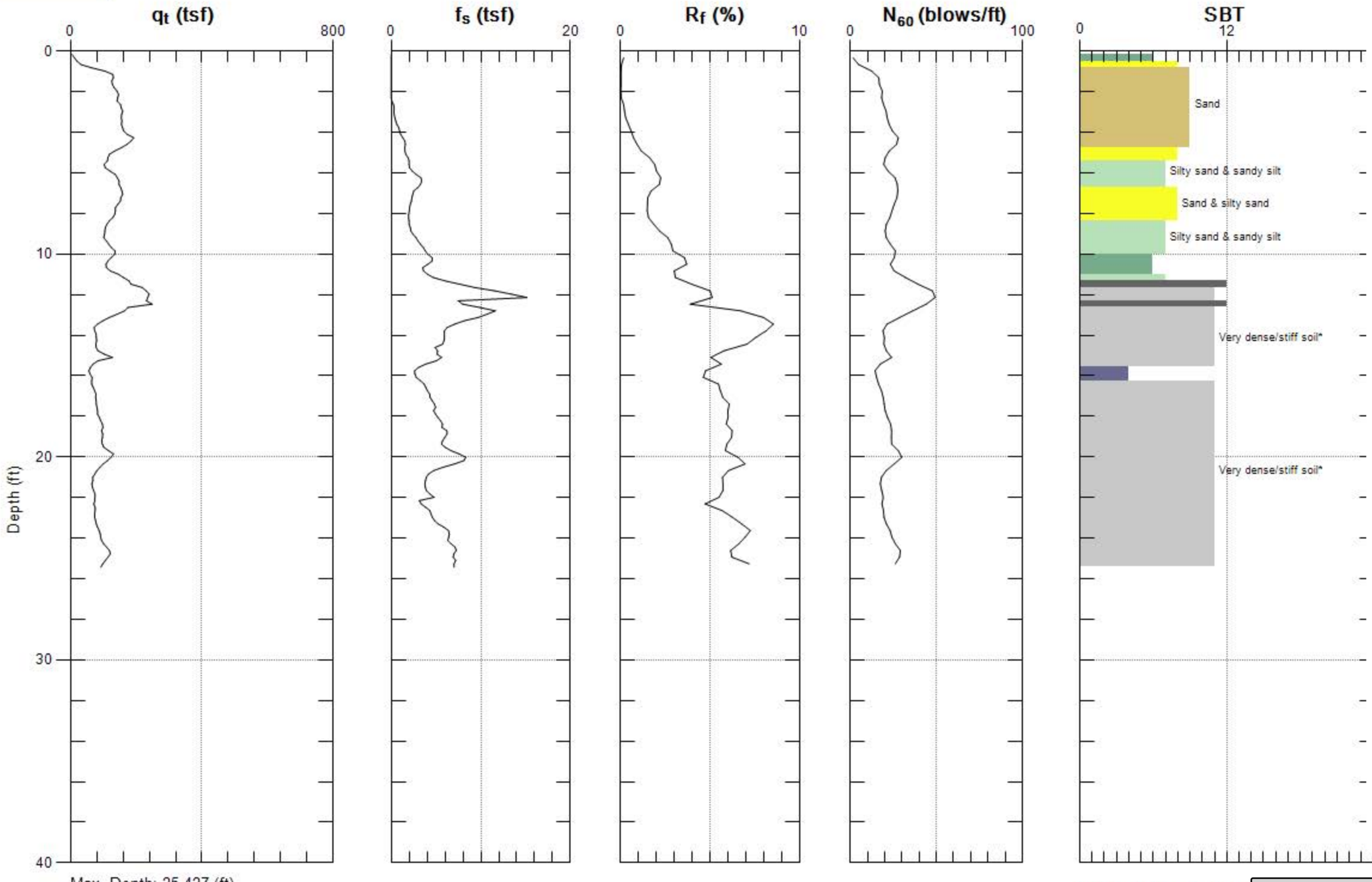
Figure SS

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-1 Date: 1/22/2018 07:51



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

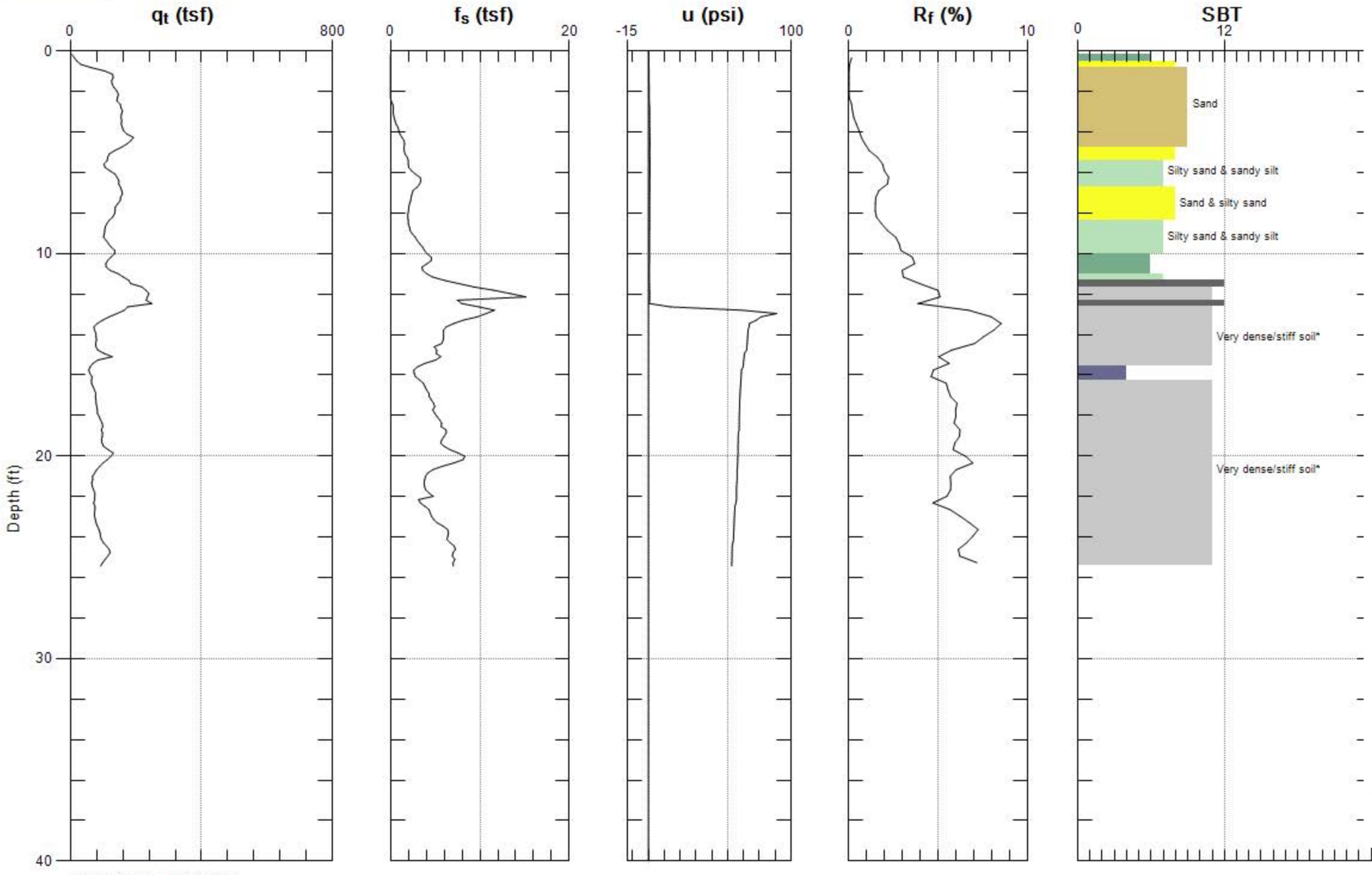
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-1 Date: 1/22/2018 07:51



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

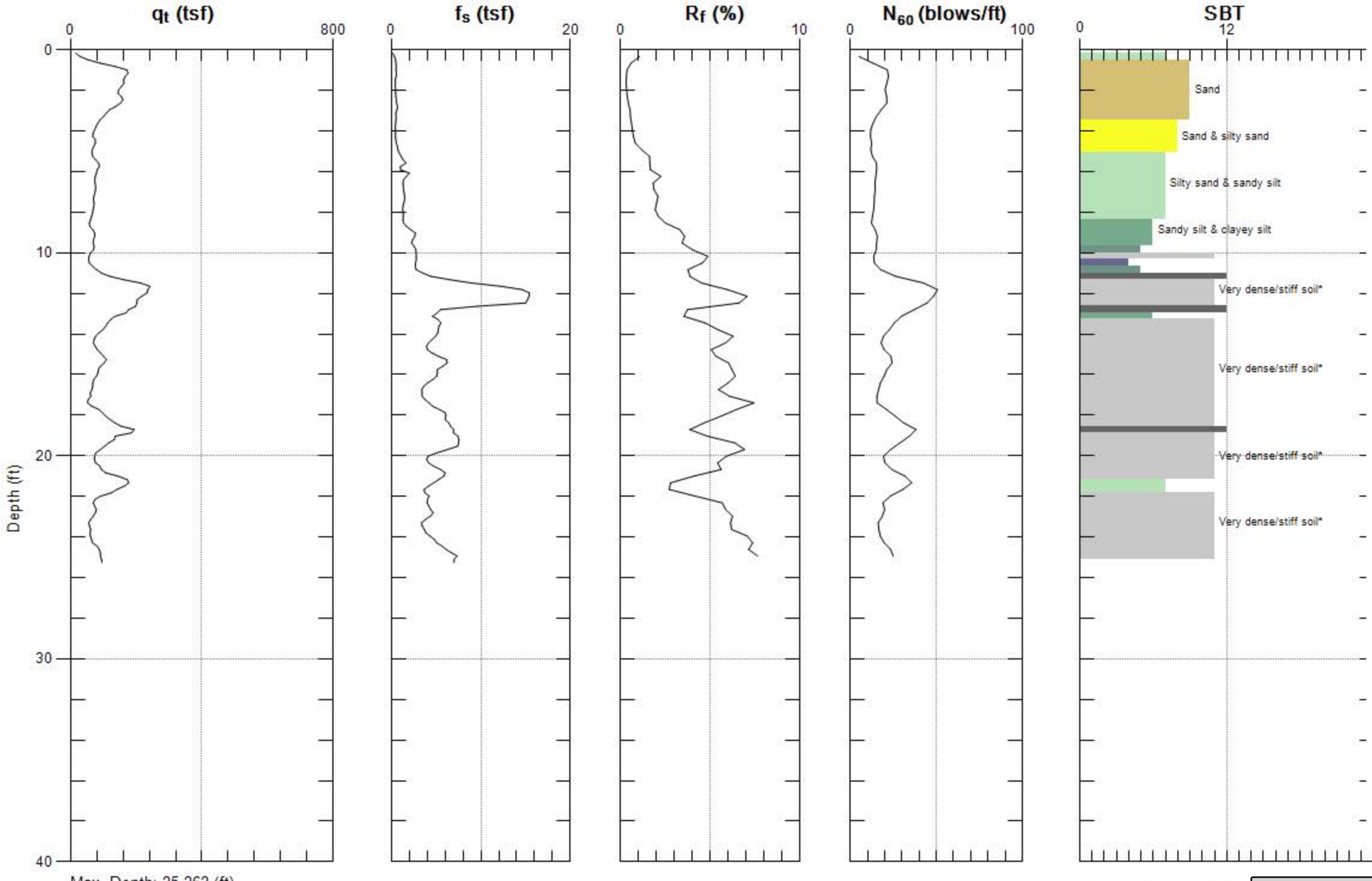
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-2 Date: 1/22/2018 07:22



Max. Depth: 25.262 (ft)
Avg. Interval: 0.328 (ft)

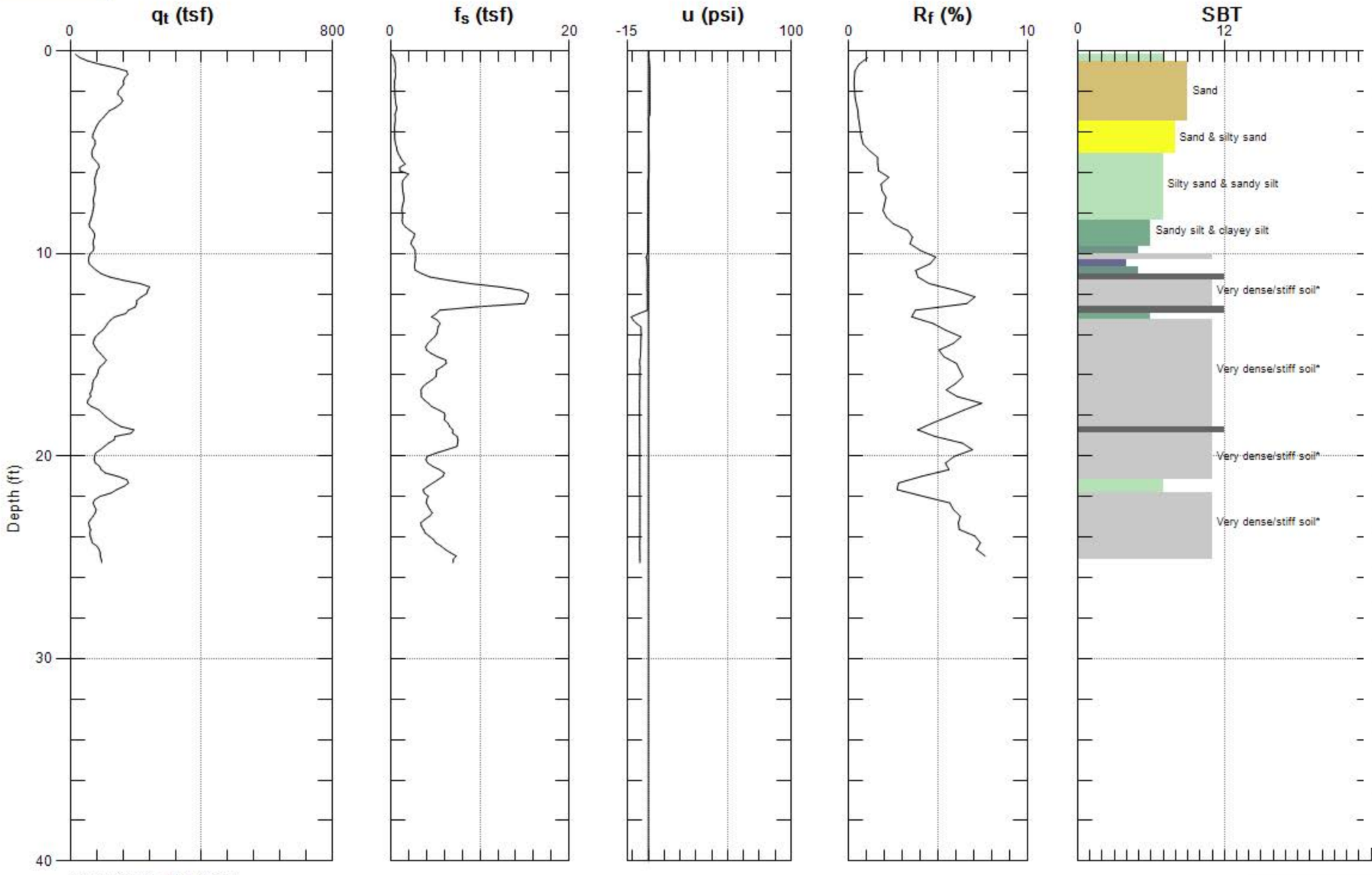
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-2 Date: 1/22/2018 07:22



Max. Depth: 25.262 (ft)
Avg. Interval: 0.328 (ft)

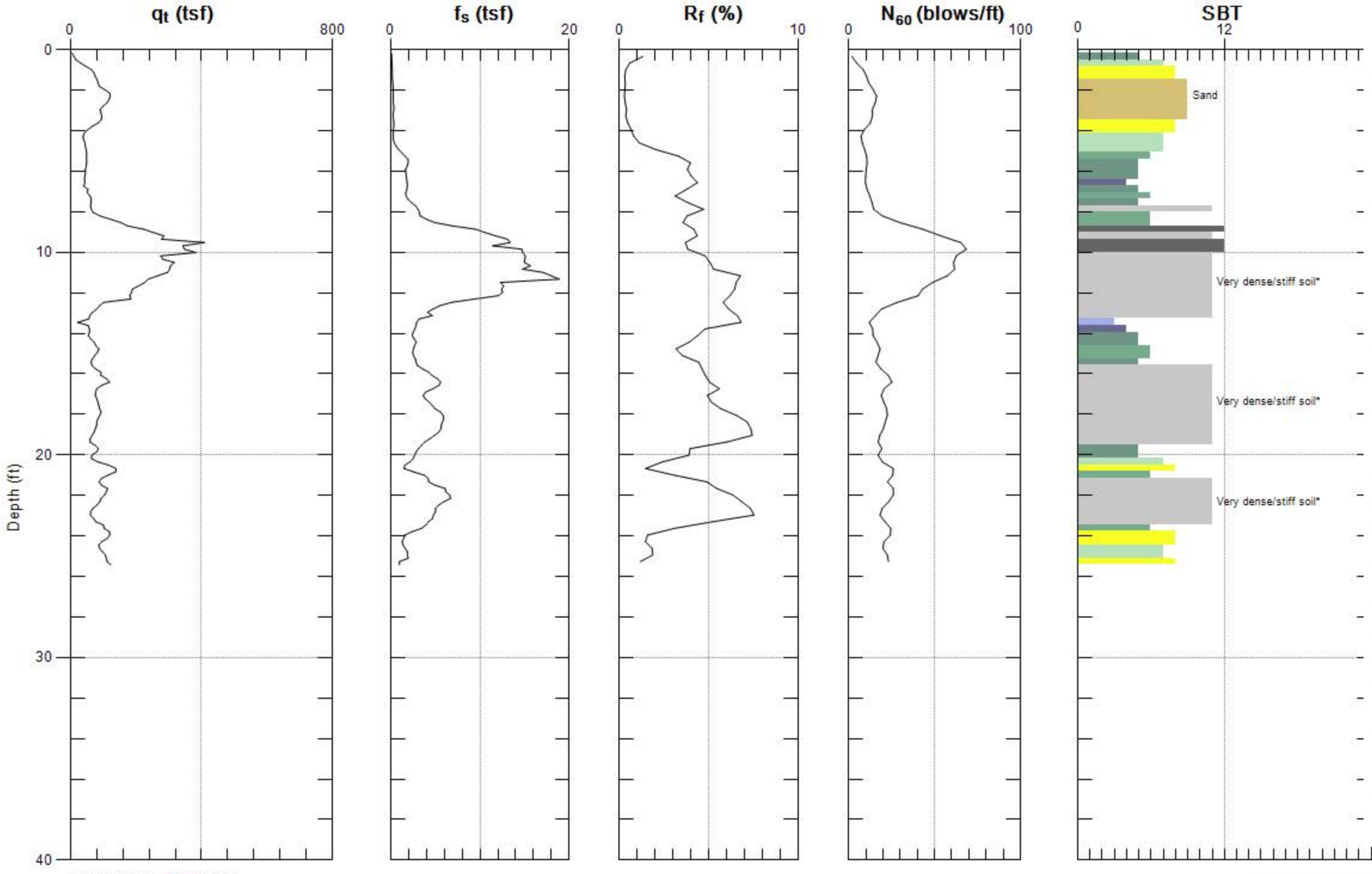
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-3 Date: 1/22/2018 08:20



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

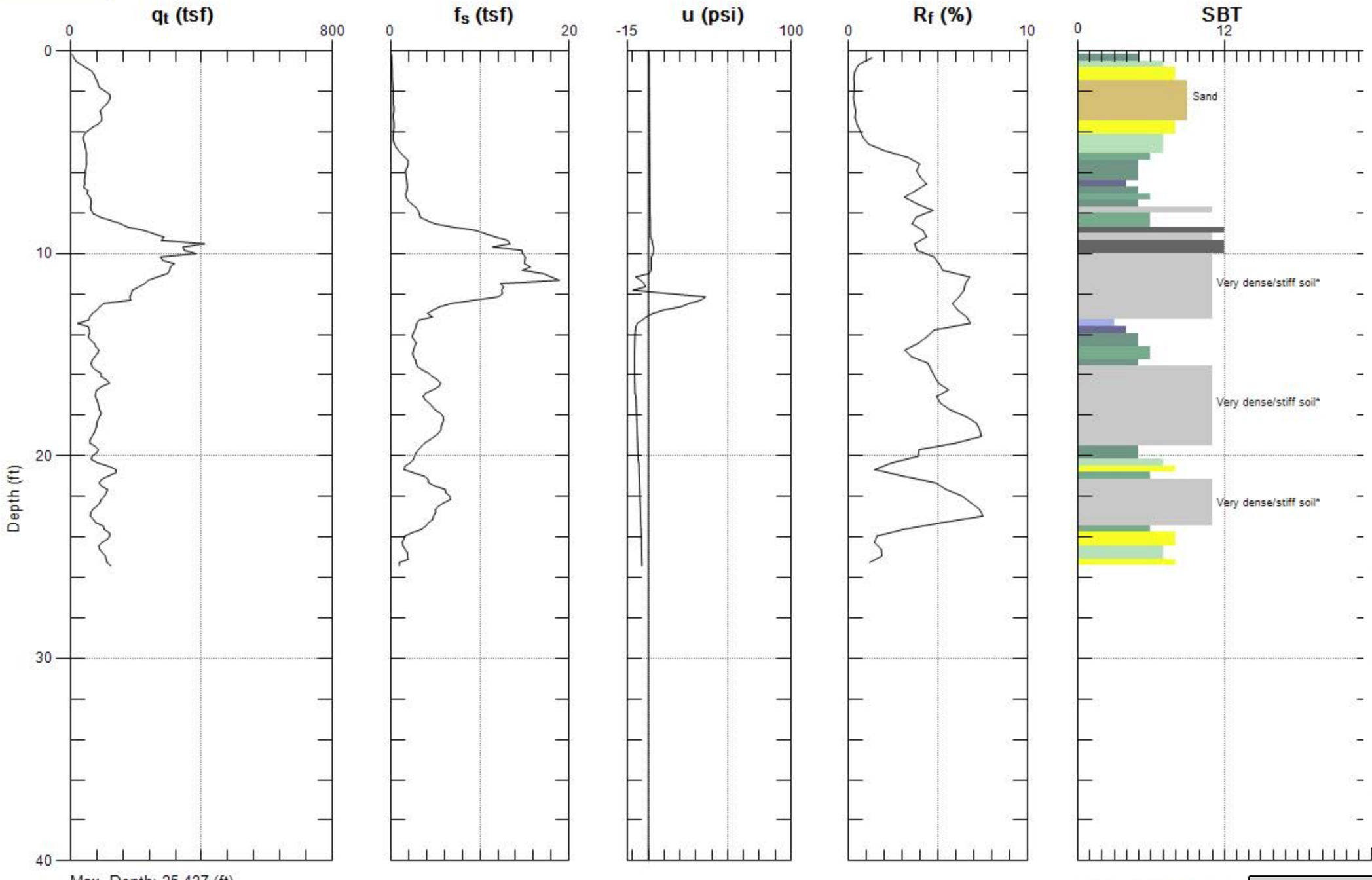
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-3 Date: 1/22/2018 08:20



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

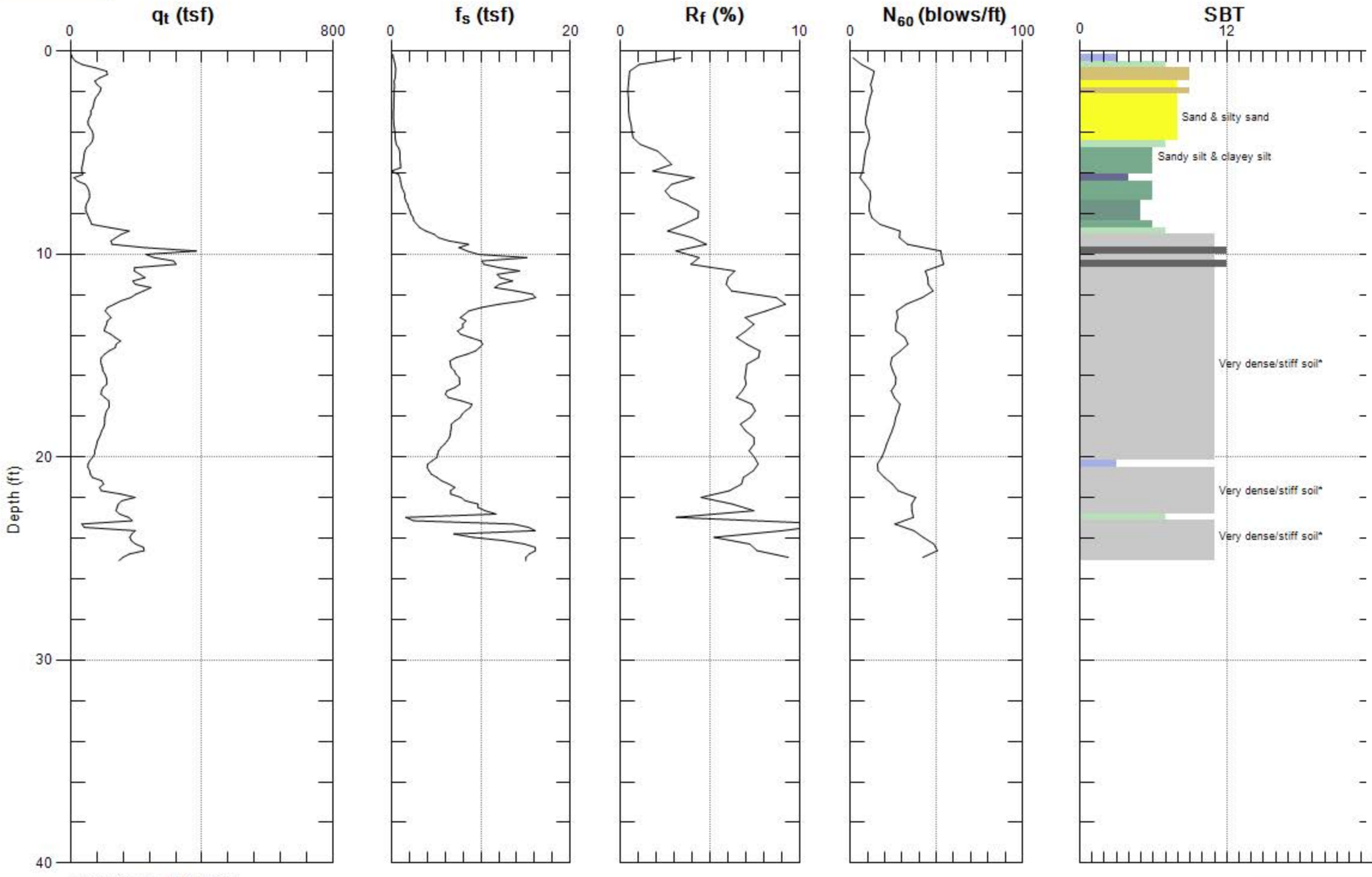
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-4 Date: 1/22/2018 08:52



Max. Depth: 25.098 (ft)
Avg. Interval: 0.328 (ft)

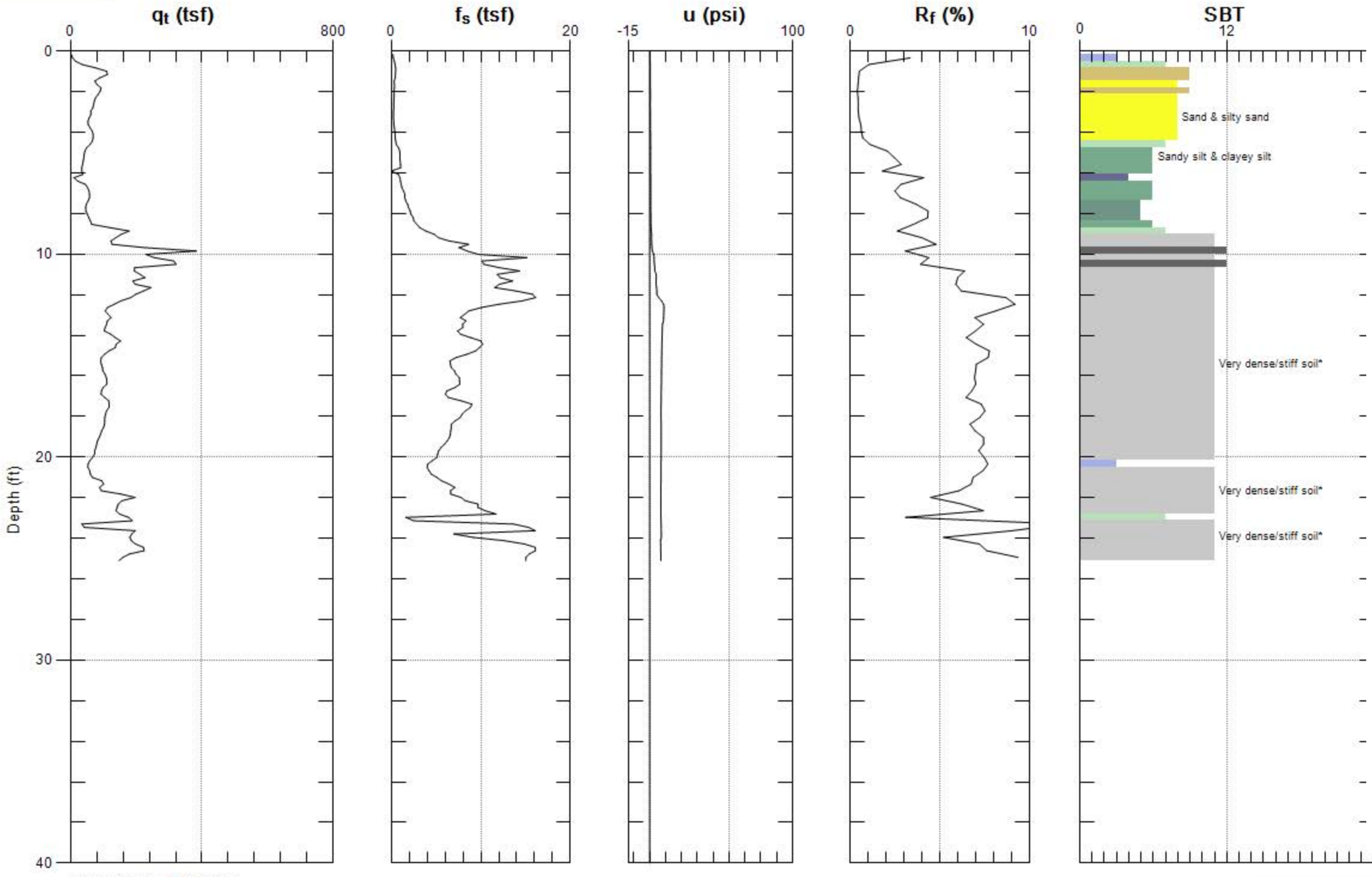
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-4 Date: 1/22/2018 08:52



Max. Depth: 25.098 (ft)
Avg. Interval: 0.328 (ft)

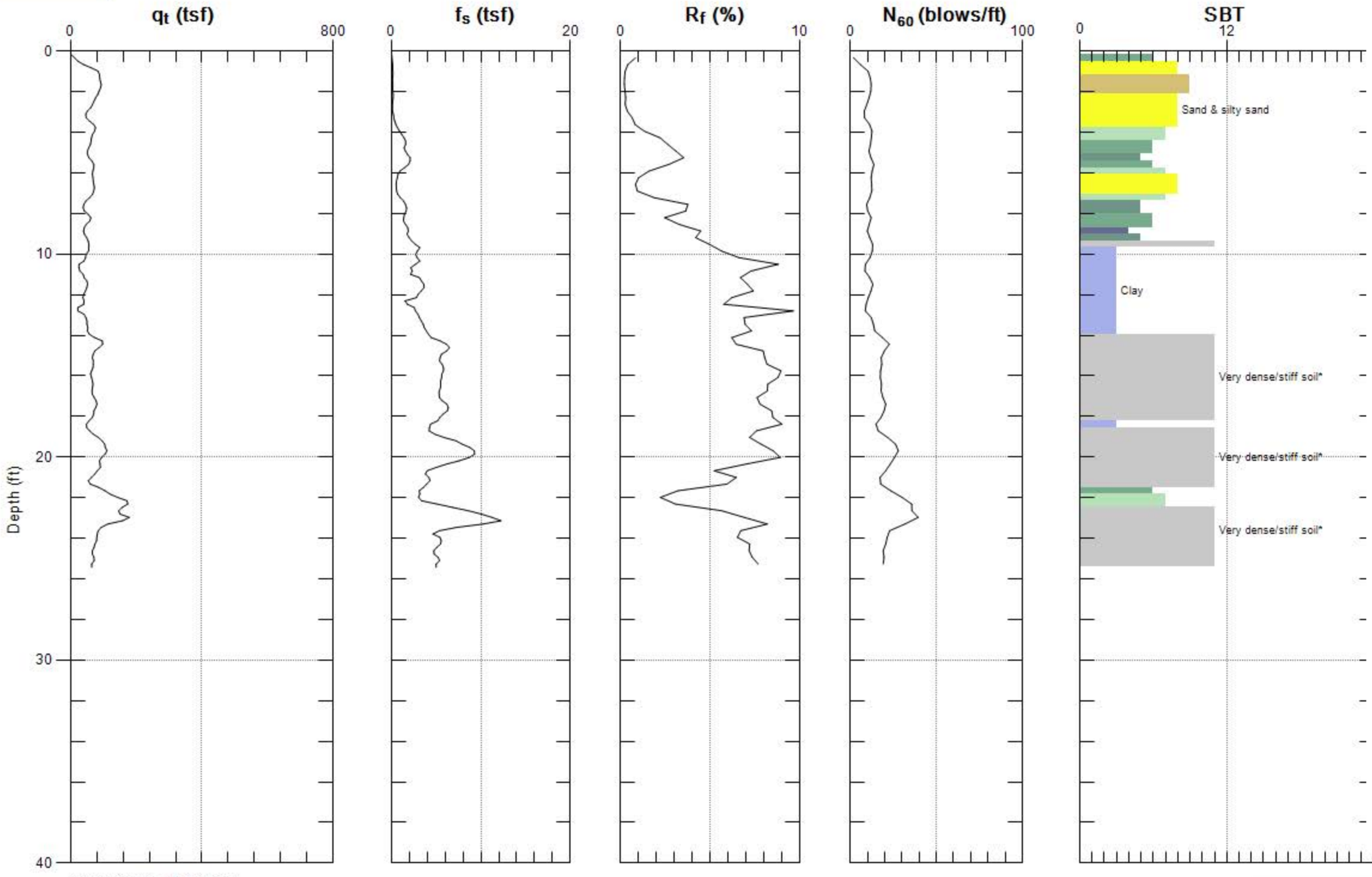
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-5 Date: 1/22/2018 09:16



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

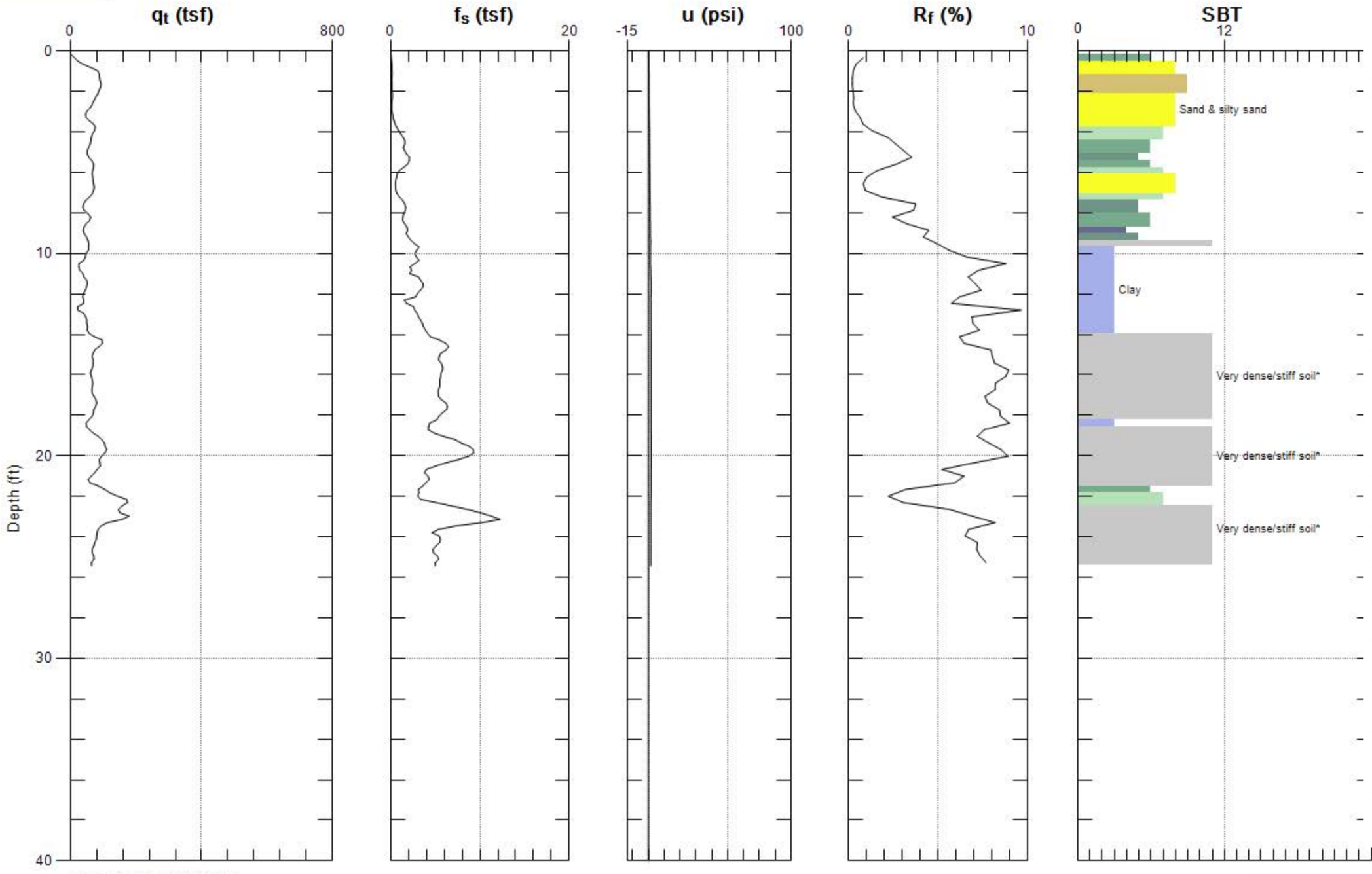
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-5 Date: 1/22/2018 09:16



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

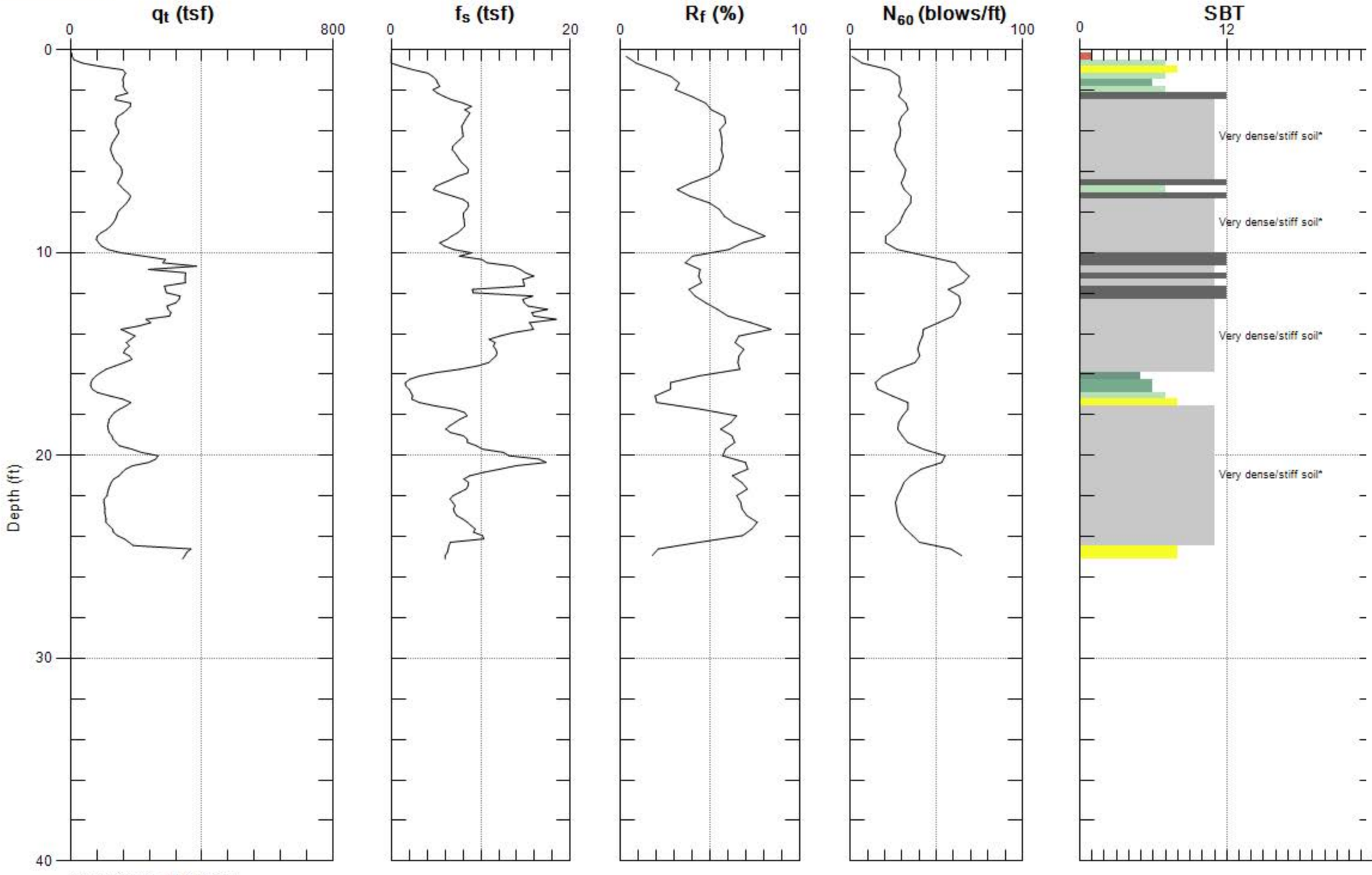
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-6 Date: 1/22/2018 09:33



Max. Depth: 25.098 (ft)
Avg. Interval: 0.328 (ft)

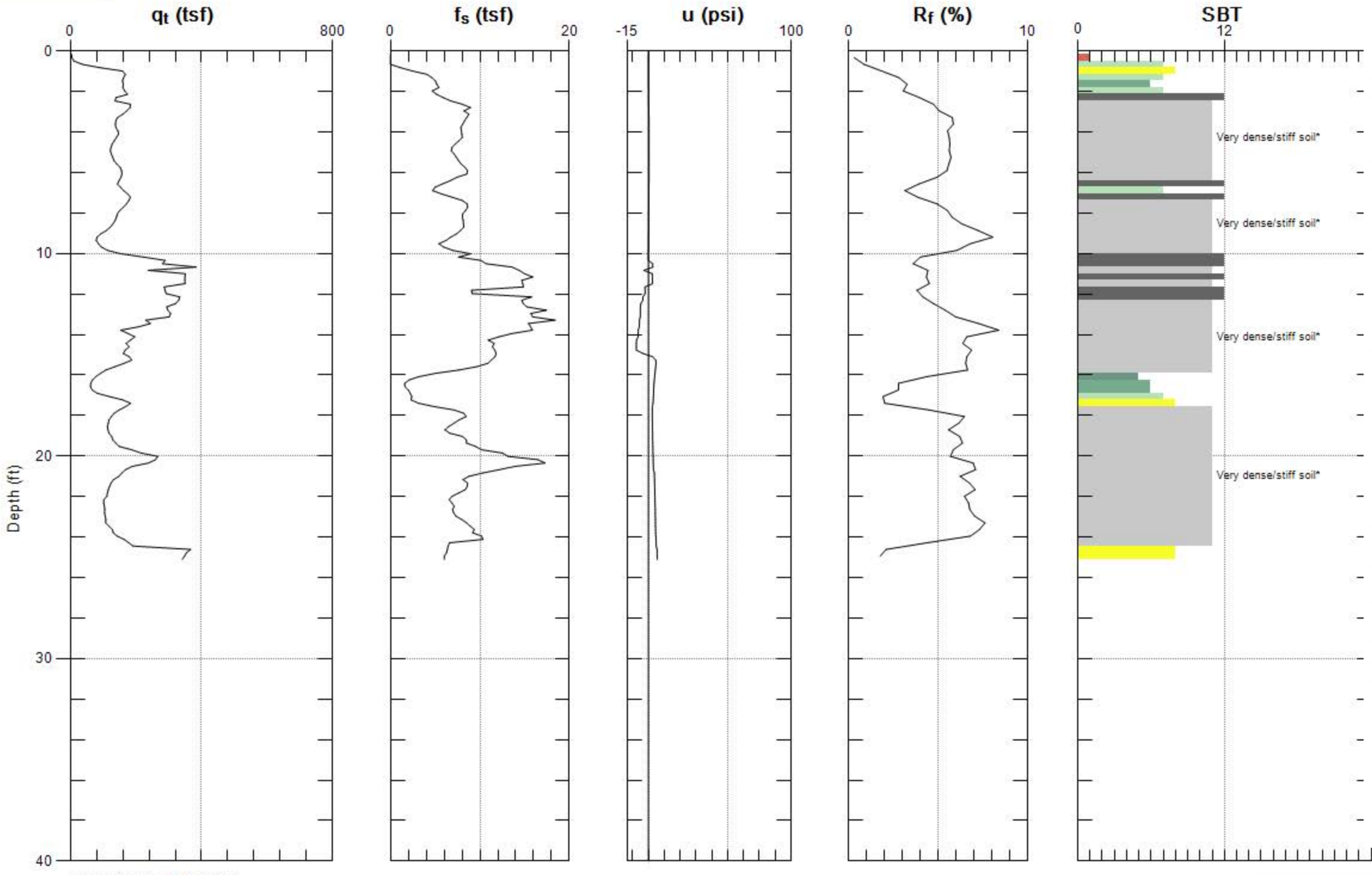
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-6 Date: 1/22/2018 09:33



Max. Depth: 25.098 (ft)
Avg. Interval: 0.328 (ft)

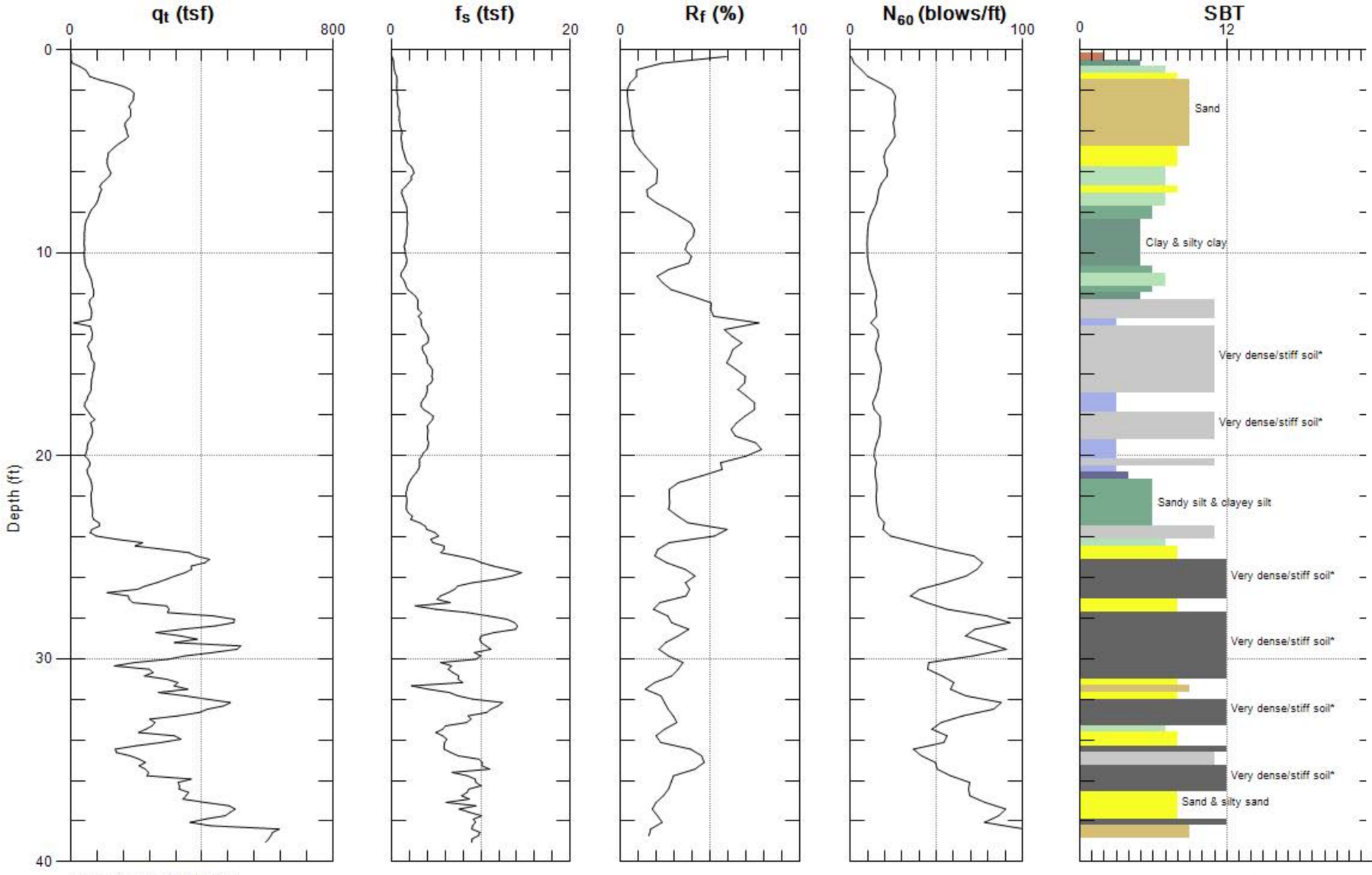
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-7 Date: 1/22/2018 10:19



Max. Depth: 39.042 (ft)
Avg. Interval: 0.328 (ft)

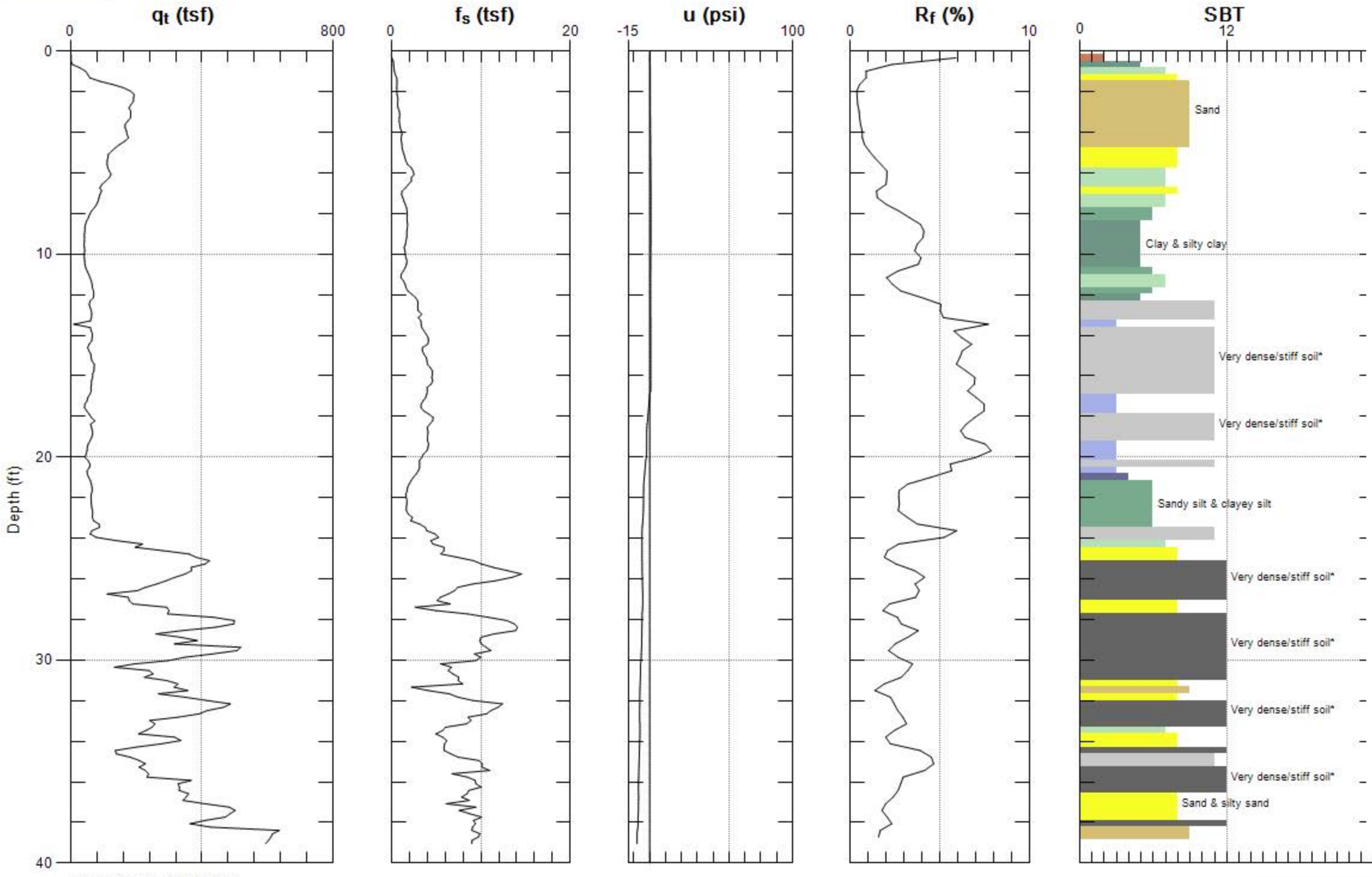
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-7 Date: 1/22/2018 10:19



Max. Depth: 39.042 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type

APPENDIX B

GEOTECHNICAL LABORATORY TESTING

Our geotechnical laboratory testing program was directed toward a quantitative and qualitative evaluation of physical and mechanical properties of soils underlying proposed improvements, and to aid in verifying soil classification.

In-Situ Moisture and Density: As-sampled soil moisture content was measured (ASTM D 2216) on selected samples recovered from our borings. In addition, in place dry density was measured (ASTM D 2937) on selected relatively undisturbed soil samples. Results of these tests are shown on our logs at the appropriate sample depths in Appendix A.

Percent Passing No. 200 Sieve: Percent fines (silt and clay) passing the No. 200 U.S. Standard Sieve was determined for soil samples in accordance with ASTM D 1140 Standard Test Method. Samples were dried and passed through a No. 4 sieve, then a No. 200 sieve. Result of this grain size analysis, as percent by dry weight passing the No. 200 U.S. Standard Sieve, is tabulated in this appendix and entered on our boring logs.

Particle Size (Sieve) Analysis: Particle size analysis of bulk soil samples by passing sieves was evaluated using the ASTM D 6913 Standard Test Method. Results of these analysis are presented on the *Particle-Size Distribution ASTM D 6913* sheets in this appendix.

Expansion Index (EI): An Expansion Index (EI) test was performed in accordance with the ASTM D 4829 Standard Test Method, for a shallow bulk soil sample from this site. EI results are included in this appendix on the "*Expansion Index of Soils*" sheet.

Consolidation: Consolidation tests run on relatively undisturbed drive soil samples from our borings were performed in accordance with ASTM D 2435. Results are included in this appendix on the *One-Dimensional Consolidation Properties of Soils* sheets.

R-value (CTM 301): For use in pavement design, two shallow subgrade bulk-soil samples were tested in accordance with CTM Test 301, to determine the R-value. Results are included in this appendix on the *R-value Test Results* sheets.

Corrosivity Tests: To evaluate corrosion potential of subsurface soils at the site, we tested two bulk soil samples collected during our subsurface exploration for pH, electrical resistivity (CTM 532/643), soluble sulfate content (CTM 417 Part II) and

soluble chloride content (CTM 422) testing. Results of these tests are enclosed at the end of this appendix.

Boring No.	LB-6							
Sample No.	B-1							
Depth (ft.)	0 - 5.0							
Sample Type	BULK							
Visual Soil Classification	SM							
Moisture Correction								
Wet Weight of Soil + Container (gm.)	1039.8							
Dry Weight of Soil + Container (gm.)	1023.1							
Weight of Container (gm)	699.7							
Moisture Content (%)	5.2							
Container No.:	123							
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	1039.8							
Weight of Container (gm.)	699.7							
Weight of Dry Sample (gm.)	323.4							
Container No.:	123							
After Wash								
Dry Weight of Sample + Container (gm)	880.8							
Weight of Container (gm)	699.7							
Dry Weight of Sample (gm)	181.1							
% Passing No. 200 Sieve	**44**							
% Retained No. 200 Sieve	56							

PERCENT PASSING No. 200 SIEVE
ASTM D 1140

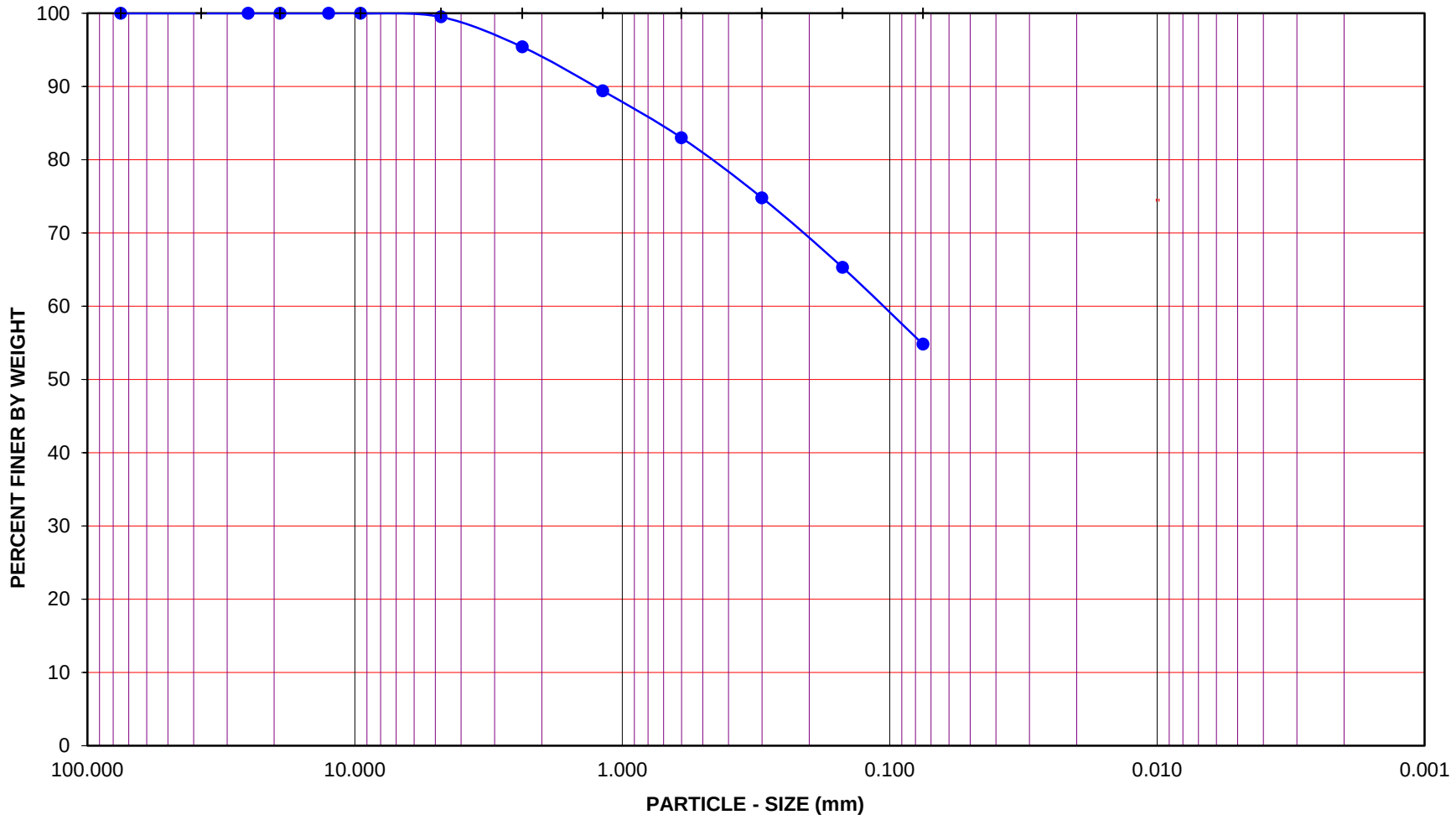
Leighton

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Client Name: T&C International Healthcare, Inc.
Tested By: F. Mina Date: 1/25/18

Rev. 08-04

GRAVEL		SAND			FINES	
COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

U.S. STANDARD SIEVE OPENING: 3.0" | 1 1/2" | 3/4" | 3/8"
U.S. STANDARD SIEVE NUMBER: #4 | #8 | #16 | #30 | #50 | #100 | #200
HYDROMETER



Project Name: T&C Skilled Nursing Facility

Project No.: 11888.001

Boring No.: LB-1 Sample No.: B-1

Depth (feet): 0 - 5.0 Soil Type : s(ML)

Soil Identification: Sandy Silt s(ML), Dark Reddish Brown.

GR:SA:FI : (%) 1 : 44 : 55

Leighton

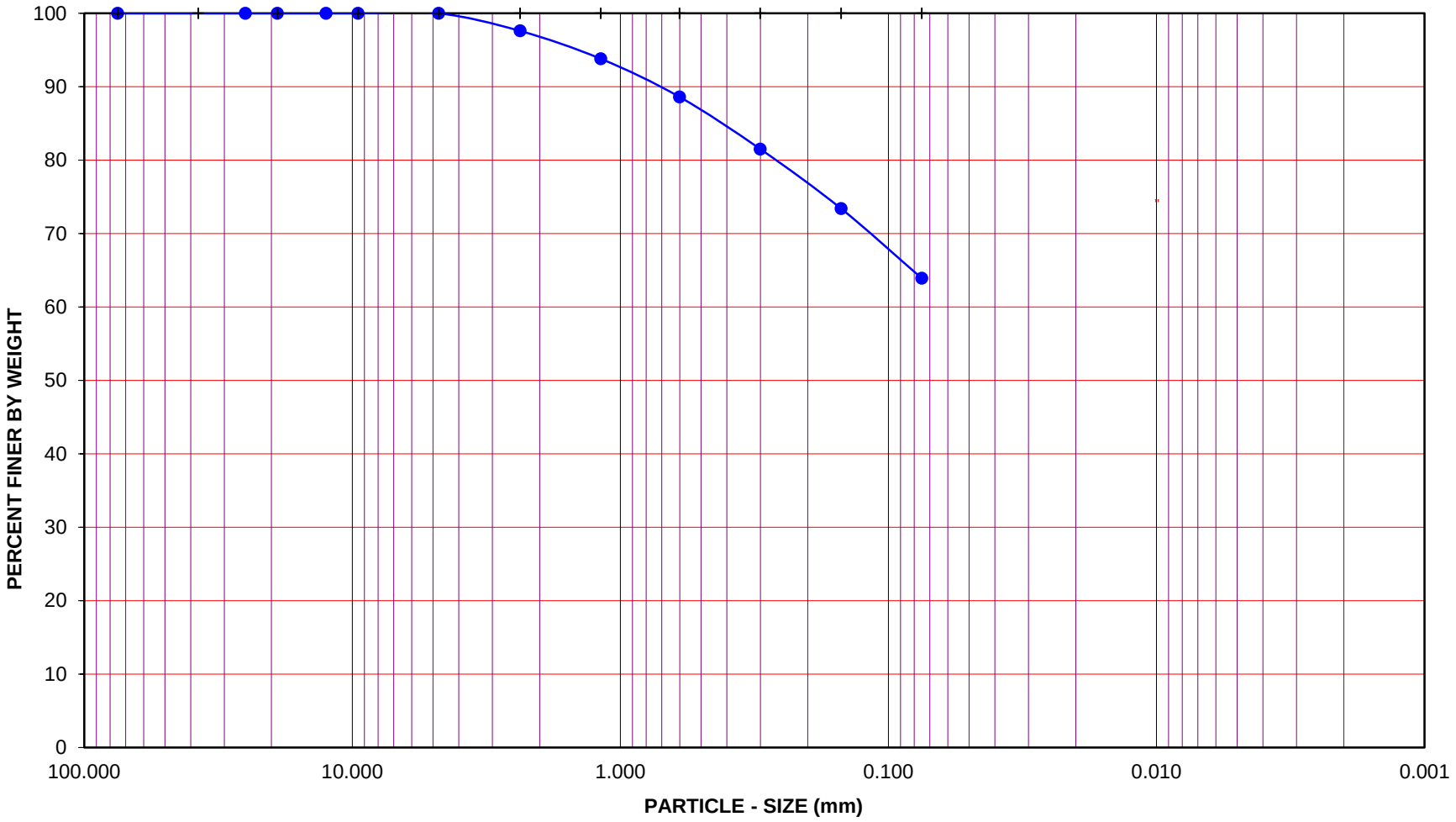
PARTICLE - SIZE DISTRIBUTION ASTM D 6913

Feb-18

Sieve; L

GRAVEL		SAND			FINES	
COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

U.S. STANDARD SIEVE OPENING: 3.0" | 1 1/2" | 3/4" | 3/8"
U.S. STANDARD SIEVE NUMBER: #4 | #8 | #16 | #30 | #50 | #100 | #200
HYDROMETER



Project Name: T&C Skilled Nursing Facility

Project No.: 11888.001

Boring No.: P-1 Sample No.: S-1

Depth (feet): 3.5 Soil Type : s(ML)

Soil Identification: Sandy Silt s(ML), Reddish Brown.

GR:SA:FI : (%) 0 : 36 : 64

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

Feb-18

Leighton

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	T&C Skilled Nursing Facility	Tested By:	F. Mina	Date:	01/29/18
Project No.:	11888.001	Input By:	M. Vinet	Date:	02/02/18
Boring No.:	LB-1	Depth (ft.):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Silt s(ML), Dark Reddish Brown.				

Preparation Method: [X] Moist [ ] Dry — [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03340 *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5663	5720	5660			
Weight of Mold (g)	3542	3542	3542			
Net Weight of Soil (g)	2121	2178	2118			
Wet Weight of Soil + Cont. (g)	2268.8	2333.5	2271.1			
Dry Weight of Soil + Cont. (g)	2120.2	2145.8	2050.9			
Weight of Container (g)	158.0	159.2	163.1			
Moisture Content (%)	7.6	9.4	11.7			
Wet Density (pcf)	140.0	143.8	139.8			
Dry Density (pcf)	130.1	131.3	125.2			

Maximum Dry Density (pcf) 131.5 **Optimum Moisture Content (%)** 9.0

PROCEDURE USED

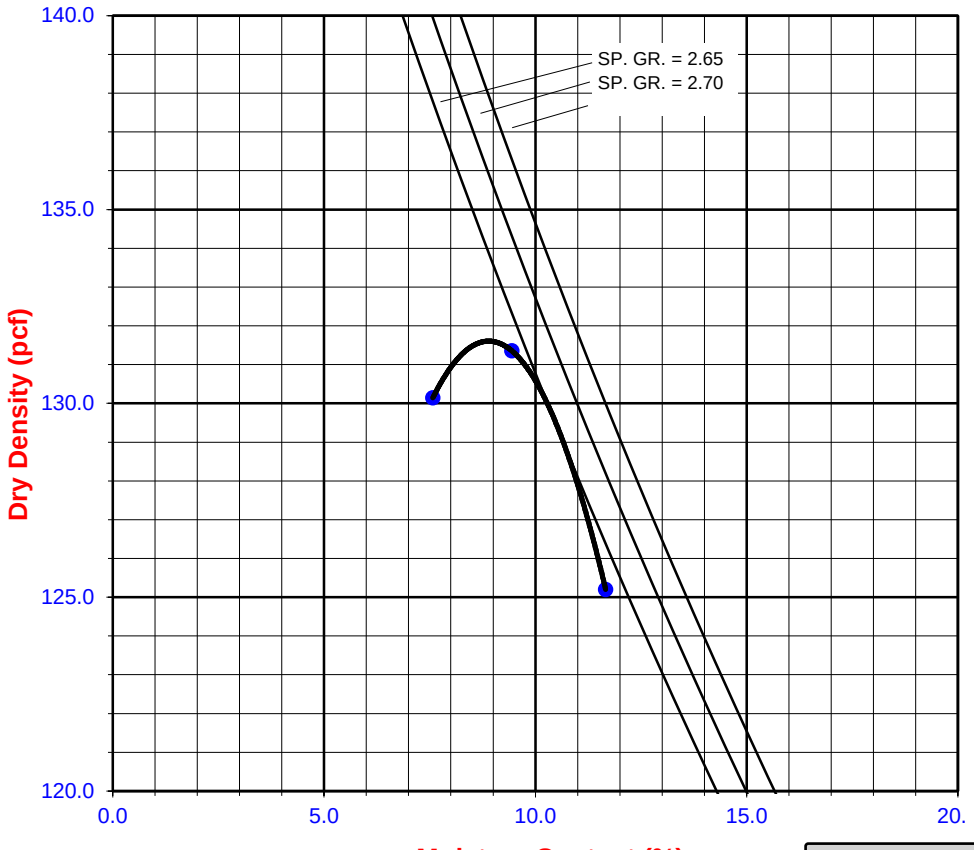
[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
1:44:55
GR:SA:FI

Atterberg Limits:
LL,PL,PI



Leighton

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	T&C Skilled Nursing Facility	Tested By:	F. Mina	Date:	01/29/18
Project No.:	11888.001	Input By:	M. Vinet	Date:	02/02/18
Boring No.:	LB-3	Depth (ft.):	5.0 - 1.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Dark Reddish Brown.				

Preparation Method: [X] Moist [ ] Dry — [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03340 *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5574	5730	5711			
Weight of Mold (g)	3542	3542	3542			
Net Weight of Soil (g)	2032	2188	2169			
Wet Weight of Soil + Cont. (g)	2173.2	2345.2	2307.1			
Dry Weight of Soil + Cont. (g)	2055.0	2180.1	2110.3			
Weight of Container (g)	144.3	171.1	152.0			
Moisture Content (%)	6.2	8.2	10.0			
Wet Density (pcf)	134.1	144.4	143.2			
Dry Density (pcf)	126.3	133.5	130.1			

Maximum Dry Density (pcf) 133.6 **Optimum Moisture Content (%)** 8.4

PROCEDURE USED

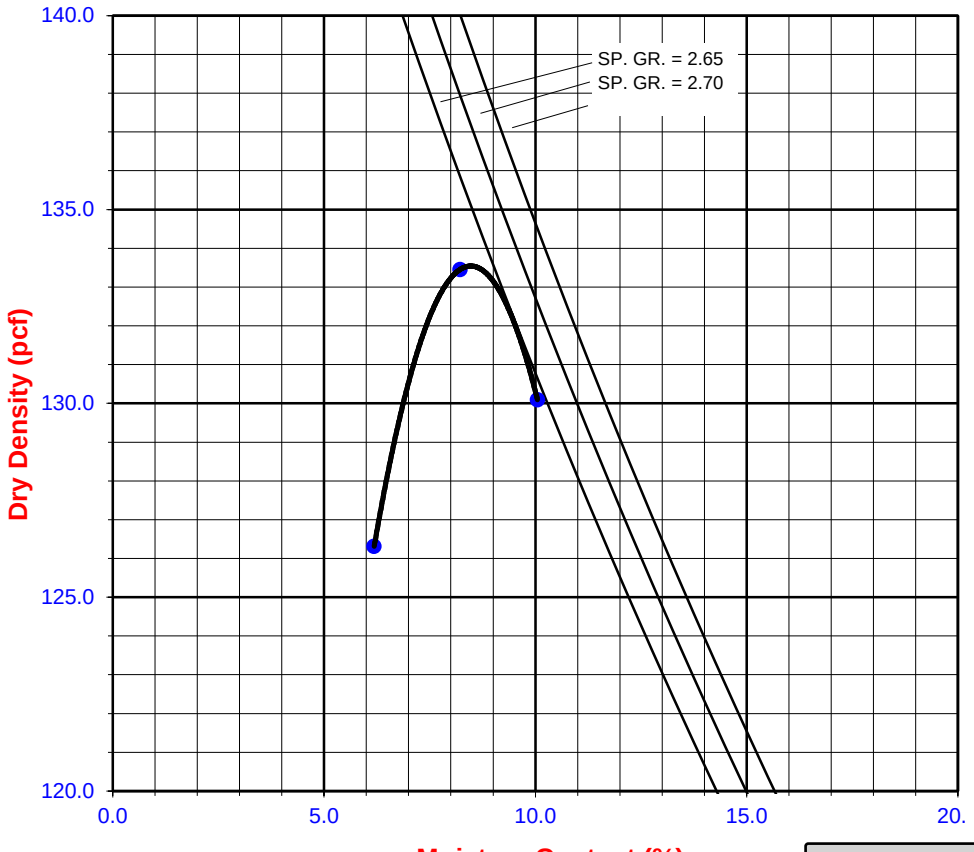
[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
GR:SA:FI

Atterberg Limits:
LL,PL,PI



Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-2**
Sample No.: **R-1**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 2.5

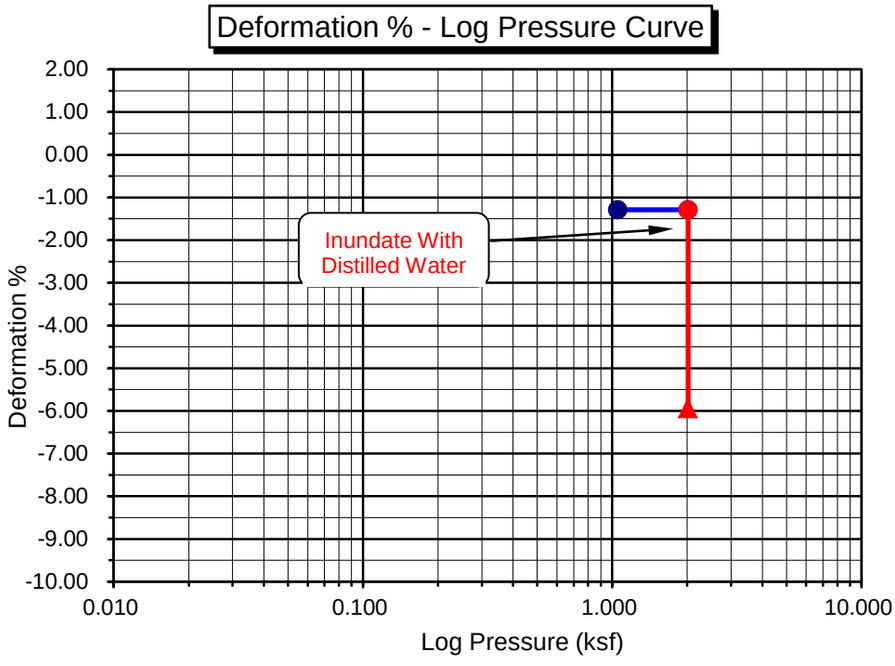
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	110.8
Initial Moisture (%):	6.2
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	117.8
Final Moisture (%) :	14.0
Initial Void ratio:	0.5217
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	31.8

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0129	0.9871	0.00	-1.29	0.5021	-1.29
2.013	0.0129	0.9871	0.00	-1.29	0.5021	-1.29
H2O	0.0595	0.9405	0.00	-5.95	0.4311	-5.95

Percent Swell / Settlement After Inundation = -4.72



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-2**
Sample No.: **R-2**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 5.0

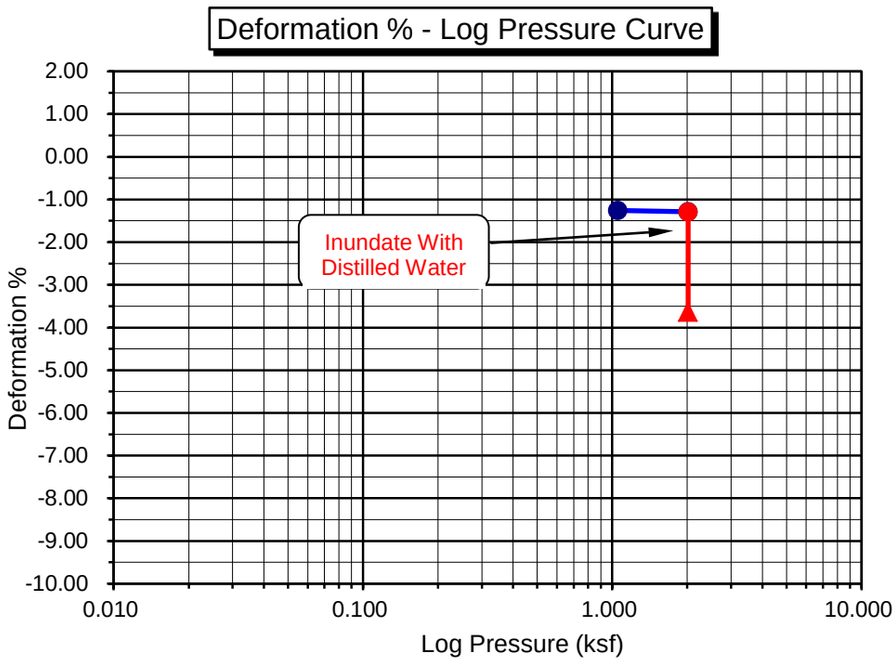
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	114.7
Initial Moisture (%):	10.4
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	119.0
Final Moisture (%) :	14.6
Initial Void ratio:	0.4699
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	59.5

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0126	0.9874	0.00	-1.26	0.4513	-1.26
2.013	0.0129	0.9871	0.00	-1.29	0.4509	-1.29
H2O	0.0364	0.9636	0.00	-3.64	0.4164	-3.64

Percent Swell / Settlement After Inundation = -2.38



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-3**
Sample No.: **R-3**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 10.0

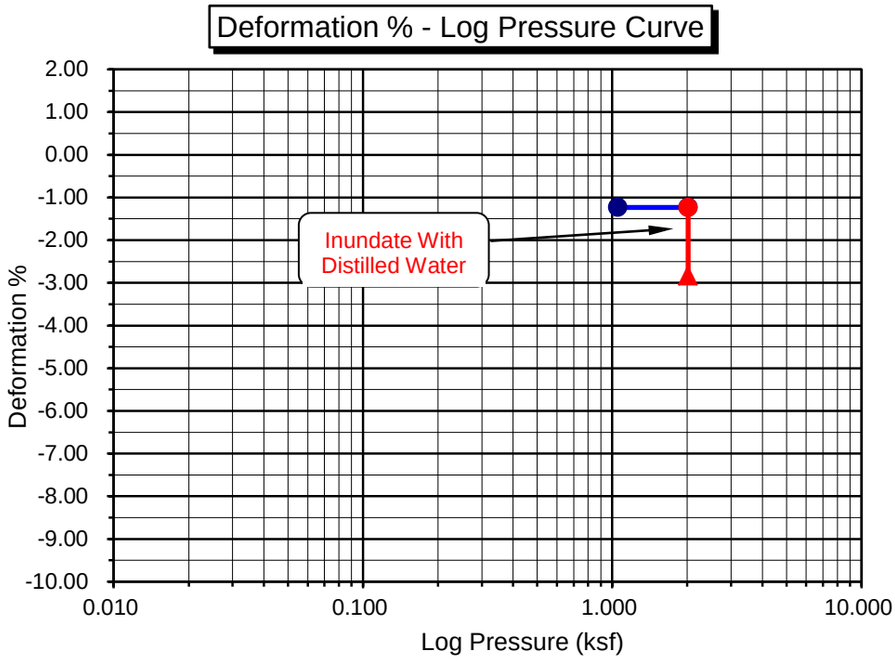
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	111.3
Initial Moisture (%):	11.7
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	114.5
Final Moisture (%) :	17.0
Initial Void ratio:	0.5149
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	61.5

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0123	0.9877	0.00	-1.23	0.4962	-1.23
2.013	0.0123	0.9877	0.00	-1.23	0.4962	-1.23
H2O	0.0284	0.9716	0.00	-2.84	0.4718	-2.84

Percent Swell / Settlement After Inundation = -1.63



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-4**
Sample No.: **R-1**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 2.5

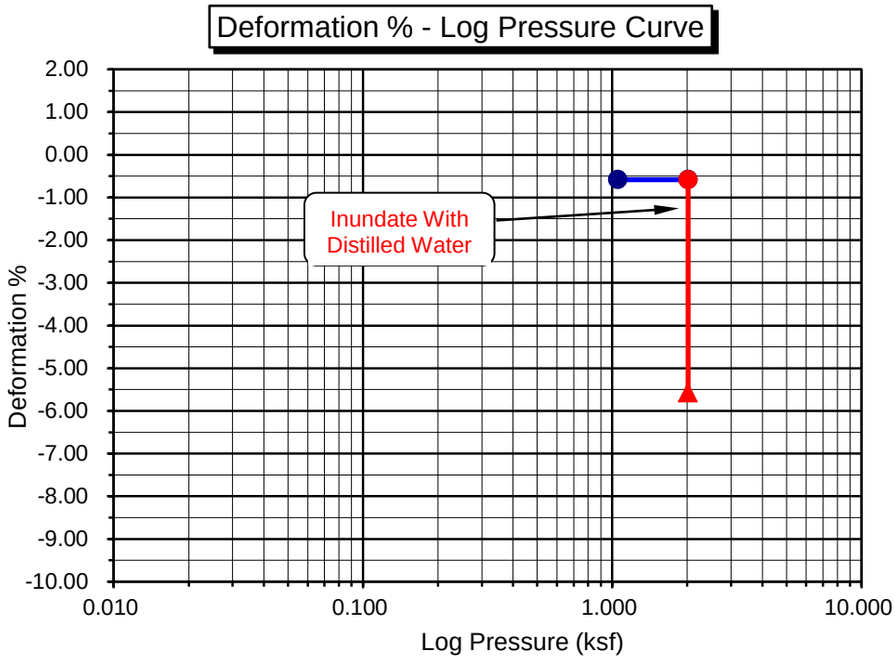
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	103.0
Initial Moisture (%):	8.9
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	109.0
Final Moisture (%) :	18.5
Initial Void ratio:	0.6371
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	37.6

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0058	0.9942	0.00	-0.58	0.6276	-0.58
2.013	0.0058	0.9942	0.00	-0.58	0.6276	-0.58
H2O	0.0558	0.9442	0.00	-5.58	0.5458	-5.58

Percent Swell / Settlement After Inundation = -5.03



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-4**
Sample No.: **R-2**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 5.0

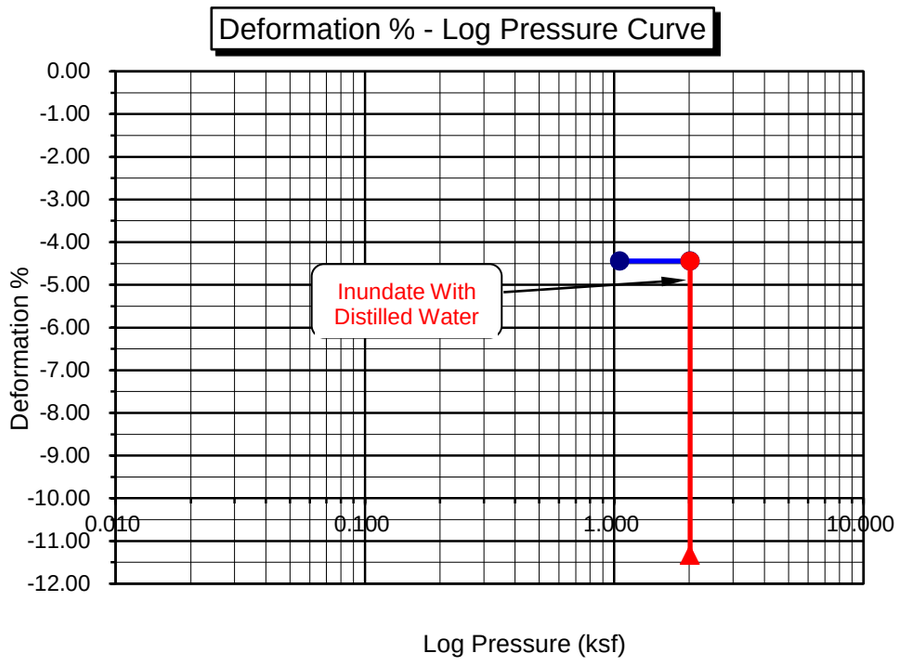
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	101.7
Initial Moisture (%):	7.1
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	114.7
Final Moisture (%) :	15.3
Initial Void ratio:	0.6572
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	29.2

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0444	0.9556	0.00	-4.44	0.5836	-4.44
2.013	0.0444	0.9556	0.00	-4.44	0.5836	-4.44
H2O	0.1134	0.8866	0.00	-11.34	0.4693	-11.34

Percent Swell / Settlement After Inundation = -7.22



Rev. 01-10

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One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-6**
Sample No.: **R-2**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/30/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 5.0

Source and Type of Water Used for Inundation: Arrowhead (Distilled)

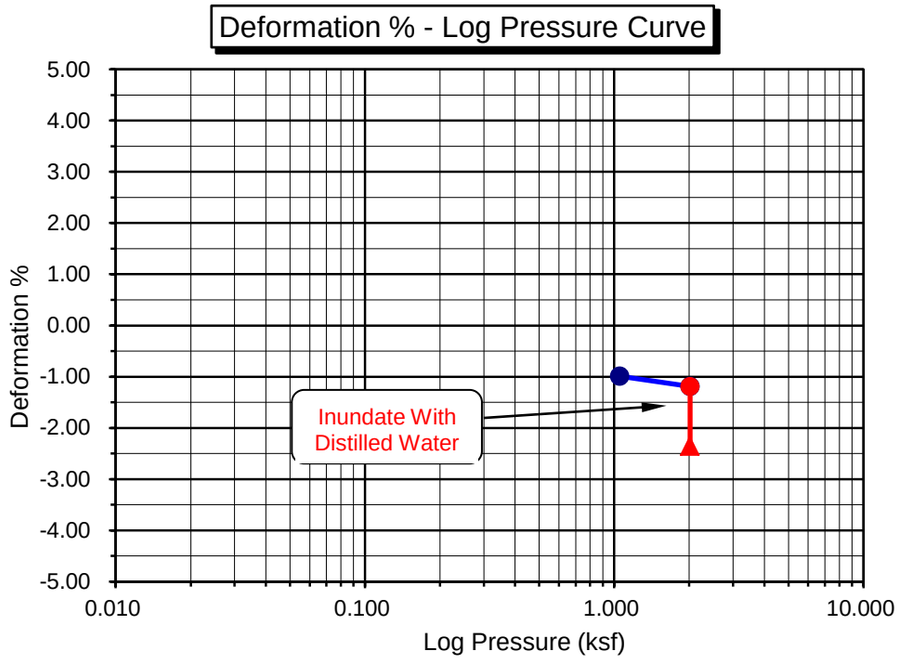
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	113.8
Initial Moisture (%):	10.4
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	116.5
Final Moisture (%) :	14.1
Initial Void ratio:	0.4817
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	58.1

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0099	0.9901	0.00	-0.99	0.4670	-0.99
2.013	0.0119	0.9881	0.00	-1.19	0.4640	-1.19
H2O	0.0236	0.9764	0.00	-2.36	0.4467	-2.36

Percent Swell / Settlement After Inundation = -1.18



Rev. 01-10

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	T&C Skilled Nursing Facility	Tested By:	F. Mina	Date:	1/22/18
Project No. :	11888.001	Checked By:	M. Vinet	Date:	2/2/18
Boring No.:	LB-1	Depth:	0 - 5.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Sandy Silt s(ML), Dark Reddish Brown.				

Dry Wt. of Soil + Cont. (gm.)	1988.7
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1988.7
Weight Soil Retained on #4 Sieve	7.1
Percent Passing # 4	99.6

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0304
Wt. Comp. Soil + Mold (gm.)	629.5	656.4
Wt. of Mold (gm.)	209.1	209.1
Specific Gravity (Assumed)	2.70	2.70
Container No.	7	7
Wet Wt. of Soil + Cont. (gm.)	444.3	656.4
Dry Wt. of Soil + Cont. (gm.)	421.3	388.2
Wt. of Container (gm.)	144.3	209.1
Moisture Content (%)	8.3	15.2
Wet Density (pcf)	126.8	130.9
Dry Density (pcf)	117.1	113.6
Void Ratio	0.440	0.484
Total Porosity	0.305	0.326
Pore Volume (cc)	63.2	69.5
Degree of Saturation (%) [S meas]	**51.0**	**85.0**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
1/22/18	11:00	1.0	0	0.5000
1/22/18	11:10	1.0	10	0.5000
	Add Distilled Water to the Specimen			
1/23/18	8:00	1.0	1250	0.5304
1/23/18	9:00	1.0	1310	0.5304

Expansion Index (EI meas) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	30.4
Expansion Index (Report) = Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**30**

Rev. 03-08

• ANALYSIS
• DESIGN

LaBelle • Marvin
PROFESSIONAL PAVEMENT ENGINEERING
A CALIFORNIA CORPORATION

• SOILS, ASPHALT
TECHNOLOGY

January 31, 2018

Mr. George Ruiz
Leighton Consulting, Inc.
17781 Cowan
Irvine, CA 92614

Project No. 43225

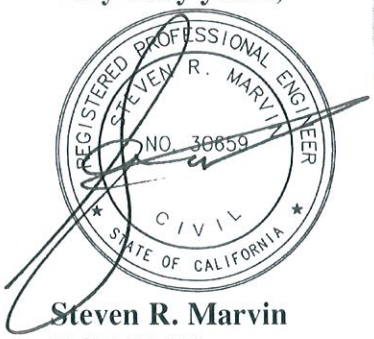
Dear Mr. Ruiz:

Laboratory testing of the bulk soil samples delivered to our laboratory on 1/30/2018 has been completed.

Reference:	P.N. 11888.001
Project:	T&C Skilled Nursing Facility GE
Samples:	LB-1 / B-1 @ 0'-5'
	LB-6 / B-1 @ 0'-5'

A tabulation of test data is transmitted herewith for your use and information. Any untested portion of the sample will be retained for a period of 60 days prior to disposal. The opportunity to be of services is appreciated and should you have any questions, kindly call.

Very truly yours,



Steven R. Marvin
RCE 30659

SRM:tw
Enclosures

2700 S. GRAND AVENUE • SANTA ANA, CA 92705-5404 • (714) 546-3468 • FAX (714) 546-5841
INFO@LABELLEMARVIN.COM

LaBelle Marvin

R - VALUE DATA SHEET

PROJECT No. 43225

DATE: 1/31/2018

BORING NO. LB-1/B-1 @ 0'-5'

T&C Skilled Nursing Facility GE

P.N. 11888.001

SAMPLE DESCRIPTION: Brown Silt

R-VALUE TESTING DATA | CA TEST 301

	SPECIMEN ID		
	a	b	c
Mold ID Number	13	14	15
Water added, grams	94	58	68
Initial Test Water, %	14.2	10.6	11.6
Compact Gage Pressure,psi	40	110	70
Exudation Pressure, psi	128	799	231
Height Sample, Inches	2.53	2.35	2.42
Gross Weight Mold, grams	3084	3018	3029
Tare Weight Mold, grams	1969	1940	1944
Sample Wet Weight, grams	1115	1078	1085
Expansion, Inches x 10exp-4	2	40	27
Stability 2,000 lbs (160psi)	51 / 125	28 / 59	33 / 80
Turns Displacement	4.98	4.12	4.93
R-Value Uncorrected	12	51	34
R-Value Corrected	12	47	32
Dry Density, pcf	116.9	125.7	121.7

DESIGN CALCULATION DATA

Traffic Index	Assumed:	4.0	4.0	4.0
G.E. by Stability		0.90	0.54	0.70
G. E. by Expansion		0.07	1.33	0.90

Equilibrium R-Value	**29** by EXPANSION	Examined & Checked: 1 /31/ 18
REMARKS:	Gf = 1.25 0.0% Retained on the 3/4" Sieve.	Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

R-VALUE GRAPHICAL PRESENTATION

LaBelle Marvin

PROJECT NO. 43225

DATE: 1 /31/ 18

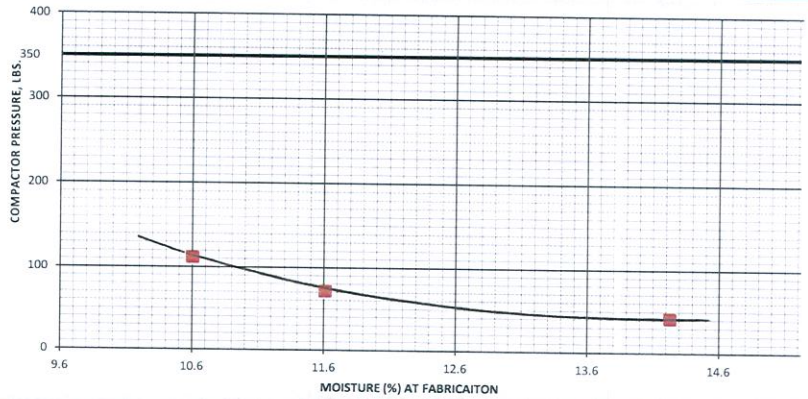
REMARKS:

BORING NO. LB-1/B-1 @ 0'-5'

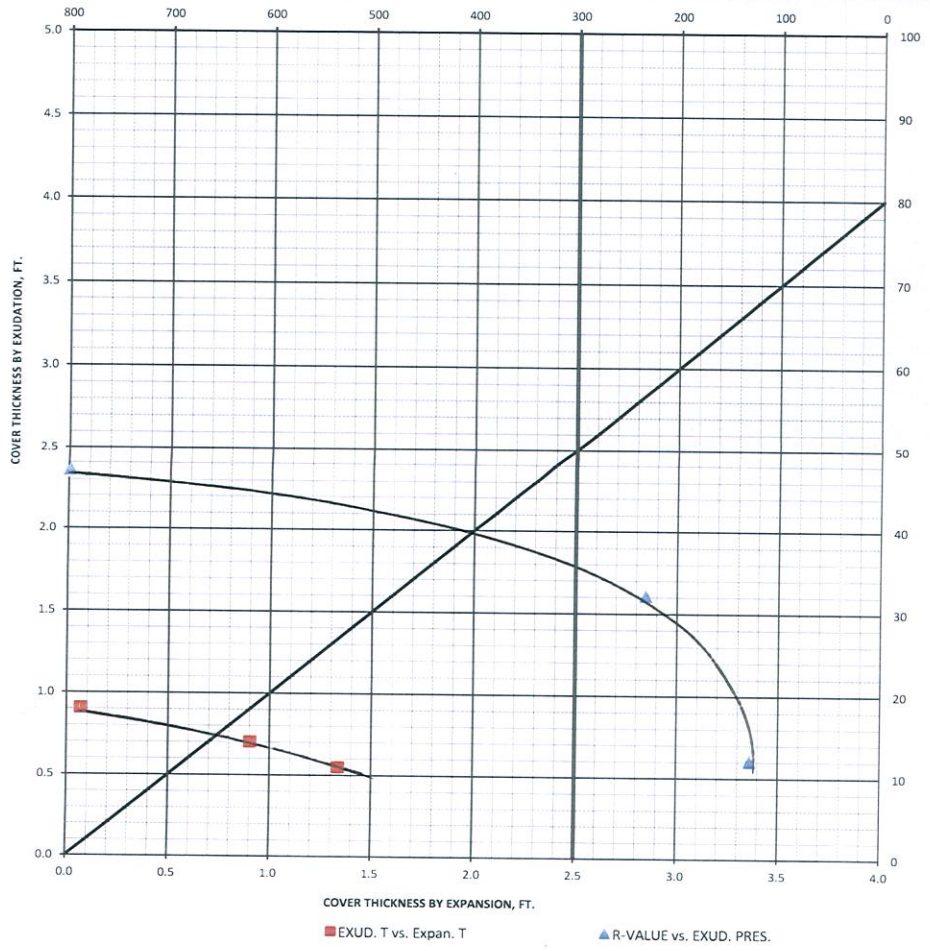
T&C Skilled Nursing Facility GE

P.N. 11888.001

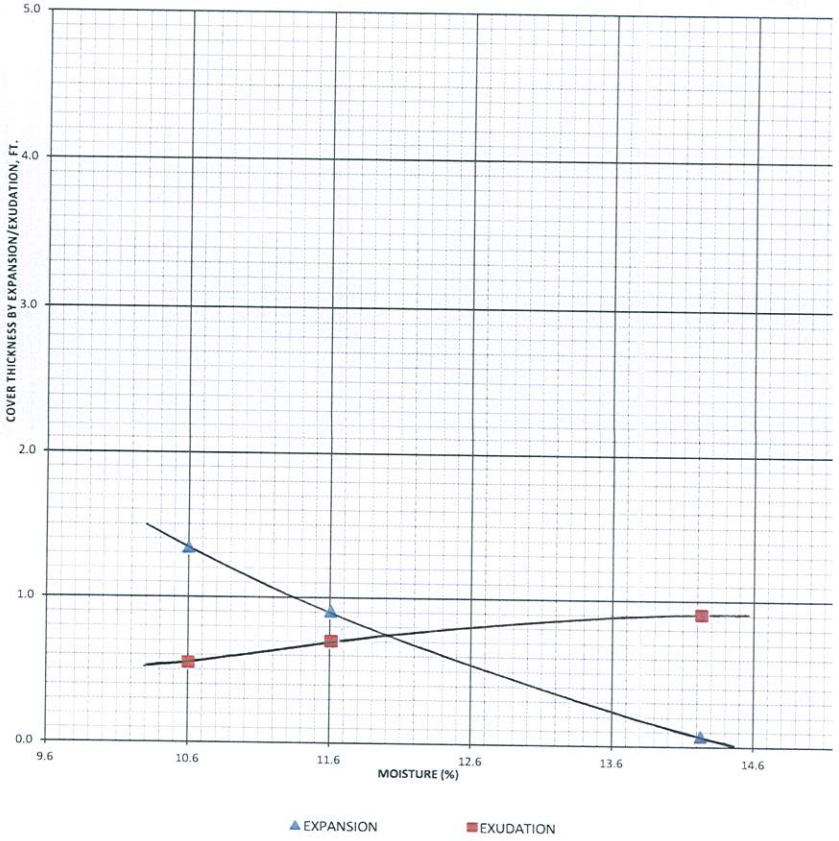
COMPACTOR PRESSURE vs MOISTURE %



COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



COVER THICKNESS vs MOISTURE %



LaBelle Marvin

R - VALUE DATA SHEET

PROJECT No. 43225

DATE: 1/31/2018

BORING NO. LB-6/B-1 @ 0'-5'

T&C Skilled Nursing Facility GE

P.N. 11888.001

SAMPLE DESCRIPTION: Brown Silt

R-VALUE TESTING DATA | CA TEST 301

	SPECIMEN ID		
	a	b	c
Mold ID Number	16	17	18
Water added, grams	68	39	30
Initial Test Water, %	13.1	10.2	9.4
Compact Gage Pressure,psi	40	70	100
Exudation Pressure, psi	144	301	425
Height Sample, Inches	2.52	2.41	2.36
Gross Weight Mold, grams	3077	3050	3049
Tare Weight Mold, grams	1948	1942	1956
Sample Wet Weight, grams	1129	1108	1093
Expansion, Inches x 10exp-4	0	25	45
Stability 2,000 lbs (160psi)	56 / 131	29 / 62	22 / 48
Turns Displacement	4.58	4.53	4.43
R-Value Uncorrected	11	47	57
R-Value Corrected	11	45	53
Dry Density, pcf	120.0	126.4	128.3

DESIGN CALCULATION DATA

Traffic Index	Assumed:	4.0	4.0	4.0
G.E. by Stability		0.91	0.56	0.48
G. E. by Expansion		0.00	0.83	1.50

Equilibrium R-Value	**40** by EXPANSION	Examined & Checked: 1 /31/ 18
REMARKS:	Gf = 1.25 0.0% Retained on the 3/4" Sieve.	Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

LaBelle Marvin

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 43225

DATE: 1 /31/ 18

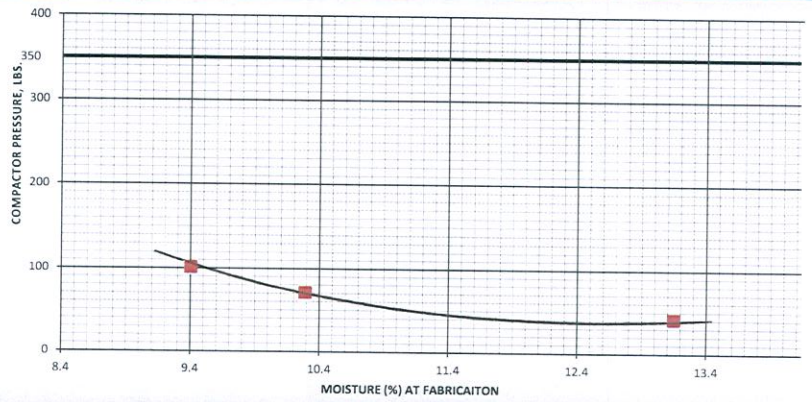
REMARKS:

BORING NO. LB-6/B-1 @ 0'-5'

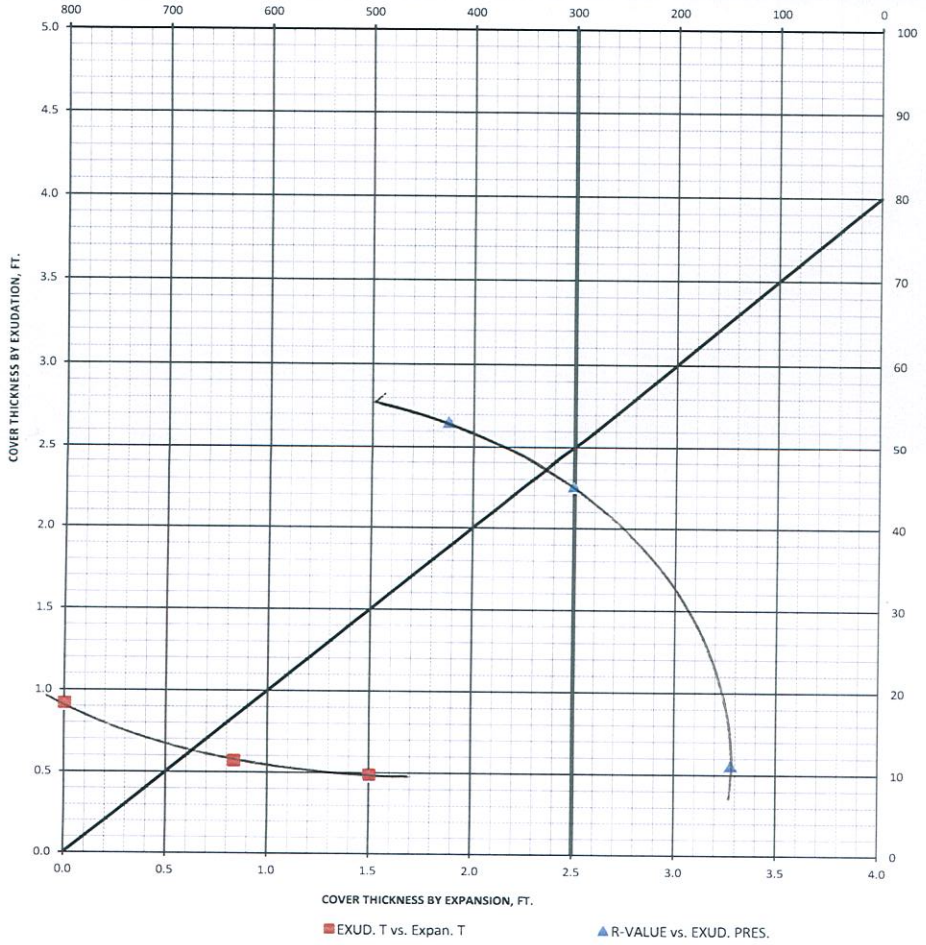
T&C Skilled Nursing Facility GE

P.N. 11888.001

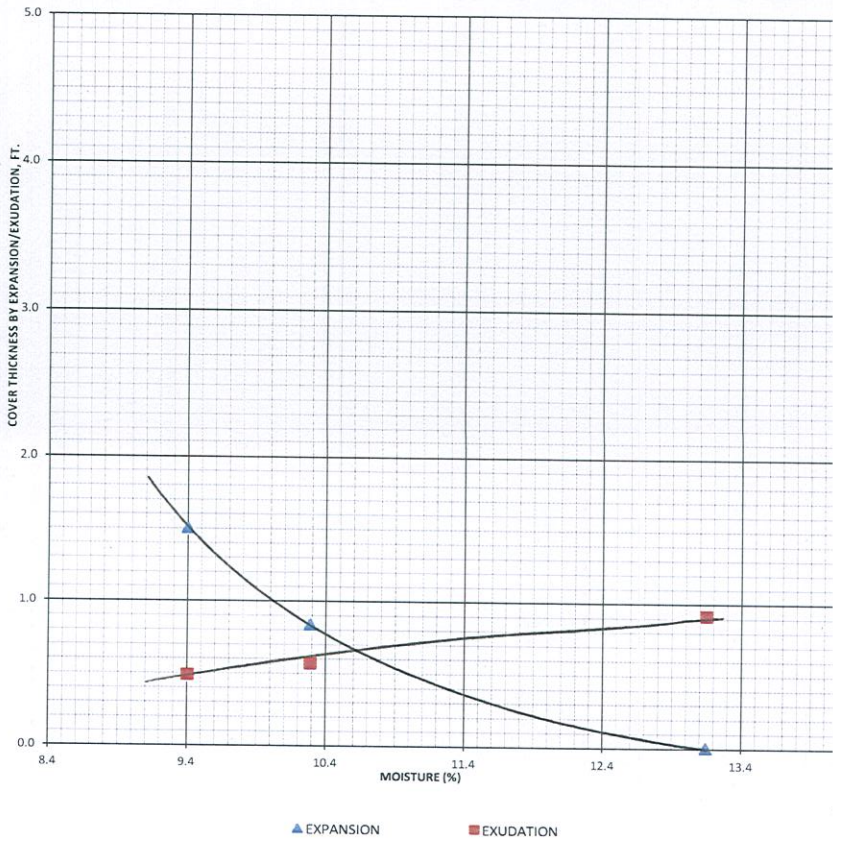
COMPACTOR PRESSURE vs MOISTURE %



COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



COVER THICKNESS vs MOISTURE %



Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY

Leighton

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: T&C Skilled Nursing Facility Tested By : G. Berdy Date: 01/24/18

Project No. : 11888.001 Data Input By: J. Ward Date: 02/01/18

Boring No.	LB-4	LB-6		
Sample No.	B-1	B-1		
Sample Depth (ft)	0-5	0-5		
Soil Identification:	Dark brown SC	Dark brown SC-SM		
Wet Weight of Soil + Container (g)	224.05	204.76		
Dry Weight of Soil + Container (g)	222.04	194.92		
Weight of Container (g)	58.32	52.57		
Moisture Content (%)	1.23	6.91		
Weight of Soaked Soil (g)	100.21	100.36		

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	16	151		
Crucible No.	15	23		
Furnace Temperature (°C)	860	860		
Time In / Time Out	9:00/9:45	9:00/9:45		
Duration of Combustion (min)	45	45		
Wt. of Crucible + Residue (g)	25.5544	23.3670		
Wt. of Crucible (g)	25.5514	23.3638		
Wt. of Residue (g) (A)	0.0030	0.0032		
PPM of Sulfate (A) x 41150	123.45	131.68		
PPM of Sulfate, Dry Weight Basis	**125**	**141**		

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	15	15		
ml of AgNO3 Soln. Used in Titration (C)	0.3	0.4		
PPM of Chloride (C -0.2) * 100 * 30 / B	20	40		
PPM of Chloride, Dry Wt. Basis	**20**	**43**		

pH TEST, DOT California Test 643

pH Value	**7.69**	**7.59**		
Temperature °C	21.7	21.6		

Leighton

SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	T&C Skilled Nursing Facility		Tested By :	G. Berdy	Date: 01/29/18
Project No. :	11888.001		Data Input By:	J. Ward	Date: 02/01/18
Boring No.:	LB-4		Depth (ft.) :	0-5	
Sample No. :	B-1				

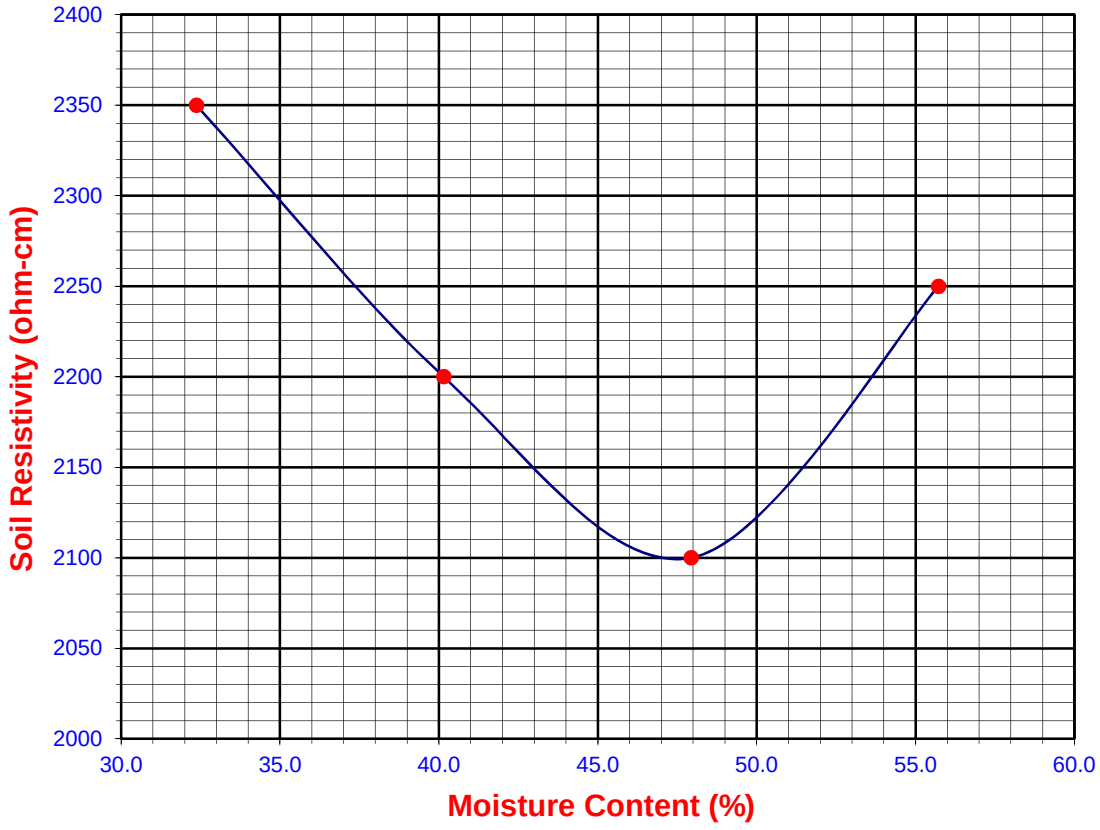
Soil Identification:* Dark brown SC

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	40	32.37	2350	2350
2	50	40.15	2200	2200
3	60	47.94	2100	2100
4	70	55.72	2250	2250
5				

Moisture Content (%) (MCi)	1.23
Wet Wt. of Soil + Cont. (g)	224.05
Dry Wt. of Soil + Cont. (g)	222.04
Wt. of Container (g)	58.32
Container No.	
Initial Soil Wt. (g) (Wt)	130.03
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2100	**47.5**	**125**	**20**	**7.69**	**21.7**



Attachment: Geotechnical Exploration (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING FACILITY, COMPRISED

Leighton

SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	T&C Skilled Nursing Facility		Tested By :	G. Berdy	Date: 01/29/18
Project No. :	11888.001		Data Input By:	J. Ward	Date: 02/01/18
Boring No.:	LB-6		Depth (ft.) :	0-5	
Sample No. :	B-1				

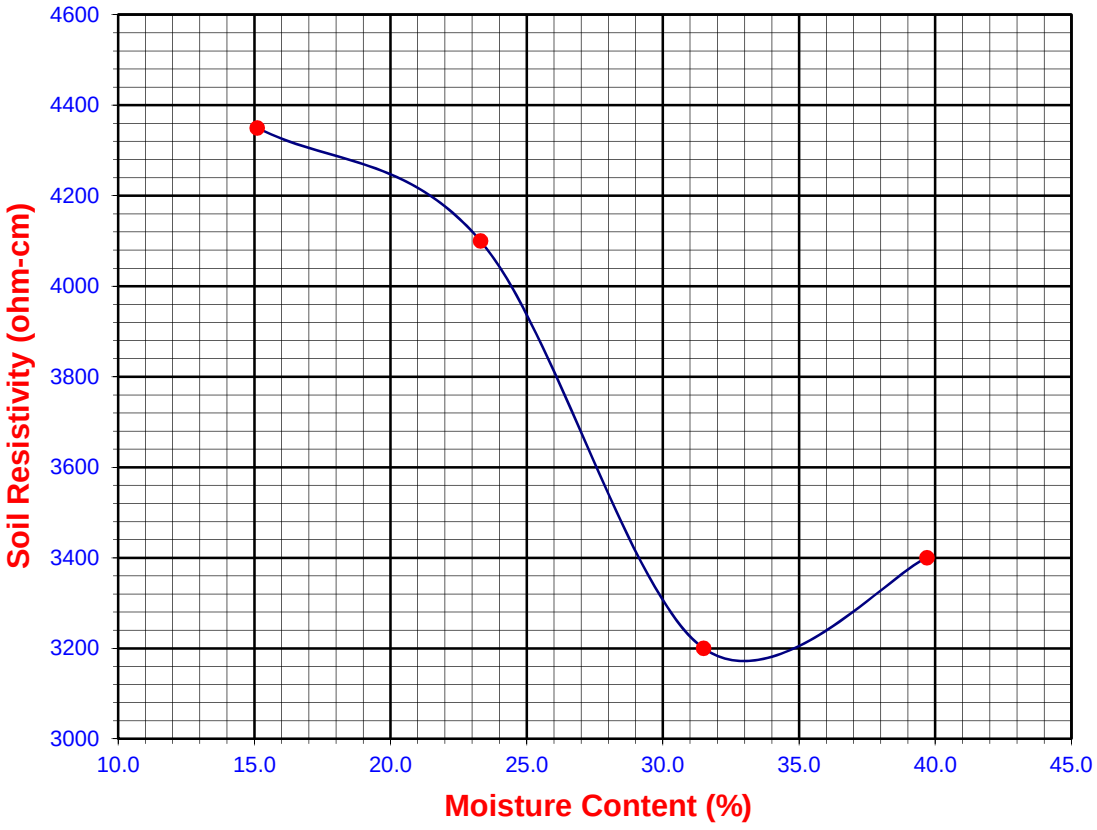
Soil Identification:* Dark brown SC-SM

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	10	15.11	4350	4350
2	20	23.30	4100	4100
3	30	31.50	3200	3200
4	40	39.70	3400	3400
5				

Moisture Content (%) (MCi)	6.91
Wet Wt. of Soil + Cont. (g)	204.76
Dry Wt. of Soil + Cont. (g)	194.92
Wt. of Container (g)	52.57
Container No.	
Initial Soil Wt. (g) (Wt)	130.45
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
3160	**33.0**	**141**	**43**	**7.59**	**21.6**



APPENDIX C

LIQUEFACTION ANALYSIS

1.n

USGS Design Maps Summary Report

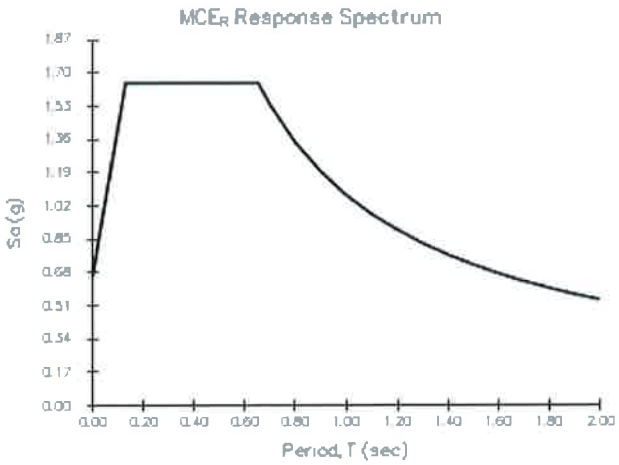
User–Specified Input

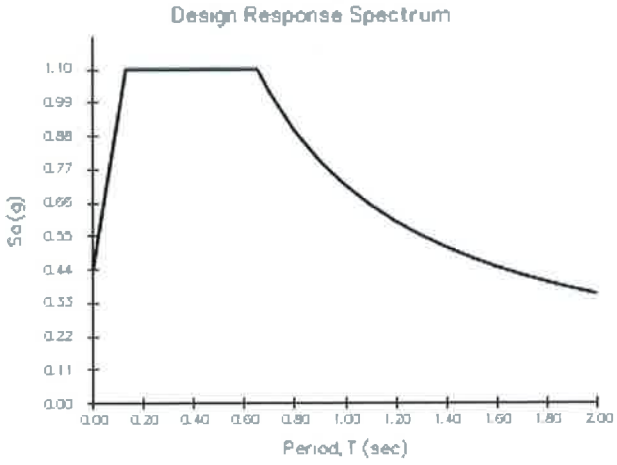
Report Title	T & C Skilled Nursing Facility Fri January 12, 2018 21:47:28 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	33.9184°N, 117.216°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	IV (e.g. essential facilities)

USGS–Provided Output

S_S =	1.649 g	S_{MS} =	1.649 g	S_{DS} =	1.100 g
S_1 =	0.718 g	S_{M1} =	1.076 g	S_{D1} =	0.718 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

USGS Design Maps Detailed Report

ASCE 7-10 Standard (33.9184°N, 117.216°W)

Site Class D – "Stiff Soil", Risk Category IV (e.g. essential facilities)

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_s) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1] $S_s = 1.649$ g

From Figure 22-2 [2] $S_1 = 0.718$ g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3-1 Site Classification

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index PI > 20, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_S

For Site Class = D and S_s = 1.649 g, F_a = 1.000

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.718 g, F_v = 1.500

Equation (11.4–1): $S_{MS} = F_a S_S = 1.000 \times 1.649 = 1.649$ g

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.500 \times 0.718 = 1.076$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

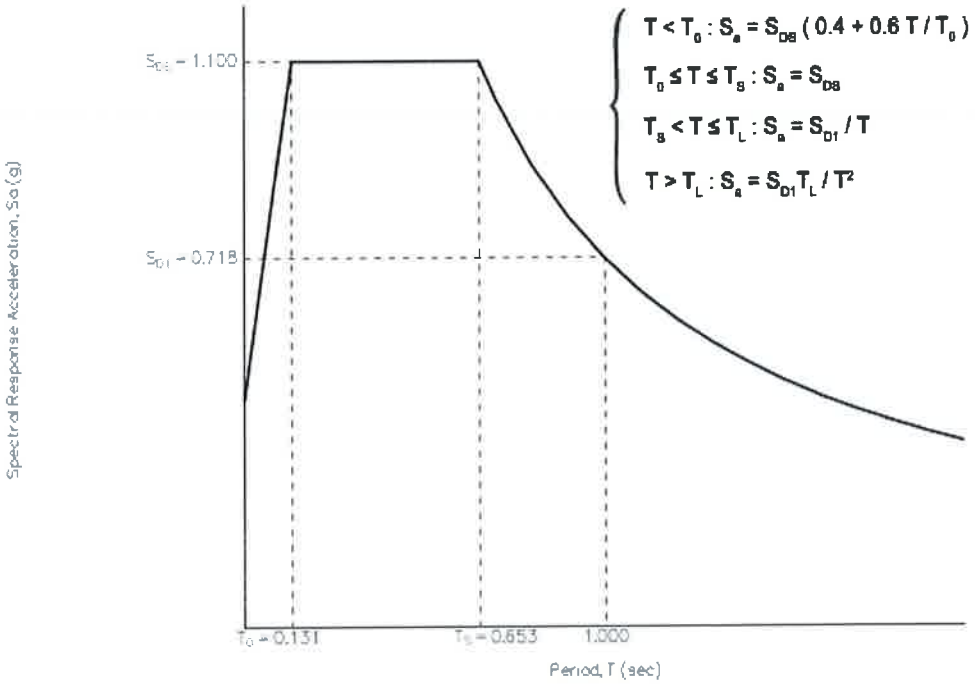
Equation (11.4–3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.649 = 1.100$ g

Equation (11.4–4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 1.076 = 0.718$ g

Section 11.4.5 — Design Response Spectrum

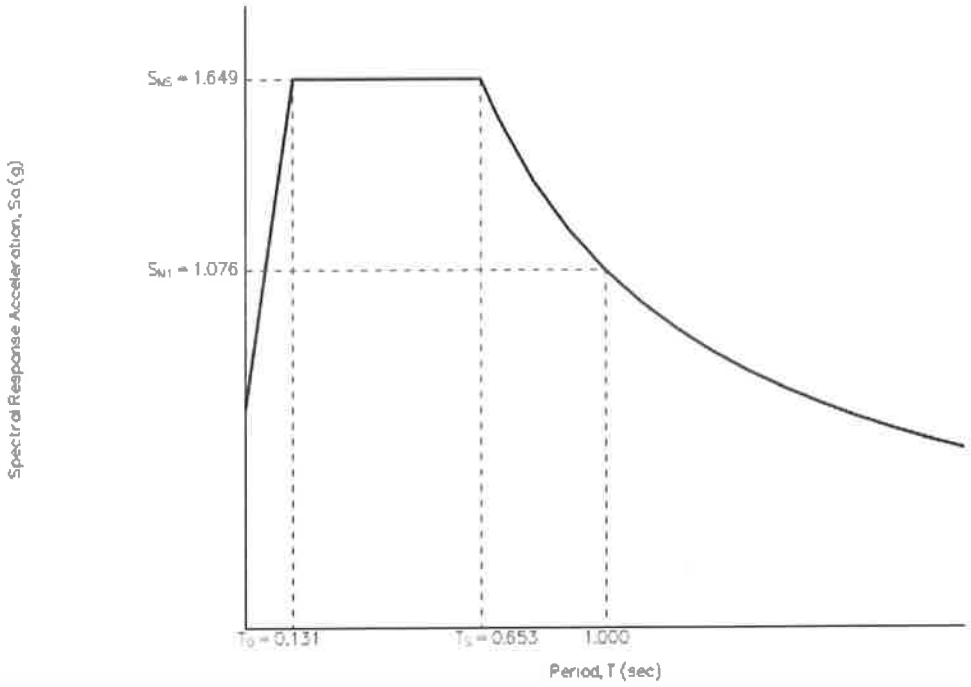
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



1.n

Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.649

Equation (11.8-1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.649 = 0.649$ g

Table 11.8-1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.649 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 - Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 1.021

From Figure 22-18 [6] C_{R1} = 0.989

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = IV and S_{DS} = 1.100 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = IV and S_{D1} = 0.718 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

TABLE OF CONTENTS

Leighton Consulting, Inc.
Geotechnical, Environmental and Materials Testing
Temecula, California

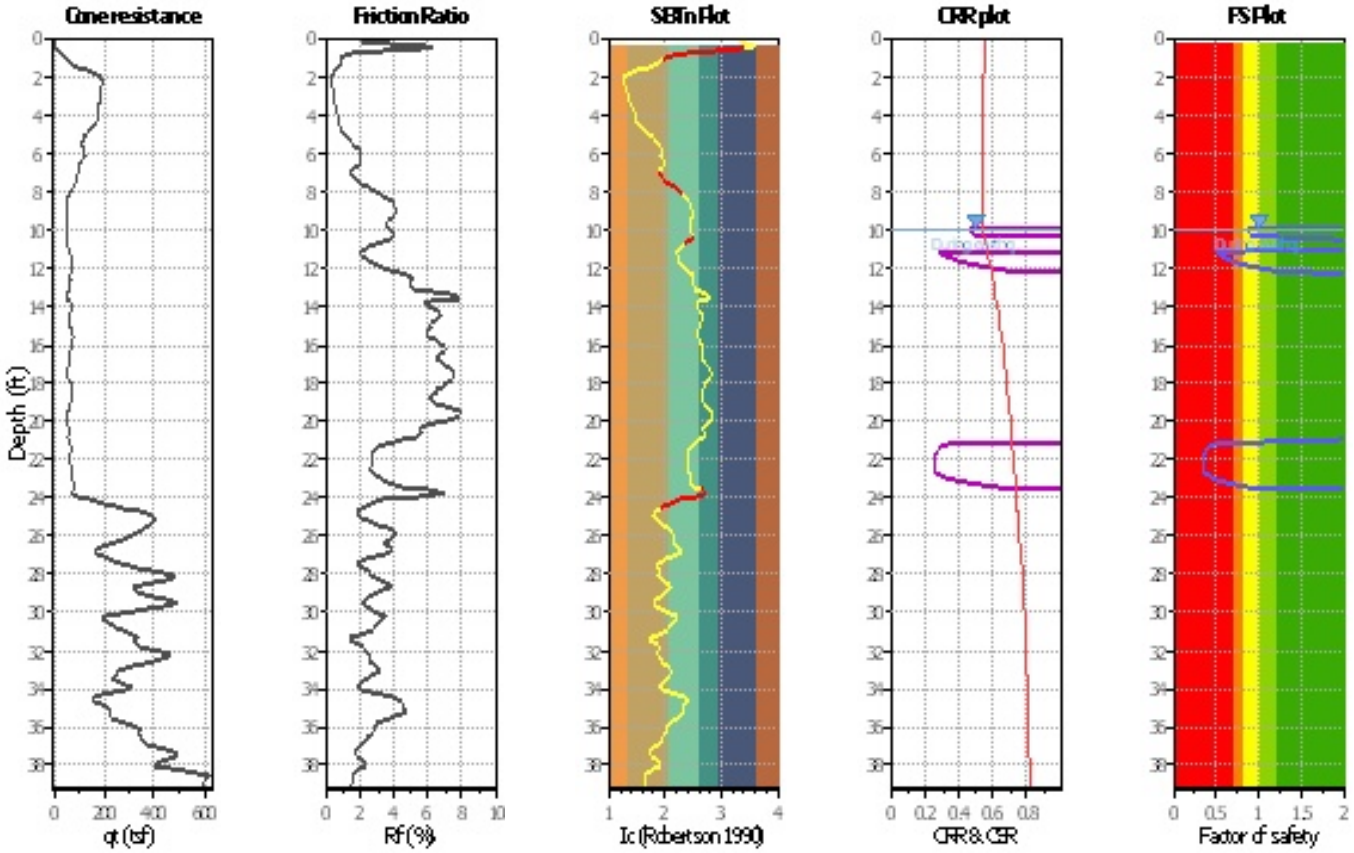
LIQUEFACTION ANALYSIS REPORT

Project title : T&C Proposed Skilled Nursing Facility **Location : 25622 Alessandro Blvd., Moreno Valley, CA**

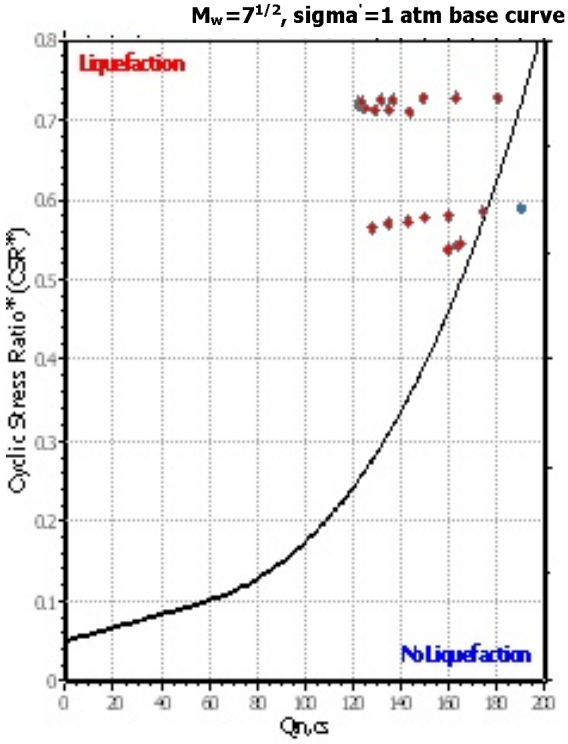
CPT file : CPT - 7

Input parameters and analysis data

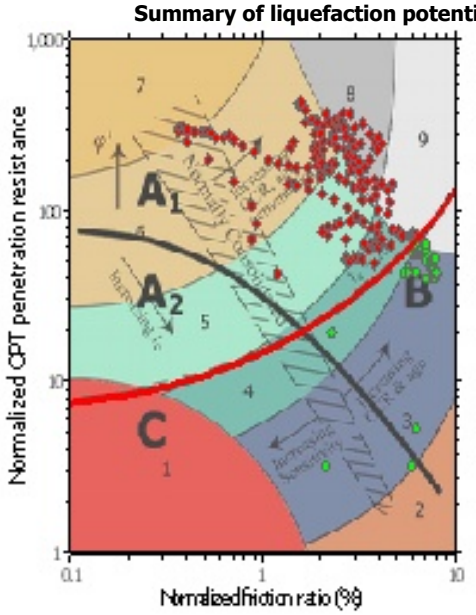
Analysis method:	NCEER (1998)	G.W.T. (in-situ):	18.00 ft	Use fill:	No	Clay like behavior applied:	Sands only
Fines correction method:	NCEER (1998)	G.W.T. (earthq.):	10.00 ft	Fill height:	N/A	Limit depth applied:	No
Points to test:	Based on Ic value	Average results interval:	3	Fill weight:	N/A	Limit depth:	N/A
Earthquake magnitude M_w:	7.50	Ic cut-off value:	2.60	Trans. detect. applied:	Yes	MSF method:	Method based
Peak ground acceleration:	0.65	Unit weight calculation:	Based on SBT	K_σ applied:	Yes		



$M_w=7^{1/2}$, sigma'=1 atm base curve

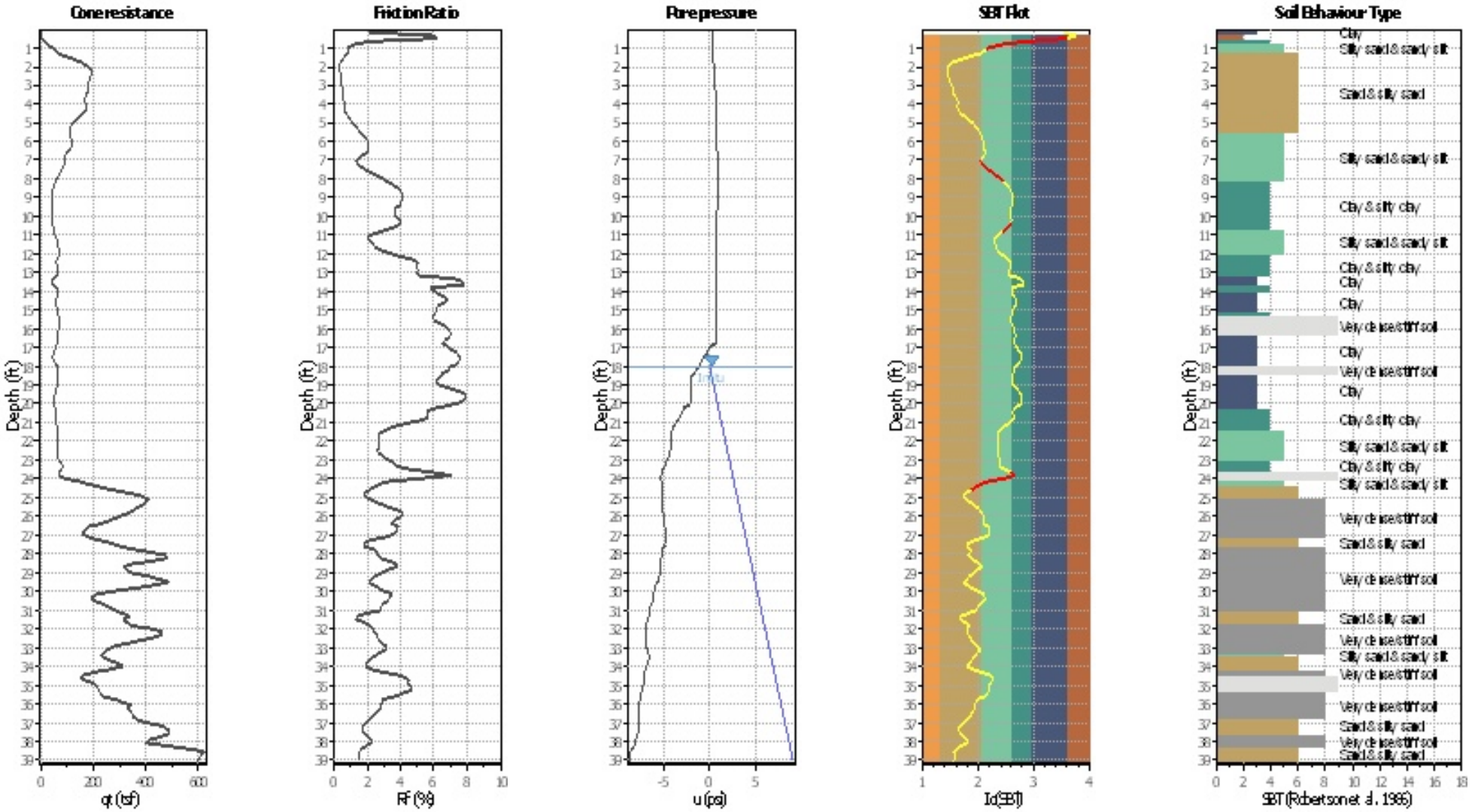


Summary of liquefaction potential



Zone A_1: Cyclic liquefaction likely depending on size and duration of cyclic loading
Zone A_2: Cyclic liquefaction and strength loss likely depending on loading and ground geometry
Zone B: Liquefaction and post-earthquake strength loss unlikely, check cyclic softening
Zone C: Cyclic liquefaction and strength loss possible depending on soil plasticity, brittleness/sensitivity, strain to peak undrained strength and ground geometry

CPT basic interpretation plo



Input parameters and analysis data

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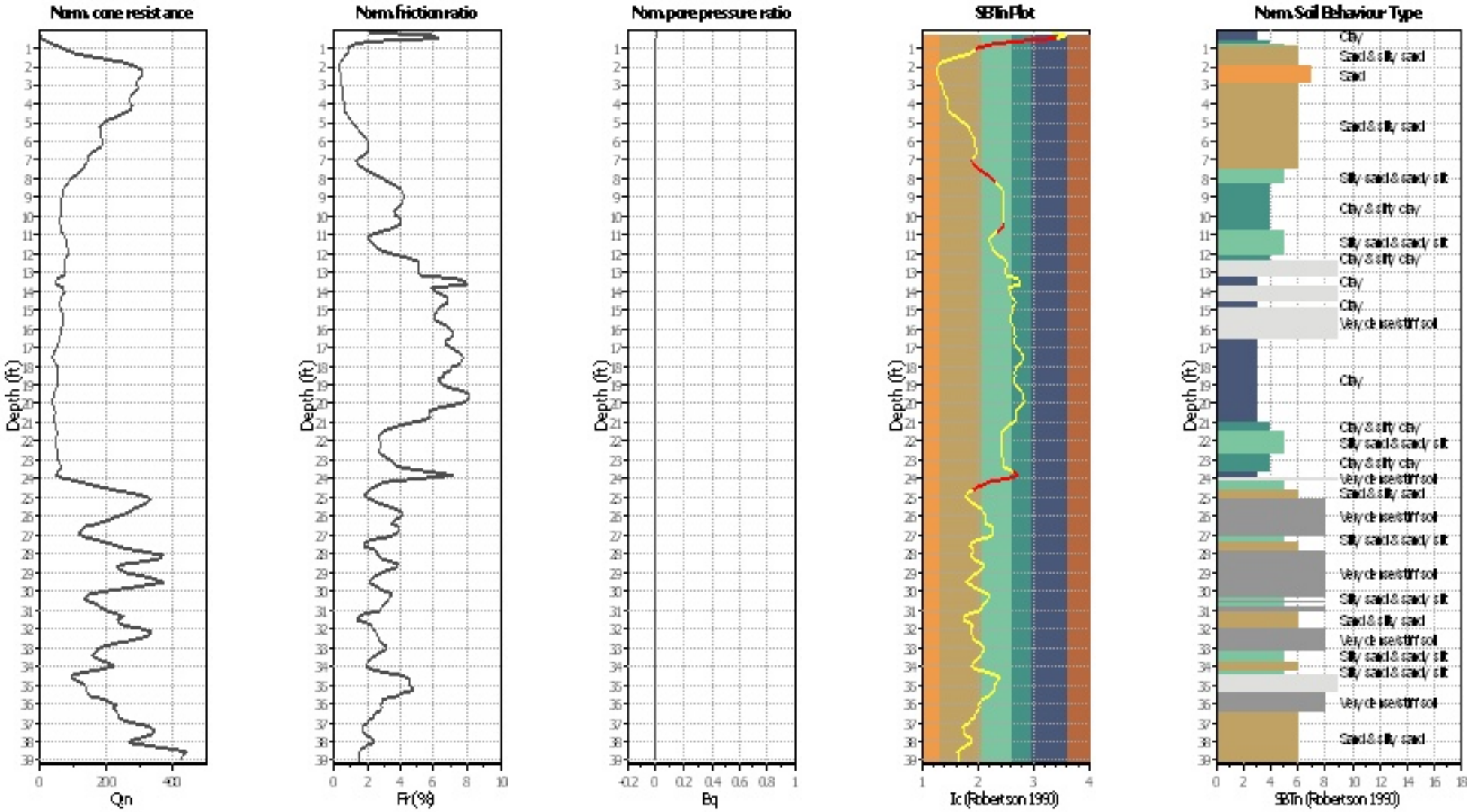
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.65	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

SBT legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

CPT basic interpretation plots (normaliz



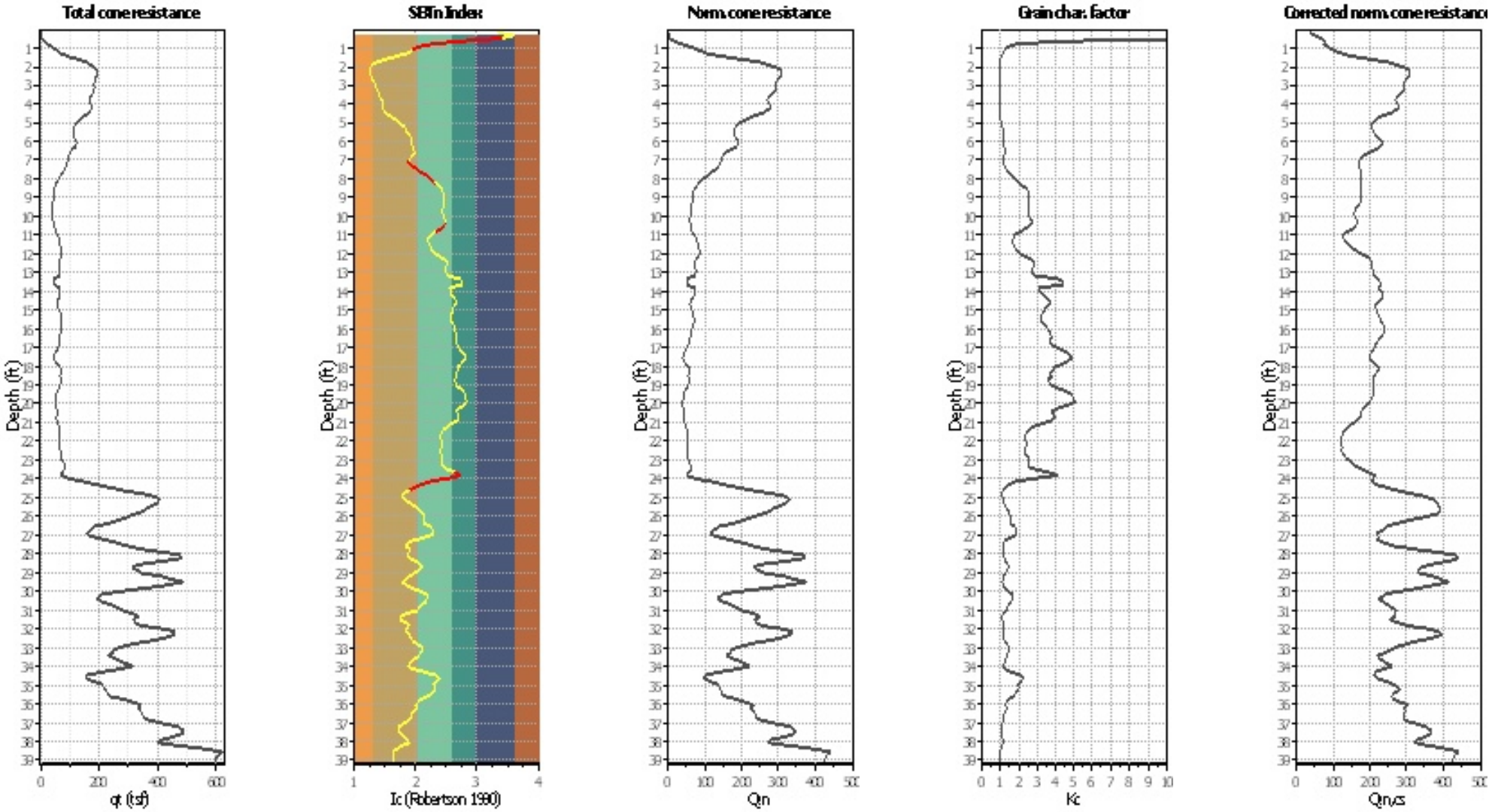
Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.65	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

SBTn legend

1. Sensitive fine grained
2. Organic material
3. Clay to silty clay
4. Clayey silt to silty
5. Silty sand to sandy silt
6. Clean sand to silty sand
7. Gravely sand to sand
8. Very stiff sand to
9. Very stiff fine grained

Liquefaction analysis overall plots (intermediate resu



Input parameters and analysis data

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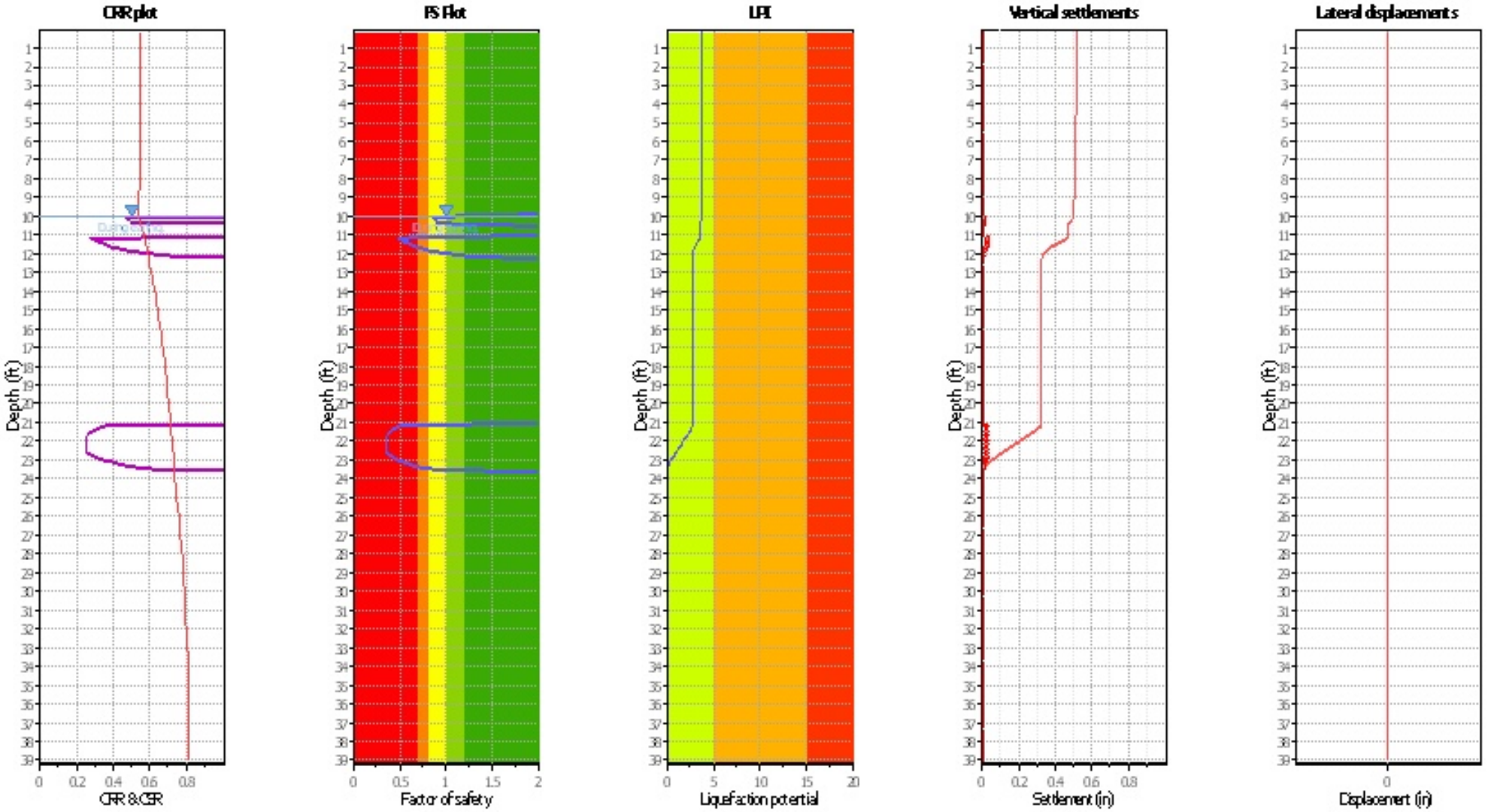
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.65	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

Liquefaction analysis overall plot



Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.65	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

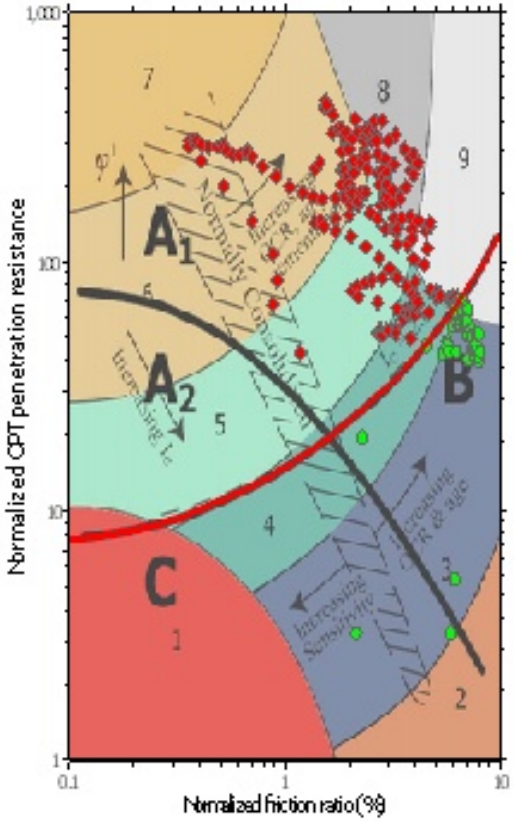
F.S. color scheme

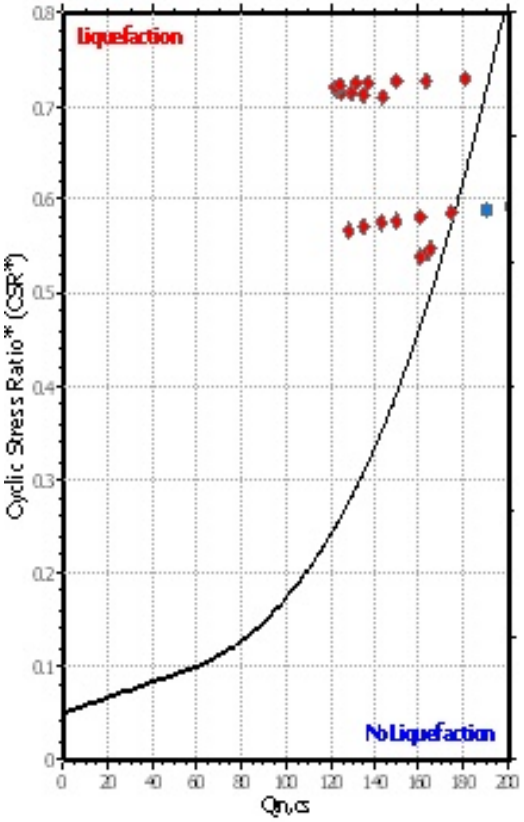
- Almost certain it will liquefy
- Very likely to liquefy
- Liquefaction and no liq. are equally likely
- Unlike to liquefy
- Almost certain it will not liquefy

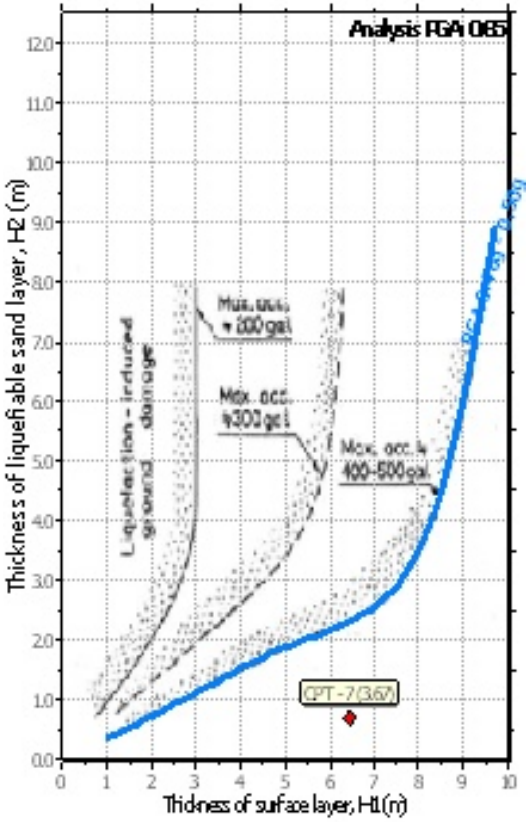
LPI color scheme

- Very high risk
- High risk
- Low risk

Liquefaction analysis summary plo



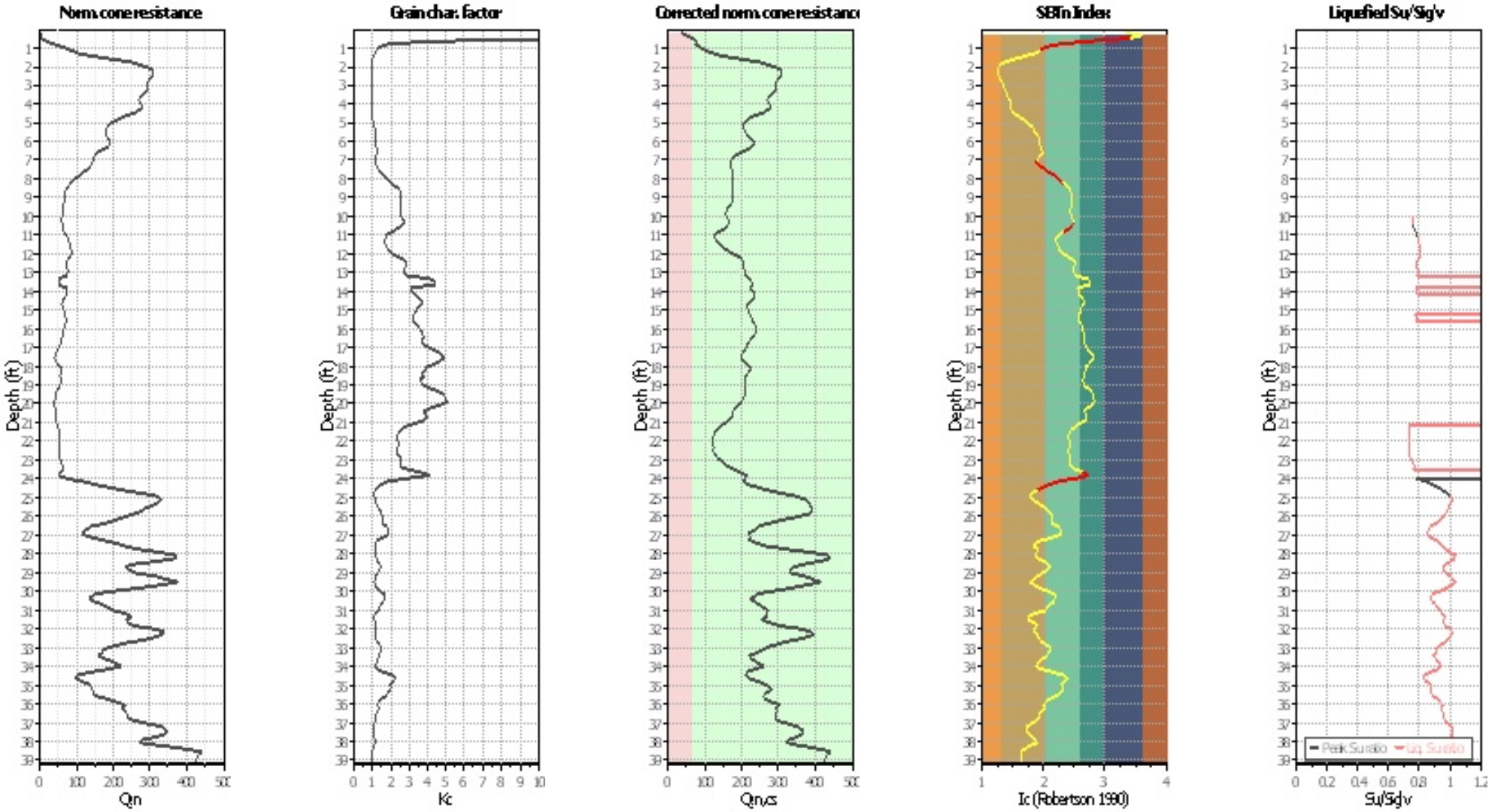




Input parameters and analysis data

Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.65	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

Check for strength loss plots (Robertson (2010))



Input parameters and analysis data

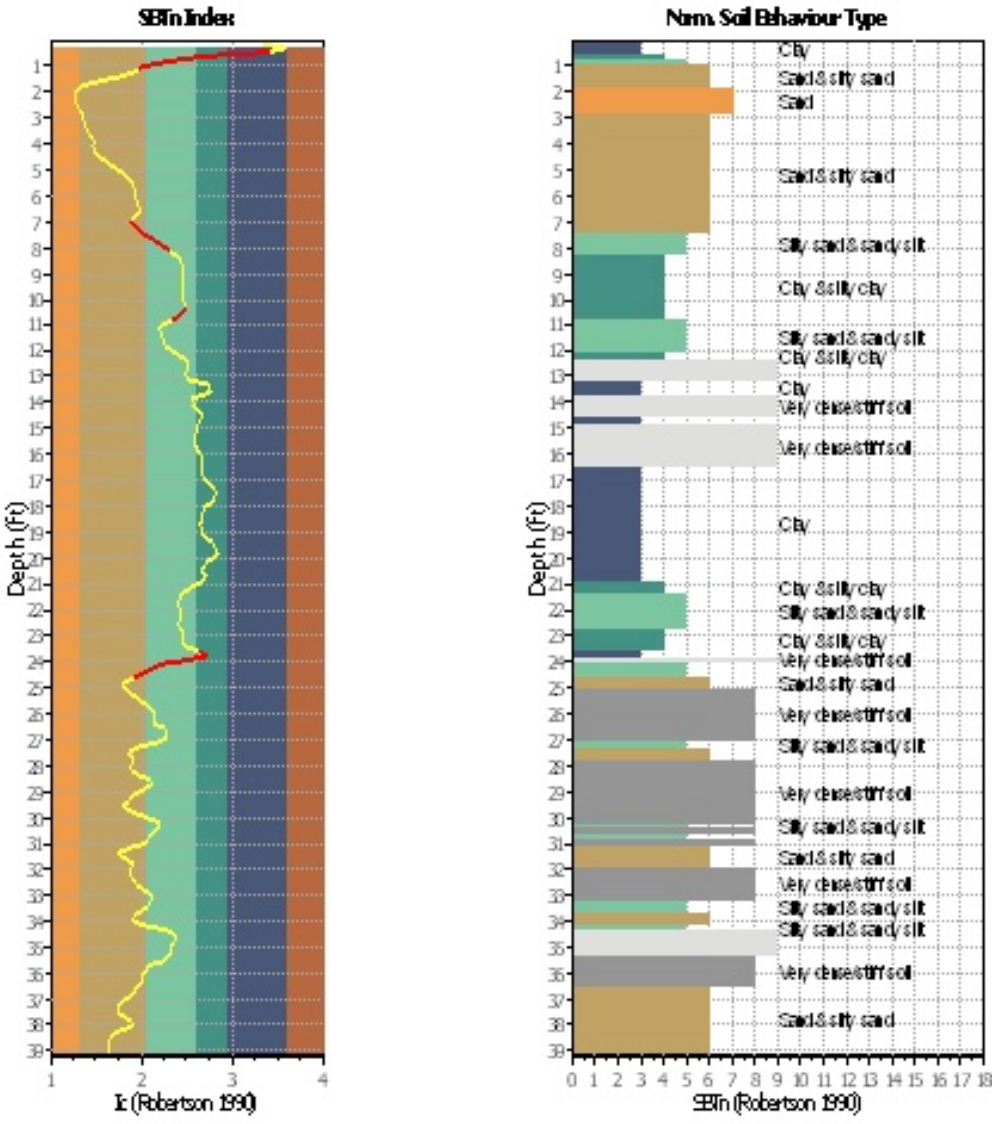
Analysis method:	NCEER (1998)	Depth to water table (erthq.):	10.00 ft	Fill weight:	N/A
Fines correction method:	NCEER (1998)	Average results interval:	3	Transition detect. applied:	Yes
Points to test:	Based on Ic value	Ic cut-off value:	2.60	K_σ applied:	Yes
Earthquake magnitude M_w:	7.50	Unit weight calculation:	Based on SBT	Clay like behavior applied:	Sands only
Peak ground acceleration:	0.65	Use fill:	No	Limit depth applied:	No
Depth to water table (insitu):	18.00 ft	Fill height:	N/A	Limit depth:	N/A

TRANSITION LAYER DETECTION ALGORITHM REPORT
Summary Details & Plots

Short description

The software will delete data when the cone is in transition from either clay to sand or vise-versa. To do this the software requires a range of I_c values over which the transition will be defined (typically somewhere between $1.80 < I_c < 3.0$) and a rate of change of I_c. Transitions typically occur when the rate of change of I_c is fast (i.e. delta I_c is small).

The SBT_n plot below, displays in red the detected transition layers based on the parameters listed below the graphs.



Transition layer algorithm properties		General statistics	
I_c minimum check value:	1.70	Total points in CPT file:	238
I_c maximum check value:	3.00	Total points excluded:	24
I_c change ratio value:	0.0250	Exclusion percentage:	10.08%
Minimum number of points in layer:	4	Number of layers detected:	4

Transition layer No	Number of points	Depth	SBT_n number	SBT_n description
Transition layer 1	5	Start depth: 0.66 (ft)	4	Clay & silty clay
		End depth: 1.31 (ft)	6	Sand & silty sand
Transition layer 2	8	Start depth: 7.22 (ft)	6	Sand & silty sand
		End depth: 8.37 (ft)	4	Clay & silty clay
Transition layer 3	4	Start depth: 10.50 (ft)	4	Clay & silty clay
		End depth: 10.99 (ft)	5	Silty sand & sandy silt
Transition layer 4	7	Start depth: 23.79 (ft)	3	Clay
		End depth: 24.77 (ft)	6	Sand & silty sand

Start depth: Depth where the transition layer begins
End depth: Depth where the transition layer ends

:: Field input data ::

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
1	0.16	2.00	0.02	0.20	84.86	88.89
2	0.33	2.00	0.09	0.20	100.00	96.33
3	0.49	2.00	0.25	0.20	90.16	101.63
4	0.66	5.96	0.28	0.36	40.20	106.99
5	0.82	28.36	0.30	0.39	20.53	109.86
6	0.98	46.14	0.36	0.39	13.22	112.19
7	1.15	52.54	0.45	0.39	11.49	114.59
8	1.31	59.11	0.63	0.39	9.29	116.55
9	1.48	87.55	0.66	0.39	5.83	118.08
10	1.64	128.11	0.64	0.39	2.73	118.91
11	1.80	161.63	0.65	0.39	0.95	119.34
12	1.97	182.92	0.63	0.42	0.16	119.76
13	2.13	193.77	0.67	0.42	0.00	120.28
14	2.30	191.97	0.75	0.42	0.02	120.72
15	2.46	191.94	0.75	0.42	0.19	120.88
16	2.63	184.38	0.73	0.42	0.37	120.88
17	2.79	177.86	0.77	0.42	0.69	121.38
18	2.95	182.94	0.92	0.46	0.99	122.04
19	3.12	183.28	0.96	0.46	1.12	122.49
20	3.28	182.97	0.93	0.52	1.23	122.41
21	3.44	173.58	0.91	0.52	1.47	122.35
22	3.61	166.38	0.96	0.52	1.83	122.50
23	3.77	166.24	1.02	0.56	2.20	123.08
24	3.94	170.60	1.15	0.56	2.41	123.65
25	4.10	171.79	1.20	0.56	2.35	123.89
26	4.26	176.73	1.11	0.62	2.41	123.85
27	4.43	166.05	1.14	0.65	2.79	123.75
28	4.59	149.78	1.21	0.59	3.72	123.79
29	4.76	136.61	1.23	0.62	4.89	123.90
30	4.92	125.43	1.31	0.62	6.21	124.13
31	5.08	115.22	1.44	0.62	7.42	124.53
32	5.25	114.06	1.54	0.65	8.48	125.01
33	5.41	111.65	1.66	0.69	9.22	125.58
34	5.58	111.49	1.84	0.69	10.27	126.54
35	5.74	113.39	2.25	0.69	11.03	127.53
36	5.91	118.25	2.45	0.72	11.39	128.37
37	6.07	123.50	2.55	0.72	11.20	128.40
38	6.23	117.98	2.25	0.75	11.45	128.14
39	6.40	107.21	2.27	0.75	11.96	127.25
40	6.56	95.53	1.92	0.82	12.56	126.26
41	6.73	89.18	1.61	0.78	11.59	124.72
42	6.89	94.62	1.24	0.82	10.53	123.40
43	7.05	89.76	1.16	0.82	10.08	122.80
44	7.22	86.69	1.31	0.82	11.06	123.08
45	7.38	84.07	1.43	0.78	12.52	123.72
46	7.55	79.46	1.57	0.82	14.31	124.25
47	7.71	72.89	1.73	0.82	16.60	124.55
48	7.87	64.08	1.77	0.82	19.10	124.62

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
49	8.04	58.53	1.80	0.78	21.31	124.44
50	8.20	54.59	1.77	0.82	23.36	124.26
51	8.37	49.20	1.79	0.78	25.42	124.10
52	8.53	45.72	1.84	0.82	27.37	123.98
53	8.69	44.04	1.81	0.78	28.35	123.84
54	8.86	43.76	1.76	0.78	28.86	123.68
55	9.02	42.24	1.76	0.78	28.99	123.55
56	9.19	42.52	1.74	0.78	29.08	123.38
57	9.35	42.49	1.66	0.78	28.97	123.12
58	9.51	41.47	1.59	0.78	28.40	122.69
59	9.68	42.46	1.45	0.75	28.06	122.54
60	9.84	43.60	1.55	0.75	28.18	122.52
61	10.01	41.55	1.58	0.69	28.93	122.83
62	10.17	42.27	1.66	0.69	29.78	123.15
63	10.34	43.10	1.77	0.69	29.78	123.39
64	10.50	44.09	1.71	0.69	28.99	123.35
65	10.66	46.19	1.58	0.69	26.68	122.88
66	10.83	50.91	1.36	0.65	23.45	122.07
67	10.99	55.33	1.12	0.65	20.45	121.36
68	11.15	59.55	1.10	0.65	19.13	121.59
69	11.32	63.64	1.39	0.65	19.23	122.56
70	11.48	65.66	1.56	0.65	19.89	123.58
71	11.65	66.51	1.65	0.65	20.36	124.40
72	11.81	70.16	1.87	0.65	21.43	125.46
73	11.97	70.76	2.31	0.65	23.08	126.74
74	12.14	70.21	2.72	0.65	26.20	127.70
75	12.30	59.86	2.97	0.65	29.22	128.13
76	12.47	56.96	3.00	0.65	31.24	128.20
77	12.63	59.97	2.96	0.65	30.94	128.30
78	12.79	63.53	3.04	0.65	30.65	128.75
79	12.96	64.66	3.44	0.65	30.35	128.86
80	13.12	63.86	3.04	0.65	31.34	129.04
81	13.29	60.55	3.33	0.69	41.53	128.14
82	13.45	10.16	3.35	0.65	43.29	128.36
83	13.62	60.30	3.42	0.69	43.38	128.65
84	13.78	63.25	3.66	0.69	33.45	129.90
85	13.94	66.87	3.92	0.72	33.75	130.42
86	14.11	65.77	4.12	0.69	34.39	130.76
87	14.27	64.52	4.18	0.69	36.26	130.73
88	14.44	57.04	4.08	0.69	37.84	130.15
89	14.60	52.07	3.48	0.69	38.44	129.60
90	14.76	56.60	3.50	0.69	37.08	129.39
91	14.93	61.71	3.67	0.69	36.02	129.84
92	15.09	62.95	3.93	0.69	35.47	130.28
93	15.26	65.30	4.00	0.69	34.47	130.65
94	15.42	72.53	4.04	0.72	33.87	131.01
95	15.58	71.98	4.36	0.69	33.91	131.43
96	15.75	71.45	4.60	0.72	35.45	131.69

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
97	15.91	67.48	4.61	0.72	36.47	131.73
98	16.08	67.28	4.53	0.72	37.82	131.66
99	16.24	63.92	4.65	0.72	38.35	131.53
100	16.40	63.78	4.46	0.72	38.66	131.18
101	16.57	62.12	4.01	0.75	38.14	130.82
102	16.73	62.92	4.04	0.72	38.40	130.47
103	16.90	59.17	3.98	0.03	39.98	130.25
104	17.06	52.90	3.85	-0.13	41.86	129.78
105	17.22	50.61	3.58	-0.29	44.38	129.12
106	17.39	43.87	3.34	-0.49	46.14	128.59
107	17.55	42.91	3.33	-0.72	46.67	128.60
108	17.72	49.53	3.62	-0.88	44.99	129.42
109	17.88	57.21	4.22	-1.11	42.78	130.58
110	18.05	63.34	4.70	-1.27	39.61	131.49
111	18.21	74.96	4.63	-1.50	39.12	131.60
112	18.37	61.40	4.32	-1.73	38.14	131.23
113	18.54	64.30	4.01	-1.99	38.84	130.82
114	18.70	66.79	4.10	-2.09	37.61	130.76
115	18.86	67.37	4.09	-2.09	37.73	130.79
116	19.03	64.28	4.05	-2.09	38.98	130.67
117	19.19	59.42	4.07	-2.09	41.64	130.54
118	19.36	53.76	4.17	-2.06	44.51	130.39
119	19.52	51.08	4.11	-2.09	46.45	130.21
120	19.68	50.66	3.99	-2.15	47.14	129.76
121	19.85	47.52	3.61	-2.19	47.71	129.22
122	20.01	44.65	3.43	-2.29	45.50	128.69
123	20.18	53.73	3.15	-2.84	41.94	128.57
124	20.34	59.69	3.18	-2.97	38.89	128.57
125	20.50	57.62	3.18	-3.13	39.35	128.44
126	20.67	50.69	3.04	-3.40	40.41	128.01
127	20.83	51.38	2.79	-3.56	39.51	127.38
128	21.00	55.69	2.48	-3.75	35.91	126.77
129	21.16	60.55	2.22	-3.98	32.15	126.15
130	21.32	63.81	2.02	-4.15	29.30	125.54
131	21.49	65.38	1.83	-4.21	27.57	125.08
132	21.65	66.32	1.79	-4.25	26.87	124.58
133	21.82	63.09	1.66	-4.28	26.92	124.32
134	21.98	62.56	1.68	-4.28	27.36	124.25
135	22.15	63.17	1.77	-4.31	27.55	124.39
136	22.31	63.67	1.75	-4.34	27.35	124.46
137	22.47	64.75	1.70	-4.38	26.65	124.42
138	22.64	67.56	1.71	-4.44	26.61	124.69
139	22.80	67.20	1.91	-4.54	27.93	125.58
140	22.97	66.54	2.37	-4.64	28.65	126.19
141	23.13	70.41	2.20	-4.80	28.61	127.72
142	23.29	86.72	3.17	-4.93	28.42	129.19
143	23.46	88.57	3.79	-5.22	31.66	130.44
144	23.62	65.33	3.99	-5.29	37.65	131.23

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
145	23.79	60.41	4.91	-5.36	41.29	131.94
146	23.95	78.69	5.30	-5.42	31.86	132.93
147	24.11	140.81	4.42	-5.39	20.20	133.90
148	24.28	219.86	4.66	-5.39	15.81	134.78
149	24.44	196.86	5.90	-5.36	12.73	136.02
150	24.61	282.42	5.89	-5.32	10.32	136.85
151	24.77	360.28	5.56	-5.32	8.20	137.28
152	24.93	383.12	7.42	-5.29	7.78	137.28
153	25.10	423.01	9.15	-5.29	8.75	137.28
154	25.26	409.45	10.08	-5.26	10.16	137.28
155	25.43	367.38	11.38	-5.22	12.01	137.28
156	25.59	368.40	12.99	-5.22	14.21	137.28
157	25.75	348.74	14.54	-5.19	15.65	137.28
158	25.92	317.98	13.47	-5.13	16.73	137.28
159	26.08	291.29	11.68	-5.09	16.80	137.28
160	26.25	262.99	9.12	-5.06	16.64	137.28
161	26.41	227.92	7.41	-5.00	16.91	137.28
162	26.57	204.06	7.07	-4.96	20.57	137.13
163	26.74	111.54	6.36	-4.83	21.62	136.18
164	26.90	175.96	5.48	-4.80	21.49	135.25
165	27.07	178.53	5.13	-4.83	18.31	135.74
166	27.23	189.93	6.62	-4.87	12.79	134.93
167	27.39	292.94	2.69	-4.93	10.04	135.27
168	27.56	299.73	5.00	-5.03	9.22	136.49
169	27.72	295.62	8.51	-5.29	10.56	137.28
170	27.89	434.55	10.82	-5.26	10.52	137.28
171	28.05	498.86	12.90	-5.29	9.71	137.28
172	28.21	496.90	13.75	-5.36	10.43	137.28
173	28.38	441.98	14.09	-5.42	12.49	137.28
174	28.54	339.57	13.88	-5.45	15.42	137.28
175	28.71	260.25	11.49	-5.49	16.19	137.28
176	28.87	335.38	10.02	-5.52	13.98	137.28
177	29.04	386.26	9.88	-5.52	12.56	137.28
178	29.20	316.16	10.04	-5.55	10.22	137.28
179	29.36	517.82	10.58	-5.62	9.24	137.28
180	29.53	507.06	11.14	-5.78	7.94	137.28
181	29.69	431.60	9.29	-5.91	9.46	137.28
182	29.86	348.63	9.99	-5.94	11.62	137.28
183	30.02	297.80	9.45	-6.04	14.41	137.28
184	30.18	194.95	5.52	-6.33	18.62	137.28
185	30.35	133.85	6.75	-6.33	18.87	136.42
186	30.51	239.68	6.36	-6.40	17.75	137.17
187	30.68	251.42	6.89	-6.46	15.51	137.28
188	30.84	225.30	7.54	-6.53	14.73	137.28
189	31.00	293.55	7.48	-6.56	13.57	137.28
190	31.17	327.12	7.98	-6.69	9.54	137.28
191	31.33	315.61	2.28	-6.76	7.03	135.91
192	31.50	356.89	4.13	-6.79	7.05	134.96

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)
193	31.66	267.93	6.50	-6.92	9.17	137.28
194	31.82	348.82	7.45	-6.92	10.43	137.28
195	31.99	414.92	9.11	-6.92	9.63	137.28
196	32.15	486.79	12.41	-6.96	9.62	137.28
197	32.32	467.38	11.95	-6.99	10.15	137.28
198	32.48	416.80	11.13	-6.99	10.76	137.28
199	32.64	392.34	10.65	-7.02	11.57	137.28
200	32.81	327.65	8.59	-7.05	13.62	137.28
201	32.97	241.42	8.91	-7.05	15.52	137.28
202	33.14	257.24	8.43	-6.82	16.34	137.28
203	33.30	248.43	6.07	-6.79	15.06	137.28
204	33.47	229.74	5.74	-6.76	14.45	136.13
205	33.63	207.32	5.00	-6.76	12.57	136.22
206	33.79	316.71	5.74	-6.89	10.68	136.74
207	33.96	336.04	6.21	-6.99	9.98	137.28
208	34.12	276.54	5.96	-7.05	12.26	137.07
209	34.28	198.32	5.90	-7.15	17.40	136.26
210	34.45	136.70	5.92	-7.22	23.67	135.92
211	34.61	139.49	6.64	-7.25	25.76	136.42
212	34.78	181.51	7.47	-7.32	24.54	137.28
213	34.94	209.34	9.81	-7.38	22.69	137.28
214	35.10	228.17	10.15	-7.45	22.94	137.28
215	35.27	209.15	10.11	-7.51	22.85	137.28
216	35.43	227.51	11.00	-7.54	20.99	137.28
217	35.60	237.67	6.79	-7.61	19.48	137.28
218	35.76	233.11	8.52	-7.67	15.02	137.28
219	35.92	367.54	9.35	-7.80	14.27	137.28
220	36.09	327.32	9.46	-7.84	13.06	137.28
221	36.25	331.76	10.02	-7.84	13.46	137.28
222	36.42	330.79	8.66	-7.84	12.55	137.28
223	36.58	359.51	8.46	-7.84	11.43	137.28
224	36.74	352.00	7.86	-7.77	11.30	137.28
225	36.91	342.00	8.73	-7.77	9.71	137.28
226	37.07	409.37	6.14	-7.80	8.67	137.28
227	37.24	483.30	9.46	-7.87	6.70	137.28
228	37.40	501.26	7.60	-7.87	6.86	137.28
229	37.57	485.45	8.77	-7.97	7.16	137.28
230	37.73	471.22	10.10	-8.13	8.50	137.28
231	37.89	409.81	9.18	-8.16	10.05	137.28
232	38.06	364.06	9.40	-8.20	10.28	137.28
233	38.22	426.38	9.08	-8.26	7.79	137.28
234	38.39	635.25	9.00	-8.62	5.91	137.28
235	38.55	615.18	9.89	-8.82	4.92	137.28
236	38.71	610.15	9.72	-8.78	5.11	137.28
237	38.88	602.53	9.00	-8.78	5.03	137.28
238	39.04	593.28	9.00	-8.82	4.97	137.28

:: Field input data :: (continued)

Point ID	Depth (ft)	q_c (tsf)	f_s (tsf)	u (tsf)	Fines content (%)	Unit weight (pcf)

Abbreviations

Depth:	Depth from free surface, at which CPT was performed (ft)
q_c:	Measured cone resistance (tsf)
f_s:	Sleeve friction resistance (tsf)
u:	Pore pressure (tsf)
Fines content:	Percentage of fines in soil (%)
Unit weight:	Bulk soil unit weight (pcf)

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data ::

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
1	0.16	0.01	0.00	0.01	1.00	0.423	1.00	0.423	1.00	1.30	2.000	No
2	0.33	0.02	0.00	0.02	1.00	0.423	1.00	0.423	1.00	1.30	2.000	No
3	0.49	0.02	0.00	0.02	1.00	0.423	1.00	0.423	1.00	1.30	2.000	No
4	0.66	0.03	0.00	0.03	1.00	0.423	1.00	0.423	1.00	1.30	2.000	Yes
5	0.82	0.04	0.00	0.04	1.00	0.422	1.00	0.423	1.00	1.30	2.000	Yes
6	0.98	0.05	0.00	0.05	1.00	0.422	1.00	0.422	1.00	1.30	2.000	Yes
7	1.15	0.06	0.00	0.06	1.00	0.422	1.00	0.422	1.00	1.30	2.000	Yes
8	1.31	0.07	0.00	0.07	1.00	0.422	1.00	0.422	1.00	1.30	2.000	Yes
9	1.48	0.08	0.00	0.08	1.00	0.422	1.00	0.422	1.00	1.30	2.000	No
10	1.64	0.09	0.00	0.09	1.00	0.422	1.00	0.422	1.00	1.30	2.000	No
11	1.80	0.10	0.00	0.10	1.00	0.422	1.00	0.422	1.00	1.30	2.000	No
12	1.97	0.11	0.00	0.11	1.00	0.421	1.00	0.422	1.00	1.30	2.000	No
13	2.13	0.12	0.00	0.12	1.00	0.421	1.00	0.421	1.00	1.30	2.000	No
14	2.30	0.13	0.00	0.13	1.00	0.421	1.00	0.421	1.00	1.30	2.000	No
15	2.46	0.14	0.00	0.14	1.00	0.421	1.00	0.421	1.00	1.30	2.000	No
16	2.63	0.15	0.00	0.15	1.00	0.421	1.00	0.421	1.00	1.30	2.000	No
17	2.79	0.16	0.00	0.16	1.00	0.421	1.00	0.421	1.00	1.30	2.000	No
18	2.95	0.17	0.00	0.17	1.00	0.420	1.00	0.421	1.00	1.30	2.000	No
19	3.12	0.18	0.00	0.18	0.99	0.420	1.00	0.420	1.00	1.30	2.000	No
20	3.28	0.19	0.00	0.19	0.99	0.420	1.00	0.420	1.00	1.30	2.000	No
21	3.44	0.20	0.00	0.20	0.99	0.420	1.00	0.420	1.00	1.30	2.000	No
22	3.61	0.21	0.00	0.21	0.99	0.420	1.00	0.420	1.00	1.30	2.000	No
23	3.77	0.22	0.00	0.22	0.99	0.420	1.00	0.420	1.00	1.30	2.000	No
24	3.94	0.23	0.00	0.23	0.99	0.419	1.00	0.420	1.00	1.30	2.000	No
25	4.10	0.24	0.00	0.24	0.99	0.419	1.00	0.419	1.00	1.30	2.000	No
26	4.26	0.25	0.00	0.25	0.99	0.419	1.00	0.419	1.00	1.30	2.000	No
27	4.43	0.26	0.00	0.26	0.99	0.419	1.00	0.419	1.00	1.30	2.000	No
28	4.59	0.27	0.00	0.27	0.99	0.419	1.00	0.419	1.00	1.30	2.000	No
29	4.76	0.28	0.00	0.28	0.99	0.419	1.00	0.419	1.00	1.30	2.000	No
30	4.92	0.29	0.00	0.29	0.99	0.418	1.00	0.419	1.00	1.30	2.000	No
31	5.08	0.30	0.00	0.30	0.99	0.418	1.00	0.418	1.00	1.30	2.000	No
32	5.25	0.31	0.00	0.31	0.99	0.418	1.00	0.418	1.00	1.30	2.000	No
33	5.41	0.32	0.00	0.32	0.99	0.418	1.00	0.418	1.00	1.30	2.000	No
34	5.58	0.33	0.00	0.33	0.99	0.418	1.00	0.418	1.00	1.30	2.000	No
35	5.74	0.34	0.00	0.34	0.99	0.418	1.00	0.418	1.00	1.30	2.000	No
36	5.91	0.35	0.00	0.35	0.99	0.417	1.00	0.418	1.00	1.30	2.000	No
37	6.07	0.36	0.00	0.36	0.99	0.417	1.00	0.417	1.00	1.30	2.000	No
38	6.23	0.37	0.00	0.37	0.99	0.417	1.00	0.417	1.00	1.30	2.000	No
39	6.40	0.38	0.00	0.38	0.99	0.417	1.00	0.417	1.00	1.30	2.000	No
40	6.56	0.39	0.00	0.39	0.99	0.417	1.00	0.417	1.00	1.30	2.000	No
41	6.73	0.40	0.00	0.40	0.99	0.417	1.00	0.417	1.00	1.30	2.000	No
42	6.89	0.41	0.00	0.41	0.99	0.417	1.00	0.417	1.00	1.30	2.000	No
43	7.05	0.42	0.00	0.42	0.99	0.416	1.00	0.417	1.00	1.30	2.000	No
44	7.22	0.43	0.00	0.43	0.99	0.416	1.00	0.416	1.00	1.30	2.000	Yes
45	7.38	0.44	0.00	0.44	0.98	0.416	1.00	0.416	1.00	1.30	2.000	Yes
46	7.55	0.45	0.00	0.45	0.98	0.416	1.00	0.416	1.00	1.30	2.000	Yes
47	7.71	0.46	0.00	0.46	0.98	0.416	1.00	0.416	1.00	1.30	2.000	Yes
48	7.87	0.47	0.00	0.47	0.98	0.416	1.00	0.416	1.00	1.30	2.000	Yes

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR*	Belongs to transition
49	8.04	0.48	0.00	0.48	0.98	0.415	1.00	0.416	1.00	1.30	2.000	Yes
50	8.20	0.50	0.00	0.50	0.98	0.415	1.00	0.415	1.00	1.30	2.000	Yes
51	8.37	0.51	0.00	0.51	0.98	0.415	1.00	0.415	1.00	1.30	2.000	Yes
52	8.53	0.52	0.00	0.52	0.98	0.415	1.00	0.415	1.00	1.30	2.000	No
53	8.69	0.53	0.00	0.53	0.98	0.415	1.00	0.415	1.00	1.30	2.000	No
54	8.86	0.54	0.00	0.54	0.98	0.415	1.00	0.415	1.00	1.30	2.000	No
55	9.02	0.55	0.00	0.55	0.98	0.415	1.00	0.415	1.00	1.30	2.000	No
56	9.19	0.56	0.00	0.56	0.98	0.414	1.00	0.415	1.00	1.30	2.000	No
57	9.35	0.57	0.00	0.57	0.98	0.414	1.00	0.414	1.00	1.30	2.000	No
58	9.51	0.58	0.00	0.58	0.98	0.414	1.00	0.414	1.00	1.30	2.000	No
59	9.68	0.59	0.00	0.59	0.98	0.414	1.00	0.414	1.00	1.30	2.000	No
60	9.84	0.60	0.00	0.60	0.98	0.414	1.00	0.414	1.00	1.30	2.000	No
61	10.01	0.61	0.00	0.61	0.98	0.414	1.00	0.414	1.00	1.30	0.538	No
62	10.17	0.62	0.01	0.61	0.98	0.417	1.00	0.417	1.00	1.30	0.542	No
63	10.34	0.63	0.01	0.62	0.98	0.420	1.00	0.421	1.00	1.30	0.547	No
64	10.50	0.64	0.02	0.62	0.98	0.424	1.00	0.424	1.00	1.30	2.000	Yes
65	10.66	0.65	0.02	0.63	0.98	0.427	1.00	0.427	1.00	1.30	2.000	Yes
66	10.83	0.66	0.03	0.63	0.98	0.430	1.00	0.430	1.00	1.30	2.000	Yes
67	10.99	0.67	0.03	0.64	0.98	0.433	1.00	0.433	1.00	1.30	2.000	Yes
68	11.15	0.68	0.04	0.64	0.98	0.436	1.00	0.436	1.00	1.30	0.567	No
69	11.32	0.69	0.04	0.65	0.98	0.439	1.00	0.439	1.00	1.30	0.571	No
70	11.48	0.70	0.05	0.65	0.98	0.442	1.00	0.442	1.00	1.30	0.574	No
71	11.65	0.71	0.05	0.66	0.98	0.445	1.00	0.445	1.00	1.30	0.578	No
72	11.81	0.72	0.06	0.66	0.98	0.447	1.00	0.447	1.00	1.30	0.582	No
73	11.97	0.73	0.06	0.67	0.97	0.450	1.00	0.450	1.00	1.30	0.585	No
74	12.14	0.74	0.07	0.67	0.97	0.453	1.00	0.453	1.00	1.30	0.589	No
75	12.30	0.75	0.07	0.68	0.97	0.455	1.00	0.455	1.00	1.30	0.592	No
76	12.47	0.76	0.08	0.68	0.97	0.458	1.00	0.458	1.00	1.30	0.595	No
77	12.63	0.77	0.08	0.69	0.97	0.460	1.00	0.461	1.00	1.30	0.599	No
78	12.79	0.78	0.09	0.69	0.97	0.463	1.00	0.463	1.00	1.30	0.602	No
79	12.96	0.79	0.09	0.70	0.97	0.465	1.00	0.466	1.00	1.30	0.605	No
80	13.12	0.80	0.10	0.70	0.97	0.468	1.00	0.468	1.00	1.30	0.608	No
81	13.29	0.81	0.10	0.71	0.97	0.470	1.00	0.470	1.00	1.30	0.611	No
82	13.45	0.82	0.11	0.71	0.97	0.472	1.00	0.473	1.00	1.30	0.614	No
83	13.62	0.83	0.11	0.72	0.97	0.475	1.00	0.475	1.00	1.30	0.617	No
84	13.78	0.84	0.12	0.73	0.97	0.477	1.00	0.477	1.00	1.30	0.620	No
85	13.94	0.85	0.12	0.73	0.97	0.479	1.00	0.479	1.00	1.30	0.623	No
86	14.11	0.87	0.13	0.74	0.97	0.481	1.00	0.481	1.00	1.30	0.626	No
87	14.27	0.88	0.13	0.74	0.97	0.483	1.00	0.484	1.00	1.30	0.629	No
88	14.44	0.89	0.14	0.75	0.97	0.486	1.00	0.486	1.00	1.30	0.631	No
89	14.60	0.90	0.14	0.75	0.97	0.488	1.00	0.488	1.00	1.30	0.634	No
90	14.76	0.91	0.15	0.76	0.97	0.490	1.00	0.490	1.00	1.30	0.637	No
91	14.93	0.92	0.15	0.76	0.97	0.492	1.00	0.492	1.00	1.30	0.639	No
92	15.09	0.93	0.16	0.77	0.97	0.494	1.00	0.494	1.00	1.30	0.642	No
93	15.26	0.94	0.16	0.78	0.97	0.495	1.00	0.496	1.00	1.30	0.644	No
94	15.42	0.95	0.17	0.78	0.97	0.497	1.00	0.497	1.00	1.30	0.647	No
95	15.58	0.96	0.17	0.79	0.97	0.499	1.00	0.499	1.00	1.30	0.649	No
96	15.75	0.97	0.18	0.79	0.97	0.501	1.00	0.501	1.00	1.30	0.651	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
97	15.91	0.98	0.18	0.80	0.97	0.503	1.00	0.503	1.00	1.30	0.654	No
98	16.08	0.99	0.19	0.80	0.97	0.504	1.00	0.505	1.00	1.30	0.656	No
99	16.24	1.00	0.19	0.81	0.97	0.506	1.00	0.506	1.00	1.30	0.658	No
100	16.40	1.02	0.20	0.82	0.97	0.508	1.00	0.508	1.00	1.30	0.660	No
101	16.57	1.03	0.20	0.82	0.97	0.510	1.00	0.510	1.00	1.30	0.663	No
102	16.73	1.04	0.21	0.83	0.96	0.511	1.00	0.511	1.00	1.30	0.665	No
103	16.90	1.05	0.22	0.83	0.96	0.513	1.00	0.513	1.00	1.30	0.667	No
104	17.06	1.06	0.22	0.84	0.96	0.514	1.00	0.515	1.00	1.30	0.669	No
105	17.22	1.07	0.23	0.84	0.96	0.516	1.00	0.516	1.00	1.30	0.671	No
106	17.39	1.08	0.23	0.85	0.96	0.518	1.00	0.518	1.00	1.30	0.673	No
107	17.55	1.09	0.24	0.85	0.96	0.519	1.00	0.519	1.00	1.30	0.675	No
108	17.72	1.10	0.24	0.86	0.96	0.521	1.00	0.521	1.00	1.30	0.677	No
109	17.88	1.11	0.25	0.87	0.96	0.522	1.00	0.522	1.00	1.30	0.679	No
110	18.05	1.12	0.25	0.87	0.96	0.523	1.00	0.524	1.00	1.30	0.681	No
111	18.21	1.13	0.26	0.88	0.96	0.525	1.00	0.525	1.00	1.30	0.683	No
112	18.37	1.14	0.26	0.88	0.96	0.526	1.00	0.526	1.00	1.30	0.684	No
113	18.54	1.15	0.27	0.89	0.96	0.528	1.00	0.528	1.00	1.30	0.686	No
114	18.70	1.16	0.27	0.89	0.96	0.529	1.00	0.529	1.00	1.30	0.688	No
115	18.86	1.18	0.28	0.90	0.96	0.530	1.00	0.530	1.00	1.30	0.690	No
116	19.03	1.19	0.28	0.90	0.96	0.532	1.00	0.532	1.00	1.30	0.691	No
117	19.19	1.20	0.29	0.91	0.96	0.533	1.00	0.533	1.00	1.30	0.693	No
118	19.36	1.21	0.29	0.92	0.96	0.534	1.00	0.534	1.00	1.30	0.695	No
119	19.52	1.22	0.30	0.92	0.96	0.535	1.00	0.536	1.00	1.30	0.696	No
120	19.68	1.23	0.30	0.93	0.96	0.537	1.00	0.537	1.00	1.30	0.698	No
121	19.85	1.24	0.31	0.93	0.96	0.538	1.00	0.538	1.00	1.30	0.699	No
122	20.01	1.25	0.31	0.94	0.96	0.539	1.00	0.539	1.00	1.30	0.701	No
123	20.18	1.26	0.32	0.94	0.96	0.540	1.00	0.540	1.00	1.30	0.702	No
124	20.34	1.27	0.32	0.95	0.96	0.541	1.00	0.541	1.00	1.30	0.704	No
125	20.50	1.28	0.33	0.95	0.96	0.542	1.00	0.543	1.00	1.30	0.705	No
126	20.67	1.29	0.33	0.96	0.96	0.544	1.00	0.544	1.00	1.30	0.707	No
127	20.83	1.30	0.34	0.96	0.95	0.545	1.00	0.545	1.00	1.30	0.708	No
128	21.00	1.31	0.34	0.97	0.95	0.546	1.00	0.546	1.00	1.30	0.710	No
129	21.16	1.32	0.35	0.98	0.95	0.547	1.00	0.547	1.00	1.30	0.711	No
130	21.32	1.33	0.35	0.98	0.95	0.548	1.00	0.548	1.00	1.30	0.713	No
131	21.49	1.34	0.36	0.99	0.95	0.549	1.00	0.549	1.00	1.30	0.714	No
132	21.65	1.35	0.36	0.99	0.95	0.550	1.00	0.550	1.00	1.30	0.715	No
133	21.82	1.36	0.37	1.00	0.95	0.551	1.00	0.551	1.00	1.30	0.717	No
134	21.98	1.37	0.37	1.00	0.95	0.552	1.00	0.552	1.00	1.30	0.718	No
135	22.15	1.38	0.38	1.01	0.95	0.553	1.00	0.553	1.00	1.30	0.719	No
136	22.31	1.40	0.38	1.01	0.95	0.554	1.00	0.554	1.00	1.30	0.721	No
137	22.47	1.41	0.39	1.02	0.95	0.555	1.00	0.555	1.00	1.30	0.722	No
138	22.64	1.42	0.39	1.02	0.95	0.556	1.00	0.556	1.00	1.30	0.723	No
139	22.80	1.43	0.40	1.03	0.95	0.557	1.00	0.557	1.00	1.30	0.724	No
140	22.97	1.44	0.40	1.03	0.95	0.558	1.00	0.558	1.00	1.30	0.726	No
141	23.13	1.45	0.41	1.04	0.95	0.559	1.00	0.559	1.00	1.30	0.727	No
142	23.29	1.46	0.41	1.04	0.95	0.560	1.00	0.560	1.00	1.30	0.728	No
143	23.46	1.47	0.42	1.05	0.95	0.560	1.00	0.561	1.00	1.30	0.729	No
144	23.62	1.48	0.43	1.05	0.95	0.561	1.00	0.561	1.00	1.30	0.730	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
145	23.79	1.49	0.43	1.06	0.95	0.562	1.00	0.562	1.00	1.30	2.000	Yes
146	23.95	1.50	0.44	1.07	0.95	0.563	1.00	0.563	1.00	1.30	2.000	Yes
147	24.11	1.51	0.44	1.07	0.94	0.563	1.00	0.564	1.00	1.30	2.000	Yes
148	24.28	1.52	0.45	1.08	0.94	0.564	1.00	0.564	1.00	1.30	2.000	Yes
149	24.44	1.53	0.45	1.08	0.94	0.565	1.00	0.565	0.99	1.30	2.000	Yes
150	24.61	1.54	0.46	1.09	0.94	0.565	1.00	0.565	0.99	1.30	2.000	Yes
151	24.77	1.56	0.46	1.10	0.94	0.566	1.00	0.566	0.99	1.30	2.000	Yes
152	24.93	1.57	0.47	1.10	0.94	0.566	1.00	0.567	0.99	1.30	0.743	No
153	25.10	1.58	0.47	1.11	0.94	0.567	1.00	0.567	0.99	1.30	0.745	No
154	25.26	1.59	0.48	1.11	0.94	0.567	1.00	0.568	0.99	1.30	0.747	No
155	25.43	1.60	0.48	1.12	0.94	0.568	1.00	0.568	0.99	1.30	0.748	No
156	25.59	1.61	0.49	1.13	0.94	0.569	1.00	0.569	0.99	1.30	0.750	No
157	25.75	1.62	0.49	1.13	0.94	0.569	1.00	0.569	0.98	1.30	0.752	No
158	25.92	1.64	0.50	1.14	0.94	0.570	1.00	0.570	0.98	1.30	0.753	No
159	26.08	1.65	0.50	1.14	0.94	0.570	1.00	0.570	0.98	1.30	0.755	No
160	26.25	1.66	0.51	1.15	0.94	0.570	1.00	0.571	0.98	1.30	0.756	No
161	26.41	1.67	0.51	1.16	0.94	0.571	1.00	0.571	0.98	1.30	0.758	No
162	26.57	1.68	0.52	1.16	0.94	0.571	1.00	0.571	0.98	1.30	0.759	No
163	26.74	1.69	0.52	1.17	0.94	0.572	1.00	0.572	0.98	1.30	0.761	No
164	26.90	1.70	0.53	1.17	0.93	0.572	1.00	0.572	0.98	1.30	0.762	No
165	27.07	1.71	0.53	1.18	0.93	0.573	1.00	0.573	0.98	1.30	0.764	No
166	27.23	1.72	0.54	1.19	0.93	0.573	1.00	0.573	0.97	1.30	0.765	No
167	27.39	1.74	0.54	1.19	0.93	0.573	1.00	0.574	0.97	1.30	0.766	No
168	27.56	1.75	0.55	1.20	0.93	0.574	1.00	0.574	0.97	1.30	0.768	No
169	27.72	1.76	0.55	1.21	0.93	0.574	1.00	0.574	0.97	1.30	0.769	No
170	27.89	1.77	0.56	1.21	0.93	0.574	1.00	0.574	0.97	1.30	0.770	No
171	28.05	1.78	0.56	1.22	0.93	0.575	1.00	0.575	0.97	1.30	0.772	No
172	28.21	1.79	0.57	1.22	0.93	0.575	1.00	0.575	0.97	1.30	0.773	No
173	28.38	1.80	0.57	1.23	0.93	0.575	1.00	0.575	0.97	1.30	0.774	No
174	28.54	1.81	0.58	1.24	0.93	0.575	1.00	0.576	0.96	1.30	0.775	No
175	28.71	1.83	0.58	1.24	0.93	0.576	1.00	0.576	0.96	1.30	0.777	No
176	28.87	1.84	0.59	1.25	0.93	0.576	1.00	0.576	0.96	1.30	0.778	No
177	29.04	1.85	0.59	1.25	0.93	0.576	1.00	0.576	0.96	1.30	0.779	No
178	29.20	1.86	0.60	1.26	0.92	0.576	1.00	0.576	0.96	1.30	0.780	No
179	29.36	1.87	0.60	1.27	0.92	0.576	1.00	0.577	0.96	1.30	0.781	No
180	29.53	1.88	0.61	1.27	0.92	0.577	1.00	0.577	0.96	1.30	0.782	No
181	29.69	1.89	0.61	1.28	0.92	0.577	1.00	0.577	0.96	1.30	0.783	No
182	29.86	1.90	0.62	1.28	0.92	0.577	1.00	0.577	0.96	1.30	0.785	No
183	30.02	1.92	0.62	1.29	0.92	0.577	1.00	0.577	0.96	1.30	0.786	No
184	30.18	1.93	0.63	1.30	0.92	0.577	1.00	0.577	0.95	1.30	0.787	No
185	30.35	1.94	0.63	1.30	0.92	0.577	1.00	0.577	0.95	1.30	0.788	No
186	30.51	1.95	0.64	1.31	0.92	0.577	1.00	0.578	0.95	1.30	0.789	No
187	30.68	1.96	0.65	1.32	0.92	0.577	1.00	0.578	0.95	1.30	0.790	No
188	30.84	1.97	0.65	1.32	0.92	0.578	1.00	0.578	0.95	1.30	0.790	No
189	31.00	1.98	0.66	1.33	0.92	0.578	1.00	0.578	0.95	1.30	0.791	No
190	31.17	1.99	0.66	1.33	0.91	0.578	1.00	0.578	0.95	1.30	0.792	No
191	31.33	2.01	0.67	1.34	0.91	0.578	1.00	0.578	0.95	1.30	0.793	No
192	31.50	2.02	0.67	1.35	0.91	0.578	1.00	0.578	0.95	1.30	0.794	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition
193	31.66	2.03	0.68	1.35	0.91	0.578	1.00	0.578	0.95	1.30	0.795	No
194	31.82	2.04	0.68	1.36	0.91	0.578	1.00	0.578	0.94	1.30	0.796	No
195	31.99	2.05	0.69	1.36	0.91	0.578	1.00	0.578	0.94	1.30	0.796	No
196	32.15	2.06	0.69	1.37	0.91	0.578	1.00	0.578	0.94	1.30	0.797	No
197	32.32	2.07	0.70	1.38	0.91	0.578	1.00	0.578	0.94	1.30	0.798	No
198	32.48	2.08	0.70	1.38	0.91	0.578	1.00	0.578	0.94	1.30	0.799	No
199	32.64	2.10	0.71	1.39	0.91	0.577	1.00	0.578	0.94	1.30	0.799	No
200	32.81	2.11	0.71	1.40	0.90	0.577	1.00	0.578	0.94	1.30	0.800	No
201	32.97	2.12	0.72	1.40	0.90	0.577	1.00	0.577	0.94	1.30	0.801	No
202	33.14	2.13	0.72	1.41	0.90	0.577	1.00	0.577	0.94	1.30	0.801	No
203	33.30	2.14	0.73	1.41	0.90	0.577	1.00	0.577	0.94	1.30	0.802	No
204	33.47	2.15	0.73	1.42	0.90	0.577	1.00	0.577	0.93	1.30	0.803	No
205	33.63	2.16	0.74	1.43	0.90	0.577	1.00	0.577	0.93	1.30	0.803	No
206	33.79	2.17	0.74	1.43	0.90	0.577	1.00	0.577	0.93	1.30	0.804	No
207	33.96	2.19	0.75	1.44	0.90	0.576	1.00	0.577	0.93	1.30	0.804	No
208	34.12	2.20	0.75	1.44	0.90	0.576	1.00	0.576	0.93	1.30	0.805	No
209	34.28	2.21	0.76	1.45	0.90	0.576	1.00	0.576	0.93	1.30	0.805	No
210	34.45	2.22	0.76	1.46	0.89	0.576	1.00	0.576	0.93	1.30	0.806	No
211	34.61	2.23	0.77	1.46	0.89	0.576	1.00	0.576	0.93	1.30	0.806	No
212	34.78	2.24	0.77	1.47	0.89	0.575	1.00	0.576	0.93	1.30	0.807	No
213	34.94	2.25	0.78	1.47	0.89	0.575	1.00	0.575	0.93	1.30	0.807	No
214	35.10	2.26	0.78	1.48	0.89	0.575	1.00	0.575	0.93	1.30	0.808	No
215	35.27	2.28	0.79	1.49	0.89	0.575	1.00	0.575	0.92	1.30	0.808	No
216	35.43	2.29	0.79	1.49	0.89	0.574	1.00	0.575	0.92	1.30	0.808	No
217	35.60	2.30	0.80	1.50	0.89	0.574	1.00	0.574	0.92	1.30	0.809	No
218	35.76	2.31	0.80	1.51	0.89	0.574	1.00	0.574	0.92	1.30	0.809	No
219	35.92	2.32	0.81	1.51	0.88	0.573	1.00	0.574	0.92	1.30	0.809	No
220	36.09	2.33	0.81	1.52	0.88	0.573	1.00	0.573	0.92	1.30	0.810	No
221	36.25	2.34	0.82	1.52	0.88	0.573	1.00	0.573	0.92	1.30	0.810	No
222	36.42	2.35	0.82	1.53	0.88	0.572	1.00	0.573	0.92	1.30	0.810	No
223	36.58	2.37	0.83	1.54	0.88	0.572	1.00	0.572	0.92	1.30	0.810	No
224	36.74	2.38	0.83	1.54	0.88	0.572	1.00	0.572	0.92	1.30	0.811	No
225	36.91	2.39	0.84	1.55	0.88	0.571	1.00	0.571	0.92	1.30	0.811	No
226	37.07	2.40	0.84	1.55	0.88	0.571	1.00	0.571	0.92	1.30	0.811	No
227	37.24	2.41	0.85	1.56	0.87	0.570	1.00	0.571	0.91	1.30	0.811	No
228	37.40	2.42	0.85	1.57	0.87	0.570	1.00	0.570	0.91	1.30	0.811	No
229	37.57	2.43	0.86	1.57	0.87	0.570	1.00	0.570	0.91	1.30	0.811	No
230	37.73	2.44	0.87	1.58	0.87	0.569	1.00	0.569	0.91	1.30	0.811	No
231	37.89	2.46	0.87	1.58	0.87	0.569	1.00	0.569	0.91	1.30	0.812	No
232	38.06	2.47	0.88	1.59	0.87	0.568	1.00	0.568	0.91	1.30	0.812	No
233	38.22	2.48	0.88	1.60	0.87	0.568	1.00	0.568	0.91	1.30	0.812	No
234	38.39	2.49	0.89	1.60	0.86	0.567	1.00	0.567	0.91	1.30	0.812	No
235	38.55	2.50	0.89	1.61	0.86	0.567	1.00	0.567	0.91	1.30	0.812	No
236	38.71	2.51	0.90	1.62	0.86	0.566	1.00	0.566	0.91	1.30	0.812	No
237	38.88	2.52	0.90	1.62	0.86	0.566	1.00	0.566	0.91	1.30	0.812	No
238	39.04	2.53	0.91	1.63	0.86	0.565	1.00	0.565	0.91	1.30	0.812	No

:: Cyclic Stress Ratio fully adjusted (CSR*) calculation data :: (continued)

Point ID	Depth (ft)	σ_v (tsf)	u_0 (tsf)	σ_v' (tsf)	r_d	CSR	MSF	CSR_{eq}	K_σ	User FS	CSR^*	Belongs to transition

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
σ_v: Total overburden pressure at test point (tsf)
u_0: Water pressure at test point (tsf)
σ_v': Effective overburden pressure based on GWT during earthquake (tsf)
r_d: Nonlinear shear mass factor
CSR: Cyclic Stress Ratio
MSF: Magnitude Scaling Factor
CSR_{eq}: CSR adjusted for M=7.5
K_σ: Effective overburden stress factor
CSR^*: CSR fully adjusted

:: Cyclic Resistance Ratio (CRR) calculation data ::

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
1	0.16	2.00	3.34	2.14	1.00	3.21	11.42	36.62	4.000	No	Yes	2.00
2	0.33	2.00	3.57	5.94	1.00	3.19	15.47	49.42	4.000	No	Yes	2.00
3	0.49	3.32	3.41	6.23	1.00	5.30	12.42	65.86	4.000	No	Yes	2.00
4	0.66	12.11	2.70	2.30	0.90	19.41	3.96	76.88	4.000	Yes	Yes	2.00
5	0.82	26.82	2.24	1.18	0.73	43.03	1.78	76.76	4.000	Yes	No	2.00
6	0.98	42.35	2.01	0.88	0.64	67.96	1.31	89.23	4.000	Yes	No	2.00
7	1.15	52.60	1.94	0.92	0.62	84.42	1.23	104.14	4.000	Yes	No	2.00
8	1.31	66.41	1.85	0.88	0.58	106.58	1.15	122.31	4.000	Yes	No	2.00
9	1.48	91.60	1.68	0.70	0.52	147.04	1.03	151.04	4.000	No	No	2.00
10	1.64	125.77	1.49	0.52	0.50	201.92	1.00	201.92	4.000	No	No	2.00
11	1.80	157.56	1.35	0.41	0.50	252.98	1.00	252.98	4.000	No	No	2.00
12	1.97	179.44	1.28	0.36	0.50	288.13	1.00	288.13	4.000	No	No	2.00
13	2.13	189.56	1.26	0.36	0.50	304.36	1.00	304.36	4.000	No	No	2.00
14	2.30	192.57	1.26	0.38	0.50	309.18	1.00	309.18	4.000	No	No	2.00
15	2.46	189.44	1.28	0.39	0.50	304.14	1.00	304.14	4.000	No	No	2.00
16	2.63	184.73	1.30	0.41	0.50	296.56	1.00	296.56	4.000	No	No	2.00
17	2.79	181.73	1.33	0.44	0.50	291.73	1.00	291.73	4.000	No	No	2.00
18	2.95	181.37	1.35	0.49	0.50	291.12	1.00	291.12	4.000	No	No	2.00
19	3.12	183.07	1.37	0.51	0.50	293.84	1.00	293.84	4.000	No	No	2.00
20	3.28	179.95	1.38	0.52	0.50	288.81	1.00	288.81	4.000	No	No	2.00
21	3.44	174.32	1.40	0.54	0.50	279.75	1.00	279.75	4.000	No	No	2.00
22	3.61	168.74	1.42	0.57	0.50	270.77	1.00	270.77	4.000	No	No	2.00
23	3.77	167.75	1.45	0.62	0.50	269.16	1.00	269.16	4.000	No	No	2.00
24	3.94	169.55	1.47	0.66	0.50	272.04	1.00	272.04	4.000	No	No	2.00
25	4.10	173.05	1.46	0.67	0.50	277.64	1.00	277.64	4.000	No	No	2.00
26	4.26	171.53	1.47	0.67	0.50	275.19	1.00	275.19	4.000	No	No	2.00
27	4.43	164.20	1.50	0.70	0.50	263.39	1.00	263.39	4.000	No	No	2.00
28	4.59	150.82	1.56	0.79	0.50	241.89	1.00	241.89	4.000	No	No	2.00
29	4.76	137.29	1.63	0.91	0.50	220.12	1.00	220.12	4.000	No	No	2.00
30	4.92	125.76	1.70	1.06	0.52	201.59	1.04	209.88	4.000	No	No	2.00
31	5.08	118.24	1.77	1.21	0.55	189.49	1.08	205.22	4.000	No	No	2.00
32	5.25	113.65	1.82	1.36	0.57	182.10	1.12	203.74	4.000	No	No	2.00
33	5.41	112.41	1.85	1.50	0.58	180.09	1.15	206.20	4.000	No	No	2.00
34	5.58	112.19	1.89	1.71	0.60	179.72	1.18	212.76	4.000	No	No	2.00
35	5.74	114.39	1.93	1.91	0.61	183.23	1.21	222.53	4.000	No	No	2.00
36	5.91	118.39	1.94	2.05	0.61	189.65	1.23	233.16	4.000	No	No	2.00
37	6.07	119.92	1.93	2.02	0.61	192.09	1.22	234.59	4.000	No	No	2.00
38	6.23	116.24	1.94	2.03	0.62	186.16	1.23	229.37	4.000	No	No	2.00
39	6.40	106.92	1.96	2.01	0.62	171.16	1.25	214.67	4.000	No	No	2.00
40	6.56	97.32	1.99	1.99	0.63	155.72	1.28	199.54	4.000	No	No	2.00
41	6.73	93.12	1.95	1.71	0.62	148.96	1.24	184.43	4.000	No	No	2.00
42	6.89	91.20	1.91	1.47	0.60	145.86	1.19	174.20	4.000	No	No	2.00
43	7.05	90.37	1.89	1.37	0.59	144.51	1.18	170.05	4.000	No	No	2.00
44	7.22	86.85	1.93	1.50	0.61	138.85	1.22	168.81	4.000	Yes	No	2.00
45	7.38	83.42	1.98	1.73	0.63	133.31	1.28	170.62	4.000	Yes	No	2.00
46	7.55	78.82	2.05	2.01	0.66	125.90	1.37	172.42	4.000	Yes	No	2.00
47	7.71	72.16	2.13	2.36	0.69	115.18	1.50	173.21	4.000	Yes	No	2.00
48	7.87	65.18	2.20	2.73	0.71	103.96	1.67	174.05	4.000	Yes	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
49	8.04	59.08	2.27	3.04	0.74	94.14	1.85	173.83	4.000	Yes	No	2.00
50	8.20	54.12	2.32	3.33	0.76	86.15	2.02	174.24	4.000	Yes	No	2.00
51	8.37	49.85	2.38	3.65	0.78	79.28	2.22	175.61	4.000	Yes	No	2.00
52	8.53	46.33	2.42	3.95	0.80	73.61	2.41	177.36	4.000	No	No	2.00
53	8.69	44.52	2.45	4.10	0.81	70.68	2.51	177.56	4.000	No	No	2.00
54	8.86	43.36	2.46	4.15	0.81	68.80	2.57	176.63	4.000	No	No	2.00
55	9.02	42.85	2.46	4.15	0.81	67.97	2.58	175.46	4.000	No	No	2.00
56	9.19	42.43	2.46	4.11	0.81	66.81	2.59	173.08	4.000	No	No	2.00
57	9.35	42.17	2.46	4.00	0.81	65.38	2.58	168.64	4.000	No	No	2.00
58	9.51	42.15	2.45	3.77	0.81	64.22	2.52	161.72	4.000	No	No	2.00
59	9.68	42.52	2.44	3.65	0.81	63.76	2.48	158.23	4.000	No	No	2.00
60	9.84	42.55	2.44	3.64	0.81	62.95	2.49	157.01	4.000	No	No	2.00
61	10.01	42.48	2.46	3.81	0.81	62.23	2.57	160.21	0.462	No	No	0.86
62	10.17	42.32	2.48	4.00	0.82	61.37	2.67	163.68	0.488	No	No	0.90
63	10.34	43.16	2.48	4.02	0.82	61.77	2.67	164.79	0.496	No	No	0.91
64	10.50	44.47	2.46	3.85	0.81	62.60	2.58	161.56	4.000	Yes	No	2.00
65	10.66	47.08	2.41	3.34	0.79	64.80	2.34	151.55	4.000	Yes	No	2.00
66	10.83	50.82	2.32	2.70	0.76	68.15	2.03	138.40	4.000	Yes	No	2.00
67	10.99	55.28	2.24	2.19	0.73	72.28	1.78	128.45	4.000	Yes	No	2.00
68	11.15	59.52	2.20	2.04	0.71	76.55	1.68	128.37	0.277	No	No	0.49
69	11.32	62.96	2.21	2.17	0.72	80.20	1.68	135.09	0.309	No	No	0.54
70	11.48	65.28	2.23	2.37	0.72	82.56	1.73	143.16	0.353	No	No	0.61
71	11.65	67.45	2.24	2.54	0.73	84.61	1.77	149.81	0.393	No	No	0.68
72	11.81	69.15	2.27	2.84	0.74	86.23	1.86	160.07	0.461	No	No	0.79
73	11.97	70.39	2.32	3.30	0.76	87.40	2.00	174.63	0.575	No	No	0.98
74	12.14	66.95	2.39	4.03	0.79	83.10	2.29	190.40	0.722	No	No	1.23
75	12.30	62.35	2.47	4.70	0.82	77.18	2.61	201.16	4.000	No	No	2.00
76	12.47	58.94	2.51	5.12	0.83	72.48	2.83	205.27	4.000	No	No	2.00
77	12.63	60.16	2.51	5.05	0.83	73.09	2.80	204.47	4.000	No	No	2.00
78	12.79	62.73	2.50	5.08	0.83	75.32	2.76	208.23	4.000	No	No	2.00
79	12.96	64.03	2.49	5.01	0.82	75.98	2.73	207.49	4.000	No	No	2.00
80	13.12	63.03	2.51	5.25	0.83	74.13	2.84	210.80	4.000	No	No	2.00
81	13.29	44.87	2.72	7.35	0.91	53.00	4.15	219.69	4.000	No	Yes	2.00
82	13.45	43.68	2.75	7.85	0.92	51.11	4.39	224.54	4.000	No	Yes	2.00
83	13.62	44.58	2.75	7.94	0.92	51.57	4.40	227.15	4.000	No	Yes	2.00
84	13.78	63.49	2.56	5.85	0.85	71.77	3.09	221.89	4.000	No	No	2.00
85	13.94	65.31	2.57	6.05	0.85	73.10	3.13	228.65	4.000	No	No	2.00
86	14.11	65.73	2.58	6.28	0.86	72.86	3.21	233.64	4.000	No	No	2.00
87	14.27	62.45	2.62	6.70	0.87	68.63	3.44	236.13	4.000	No	Yes	2.00
88	14.44	57.89	2.65	6.86	0.88	63.00	3.64	229.61	4.000	No	Yes	2.00
89	14.60	55.25	2.66	6.78	0.89	59.48	3.72	221.50	4.000	No	Yes	2.00
90	14.76	56.80	2.63	6.35	0.88	60.44	3.55	214.34	4.000	No	Yes	2.00
91	14.93	60.43	2.61	6.21	0.87	63.62	3.41	216.96	4.000	No	Yes	2.00
92	15.09	63.33	2.60	6.20	0.87	66.00	3.34	220.54	4.000	No	Yes	2.00
93	15.26	66.94	2.58	6.04	0.86	69.05	3.22	222.10	4.000	No	No	2.00
94	15.42	69.95	2.57	5.99	0.85	71.45	3.14	224.61	4.000	No	No	2.00
95	15.58	72.00	2.57	6.10	0.85	72.86	3.15	229.37	4.000	No	No	2.00
96	15.75	70.31	2.60	6.53	0.87	70.52	3.34	235.40	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
97	15.91	68.75	2.62	6.76	0.87	68.30	3.47	236.83	4.000	No	Yes	2.00
98	16.08	66.24	2.65	7.05	0.88	65.18	3.64	237.39	4.000	No	Yes	2.00
99	16.24	65.00	2.66	7.10	0.89	63.34	3.71	235.13	4.000	No	Yes	2.00
100	16.40	63.28	2.67	7.02	0.89	61.05	3.75	229.21	4.000	No	Yes	2.00
101	16.57	62.95	2.66	6.73	0.89	60.14	3.69	221.65	4.000	No	Yes	2.00
102	16.73	61.41	2.66	6.64	0.89	58.10	3.72	216.13	4.000	No	Yes	2.00
103	16.90	58.33	2.69	6.90	0.90	54.64	3.93	214.78	4.000	No	Yes	2.00
104	17.06	54.22	2.73	7.15	0.91	50.25	4.19	210.54	4.000	No	Yes	2.00
105	17.22	49.12	2.77	7.47	0.93	45.00	4.55	204.69	4.000	No	Yes	2.00
106	17.39	45.79	2.80	7.64	0.94	41.47	4.81	199.31	4.000	No	Yes	2.00
107	17.55	45.43	2.81	7.74	0.95	40.75	4.88	199.03	4.000	No	Yes	2.00
108	17.72	49.87	2.78	7.63	0.94	44.43	4.64	206.02	4.000	No	Yes	2.00
109	17.88	56.68	2.74	7.52	0.92	50.20	4.32	216.90	4.000	No	Yes	2.00
110	18.05	65.15	2.68	7.05	0.90	57.48	3.88	223.07	4.000	No	Yes	2.00
111	18.21	66.55	2.67	6.96	0.89	58.47	3.82	223.10	4.000	No	Yes	2.00
112	18.37	66.87	2.66	6.58	0.89	58.51	3.69	215.64	4.000	No	Yes	2.00
113	18.54	64.14	2.67	6.58	0.89	55.80	3.78	210.80	4.000	No	Yes	2.00
114	18.70	66.12	2.65	6.26	0.88	57.34	3.62	207.30	4.000	No	Yes	2.00
115	18.86	66.11	2.65	6.29	0.88	57.07	3.63	207.27	4.000	No	Yes	2.00
116	19.03	63.66	2.67	6.52	0.89	54.63	3.80	207.39	4.000	No	Yes	2.00
117	19.19	59.12	2.72	7.07	0.91	50.34	4.16	209.40	4.000	No	Yes	2.00
118	19.36	54.72	2.77	7.69	0.93	46.22	4.57	211.07	4.000	No	Yes	2.00
119	19.52	51.80	2.81	8.09	0.94	43.44	4.85	210.75	4.000	No	Yes	2.00
120	19.68	49.72	2.82	8.05	0.95	41.44	4.95	205.29	4.000	No	Yes	2.00
121	19.85	47.58	2.83	7.93	0.95	39.41	5.04	198.58	4.000	No	Yes	2.00
122	20.01	48.60	2.79	7.17	0.94	40.15	4.71	189.18	4.000	No	Yes	2.00
123	20.18	52.65	2.73	6.33	0.91	43.52	4.20	182.87	4.000	No	Yes	2.00
124	20.34	56.97	2.67	5.69	0.89	47.11	3.78	178.28	4.000	No	Yes	2.00
125	20.50	55.96	2.68	5.73	0.90	46.04	3.85	177.08	4.000	No	Yes	2.00
126	20.67	53.18	2.70	5.79	0.90	43.47	3.99	173.44	4.000	No	Yes	2.00
127	20.83	52.54	2.68	5.40	0.90	42.79	3.87	165.49	4.000	No	Yes	2.00
128	21.00	55.82	2.61	4.58	0.87	45.52	3.40	154.62	4.000	No	Yes	2.00
129	21.16	59.96	2.53	3.81	0.84	49.00	2.94	143.94	0.357	No	No	0.50
130	21.32	63.19	2.47	3.27	0.82	51.70	2.61	135.17	0.310	No	No	0.43
131	21.49	65.11	2.43	2.95	0.80	53.24	2.43	129.40	0.282	No	No	0.39
132	21.65	64.87	2.41	2.77	0.79	52.91	2.36	124.80	0.261	No	No	0.36
133	21.82	63.93	2.41	2.73	0.79	51.95	2.36	122.79	0.252	No	No	0.35
134	21.98	62.88	2.42	2.76	0.80	50.87	2.41	122.51	0.251	No	No	0.35
135	22.15	63.07	2.43	2.80	0.80	50.84	2.43	123.46	0.255	No	No	0.35
136	22.31	63.80	2.42	2.79	0.80	51.28	2.41	123.49	0.255	No	No	0.35
137	22.47	65.26	2.41	2.69	0.79	52.37	2.34	122.34	0.250	No	No	0.35
138	22.64	66.44	2.40	2.73	0.79	53.16	2.33	123.99	0.257	No	No	0.36
139	22.80	67.04	2.44	3.04	0.80	53.34	2.47	131.66	0.292	No	No	0.40
140	22.97	67.98	2.45	3.24	0.81	53.86	2.54	137.04	0.319	No	No	0.44
141	23.13	74.49	2.45	3.53	0.81	58.92	2.54	149.67	0.392	No	No	0.54
142	23.29	81.83	2.45	3.80	0.81	64.63	2.52	162.90	0.482	No	No	0.66
143	23.46	80.13	2.52	4.64	0.84	62.68	2.88	180.55	0.627	No	No	0.86
144	23.62	71.36	2.65	6.05	0.88	54.94	3.62	198.91	4.000	No	Yes	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
145	23.79	68.06	2.72	7.11	0.91	51.84	4.11	213.12	4.000	Yes	Yes	2.00
146	23.95	93.23	2.53	5.32	0.84	72.26	2.90	209.85	4.000	Yes	No	2.00
147	24.11	146.37	2.24	3.31	0.73	116.53	1.76	204.85	4.000	Yes	No	2.00
148	24.28	185.77	2.10	2.71	0.68	149.46	1.46	217.46	4.000	Yes	No	2.00
149	24.44	232.97	1.99	2.37	0.63	188.95	1.29	243.65	4.000	Yes	No	2.00
150	24.61	279.78	1.90	2.08	0.60	228.43	1.19	270.95	4.000	Yes	No	2.00
151	24.77	341.86	1.80	1.85	0.56	281.02	1.11	311.73	4.000	Yes	No	2.00
152	24.93	388.73	1.78	1.91	0.56	319.48	1.10	349.85	4.000	No	No	2.00
153	25.10	405.12	1.83	2.20	0.57	330.74	1.13	373.24	4.000	No	No	2.00
154	25.26	399.87	1.89	2.56	0.60	323.67	1.18	381.93	4.000	No	No	2.00
155	25.43	381.67	1.96	3.02	0.62	305.79	1.26	384.26	4.000	No	No	2.00
156	25.59	361.43	2.05	3.60	0.65	286.38	1.36	390.62	4.000	No	No	2.00
157	25.75	344.97	2.09	3.98	0.67	271.11	1.45	391.76	4.000	No	No	2.00
158	25.92	319.26	2.13	4.17	0.69	249.14	1.51	376.63	4.000	No	No	2.00
159	26.08	290.68	2.13	3.95	0.69	225.97	1.52	342.60	4.000	No	No	2.00
160	26.25	260.66	2.13	3.63	0.69	201.99	1.51	304.21	4.000	No	No	2.00
161	26.41	231.58	2.14	3.42	0.69	178.60	1.52	272.03	4.000	No	No	2.00
162	26.57	181.11	2.25	3.87	0.73	137.29	1.79	245.29	4.000	No	No	2.00
163	26.74	163.79	2.28	3.89	0.74	123.23	1.87	230.75	4.000	No	No	2.00
164	26.90	155.27	2.27	3.68	0.74	116.44	1.86	216.75	4.000	No	No	2.00
165	27.07	181.40	2.18	3.20	0.71	137.27	1.62	222.03	4.000	No	No	2.00
166	27.23	220.40	1.99	2.20	0.63	170.20	1.29	219.97	4.000	No	No	2.00
167	27.39	260.80	1.89	1.84	0.59	203.71	1.18	239.38	4.000	No	No	2.00
168	27.56	296.02	1.85	1.83	0.58	231.80	1.14	265.41	4.000	No	No	2.00
169	27.72	343.23	1.91	2.38	0.60	266.46	1.20	318.59	4.000	No	No	2.00
170	27.89	409.60	1.91	2.63	0.60	317.52	1.19	379.01	4.000	No	No	2.00
171	28.05	476.69	1.87	2.63	0.59	370.37	1.16	430.73	4.000	No	No	2.00
172	28.21	479.17	1.90	2.84	0.60	369.97	1.19	440.33	4.000	No	No	2.00
173	28.38	426.07	1.98	3.28	0.63	324.58	1.28	414.82	4.000	No	No	2.00
174	28.54	347.19	2.09	3.81	0.67	260.00	1.43	372.27	4.000	No	No	2.00
175	28.71	311.66	2.11	3.81	0.68	231.82	1.48	342.65	4.000	No	No	2.00
176	28.87	327.22	2.04	3.22	0.65	245.23	1.35	331.56	4.000	No	No	2.00
177	29.04	345.85	1.99	2.90	0.63	260.38	1.28	333.73	4.000	No	No	2.00
178	29.20	406.67	1.89	2.51	0.60	309.47	1.18	365.89	4.000	No	No	2.00
179	29.36	446.93	1.85	2.38	0.58	341.38	1.15	391.15	4.000	No	No	2.00
180	29.53	485.41	1.79	2.14	0.56	373.08	1.10	410.53	4.000	No	No	2.00
181	29.69	429.01	1.86	2.37	0.58	325.65	1.15	375.72	4.000	No	No	2.00
182	29.86	359.26	1.95	2.68	0.62	268.42	1.24	332.60	4.000	No	No	2.00
183	30.02	280.37	2.05	2.99	0.66	205.59	1.37	282.65	4.000	No	No	2.00
184	30.18	208.78	2.19	3.50	0.71	149.35	1.64	244.87	4.000	No	No	2.00
185	30.35	189.40	2.20	3.31	0.71	134.82	1.66	223.53	4.000	No	No	2.00
186	30.51	208.22	2.16	3.23	0.70	148.69	1.58	234.77	4.000	No	No	2.00
187	30.68	238.71	2.09	2.93	0.67	172.02	1.44	247.16	4.000	No	No	2.00
188	30.84	256.66	2.06	2.87	0.66	185.31	1.39	258.07	4.000	No	No	2.00
189	31.00	281.89	2.02	2.74	0.65	204.40	1.33	272.05	4.000	No	No	2.00
190	31.17	312.00	1.86	1.91	0.59	231.39	1.16	267.60	4.000	No	No	2.00
191	31.33	333.11	1.75	1.45	0.54	251.09	1.07	268.58	4.000	No	No	2.00
192	31.50	313.38	1.75	1.38	0.54	235.61	1.07	252.17	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS
193	31.66	324.45	1.85	1.87	0.58	239.67	1.14	274.00	4.000	No	No	2.00
194	31.82	343.79	1.90	2.25	0.60	251.31	1.19	299.14	4.000	No	No	2.00
195	31.99	416.75	1.87	2.33	0.59	305.92	1.16	354.82	4.000	No	No	2.00
196	32.15	456.26	1.87	2.46	0.59	334.33	1.16	387.71	4.000	No	No	2.00
197	32.32	456.89	1.89	2.60	0.60	332.81	1.18	392.56	4.000	No	No	2.00
198	32.48	425.41	1.91	2.66	0.60	307.80	1.20	370.36	4.000	No	No	2.00
199	32.64	378.83	1.95	2.69	0.62	271.82	1.24	336.27	4.000	No	No	2.00
200	32.81	320.37	2.02	2.95	0.65	226.16	1.33	301.56	4.000	No	No	2.00
201	32.97	275.34	2.09	3.16	0.67	191.54	1.44	275.31	4.000	No	No	2.00
202	33.14	248.93	2.12	3.16	0.68	171.79	1.49	255.46	4.000	No	No	2.00
203	33.30	245.04	2.07	2.78	0.67	169.89	1.41	239.71	4.000	No	No	2.00
204	33.47	228.40	2.05	2.48	0.66	158.44	1.38	218.17	4.000	No	No	2.00
205	33.63	251.16	1.99	2.21	0.63	176.03	1.28	225.70	4.000	No	No	2.00
206	33.79	286.59	1.91	1.99	0.60	203.25	1.20	243.92	4.000	No	No	2.00
207	33.96	309.66	1.88	1.94	0.59	220.39	1.17	258.50	4.000	No	No	2.00
208	34.12	270.20	1.97	2.25	0.63	188.56	1.27	239.04	4.000	No	No	2.00
209	34.28	203.75	2.15	2.94	0.69	137.03	1.56	213.17	4.000	No	No	2.00
210	34.45	158.06	2.33	3.95	0.76	102.31	2.05	209.79	4.000	No	No	2.00
211	34.61	152.46	2.38	4.44	0.78	97.40	2.25	218.96	4.000	No	No	2.00
212	34.78	176.67	2.35	4.57	0.77	113.41	2.13	241.73	4.000	No	No	2.00
213	34.94	206.23	2.30	4.48	0.75	133.47	1.96	262.01	4.000	No	No	2.00
214	35.10	215.44	2.31	4.70	0.76	138.94	1.99	275.84	4.000	No	No	2.00
215	35.27	221.50	2.31	4.75	0.75	142.56	1.98	281.87	4.000	No	No	2.00
216	35.43	224.66	2.26	4.18	0.74	145.63	1.82	265.13	4.000	No	No	2.00
217	35.60	232.65	2.21	3.81	0.72	151.72	1.70	258.30	4.000	No	No	2.00
218	35.76	279.33	2.07	2.97	0.67	187.01	1.41	263.42	4.000	No	No	2.00
219	35.92	309.21	2.05	2.97	0.66	207.73	1.37	284.06	4.000	No	No	2.00
220	36.09	342.09	2.00	2.83	0.64	231.41	1.31	302.09	4.000	No	No	2.00
221	36.25	329.84	2.02	2.86	0.64	221.93	1.33	294.13	4.000	No	No	2.00
222	36.42	340.58	1.99	2.68	0.63	230.20	1.28	294.94	4.000	No	No	2.00
223	36.58	347.32	1.94	2.41	0.62	236.31	1.23	290.93	4.000	No	No	2.00
224	36.74	351.06	1.94	2.40	0.61	238.61	1.23	292.42	4.000	No	No	2.00
225	36.91	367.68	1.87	2.07	0.59	252.78	1.16	293.91	4.000	No	No	2.00
226	37.07	411.45	1.83	1.98	0.57	285.13	1.13	320.94	4.000	No	No	2.00
227	37.24	464.53	1.73	1.67	0.53	327.79	1.06	346.92	4.000	No	No	2.00
228	37.40	489.89	1.74	1.77	0.54	344.58	1.06	366.55	4.000	No	No	2.00
229	37.57	485.86	1.75	1.83	0.54	340.04	1.07	365.21	4.000	No	No	2.00
230	37.73	455.38	1.82	2.06	0.57	313.80	1.12	351.33	4.000	No	No	2.00
231	37.89	414.92	1.89	2.32	0.59	281.18	1.18	330.53	4.000	No	No	2.00
232	38.06	399.97	1.90	2.32	0.60	269.87	1.18	319.71	4.000	No	No	2.00
233	38.22	475.11	1.78	1.94	0.55	327.90	1.10	359.14	4.000	No	No	2.00
234	38.39	558.81	1.69	1.68	0.52	393.16	1.03	405.10	4.000	No	No	2.00
235	38.55	620.07	1.63	1.54	0.50	440.31	1.00	440.31	4.000	No	No	2.00
236	38.71	609.16	1.64	1.57	0.50	431.40	1.00	431.09	4.000	No	No	2.00
237	38.88	601.86	1.64	1.54	0.50	425.91	1.00	425.91	4.000	No	No	2.00
238	39.04	596.24	1.64	1.52	0.50	421.22	1.00	421.22	4.000	No	No	2.00

:: Cyclic Resistance Ratio (CRR) calculation data :: (continued)

Point ID	Depth (ft)	q_t (tsf)	I_c	Fr (%)	n	Q_{tn}	K_c	$Q_{tn,cs}$	$CRR_{7.5}$	Belongs to trans. layer	Clay-like behaviour	FS

Abbreviations

Depth: Depth from free surface, at which CPT was performed (ft)
q_t: Total cone resistance
I_c: Soil behavior type index
Fr: Normalized friction ratio (%)
n: Stress exponent
Q_{tn}: Normalized cone resistance
K_c: Cone resistance correction factor due to fines
$Q_{tn,cs}$: Normalized and adjusted cone resistance
$CRR_{7.5}$: Cyclic resistance ratio for M_w=7.5
FS: Factor of safety against soil liquefaction

:: Liquefaction Potential Index calculation data ::

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
0.16	2.00	0.00	9.98	0.16	0.00	0.33	2.00	0.00	9.95	0.16	0.00
0.49	2.00	0.00	9.93	0.16	0.00	0.66	2.00	0.00	9.90	0.16	0.00
0.82	2.00	0.00	9.88	0.16	0.00	0.98	2.00	0.00	9.85	0.16	0.00
1.15	2.00	0.00	9.83	0.16	0.00	1.31	2.00	0.00	9.80	0.16	0.00
1.48	2.00	0.00	9.78	0.16	0.00	1.64	2.00	0.00	9.75	0.16	0.00
1.80	2.00	0.00	9.73	0.16	0.00	1.97	2.00	0.00	9.70	0.17	0.00
2.13	2.00	0.00	9.67	0.16	0.00	2.30	2.00	0.00	9.65	0.16	0.00
2.46	2.00	0.00	9.62	0.16	0.00	2.63	2.00	0.00	9.60	0.16	0.00
2.79	2.00	0.00	9.57	0.16	0.00	2.95	2.00	0.00	9.55	0.16	0.00
3.12	2.00	0.00	9.52	0.16	0.00	3.28	2.00	0.00	9.50	0.16	0.00
3.44	2.00	0.00	9.47	0.16	0.00	3.61	2.00	0.00	9.45	0.16	0.00
3.77	2.00	0.00	9.42	0.16	0.00	3.94	2.00	0.00	9.40	0.16	0.00
4.10	2.00	0.00	9.38	0.16	0.00	4.26	2.00	0.00	9.35	0.16	0.00
4.43	2.00	0.00	9.33	0.16	0.00	4.59	2.00	0.00	9.30	0.16	0.00
4.76	2.00	0.00	9.28	0.16	0.00	4.92	2.00	0.00	9.25	0.16	0.00
5.08	2.00	0.00	9.23	0.16	0.00	5.25	2.00	0.00	9.20	0.16	0.00
5.41	2.00	0.00	9.18	0.16	0.00	5.58	2.00	0.00	9.15	0.16	0.00
5.74	2.00	0.00	9.13	0.16	0.00	5.91	2.00	0.00	9.10	0.17	0.00
6.07	2.00	0.00	9.07	0.16	0.00	6.23	2.00	0.00	9.05	0.16	0.00
6.40	2.00	0.00	9.02	0.16	0.00	6.56	2.00	0.00	9.00	0.16	0.00
6.73	2.00	0.00	8.97	0.16	0.00	6.89	2.00	0.00	8.95	0.16	0.00
7.05	2.00	0.00	8.92	0.16	0.00	7.22	2.00	0.00	8.90	0.16	0.00
7.38	2.00	0.00	8.87	0.16	0.00	7.55	2.00	0.00	8.85	0.16	0.00
7.71	2.00	0.00	8.82	0.16	0.00	7.87	2.00	0.00	8.80	0.16	0.00
8.04	2.00	0.00	8.78	0.16	0.00	8.20	2.00	0.00	8.75	0.16	0.00
8.37	2.00	0.00	8.73	0.16	0.00	8.53	2.00	0.00	8.70	0.16	0.00
8.69	2.00	0.00	8.68	0.16	0.00	8.86	2.00	0.00	8.65	0.16	0.00
9.02	2.00	0.00	8.63	0.16	0.00	9.19	2.00	0.00	8.60	0.16	0.00
9.35	2.00	0.00	8.58	0.16	0.00	9.51	2.00	0.00	8.55	0.16	0.00
9.68	2.00	0.00	8.53	0.16	0.00	9.84	2.00	0.00	8.50	0.16	0.00
10.01	0.86	0.14	8.47	0.16	0.06	10.17	0.90	0.10	8.45	0.16	0.04
10.34	0.91	0.09	8.42	0.16	0.04	10.50	2.00	0.00	8.40	0.16	0.00
10.66	2.00	0.00	8.37	0.16	0.00	10.83	2.00	0.00	8.35	0.16	0.00
10.99	2.00	0.00	8.32	0.16	0.00	11.15	0.49	0.51	8.30	0.16	0.21
11.32	0.54	0.46	8.27	0.16	0.19	11.48	0.61	0.39	8.25	0.16	0.16
11.65	0.68	0.32	8.22	0.16	0.13	11.81	0.79	0.21	8.20	0.16	0.08
11.97	0.98	0.02	8.18	0.16	0.01	12.14	1.23	0.00	8.15	0.16	0.00
12.30	2.00	0.00	8.13	0.16	0.00	12.47	2.00	0.00	8.10	0.16	0.00
12.63	2.00	0.00	8.08	0.16	0.00	12.79	2.00	0.00	8.05	0.16	0.00
12.96	2.00	0.00	8.03	0.16	0.00	13.12	2.00	0.00	8.00	0.16	0.00
13.29	2.00	0.00	7.98	0.16	0.00	13.45	2.00	0.00	7.95	0.16	0.00
13.62	2.00	0.00	7.93	0.16	0.00	13.78	2.00	0.00	7.90	0.16	0.00
13.94	2.00	0.00	7.87	0.16	0.00	14.11	2.00	0.00	7.85	0.16	0.00
14.27	2.00	0.00	7.82	0.16	0.00	14.44	2.00	0.00	7.80	0.16	0.00
14.60	2.00	0.00	7.77	0.16	0.00	14.76	2.00	0.00	7.75	0.16	0.00
14.93	2.00	0.00	7.72	0.16	0.00	15.09	2.00	0.00	7.70	0.16	0.00
15.26	2.00	0.00	7.67	0.16	0.00	15.42	2.00	0.00	7.65	0.16	0.00
15.58	2.00	0.00	7.62	0.16	0.00	15.75	2.00	0.00	7.60	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
15.91	2.00	0.00	7.58	0.16	0.00	16.08	2.00	0.00	7.55	0.16	0.00
16.24	2.00	0.00	7.53	0.16	0.00	16.40	2.00	0.00	7.50	0.16	0.00
16.57	2.00	0.00	7.48	0.16	0.00	16.73	2.00	0.00	7.45	0.16	0.00
16.90	2.00	0.00	7.43	0.16	0.00	17.06	2.00	0.00	7.40	0.16	0.00
17.22	2.00	0.00	7.38	0.16	0.00	17.39	2.00	0.00	7.35	0.16	0.00
17.55	2.00	0.00	7.33	0.16	0.00	17.72	2.00	0.00	7.30	0.16	0.00
17.88	2.00	0.00	7.27	0.16	0.00	18.05	2.00	0.00	7.25	0.16	0.00
18.21	2.00	0.00	7.22	0.16	0.00	18.37	2.00	0.00	7.20	0.16	0.00
18.54	2.00	0.00	7.17	0.16	0.00	18.70	2.00	0.00	7.15	0.16	0.00
18.86	2.00	0.00	7.12	0.16	0.00	19.03	2.00	0.00	7.10	0.16	0.00
19.19	2.00	0.00	7.07	0.16	0.00	19.36	2.00	0.00	7.05	0.16	0.00
19.52	2.00	0.00	7.02	0.16	0.00	19.68	2.00	0.00	7.00	0.16	0.00
19.85	2.00	0.00	6.98	0.16	0.00	20.01	2.00	0.00	6.95	0.16	0.00
20.18	2.00	0.00	6.93	0.16	0.00	20.34	2.00	0.00	6.90	0.16	0.00
20.50	2.00	0.00	6.88	0.16	0.00	20.67	2.00	0.00	6.85	0.16	0.00
20.83	2.00	0.00	6.83	0.16	0.00	21.00	2.00	0.00	6.80	0.16	0.00
21.16	0.50	0.50	6.78	0.16	0.17	21.32	0.43	0.57	6.75	0.16	0.19
21.49	0.39	0.61	6.72	0.16	0.20	21.65	0.36	0.64	6.70	0.16	0.21
21.82	0.35	0.65	6.67	0.16	0.22	21.98	0.35	0.65	6.65	0.16	0.22
22.15	0.35	0.65	6.62	0.16	0.21	22.31	0.35	0.65	6.60	0.16	0.21
22.47	0.35	0.65	6.57	0.16	0.21	22.64	0.36	0.64	6.55	0.16	0.21
22.80	0.40	0.60	6.52	0.16	0.19	22.97	0.44	0.56	6.50	0.16	0.18
23.13	0.54	0.46	6.47	0.16	0.15	23.29	0.66	0.34	6.45	0.16	0.11
23.46	0.86	0.14	6.43	0.16	0.04	23.62	2.00	0.00	6.40	0.16	0.00
23.79	2.00	0.00	6.38	0.16	0.00	23.95	2.00	0.00	6.35	0.16	0.00
24.11	2.00	0.00	6.33	0.16	0.00	24.28	2.00	0.00	6.30	0.16	0.00
24.44	2.00	0.00	6.28	0.16	0.00	24.61	2.00	0.00	6.25	0.16	0.00
24.77	2.00	0.00	6.23	0.16	0.00	24.93	2.00	0.00	6.20	0.16	0.00
25.10	2.00	0.00	6.18	0.16	0.00	25.26	2.00	0.00	6.15	0.16	0.00
25.43	2.00	0.00	6.12	0.16	0.00	25.59	2.00	0.00	6.10	0.16	0.00
25.75	2.00	0.00	6.07	0.16	0.00	25.92	2.00	0.00	6.05	0.16	0.00
26.08	2.00	0.00	6.02	0.16	0.00	26.25	2.00	0.00	6.00	0.16	0.00
26.41	2.00	0.00	5.97	0.16	0.00	26.57	2.00	0.00	5.95	0.16	0.00
26.74	2.00	0.00	5.92	0.16	0.00	26.90	2.00	0.00	5.90	0.16	0.00
27.07	2.00	0.00	5.87	0.16	0.00	27.23	2.00	0.00	5.85	0.16	0.00
27.39	2.00	0.00	5.83	0.16	0.00	27.56	2.00	0.00	5.80	0.16	0.00
27.72	2.00	0.00	5.78	0.16	0.00	27.89	2.00	0.00	5.75	0.16	0.00
28.05	2.00	0.00	5.73	0.16	0.00	28.21	2.00	0.00	5.70	0.16	0.00
28.38	2.00	0.00	5.68	0.16	0.00	28.54	2.00	0.00	5.65	0.16	0.00
28.71	2.00	0.00	5.63	0.16	0.00	28.87	2.00	0.00	5.60	0.16	0.00
29.04	2.00	0.00	5.58	0.16	0.00	29.20	2.00	0.00	5.55	0.16	0.00
29.36	2.00	0.00	5.52	0.16	0.00	29.53	2.00	0.00	5.50	0.16	0.00
29.69	2.00	0.00	5.47	0.16	0.00	29.86	2.00	0.00	5.45	0.16	0.00
30.02	2.00	0.00	5.42	0.16	0.00	30.18	2.00	0.00	5.40	0.16	0.00
30.35	2.00	0.00	5.37	0.16	0.00	30.51	2.00	0.00	5.35	0.16	0.00
30.68	2.00	0.00	5.32	0.16	0.00	30.84	2.00	0.00	5.30	0.16	0.00
31.00	2.00	0.00	5.27	0.16	0.00	31.17	2.00	0.00	5.25	0.16	0.00
31.33	2.00	0.00	5.23	0.16	0.00	31.50	2.00	0.00	5.20	0.16	0.00

:: Liquefaction Potential Index calculation data :: (continued)

Depth (ft)	FS	F_L	w_z	d_z	LPI	Depth (ft)	FS	F_L	w_z	d_z	LPI
31.66	2.00	0.00	5.18	0.16	0.00	31.82	2.00	0.00	5.15	0.16	0.00
31.99	2.00	0.00	5.13	0.16	0.00	32.15	2.00	0.00	5.10	0.16	0.00
32.32	2.00	0.00	5.08	0.16	0.00	32.48	2.00	0.00	5.05	0.16	0.00
32.64	2.00	0.00	5.03	0.16	0.00	32.81	2.00	0.00	5.00	0.16	0.00
32.97	2.00	0.00	4.98	0.16	0.00	33.14	2.00	0.00	4.95	0.16	0.00
33.30	2.00	0.00	4.92	0.16	0.00	33.47	2.00	0.00	4.90	0.16	0.00
33.63	2.00	0.00	4.87	0.16	0.00	33.79	2.00	0.00	4.85	0.16	0.00
33.96	2.00	0.00	4.82	0.16	0.00	34.12	2.00	0.00	4.80	0.16	0.00
34.28	2.00	0.00	4.77	0.16	0.00	34.45	2.00	0.00	4.75	0.16	0.00
34.61	2.00	0.00	4.72	0.16	0.00	34.78	2.00	0.00	4.70	0.16	0.00
34.94	2.00	0.00	4.67	0.16	0.00	35.10	2.00	0.00	4.65	0.16	0.00
35.27	2.00	0.00	4.63	0.16	0.00	35.43	2.00	0.00	4.60	0.16	0.00
35.60	2.00	0.00	4.58	0.16	0.00	35.76	2.00	0.00	4.55	0.16	0.00
35.92	2.00	0.00	4.53	0.16	0.00	36.09	2.00	0.00	4.50	0.16	0.00
36.25	2.00	0.00	4.48	0.16	0.00	36.42	2.00	0.00	4.45	0.16	0.00
36.58	2.00	0.00	4.43	0.16	0.00	36.74	2.00	0.00	4.40	0.16	0.00
36.91	2.00	0.00	4.38	0.16	0.00	37.07	2.00	0.00	4.35	0.16	0.00
37.24	2.00	0.00	4.32	0.16	0.00	37.40	2.00	0.00	4.30	0.16	0.00
37.57	2.00	0.00	4.27	0.16	0.00	37.73	2.00	0.00	4.25	0.16	0.00
37.89	2.00	0.00	4.22	0.16	0.00	38.06	2.00	0.00	4.20	0.16	0.00
38.22	2.00	0.00	4.17	0.16	0.00	38.39	2.00	0.00	4.15	0.16	0.00
38.55	2.00	0.00	4.12	0.16	0.00	38.71	2.00	0.00	4.10	0.16	0.00
38.88	2.00	0.00	4.07	0.16	0.00	39.04	2.00	0.00	4.05	0.16	0.00

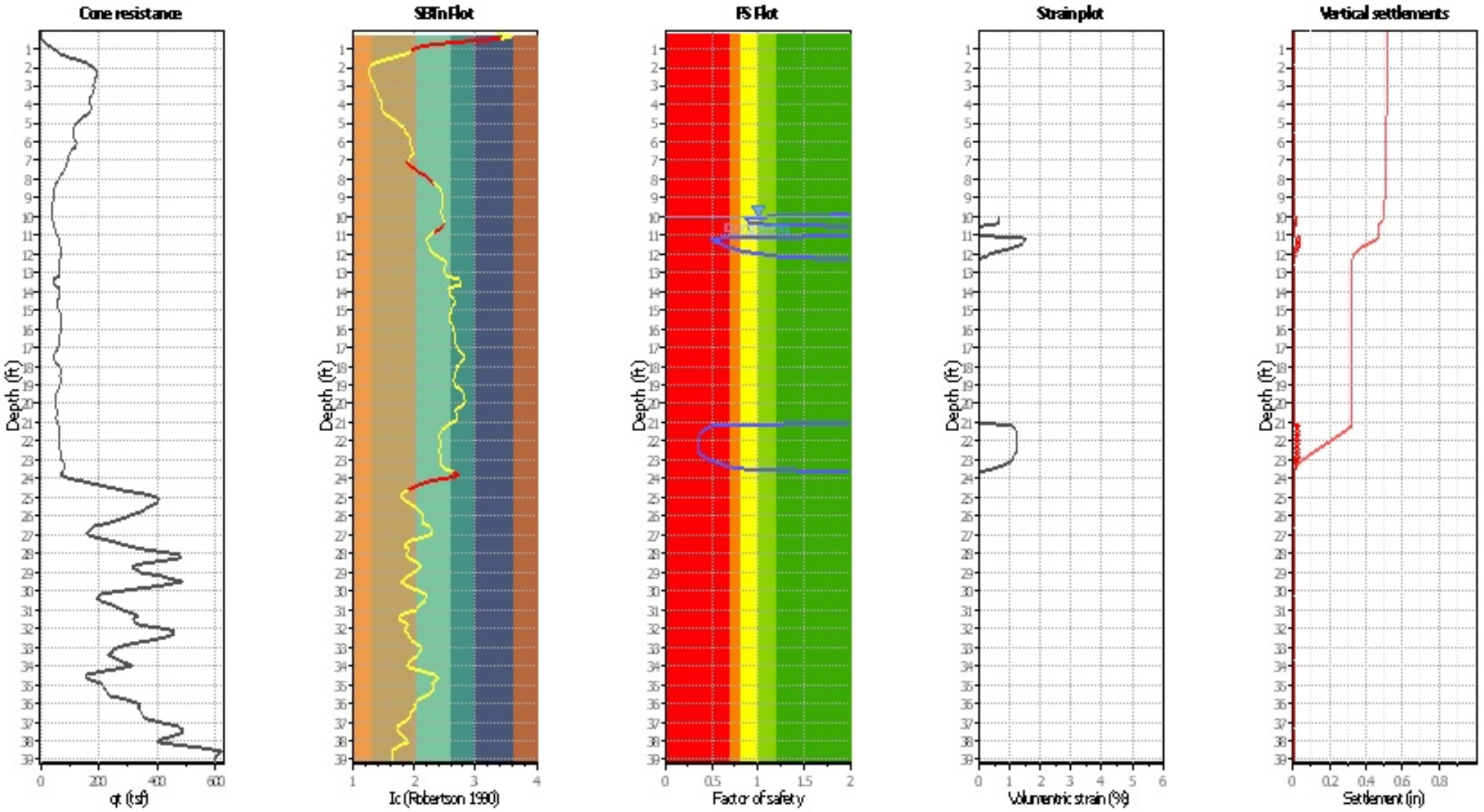
Overall liquefaction potential: 3.67

LPI = 0.00 - Liquefaction risk very low
LPI between 0.00 and 5.00 - Liquefaction risk low
LPI between 5.00 and 15.00 - Liquefaction risk high
LPI > 15.00 - Liquefaction risk very high

Abbreviations

FS: Calculated factor of safety for test point
F_L: 1 - FS
w_z: Function value of the extend of soil liquefaction according to depth
d_z: Layer thickness (ft)
LPI: Liquefaction potential index value for test point

Estimation of post-earthquake settlements



Abbreviations

q_t:	Total cone resistance (cone resistance q_c corrected for pore water effects)
I_c:	Soil Behaviour Type Index
FS:	Calculated Factor of Safety against liquefaction
Volumentric strain:	Post-liquefaction volumentric strain

:: Post-earthquake settlement of dry sands ::

Depth (ft)	Ic	Kc	Qc1n	Qc1n,cs	N1,60 (blows)	Vs (ft/s)	Gmax (tsf)	CSR	Shear, γ (%)	Svol,15 (%)	Nc	ev (%)	Settle. (in)
0.16	3.34	11.42	3.21	36.62	0	0.0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.33	3.57	15.47	3.19	49.42	0	0.0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.49	3.41	12.42	5.30	65.86	0	0.0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.66	2.70	3.96	19.41	76.88	0	0.0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.82	2.24	1.78	43.03	76.76	0	0.0	0	0.55	0.000	0.00	0.00	0.00	0.000
0.98	2.01	1.31	67.96	89.23	0	0.0	0	0.55	0.000	0.00	0.00	0.00	0.000
1.15	1.94	1.23	84.42	104.14	0	0.0	0	0.55	0.000	0.00	0.00	0.00	0.000
1.31	1.85	1.15	106.58	122.31	0	0.0	0	0.55	0.000	0.00	0.00	0.00	0.000
1.48	1.68	1.03	147.04	151.04	28	799.6	321	0.55	0.037	0.02	15.16	0.02	0.001
1.64	1.49	1.00	201.92	201.92	35	830.0	369	0.55	0.029	0.01	15.16	0.01	0.001
1.80	1.35	1.00	252.98	252.98	42	849.2	408	0.55	0.026	0.01	15.16	0.01	0.000
1.97	1.28	1.00	288.13	288.13	47	864.0	445	0.55	0.025	0.01	15.16	0.01	0.000
2.13	1.26	1.00	304.36	304.36	49	877.2	481	0.55	0.023	0.01	15.16	0.01	0.000
2.30	1.26	1.00	309.18	309.18	50	887.1	514	0.55	0.022	0.01	15.16	0.01	0.000
2.46	1.28	1.00	304.14	304.14	50	889.7	537	0.55	0.023	0.01	15.16	0.01	0.000
2.63	1.30	1.00	296.56	296.56	49	888.5	555	0.55	0.023	0.01	15.16	0.01	0.000
2.79	1.33	1.00	291.73	291.73	48	898.5	588	0.55	0.022	0.01	15.16	0.01	0.000
2.95	1.35	1.00	291.12	291.12	49	913.2	630	0.55	0.021	0.01	15.16	0.01	0.000
3.12	1.37	1.00	293.84	293.84	49	924.1	667	0.55	0.020	0.01	15.16	0.01	0.000
3.28	1.38	1.00	288.81	288.81	48	921.5	681	0.55	0.021	0.01	15.16	0.01	0.000
3.44	1.40	1.00	279.75	279.75	47	918.7	694	0.55	0.022	0.01	15.16	0.01	0.000
3.61	1.42	1.00	270.77	270.77	46	920.7	716	0.55	0.022	0.01	15.16	0.01	0.000
3.77	1.45	1.00	269.16	269.16	46	934.5	759	0.55	0.021	0.01	15.16	0.01	0.000
3.94	1.47	1.00	272.04	272.04	47	949.1	804	0.55	0.020	0.01	15.16	0.01	0.000
4.10	1.46	1.00	277.64	277.64	48	956.2	836	0.55	0.020	0.01	15.16	0.01	0.000
4.26	1.47	1.00	275.19	275.19	48	954.8	851	0.55	0.020	0.01	15.16	0.01	0.000
4.43	1.50	1.00	263.39	263.39	46	950.2	859	0.54	0.021	0.01	15.16	0.01	0.000
4.59	1.56	1.00	241.89	241.89	43	947.7	871	0.54	0.021	0.01	15.16	0.01	0.000
4.76	1.63	1.00	220.12	220.12	40	946.2	885	0.54	0.022	0.01	15.16	0.01	0.000
4.92	1.70	1.04	201.59	209.88	39	948.5	907	0.54	0.022	0.01	15.16	0.01	0.000
5.08	1.77	1.08	189.49	205.22	39	956.3	941	0.54	0.021	0.01	15.16	0.01	0.000
5.25	1.82	1.12	182.10	203.74	40	967.5	984	0.54	0.021	0.01	15.16	0.01	0.000
5.41	1.85	1.15	180.09	206.20	41	982.8	1037	0.54	0.020	0.01	15.16	0.01	0.000
5.58	1.89	1.18	179.72	212.76	43	1010.0	1121	0.54	0.018	0.01	15.16	0.01	0.000
5.74	1.93	1.21	183.23	222.53	45	1040.3	1217	0.54	0.016	0.01	15.16	0.01	0.000
5.91	1.94	1.23	189.65	233.16	47	1068.0	1311	0.54	0.015	0.01	15.16	0.00	0.000
6.07	1.93	1.22	192.09	234.59	48	1069.6	1335	0.54	0.015	0.01	15.16	0.00	0.000
6.23	1.94	1.23	186.16	229.37	47	1059.8	1327	0.54	0.016	0.01	15.16	0.01	0.000
6.40	1.96	1.25	171.16	214.67	44	1029.0	1260	0.54	0.018	0.01	15.16	0.01	0.000
6.56	1.99	1.28	155.72	199.54	41	995.7	1186	0.54	0.021	0.01	15.16	0.01	0.000
6.73	1.95	1.24	148.96	184.43	38	951.3	1083	0.54	0.025	0.01	15.16	0.01	0.000
6.89	1.91	1.19	145.86	174.20	35	916.3	1006	0.54	0.029	0.02	15.16	0.01	0.001
7.05	1.89	1.18	144.51	170.05	34	901.2	981	0.54	0.032	0.02	15.16	0.02	0.001
7.22	1.93	1.22	138.85	168.81	0	0.0	0	0.54	0.000	0.00	0.00	0.00	0.000
7.38	1.98	1.28	133.31	170.62	0	0.0	0	0.54	0.000	0.00	0.00	0.00	0.000
7.55	2.05	1.37	125.90	172.42	0	0.0	0	0.54	0.000	0.00	0.00	0.00	0.000
7.71	2.13	1.50	115.18	173.21	0	0.0	0	0.54	0.000	0.00	0.00	0.00	0.000
7.87	2.20	1.67	103.96	174.05	0	0.0	0	0.54	0.000	0.00	0.00	0.00	0.000

:: Post-earthquake settlement of dry sands :: (continued)

Depth (ft)	Ic	Kc	Qc1n	Qc1n,cs	N1,60 (blows)	Vs (ft/s)	Gmax (tsf)	CSR	Shear, γ (%)	Svol,15 (%)	Nc	ev (%)	Settle. (in)
8.04	2.27	1.85	94.14	173.83	0	0.0	0	0.54	0.000	0.00	0.00	0.00	0.000
8.20	2.32	2.02	86.15	174.24	0	0.0	0	0.54	0.000	0.00	0.00	0.00	0.000
8.37	2.38	2.22	79.28	175.61	0	0.0	0	0.54	0.000	0.00	0.00	0.00	0.000
8.53	2.42	2.41	73.61	177.36	44	903.3	1097	0.54	0.034	0.01	15.16	0.01	0.000
8.69	2.45	2.51	70.68	177.56	45	898.3	1094	0.54	0.035	0.01	15.16	0.01	0.000
8.86	2.46	2.57	68.80	176.63	45	893.0	1090	0.54	0.036	0.01	15.16	0.01	0.000
9.02	2.46	2.58	67.97	175.46	44	889.3	1090	0.54	0.037	0.01	15.16	0.01	0.000
9.19	2.46	2.59	66.81	173.08	44	882.8	1083	0.54	0.039	0.02	15.16	0.01	0.001
9.35	2.46	2.58	65.38	168.64	43	872.0	1064	0.54	0.041	0.02	15.16	0.01	0.001
9.51	2.45	2.52	64.22	161.72	41	857.0	1033	0.54	0.045	0.02	15.16	0.02	0.001
9.68	2.44	2.48	63.76	158.23	40	849.5	1023	0.54	0.047	0.02	15.16	0.02	0.001
9.84	2.44	2.49	62.95	157.01	39	845.6	1022	0.54	0.048	0.02	15.16	0.02	0.001

Total estimated settlement: 0.02

:: Post-earthquake settlement due to soil liquefaction ::

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
10.01	160.21	0.86	0.65	0.83	0.01	10.17	163.68	0.90	0.63	0.83	0.01
10.34	164.79	0.91	0.62	0.82	0.01	10.50	161.56	2.00	0.00	0.82	0.00
10.66	151.55	2.00	0.00	0.82	0.00	10.83	138.40	2.00	0.00	0.82	0.00
10.99	128.45	2.00	0.00	0.81	0.00	11.15	128.37	0.49	1.54	0.81	0.03
11.32	135.09	0.54	1.48	0.81	0.03	11.48	143.16	0.61	1.40	0.81	0.03
11.65	149.81	0.68	1.11	0.80	0.02	11.81	160.07	0.79	0.82	0.80	0.02
11.97	174.63	0.98	0.42	0.80	0.01	12.14	190.40	1.23	0.21	0.79	0.00
12.30	201.16	2.00	0.00	0.79	0.00	12.47	205.27	2.00	0.00	0.79	0.00
12.63	204.47	2.00	0.00	0.79	0.00	12.79	208.23	2.00	0.00	0.78	0.00
12.96	207.49	2.00	0.00	0.78	0.00	13.12	210.80	2.00	0.00	0.78	0.00
13.29	219.69	2.00	0.00	0.77	0.00	13.45	224.54	2.00	0.00	0.77	0.00
13.62	227.15	2.00	0.00	0.77	0.00	13.78	221.89	2.00	0.00	0.77	0.00
13.94	228.65	2.00	0.00	0.76	0.00	14.11	233.64	2.00	0.00	0.76	0.00
14.27	236.13	2.00	0.00	0.76	0.00	14.44	229.61	2.00	0.00	0.76	0.00
14.60	221.50	2.00	0.00	0.75	0.00	14.76	214.34	2.00	0.00	0.75	0.00
14.93	216.96	2.00	0.00	0.75	0.00	15.09	220.54	2.00	0.00	0.74	0.00
15.26	222.10	2.00	0.00	0.74	0.00	15.42	224.61	2.00	0.00	0.74	0.00
15.58	229.37	2.00	0.00	0.74	0.00	15.75	235.40	2.00	0.00	0.73	0.00
15.91	236.83	2.00	0.00	0.73	0.00	16.08	237.39	2.00	0.00	0.73	0.00
16.24	235.13	2.00	0.00	0.72	0.00	16.40	229.21	2.00	0.00	0.72	0.00
16.57	221.65	2.00	0.00	0.72	0.00	16.73	216.13	2.00	0.00	0.72	0.00
16.90	214.78	2.00	0.00	0.71	0.00	17.06	210.54	2.00	0.00	0.71	0.00
17.22	204.69	2.00	0.00	0.71	0.00	17.39	199.31	2.00	0.00	0.71	0.00
17.55	199.03	2.00	0.00	0.70	0.00	17.72	206.02	2.00	0.00	0.70	0.00
17.88	216.90	2.00	0.00	0.70	0.00	18.05	223.07	2.00	0.00	0.69	0.00
18.21	223.10	2.00	0.00	0.69	0.00	18.37	215.64	2.00	0.00	0.69	0.00
18.54	210.80	2.00	0.00	0.69	0.00	18.70	207.30	2.00	0.00	0.68	0.00
18.86	207.27	2.00	0.00	0.68	0.00	19.03	207.39	2.00	0.00	0.68	0.00
19.19	209.40	2.00	0.00	0.67	0.00	19.36	211.07	2.00	0.00	0.67	0.00
19.52	210.75	2.00	0.00	0.67	0.00	19.68	205.29	2.00	0.00	0.67	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
19.85	198.58	2.00	0.00	0.66	0.00	20.01	189.18	2.00	0.00	0.66	0.00
20.18	182.87	2.00	0.00	0.66	0.00	20.34	178.28	2.00	0.00	0.66	0.00
20.50	177.08	2.00	0.00	0.65	0.00	20.67	173.44	2.00	0.00	0.65	0.00
20.83	165.49	2.00	0.00	0.65	0.00	21.00	154.62	2.00	0.00	0.64	0.00
21.16	143.94	0.50	1.11	0.64	0.02	21.32	135.17	0.43	1.17	0.64	0.02
21.49	129.40	0.39	1.20	0.64	0.02	21.65	124.80	0.36	1.23	0.63	0.02
21.82	122.79	0.35	1.24	0.63	0.02	21.98	122.51	0.35	1.24	0.63	0.02
22.15	123.46	0.35	1.23	0.62	0.02	22.31	123.49	0.35	1.22	0.62	0.02
22.47	122.34	0.35	1.23	0.62	0.02	22.64	123.99	0.36	1.21	0.62	0.02
22.80	131.66	0.40	1.14	0.61	0.02	22.97	137.04	0.44	1.10	0.61	0.02
23.13	149.67	0.54	1.02	0.61	0.02	23.29	162.90	0.66	0.74	0.61	0.01
23.46	180.55	0.86	0.39	0.60	0.01	23.62	198.91	2.00	0.00	0.60	0.00
23.79	213.12	2.00	0.00	0.60	0.00	23.95	209.85	2.00	0.00	0.59	0.00
24.11	204.85	2.00	0.00	0.59	0.00	24.28	217.46	2.00	0.00	0.59	0.00
24.44	243.65	2.00	0.00	0.59	0.00	24.61	270.95	2.00	0.00	0.58	0.00
24.77	311.73	2.00	0.00	0.58	0.00	24.93	349.85	2.00	0.00	0.58	0.00
25.10	373.24	2.00	0.00	0.57	0.00	25.26	381.93	2.00	0.00	0.57	0.00
25.43	384.26	2.00	0.00	0.57	0.00	25.59	390.62	2.00	0.00	0.57	0.00
25.75	391.76	2.00	0.00	0.56	0.00	25.92	376.63	2.00	0.00	0.56	0.00
26.08	342.60	2.00	0.00	0.56	0.00	26.25	304.21	2.00	0.00	0.56	0.00
26.41	272.03	2.00	0.00	0.55	0.00	26.57	245.29	2.00	0.00	0.55	0.00
26.74	230.75	2.00	0.00	0.55	0.00	26.90	216.75	2.00	0.00	0.54	0.00
27.07	222.03	2.00	0.00	0.54	0.00	27.23	219.97	2.00	0.00	0.54	0.00
27.39	239.38	2.00	0.00	0.54	0.00	27.56	265.41	2.00	0.00	0.53	0.00
27.72	318.59	2.00	0.00	0.53	0.00	27.89	379.01	2.00	0.00	0.53	0.00
28.05	430.73	2.00	0.00	0.52	0.00	28.21	440.33	2.00	0.00	0.52	0.00
28.38	414.82	2.00	0.00	0.52	0.00	28.54	372.27	2.00	0.00	0.52	0.00
28.71	342.65	2.00	0.00	0.51	0.00	28.87	331.56	2.00	0.00	0.51	0.00
29.04	333.73	2.00	0.00	0.51	0.00	29.20	365.89	2.00	0.00	0.51	0.00
29.36	391.15	2.00	0.00	0.50	0.00	29.53	410.53	2.00	0.00	0.50	0.00
29.69	375.72	2.00	0.00	0.50	0.00	29.86	332.60	2.00	0.00	0.49	0.00
30.02	282.65	2.00	0.00	0.49	0.00	30.18	244.87	2.00	0.00	0.49	0.00
30.35	223.53	2.00	0.00	0.49	0.00	30.51	234.77	2.00	0.00	0.48	0.00
30.68	247.16	2.00	0.00	0.48	0.00	30.84	258.07	2.00	0.00	0.48	0.00
31.00	272.05	2.00	0.00	0.47	0.00	31.17	267.60	2.00	0.00	0.47	0.00
31.33	268.58	2.00	0.00	0.47	0.00	31.50	252.17	2.00	0.00	0.47	0.00
31.66	274.00	2.00	0.00	0.46	0.00	31.82	299.14	2.00	0.00	0.46	0.00
31.99	354.82	2.00	0.00	0.46	0.00	32.15	387.71	2.00	0.00	0.46	0.00
32.32	392.56	2.00	0.00	0.45	0.00	32.48	370.36	2.00	0.00	0.45	0.00
32.64	336.27	2.00	0.00	0.45	0.00	32.81	301.56	2.00	0.00	0.44	0.00
32.97	275.31	2.00	0.00	0.44	0.00	33.14	255.46	2.00	0.00	0.44	0.00
33.30	239.71	2.00	0.00	0.44	0.00	33.47	218.17	2.00	0.00	0.43	0.00
33.63	225.70	2.00	0.00	0.43	0.00	33.79	243.92	2.00	0.00	0.43	0.00
33.96	258.50	2.00	0.00	0.42	0.00	34.12	239.04	2.00	0.00	0.42	0.00
34.28	213.17	2.00	0.00	0.42	0.00	34.45	209.79	2.00	0.00	0.42	0.00
34.61	218.96	2.00	0.00	0.41	0.00	34.78	241.73	2.00	0.00	0.41	0.00
34.94	262.01	2.00	0.00	0.41	0.00	35.10	275.84	2.00	0.00	0.41	0.00
35.27	281.87	2.00	0.00	0.40	0.00	35.43	265.13	2.00	0.00	0.40	0.00

:: Post-earthquake settlement due to soil liquefaction :: (continued)

Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)	Depth (ft)	$Q_{tn,cs}$	FS	e_v (%)	DF	Settlement (in)
35.60	258.30	2.00	0.00	0.40	0.00	35.76	263.42	2.00	0.00	0.39	0.00
35.92	284.06	2.00	0.00	0.39	0.00	36.09	302.09	2.00	0.00	0.39	0.00
36.25	294.13	2.00	0.00	0.39	0.00	36.42	294.94	2.00	0.00	0.38	0.00
36.58	290.93	2.00	0.00	0.38	0.00	36.74	292.42	2.00	0.00	0.38	0.00
36.91	293.91	2.00	0.00	0.37	0.00	37.07	320.94	2.00	0.00	0.37	0.00
37.24	346.92	2.00	0.00	0.37	0.00	37.40	366.55	2.00	0.00	0.37	0.00
37.57	365.21	2.00	0.00	0.36	0.00	37.73	351.33	2.00	0.00	0.36	0.00
37.89	330.53	2.00	0.00	0.36	0.00	38.06	319.71	2.00	0.00	0.35	0.00
38.22	359.14	2.00	0.00	0.35	0.00	38.39	405.10	2.00	0.00	0.35	0.00
38.55	440.31	2.00	0.00	0.35	0.00	38.71	431.09	2.00	0.00	0.34	0.00
38.88	425.91	2.00	0.00	0.34	0.00	39.04	421.22	2.00	0.00	0.34	0.00

Total estimated settlement: 0.50

Abbreviations

$Q_{tn,cs}$:	Equivalent clean sand normalized cone resistance
FS:	Factor of safety against liquefaction
e_v (%):	Post-liquefaction volumentric strain
DF:	e_v depth weighting factor
Settlement:	Calculated settlement

:: Strength loss calculation (Robertson (2009) ::

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
0.16	2.00	3.21	11.42	36.62	3.34	N/A	N/A
0.33	2.00	3.19	15.47	49.42	3.57	N/A	N/A
0.49	3.32	5.30	12.42	65.86	3.41	N/A	N/A
0.66	12.11	19.41	3.96	76.88	2.70	N/A	N/A
0.82	26.82	43.03	1.78	76.76	2.24	N/A	N/A
0.98	42.35	67.96	1.31	89.23	2.01	N/A	N/A
1.15	52.60	84.42	1.23	104.14	1.94	N/A	N/A
1.31	66.41	106.58	1.15	122.31	1.85	N/A	N/A
1.48	91.60	147.04	1.03	151.04	1.68	N/A	N/A
1.64	125.77	201.92	1.00	201.92	1.49	N/A	N/A
1.80	157.56	252.98	1.00	252.98	1.35	N/A	N/A
1.97	179.44	288.13	1.00	288.13	1.28	N/A	N/A
2.13	189.56	304.36	1.00	304.36	1.26	N/A	N/A
2.30	192.57	309.18	1.00	309.18	1.26	N/A	N/A
2.46	189.44	304.14	1.00	304.14	1.28	N/A	N/A
2.63	184.73	296.56	1.00	296.56	1.30	N/A	N/A
2.79	181.73	291.73	1.00	291.73	1.33	N/A	N/A
2.95	181.37	291.12	1.00	291.12	1.35	N/A	N/A
3.12	183.07	293.84	1.00	293.84	1.37	N/A	N/A
3.28	179.95	288.81	1.00	288.81	1.38	N/A	N/A
3.44	174.32	279.75	1.00	279.75	1.40	N/A	N/A
3.61	168.74	270.77	1.00	270.77	1.42	N/A	N/A
3.77	167.75	269.16	1.00	269.16	1.45	N/A	N/A
3.94	169.55	272.04	1.00	272.04	1.47	N/A	N/A
4.10	173.05	277.64	1.00	277.64	1.46	N/A	N/A
4.26	171.53	275.19	1.00	275.19	1.47	N/A	N/A
4.43	164.20	263.39	1.00	263.39	1.50	N/A	N/A
4.59	150.82	241.89	1.00	241.89	1.56	N/A	N/A
4.76	137.29	220.12	1.00	220.12	1.63	N/A	N/A
4.92	125.76	201.59	1.04	209.88	1.70	N/A	N/A
5.08	118.24	189.49	1.08	205.22	1.77	N/A	N/A
5.25	113.65	182.10	1.12	203.74	1.82	N/A	N/A
5.41	112.41	180.09	1.15	206.20	1.85	N/A	N/A
5.58	112.19	179.72	1.18	212.76	1.89	N/A	N/A
5.74	114.39	183.23	1.21	222.53	1.93	N/A	N/A
5.91	118.39	189.65	1.23	233.16	1.94	N/A	N/A
6.07	119.92	192.09	1.22	234.59	1.93	N/A	N/A
6.23	116.24	186.16	1.23	229.37	1.94	N/A	N/A
6.40	106.92	171.16	1.25	214.67	1.96	N/A	N/A
6.56	97.32	155.72	1.28	199.54	1.99	N/A	N/A
6.73	93.12	148.96	1.24	184.43	1.95	N/A	N/A
6.89	91.20	145.86	1.19	174.20	1.91	N/A	N/A
7.05	90.37	144.51	1.18	170.05	1.89	N/A	N/A
7.22	86.85	138.85	1.22	168.81	1.93	N/A	N/A
7.38	83.42	133.31	1.28	170.62	1.98	N/A	N/A
7.55	78.82	125.90	1.37	172.42	2.05	N/A	N/A
7.71	72.16	115.18	1.50	173.21	2.13	N/A	N/A
7.87	65.18	103.96	1.67	174.05	2.20	N/A	N/A

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
8.04	59.08	94.14	1.85	173.83	2.27	N/A	N/A
8.20	54.12	86.15	2.02	174.24	2.32	N/A	N/A
8.37	49.85	79.28	2.22	175.61	2.38	N/A	N/A
8.53	46.33	73.61	2.41	177.36	2.42	N/A	N/A
8.69	44.52	70.68	2.51	177.56	2.45	N/A	N/A
8.86	43.36	68.80	2.57	176.63	2.46	N/A	N/A
9.02	42.85	67.97	2.58	175.46	2.46	N/A	N/A
9.19	42.43	66.81	2.59	173.08	2.46	N/A	N/A
9.35	42.17	65.38	2.58	168.64	2.46	N/A	N/A
9.51	42.15	64.22	2.52	161.72	2.45	N/A	N/A
9.68	42.52	63.76	2.48	158.23	2.44	N/A	N/A
9.84	42.55	62.95	2.49	157.01	2.44	N/A	N/A
10.01	42.48	62.23	2.57	160.21	2.46	0.76	0.76
10.17	42.32	61.37	2.67	163.68	2.48	0.76	0.76
10.34	43.16	61.77	2.67	164.79	2.48	0.76	0.76
10.50	44.47	62.60	2.58	161.56	2.46	0.76	0.76
10.66	47.08	64.80	2.34	151.55	2.41	0.77	0.77
10.83	50.82	68.15	2.03	138.40	2.32	0.77	0.77
10.99	55.28	72.28	1.78	128.45	2.24	0.78	0.78
11.15	59.52	76.55	1.68	128.37	2.20	0.79	0.79
11.32	62.96	80.20	1.68	135.09	2.21	0.80	0.80
11.48	65.28	82.56	1.73	143.16	2.23	0.80	0.80
11.65	67.45	84.61	1.77	149.81	2.24	0.80	0.80
11.81	69.15	86.23	1.86	160.07	2.27	0.81	0.81
11.97	70.39	87.40	2.00	174.63	2.32	0.81	0.81
12.14	66.95	83.10	2.29	190.40	2.39	0.80	0.80
12.30	62.35	77.18	2.61	201.16	2.47	0.79	0.79
12.47	58.94	72.48	2.83	205.27	2.51	0.78	0.78
12.63	60.16	73.09	2.80	204.47	2.51	0.78	0.78
12.79	62.73	75.32	2.76	208.23	2.50	0.79	0.79
12.96	64.03	75.98	2.73	207.49	2.49	0.79	0.79
13.12	63.03	74.13	2.84	210.80	2.51	0.79	0.79
13.29	44.87	53.00	4.15	219.69	2.72	3.88	3.88
13.45	43.68	51.11	4.39	224.54	2.75	3.72	3.72
13.62	44.58	51.57	4.40	227.15	2.75	3.75	3.75
13.78	63.49	71.77	3.09	221.89	2.56	0.78	0.78
13.94	65.31	73.10	3.13	228.65	2.57	0.78	0.78
14.11	65.73	72.86	3.21	233.64	2.58	0.78	0.78
14.27	62.45	68.63	3.44	236.13	2.62	5.02	5.02
14.44	57.89	63.00	3.64	229.61	2.65	4.59	4.59
14.60	55.25	59.48	3.72	221.50	2.66	4.33	4.33
14.76	56.80	60.44	3.55	214.34	2.63	4.40	4.40
14.93	60.43	63.62	3.41	216.96	2.61	4.63	4.63
15.09	63.33	66.00	3.34	220.54	2.60	4.80	4.80
15.26	66.94	69.05	3.22	222.10	2.58	0.78	0.78
15.42	69.95	71.45	3.14	224.61	2.57	0.78	0.78
15.58	72.00	72.86	3.15	229.37	2.57	0.78	0.78
15.75	70.31	70.52	3.34	235.40	2.60	5.09	5.09

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
15.91	68.75	68.30	3.47	236.83	2.62	4.92	4.92
16.08	66.24	65.18	3.64	237.39	2.65	4.69	4.69
16.24	65.00	63.34	3.71	235.13	2.66	4.55	4.55
16.40	63.28	61.05	3.75	229.21	2.67	4.38	4.38
16.57	62.95	60.14	3.69	221.65	2.66	4.31	4.31
16.73	61.41	58.10	3.72	216.13	2.66	4.16	4.16
16.90	58.33	54.64	3.93	214.78	2.69	3.91	3.91
17.06	54.22	50.25	4.19	210.54	2.73	3.59	3.59
17.22	49.12	45.00	4.55	204.69	2.77	3.21	3.21
17.39	45.79	41.47	4.81	199.31	2.80	2.96	2.96
17.55	45.43	40.75	4.88	199.03	2.81	2.91	2.91
17.72	49.87	44.43	4.64	206.02	2.78	3.17	3.17
17.88	56.68	50.20	4.32	216.90	2.74	3.57	3.57
18.05	65.15	57.48	3.88	223.07	2.68	4.08	4.08
18.21	66.55	58.47	3.82	223.10	2.67	4.15	4.15
18.37	66.87	58.51	3.69	215.64	2.66	4.15	4.15
18.54	64.14	55.80	3.78	210.80	2.67	3.96	3.96
18.70	66.12	57.34	3.62	207.30	2.65	4.06	4.06
18.86	66.11	57.07	3.63	207.27	2.65	4.04	4.04
19.03	63.66	54.63	3.80	207.39	2.67	3.87	3.87
19.19	59.12	50.34	4.16	209.40	2.72	3.57	3.57
19.36	54.72	46.22	4.57	211.07	2.77	3.28	3.28
19.52	51.80	43.44	4.85	210.75	2.81	3.09	3.09
19.68	49.72	41.44	4.95	205.29	2.82	2.94	2.94
19.85	47.58	39.41	5.04	198.58	2.83	2.80	2.80
20.01	48.60	40.15	4.71	189.18	2.79	2.85	2.85
20.18	52.65	43.52	4.20	182.87	2.73	3.08	3.08
20.34	56.97	47.11	3.78	178.28	2.67	3.32	3.32
20.50	55.96	46.04	3.85	177.08	2.68	3.24	3.24
20.67	53.18	43.47	3.99	173.44	2.70	3.07	3.07
20.83	52.54	42.79	3.87	165.49	2.68	3.01	3.01
21.00	55.82	45.52	3.40	154.62	2.61	3.19	3.19
21.16	59.96	49.00	2.94	143.94	2.53	0.73	0.73
21.32	63.19	51.70	2.61	135.17	2.47	0.74	0.74
21.49	65.11	53.24	2.43	129.40	2.43	0.74	0.74
21.65	64.87	52.91	2.36	124.80	2.41	0.74	0.74
21.82	63.93	51.95	2.36	122.79	2.41	0.74	0.74
21.98	62.88	50.87	2.41	122.51	2.42	0.74	0.74
22.15	63.07	50.84	2.43	123.46	2.43	0.74	0.74
22.31	63.80	51.28	2.41	123.49	2.42	0.74	0.74
22.47	65.26	52.37	2.34	122.34	2.41	0.74	0.74
22.64	66.44	53.16	2.33	123.99	2.40	0.74	0.74
22.80	67.04	53.34	2.47	131.66	2.44	0.74	0.74
22.97	67.98	53.86	2.54	137.04	2.45	0.74	0.74
23.13	74.49	58.92	2.54	149.67	2.45	0.76	0.76
23.29	81.83	64.63	2.52	162.90	2.45	0.77	0.77
23.46	80.13	62.68	2.88	180.55	2.52	0.76	0.76
23.62	71.36	54.94	3.62	198.91	2.65	3.83	3.83

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
23.79	68.06	51.84	4.11	213.12	2.72	3.63	3.63
23.95	93.23	72.26	2.90	209.85	2.53	0.78	0.78
24.11	146.37	116.53	1.76	204.85	2.24	0.85	0.85
24.28	185.77	149.46	1.46	217.46	2.10	0.89	0.89
24.44	232.97	188.95	1.29	243.65	1.99	0.92	0.92
24.61	279.78	228.43	1.19	270.95	1.90	0.95	0.95
24.77	341.86	281.02	1.11	311.73	1.80	0.98	0.98
24.93	388.73	319.48	1.10	349.85	1.78	1.01	1.01
25.10	405.12	330.74	1.13	373.24	1.83	1.01	1.01
25.26	399.87	323.67	1.18	381.93	1.89	1.01	1.01
25.43	381.67	305.79	1.26	384.26	1.96	1.00	1.00
25.59	361.43	286.38	1.36	390.62	2.05	0.99	0.99
25.75	344.97	271.11	1.45	391.76	2.09	0.98	0.98
25.92	319.26	249.14	1.51	376.63	2.13	0.96	0.96
26.08	290.68	225.97	1.52	342.60	2.13	0.95	0.95
26.25	260.66	201.99	1.51	304.21	2.13	0.93	0.93
26.41	231.58	178.60	1.52	272.03	2.14	0.91	0.91
26.57	181.11	137.29	1.79	245.29	2.25	0.87	0.87
26.74	163.79	123.23	1.87	230.75	2.28	0.86	0.86
26.90	155.27	116.44	1.86	216.75	2.27	0.85	0.85
27.07	181.40	137.27	1.62	222.03	2.18	0.87	0.87
27.23	220.40	170.20	1.29	219.97	1.99	0.90	0.90
27.39	260.80	203.71	1.18	239.38	1.89	0.93	0.93
27.56	296.02	231.80	1.14	265.41	1.85	0.95	0.95
27.72	343.23	266.46	1.20	318.59	1.91	0.98	0.98
27.89	409.60	317.52	1.19	379.01	1.91	1.00	1.00
28.05	476.69	370.37	1.16	430.73	1.87	1.03	1.03
28.21	479.17	369.97	1.19	440.33	1.90	1.03	1.03
28.38	426.07	324.58	1.28	414.82	1.98	1.01	1.01
28.54	347.19	260.00	1.43	372.27	2.09	0.97	0.97
28.71	311.66	231.82	1.48	342.65	2.11	0.95	0.95
28.87	327.22	245.23	1.35	331.56	2.04	0.96	0.96
29.04	345.85	260.38	1.28	333.73	1.99	0.97	0.97
29.20	406.67	309.47	1.18	365.89	1.89	1.00	1.00
29.36	446.93	341.38	1.15	391.15	1.85	1.02	1.02
29.53	485.41	373.08	1.10	410.53	1.79	1.03	1.03
29.69	429.01	325.65	1.15	375.72	1.86	1.01	1.01
29.86	359.26	268.42	1.24	332.60	1.95	0.98	0.98
30.02	280.37	205.59	1.37	282.65	2.05	0.93	0.93
30.18	208.78	149.35	1.64	244.87	2.19	0.89	0.89
30.35	189.40	134.82	1.66	223.53	2.20	0.87	0.87
30.51	208.22	148.69	1.58	234.77	2.16	0.88	0.88
30.68	238.71	172.02	1.44	247.16	2.09	0.91	0.91
30.84	256.66	185.31	1.39	258.07	2.06	0.92	0.92
31.00	281.89	204.40	1.33	272.05	2.02	0.93	0.93
31.17	312.00	231.39	1.16	267.60	1.86	0.95	0.95
31.33	333.11	251.09	1.07	268.58	1.75	0.97	0.97
31.50	313.38	235.61	1.07	252.17	1.75	0.96	0.96

:: Strength loss calculation (Robertson (2009) :: (continued)

Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$
31.66	324.45	239.67	1.14	274.00	1.85	0.96	0.96
31.82	343.79	251.31	1.19	299.14	1.90	0.97	0.97
31.99	416.75	305.92	1.16	354.82	1.87	1.00	1.00
32.15	456.26	334.33	1.16	387.71	1.87	1.01	1.01
32.32	456.89	332.81	1.18	392.56	1.89	1.01	1.01
32.48	425.41	307.80	1.20	370.36	1.91	1.00	1.00
32.64	378.83	271.82	1.24	336.27	1.95	0.98	0.98
32.81	320.37	226.16	1.33	301.56	2.02	0.95	0.95
32.97	275.34	191.54	1.44	275.31	2.09	0.92	0.92
33.14	248.93	171.79	1.49	255.46	2.12	0.91	0.91
33.30	245.04	169.89	1.41	239.71	2.07	0.90	0.90
33.47	228.40	158.44	1.38	218.17	2.05	0.89	0.89
33.63	251.16	176.03	1.28	225.70	1.99	0.91	0.91
33.79	286.59	203.25	1.20	243.92	1.91	0.93	0.93
33.96	309.66	220.39	1.17	258.50	1.88	0.94	0.94
34.12	270.20	188.56	1.27	239.04	1.97	0.92	0.92
34.28	203.75	137.03	1.56	213.17	2.15	0.87	0.87
34.45	158.06	102.31	2.05	209.79	2.33	0.83	0.83
34.61	152.46	97.40	2.25	218.96	2.38	0.82	0.82
34.78	176.67	113.41	2.13	241.73	2.35	0.85	0.85
34.94	206.23	133.47	1.96	262.01	2.30	0.87	0.87
35.10	215.44	138.94	1.99	275.84	2.31	0.87	0.87
35.27	221.50	142.56	1.98	281.87	2.31	0.88	0.88
35.43	224.66	145.63	1.82	265.13	2.26	0.88	0.88
35.60	232.65	151.72	1.70	258.30	2.21	0.89	0.89
35.76	279.33	187.01	1.41	263.42	2.07	0.92	0.92
35.92	309.21	207.73	1.37	284.06	2.05	0.94	0.94
36.09	342.09	231.41	1.31	302.09	2.00	0.95	0.95
36.25	329.84	221.93	1.33	294.13	2.02	0.95	0.95
36.42	340.58	230.20	1.28	294.94	1.99	0.95	0.95
36.58	347.32	236.31	1.23	290.93	1.94	0.96	0.96
36.74	351.06	238.61	1.23	292.42	1.94	0.96	0.96
36.91	367.68	252.78	1.16	293.91	1.87	0.97	0.97
37.07	411.45	285.13	1.13	320.94	1.83	0.99	0.99
37.24	464.53	327.79	1.06	346.92	1.73	1.01	1.01
37.40	489.89	344.58	1.06	366.55	1.74	1.02	1.02
37.57	485.86	340.04	1.07	365.21	1.75	1.02	1.02
37.73	455.38	313.80	1.12	351.33	1.82	1.00	1.00
37.89	414.92	281.18	1.18	330.53	1.89	0.98	0.98
38.06	399.97	269.87	1.18	319.71	1.90	0.98	0.98
38.22	475.11	327.90	1.10	359.14	1.78	1.01	1.01
38.39	558.81	393.16	1.03	405.10	1.69	1.04	1.04
38.55	620.07	440.31	1.00	440.31	1.63	1.06	1.06
38.71	609.16	431.40	1.00	431.09	1.64	1.06	1.06
38.88	601.86	425.91	1.00	425.91	1.64	1.05	1.05
39.04	596.24	421.22	1.00	421.22	1.64	1.05	1.05

:: Strength loss calculation (Robertson (2009) :: (continued)

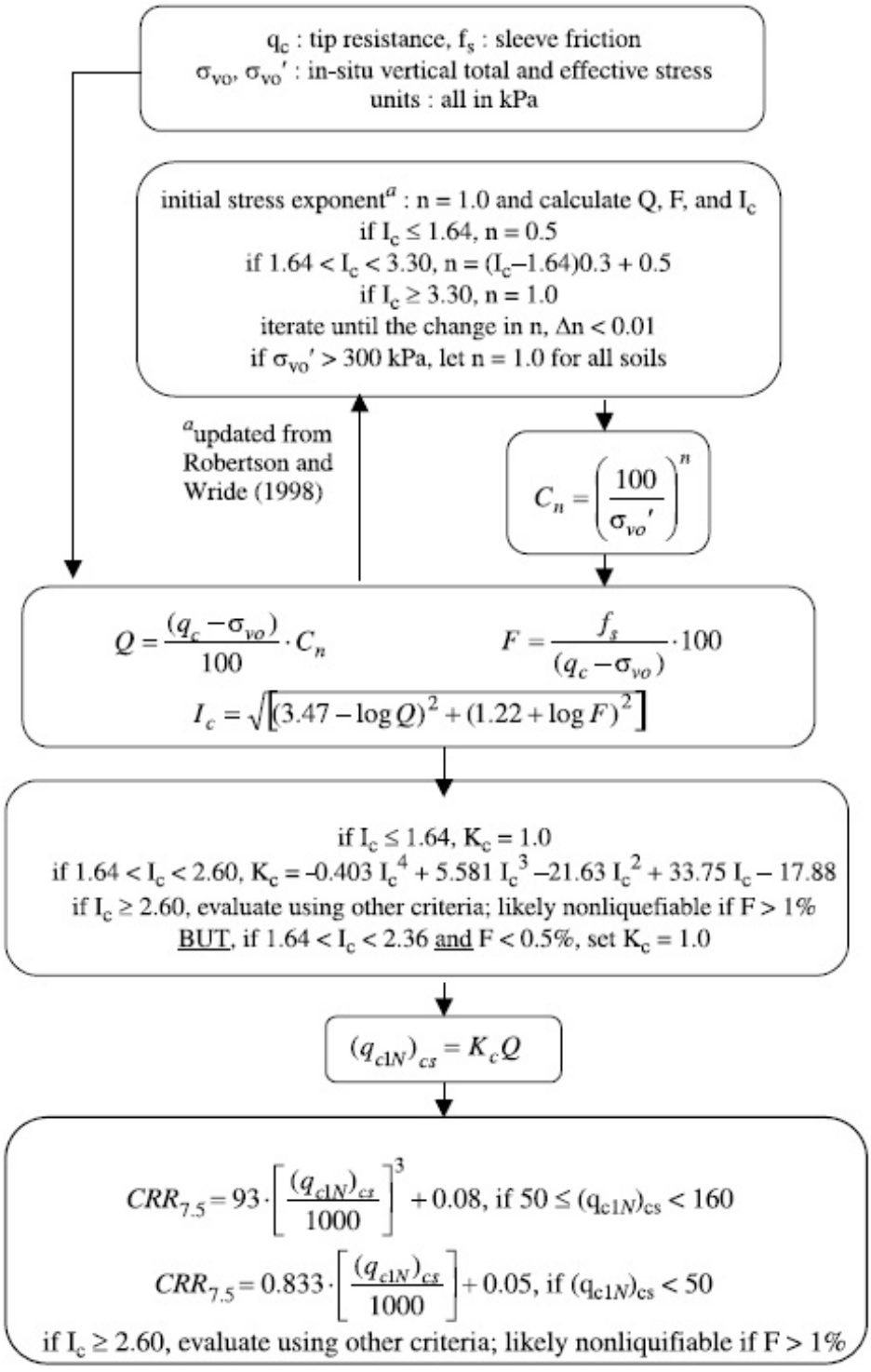
Depth (ft)	q_t (tsf)	Q_{tn}	K_c	$Q_{tn,cs}$	I_c	$S_{u(liq)}/\sigma'_v$	$S_{u(peak)}/\sigma'_v$

Abbreviations

q_t:	Total cone resistance
K_c:	Cone resistance correction factor due to fines
$Q_{tn,cs}$:	Adjusted and corrected cone resistance due to fines
I_c:	Soil behavior type index
$S_{u(liq)}/\sigma'_v$:	Calculated liquefied undrained strength ratio
$S_{u(peak)}/\sigma'_v$:	Calculated peak undrained strength ratio

Procedure for the evaluation of soil liquefaction resistance, NCEER (1998)

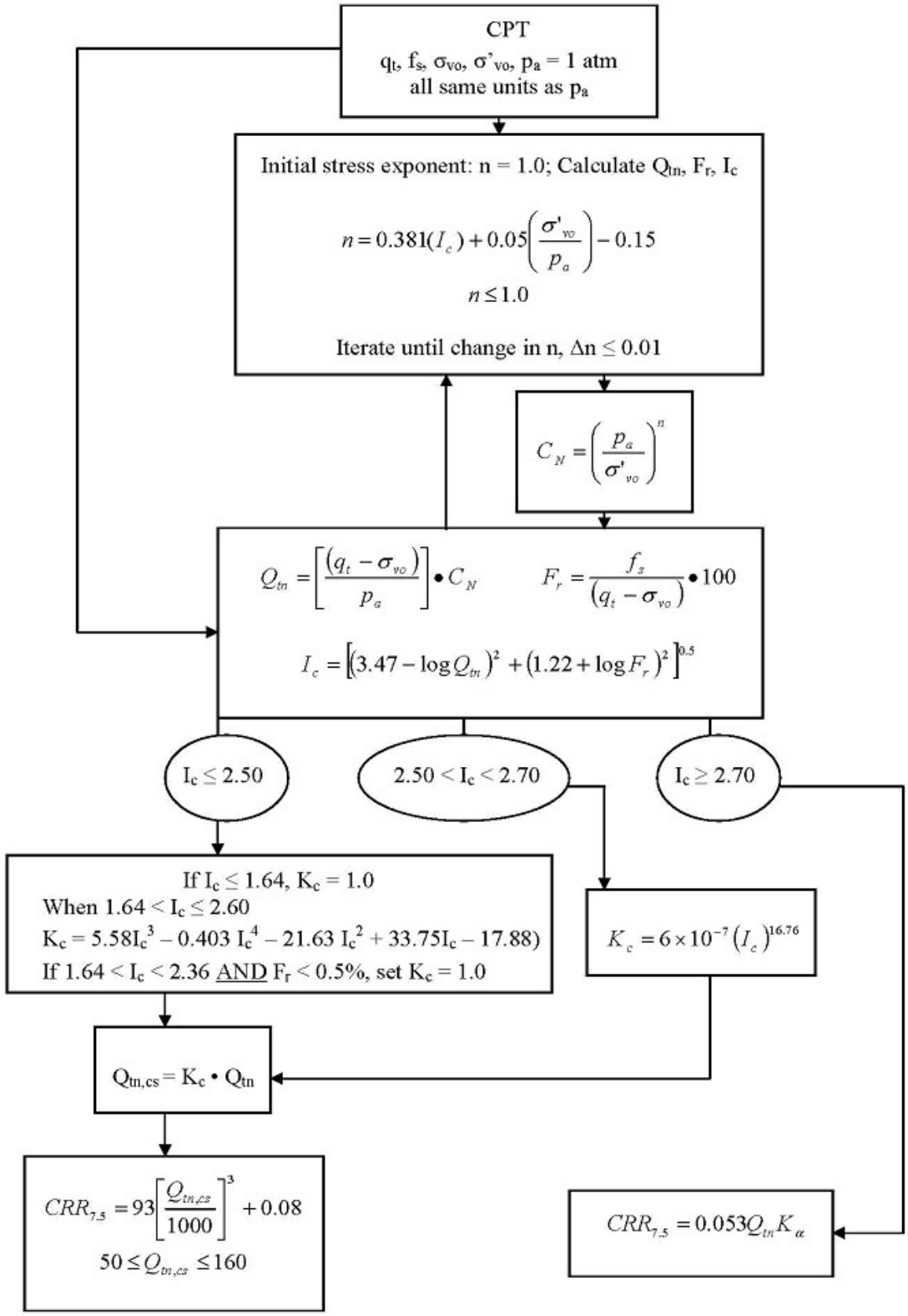
Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. The procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:



[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

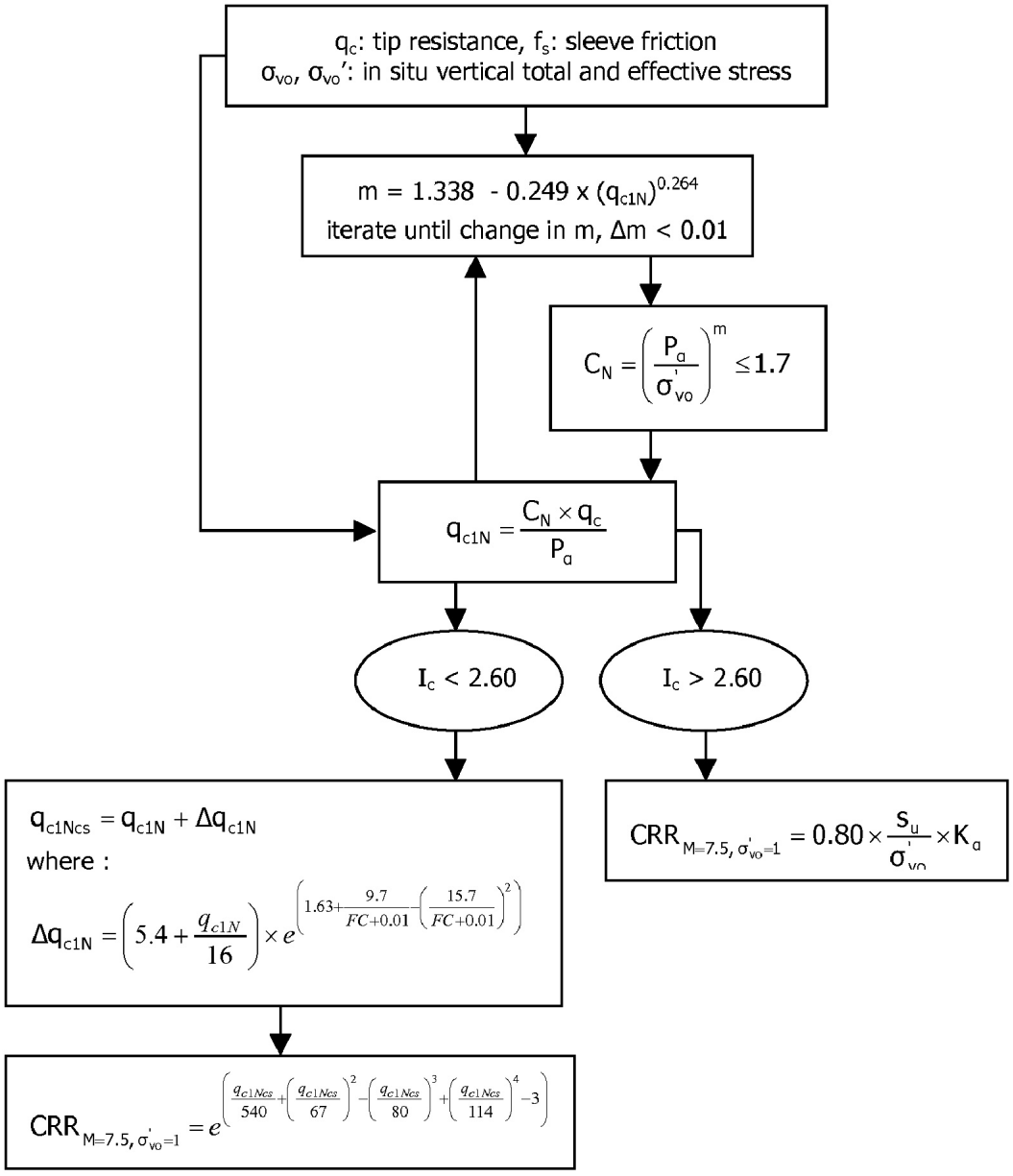
Procedure for the evaluation of soil liquefaction resistance (all soils), Robertson (2010)

Calculation of soil resistance against liquefaction is performed according to the Robertson & Wride (1998) procedure. This procedure used in the software, slightly differs from the one originally published in NCEER-97-0022 (Proceedings of the NCEER Workshop on Evaluation of Liquefaction Resistance of Soils). The revised procedure is presented below in the form of a flowchart[1]:

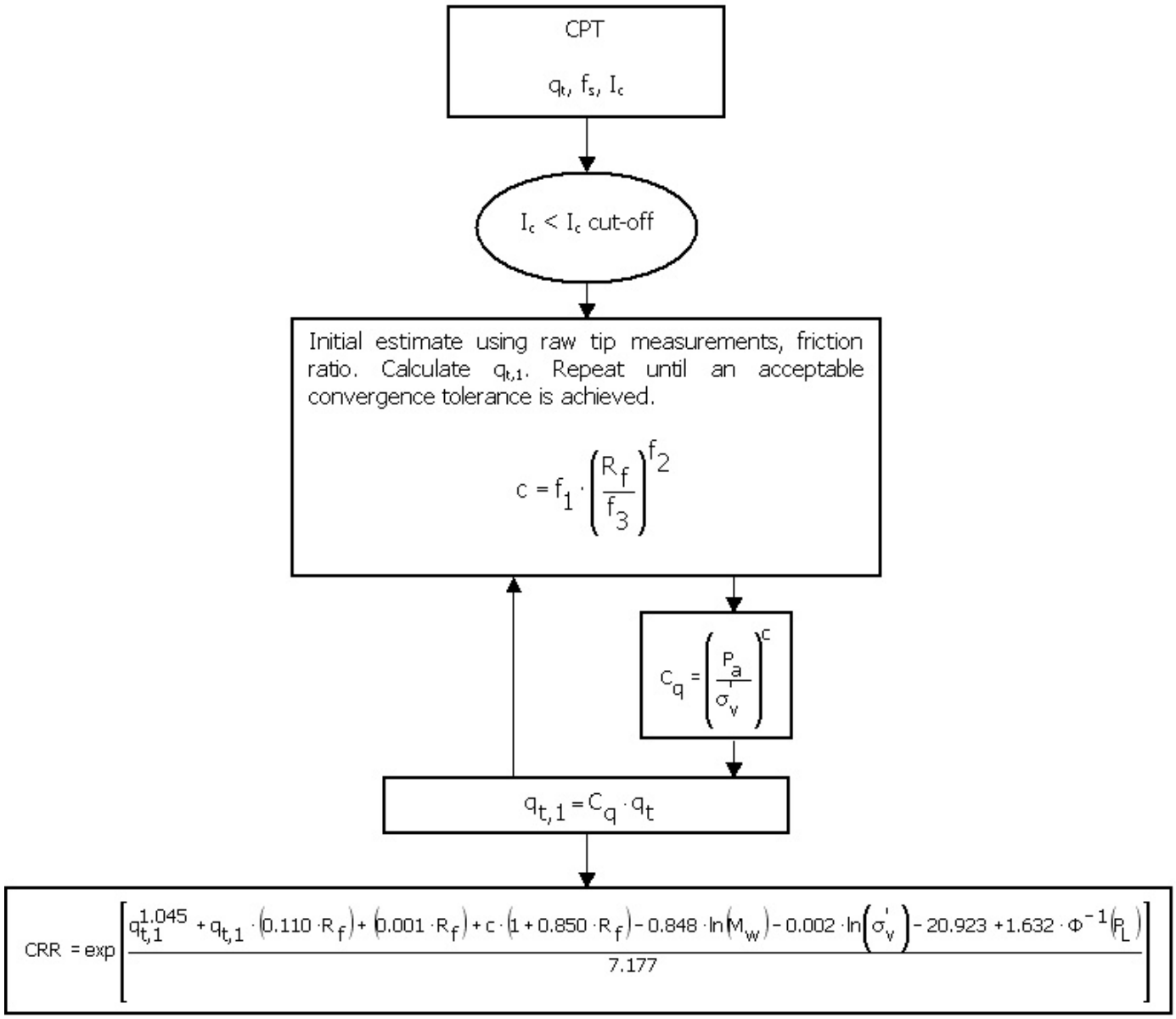


[1] P.K. Robertson, 2009. "Performance based earthquake design using the CPT", Keynote Lecture, International Conference on Performance-based Design in Earthquake Geotechnical Engineering – from case history to practice, IS-Tokyo, June 2009

Procedure for the evaluation of soil liquefaction resistance, Idriss & Boulanger (2008)



Procedure for the evaluation of soil liquefaction resistance (sandy soils), Moss et al. (2006)



Procedure for the evaluation of soil liquefaction resistance, Boulanger & Idriss(2014)

$$FS_{liq} = \frac{CRR_{M=7.5,\sigma'_v=1atm}}{CSR_{M=7.5,\sigma'_v=1atm}}$$

$$CSR_{M=7.5,\sigma'_v=1atm} = 0.65 \frac{\sigma_v}{\sigma'_v} \frac{a_{max}}{g} r_d \frac{1}{MSF} \frac{1}{K_\sigma}$$

$$r_d = \exp\left[\alpha(z) + \beta(z) \cdot M\right]$$

$$\alpha(z) = -1.012 - 1.126 \sin\left(\frac{z}{11.73} + 5.133\right)$$

$$\beta(z) = 0.106 + 0.118 \sin\left(\frac{z}{11.28} + 5.142\right)$$

$$K_\sigma = 1 - C_\sigma \ln\left(\frac{\sigma'_v}{P_a}\right) \le 1.1$$

$$C_\sigma = \frac{1}{37.3 - 8.27\left(q_{c1Ncs}\right)^{0.264}} \le 0.3$$

$$MSF = 1 + \left(MSF_{max} - 1\right)\left(8.64 \exp\left(\frac{-M}{4}\right) - 1.325\right)$$

$$MSF_{max} = 1.09 + \left(\frac{q_{c1Ncs}}{180}\right)^3 \le 2.2$$

σ'_v *and* σ_v *at start of earthquake shaking*

$$CRR_{M=7.5,\sigma'_v=1atm} = \exp\left(\frac{q_{c1Ncs}}{113} + \left(\frac{q_{c1Ncs}}{1000}\right)^2 - \left(\frac{q_{c1Ncs}}{140}\right)^3 + \left(\frac{q_{c1Ncs}}{137}\right)^4 - 2.80\right)$$

$$q_{c1Ncs} = q_{c1N} + \Delta q_{c1N}$$

$$\Delta q_{c1N} = \left(11.9 + \frac{q_{c1N}}{14.6}\right) \exp\left(1.63 - \frac{9.7}{FC+2} - \left(\frac{15.7}{FC+2}\right)^2\right)$$

$$q_{c1N} = C_{Ne} \frac{q_c}{P_a}$$

$$C_{Ne} = \left(\frac{P_a}{\sigma'_v}\right)^m \le 1.7$$

$$m = 1.338 - 0.249\left(q_{c1Ncs}\right)^{0.264} \quad with \quad 0.264 \le m \le 0.782$$

$$FC = 80\left(I_C + C_{FC}\right) - 137 \quad with \quad 0\% \le FC \le 100\%$$

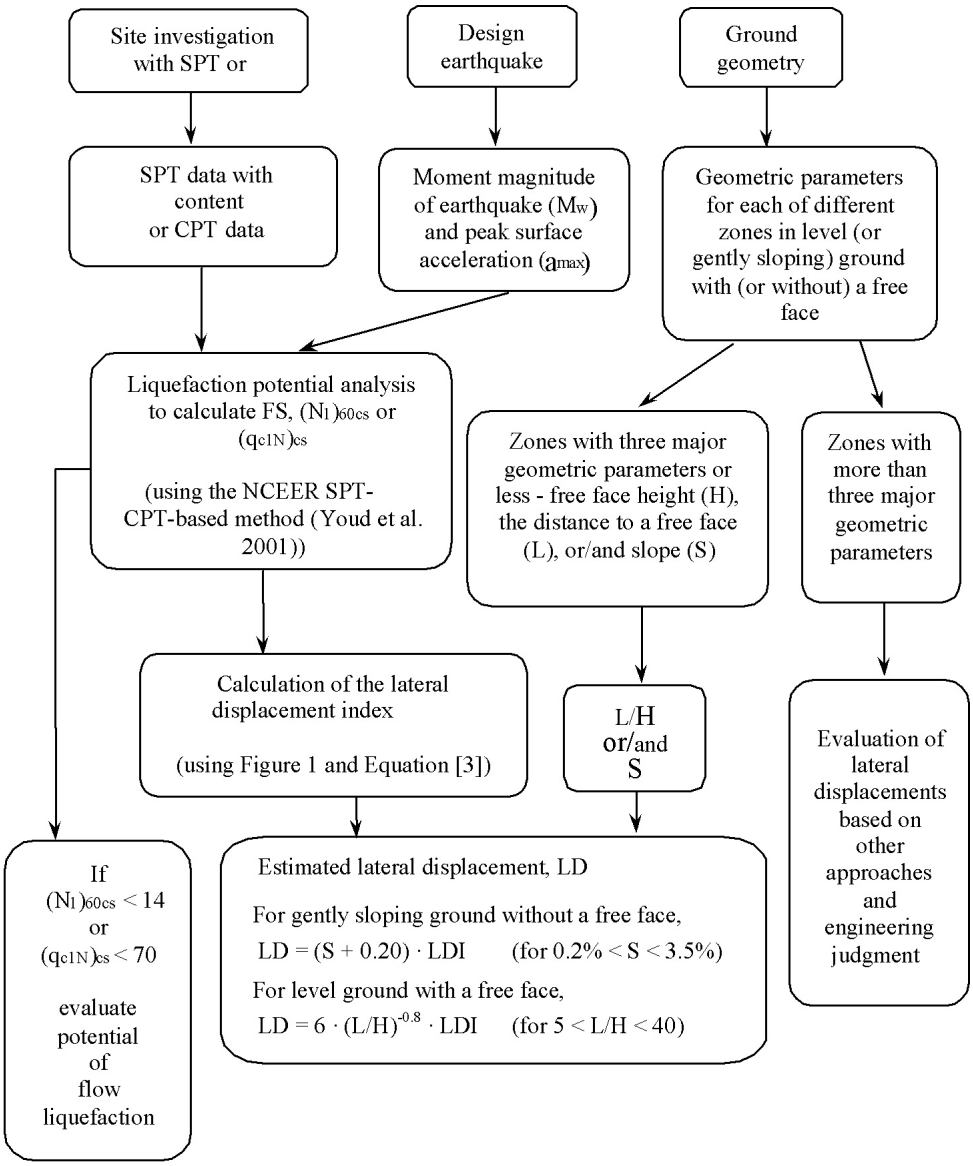
$$I_c = \left[\left(3.47 - \log\left(Q\right)\right)^2 + \left(1.22 + \log\left(F\right)\right)^2\right]^{0.5}$$

$$Q = \left(\frac{q_c - \sigma_{vc}}{P_a}\right)\left(\frac{P_a}{\sigma'_{vc}}\right)^n \; with \; 0.5 \le n \le 1.0 \; per \; Robertson \; \& \; Wride \; (1998)$$

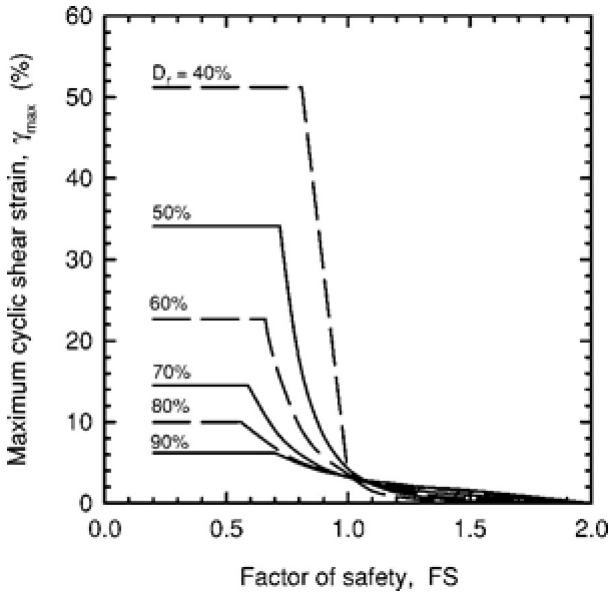
$$F = \left(\frac{f_s}{q_c - \sigma_{vc}}\right) \cdot 100\%$$

σ'_v *at time of CPT sounding*

Procedure for the evaluation of liquefaction-induced lateral spreading displacements



[1] Flow chart illustrating major steps in estimating liquefaction-induced lateral spreading displacements using the proposed approach



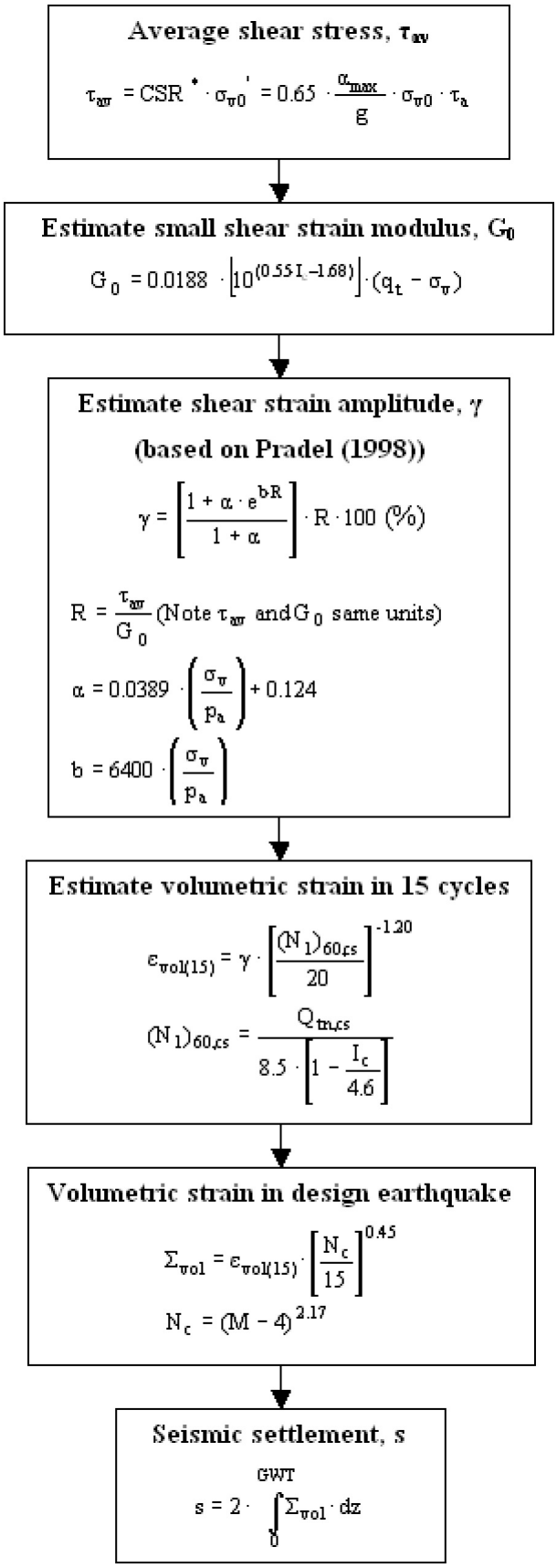
[1] Figure 1

$$LDI = \int_0^{z_{max}} \gamma_{max} dz$$

[1] Equation [3]

[1] "Estimating liquefaction-induced ground settlements from CPT for level ground", G. Zhang, P.K. Robertson, and R.W.I. Brachman

Procedure for the estimation of seismic induced settlements in dry sands



Robertson, P.K. and Lisheng, S., 2010, "Estimation of seismic compression in dry soils using the CPT" FIFTH INTERNATIONAL CONFERENCE ON RECENT ADVANCES IN GEOTECHNICAL EARTHQUAKE ENGINEERING AND SOIL DYNAMICS, Symposium in honor of professor I. M. Idriss, San Diego, CA

Liquefaction Potential Index (LPI) calculation procedure

Calculation of the Liquefaction Potential Index (LPI) is used to interpret the liquefaction assessment calculations in terms of severity over depth. The calculation procedure is based on the methology developed by Iwasaki (1982) and is adopted by AFPS.

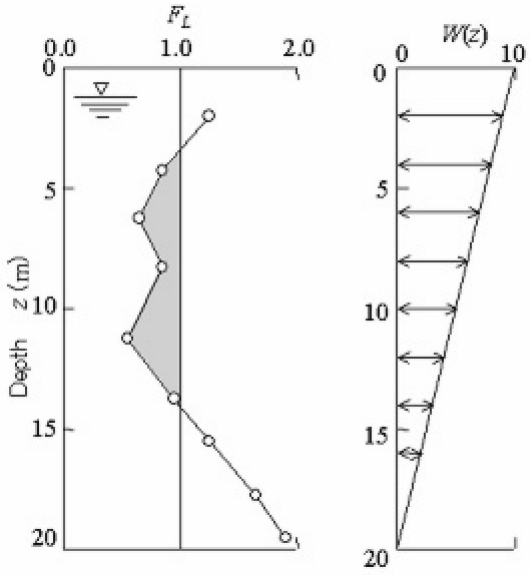
To estimate the severity of liquefaction extent at a given site, LPI is calculated based on the following equation:

$$\mathbf{LPI} = \int_0^{20} (10 - 0{,}5z) \times F_L \times dz$$

where:
F_L = 1 - F.S. when F.S. less than 1
F_L = 0 when F.S. greater than 1
z depth of measurment in meters

Values of LPI range between zero (0) when no test point is characterized as liquefiable and 100 when all points are characterized as susceptible to liquefaction. Iwasaki proposed four (4) discrete categories based on the numeric value of LPI:

- LPI = 0 : Liquefaction risk is very low
- 0 < LPI <= 5 : Liquefaction risk is low
- 5 < LPI <= 15 : Liquefaction risk is high
- LPI > 15 : Liquefaction risk is very high



Graphical presentation of the LPI calculation procedure

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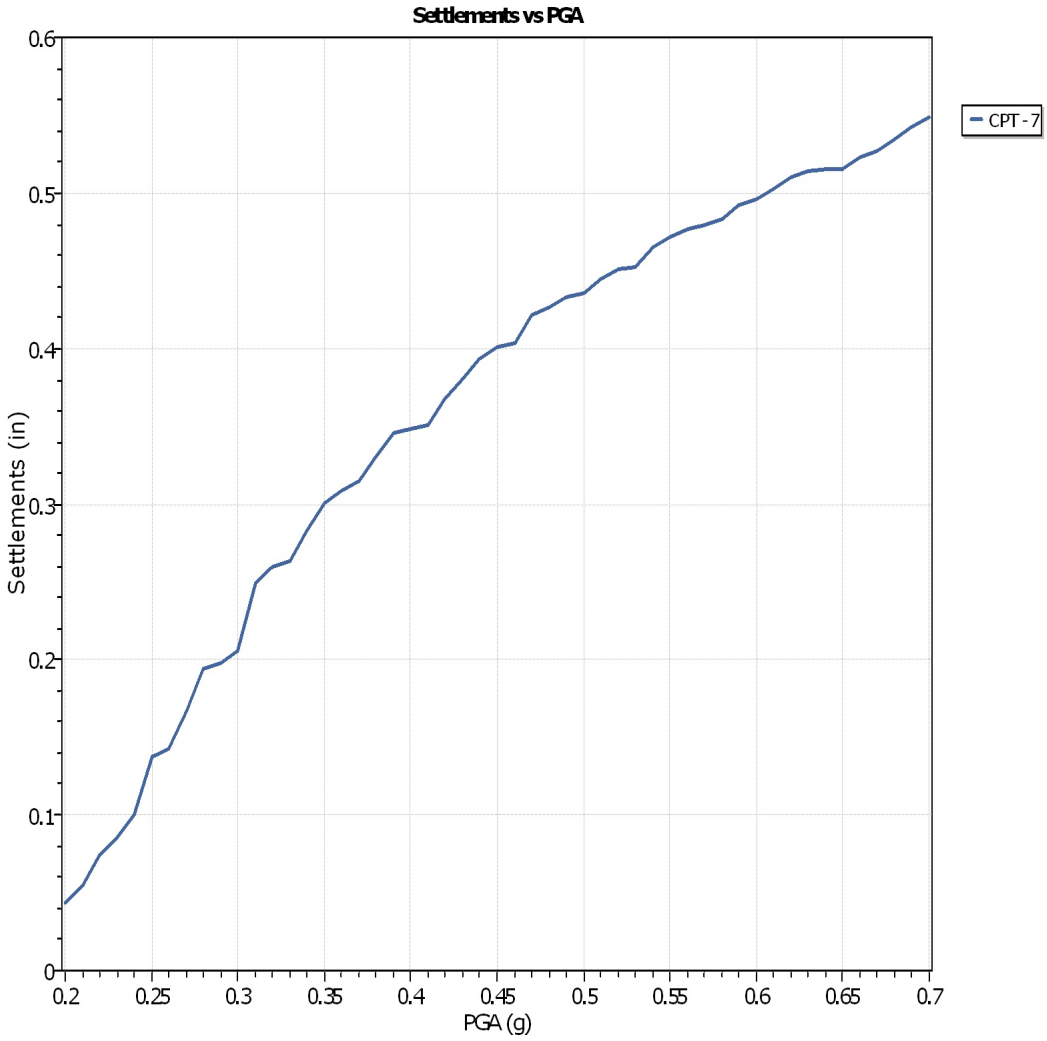
Leighton Consulting, Inc.
Geotechnical, Environmental and Materials Testing
Temecula, California

PGA Based Parametric Analysis



:: CPT main liquefaction parameters details ::

CPT Name	Assesment method	Earthquake Mag.	GWT in situ (ft)	GWT earthq. (ft)
CPT - 7	NCEER (1998)	7.50	18.00	10.00

APPENDIX D

GBA'S *IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT*

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

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e-mail: info@geoprofessional.org www.geoprofessional.org

Moreno Valley Skilled Nursing Facility

GREENHOUSE GAS ANALYSIS

CITY OF MORENO VALLEY

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JUNE 6, 2018

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APPENDICES

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COMBINED CONSTRUCTION-RELATED EMISSIONS

LIST OF ABBREVIATED TERMS

(1)	Reference
APS	Alternative Planning Organizations
ARB	California Air Resources Board
CAA	Federal Clean Air Act
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CAT	Climate Action Team
CBSC	California Building Standards Commission
CEC	California Energy Commission
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFC	Chlorofluorocarbons
CFR	Code of Federal Regulations
CH4	Methane
CO	Carbon Monoxide
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
EPA	Environmental Protection Agency
EPS	Emission Performance Standard
GCC	Global Climate Change
GHGA	Greenhouse Gas Analysis
GWP	Global Warming Potential
HFC	Hydrofluorocarbons
LCA	Life-Cycle Analysis
MMs	Mitigation Measures
MMTCO2e	Million Metric Ton of Carbon Dioxide Equivalent
MPOs	Metropolitan Planning Organizations
MTCO2e	Metric Ton of Carbon Dioxide Equivalent
N20	Nitrogen Dioxide
NIOSH	National Institute for Occupational Safety and Health

NOx	Oxides of Nitrogen
PFC	Perfluorocarbons
PM10	Particulate Matter 10 microns in diameter or less
PM2.5	Particulate Matter 2.5 microns in diameter or less
PPM	Parts Per Million
Project	Moreno Valley Skilled Nursing Facility
RTP	Regional Transportation Plan
SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategies
UNFCCC	United Nations' Framework Convention on Climate Change
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

Threshold 1: Would the Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The City of Moreno Valley has not adopted its own numeric threshold of significance for determining impacts with respect to greenhouse gas (GHG) emissions. A screening threshold of 3,000 MTCO2e per year to determine if additional analysis is required is an acceptable approach for small projects. This approach is a widely accepted screening threshold used by the County of Riverside (1) and numerous cities in the South Coast Air Basin and is based on the South Coast Air Quality Management District (SCAQMD) staff's proposed GHG screening threshold for stationary source emissions for non-industrial projects, as described in the SCAQMD's *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* ("SCAQMD Interim GHG Threshold"). The SCAQMD Interim GHG Threshold identifies a screening threshold to determine whether additional analysis is required (2).

As shown on Table ES-1, the Project will result in approximately 877.1 MTCO2e per year; the proposed project would not exceed the SCAQMD/City's screening threshold of 3,000 MTCO2e per year. Thus, project-related emissions would not have a significant direct or indirect impact on GHG and climate change and no mitigation or further analysis is required.

TABLE ES-1: TOTAL PROJECT GREENHOUSE GAS EMISSIONS (ANNUAL)

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Annual construction-related emissions amortized over 30 years	26.00	0.00	0.00	26.09
Area	1.49	1.45e-03	0.00	1.52
Energy	202.54	0.01	2.41e-03	203.43
Mobile Sources	560.45	0.03	0.00	561.16
Waste	16.30	0.96	0.00	40.38
Water Usage	38.40	0.19	4.72e-03	44.52
Total CO_2E (All Sources)	**877.10**			
SCAQMD Threshold	**3,000**			
Significant?	**NO**			

Source: CalEEMod™ model output, See Appendix 3.1 for detailed model outputs.
Note: Totals obtained from CalEEMod™ and may not total 100% due to rounding.
Table results include scientific notation. *e* is used to represent *times ten raised to the power of* (which would be written as x 10^{b}") and is followed by the value of the exponent

Threshold 2: Would the Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Applicable plans adopted for the purpose of reducing GHG emissions include the California Air Resources Board's (CARB) Scoping Plan (2008 and 2017 Scoping Plans) and the City of Moreno

Valley Climate Action Plan (CAP). Detailed evaluation with respect to the 2008 Scoping Plan, 2017 Scoping Plan, and the City of Moreno Valley CAP is presented in Sections 3.8, 3.9, and 3.10 respectively. As shown in these sections, the Project would be consistent with the 2008 Scoping Plan, the 2017 Scoping Plan, and the City of Moreno Valley CAP. As such, the Project would not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases and a less than significant impact would occur with respect to this threshold.

SUMMARY OF CEQA SIGNIFICANCE FINDINGS & MITIGATION MEASURES

The results of this Moreno Valley Skilled Nursing Facility Air Quality Impact Analysis are summarized below based on the GHG Impact Criteria 1 and 2. Table ES-2 shows the findings of significance for potential greenhouse gas impacts under CEQA before and after any required mitigation measures described below.

GHG THRESHOLD #1

The Project would not generate direct or indirect greenhouse gas emission that would result in a significant impact on the environment.

GHG THRESHOLD #2

The Project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

TABLE ES-2: SUMMARY OF CEQA SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Greenhouse Gas Emissions	3.0	*Less Than Significant*	*n/a*

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1 INTRODUCTION

This report presents the results of the greenhouse gas analysis (GHGA) prepared by Urban Crossroads, Inc., for the proposed Moreno Valley Skilled Nursing Facility Project (referred to as "Project").

The purpose of this GHGA is to evaluate Project-related construction and operational emissions and determine the level of greenhouse gas (GHG) impacts as a result of constructing and operating the proposed Project.

1.1 SITE LOCATION

The proposed Project site is located on the north side of Allessandro Boulevard, west of Kitching Street (APN 479230018) in the City of Moreno Valley.

1.2 PROJECT DESCRIPTION

The Project proposes the development of a skilled nursing facility containing 88 total dwelling units on a 4.54-acre parcel, as shown on Exhibit 1-A. For the purposes of this GHGA, it is assumed that the Project will be constructed and at full occupancy in 2020.

1.3 REGULATORY REQUIREMENTS

The Project would be required to comply with all mandates imposed by the State of California and the South Coast Air Quality Management District aimed at the reduction of air quality emissions. Those that are applicable to the Project and that would assist in the reduction of greenhouse gas emissions are:

- Global Warming Solutions Act of 2006 (AB32) (3)
- Regional GHG Emissions Reduction Targets/Sustainable Communities Strategies (SB 375) (4)
- Pavley Fuel Efficiency Standards (AB1493). Establishes fuel efficiency ratings for new vehicles (5).
- Title 24 California Code of Regulations (California Building Code). Establishes energy efficiency requirements for new construction (6).
- Title 20 California Code of Regulations (Appliance Energy Efficiency Standards). Establishes energy efficiency requirements for appliances (7).
- Title 17 California Code of Regulations (Low Carbon Fuel Standard). Requires carbon content of fuel sold in California to be 10% less by 2020 (8).
- California Water Conservation in Landscaping Act of 2006 (AB1881). Requires local agencies to adopt the Department of Water Resources updated Water Efficient Landscape Ordinance or equivalent by January 1, 2010 to ensure efficient landscapes in new development and reduced water waste in existing landscapes (9).
- Statewide Retail Provider Emissions Performance Standards (SB 1368). Requires energy generators to achieve performance standards for GHG emissions (10).

- Renewable Portfolio Standards (SB 1078). Requires electric corporations to increase the amount of energy obtained from eligible renewable energy resources to 20 percent by 2010 and 33 percent by 2020 (11).
- Senate Bill 32 (SB 32). Requires the state to reduce statewide greenhouse gas emissions to 40% below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15 (12).

Promulgated regulations that will affect the Project's emissions are accounted for in the Project's GHG calculations provided in this report. In particular, the Pavley Standards, Low Carbon Fuel Standards, and Renewable Portfolio Standards (RPS) will be in effect for the AB 32 target year of 2020, and therefore are accounted for in the Project's emission calculations.

1.4 Construction and Operational-Source Mitigation Measures

No significant impacts were identified; therefore, no mitigation measures are required.

EXHIBIT 1-A: SITE PLAN

PROJECT STATISTICS

APPLICANT/PROPERTY OWNER:
WILLIAM CHU
T&C INTERNATIONAL HEALTH, INC.
4186 RIVERSIDE DR.
CHINO, CA 91710
(626)689-9393

SITE DATA

PROJECT ADDRESS:	N/A
PARCEL NUMBER:	479-230-016
EXISTING ZONING:	R-10
SITE AREA:	4.54 ACRES (197,762.4 S.F.)
OPEN SPACE:	13.7%
LANDSCAPING:	21.6%
LOT COVERAGE:	34.8%

BUILDING DATA

OCCUPANCY:	I-2, SKILLED NURSING FACILITY
CONSTRUCTION TYPE:	TYPE V-A ONE-HOUR, FIRE SPRINKLERED
STORIES:	1-STORY, ROUGHLY 24' HEIGHT MAX.

BUILDING AREA

BUILDING 100	16,970 SF
BUILDING 200	33,440 SF
BUILDING 300	18,340 SF
TOTAL BUILDING AREA:	68,750 SF

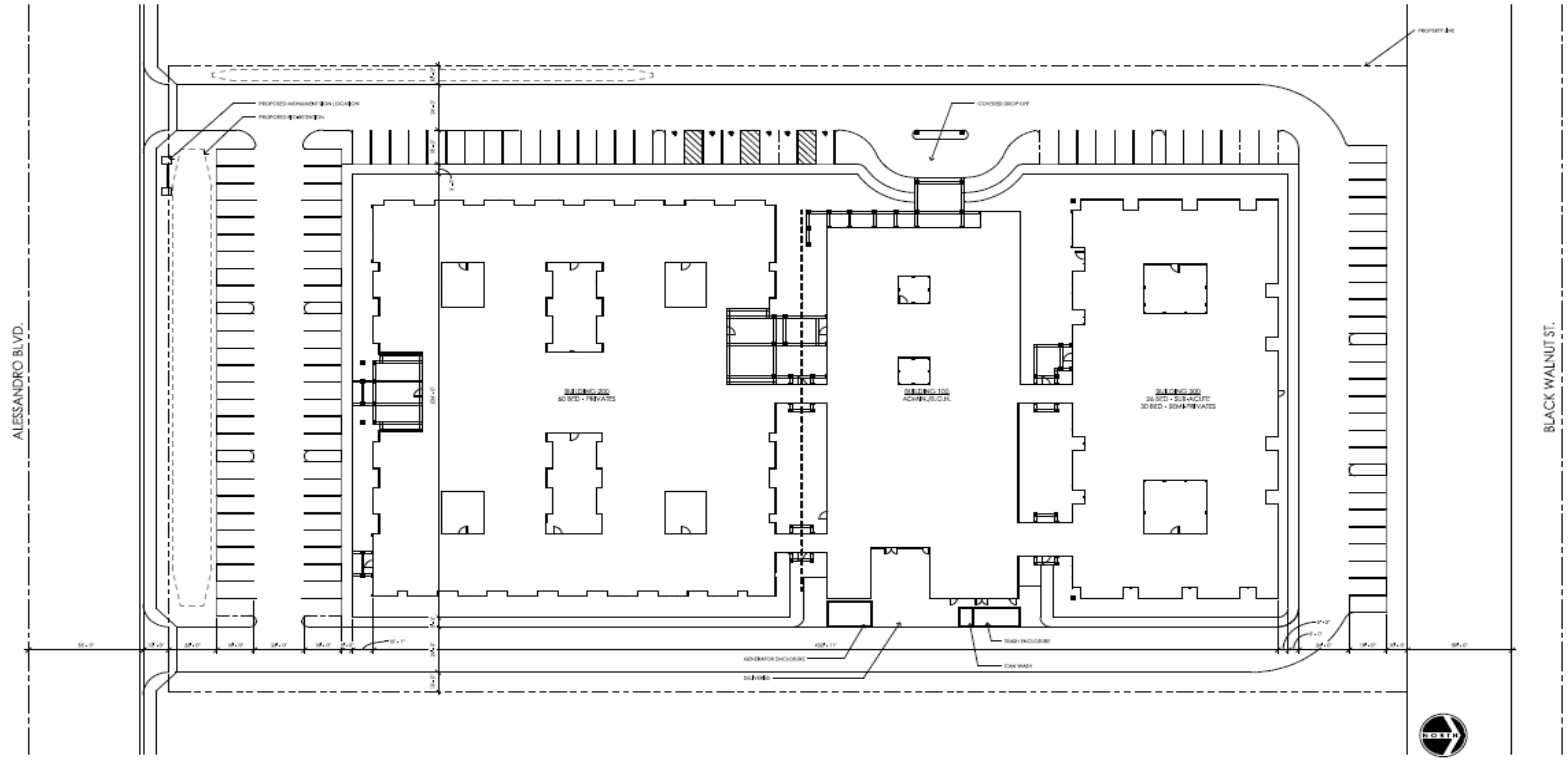
NUMBER OF BEDS

SEMI-PRIVATE: 2-BED	15 ROOMS X 2	30 BEDS
SEMI-PRIVATE SUB-ACUTE: 2-BED	13 ROOMS X 2	26 BEDS
PRIVATE: 1-BED	40 ROOMS X 1	40 BEDS
TOTAL BED COUNT:	88 ROOMS	116 BEDS

PARKING TABULATION

REQUIRED PARKING:	
1/3 SPACES X 116 BEDS =	39 SPACES
PROPOSED PARKING:	
STANDARD SPACES	106 SPACES
HANDICAP SPACES	6 SPACES
TOTAL:	112 SPACES

VACINITY MAP



OVERALL SITE PLAN

MORENO VALLEY SKILLED NURSING FACILITY
T&C INTERNATIONAL HEALTH, INC.

SD-1
04/16/18
GREGG MAEDO + ASSOCIATES

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2 CLIMATE CHANGE SETTING

2.1 INTRODUCTION TO GLOBAL CLIMATE CHANGE

Global Climate Change (GCC) is defined as the change in average meteorological conditions on the earth with respect to temperature, precipitation, and storms. GCC is currently one of the most controversial environmental issues in the United States, and much debate exists within the scientific community about whether or not GCC is occurring naturally or as a result of human activity. Some data suggests that GCC has occurred in the past over the course of thousands or millions of years. These historical changes to the Earth's climate have occurred naturally without human influence, as in the case of an ice age. However, many scientists believe that the climate shift taking place since the industrial revolution (1900) is occurring at a quicker rate and magnitude than in the past. Scientific evidence suggests that GCC is the result of increased concentrations of greenhouse gases in the earth's atmosphere, including carbon dioxide, methane, nitrous oxide, and fluorinated gases. Many scientists believe that this increased rate of climate change is the result of greenhouse gases resulting from human activity and industrialization over the past 200 years.

An individual project like the proposed Project evaluated in this GHGA cannot generate enough greenhouse gas emissions to affect a discernible change in global climate. However, the proposed Project may participate in the potential for GCC by its incremental contribution of greenhouse gases combined with the cumulative increase of all other sources of greenhouse gases, which when taken together constitute potential influences on GCC. Because these changes may have serious environmental consequences, Section 3.0 will evaluate the potential for the proposed Project to have a significant effect upon the environment as a result of its potential contribution to the greenhouse effect.

2.2 GLOBAL CLIMATE CHANGE DEFINED

Global Climate Change (GCC) refers to the change in average meteorological conditions on the earth with respect to temperature, wind patterns, precipitation and storms. Global temperatures are regulated by naturally occurring atmospheric gases such as water vapor, CO2 (Carbon Dioxide), N2O (Nitrous Oxide), CH4 (Methane), hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. These particular gases are important due to their residence time (duration they stay) in the atmosphere, which ranges from 10 years to more than 100 years. These gases allow solar radiation into the Earth's atmosphere, but prevent radioactive heat from escaping, thus warming the Earth's atmosphere. GCC can occur naturally as it has in the past with the previous ice ages. According to the California Air Resources Board (CARB), the climate change since the industrial revolution differs from previous climate changes in both rate and magnitude (13).

Gases that trap heat in the atmosphere are often referred to as greenhouse gases. Greenhouse gases are released into the atmosphere by both natural and anthropogenic (human) activity. Without the natural greenhouse gas effect, the Earth's average temperature would be approximately 61° Fahrenheit (F) cooler than it is currently. The cumulative accumulation of

these gases in the earth's atmosphere is considered to be the cause for the observed increase in the earth's temperature.

Although California's rate of growth of greenhouse gas emissions is slowing, the state is still a substantial contributor to the U.S. emissions inventory total. In 2014, California produced approximately 441.5 million gross metric tons of carbon dioxide equivalent (CO2e) greenhouse gas emissions. This represents an overall decrease of 9.4% since peak levels in 2004. Between 2000-2014, per capita GHG emissions in California dropped 18% from peak 2001 levels of 13.9 tonnes per person. California has significantly slowed the rate of growth of greenhouse gas emissions due to the implementation of energy efficiency programs as well as adoption of strict emission controls (14).

2.3 GREENHOUSE GAS EMISSIONS INVENTORIES

Global

Worldwide anthropogenic (human) GHG emissions are tracked by the Intergovernmental Panel on Climate Change for industrialized nations (referred to as Annex I) and developing nations (referred to as Non-Annex I). Human GHG emissions data for Annex I nations are available through 2015. For the Year 2015, the sum of these emissions totaled approximately 28,872,564 Gg CO2e[1] (15) (12). The GHG emissions in more recent years may differ from the inventories presented in Table 2-1; however, the data is representative of currently available inventory data.

United States

As noted in Table 2-1, the United States, as a single country, was the number two producer of GHG emissions in 2015. The primary greenhouse gas emitted by human activities in the United States was CO2, representing approximately 83 percent of total greenhouse gas emissions (17). Carbon dioxide from fossil fuel combustion, the largest source of US greenhouse gas emissions, accounted for approximately 78 percent of the GHG emissions.

TABLE 2-1: TOP GHG PRODUCER COUNTRIES AND THE EUROPEAN UNION [2]

Emitting Countries	GHG Emissions (Gg CO2e)
China	11,895,765
United States	6,586,655
European Union (28 member countries)	4,315,773
India	2,650,954
Russian Federation	2,100,849
Japan	1,322,568
Total	**28,872,564**

1 The global emissions are the sum of Annex I and non-Annex I countries, without counting Land-Use, Land-Use Change and Forestry (LULUCF). For countries without 2005 data, the UNFCCC data for the most recent year were used. United Nations Framework Convention on Climate Change, "Annex I Parties – GHG total without LULUCF,"

2 Used http://unfccc.int data for Annex I countries. Consulted the CAIT Climate Data Explorer in http://www.wri.org site to reference Non-Annex I countries such as China and India.

State of California

CARB compiles GHG inventories for the State of California. CARB GHG inventory data indicates that in 2014 (the most recent inventory of record) California GHG emissions totaled approximately 441.5 Million Metric Tons of Carbon Dioxide Equivalent (MMTCO2e) (14). "In 2010, California accounted for 6.8 percent of all emissions in the country [United States], and ranked second highest among the states with total emissions of 453 MMTCO2e, only behind Texas with 763 MMTCO2e. From a per capita standpoint, California has the 45th lowest emissions with 12.1 MMTCO2e /person in 2010."[3]

2.4 GREENHOUSE GASES

Water Vapor: Water vapor (H2O) is the most abundant, important, and variable greenhouse gas in the atmosphere. Water vapor is not considered a pollutant; in the atmosphere it maintains a climate necessary for life. Changes in its concentration are primarily considered to be a result of climate feedbacks related to the warming of the atmosphere rather than a direct result of industrialization. A climate feedback is an indirect, or secondary, change, either positive or negative, that occurs within the climate system in response to a forcing mechanism. The feedback loop in which water is involved is critically important to projecting future climate change.

As the temperature of the atmosphere rises, more water is evaporated from ground storage (rivers, oceans, reservoirs, soil). Because the air is warmer, the relative humidity can be higher (in essence, the air is able to 'hold' more water when it is warmer), leading to more water vapor in the atmosphere. As a GHG, the higher concentration of water vapor is then able to absorb more thermal indirect energy radiated from the Earth, thus further warming the atmosphere. The warmer atmosphere can then hold more water vapor and so on and so on. This is referred to as a "positive feedback loop." The extent to which this positive feedback loop will continue is unknown as there are also dynamics that hold the positive feedback loop in check. As an example, when water vapor increases in the atmosphere, more of it will eventually also condense into clouds, which are more able to reflect incoming solar radiation (thus allowing less energy to reach the Earth's surface and heat it up).

There are no human health effects from water vapor itself; however, when some pollutants come in contact with water vapor, they can dissolve and the water vapor can then act as a pollutant-carrying agent. The main source of water vapor is evaporation from the oceans (approximately 85 percent). Other sources include: evaporation from other water bodies, sublimation (change from solid to gas) from sea ice and snow, and transpiration from plant leaves.

Carbon Dioxide: Carbon dioxide (CO2) is an odorless and colorless GHG. Outdoor levels of carbon dioxide are not high enough to result in negative health effects. Carbon dioxide is emitted from natural and manmade sources. Natural sources include: the decomposition of dead organic matter; respiration of bacteria, plants, animals and fungus; evaporation from oceans; and volcanic outgassing. Anthropogenic sources include: the burning of coal, oil, natural gas, and

3 California Environmental Protection Agency. Air Resources Board. California's Greenhouse Gas Emission Inventory - 2014 Edition (May 2014), p. 28.

wood. Carbon dioxide is naturally removed from the air by photosynthesis, dissolution into ocean water, transfer to soils and ice caps, and chemical weathering of carbonate rocks (17).

Since the industrial revolution began in the mid-1700s, the sort of human activity that increases GHG emissions has increased dramatically in scale and distribution. Data from the past 50 years suggests a corollary increase in levels and concentrations. As an example, prior to the industrial revolution, CO2 concentrations were fairly stable at 280 parts per million (ppm). Today, they are around 370 ppm, an increase of more than 30 percent. Left unchecked, the concentration of carbon dioxide in the atmosphere is projected to increase to a minimum of 540 ppm by 2100 as a direct result of anthropogenic sources (18).

Methane: Methane (CH4) is an extremely effective absorber of radiation, though its atmospheric concentration is less than carbon dioxide and its lifetime in the atmosphere is brief (10-12 years), compared to other GHGs.

Methane has both natural and anthropogenic sources. It is released as part of the biological processes in low oxygen environments, such as in swamplands or in rice production (at the roots of the plants). Over the last 50 years, human activities such as growing rice, raising cattle, using natural gas, and mining coal have added to the atmospheric concentration of methane. Other anthropocentric sources include fossil-fuel combustion and biomass burning.

Nitrous Oxide: Nitrous oxide (N2O), also known as laughing gas, is a colorless greenhouse gas. Nitrous oxide can cause dizziness, euphoria, and sometimes slight hallucinations. In small doses, it is considered harmless. However, in some cases, heavy and extended use can cause Olney's Lesions (brain damage) (19).

Concentrations of nitrous oxide also began to rise at the beginning of the industrial revolution. In 1998, the global concentration was 314 parts per billion (ppb). Nitrous oxide is produced by microbial processes in soil and water, including those reactions which occur in fertilizer containing nitrogen. In addition to agricultural sources, some industrial processes (fossil fuel-fired power plants, nylon production, nitric acid production, and vehicle emissions) also contribute to its atmospheric load. It is used as an aerosol spray propellant, i.e., in whipped cream bottles. It is also used in potato chip bags to keep chips fresh. It is used in rocket engines and in race cars. Nitrous oxide can be transported into the stratosphere, be deposited on the Earth's surface, and be converted to other compounds by chemical reaction

Chlorofluorocarbons: Chlorofluorocarbons (CFCs) are gases formed synthetically by replacing all hydrogen atoms in methane or ethane (C2H6) with chlorine and/or fluorine atoms. CFCs are nontoxic, nonflammable, insoluble and chemically unreactive in the troposphere (the level of air at the Earth's surface). CFCs are no longer being used; therefore, it is not likely that health effects would be experienced. Nonetheless, in confined indoor locations, working with CFC-113 or other CFCs is thought to result in death by cardiac arrhythmia (heart frequency too high or too low) or asphyxiation.

CFCs have no natural source, but were first synthesized in 1928. They were used for refrigerants, aerosol propellants and cleaning solvents. Due to the discovery that they are able to destroy stratospheric ozone, a global effort to halt their production was undertaken and was extremely

successful, so much so that levels of the major CFCs are now remaining steady or declining. However, their long atmospheric lifetimes mean that some of the CFCs will remain in the atmosphere for over 100 years.

Hydrofluorocarbons: Hydrofluorocarbons (HFCs) are synthetic, man-made chemicals that are used as a substitute for CFCs. Out of all the greenhouse gases, they are one of three groups with the highest global warming potential. The HFCs with the largest measured atmospheric abundances are (in order), HFC-23 (CHF3), HFC-134a (CF3CH2F), and HFC-152a (CH3CHF2). Prior to 1990, the only significant emissions were of HFC-23. HFC-134a emissions are increasing due to its use as a refrigerant. The U.S. EPA estimates that concentrations of HFC-23 and HFC-134a are now about 10 parts per trillion (ppt) each; and that concentrations of HFC-152a are about 1 ppt (20). No health effects are known to result from exposure to HFCs, which are manmade for applications such as automobile air conditioners and refrigerants.

Perfluorocarbons: Perfluorocarbons (PFCs) have stable molecular structures and do not break down through chemical processes in the lower atmosphere. High-energy ultraviolet rays, which occur about 60 kilometers above Earth's surface, are able to destroy the compounds. Because of this, PFCs have very long lifetimes, between 10,000 and 50,000 years. Two common PFCs are tetrafluoromethane (CF4) and hexafluoroethane (C2F6). The U.S. EPA estimates that concentrations of CF4 in the atmosphere are over 70 ppt.

No health effects are known to result from exposure to PFCs. The two main sources of PFCs are primary aluminum production and semiconductor manufacture.

Sulfur Hexafluoride: Sulfur hexafluoride (SF6) is an inorganic, odorless, colorless, nontoxic, nonflammable gas. It also has the highest GWP of any gas evaluated (22,800). The U.S. EPA indicates that concentrations in the 1990s were about 4 ppt. In high concentrations in confined areas, the gas presents the hazard of suffocation because it displaces the oxygen needed for breathing.

Sulfur hexafluoride is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semiconductor manufacturing, and as a tracer gas for leak detection.

For the purposes of this analysis, emissions of carbon dioxide, methane, and nitrous oxide were evaluated because these gases are the primary contributors to GCC from development projects. Although other substances such as fluorinated gases also contribute to GCC, sources of fluorinated gases are not well-defined and no accepted emissions factors or methodology exist to accurately calculate these gases.

Greenhouse gases have varying global warming potential (GWP) values; GWP values represent the potential of a gas to trap heat in the atmosphere. In order to calculate the total carbon footprint, each GHG's individual GWP values are utilized as a conversion to a single unit: CO2e. Carbon dioxide is utilized as the reference gas for GWP, and thus has a GWP of 1.

The atmospheric lifetime (how long a particular GHG stays in the atmosphere) and GWP of selected greenhouse gases are summarized at Table 2-2. As shown in the table below, GWP range from 1 for carbon dioxide to 22,800 for sulfur hexafluoride.

TABLE 2-2: GLOBAL WARMING POTENTIAL AND ATMOSPHERIC LIFETIME OF SELECT GHGS

Gas	Atmospheric Lifetime (years)	Global Warming Potential (100 year time horizon)	
		Second Assessment Report (SAR)	4th Assessment Report (AR4)
Carbon Dioxide	50-200	1	1
Methane	12 ± 3	21	25
Nitrous Oxide	120	310	298
HFC-23	264	11,700	14,800
HFC-134a	14.6	1,300	1,430
HFC-152a	1.5	140	124
Sulfur Hexafluoride (SF6)	3,200	23,900	22,800

Source: Table 2.14 of the IPCC Fourth Assessment Report, 2007

2.5 EFFECTS OF CLIMATE CHANGE IN CALIFORNIA

Public Health

Higher temperatures may increase the frequency, duration, and intensity of conditions conducive to air pollution formation. For example, days with weather conducive to ozone formation could increase from 25 to 35 percent under the lower warming range to 75 to 85 percent under the medium warming range. In addition, if global background ozone levels increase as predicted in some scenarios, it may become impossible to meet local air quality standards. Air quality could be further compromised by increases in wildfires, which emit fine particulate matter that can travel long distances, depending on wind conditions. The Climate Scenarios report indicates that large wildfires could become up to 55 percent more frequent if GHG emissions are not significantly reduced.

In addition, under the higher warming range scenario, there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and 95°F in Sacramento by 2100. This is a large increase over historical patterns and approximately twice the increase projected if temperatures remain within or below the lower warming range. Rising temperatures could increase the risk of death from dehydration, heat stroke/exhaustion, heart attack, stroke, and respiratory distress caused by extreme heat.

Water Resources

A vast network of man-made reservoirs and aqueducts captures and transports water throughout the state from northern California rivers and the Colorado River. The current distribution system

relies on Sierra Nevada snowpack to supply water during the dry spring and summer months. Rising temperatures, potentially compounded by decreases in precipitation, could severely reduce spring snowpack, increasing the risk of summer water shortages.

If temperatures continue to increase, more precipitation could fall as rain instead of snow, and the snow that does fall could melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. Under the lower warming range scenario, snowpack losses could be only half as large as those possible if temperatures were to rise to the higher warming range. How much snowpack could be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under the wetter climate projections, the loss of snowpack could pose challenges to water managers and hamper hydropower generation. It could also adversely affect winter tourism. Under the lower warming range, the ski season at lower elevations could be reduced by as much as a month. If temperatures reach the higher warming range and precipitation declines, there might be many years with insufficient snow for skiing and snowboarding.

The State's water supplies are also at risk from rising sea levels. An influx of saltwater could degrade California's estuaries, wetlands, and groundwater aquifers. Saltwater intrusion caused by rising sea levels is a major threat to the quality and reliability of water within the southern edge of the Sacramento/San Joaquin River Delta – a major fresh water supply.

Agriculture

Increased temperatures could cause widespread changes to the agriculture industry reducing the quantity and quality of agricultural products statewide. First, California farmers could possibly lose as much as 25 percent of the water supply they need. Although higher CO2 levels can stimulate plant production and increase plant water-use efficiency, California's farmers could face greater water demand for crops and a less reliable water supply as temperatures rise. Crop growth and development could change, as could the intensity and frequency of pest and disease outbreaks. Rising temperatures could aggravate O3 pollution, which makes plants more susceptible to disease and pests and interferes with plant growth.

Plant growth tends to be slow at low temperatures, increasing with rising temperatures up to a threshold. However, faster growth can result in less-than-optimal development for many crops, so rising temperatures could worsen the quantity and quality of yield for a number of California's agricultural products. Products likely to be most affected include wine grapes, fruits and nuts.

In addition, continued global climate change could shift the ranges of existing invasive plants and weeds and alter competition patterns with native plants. Range expansion could occur in many species while range contractions may be less likely in rapidly evolving species with significant populations already established. Should range contractions occur, new or different weed species could fill the emerging gaps. Continued global climate change could alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates.

Forests and Landscapes

Global climate change has the potential to intensify the current threat to forests and landscapes by increasing the risk of wildfire and altering the distribution and character of natural vegetation. If temperatures rise into the medium warming range, the risk of large wildfires in California could increase by as much as 55 percent, which is almost twice the increase expected if temperatures stay in the lower warming range. However, since wildfire risk is determined by a combination of factors, including precipitation, winds, temperature, and landscape and vegetation conditions, future risks will not be uniform throughout the state. In contrast, wildfires in northern California could increase by up to 90 percent due to decreased precipitation.

Moreover, continued global climate change has the potential to alter natural ecosystems and biological diversity within the state. For example, alpine and subalpine ecosystems could decline by as much as 60 to 80 percent by the end of the century as a result of increasing temperatures. The productivity of the state's forests has the potential to decrease as a result of global climate change.

Rising Sea Levels

Rising sea levels, more intense coastal storms, and warmer water temperatures could increasingly threaten the state's coastal regions. Under the higher warming range scenario, sea level is anticipated to rise 22 to 35 inches by 2100. Elevations of this magnitude would inundate low-lying coastal areas with salt water, accelerate coastal erosion, threaten vital levees and inland water systems, and disrupt wetlands and natural habitats. Under the lower warming range scenario, sea level could rise 12-14 inches.

2.6 HUMAN HEALTH EFFECTS

The potential health effects related directly to the emissions of carbon dioxide, methane, and nitrous oxide as they relate to development projects such as the proposed Project are still being debated in the scientific community. Their cumulative effects to global climate change have the potential to cause adverse effects to human health. Increases in Earth's ambient temperatures would result in more intense heat waves, causing more heat-related deaths. Scientists also purport that higher ambient temperatures would increase disease survival rates and result in more widespread disease. Climate change will likely cause shifts in weather patterns, potentially resulting in devastating droughts and food shortages in some areas (21). Exhibit 2-A presents the potential impacts of global warming (22).

Specific health effects associated with directly emitted GHG emissions are as follows:

Water Vapor: There are no known direct health effects related to water vapor at this time. It should be noted however that when some pollutants react with water vapor, the reaction forms a transport mechanism for some of these pollutants to enter the human body through water vapor.

Carbon Dioxide: According to the National Institute for Occupational Safety and Health (NIOSH) high concentrations of carbon dioxide can result in health effects such as: headaches, dizziness, restlessness, difficulty breathing, sweating, increased heart rate, increased cardiac output, increased blood pressure, coma, asphyxia, and/or convulsions. It should be noted that current

concentrations of carbon dioxide in the earth's atmosphere are estimated to be approximately 370 parts per million (ppm), the actual reference exposure level (level at which adverse health effects typically occur) is at exposure levels of 5,000 ppm averaged over 10 hours in a 40-hour workweek and short-term reference exposure levels of 30,000 ppm averaged over a 15 minute period (23).

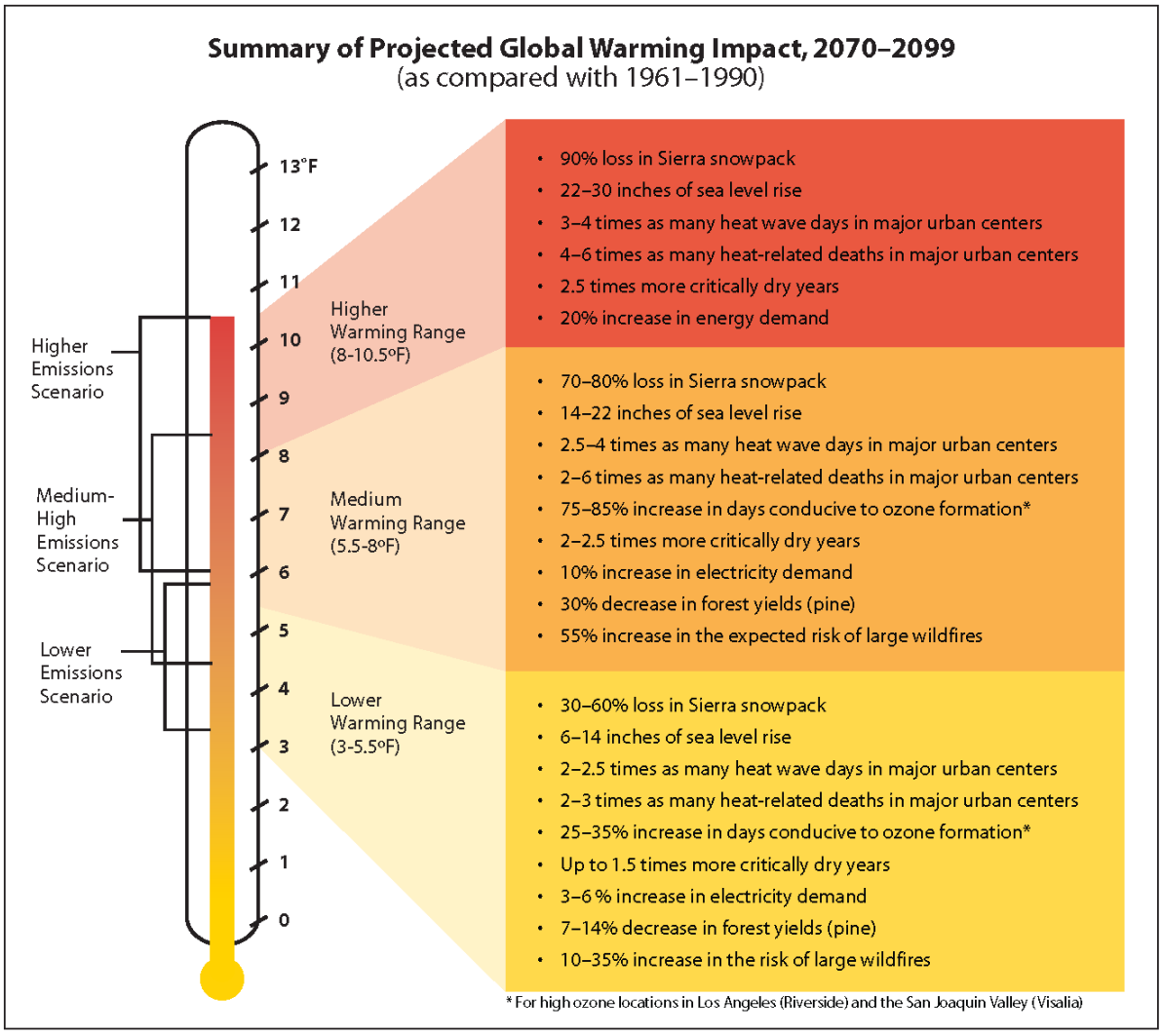
Methane: Methane is extremely reactive with oxidizers, halogens, and other halogen-containing compounds. Methane is also an asphyxiant and may displace oxygen in an enclosed space (24).

Nitrous Oxide: Nitrous Oxide is often referred to as laughing gas; it is a colorless greenhouse gas. The health effects associated with exposure to elevated concentrations of nitrous oxide include dizziness, euphoria, slight hallucinations, and in extreme cases of elevated concentrations nitrous oxide can also cause brain damage (24).

Fluorinated Gases: High concentrations of fluorinated gases can also result in adverse health effects such as asphyxiation, dizziness, headache, cardiovascular disease, cardiac disorders, and in extreme cases, increased mortality (23).

Aerosols: The health effects of aerosols are similar to that of other fine particulate matter. Thus aerosols can cause elevated respiratory and cardiovascular diseases as well as increased mortality (25).

EXHIBIT 2-A: SUMMARY OF PROJECTED GLOBAL WARMING IMPACT



Source: Barbara H. Allen-Diaz. "Climate change affects us all." *University of California, Agriculture and Natural Resources*, 2009.

2.7 REGULATORY SETTING

NATIONAL

Prior to the last decade, there have been no concrete federal regulations of GHGs or major planning for climate change adaptation. The following are actions regarding the federal government, GHGs, and fuel efficiency.

GHG Endangerment. In *Massachusetts v. Environmental Protection Agency* 549 U.S. 497 (2007), decided on April 2, 2007, the Supreme Court found that four GHGs, including carbon dioxide, are air pollutants subject to regulation under Section 202(a)(1) of the Clean Air Act. The Court held that the EPA Administrator must determine whether emissions of GHGs from new motor vehicles cause or contribute to air pollution, which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. On

December 7, 2009, the EPA Administrator signed two distinct findings regarding GHGs under section 202(a) of the Clean Air Act:

- Endangerment Finding: The Administrator finds that the current and projected concentrations of the six key well-mixed GHGs—carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The Administrator finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution, which threatens public health and welfare.

These findings do not impose requirements on industry or other entities. However, this was a prerequisite for implementing GHG emissions standards for vehicles, as discussed in the section "Clean Vehicles" below. After a lengthy legal challenge, the U.S. Supreme Court declined to review an Appeals Court ruling that upheld the EPA Administrator's findings (26).

Clean Vehicles. Congress first passed the Corporate Average Fuel Economy law in 1975 to increase the fuel economy of cars and light duty trucks. The law has become more stringent over time. On May 19, 2009, President Obama put in motion a new national policy to increase fuel economy for all new cars and trucks sold in the U.S. On April 1, 2010, the EPA and the Department of Transportation's National Highway Safety Administration announced a joint final rule establishing a national program that would reduce GHG emissions and improve fuel economy for new cars and trucks sold in the U.S.

The first phase of the national program applies to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. They require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. Together, these standards would cut carbon dioxide emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012–2016). The EPA and the National Highway Safety Administration issued final rules on a second-phase joint rulemaking establishing national standards for light-duty vehicles for model years 2017 through 2025 in August 2012 (EPA 2012c). The new standards for model years 2017 through 2025 apply to passenger cars, light-duty trucks, and medium duty passenger vehicles. The final standards are projected to result in an average industry fleetwide level of 163 grams/mile of carbon dioxide (CO_2) in model year 2025, which is equivalent to 54.5 miles per gallon (mpg) if achieved exclusively through fuel economy improvements.

The EPA and the U.S. Department of Transportation issued final rules for the first national standards to reduce GHG emissions and improve fuel efficiency of heavy-duty trucks and buses on September 15, 2011, effective November 14, 2011. For combination tractors, the agencies are proposing engine and vehicle standards that begin in the 2014 model year and achieve up to a 20 percent reduction in carbon dioxide emissions and fuel consumption by the 2018 model year. For heavy-duty pickup trucks and vans, the agencies are proposing separate gasoline and

diesel truck standards, which phase in starting in the 2014 model year and achieve up to a 10-percent reduction for gasoline vehicles and a 15 percent reduction for diesel vehicles by the 2018 model year (12 and 17 percent respectively if accounting for air conditioning leakage). Lastly, for vocational vehicles, the engine and vehicle standards would achieve up to a 10 percent reduction in fuel consumption and carbon dioxide emissions from the 2014 to 2018 model years.

Mandatory Reporting of GHGs. The Consolidated Appropriations Act of 2008, passed in December 2007, requires the establishment of mandatory GHG reporting requirements. On September 22, 2009, the EPA issued the Final Mandatory Reporting of GHGs Rule, which became effective January 1, 2010. The rule requires reporting of GHG emissions from large sources and suppliers in the U.S,, and is intended to collect accurate and timely emissions data to inform future policy decisions. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHG emissions are required to submit annual reports to the EPA.

New Source Review. The EPA issued a final rule on May 13, 2010, that establishes thresholds for GHGs that define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. This final rule "tailors" the requirements of these Clean Air Act permitting programs to limit which facilities will be required to obtain Prevention of Significant Deterioration and Title V permits. In the preamble to the revisions to the Federal Code of Regulations, the EPA states:

> This rulemaking is necessary because without it the Prevention of Significant Deterioration and Title V requirements would apply, as of January 2, 2011, at the 100 or 250 tons per year levels provided under the Clean Air Act, greatly increasing the number of required permits, imposing undue costs on small sources, overwhelming the resources of permitting authorities, and severely impairing the functioning of the programs. EPA is relieving these resource burdens by phasing in the applicability of these programs to GHG sources, starting with the largest GHG emitters. This rule establishes two initial steps of the phase-in. The rule also commits the agency to take certain actions on future steps addressing smaller sources, but excludes certain smaller sources from Prevention of Significant Deterioration and Title V permitting for GHG emissions until at least April 30, 2016.

The EPA estimates that facilities responsible for nearly 70 percent of the national GHG emissions from stationary sources will be subject to permitting requirements under this rule. This includes the nation's largest GHG emitters—power plants, refineries, and cement production facilities.

Standards of Performance for GHG Emissions for New Stationary Sources: Electric Utility Generating Units. As required by a settlement agreement, the EPA proposed new performance standards for emissions of carbon dioxide for new, affected, fossil fuel-fired electric utility generating units on March 27, 2012. New sources greater than 25 megawatts would be required to meet an output based standard of 1,000 pounds of carbon dioxide per megawatt-hour, based on the performance of widely used natural gas combined cycle technology. It should be noted that on February 9, 2016 the U.S. Supreme Court issued a stay of this regulation pending litigation. Additionally, the current EPA Administrator has also signed a measure to repeal the Clean Power Plan, including the CO2 standards.

Cap and Trade. Cap and trade refers to a policy tool where emissions are limited to a certain amount and can be traded, or provides flexibility on how the emitter can comply. Successful examples in the U.S. include the Acid Rain Program and the NO_x Budget Trading Program and Clean Air Interstate Rule in the northeast. There is no federal GHG cap and trade program currently; however, some states have joined to create initiatives to provide a mechanism for cap and trade.

The Regional GHG Initiative is an effort to reduce GHGs among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Each state caps carbon dioxide emissions from power plants, auctions carbon dioxide emission allowances, and invests the proceeds in strategic energy programs that further reduce emissions, save consumers money, create jobs, and build a clean energy economy. The Initiative began in 2008.

The Western Climate Initiative partner jurisdictions have developed a comprehensive initiative to reduce regional GHG emissions to 15 percent below 2005 levels by 2020. The partners were originally California, British Columbia, Manitoba, Ontario, and Quebec. However, Manitoba and Ontario are not currently participating. California linked with Quebec's cap and trade system January 1, 2014, and joint offset auctions took place in 2015 (C2ES 2015).

SmartWay Program. The SmartWay Program is a public-private initiative between the EPA, large and small trucking companies, rail carriers, logistics companies, commercial manufacturers, retailers, and other federal and state agencies. Its purpose is to improve fuel efficiency and the environmental performance (reduction of both GHG emissions and air pollution) of the goods movement supply chains. SmartWay is comprised of four components (EPA 2014):

1. SmartWay Transport Partnership: A partnership in which freight carriers and shippers commit to benchmark operations, track fuel consumption, and improve performance annually.
2. SmartWay Technology Program: A testing, verification, and designation program to help freight companies identify equipment, technologies, and strategies that save fuel and lower emissions.
3. SmartWay Vehicles: A program that ranks light-duty cars and small trucks and identifies superior environmental performers with the SmartWay logo.
4. SmartWay International Interests: Guidance and resources for countries seeking to develop freight sustainability programs modeled after SmartWay.

SmartWay effectively refers to requirements geared towards reducing fuel consumption. Most large trucking fleets driving newer vehicles are compliant with SmartWay design requirements. Moreover, over time, all heavy-duty trucks will have to comply with the ARB GHG Regulation that is designed with the SmartWay Program in mind, to reduce GHG emissions by making them more fuel-efficient. For instance, in 2015, 53 foot or longer dry vans or refrigerated trailers equipped with a combination of SmartWay-verified low-rolling resistance tires and SmartWay-verified aerodynamic devices would obtain a total of 10 percent or more fuel savings over traditional trailers.

Through the SmartWay Technology Program, the EPA has evaluated the fuel saving benefits of various devices through grants, cooperative agreements, emissions and fuel economy testing,

demonstration projects and technical literature review. As a result, the EPA has determined the following types of technologies provide fuel saving and/or emission reducing benefits when used properly in their designed applications, and has verified certain products:

- Idle reduction technologies – less idling of the engine when it is not needed would reduce fuel consumption.
- Aerodynamic technologies minimize drag and improve airflow over the entire tractor-trailer vehicle. Aerodynamic technologies include gap fairings that reduce turbulence between the tractor and trailer, side skirts that minimize wind under the trailer, and rear fairings that reduce turbulence and pressure drop at the rear of the trailer.
- Low rolling resistance tires can roll longer without slowing down, thereby reducing the amount of fuel used. Rolling resistance (or rolling friction or rolling drag) is the force resisting the motion when a tire rolls on a surface. The wheel will eventually slow down because of this resistance.
- Retrofit technologies include things such as diesel particulate filters, emissions upgrades (to a higher tier), etc., which would reduce emissions.
- Federal excise tax exemptions.

CALIFORNIA

Legislative Actions to Reduce GHGs

The State of California legislature has enacted a series of bills that constitute the most aggressive program to reduce GHGs of any state in the nation. Some legislation such as the landmark Assembly Bill (AB 32) California Global Warming Solutions Act of 2006 was specifically enacted to address GHG emissions. Other legislation such as Title 24 and Title 20 energy standards were originally adopted for other purposes such as energy and water conservation, but also provide GHG reductions. This section describes the major provisions of the legislation.

AB 32. The California State Legislature enacted AB 32, which requires that GHGs emitted in California be reduced to 1990 levels by the year 2020. "GHGs" as defined under AB 32 include carbon dioxide, methane, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Since AB 32 was enacted, a seventh chemical, nitrogen trifluoride, has also been added to the list of GHGs. The California Air Resources Board (ARB) is the state agency charged with monitoring and regulating sources of GHGs. AB 32 states the following:

> Global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California. The potential adverse impacts of global warming include the exacerbation of air quality problems, a reduction in the quality and supply of water to the state from the Sierra snowpack, a rise in sea levels resulting in the displacement of thousands of coastal businesses and residences, damage to marine ecosystems and the natural environment, and an increase in the incidences of infectious diseases, asthma, and other human health-related problems.

ARB approved the 1990 GHG emissions level of 427 $MMTCO_2e$ on December 6, 2007 (ARB 2007). Therefore, emissions generated in California in 2020 are required to be equal to or less than 427 $MMTCO_2e$. Emissions in 2020 in a "business as usual" (BAU) scenario were estimated to be 596

$MMTCO_2e$, which do not account for reductions from AB 32 regulations (ARB 2008). At that level, a 28.4 percent reduction was required to achieve the 427 million $MTCO_2e$ 1990 inventory. In October 2010, ARB prepared an updated 2020 forecast to account for the recession and slower forecasted growth. The forecasted inventory without the benefits of adopted regulation is now estimated at 545 million $MTCO_2e$. Therefore, under the updated forecast, a 21.7 percent reduction from BAU is required to achieve 1990 levels (ARB 2010).

PROGRESS IN ACHIEVING AB 32 TARGETS AND REMAINING REDUCTIONS REQUIRED

The State has made steady progress in implementing AB 32 and achieving targets included in Executive Order S-3-05. The progress is shown in updated emission inventories prepared by ARB for 2000 through 2012 (ARB 2014a). The State has achieved the Executive Order S-3-05 target for 2010 of reducing GHG emissions to 2000 levels. As shown below, the 2010 emission inventory achieved this target.

- 1990: 427 million $MTCO_2e$ (AB 32 2020 target)
- 2000: 463 million $MTCO_2e$ (an average 8 percent reduction needed to achieve 1990 base)
- 2010: 450 million $MTCO_2e$ (an average 5 percent reduction needed to achieve 1990 base)

ARB has also made substantial progress in achieving its goal of achieving 1990 emissions levels by 2020. As described earlier in this section, ARB revised the 2020 BAU inventory forecast to account for new lower growth projections, which resulted in a new lower reduction from BAU to achieve the 1990 base. The previous reduction from 2020 BAU needed to achieve 1990 levels was 28.4 percent and the latest reduction from 2020 BAU is 21.7 percent.

- 2020: 545 million $MTCO_2e$ BAU (an average 21.7 percent reduction from BAU needed to achieve 1990 base)

ARB Scoping Plan. ARB's Climate Change Scoping Plan (Scoping Plan) contains measures designed to reduce the State's emissions to 1990 levels by the year 2020 to comply with AB 32 (ARB 2008). The Scoping Plan identifies recommended measures for multiple GHG emission sectors and the associated emission reductions needed to achieve the year 2020 emissions target—each sector has a different emission reduction target. Most of the measures target the transportation and electricity sectors. More specifically for this Project actions related to transportation, electricity and natural gas use, green building design and industrial uses would apply. As stated in the Scoping Plan, the key elements of the strategy for achieving the 2020 GHG target include:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards;
- Achieving a statewide renewables energy mix of 33 percent;
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system;
- Establishing targets for transportation-related GHG emissions for regions throughout California and pursuing policies and incentives to achieve those targets;

- Adopting and implementing measures pursuant to existing State laws and policies, including California's clean car standards, goods movement measures, and the Low Carbon Fuel Standard; and
- Creating targeted fees, including a public goods charge on water use, fees on high global warming potential gases, and a fee to fund the administrative costs of the State's long-term commitment to AB 32 implementation.

The ARB approved the First Update to the Scoping Plan (Update) on May 22, 2014. The Update identifies the next steps for California's climate change strategy. The Update shows how California continues on its path to meet the near-term 2020 GHG limit, but also sets a path toward long-term, deep GHG emission reductions. The report establishes a broad framework for continued emission reductions beyond 2020, on the path to 80 percent below 1990 levels by 2050. The Update identifies progress made to meet the near-term objectives of AB 32 and defines California's climate change priorities and activities Climate for the next several years. The Update does not set new targets for the State, but describes a path that would achieve the long term 2050 goal of Executive Order S-05-03 for emissions to decline to 80 percent below 1990 levels by 2050 (ARB 2014).

Forecasting the amount of emissions that would occur in 2020 if no actions are taken was necessary to assess the amount of reductions California must achieve to return to the 1990 emissions level by 2020 as required by AB 32. The no-action scenario is known as "business-as-usual" or BAU. The ARB originally defined the BAU scenario as emissions in the absence of any GHG emission reduction measures discussed in the Scoping Plan.

As part of CEQA compliance for the Scoping Plan, ARB prepared a Supplemental Functional Equivalent Document (FED) in 2011. The FED included an updated 2020 BAU emissions inventory projection based on current economic forecasts (i.e., as influenced by the economic downturn) and emission reduction measures already in place, replacing its prior 2020 BAU emissions inventory. ARB staff derived the updated emissions estimates by projecting emissions growth, by sector, from the state's average emissions from 2006–2008. The new BAU estimate includes emission reductions for the million-solar-roofs program, the AB 1493 (Pavley I) motor vehicle GHG emission standards, and the Low Carbon Fuels Standard. In addition, ARB factored into the 2020 BAU inventory emissions reductions associated with 33 percent Renewable Energy Portfolio Standard (RPS) for electricity generation. The updated BAU estimate of 507 $MMTCO_2e$ by 2020 requires a reduction of 80 $MMTCO_2e$, or a 16 percent reduction below the estimated BAU levels to return to 1990 levels (i.e., 427 $MMTCO_2e$) by 2020.

In order to provide a BAU reduction that is consistent with the original definition in the Scoping Plan and with threshold definitions used in thresholds adopted by lead agencies for CEQA purposes and many climate action plans, the updated inventory without regulations was also included in the Supplemental FED. The ARB 2020 BAU projection for GHG emissions in California was originally estimated to be 596 $MMTCO_2e$. The updated ARB 2020 BAU projection in the Supplemental FED is 545 $MMTCO_2e$. Considering the updated BAU estimate of 545 $MMTCO_2e$ by 2020, ARB estimates a 21.7 percent reduction below the estimated statewide BAU levels is necessary to return to 1990 emission levels (i.e., 427 $MMTCO_2e$) by 2020, instead of the

approximate 28.4 percent BAU reduction previously reported under the original Climate Change Scoping Plan (2008).

2017 Climate Change Scoping Plan Update

In November 2017, ARB released the final 2017 Scoping Plan Update, which identifies the State's post-2020 reduction strategy. The 2017 Scoping Plan Update reflects the 2030 target of a 40 percent reduction below 1990 levels, set by Executive Order B-30-15 and codified by Senate Bill 32 (SB 32). Key programs that the proposed Second Update builds upon include the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and much cleaner cars, trucks and freight movement, utilizing cleaner, renewable energy, and strategies to reduce methane emissions from agricultural and other wastes.

The 2017 Scoping Plan establishes a new emissions limit of 260 MMTCO2e for the year 2030, which corresponds to a 40 percent decrease in 1990 levels by 2030.

California's climate strategy will require contributions from all sectors of the economy, including the land base, and will include enhanced focus on zero- and near-zero-emission (ZE/NZE) vehicle technologies; continued investment in renewables, including solar roofs, wind, and other distributed generation; greater use of low carbon fuels; integrated land conservation and development strategies; coordinated efforts to reduce emissions of short-lived climate pollutants (methane, black carbon, and fluorinated gases); and an increased focus on integrated land use planning to support livable, transit-connected communities and conservation of agricultural and other lands. Requirements for direct GHG reductions at refineries will further support air quality co-benefits in neighborhoods, including in disadvantaged communities historically located adjacent to these large stationary sources, as well as efforts with California's local air pollution control and air quality management districts (air districts) to tighten emission limits on a broad spectrum of industrial sources. Major elements of the 2017 Scoping Plan framework include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing ZEV buses and trucks.
- Low Carbon Fuel Standard (LCFS), with an increased stringency (18 percent by 2030).
- Implementing SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030.
- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of ZEV trucks.
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing methane and hydroflurocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030.
- Continued implementation of SB 375.
- Post-2020 Cap-and-Trade Program that includes declining caps.
- 20 percent reduction in GHG emissions from refineries by 2030.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink.

In addition to the statewide strategies listed above, the 2017 Scoping Plan also identifies local governments as essential partners in achieving the State's long-term GHG reduction goals and identifies local actions to reduce GHG emissions. As part of the recommended actions, CARB recommends that local governments achieve a community-wide goal to achieve emissions of no more than 6 MTCO2e or less per capita by 2030 and 2 MTCO2e or less per capita by 2050. For CEQA projects, CARB states that lead agencies may develop evidenced-based bright-line numeric thresholds—consistent with the Scoping Plan and the State's long-term GHG goals—and projects with emissions over that amount may be required to incorporate on-site design features and mitigation measures that avoid or minimize project emissions to the degree feasible; or, a performance-based metric using a climate action plan or other plan to reduce GHG emissions is appropriate.

According to research conducted by the Lawrence Berkeley National Laboratory and supported by ARB, California, under its existing and proposed GHG reduction policies, is on track to meet the 2020 reduction targets under AB 32 and could achieve the 2030 goals under SB 32. The research utilized a new, validated model known as the California LBNL GHG Analysis of Policies Spreadsheet (CALGAPS), which simulates GHG and criteria pollutant emissions in California from 2010 to 2050 in accordance to existing and future GHG-reducing policies. The CALGAPS model showed that GHG emissions through 2020 could range from 317 to 415 MTCO2e per year, "indicating that existing state policies will likely allow California to meet its target [of 2020 levels under AB 32]." CALGAPS also showed that by 2030, emissions could range from 211 to 428 MTCO2e per year, indicating that "even if all modeled policies are not implemented, reductions could be sufficient to reduce emissions 40 percent below the 1990 level [of SB 32]." CALGAPS analyzed emissions through 2050 even though it did not generally account for policies that might be put in place after 2030. Though the research indicated that the emissions would not meet the State's 80 percent reduction goal by 2050, various combinations of policies could allow California's cumulative emissions to remain very low through 2050 (27) (28).

Senate Bill 32. On September 8, 2016, Governor Jerry Brown signed the Senate Bill (SB) 32 and its companion bill, Assembly Bill (AB) 197. SB 32 requires the state to reduce statewide GHG emissions to 40 percent below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15. The new legislation builds upon the AB 32 goal of 1990 levels by 2020 and provides an intermediate goal to achieving S-3-05, which sets a statewide GHG reduction target of 80 percent below 1990 levels by 2050. AB 197 creates a legislative committee to oversee regulators to ensure that ARB is not only respond to the Governor, but also the Legislature (12) (29).

Cap and Trade Program. The Scoping Plan identifies a Cap-and-Trade Program as one of the key strategies for California to reduce GHG emissions. According to ARB, a cap-and-trade program will help put California on the path to meet its goal of reducing GHG emissions to 1990 levels by the year 2020 and ultimately achieving an 80 percent reduction from 1990 levels by 2050. Under cap-and-trade, an overall limit on GHG emissions from capped sectors is established, and facilities subject to the cap will be able to trade permits to emit GHGs within the overall limit.

ARB adopted a California Cap-and-Trade Program pursuant to its authority under AB 32. See 17 California Code of Regulations (CCR) §§ 95800 to 96023. The Cap-and-Trade Program is designed

to reduce GHG emissions from major sources (deemed "covered entities") by setting a firm cap on statewide GHG emissions and employing market mechanisms to achieve AB 32's emission-reduction mandate of returning to 1990 levels of emissions by 2020. The statewide cap for GHG emissions from the capped sectors (e.g., electricity generation, petroleum refining, and cement production) commenced in 2013 and will decline over time, achieving GHG emission reductions throughout the program's duration.

Covered entities that emit more than 25.000 $MTCO_2e$ per year must comply with the Cap-and-Trade Program. Triggering of the 25.000 $MTCO_2e$ per year "inclusion threshold" is measured against a subset of emissions reported and verified under the California Regulation for the Mandatory Reporting of GHG Emissions (Mandatory Reporting Rule or "MRR").

Under the Cap-and-Trade Program, ARB issues allowances equal to the total amount of allowable emissions over a given compliance period and distributes these to regulated entities. Covered entities are allocated free allowances in whole or part (if eligible), and may buy allowances at auction, purchase allowances from others, or purchase offset credits. Each covered entity with a compliance obligation is required to surrender "compliance instruments" (30) for each $MTCO_2e$ of GHG they emit. There also are requirements to surrender compliance instruments covering 30 percent of the prior year's compliance obligation by November of each year. For example, in November 2014, a covered entity was required to submit compliance instruments to cover 30 percent of its 2013 GHG emissions.

The Cap-and-Trade Program provides a firm cap, ensuring that the 2020 statewide emission limit will not be exceeded. An inherent feature of the Cap-and-Trade program is that it does not guarantee GHG emissions reductions in any discrete location or by any particular source. Rather, GHG emissions reductions are only guaranteed on an accumulative basis. As summarized by ARB in the First Update:

> The Cap-and-Trade Regulation gives companies the flexibility to trade allowances with others or take steps to cost-effectively reduce emissions at their own facilities. Companies that emit more have to turn in more allowances or other compliance instruments. Companies that can cut their GHG emissions have to turn in fewer allowances. But as the cap declines, aggregate emissions must be reduced. In other words, a covered entity theoretically could increase its GHG emissions every year and still comply with the Cap-and-Trade Program if there is a reduction in GHG emissions from other covered entities. Such a focus on aggregate GHG emissions is considered appropriate because climate change is a global phenomenon, and the effects of GHG emissions are considered cumulative (ARB 2014).

The Cap-and-Trade Program works with other direct regulatory measures and provides an economic incentive to reduce emissions. If California's direct regulatory measures reduce GHG emissions more than expected, then the Cap-and-Trade Program will be responsible for relatively fewer emissions reductions. If California's direct regulatory measures reduce GHG emissions less than expected, then the Cap-and-Trade Program will be responsible for relatively more emissions

reductions. Thus. the Cap-and-Trade Program assures that California will meet its 2020 GHG emissions reduction mandate:

> The Cap-and-Trade Program establishes an overall limit on GHG emissions from most of the California economy—the "capped sectors." Within the capped sectors, some of the reductions are being accomplished through direct regulations, such as improved building and appliance efficiency standards, the [Low Carbon Fuel Standard] LCFS, and the 33 percent [Renewables Portfolio Standard] RPS. Whatever additional reductions are needed to bring emissions within the cap is accomplished through price incentives posed by emissions allowance prices. Together, direct regulation and price incentives assure that emissions are brought down cost-effectively to the level of the overall cap. The Cap-and-Trade Regulation provides assurance that California's 2020 limit will be met because the regulation sets a firm limit on 85 percent of California's GHG emissions. In sum, the Cap-and-Trade Program will achieve aggregate, rather than site specific or project-level, GHG emissions reductions. Also, due to the regulatory architecture adopted by ARB in AB 32, the reductions attributed to the Cap-and-Trade Program can change over time depending on the State's emissions forecasts and the effectiveness of direct regulatory measures (ARB 2014).

As of January 1, 2015, the Cap-and-Trade Program covered approximately 85 percent of California's GHG emissions. The Cap-and-Trade Program covers the GHG emissions associated with electricity consumed in California, whether generated in-state or imported. Accordingly, GHG emissions associated with CEQA projects' electricity usage are covered by the Cap-and-Trade Program.

The Cap-and-Trade Program also covers fuel suppliers (natural gas and propane fuel providers and transportation fuel providers) to address emissions from such fuels and from combustion of other fossil fuels not directly covered at large sources in the Program's first compliance period. While the Cap-and-Trade Program technically covered fuel suppliers as early as 2012, they did not have a compliance obligation (i.e., they were not fully regulated) until 2015. The Cap-and-Trade Program covers the GHG emissions associated with the combustion of transportation fuels in California, whether refined in-state or imported. The point of regulation for transportation fuels is when they are "supplied" (i.e., delivered into commerce). Accordingly, as with stationary source GHG emissions and GHG emissions attributable to electricity use, virtually all, if not all, of GHG emissions from CEQA projects associated with vehicle-miles traveled (VMT) are covered by the Cap-and-Trade Program (ARB 2015) (30).

In addition, the Scoping Plan differentiates between "capped" and "uncapped" strategies. "Capped" strategies are subject to the proposed cap-and-trade program. The Scoping Plan states that the inclusion of these emissions within the Program will help ensure that the year 2020 emission targets are met despite some degree of uncertainty in the emission reduction estimates for any individual measure. Implementation of the capped strategies is calculated to achieve a sufficient amount of reductions by 2020 to achieve the emission target contained in AB 32. "Uncapped" strategies that will not be subject to the cap-and-trade emissions caps and

requirements are provided as a margin of safety by accounting for additional GHG emission reductions.[4]

SB 375 - the Sustainable Communities and Climate Protection Act of 2008. Passing the Senate on August 30, 2008, Senate Bill (SB) 375 was signed by the Governor on September 30, 2008. According to SB 375, the transportation sector is the largest contributor of GHG emissions, which emits over 40 percent of the total GHG emissions in California. SB 375 states, "Without improved land use and transportation policy, California will not be able to achieve the goals of AB 32." SB 375 does the following: it (1) requires metropolitan planning organizations to include sustainable community strategies in their regional transportation plans for reducing GHG emissions, (2) aligns planning for transportation and housing, and (3) creates specified incentives for the implementation of the strategies.

Concerning CEQA, SB 375, as codified in Public Resources Code Section 21159.28, states that CEQA findings for certain projects are not required to reference, describe, or discuss (1) growth inducing impacts, or (2) any project-specific or cumulative impacts from cars and light-duty truck trips generated by the project on global warming or the regional transportation network, if the project:

1. Is in an area with an approved sustainable communities strategy or an alternative planning strategy that the ARB accepts as achieving the GHG emission reduction targets.
2. Is consistent with that strategy (in designation, density, building intensity, and applicable policies).
3. Incorporates the mitigation measures required by an applicable prior environmental document.

AB 1493 Pavley Regulations and Fuel Efficiency Standards. California AB 1493, enacted on July 22, 2002, required ARB to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks. Implementation of the regulation was delayed by lawsuits filed by automakers and by the EPA's denial of an implementation waiver. The EPA subsequently granted the requested waiver in 2009, which was upheld by the U.S. District Court for the District of Columbia in 2011.

The standards phase in during the 2009 through 2016 model years. When fully phased in, the near-term (2009–2012) standards will result in about a 22 percent reduction compared with the 2002 fleet, and the mid-term (2013–2016) standards will result in about a 30 percent reduction. Several technologies stand out as providing significant reductions in emissions at favorable costs. These include discrete variable valve lift or camless valve actuation to optimize valve operation rather than relying on fixed valve timing and lift as has historically been done; turbocharging to boost power and allow for engine downsizing; improved multi-speed transmissions; and

[4] On March 17, 2011, the San Francisco Superior Court issued a final decision in *Association of Irritated Residents v. California Air Resources Board* (Case No. CPF-09-509562). While the Court upheld the validity of the ARB Scoping Plan for the implementation of AB 32, the Court enjoined ARB from further rulemaking under AB 32 until ARB amends its CEQA environmental review of the Scoping Plan to address the flaws identified by the Court. On May 23, 2011, ARB filed an appeal. On June 24, 2011, the Court of Appeal granted ARB's petition staying the trail court's order pending consideration of the appeal. In the interest of informed decision-making, on June 13, 2011, ARB released the expanded alternatives analysis in a draft Supplement to the AB 32 Scoping Plan Functional Equivalent Document. The ARB Board approved the Scoping Plan and the CEQA document on August 24, 2011.

improved air conditioning systems that operate optimally, leak less, and/or use an alternative refrigerant.

The second phase of the implementation for the Pavley bill was incorporated into Amendments to the Low-Emission Vehicle Program referred to as LEV III or the Advanced Clean Cars program. The Advanced Clean Car program combines the control of smog-causing pollutants and GHG emissions into a single coordinated package of requirements for model years 2017 through 2025. The regulation will reduce GHGs from new cars by 34 percent from 2016 levels by 2025. The new rules will clean up gasoline and diesel-powered cars, and deliver increasing numbers of zero-emission technologies, such as full battery electric cars, newly emerging plug-in hybrid electric vehicles and hydrogen fuel cell cars. The package will also ensure adequate fueling infrastructure is available for the increasing numbers of hydrogen fuel cell vehicles planned for deployment in California.

SB 350— Clean Energy and Pollution Reduction Act of 2015. In October 2015, the legislature approved and the Governor signed SB 350, which reaffirms California's commitment to reducing its GHG emissions and addressing climate change. Key provisions include an increase in the renewables portfolio standard (RPS), higher energy efficiency requirements for buildings, initial strategies towards a regional electricity grid, and improved infrastructure for electric vehicle charging stations. Provisions for a 50 percent reduction in the use of petroleum statewide were removed from the Bill because of opposition and concern that it would prevent the Bill's passage. Specifically, SB 350 requires the following to reduce statewide GHG emissions:

- Increase the amount of electricity procured from renewable energy sources from 33 percent to 50 percent by 2030, with interim targets of 40 percent by 2024, and 25 percent by 2027.
- Double the energy efficiency in existing buildings by 2030. This target will be achieved through the California Public Utility Commission (CPUC), the California Energy Commission (CEC), and local publicly-owned utilities.
- Reorganize the Independent System Operator (ISO) to develop more regional electrify transmission markets and to improve accessibility in these markets, which will facilitate the growth of renewable energy markets in the western United States (California Leginfo 2015).

EXECUTIVE ORDERS RELATED TO GHG EMISSIONS

California's Executive Branch has taken several actions to reduce GHGs through the use of Executive Orders. Although not regulatory, they set the tone for the state and guide the actions of state agencies.

Executive Order S-3-05. Former California Governor Arnold Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05, the following reduction targets for GHG emissions:

- By 2010, reduce GHG emissions to 2000 levels.
- By 2020, reduce GHG emissions to 1990 levels.
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The 2050 reduction goal represents what some scientists believe is necessary to reach levels that will stabilize the climate. The 2020 goal was established to be a mid-term target. Because this is

an executive order, the goals are not legally enforceable for local governments or the private sector.

Executive Order S-01-07 – Low Carbon Fuel Standard. The Governor signed Executive Order S-01-07 on January 18, 2007. The order mandates that a statewide goal shall be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. In particular, the Executive Order established a Low Carbon Fuel Standard and directed the Secretary for Environmental Protection to coordinate the actions of the California Energy Commission, the ARB, the University of California, and other agencies to develop and propose protocols for measuring the "life-cycle carbon intensity" of transportation fuels. This analysis supporting development of the protocols was included in the State Implementation Plan for alternative fuels (State Alternative Fuels Plan adopted by California Energy Commission on December 24, 2007) and was submitted to ARB for consideration as an "early action" item under AB 32. The ARB adopted the Low Carbon Fuel Standard on April 23, 2009.

The Low Carbon Fuel Standard was challenged in the U.S. District Court in Fresno in 2011. The court's ruling issued on December 29, 2011, included a preliminary injunction against ARB's implementation of the rule. The Ninth Circuit Court of Appeals stayed the injunction on April 23, 2012, pending final ruling on appeal, allowing ARB to continue to implement and enforce the regulation. The Ninth Circuit Court's decision, filed September 18, 2013, vacated the preliminary injunction. In essence, the court held that Low Carbon Fuel Standards adopted by ARB were not in conflict with federal law. On August 8, 2013, the Fifth District Court of Appeal (California) ruled ARB failed to comply with CEQA and the Administrative Procedure Act (APA) when adopting regulations for Low Carbon Fuel Standards. In a partially published opinion, the Court of Appeal reversed the trial court's judgment and directed issuance of a writ of mandate setting aside Resolution 09-31 and two executive orders of ARB approving Low Carbon Fuel Standards (LCFS) regulations promulgated to reduce GHG emissions. However, the court tailored its remedy to protect the public interest by allowing the LCFS regulations to remain operative while ARB complies with the procedural requirements it failed to satisfy.

To address the Court ruling, ARB was required to bring a new LCFS regulation to tits Board for consideration in February 2015. The proposed LCFS regulation was required to contain revisions to the 2010 LCFS as well as new provisions designed to foster investments in the production of the low-carbon intensity (low-CI) fuels, offer additional flexibility to regulated parties, update critical technical information, simplify and streamline program operations, and enhance enforcement. The second public hearing was held on September 24 and September 25, 2015, where the LCFS Regulation was adopted. The Final Rulemaking Package adopting the regulation was filed with Office of Administrative Law (OAL) on October 2, 2015. OAL had until November 16, 2015 to make a determination (ARB 2015d).

Executive Order S-13-08. Executive Order S-13-08 states that "climate change in California during the next century is expected to shift precipitation patterns, accelerate sea level rise and increase temperatures, thereby posing a serious threat to California's economy, to the health and welfare of its population and to its natural resources." Pursuant to the requirements in the Order, the 2009 California Climate Adaptation Strategy (California Natural Resources Agency 2009) was adopted, which is the ". . . first statewide, multi-sector, region-specific, and

information-based climate change adaptation strategy in the United States." Objectives include analyzing risks of climate change in California, identifying and exploring strategies to adapt to climate change, and specifying a direction for future research.

Executive Order B-30-15. On April 29, 2015, Governor Edmund G. Brown Jr. issued an executive order to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments ahead of the United Nations Climate Change Conference in Paris late 2015. The Order sets a new interim statewide GHG emission reduction target to reduce GHG emissions to 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050 and directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of CO_2 equivalent ($MMCO_2e$). The Order also requires the state's climate adaptation plan to be updated every three years, and for the State to continue its climate change research program, among other provisions. As with Executive Order S-3-05, this Order is not legally enforceable for local governments and the private sector. Legislation that would update AB 32 to make post 2020 targets and requirements a mandate is in process in the State Legislature.

CALIFORNIA REGULATIONS AND BUILDING CODES

California has a long history of adopting regulations to improve energy efficiency in new and remodeled buildings. These regulations have kept California's energy consumption relatively flat even with rapid population growth.

Title 20 Appliance Efficiency Standards. California Code of Regulations, Title 20: Division 2, Chapter 4, Article 4, Sections 1601-1608: Appliance Efficiency Regulations regulates the sale of appliances in California. The Appliance Efficiency Regulations include standards for both federally regulated appliances and non-federally regulated appliances. 23 categories of appliances are included in the scope of these regulations. The standards within these regulations apply to appliances that are sold or offered for sale in California, except those sold wholesale in California for final retail sale outside the state and those designed and sold exclusively for use in recreational vehicles or other mobile equipment (CEC 2012).

Title 24 Energy Efficiency Standards and California Green Building Standards. California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings, was first adopted in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficient technologies and methods. Energy efficient buildings require less electricity; therefore, increased energy efficiency reduces fossil fuel consumption and decreases GHG emissions. The newest 2016 version of Title 24 was adopted by the California Energy Commission (CEC) and became effective on January 1, 2017.

The CEC indicates that the 2016 Title 24 standards will reduce energy consumption by 5 percent for nonresidential buildings above that achieved by the 2013 Title 24 (CEC 2015).

California Code of Regulations, Title 24, Part 11: California Green Building Standards Code (CALGreen) is a comprehensive and uniform regulatory code for all residential, commercial, and

school buildings that went in effect on January 1, 2011, and is administered by the California Building Standards Commission. CALGreen is updated on a regular basis, with the most recent update consisting of the 2016 California Green Building Code Standards that became effective January 1, 2017. Local jurisdictions are permitted to adopt more stringent requirements, as state law provides methods for local enhancements. CALGreen recognizes that many jurisdictions have developed existing construction and demolition ordinances, and defers to them as the ruling guidance provided they establish a minimum 50 percent diversion requirement. The code also provides exemptions for areas not served by construction and demolition recycling infrastructure. The State Building Code provides the minimum standard that buildings must meet in order to be certified for occupancy, which is generally enforced by the local building official. CALGreen requires:

- Short-term bicycle parking. If a commercial project is anticipated to generate visitor traffic, provide permanently anchored bicycle racks within 200 feet of the visitors' entrance, readily visible to passers-by, for 5 percent of visitor motorized vehicle parking capacity, with a minimum of one two-bike capacity rack (5.106.4.1.1).
- Long-term bicycle parking. For new buildings with 10 or more tenant-occupants, provide secure bicycle parking for 5 percent of tenant-occupied motorized vehicle parking capacity, with a minimum of one space (5.106.4.1.2).
- Designated parking. Provide designated parking in commercial projects for any combination of low-emitting, fuel-efficient and carpool/van pool vehicles as shown in Table 5.106.5.2 (5.106.5.2).
- Recycling by Occupants. Provide readily accessible areas that serve the entire building and are identified for the depositing, storage and collection of nonhazardous materials for recycling (5.410.1).
- Construction waste. A minimum 65 percent diversion of construction and demolition waste from landfills, increasing voluntarily to 80 percent for new homes and commercial projects (5.408.1, A5.408.3.1 [nonresidential], A5.408.3.1 [residential]). All (100 percent) of trees, stumps, rocks and associated vegetation and soils resulting from land clearing shall be reused or recycled (5.408.3).
- Wastewater reduction. Each building shall reduce the generation of wastewater by one of the following methods:
    - The installation of water-conserving fixtures (5.303.3) or
    - Using nonpotable water systems (5.303.4).
- Water use savings. 20 percent mandatory reduction of indoor water use with voluntary goal standards for 30, 35 and 40 percent reductions (5.303.2, A5303.2.3 [nonresidential]).
- Water meters. Separate water meters for buildings in excess of 50,000 square feet or buildings projected to consume more than 1,000 gallons per day (5.303.1).
- Irrigation efficiency. Moisture-sensing irrigation systems for larger landscaped areas (5.304.3).
- Materials pollution control. Low-pollutant emitting interior finish materials such as paints, carpet, vinyl flooring, and particleboard (5.404).
- Building commissioning. Mandatory inspections of energy systems (i.e., heat furnace, air conditioner, mechanical equipment) for nonresidential buildings over 10,000 square feet to ensure that all are working at their maximum capacity according to their design efficiencies (5.410.2)..

Model Water Efficient Landscape Ordinance. The Model Water Efficient Landscape Ordinance (Ordinance) was required by AB 1881, the Water Conservation Act. The bill required local agencies to adopt a local landscape ordinance at least as effective in conserving water as the Model Ordinance by January 1, 2010. Reductions in water use of 20 percent consistent with (SBX-7-7) 2020 mandate are expected upon compliance with the ordinance. Governor Brown's Drought Executive Order of April 1, 2015 (EO B-29-15) directed Department of Water Resources (DWR) to update the Ordinance through expedited regulation. The California Water Commission approved the revised Ordinance on July 15, 2015 effective December 15, 2015. New development projects that include landscape areas of 500 square feet or more are subject to the Ordinance. The update requires:

- More efficient irrigation systems;
- Incentives for graywater usage;
- Improvements in on-site stormwater capture;
- Limiting the portion of landscapes that can be planted with high water use plants; and
- Reporting requirements for local agencies.

ARB Refrigerant Management Program. ARB adopted a regulation in 2009 to reduce refrigerant GHG emissions from stationary sources through refrigerant leak detection and monitoring, leak repair, system retirement and retrofitting, reporting and recordkeeping, and proper refrigerant cylinder use, sale, and disposal. The regulation is set forth in sections 95380 to 95398 of Title 17, California Code of Regulations. The rules implementing the regulation establish a limit on statewide GHG emissions from stationary facilities with refrigeration systems with more than 50 pounds of a high GWP refrigerant. The refrigerant management program is designed to (1) reduce emissions of high-GWP GHG refrigerants from leaky stationary, non-residential refrigeration equipment; (2) reduce emissions from the installation and servicing of refrigeration and air-conditioning appliances using high-GWP refrigerants; and (3) verify GHG emission reductions.

Tractor-Trailer GHG Regulation. The tractors and trailers subject to this regulation must either use EPA SmartWay certified tractors and trailers, or retrofit their existing fleet with SmartWay verified technologies. The regulation applies primarily to owners of 53-foot or longer box-type trailers, including both dry-van and refrigerated-van trailers, and owners of the heavy-duty tractors that pull them on California highways. These owners are responsible for replacing or retrofitting their affected vehicles with compliant aerodynamic technologies and low rolling resistance tires. Sleeper cab tractors model year 2011 and later must be SmartWay certified. All other tractors must use SmartWay verified low rolling resistance tires. There are also requirements for trailers to have low rolling resistance tires and aerodynamic devices.

Phase I and 2 Heavy-Duty Vehicle GHG Standards. ARB has adopted a new regulation for greenhouse gas (GHG) emissions from heavy-duty trucks and engines sold in California. It establishes GHG emission limits on truck and engine manufacturers and harmonizes with the U.S. EPA rule for new trucks and engines nationally. Existing heavy-duty vehicle regulations in California include engine criteria emission standards, tractor-trailer GHG requirements to implement SmartWay strategies (i.e., the Heavy-Duty Tractor-Trailer Greenhouse Gas

Regulation), and in-use fleet retrofit requirements such as the Truck and Bus Regulation. In September 2011, the U.S. EPA adopted their new rule for heavy-duty trucks and engines. The U.S. EPA rule has compliance requirements for new compression and spark ignition engines, as well as trucks from Class 2b through Class 8. Compliance requirements begin with model year (MY) 2014 with stringency levels increasing through MY 2018. The rule organizes truck compliance into three groupings, which include a) heavy-duty pickups and vans; b) vocational vehicles; and c) combination tractors. The U.S. EPA rule does not regulate trailers.

ARB staff has worked jointly with the U.S. Environmental Protection Agency (U.S. EPA) and the National Highway Traffic Safety Administration (NHTSA) on the next phase of federal greenhouse gas (GHG) emission standards for medium- and heavy-duty vehicles, called federal Phase 2. The federal Phase 2 standards were built on the improvements in engine and vehicle efficiency required by the Phase 1 emission standards and represent a significant opportunity to achieve further GHG reductions for 2018 and later model year heavy-duty vehicles, including trailers.

U.S. EPA and NHTSA issued a Notice of Proposed Rulemaking for Phase 2 in June 2015, and published the final rule in October 2016. ARB staff plans to bring a proposed California Phase 2 program before the Board in early 2018. ARB staff remains committed to a strong national program which will support California's GHG reduction commitments.

SB 97 and the CEQA Guidelines Update. Passed in August 2007, SB 97 added Section 21083.05 to the Public Resources Code. The code states "(a) On or before July 1, 2009, the Office of Planning and Research shall prepare, develop, and transmit to the Resources Agency guidelines for the mitigation of GHG emissions or the effects of GHG emissions as required by this division, including, but not limited to, effects associated with transportation or energy consumption. (b) On or before January 1, 2010, the Resources Agency shall certify and adopt guidelines prepared and developed by the Office of Planning and Research pursuant to subdivision (a)." Section 21097 was also added to the Public Resources Code. It provided CEQA protection until January 1, 2010 for transportation projects funded by the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006 or projects funded by the Disaster Preparedness and Flood Prevention Bond Act of 2006, in stating that the failure to analyze adequately the effects of GHGs would not violate CEQA.

On April 13, 2009, the Office of Planning and Research submitted to the Secretary for Natural Resources its recommended amendments to the CEQA Guidelines for addressing GHG emissions. On July 3, 2009, the Natural Resources Agency commenced the Administrative Procedure Act rulemaking process for certifying and adopting these amendments pursuant to Public Resources Code section 21083.05. Following a 55-day public comment period and two public hearings, the Natural Resources Agency proposed revisions to the text of the proposed Guidelines amendments. The Natural Resources Agency transmitted the adopted amendments and the entire rulemaking file to the Office of Administrative Law on December 31, 2009. On February 16, 2010, the Office of Administrative Law approved the Amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The Amendments became effective on March 18, 2010.

The CEQA Amendments provide guidance to public agencies regarding the analysis and mitigation of the effects of GHG emissions in CEQA documents. The CEQA Amendments fit within the existing CEQA framework by amending existing CEQA Guidelines to reference climate change.

A new section, CEQA Guidelines Section 15064.4, was added to assist agencies in determining the significance of GHG emissions. The new section allows agencies the discretion to determine whether a quantitative or qualitative analysis is best for a particular project. However, little guidance is offered on the crucial next step in this assessment process—how to determine whether the project's estimated GHG emissions are significant or cumulatively considerable.

Also amended were CEQA Guidelines Sections 15126.4 and 15130, which address mitigation measures and cumulative impacts, respectively. GHG mitigation measures are referenced in general terms, but no specific measures are championed. The revision to the cumulative impact discussion requirement (Section 15130) simply directs agencies to analyze GHG emissions in an EIR when a project's incremental contribution of emissions may be cumulatively considerable, however it does not answer the question of when emissions are cumulatively considerable.

Section 15183.5 permits programmatic GHG analysis and later project-specific tiering, as well as the preparation of GHG Reduction Plans. Compliance with such plans can support a determination that a project's cumulative effect is not cumulatively considerable, according to Section 15183.5(b).

In addition, the amendments revised Appendix F of the CEQA Guidelines, which focuses on Energy Conservation. The sample environmental checklist in Appendix G was amended to include GHG questions.

REGIONAL

The project is within the Southern California Air Basin (SoCAB), which is under the jurisdiction of the SCAQMD.

South Coast Air Quality Management District

SCAQMD is the agency responsible for air quality planning and regulation in the SoCAB. The SCAQMD addresses the impacts to climate change of projects subject to SCAQMD permit as a lead agency if they are the only agency having discretionary approval for the project and acts as a responsible agency when a land use agency must also approve discretionary permits for the project. The SCAQMD acts as an expert commenting agency for impacts to air quality. This expertise carries over to GHG emissions, so the agency helps local land use agencies through the development of models and emission thresholds that can be used to address GHG emissions.

In 2008, SCAQMD formed a Working Group to identify GHG emissions thresholds for land use projects that could be used by local lead agencies in the SoCAB. The Working Group developed several different options that are contained in the SCAQMD Draft Guidance Document – Interim CEQA GHG Significance Threshold, that could be applied by lead agencies. The working group has not provided additional guidance since release of the interim guidance in 2008. The SCAQMD Board has not approved the thresholds; however, the Guidance Document provides substantial evidence supporting the approaches to significance of GHG emissions that can be considered by

the lead agency in adopting its own threshold. The current interim thresholds consist of the following tiered approach:

- Tier 1 consists of evaluating whether or not the project qualifies for any applicable exemption under CEQA.
- Tier 2 consists of determining whether the project is consistent with a GHG reduction plan. If a project is consistent with a qualifying local GHG reduction plan, it does not have significant GHG emissions.
- Tier 3 consists of screening values, which the lead agency can choose, but must be consistent with all projects within its jurisdiction. A project's construction emissions are averaged over 30 years and are added to the project's operational emissions. If a project's emissions are below one of the following screening thresholds, then the project is less than significant:
    - Residential and Commercial land use: 3,000 $MTCO_2e$ per year
    - Based on land use type: residential: 3,500 $MTCO_2e$ per year; commercial: 1,400 $MTCO_2e$ per year; or mixed use: 3,000 $MTCO_2e$ per year
- Tier 4 has the following options:
    - Option 1: Reduce BAU emissions by a certain percentage; this percentage is currently undefined.
    - Option 2: Early implementation of applicable AB 32 Scoping Plan measures
    - Option 3, 2020 target for service populations (SP), which includes residents and employees: 4.8 $MTCO_2e$/SP/year for projects and 6.6 $MTCO_2e$/SP/year for plans;
    - Option 3, 2035 target: 3.0 $MTCO_2e$/SP/year for projects and 4.1 $MTCO_2e$/SP/year for plans
- Tier 5 involves mitigation offsets to achieve target significance threshold.

The SCAQMD's interim thresholds used the Executive Order S-3-05 year 2050 goal as the basis for the Tier 3 screening level. Achieving the Executive Order's objective would contribute to worldwide efforts to cap carbon dioxide concentrations at 450 ppm, thus stabilizing global climate.

SCAQMD only has authority over GHG emissions from development projects that include air quality permits. At this time, it is unknown if the project would include stationary sources of emissions subject to SCAQMD permits. Notwithstanding, if the Project requires a stationary permit, it would be subject to the applicable SCAQMD regulations.

SCAQMD Regulation XXVII, adopted in 2009 includes the following rules:

- Rule 2700 defines terms and post global warming potentials.
- Rule 2701, SoCal Climate Solutions Exchange, establishes a voluntary program to encourage, quantify, and certify voluntary, high quality certified GHG emission reductions in the SCAQMD.
- Rule 2702, GHG Reduction Program created a program to produce GHG emission reductions within the SCAQMD. The SCAQMD will fund projects through contracts in response to requests for proposals or purchase reductions from other parties.

2.8 CITY OF MORENO VALLEY ENERGY EFFICIENCY AND CLIMATE ACTION STRATEGY

The City of Moreno Valley released an Energy Efficiency and Climate Action Strategy (CAS) as well as a Greenhouse Gas Analysis for public review on May 8, 2012. The documents were approved on October 9, 2012. The CAS identifies ways that the City can reduce energy and water consumption and greenhouse gas emissions as an organization (its employees and the operation of its facilities) and outlines the actions that the City can encourage and community members can employ to reduce their own energy and water consumption and greenhouse gas emissions. The policies in the document are to reduce greenhouse gas emissions in 2010 by 15 percent by 2020. The following consists of an analysis of project consistency with the policies in the CAS.

- R2-T1: Land Use Based Trips and VMT Reduction Policies. Encourage the development of Transit Priority Projects along High-Quality Transit Corridors identified in the SCAG Sustainable Communities Plan, to allow a reduction in vehicle miles traveled.

  Project consistency: Not applicable.

- R2-T3: Employment-Based Trip Reductions. Require a Transportation Demand Management (TDM) program for new development to reduce automobile travel by encouraging ride-sharing, carpooling, and alternative modes of transportation.

  Project consistency: The Project will encourage carpooling and provide information to employees on the use of public transit.

- R2-E1: New Construction Residential Energy Efficiency Requirements. Require energy efficient design for all new residential buildings to be 10 percent beyond the current Title 24 standards. (Reach Code)

  Project consistency: Consistent; the project will comply with the City of Moreno Valley's New Construction Requirements.

- R2-E2: New Construction Residential Renewable Energy. Facilitate the use of renewable energy (such as solar (photovoltaic) panels or small wind turbines) for new residential developments. Alternative approach would be the purchase of renewable energy resources offsite.

  Project consistency: Not applicable; this measure applies to residential projects.

- R2-E5: New Construction Commercial Energy Efficiency Requirements. Require energy efficient design for all new commercial buildings to be 10% beyond the 2008 Title 24 standards (which were in effect at the time the CAP was adopted). (Reach Code)

  Project consistency: Not applicable.

- R3-E1: Energy Efficient Development, and Renewable Energy Deployment Facilitation and Streamlining. Updating of codes and zoning requirements and guidelines to further implement green building practices. This could include incentives for energy efficient projects.

  Project consistency: Not applicable on a project-level.

- R3-L2: Heat Island Plan. Develop measures that address "heat islands." Potential measures include using strategically placed shade trees, using paving materials with a Solar Reflective Index of at least 29, an open grid pavement system, or covered parking.

  Project consistency: Consistent; the Project will comply with the City of Moreno Valley's landscaping requirements.

- R2-W1: Water Use Reduction Initiative. Consider adopting a per capita water use reduction goal, which mandates the reduction of water use of 20 percent per capita with requirements applicable to new development and with cooperative support of the water agencies.

  Project consistency: Consistent. California Green Building Standards Code, Chapter 5, Division 5.3, Section 5.303.2 requires that indoor water use be reduced by 20 percent. Section 5.304.3 requires irrigation controllers and sensors.

- R3-W1: Water Efficiency Training and Education. Work with EMWD and local water companies to implement a public information and education program that promotes water conservation.

  Project consistency: Not applicable at a project-level.

- R2-S1: City Diversion Program. For Solid Waste, consider a target of increasing the waste diverted from the landfill to a total of 75 percent by 2020.

  Project consistency: Consistent; the Project will comply with the City of Moreno Valley's citywide goal of solid waste reduction. Additionally, the Project will be compliant with the City of Moreno Valley's Municipal Code 8.80.030 by implementing a Waste Management Plan.

2.9 Discussion on Establishment of Significance Thresholds

The City of Moreno Valley has not adopted its own numeric threshold of significance for determining impacts with respect to greenhouse gas (GHG) emissions. A screening threshold of 3,000 MTCO2e per year to determine if additional analysis is required is an acceptable approach for small projects. This approach is a widely accepted screening threshold used by the County of Riverside (1) and numerous cities in the South Coast Air Basin and is based on the South Coast Air Quality Management District (SCAQMD) staff's proposed GHG screening threshold for stationary source emissions for non-industrial projects, as described in the SCAQMD's *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* ("SCAQMD Interim GHG Threshold"). The SCAQMD Interim GHG Threshold identifies a screening threshold to determine whether additional analysis is required (2). As noted by the SCAQMD:

> "…the…screening level for stationary sources is based on an emission capture rate of 90 percent for all new or modified projects...the policy objective of [SCAQMD's] recommended interim GHG significance threshold proposal is to achieve an emission capture rate of 90 percent of all new or modified stationary source projects. A GHG significance threshold based on a 90 percent emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change because most projects will be required to implement GHG reduction measures. Further, a 90 percent emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that [SCAQMD] staff estimates that these GHG emissions would account for slightly less than one percent of future 2050 statewide GHG emissions target (85 [MMTCO2e/yr]). In addition, these small projects may be subject to future applicable GHG control regulations that would further reduce their overall future contribution to the

> statewide GHG inventory. Finally, these small sources are already subject to [Best Available Control Technology] (BACT) for criteria pollutants and are more likely to be single-permit facilities, so they are more likely to have few opportunities readily available to reduce GHG emissions from other parts of their facility." (2)

Thus, and based on guidance from the SCAQMD, if a non-industrial project would emit GHGs less than 3,000 $MTCO_2e$ per year, the project is not considered a substantial GHG emitter and the GHG impact is less than significant, requiring no additional analysis and no mitigation. On the other hand, if a non-industrial project would emit GHGs in excess of 3,000 MTCO2e per year, then the project could be considered a substantial GHG emitter, requiring additional analysis and potential mitigation.

As previously discussed, a screening threshold of 3,000 MTCO2e per year is an acceptable approach for small projects to determine if additional analysis is required and is therefore applied for this Project.

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3 PROJECT GREENHOUSE GAS IMPACT

3.1 INTRODUCTION

The Project has been evaluated to determine if it will result in a significant greenhouse gas impact. The significance of these potential impacts is described in the following section.

3.2 STANDARDS OF SIGNIFICANCE

The criteria used to determine the significance of potential Project-related greenhouse gas impacts are taken from the Initial Study Checklist in Appendix G of the State CEQA Guidelines (14 California Code of Regulations §§15000, et seq.). Based on these thresholds, a project would result in a significant impact related to air quality if it would:

- Threshold 1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The City of Moreno Valley has not adopted its own numeric threshold of significance for determining impacts with respect to greenhouse gas (GHG) emissions. A screening threshold of 3,000 MTCO2e per year to determine if additional analysis is required is an acceptable approach for small projects. This approach is a widely accepted screening threshold used by the County of Riverside (1) and numerous cities in the South Coast Air Basin and is based on the South Coast Air Quality Management District (SCAQMD) staff's proposed GHG screening threshold for stationary source emissions for non-industrial projects, as described in the SCAQMD's *Interim CEQA GHG Significance Threshold for Stationary Sources, Rules and Plans* ("SCAQMD Interim GHG Threshold"). The SCAQMD Interim GHG Threshold identifies a screening threshold to determine whether additional analysis is required (2). As noted by the SCAQMD:

> "…the…screening level for stationary sources is based on an emission capture rate of 90 percent for all new or modified projects...the policy objective of [SCAQMD's] recommended interim GHG significance threshold proposal is to achieve an emission capture rate of 90 percent of all new or modified stationary source projects. A GHG significance threshold based on a 90 percent emission capture rate may be more appropriate to address the long-term adverse impacts associated with global climate change because most projects will be required to implement GHG reduction measures. Further, a 90 percent emission capture rate sets the emission threshold low enough to capture a substantial fraction of future stationary source projects that will be constructed to accommodate future statewide population and economic growth, while setting the emission threshold high enough to exclude small projects that will in aggregate contribute a relatively small fraction of the cumulative statewide GHG emissions. This assertion is based on the fact that [SCAQMD] staff estimates that these GHG emissions would account for slightly less than one percent of future 2050 statewide GHG emissions target (85 [MMTCO2e/yr]). In addition, these small projects may be subject to future applicable GHG control regulations that would further reduce their overall future contribution to the statewide GHG inventory. Finally, these small sources are already subject to [Best

Available Control Technology] (BACT) for criteria pollutants and are more likely to be single-permit facilities, so they are more likely to have few opportunities readily available to reduce GHG emissions from other parts of their facility." (2)

Thus, and based on guidance from the SCAQMD, if a non-industrial project would emit GHGs less than 3,000 $MTCO_2e$ per year, the project is not considered a substantial GHG emitter and the GHG impact is less than significant, requiring no additional analysis and no mitigation. On the other hand, if a non-industrial project would emit GHGs in excess of 3,000 MTCO2e per year, then the project could be considered a substantial GHG emitter, requiring additional analysis and potential mitigation.

As previously discussed, a screening threshold of 3,000 MTCO2e per year is an acceptable approach for small projects to determine if additional analysis is required and is therefore applied for this Project.

- Threshold 2: Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Sections 3.8, 3.9, and 3.10 identify the Project's consistency with the 2008 Scoping Plan, 2017 Scoping Plan, and City of Moreno Valley CAP. As such, these sections are used to determine impacts with respect to Threshold 2.

3.3 Project Related Greenhouse Gas Emissions

CEQA Guidelines 15064.4 (b) (1) states that a lead agency may use a model or methodology to quantify greenhouse gas emissions associated with a project (32).

On October 17, 2017, the SCAQMD in conjunction with the California Air Pollution Control Officers Association (CAPCOA) and other California air districts, released the latest version of the California Emissions Estimator Model™ (CalEEMod™) v2016.3.2. The purpose of this model is to more accurately calculate construction-source and operational-source criteria pollutant (NO_x, VOC, PM_{10}, $PM_{2.5}$, SO_x, and CO) and greenhouse gas (GHG) emissions from direct and indirect sources; and quantify applicable air quality and GHG reductions achieved from mitigation measures (33). Accordingly, the latest version of CalEEMod™ has been used for this Project to determine construction and operational air quality impacts. Output from the model runs for both construction and operational activity are provided in Appendix 3.1.

3.4 Construction and Operational Life-Cycle Analysis

A full life-cycle analysis (LCA) for construction and operational activity is not included in this analysis due to the lack of consensus guidance on LCA methodology at this time. Life-cycle analysis (i.e., assessing economy-wide GHG emissions from the processes in manufacturing and transporting all raw materials used in the project development, infrastructure and on-going operations) depends on emission factors or econometric factors that are not well established for all processes. At this time a LCA would be extremely speculative and thus has not been prepared.

3.5 CONSTRUCTION EMISSIONS

Construction activities associated with the proposed Project will result in emissions of CO2 and CH4 from construction activities.

The report Moreno Valley Skilled Nursing Facility Air Quality Impact Analysis Report, Urban Crossroads, Inc. (2018) contains detailed information regarding construction activity (34).

For construction phase Project emissions, GHGs are quantified and amortized over the life of the Project. To amortize the emissions over the life of the Project, the SCAQMD recommends calculating the total greenhouse gas emissions for the construction activities, dividing it by a 30-year project life then adding that number to the annual operational phase GHG emissions (35). As such, construction emissions were amortized over a 30-year period and added to the annual operational phase GHG emissions.

As discussed in the AQIA report, construction emissions associated with off-site utility, infrastructure, and on-site ancillary improvements may occur, however at this time, a specific schedule of activities is unknown. Notwithstanding, impacts associated with these potential activities are not expected to exceed the emissions totals identified for other Project-related construction activities evaluated in this report. As such, no impacts beyond what has already been identified in this report are expected to occur.

3.6 OPERATIONAL EMISSIONS

Operational activities associated with the proposed Project will result in emissions of CO2, CH4, and N2O from the following primary sources:

- Area Source Emissions
- Energy Source Emissions
- Mobile Source Emissions
- Solid Waste
- Water Supply, Treatment and Distribution

3.6.1 AREA SOURCE EMISSIONS

Hearths/Fireplaces

GHG emissions would result from the combustion of wood or biomass and are considered biogenic emissions of CO2. The emissions associated with use of hearths/fireplaces were calculated based on assumptions provided in the CalEEMod model. The Project is required to comply with SCAQMD Rule 445, which prohibits the use of wood burning stoves and fireplaces in new development. In order to account for the requirements of this Rule, the unmitigated CalEEMod model estimates were adjusted to remove wood burning stoves and fireplaces. As the project is required to comply with SCAQMD Rule 445, the removal of wood burning stoves and fireplaces is not considered "mitigation" although it must be identified as such in CalEEMod in order to treat the case appropriately.

Landscape Maintenance Equipment

Landscape maintenance equipment would generate emissions from fuel combustion and evaporation of unburned fuel. Equipment in this category would include lawnmowers, shedders/grinders, blowers, trimmers, chain saws, and hedge trimmers used to maintain the landscaping of the Project. CalEEMod default parameters were used to estimate emissions associated with landscape maintenance equipment for the Project scenario.

3.6.2 Energy Source Emissions

Combustion Emissions Associated with Natural Gas and Electricity

GHGs are emitted from buildings as a result of activities for which electricity and natural gas are typically used as energy sources. Combustion of any type of fuel emits CO2 and other GHGs directly into the atmosphere; these emissions are considered direct emissions associated with a building. GHGs are also emitted during the generation of electricity from fossil fuels; these emissions are considered to be indirect emissions. CalEEmod default parameters were used to estimate electricity and natural gas demand for the Project scenario.

3.6.3 Mobile Source Emissions

Vehicles

GHG emissions will also result from mobile sources associated with the Project. These mobile source emissions will result from the typical daily operation of motor vehicles by visitors and residents. The emissions associated with mobile source emissions were calculated using the CalEEMod. Trip characteristics available from the technical memorandum, *Trip Generation Analysis for Proposed Skilled Nursing Facility (EPD Solutions, 2018)* were utilized in this analysis (25).

Per the *Trip Generation Analysis for Proposed Skilled Nursing Facility,* when calculated using square feet, the project is forecast to generate 457 daily trips per day, including 38 trips during the AM peak hour and 41 trips during the PM peak hour (25). According to CalEEMod, trip rates for the nursing home land use is calculated using dwelling units. It should be noted that trip rates for the Project are calculated using ITE Land Use Code 620 (nursing home) which is based on trips per thousand square feet. As such, the trip rates input in CalEEMod were modified to reflect the total trips generated by the Project, based on the number of beds modeled in the analysis. This ensures that the total number of trips evaluated in this report is consistent with the trip generation evaluation.

3.6.4 Solid Waste

Residential land uses will result in the generation and disposal of solid waste. A large percentage of this waste will be diverted from landfills by a variety of means, such as reducing the amount of waste generated, recycling, and/or composting. The remainder of the waste not diverted will be disposed of at a landfill. GHG emissions from landfills are associated with the anaerobic breakdown of material. CalEEmod default parameters were used to estimate GHG emissions associated with the disposal of solid waste for the Project scenario.

3.6.5 WATER SUPPLY, TREATMENT AND DISTRIBUTION

Indirect GHG emissions result from the production of electricity used to convey, treat and distribute water and wastewater. The amount of electricity required to convey, treat and distribute water depends on the volume of water as well as the sources of the water. CalEEMod default parameters were used to estimate GHG emissions associated with water supply, treatment and distribution for the Project scenario.

3.7 EMISSIONS SUMMARY

The annual GHG emissions associated with the operation of the proposed Project are estimated to be 877.10 MTCO2e per year as summarized in Table 3-1. Direct and indirect operational emissions associated with the Project are compared with the SCAQMD threshold of significance for small land use projects, which is 3,000 MTCO2e per year (36). As shown, the proposed Project would result in a less than significant impact with respect to GHG emissions.

TABLE 3-1: TOTAL PROJECT GREENHOUSE GAS EMISSIONS (ANNUAL)

Emission Source	Emissions (metric tons per year)			
	CO_2	CH_4	N_2O	Total CO_2E
Annual construction-related emissions amortized over 30 years	26.00	0.00	0.00	26.09
Area	1.49	0.00	0.00	1.52
Energy	202.54	0.01	0.00	203.43
Mobile Sources	560.45	0.03	0.00	561.16
Waste	16.30	0.96	0.00	40.38
Water Usage	38.40	0.19	0.00	44.52
Total CO_2E (All Sources)	**877.10**			
SCAQMD Threshold	**3,000**			
Significant?	**NO**			

Source: CalEEMod™ model output, See Appendix 3.1 for detailed model outputs.
Note: Totals obtained from CalEEMod™ and may not total 100% due to rounding. Table results include scientific notation. *e* is used to represent *times ten raised to the power of* (which would be written as x 10^{b}") and is followed by the value of the exponent

3.8 2008 CARB SCOPING PLAN CONSISTENCY

AB 32 requires California to reduce its GHG emissions by approximately 28.5% when compared to GHG emissions produced under a Business as Usual scenario (37). CARB identified reduction measures to achieve this goal as set forth in the CARB Scoping Plan.

The Project would generate GHG emissions from a variety of sources which would all emit Carbon CO2, CH4, and N2O. GHGs could also be indirectly generated by incremental electricity consumption and waste generation from the Project.

As stated previously, the CARB Scoping Plan recommends strategies for implementation at the statewide level to meet the goals of AB 32. The CARB Scoping Plan recommendations serve as statewide measures to reduce GHG emissions levels. The Project would be consistent with the applicable measures established in the Scoping Plan, as shown in Table 3-2.

TABLE 3-2: PROJECT CONSISTENCY WITH SCOPING PLAN GREENHOUSE GAS EMISSION REDUCTION

Number	Scoping Plan Measure	Remarks
T-1	Pavley Motor Vehicle Standards (AB 1493)	Residents would purchase vehicles in compliance with incumbent CARB vehicle standards
H-4	Limit High GWP Use in Consumer Products	Residents would use consumer products that would comply with the incumbent regulations
H-1	Motor Vehicle Air Conditioning Systems – Reduction from Non-Professional Servicing	Residents would be prohibited from performing air conditioning repairs and required to use professional servicing.
T-4	Tire Pressure Program	Motor vehicles driven by residents would maintain proper tire pressure when vehicles are serviced.
T-2	Low Carbon Fuel Standard	Motor vehicles driven by residents would use fuels that are compliant with incumbent standards.
W-1	Water Use Efficiency	Development proposals within the Project site would implement measures to minimize water use and maximize efficiency.
GB-1	Green Buildings	Development proposals within the Project site would be constructed in compliance with incumbent state or local green building standards.
H-5	Air Conditioning Refrigerant Leak Test During Vehicle Smog Check	Motor vehicles driven by residents, employees, and customers would comply with the leak test requirements during smog checks.
E-1	Energy Efficiency Measures (Electricity)	The Project would comply with incumbent electrical energy efficiency standards
CR-1	Energy Efficiency (Natural Gas)	Development proposals within the Project site would comply with incumbent natural gas energy efficiency standards
GB-1	Greening New Residential and Commercial Construction	Development proposals within the Project site would comply with incumbent green building standards
GB-1	Greening Existing Homes and Commercial Buildings	Development proposals within the Project site would meet retrofit standards as they become effective.

3.9 SB32/2017 Scoping Plan Consistency

Senate Bill 32 (SB 32) requires the state to reduce statewide greenhouse gas emissions to 40% below 1990 levels by 2030, a reduction target that was first introduced in Executive Order B-30-15. The new legislation builds upon the AB 32 goal of 1990 levels by 2020 and provides an intermediate goal to achieving S-3-05, which sets a statewide greenhouse gas reduction target of 80% below 1990 levels by 2050 (12) (29).

According to research conducted by the Lawrence Berkeley National Laboratory and supported by the CARB, California, under its existing and proposed GHG reduction policies, is on track to meet the 2020 reduction targets under AB 32 and could achieve the 2030 goals under SB 32. (27) (28).

The Project reduces its GHG emissions to the maximum extent feasible as discussed in this document. Additionally, the project applicant would not actively interfere with any future County-mandated, state-mandated, or federally-mandated retrofit obligations enacted or promulgated to legally require development County-wide, state-wide, or nation-wide to assist in meeting state-adopted greenhouse gas emissions reduction targets, including that established under Executive Order S-3-05, Executive Order B-30-15, or SB 32.

The Project does not interfere with the state's implementation of (i) Executive Order B-30-15 and SB 32's target of reducing statewide GHG emissions to 40% below 1990 levels by 2030 or (ii) Executive Order S-3-05's target of reducing statewide GHG emissions to 80% below 1990 levels by 2050 because it does not interfere with the state's implementation of GHG reduction plans described in the CARB's Updated Scoping Plan, including the state providing for 12,000 MW of renewable distributed generation by 2020, the California Building Commission mandating net zero energy homes in the building code after 2020, or existing building retrofits under AB 758. Therefore, the project's impacts on greenhouse gas emissions in the 2030 and 2050 horizon years are less than significant.

The 2017 Scoping Plan builds on the 2008 Scoping Plan in order to achieve the 40 percent reduction from 1990 levels by 2030. Major elements of the 2017 Scoping Plan framework that will achieve the GHG reductions include:

- Implementing and/or increasing the standards of the Mobile Source Strategy, which include increasing ZEV buses and trucks. When adopted, this measure would apply to all trucks accessing the Project site. This may include providing incentives for existing truck retrofits or new trucks purchased by the building operators to be ZEV. As such, this measure has the potential to expedite the Project's implementation of ZEVs through incentives.
- Low Carbon Fuel Standard (LCFS), with an increased stringency (18 percent by 2030). When adopted, this measure would apply to all fuel purchased and used by the Project in the state.
- Implementing SB 350, which expands the Renewables Portfolio Standard (RPS) to 50 percent RPS and doubles energy efficiency savings by 2030. When adopted, this measure would apply when electricity is provided to the Project by a utility company.
- California Sustainable Freight Action Plan, which improves freight system efficiency, utilizes near-zero emissions technology, and deployment of ZEV trucks. When adopted, this measure would apply to all trucks accessing the Project site, this may include existing trucks or new trucks that are part of the statewide goods movement sector.
- Implementing the proposed Short-Lived Climate Pollutant Strategy (SLPS), which focuses on reducing methane and hydroflurocarbon emissions by 40 percent and anthropogenic black carbon emissions by 50 percent by year 2030. When adopted, the Project would be required to comply with this measure and reduce SLPS accordingly.
- Continued implementation of SB 375. The Project is not within the purview of SB 375 and would therefore not conflict with this measure.

- Post-2020 Cap-and-Trade Program that includes declining caps. When adopted, the Project would be required to comply with the Cap-and-Trade Program if it generates emissions from sectors covered by Cap-and-Trade.
- 20 percent reduction in GHG emissions from refineries by 2030. When adopted, the Project would be required to comply with this measure if it were to utilize any fuel from refineries.
- Development of a Natural and Working Lands Action Plan to secure California's land base as a net carbon sink. This is a statewide measure that would not apply to the Project.

As shown above, the Project would not conflict with any of the 2017 Scoping Plan elements as any regulations adopted would apply directly or indirectly to the Project.

Further, as discussed above the State's existing and proposed regulatory framework will allow the State to reduce its GHG emissions level to 40 percent below 1990 levels by 2030.

3.10 City of Moreno Valley Climate Action Plan Consistency

The City of Moreno Valley adopted its CAP in October 2012. The measures identified in the CAP represent the City's actions to achieve the GHG reduction targets of AB 32 for target year 2020. Local measures included in the CAP include:

- R2-T1: Land Use Based Trips and VMT Reduction Policies. Encourage the development of Transit Priority Projects along High Quality Transit Corridors identified in the SCAG Sustainable Communities Plan, to allow a reduction in vehicle miles traveled.
- R2-T3: Employment-Based Trip Reductions. Require a Transportation Demand Management (TDM) program for new development to reduce automobile travel by encouraging ride-sharing, carpooling, and alternative modes of transportation..
- R2-E1: New Construction Residential Energy Efficiency Requirements. Require energy efficient design for all new residential buildings to be 10% beyond the current Title 24 standards. (Reach Code)
- R2-E2: New Construction Residential Renewable Energy. Facilitate the use of renewable energy (such as solar (photovoltaic) panels or small wind turbines) for new residential developments. Alternative approach would be the purchase of renewable energy resources offsite.
- R2-E5: New Construction Commercial Energy Efficiency Requirements. Require energy efficient design for all new commercial buildings to be 10% beyond the current Title 24 standards. (Reach Code)
- R3-E1: Energy Efficient Development, and Renewable Energy Deployment Facilitation and Streamlining. Updating of codes and zoning requirements and guidelines to further implement green building practices. This could include incentives for energy efficient projects.
- R3-L2: Heat Island Plan. Develop measures that address "heat islands." Potential measures include using strategically placed shade trees, using paving materials with a Solar Reflective Index of at least 29, an open grid pavement system, or covered parking.
- R2-W1: Water Use Reduction Initiative. Consider adopting a per capita water use reduction goal which mandates the reduction of water use of 20 percent per capita with requirements applicable to new development and with cooperative support of the water agencies.

- R3-W1: Water Efficiency Training and Education. Work with EMWD and local water companies to implement a public information and education program that promotes water conservation.
- R2-S1: City Diversion Program. For Solid Waste, consider a target of increasing the waste diverted from the landfill to a total of 75% by 2020. (41)

The proposed project would not conflict with these local strategies. Additionally, the proposed project is consistent with state and regional strategies, listed in the CAP. Further, the proposed project is subject to California Building Code requirements. New buildings must achieve the 2016 Building and Energy Efficiency Standards and the 2016 California Green Building Standards requirements, which include water conservation measures. Overall, the proposed project overall would not conflict with the City of Moreno Valley CAP and impacts would be less than significant. No mitigation measures are necessary.

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5 CERTIFICATION

The contents of this greenhouse gas study report represent an accurate depiction of the greenhouse gas impacts associated with the proposed Moreno Valley Skilled Nursing Facility. The information contained in this greenhouse gas report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5987.

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EDUCATION

Master of Science in Environmental Studies
California State University, Fullerton • May, 2010

Bachelor of Arts in Environmental Analysis and Design
University of California, Irvine • June, 2006

PROFESSIONAL AFFILIATIONS

AEP – Association of Environmental Planners
AWMA – Air and Waste Management Association
ASTM – American Society for Testing and Materials

PROFESSIONAL CERTIFICATIONS

Planned Communities and Urban Infill – Urban Land Institute • June, 2011
Indoor Air Quality and Industrial Hygiene – EMSL Analytical • April, 2008
Principles of Ambient Air Monitoring – California Air Resources Board • August, 2007
AB2588 Regulatory Standards – Trinity Consultants • November, 2006
Air Dispersion Modeling – Lakes Environmental • June, 2006

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APPENDIX 3.1:

CALEEMOD EMISSIONS MODEL OUTPUTS

Moreno Valley Skilled Nursing Facility

South Coast AQMD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Non-Asphalt Surfaces	1.60	Acre	1.60	69,696.00	0
Parking Lot	112.00	Space	1.36	44,800.00	0
Congregate Care (Assisted Living)	88.00	Dwelling Unit	1.58	68,750.00	252

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	31
Climate Zone	10			**Operational Year**	2020
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Lot acreage based on provided site plan

Construction Phase - Construction schedule based on provided information

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information

Off-road Equipment - Equipment list based on client provided information and an 8 hour operating work day

Off-road Equipment - Equipment list based on client provided information

Grading - Site is balanced. No import or export

Vehicle Trips - Trip rates based on ITE 10th Edition, Land Use Code 620- Nursing Home and calculated to reflect per dwelling unit instead of per TSF

Woodstoves - No woostoves or fireplaces

Construction Off-road Equipment Mitigation - Watering 3x/day

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	18.00	90.00
tblConstructionPhase	NumDays	230.00	390.00
tblConstructionPhase	NumDays	8.00	30.00
tblConstructionPhase	NumDays	18.00	15.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblConstructionPhase	NumDaysWeek	5.00	7.00
tblFireplaces	FireplaceDayYear	25.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	1,019.20	0.00

tblFireplaces	NumberGas	74.80	0.00
tblFireplaces	NumberNoFireplace	8.80	0.00
tblFireplaces	NumberWood	4.40	0.00
tblLandUse	LandUseSquareFeet	88,000.00	68,750.00
tblLandUse	LotAcreage	1.01	1.36
tblLandUse	LotAcreage	5.50	1.58
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	4.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	WorkerTripNumber	5.00	18.00
tblTripsAndVMT	WorkerTripNumber	8.00	15.00
tblTripsAndVMT	WorkerTripNumber	15.00	20.00
tblVehicleTrips	ST_TR	2.20	1.81
tblVehicleTrips	SU_TR	2.44	1.88
tblVehicleTrips	WD_TR	2.74	5.19
tblWoodstoves	NumberCatalytic	4.40	0.00
tblWoodstoves	NumberNoncatalytic	4.40	0.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00

tblWoodstoves	WoodstoveWoodMass	999.60	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2019	0.3285	2.7455	2.3578	5.2800e-003	0.2653	0.1285	0.3939	0.0954	0.1214	0.2167	0.0000	473.0839	473.0839	0.0710	0.0000	474.8584
2020	0.4831	1.5190	1.4891	3.4500e-003	0.1203	0.0692	0.1895	0.0323	0.0660	0.0983	0.0000	306.9935	306.9935	0.0389	0.0000	307.9658
Maximum	**0.4831**	**2.7455**	**2.3578**	**5.2800e-003**	**0.2653**	**0.1285**	**0.3939**	**0.0954**	**0.1214**	**0.2167**	**0.0000**	**473.0839**	**473.0839**	**0.0710**	**0.0000**	**474.8584**

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					
2019	0.3285	2.7455	2.3578	5.2800e-003	0.2054	0.1285	0.3339	0.0645	0.1214	0.1859	0.0000	473.0836	473.0836	0.0710	0.0000	474.8580
2020	0.4831	1.5190	1.4891	3.4500e-003	0.1203	0.0692	0.1895	0.0323	0.0660	0.0983	0.0000	306.9933	306.9933	0.0389	0.0000	307.9656
Maximum	**0.4831**	**2.7455**	**2.3578**	**5.2800e-003**	**0.2054**	**0.1285**	**0.3339**	**0.0645**	**0.1214**	**0.1859**	**0.0000**	**473.0836**	**473.0836**	**0.0710**	**0.0000**	**474.8580**

	ROG	NOx	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**	**15.55**	**0.00**	**10.28**	**24.14**	**0.00**	**9.78**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**4-1-2019**	**6-30-2019**	0.9052	0.9052
2	**7-1-2019**	**9-30-2019**	1.0174	1.0174
3	**10-1-2019**	**12-31-2019**	1.1436	1.1436
4	**1-1-2020**	**3-31-2020**	1.3347	1.3347
5	**4-1-2020**	**6-30-2020**	0.6645	0.6645
		Highest	1.3347	1.3347

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3128	0.0105	0.9120	5.0000e-005		5.0100e-003	5.0100e-003		5.0100e-003	5.0100e-003	0.0000	1.4852	1.4852	1.4500e-003	0.0000	1.5216
Energy	7.0200e-003	0.0600	0.0255	3.8000e-004		4.8500e-003	4.8500e-003		4.8500e-003	4.8500e-003	0.0000	202.5418	202.5418	6.8300e-003	2.4100e-003	203.4307
Mobile	0.1283	0.7237	1.7605	6.0800e-003	0.4838	6.1800e-003	0.4900	0.1297	5.8100e-003	0.1355	0.0000	560.4473	560.4473	0.0286	0.0000	561.1624
Waste						0.0000	0.0000		0.0000	0.0000	16.3002	0.0000	16.3002	0.9633	0.0000	40.3830
Water						0.0000	0.0000		0.0000	0.0000	1.8190	36.5826	38.4016	0.1883	4.7200e-003	44.5177
Total	**0.4481**	**0.7942**	**2.6980**	**6.5100e-003**	**0.4838**	**0.0160**	**0.4999**	**0.1297**	**0.0157**	**0.1453**	**18.1192**	**801.0569**	**819.1760**	**1.1885**	**7.1300e-003**	**851.0154**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.3128	0.0105	0.9120	5.0000e-005		5.0100e-003	5.0100e-003		5.0100e-003	5.0100e-003	0.0000	1.4852	1.4852	1.4500e-003	0.0000	1.5216
Energy	7.0200e-003	0.0600	0.0255	3.8000e-004		4.8500e-003	4.8500e-003		4.8500e-003	4.8500e-003	0.0000	202.5418	202.5418	6.8300e-003	2.4100e-003	203.4307
Mobile	0.1283	0.7237	1.7605	6.0800e-003	0.4838	6.1800e-003	0.4900	0.1297	5.8100e-003	0.1355	0.0000	560.4473	560.4473	0.0286	0.0000	561.1624
Waste						0.0000	0.0000		0.0000	0.0000	16.3002	0.0000	16.3002	0.9633	0.0000	40.3830
Water						0.0000	0.0000		0.0000	0.0000	1.8190	36.5826	38.4016	0.1883	4.7200e-003	44.5177
Total	**0.4481**	**0.7942**	**2.6980**	**6.5100e-003**	**0.4838**	**0.0160**	**0.4999**	**0.1297**	**0.0157**	**0.1453**	**18.1192**	**801.0569**	**819.1760**	**1.1885**	**7.1300e-003**	**851.0154**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	4/8/2019	4/12/2019	7	5	
2	Grading	Grading	4/13/2019	5/12/2019	7	30	
3	Building Construction	Building Construction	5/13/2019	6/5/2020	7	390	
4	Paving	Paving	12/1/2019	12/15/2019	7	15	
5	Architectural Coating	Architectural Coating	1/1/2020	3/30/2020	7	90	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 15

Acres of Paving: 2.96

Residential Indoor: 178,200; Residential Outdoor: 59,400; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 6,870 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Grading	Excavators	1	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Cement and Mortar Mixers	0	8.00	9	0.56
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	2	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	3	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	111.00	28.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	20.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	22.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1600e-003	0.0117	0.0115	2.0000e-005		7.8000e-004	7.8000e-004		7.2000e-004	7.2000e-004	0.0000	1.3950	1.3950	4.4000e-004	0.0000	1.4060
Total	**1.1600e-003**	**0.0117**	**0.0115**	**2.0000e-005**	**0.0000**	**7.8000e-004**	**7.8000e-004**	**0.0000**	**7.2000e-004**	**7.2000e-004**	**0.0000**	**1.3950**	**1.3950**	**4.4000e-004**	**0.0000**	**1.4060**

3.2 Site Preparation - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.7000e-004	1.8800e-003	1.0000e-005	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4587	0.4587	1.0000e-005	0.0000	0.4590
Total	**2.2000e-004**	**1.7000e-004**	**1.8800e-003**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4587**	**0.4587**	**1.0000e-005**	**0.0000**	**0.4590**

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					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1600e-003	0.0117	0.0115	2.0000e-005		7.8000e-004	7.8000e-004		7.2000e-004	7.2000e-004	0.0000	1.3950	1.3950	4.4000e-004	0.0000	1.4060
Total	**1.1600e-003**	**0.0117**	**0.0115**	**2.0000e-005**	**0.0000**	**7.8000e-004**	**7.8000e-004**	**0.0000**	**7.2000e-004**	**7.2000e-004**	**0.0000**	**1.3950**	**1.3950**	**4.4000e-004**	**0.0000**	**1.4060**

3.2 Site Preparation - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.2000e-004	1.7000e-004	1.8800e-003	1.0000e-005	4.9000e-004	0.0000	5.0000e-004	1.3000e-004	0.0000	1.3000e-004	0.0000	0.4587	0.4587	1.0000e-005	0.0000	0.4590
Total	**2.2000e-004**	**1.7000e-004**	**1.8800e-003**	**1.0000e-005**	**4.9000e-004**	**0.0000**	**5.0000e-004**	**1.3000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.4587**	**0.4587**	**1.0000e-005**	**0.0000**	**0.4590**

3.3 Grading - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0983	0.0000	0.0983	0.0505	0.0000	0.0505	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0282	0.3200	0.1408	3.0000e-004		0.0139	0.0139		0.0128	0.0128	0.0000	27.4085	27.4085	8.6700e-003	0.0000	27.6253
Total	**0.0282**	**0.3200**	**0.1408**	**3.0000e-004**	**0.0983**	**0.0139**	**0.1122**	**0.0505**	**0.0128**	**0.0633**	**0.0000**	**27.4085**	**27.4085**	**8.6700e-003**	**0.0000**	**27.6253**

3.3 Grading - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0900e-003	8.6000e-004	9.3800e-003	3.0000e-005	2.4700e-003	2.0000e-005	2.4900e-003	6.6000e-004	2.0000e-005	6.7000e-004	0.0000	2.2934	2.2934	7.0000e-005	0.0000	2.2952
Total	**1.0900e-003**	**8.6000e-004**	**9.3800e-003**	**3.0000e-005**	**2.4700e-003**	**2.0000e-005**	**2.4900e-003**	**6.6000e-004**	**2.0000e-005**	**6.7000e-004**	**0.0000**	**2.2934**	**2.2934**	**7.0000e-005**	**0.0000**	**2.2952**

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					0.0383	0.0000	0.0383	0.0197	0.0000	0.0197	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0282	0.3200	0.1408	3.0000e-004		0.0139	0.0139		0.0128	0.0128	0.0000	27.4085	27.4085	8.6700e-003	0.0000	27.6253
Total	**0.0282**	**0.3200**	**0.1408**	**3.0000e-004**	**0.0383**	**0.0139**	**0.0523**	**0.0197**	**0.0128**	**0.0325**	**0.0000**	**27.4085**	**27.4085**	**8.6700e-003**	**0.0000**	**27.6253**

3.3 Grading - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0900e-003	8.6000e-004	9.3800e-003	3.0000e-005	2.4700e-003	2.0000e-005	2.4900e-003	6.6000e-004	2.0000e-005	6.7000e-004	0.0000	2.2934	2.2934	7.0000e-005	0.0000	2.2952
Total	**1.0900e-003**	**8.6000e-004**	**9.3800e-003**	**3.0000e-005**	**2.4700e-003**	**2.0000e-005**	**2.4900e-003**	**6.6000e-004**	**2.0000e-005**	**6.7000e-004**	**0.0000**	**2.2934**	**2.2934**	**7.0000e-005**	**0.0000**	**2.2952**

3.4 Building Construction - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2096	1.8738	1.4479	2.4600e-003		0.1039	0.1039		0.0987	0.0987	0.0000	213.1503	213.1503	0.0475	0.0000	214.3379
Total	**0.2096**	**1.8738**	**1.4479**	**2.4600e-003**		**0.1039**	**0.1039**		**0.0987**	**0.0987**	**0.0000**	**213.1503**	**213.1503**	**0.0475**	**0.0000**	**214.3379**

3.4 Building Construction - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0128	0.3804	0.0954	8.4000e-004	0.0206	2.4900e-003	0.0231	5.9300e-003	2.3800e-003	8.3100e-003	0.0000	80.7577	80.7577	5.5900e-003	0.0000	80.8974
Worker	0.0625	0.0496	0.5392	1.4600e-003	0.1419	1.1200e-003	0.1430	0.0377	1.0400e-003	0.0387	0.0000	131.8098	131.8098	4.1200e-003	0.0000	131.9128
Total	**0.0753**	**0.4300**	**0.6345**	**2.3000e-003**	**0.1624**	**3.6100e-003**	**0.1661**	**0.0436**	**3.4200e-003**	**0.0470**	**0.0000**	**212.5674**	**212.5674**	**9.7100e-003**	**0.0000**	**212.8101**

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	0.2096	1.8738	1.4479	2.4600e-003		0.1039	0.1039		0.0987	0.0987	0.0000	213.1500	213.1500	0.0475	0.0000	214.3376
Total	**0.2096**	**1.8738**	**1.4479**	**2.4600e-003**		**0.1039**	**0.1039**		**0.0987**	**0.0987**	**0.0000**	**213.1500**	**213.1500**	**0.0475**	**0.0000**	**214.3376**

3.4 Building Construction - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0128	0.3804	0.0954	8.4000e-004	0.0206	2.4900e-003	0.0231	5.9300e-003	2.3800e-003	8.3100e-003	0.0000	80.7577	80.7577	5.5900e-003	0.0000	80.8974
Worker	0.0625	0.0496	0.5392	1.4600e-003	0.1419	1.1200e-003	0.1430	0.0377	1.0400e-003	0.0387	0.0000	131.8098	131.8098	4.1200e-003	0.0000	131.9128
Total	**0.0753**	**0.4300**	**0.6345**	**2.3000e-003**	**0.1624**	**3.6100e-003**	**0.1661**	**0.0436**	**3.4200e-003**	**0.0470**	**0.0000**	**212.5674**	**212.5674**	**9.7100e-003**	**0.0000**	**212.8101**

3.4 Building Construction - 2020

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	0.1267	1.1502	0.9536	1.6600e-003		0.0606	0.0606		0.0575	0.0575	0.0000	141.7756	141.7756	0.0314	0.0000	142.5608
Total	**0.1267**	**1.1502**	**0.9536**	**1.6600e-003**		**0.0606**	**0.0606**		**0.0575**	**0.0575**	**0.0000**	**141.7756**	**141.7756**	**0.0314**	**0.0000**	**142.5608**

3.4 Building Construction - 2020

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	7.3600e-003	0.2346	0.0581	5.6000e-004	0.0139	1.1500e-003	0.0150	4.0000e-003	1.1000e-003	5.1000e-003	0.0000	54.0602	54.0602	3.5500e-003	0.0000	54.1490
Worker	0.0389	0.0298	0.3300	9.5000e-004	0.0956	7.4000e-004	0.0963	0.0254	6.8000e-004	0.0261	0.0000	86.0603	86.0603	2.4700e-003	0.0000	86.1220
Total	**0.0463**	**0.2644**	**0.3881**	**1.5100e-003**	**0.1095**	**1.8900e-003**	**0.1113**	**0.0294**	**1.7800e-003**	**0.0312**	**0.0000**	**140.1205**	**140.1205**	**6.0200e-003**	**0.0000**	**140.2710**

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	0.1267	1.1502	0.9536	1.6600e-003		0.0606	0.0606		0.0575	0.0575	0.0000	141.7754	141.7754	0.0314	0.0000	142.5606
Total	**0.1267**	**1.1502**	**0.9536**	**1.6600e-003**		**0.0606**	**0.0606**		**0.0575**	**0.0575**	**0.0000**	**141.7754**	**141.7754**	**0.0314**	**0.0000**	**142.5606**

3.4 Building Construction - 2020

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	7.3600e-003	0.2346	0.0581	5.6000e-004	0.0139	1.1500e-003	0.0150	4.0000e-003	1.1000e-003	5.1000e-003	0.0000	54.0602	54.0602	3.5500e-003	0.0000	54.1490
Worker	0.0389	0.0298	0.3300	9.5000e-004	0.0956	7.4000e-004	0.0963	0.0254	6.8000e-004	0.0261	0.0000	86.0603	86.0603	2.4700e-003	0.0000	86.1220
Total	**0.0463**	**0.2644**	**0.3881**	**1.5100e-003**	**0.1095**	**1.8900e-003**	**0.1113**	**0.0294**	**1.7800e-003**	**0.0312**	**0.0000**	**140.1205**	**140.1205**	**6.0200e-003**	**0.0000**	**140.2710**

3.5 Paving - 2019

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0105	0.1084	0.1055	1.6000e-004		6.2100e-003	6.2100e-003		5.7100e-003	5.7100e-003	0.0000	14.2817	14.2817	4.5200e-003	0.0000	14.3946
Paving	1.7800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0123**	**0.1084**	**0.1055**	**1.6000e-004**		**6.2100e-003**	**6.2100e-003**		**5.7100e-003**	**5.7100e-003**	**0.0000**	**14.2817**	**14.2817**	**4.5200e-003**	**0.0000**	**14.3946**

3.5 Paving - 2019

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2000e-004	5.8000e-004	6.2500e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.5289	1.5289	5.0000e-005	0.0000	1.5301
Total	**7.2000e-004**	**5.8000e-004**	**6.2500e-003**	**2.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.5289**	**1.5289**	**5.0000e-005**	**0.0000**	**1.5301**

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	0.0105	0.1084	0.1055	1.6000e-004		6.2100e-003	6.2100e-003		5.7100e-003	5.7100e-003	0.0000	14.2817	14.2817	4.5200e-003	0.0000	14.3946
Paving	1.7800e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0123**	**0.1084**	**0.1055**	**1.6000e-004**		**6.2100e-003**	**6.2100e-003**		**5.7100e-003**	**5.7100e-003**	**0.0000**	**14.2817**	**14.2817**	**4.5200e-003**	**0.0000**	**14.3946**

3.5 Paving - 2019

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.2000e-004	5.8000e-004	6.2500e-003	2.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.5289	1.5289	5.0000e-005	0.0000	1.5301
Total	**7.2000e-004**	**5.8000e-004**	**6.2500e-003**	**2.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.5289**	**1.5289**	**5.0000e-005**	**0.0000**	**1.5301**

3.6 Architectural Coating - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2912					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0145	0.1010	0.1099	1.8000e-004		6.6600e-003	6.6600e-003		6.6600e-003	6.6600e-003	0.0000	15.3195	15.3195	1.1900e-003	0.0000	15.3492
Total	**0.3058**	**0.1010**	**0.1099**	**1.8000e-004**		**6.6600e-003**	**6.6600e-003**		**6.6600e-003**	**6.6600e-003**	**0.0000**	**15.3195**	**15.3195**	**1.1900e-003**	**0.0000**	**15.3492**

3.6 Architectural Coating - 2020

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	4.4200e-003	3.3900e-003	0.0375	1.1000e-004	0.0109	8.0000e-005	0.0110	2.8800e-003	8.0000e-005	2.9600e-003	0.0000	9.7779	9.7779	2.8000e-004	0.0000	9.7849
Total	**4.4200e-003**	**3.3900e-003**	**0.0375**	**1.1000e-004**	**0.0109**	**8.0000e-005**	**0.0110**	**2.8800e-003**	**8.0000e-005**	**2.9600e-003**	**0.0000**	**9.7779**	**9.7779**	**2.8000e-004**	**0.0000**	**9.7849**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2912					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0145	0.1010	0.1099	1.8000e-004		6.6600e-003	6.6600e-003		6.6600e-003	6.6600e-003	0.0000	15.3195	15.3195	1.1900e-003	0.0000	15.3492
Total	**0.3058**	**0.1010**	**0.1099**	**1.8000e-004**		**6.6600e-003**	**6.6600e-003**		**6.6600e-003**	**6.6600e-003**	**0.0000**	**15.3195**	**15.3195**	**1.1900e-003**	**0.0000**	**15.3492**

3.6 Architectural Coating - 2020

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	4.4200e-003	3.3900e-003	0.0375	1.1000e-004	0.0109	8.0000e-005	0.0110	2.8800e-003	8.0000e-005	2.9600e-003	0.0000	9.7779	9.7779	2.8000e-004	0.0000	9.7849
Total	**4.4200e-003**	**3.3900e-003**	**0.0375**	**1.1000e-004**	**0.0109**	**8.0000e-005**	**0.0110**	**2.8800e-003**	**8.0000e-005**	**2.9600e-003**	**0.0000**	**9.7779**	**9.7779**	**2.8000e-004**	**0.0000**	**9.7849**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.1283	0.7237	1.7605	6.0800e-003	0.4838	6.1800e-003	0.4900	0.1297	5.8100e-003	0.1355	0.0000	560.4473	560.4473	0.0286	0.0000	561.1624
Unmitigated	0.1283	0.7237	1.7605	6.0800e-003	0.4838	6.1800e-003	0.4900	0.1297	5.8100e-003	0.1355	0.0000	560.4473	560.4473	0.0286	0.0000	561.1624

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Congregate Care (Assisted Living)	456.72	159.28	165.44	1,273,289	1,273,289
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Total	456.72	159.28	165.44	1,273,289	1,273,289

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
Congregate Care (Assisted	14.70	5.90	8.70	40.20	19.20	40.60	86	11	3
Other Non-Asphalt Surfaces	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0
Parking Lot	16.60	8.40	6.90	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Congregate Care (Assisted Living)	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Other Non-Asphalt Surfaces	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956
Parking Lot	0.547828	0.043645	0.199892	0.122290	0.016774	0.005862	0.020637	0.032653	0.002037	0.001944	0.004777	0.000705	0.000956

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	133.0686	133.0686	5.4900e-003	1.1400e-003	133.5446
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	133.0686	133.0686	5.4900e-003	1.1400e-003	133.5446
NaturalGas Mitigated	7.0200e-003	0.0600	0.0255	3.8000e-004		4.8500e-003	4.8500e-003		4.8500e-003	4.8500e-003	0.0000	69.4732	69.4732	1.3300e-003	1.2700e-003	69.8861
NaturalGas Unmitigated	7.0200e-003	0.0600	0.0255	3.8000e-004		4.8500e-003	4.8500e-003		4.8500e-003	4.8500e-003	0.0000	69.4732	69.4732	1.3300e-003	1.2700e-003	69.8861

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					
Congregate Care (Assisted Living)	1.30188e+006	7.0200e-003	0.0600	0.0255	3.8000e-004		4.8500e-003	4.8500e-003		4.8500e-003	4.8500e-003	0.0000	69.4732	69.4732	1.3300e-003	1.2700e-003	69.8861
Other Non-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
Parking Lot	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
Total		**7.0200e-003**	**0.0600**	**0.0255**	**3.8000e-004**		**4.8500e-003**	**4.8500e-003**		**4.8500e-003**	**4.8500e-003**	**0.0000**	**69.4732**	**69.4732**	**1.3300e-003**	**1.2700e-003**	**69.8861**

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					
Congregate Care (Assisted Living)	1.30188e+006	7.0200e-003	0.0600	0.0255	3.8000e-004		4.8500e-003	4.8500e-003		4.8500e-003	4.8500e-003	0.0000	69.4732	69.4732	1.3300e-003	1.2700e-003	69.8861
Other Non-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
Parking Lot	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
Total		**7.0200e-003**	**0.0600**	**0.0255**	**3.8000e-004**		**4.8500e-003**	**4.8500e-003**		**4.8500e-003**	**4.8500e-003**	**0.0000**	**69.4732**	**69.4732**	**1.3300e-003**	**1.2700e-003**	**69.8861**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Congregate Care (Assisted Living)	401958	128.0726	5.2900e-003	1.0900e-003	128.5308
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	15680	4.9960	2.1000e-004	4.0000e-005	5.0139
Total		**133.0686**	**5.5000e-003**	**1.1300e-003**	**133.5446**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Congregate Care (Assisted Living)	401958	128.0726	5.2900e-003	1.0900e-003	128.5308
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	15680	4.9960	2.1000e-004	4.0000e-005	5.0139
Total		**133.0686**	**5.5000e-003**	**1.1300e-003**	**133.5446**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.3128	0.0105	0.9120	5.0000e-005		5.0100e-003	5.0100e-003		5.0100e-003	5.0100e-003	0.0000	1.4852	1.4852	1.4500e-003	0.0000	1.5216
Unmitigated	0.3128	0.0105	0.9120	5.0000e-005		5.0100e-003	5.0100e-003		5.0100e-003	5.0100e-003	0.0000	1.4852	1.4852	1.4500e-003	0.0000	1.5216

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	0.0291					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2558					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	0.0279	0.0105	0.9120	5.0000e-005		5.0100e-003	5.0100e-003		5.0100e-003	5.0100e-003	0.0000	1.4852	1.4852	1.4500e-003	0.0000	1.5216
Total	**0.3128**	**0.0105**	**0.9120**	**5.0000e-005**		**5.0100e-003**	**5.0100e-003**		**5.0100e-003**	**5.0100e-003**	**0.0000**	**1.4852**	**1.4852**	**1.4500e-003**	**0.0000**	**1.5216**

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	0.0291					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.2558					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	0.0279	0.0105	0.9120	5.0000e-005		5.0100e-003	5.0100e-003		5.0100e-003	5.0100e-003	0.0000	1.4852	1.4852	1.4500e-003	0.0000	1.5216
Total	**0.3128**	**0.0105**	**0.9120**	**5.0000e-005**		**5.0100e-003**	**5.0100e-003**		**5.0100e-003**	**5.0100e-003**	**0.0000**	**1.4852**	**1.4852**	**1.4500e-003**	**0.0000**	**1.5216**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	38.4016	0.1883	4.7200e-003	44.5177
Unmitigated	38.4016	0.1883	4.7200e-003	44.5177

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Congregate Care (Assisted Living)	5.73355 / 3.61463	38.4016	0.1883	4.7200e-003	44.5177
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**38.4016**	**0.1883**	**4.7200e-003**	**44.5177**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Congregate Care (Assisted Living)	5.73355 / 3.61463	38.4016	0.1883	4.7200e-003	44.5177
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**38.4016**	**0.1883**	**4.7200e-003**	**44.5177**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	16.3002	0.9633	0.0000	40.3830
Unmitigated	16.3002	0.9633	0.0000	40.3830

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Congregate Care (Assisted Living)	80.3	16.3002	0.9633	0.0000	40.3830
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**16.3002**	**0.9633**	**0.0000**	**40.3830**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Congregate Care (Assisted Living)	80.3	16.3002	0.9633	0.0000	40.3830
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Total		**16.3002**	**0.9633**	**0.0000**	**40.3830**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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PHASE I AND LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT 25622 ALESSANDRO BOULEVARD, CITY OF MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA

Prepared For:

T&C INTERNATIONAL HEALTHCARE, INC.
1961 Scenic Ridge Drive
Chino Hills, California 91709

Project No. 11888.002

January 31, 2018

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

January 31, 2018

Project No. 11888.002

T&C International Healthcare, Inc.
1961 Scenic Ridge Drive
Chino Hills, California 91709

Attention: Mr. Zanwei Chen

**Subject: Phase I and Limited Phase II Environmental Site Assessment,
25622 Alessandro Boulevard,
City of Moreno Valley, Riverside County, California**

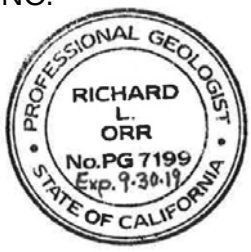
Leighton Consulting, Inc. (Leighton) is pleased to present this Phase I and Limited Phase II Environmental Site Assessment (ESA) for property located at 25622 Alessandro Boulevard in the city of Moreno Valley, Riverside County, California (subject site). Leighton declares that, to the best of our professional knowledge and belief, we meet the definition of Environmental Professional as defined in §312.10 of 40 Code of Federal Regulations (CFR) 312, and the ASTM International E1527-13.

Leighton has the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject site. Leighton has developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

If you have questions regarding this report, please contact us. We appreciate the opportunity to be of service to T&C International Healthcare, Inc.

Respectfully submitted,

LEIGHTON CONSULTING, INC.



Richard L. Orr, PG
Associate Geologist

Distribution: (3) Addressee and (1) PDF

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1.0 INTRODUCTION

1.1 Authorization

Leighton Consulting, Inc. (Leighton) performed a Phase I and Limited Phase II Environmental Site Assessment (ESA) of the property located at 25622 Alessandro Boulevard in the city of Moreno Valley, Riverside County, California (subject site – Figure 1) in accordance with the authorization of T&C International Healthcare, Inc. (T&C).

1.2 Purpose

The purpose of the Phase I ESA was to identify, to the extent feasible and pursuant to the processes prescribed in ASTM International (ASTM) E1527-13, recognized environmental conditions (RECs), historical RECs (HRECs), or controlled RECs (CRECs) in connection with the subject site.

RECs are defined, according to ASTM E1527-13 as "*the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to any release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. De minimis conditions are not RECs.*"

HRECs are defined, according to ASTM E1527-13 as "*a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted use criteria established by a regulatory authority, without subjecting the property to any required controls.*"

CRECs are defined, according to ASTM E1527-13 as "*a REC resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls.*" (ASTM E1527-13, 2013).

The purpose of the Limited Phase II ESA was to assess the potential impacts from the soil stockpiles of unknown origin and composition, observed in the northwestern and southeastern areas of the subject site.

1.3 Scope of Work

The scope of work was performed in accordance with Leighton's Phase I ESA proposal, dated January 8, 2018. The proposal included the following tasks:

- A reconnaissance-level visit of the subject site for evidence of the release(s) of hazardous materials and petroleum products and to assess the potential for onsite releases of hazardous materials and petroleum products;
- Records review (including review of previous environmental reports, selected governmental databases, and historical review);
- Interviews;
- Collection of soil samples from eleven soil borings located throughout the subject site and analysis of select soil samples for arsenic, lead, organochlorine pesticides (OCPs), and polynuclear aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs) and Title 22 CAM 17 Metals;
- Preparation of a report presenting our findings.

1.4 Significant Assumptions

Leighton assumes that the purpose of this Phase I and Limited Phase II ESA is to provide appropriate inquiry into the previous ownership and use of the subject site so that the Client may qualify for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) landowner liability protections as defined in CERCLA, 42 USC §9601(35)(B). Leighton also assumes that the information provided by the Client and its agents, regulatory database provider, and regulatory agencies is true and reliable.

1.5 Limitations and Exceptions

Leighton performed the Phase I ESA in conformance with the scope and limitations of ASTM Practice E1527-13 of the subject site. Other than the non-scope items shown in Section 1.6 that were not applicable, there were no exceptions to, or deletions from, this practice.

Property specific activities performed by Leighton and information collected regarding these activities are summarized within this report. The findings of the

Phase I and Limited Phase II ESA are presented in Section 8.0. Opinions, and conclusions drawn by Leighton, based on the information collected as part of the Phase I and Limited Phase II ESA, are presented in Sections 9.0 and 10.0, respectively. References are included as Appendix A. Subject site photographs are presented in Appendix B. Completed interview forms are included as Appendix C. An Environmental Lien and Activity and Use Limitations (AUL) report is included in Appendix D. The Environmental Radius Report is included as Appendix E. Regulatory requests and documentation is provided in Appendix F. Historical documentation is provided in Appendix G. The laboratory reports, including the chain-of-custody forms, are included in Appendix H.

This Phase I and Limited Phase II ESA was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions.

The observations and conclusions presented in this report are professional opinions based on the scope of activities, work schedule, and information obtained through the Phase I and Limited Phase II ESA described herein. Opinions presented herein apply to property conditions existing at the time of our study and cannot necessarily be taken to apply to property conditions or changes that we are not aware of or have not had the opportunity to evaluate. It must be recognized that conclusions drawn from these data are limited to the amount, type, distribution, and integrity of the information collected at the time of the investigation, the methods utilized to collect and evaluate the data, and that a full and complete determination of environmental risks cannot be made. Although Leighton has taken steps to obtain true copies of available information, we make no representation or warranty with respect to the accuracy or completeness of this information.

This practice does not address whether requirements in addition to all appropriate inquiry have been met in order to qualify for the landowner liability protections including the continuing obligation not to impede the integrity and effectiveness of activity and use limitations, or the duty to take reasonable steps to prevent releases, or the duty to comply with legally required release reporting obligations. Users should also be aware that there are likely to be other legal obligations with regard to hazardous substances or petroleum products discovered on the subject site that are not addressed in this practice and that may pose risks of civil and/or criminal sanctions for non-compliance.

1.6 Special Terms and Conditions

The scope of work for this Phase I and Limited Phase II ESA did not include testing of electrical equipment for the presence of polychlorinated biphenyls (PCBs) or collection of other environmental samples such as air, water, building materials, paint, or other media, other than those described in Section 7.0; assessment of natural hazards such as naturally occurring asbestos, radon gas or methane gas; assessment of the potential presence of radionuclides; or assessment of nonchemical hazards such as the potential for damage from earthquakes or floods, or the presence of endangered species or wildlife habitats. This Phase I and Limited Phase II ESA also did not include an extensive assessment of the environmental compliance status of the subject site or of businesses operating at the subject site or a health-based risk assessment.

1.7 User Reliance

This report is for the exclusive use of T&C, their lender, the County of Riverside and T&C's consultants. Use of this report by another party shall be at such party's sole risk.

1.8 Important Information about Geoenvironmental Reports

T&C is referred to Appendix I regarding important information provided by Geoprofessional Business Association (GBA) on geoenvironmental studies and reports.

2.0 SITE DESCRIPTION

2.1 Location and Legal Description

The subject site is located northeast of the intersection of Riverside Drive and Pipeline Avenue, at the address of 25622 Alessandro Boulevard in the city of Moreno Valley, Riverside County, California (Figure 1). The Riverside County Assessor's office designated the subject site as Assessor Parcel Number (APN) 479-230-018-6.

2.2 Subject Site and Vicinity General Characteristics

The subject site vicinity is generally developed for residential and commercial purposes.

2.3 Current Use of the Subject Site

The subject site is comprised of approximately 4.54 acres of vacant land (Appendix B, Photos 1 through 11).

2.4 Structures, Roads and Other Improvements on the Subject Site

No structures, roads, or other improvements are located onsite. The following utilities provide, or will provide, service to the subject site:

Natural Gas	:	Southern California Gas Company
Source of Potable Water	:	Eastern Municipal Water District
Electric	:	Moreno Valley Electric Utility
Sewage Disposal	:	Eastern Municipal Water District
Solid Waste Disposal	:	Waste Management Inland Valley

2.5 Current Uses of Adjoining Properties

The subject site is bordered by a storm water channel to the north followed by a single family residences, and a Moreno Valley Unified School District office building and an Allstate Insurance building to the east. The subject site is bordered by the Excel Prep Academy to the west and Alessandro Boulevard to the south followed by vacant land and New Horizon Mobile Home Park to the southeast.

3.0 USER PROVIDED INFORMATION

The user of this Phase I ESA is identified as T&C International Healthcare, Inc. (T&C). As a part of the ASTM E1527-13 process, Mr. William Chu, with T&C, completed a questionnaire regarding the subject site. A copy of this questionnaire is provided in Appendix C.

3.1 Environmental Liens or Activity and Use Limitations

Leighton reviewed the Environmental Lien and Activity and Use Limitation (AUL) Search report prepared by EDR on January 16, 2018. According to the report, no environmental liens or AULs were found for the subject site. A copy of the Environmental Lien and AUL Search report is provided in Appendix D.

3.2 Specialized Knowledge

Mr. Chu does not have specialized knowledge of the subject site or nearby properties.

3.3 Commonly Known or Reasonably Ascertainable Information

Mr. Chu is not aware of commonly known or reasonably ascertainable information related to the subject site.

3.4 Valuation Reduction for Environmental Issues

Mr. Chu indicated that the purchase price being paid for the subject site is based on fair market value.

3.5 Owner, Property Manager, and Occupant Information

The subject site is currently vacant land therefore no occupant was interviewed. Owner information is provided in Section 6.0.

3.6 Reason for Performing Phase I ESA

According to Mr. Chu, the reason for requesting this Phase I ESA was for property purchase and the future development of the property for a potential skilled nursing facility.

3.7 Other

Previous environmental assessments completed by others for the subject site were not provided by T&C.

4.0 RECORDS REVIEW

4.1 Physical Setting Source(s)

Leighton reviewed pertinent maps and readily available literature for information on the physiography and hydrogeology of the subject site. A summary of this information is presented in the following subsections.

4.1.1 Topography

The subject site is located in Section 8 of Township 3 South, Range 3 West of the San Bernardino Baseline and Meridian. Topographic map coverage of the subject site vicinity is provided by the United States Geological Survey (USGS) Sunnymead (2012) map. The elevation of the subject site is approximately 1,571 feet above mean sea level and topography is relatively flat, sloping gently to the southwest.

4.1.2 Surface Water

No surface water was observed onsite or on the surrounding properties during the subject site reconnaissance. A storm water channel is located along the northern border of the subject site.

4.1.3 Geology and Soils

The subject property is located within the Perris Block of the Peninsular Ranges Geomorphic Province, a tectonic region bounded by Cucamonga-Sierra Madre fault and the San Gabriel/San Bernardino Mountains to the north, the San Jacinto and Rialto-Colton faults to the east and the Elsinore and Chino faults to the west. The block is characterized by relatively shallow alluvial basins and low seismic activity in comparison with the surrounding regions.

Based on the concurrent Geotechnical Engineering and Geologic Hazard report completed by Leighton, the soils encountered in all of the borings and test pits were Quaternary-age alluvial soils consisting of silty sands and sandy silts with varying amounts of gravel (Leighton, 2018). San Timoteo Canyon formation was encountered at depths of approximately 45 and 35 feet below the ground surface (bgs) and the formation material

appeared to be very weathered and consisted of silty sand with varying amounts of gravel (Leighton, 2018).

4.1.4 Hydrogeology

The subject site is situated within the Perris Valley hydrologic sub-unit of the San Jacinto Hydrogeologic Unit (Regional Water Quality Control Board, Santa Ana Region [RWQCB], 1995).

No standing or surface water was observed on the site at the time of our field exploration. Groundwater was not encountered during this investigation or in the previous investigation (Ninyo & Moore, 2009). Historic groundwater data, as indicated on the Department of Water Resources website for well number 339556N1171791W001, located approximately 0.5 miles northwest of the site, reflect a groundwater elevation of 1,680 feet (about 240 feet bgs) in April 2015. Groundwater flow direction is assumed to flow to the southwest generally following topography.

4.1.5 Oil and Gas Fields

Leighton reviewed the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR), Online Mapping System, on January 12, 2018. No oil and gas wells were identified on the subject site and surrounding properties.

4.2 Standard Environmental Record Sources

A search of selected government databases was conducted by Leighton using the EDR Radius Report environmental database report system. Details and descriptions of the database search are provided in the EDR report. The report meets the government records search requirements of ASTM E1527-13 Standard Practice for Environmental Property Assessments: Phase I Environmental Property Assessment Process. The database listings were reviewed within the specified radii established by the ASTM E1527-13. A copy of this report is included in Appendix E.

4.2.1 Subject Property

The subject site was not identified in the EDR database report.

4.2.2 Offsite

Information in the environmental database report was reviewed for facilities of potential environmental concern to the subject site. The State Water Resources Control Board (SWRCB) Geotracker website and the Department of Toxic Substance Control (DTSC) Envirostor website were used to supplement the information in the database report.

Proposed Alessandro administration building expansion, located approximately 0.134 miles east of the subject site, was listed on ENVIROSTOR database provided by the Department of Toxic Substances Control (DTSC). According to the EDR report, a Preliminary Environmental Assessment (PEA) completed by The Planning Center (TPC) on October 17, 2009, of the property identified the past use of the property for agricultural purposes and soil stockpiles from an unknown source were observed on the property. According to the PEA the soil samples collected onsite and from the stockpiles were analyzed for Title 22 Metals (metals), organochlorine pesticides (OCPs), volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and polychlorinated biphenyls (PCBs). According to TPC, the concentrations of metals and pesticides detected within onsite soils were below regulatory screening levels. No concentrations of VOCs, SVOCs, and PCBs were detected above the laboratory reporting limit (TPC, 2008). No leaks or violations were reported for this facility. Based on the results of the PEA soil sampling activities there is a low potential for this facility to adversely affect the subject site.

Sunnymead District Maintenance yard, located 0.478 miles northwest of the subject site, at 25241 Cottonwood Avenue, was listed on the LUST and Hist Cortese databases. Records reviewed on Geotracker from the County of Riverside Health Services Agency stated that two underground storage tanks (USTs) consisting of one 3,000-gallon diesel tank and one 10,000-gallon tank, were removed from the property in September of 2005. A minor leak was detected at the south end of the larger tank. Soil samples were collected after the tanks were removed and the reported concentrations of total petroleum hydrocarbons (TPH), lead, benzene and Methyl *tert*-butyl ether (MTBE). Due to the distance of this facility to the subject site and that is it cross-gradient from the subject site there is a low potential for this property to adversely affect the subject site.

The remaining listings in the EDR database report were reviewed and not interpreted to represent an adverse effect to the subject site at the time of this report preparation based on one or more of the following:

- Closure received from regulatory agency;
- Distance of the facility to the subject site; and
- Direction of groundwater flow (west-southwest) and location of the facility to the subject site (down-gradient).

4.2.3 Vapor Encroachment

Leighton reviewed the Vapor Encroachment Screen (VES) produced using EDR's Vapor Encroachment Worksheet application that gathers regulatory database information from the accompanying Radius Report and allows the user to integrate groundwater information, regional geology, and other information to evaluate the concern for potential vapor encroachment from onsite activities and from adjacent properties. The VES application was designed by EDR to assist parties seeking to meet the search requirements of the ASTM Standard Practice for Assessment of Vapor Encroachment into Structures on Property Involved in Real Estate Transactions (E2600-10), also referred to as the Tier 1 VES, as defined by ASTM E2600-10.

No offsite database listings with potential to negatively impact the subject site were identified near the subject site; therefore, vapor encroachment is not considered a REC. A copy of the VES report has been included as Appendix E.

4.2.4 Regulatory Agency Contacts

Leighton requested regulatory records for the APN associated with the subject site. The following agencies were contacted or their respective online databases were researched:

- Department of Toxic Substances Control (DTSC);
- National Pipeline Mapping System (NPMS);
- South Coast Air Quality Management District (SCAQMD); and
- State Water Resources Control Board (SWRCB).

Records were not found for the subject site.

4.2.5 Other Reports

Leighton was not provided with other reports to review.

4.3 Historical Use Information on the Property

Leighton reviewed selected historical information on the subject site. These references were reviewed for evidence of activities, which would suggest the presence of hazardous substances at the subject site and to evaluate the potential for the subject site to be impacted by offsite sources of contamination. The following paragraphs are a chronological summary of the review.

4.3.1 Aerial Photographs

Historical aerial photographs were reviewed for information regarding past subject site uses. Aerial photographs dated 1938, 1949, 1953, 1967, 1978, 1985, 1989, 1997, 2002, 2005, 2006 2009, 2010, and 2012, provided by EDR, were reviewed. Copies of these photographs are included in Appendix G.

In the **1938** aerial photograph, the majority of the subject site and the western and eastern adjacent properties were observed to be fallow agricultural fields. Residential and out buildings were observed in the southeastern corner of the subject site. The northern and southern adjacent properties were observed to have been cleared of vegetation. Residential buildings were observed in the southwestern corner of the western adjacent property. Alessandro Blvd was observed to be a dirt road along the southern border of the subject site.

In the **1949** and **1952** aerial photographs, residential structures were observed in the southwestern area of the subject site. The subject site and the surrounding properties were observed to be dry farmed. Rural residential housing was observed within the southern adjacent property. A white rectangular building was observed within the eastern adjacent property. Alessandro Blvd was observed to be a paved road along the southern border of the subject site.

In the **1967** aerial photograph, significant changes were not observed with the subject site and the surrounding properties with the exception of additional structures observed within the southern adjacent property.

In the **1978** aerial photograph, the eastern portion of the subject site was observed to have been incorporated into the eastern adjacent property which was observed to contain several farm buildings within the central area of the property. Animal corrals and stockyards were observed in the central and northern areas of the eastern adjacent property. The buildings previously observed in the southeastern corner of the subject sire were no longer observed. No significant changes were observed on the northern, western and southern adjacent properties with the exception of the. The New Horizon Mobile Home residential community was observed in the southeastern adjacent property.

In the **1985** aerial photograph, significant changes were not observed with the subject site or the northern, eastern and southern adjacent properties. The Excel Prep Charter School was observed under construction, within the western adjacent property.

In the **1989** aerial photograph, the subject site was observed to be vacant land. The eastern area of the subject site was observed to have been graded along with the majority of the eastern adjacent property. Commercial buildings were observed in the southern area of the eastern adjacent property adjacent to Alessandro Boulevard. A paved storm water channel was observed along the northern border of the subject site followed by residential housing. The Excel Prep Charter School was observed complete and in its present day configuration within the western adjacent property. The southern adjacent property was observed to be vacant land.

In the **1997** and **2002** aerial photographs, the subject site was observed to be vacant land. Several stockpiles were observed in northwestern and southeastern areas of the subject site. Commercial buildings and associated parking lots were observed within the eastern adjacent property in their present day configuration. No significant changes were observed with the northern, western, and southern adjacent properties.

In the **2005, 2006, 2009, 2010** and **2102** aerial photographs, significant changes were not observed with the subject site or the surrounding properties which were observed in their present day configurations.

4.3.2 Historical Topographic Maps

Historical topographic maps provided in the EDR Historical Topographic Map Report were reviewed for information regarding past subject site uses, and include the following quadrangles: Elsinore (1901), Perris (1942 and 1943), and Sunnymead (1953, 1967, 1973, 1980 and 2012). Copies of these maps are provided in Appendix G.

Elsinore 1901: Structures, tanks, wells, or roads are not depicted on the subject site. Square structures were observed in the northern, eastern and southern adjacent properties.

Perris 1942 and 1943: One square structure was depicted in the southeastern area of the subject site. Alessandro Boulevard was depicted along the southern border of the subject site. Square structures were depicted in the eastern and southern adjacent properties. An unnamed creek was observed within the northern and eastern adjacent properties.

Sunnymead 1953, 1967 and 1973: No significant land use changes were depicted on the subject site and the adjacent properties, with the exception of the unnamed creek no longer depicted in the northern and eastern adjacent properties.

Sunnymead 1980: No significant land use changes are depicted on the subject site and the adjacent properties with the exception of a trailer park depicted in the southeastern adjacent property and additional structures depicted in the eastern adjacent property.

Sunnymead 2012: Only landmark structures are depicted on the topographic map. Alessandro Boulevard is depicted along the southern border of the subject site.

4.3.3 Fire Insurance Maps

Fire insurance maps, or Sanborn® maps, are detailed city plans showing building footprints, construction details, use of structure, street address, etc. The maps were designed to assist fire insurance agents in determining the degree of hazard associated with a particular property. Sanborn Maps were produced from approximately 1867 to the present for commercial, industrial, and residential sections of approximately 12,000 cities and towns in the United States.

According to the report by EDR, there is no Sanborn Fire Insurance Map coverage for the subject site. A copy of this report has been provided in Appendix G.

4.3.4 Historical City Directories

City Directories have been published for cities and towns across the US since the 1700s. Originally a list of residents, the City Directory developed into a tool for locating individuals and businesses in particular. For each street address listed, the directory recorded the name of the resident or business that operated from this addresses. While City Directory coverage is usually comprehensive for major cities, it may be sporadic for rural areas and small towns. The purpose of the City Directory research was to attempt to determine the businesses that were historically located at the subject site and adjacent addresses.

Leighton reviewed the EDR City Directory reports dated July 21, 2017 (Appendix G). Records were reviewed from 1975 to 2014 at approximate 5 year intervals. The address associated with the subject site, 25622 Alessandro Boulevard, was identified in the City Directory Report in the 1980 and 1985 directories. The listing Taylor C K was reported for the subject site in both the 1980 and 1985 directories.

Surrounding properties consisted of primarily residential, religious and commercial properties. Listings of environmental concern were not identified.

4.3.5 Other Historical Sources

Historical building permits for the address of 25622 Alessandro Boulevard were not available in the EDR Building Permits report or were not found from the Riverside County Department of Building and Safety. A response from the City of Moreno Valley has not been received as of the date of this report.

4.3.6 Summary of Historical Land Use

Based on historical records, land usage is summarized as follows:

Time Period	Land Usage	Reference
Prior to 1938	Unknown	None Available
Approximately 1938 to 1949	Agricultural Dry Farming	Aerial Photographs
Approximately 1949 to 1978	Agricultural Dry Farming and Residential associated structures (SE corner)	Aerial Photographs Topographic Maps
Approximately 1978 to present	Vacant land	Aerial Photographs Topographic Maps Interviews Site Reconnaissance

5.0 SITE RECONNAISSANCE

5.1 Methodology and Limiting Conditions

On January 15, 2018, a representative of Leighton conducted a reconnaissance–level assessment of the subject site, which consisted of observing and documenting existing conditions of the subject site and nature of the neighboring development. Photographs of the subject site are presented in Appendix B and their view directions are noted on Figure 2. Items noted during the subject site reconnaissance are also depicted on Figure 2.

5.2 General Property Setting

The subject site vicinity is generally developed for residential and commercial purposes.

The subject site is comprised of approximately 4.54 acres of vacant land (Photos 1 through 11, Appendix B). No structures, roads, or other improvements are located onsite.

5.3 Exterior and Interior Observations

5.3.1 Hazardous Substances, Drums, and Other Chemical Containers

No hazardous substances, drums, or other chemical containers were observed on the subject site.

5.3.2 Storage Tanks

Evidence of underground storage tanks (USTs) (such as vent lines, fill or overfill ports) and ASTs was not observed on the subject site.

5.3.3 Polychlorinated Biphenyls (PCBs)

PCBs were once used as industrial chemicals whose high stability contributed to both their commercial usefulness and their long-term deleterious environmental and health effects. PCBs can be present in coolants or lubricating oils used in older electrical transformers, hydraulic systems, and other similar equipment. In 1979, the US EPA generally

prohibited the domestic use of PCBs in electrical capacitors, electrical transformers, vacuum pumps, hydraulic pumps, and gas turbines.

Transformers were not observed on the subject site.

5.3.4 Waste Disposal

Evidence of waste disposal was not observed on the subject site.

5.3.5 Dumping

With the exception of the stockpiles located in the northwestern and southeastern areas of the subject site, evidence of dumping was not observed on the subject site (Photos 1 through 11, Appendix B).

5.3.6 Pits, Ponds, Lagoons, Septic Systems, Wastewater, Drains, Cisterns, and Sumps

Evidence of pits, ponds, lagoons, septic systems, wastewater, drains, sumps, and cisterns were not observed on the subject site.

5.3.7 Pesticide Use

Evidence of pesticide use and storage was not observed on the subject site.

5.3.8 Staining, Discolored Soils, Corrosion

Stained or discolored soil and/or corrosion were not observed on the subject site.

5.3.9 Stressed Vegetation

Evidence of stressed vegetation was not observed on the subject site.

5.3.10 Unusual Odors

Unusual odors were not detected on the subject site.

5.3.11 Onsite Wells

Evidence of onsite water, oil, or gas wells was not observed onsite.

5.3.12 Other Observations

No other observations were made during the site reconnaissance.

6.0 INTERVIEWS

Leighton conducted interviews with persons having knowledge of current or past subject site usage. Interviews were conducted either orally or in the form of a written questionnaire. Written responses are included as Appendix C.

6.1 Interview with Owner

A Phase I ESA Owner Interview form was completed by Mr. Wen Hua, representative of the owner of the subject site. Mr. Hua stated that the previous use of the subject site was vacant land. Mr. Hua was not aware of environmental concerns currently associated with the subject site or surrounding properties.

6.2 Interview with Site/Property Manager

Interviews with property managers, other than those noted in 6.1, were not conducted.

6.3 Interviews with Occupants

There are no known occupants associated with the subject site.

6.4 Interviews with Local Government Officials

Leighton did not interview employees with local government agencies to request information regarding historic and current uses of the subject site with the exception of those noted in Section 4.2.

6.5 Interviews with Others

Leighton did not conduct additional interviews for this Phase I ESA with the exception of the User interview discussed in Section 3.

7.0 LIMITED PHASE II ESA

On January 15, 2018, Leighton completed a limited Phase II ESA of the subject site based on the presence of soil stockpiles of unknown origin and composition, observed in the northwestern and southeastern areas of the subject site. The scope of work for the limited Phase II ESA is described below.

7.1 Pre-field Activities

Health and Safety Plan

Leighton prepared a site-specific Health and Safety Plan (HSP) for the field work to be performed. The HSP documented the safety aspects of the work and complied with Occupational Safety and Health Administration (OSHA) regulation 29 CFR 1910.120 and California Code of Regulations CCR 5192. The HSP was onsite with Leighton personnel at all times. The HSP outlined site procedures, potential hazards, and contained a hospital location map.

Utility Clearance

Underground Service Alert (USA) was contacted at least 48 hours prior to the commencement of fieldwork to mark underground utility locations. Each proposed boring location was clearly marked in white paint prior to contacting USA.

7.2 Field Activities

On January 15, 2018, seven soil samples were collected from representative stockpiles located on the subject site (S-1 through S-7). Soil samples were retained in laboratory-supplied 4-ounce glass jars, clearly marked with sample identification, placed in an ice-cooled chest for temporary storage, and transported to Enviro-Chem, Inc., a California Certified laboratory, located in Pomona, California, for chemical analysis.

7.3 Laboratory Analysis

The soil samples were analyzed for organochlorine pesticides (OCPs) by Environmental Protection Agency (EPA) Method 8081A, polychlorinated biphenyls (PCBs) by EPA Method 8082, polynuclear aromatic hydrocarbons (PAHs) EPA Method 8270C, volatile organic compounds (VOCs) EPA Method 5035/8260B, semi-volatile organic compounds (SVOCs) EPA Method 8270C ,

Title 22 Metals by EPA Method 6010B/7171A.

7.4 Results

The complete laboratory reports and chain-of-custody forms are included in Appendix H. A summary of laboratory results is presented in Table 1.

The soil analytical results were compared to one or more of the following regulatory screening criteria:

- November 2017 EPA Region 9 Regional Screening Levels (RSLs) for residential land use for OCPs and metals;
- DTSC Office of Human and Ecological Risk (HERO) Note Number 3 (DTSC, 2016) Screening Levels (SLs); and
- DTSC Southern California Background concentration of 12 mg/kg for arsenic only (DTSC, 2008); and
- DTSC background PAH concentrations described in DTSC Manufactured Gas Plant Site Cleanup Process (DTSC, 2009).

Arsenic was detected in the 7 soil samples analyzed at concentrations ranging from 0.833 milligram per kilogram (mg/kg) to 1.86 mg/kg. The detected concentrations of arsenic were above the US EPA RSL of 0.68 mg/kg and the DTSC Note 3 SL of 0.067 mg/kg for residential health risk screening. However, the detected concentrations were below the DTSC Southern California ambient background concentration of 12 mg/kg (DTSC, 2008).

OCPs were not detected at concentrations exceeding the laboratory method detection limit with the exception of 4,4'-DDE in soil samples S-1 through S-4, at concentrations ranging from 0.001 mg/kg to 0.025 mg/kg. The detected concentrations of 4,4'-DDE was below the US EPA RSL of 2.0 mg/kg.

SVOCs were not detected at concentrations exceeding the laboratory method detection limit with the exception of bis(2-ethylhexl) phthalate in soil samples S-5 and S-7, at concentrations ranging from 0.459J mg/kg and 0.341J mg/kg. The detected concentrations of (2-ethylhexl) phthalate were below the US EPA RSL of 39 mg/kg.

PCBs, VOCs, and PAHs were not detected at concentrations above the laboratory reporting limits.

8.0 FINDINGS

Leighton performed a Phase I and Limited Phase II ESA of property located at 25622 Alessandro Boulevard, Moreno Valley, Riverside County, California in accordance with T&C International Healthcare, Inc.'s authorization.

8.1 Onsite

Historically, the subject site was used primarily agricultural dry farming ad minor residential associated building on the southeast corner from at least 1938 until 1978, when the subject site was cleared of all buildings and vegetation.

Currently, the subject site is comprised of approximately 4.54 acres of vacant land (Appendix B, Photos 1 through 11).

A search of selected government databases was conducted by Leighton using the EDR Radius Report environmental database report system. Details of the database search along with descriptions of each database researched are provided in the EDR report. The report meets the government records search requirements of ASTM E1527-13 Standard Practice for Environmental Property Assessments: Phase I and Limited Phase II Environmental Property Assessment Process. The database listings were reviewed within the specified radii established by the ASTM E1527-13. The subject site was not identified in the EDR report. The EDR listings do not present a REC in connection with the subject site.

Based on the results of our concurrent limited Phase II ESA, the presence of PCBs, OCPs, PAHs, metals, VOCs and SVOCs were not detected in the soil samples at concentrations that pose a threat to human health and/or the environment.

8.2 Offsite

Historically, the adjacent properties were residential and agricultural land until the late-1960s when the primary purpose of the eastern adjacent property was a farm with animal stockyards and corrals. The eastern adjacent property was redeveloped for commercial purposes in the late-1980's. The primary purposes of the adjacent properties remained a mix of residential and commerical since the late-1980's and continues presently.

Currently, the subject site is bordered by a storm water channel to the north followed by a single family residences, and a Moreno Valley Unified School District office building and an Allstate Insurance building to the east. The subject site is bordered by the Excel Prep Academy to the west and Alessandro Boulevard to the south followed by vacant land and New Horizon Mobile Home Park to the southeast.

8.3 Data Gaps

The following data gap was identified by Leighton:

- A response to a record request sent to the City of Moreno Valley has not yet been received by Leighton.

This data gap is not likely to alter the conclusions and recommendations of this report. If records are obtained that do alter the conclusions and recommendations of this report, an addendum will be issued.

9.0 OPINION

9.1 Onsite

No RECs, HRECs, or CRECs were identified on the subject site. The site was formerly used for dry farming agricultural purposes and associated residential structures were present on the southeast corner of the site from before 1953 to after 1980. The eastern area of the subject site was previously graded during redevelopment of the eastern adjacent property and the soils generated from this were most likely stockpiled on the subject site. Leighton sampled these soils and the results from a limited Phase II ESA indicate the concentrations of pesticides, metals, VOCs, SVOCs, PCBs, PAHs are below the residential health risk screening levels and do not appear to pose a risk to future development.

9.2 Offsite

No offsite RECs, HRECs, or CRECs were identified that would negatively impact the subject site.

10.0 CONCLUSIONS

Leighton has performed a Phase I ESA in conformance with the scope and limitations of ASTM E1527-13 of the property located at 25622 Alessandro Boulevard in the city of Moreno Valley, Riverside County, California. Any exceptions to, or deletions from, this practice are described in Section 1.5 of this report. This assessment has revealed no evidence of RECs, CRECs, or HRECs associated with the subject site.

In general, observations should be made during future property development for areas of possible contamination such as, but not limited to, the presence of underground facilities, buried debris, waste drums, and tanks, stained soil or odorous soils. Should such materials be encountered, further investigation and analysis may be necessary at that time.

11.0 DEVIATIONS

Leighton did not deviate from or alter the scope of work, as defined in Section 1.3 of this report. Significant data gaps were not identified that affect the ability of Leighton to identify RECs at the subject site.

12.0 ADDITIONAL SERVICES

Leighton did not perform work outside the scope of work as defined in Section 1.3 and 1.6 of this report.

13.0 QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

13.1 Corporate

Leighton is a California corporation, providing geotechnical and environmental consulting services throughout California. We are solely a consulting firm without interests in real property other than our office locations in Southern California. We provide professional environmental consulting services including application of science and engineering to environmental compliance, hazardous materials/waste assessment and cleanup, and management of hazardous, solid and industrial waste. Phase I ESAs are a part of this practice area and have been conducted by us.

13.2 Individual

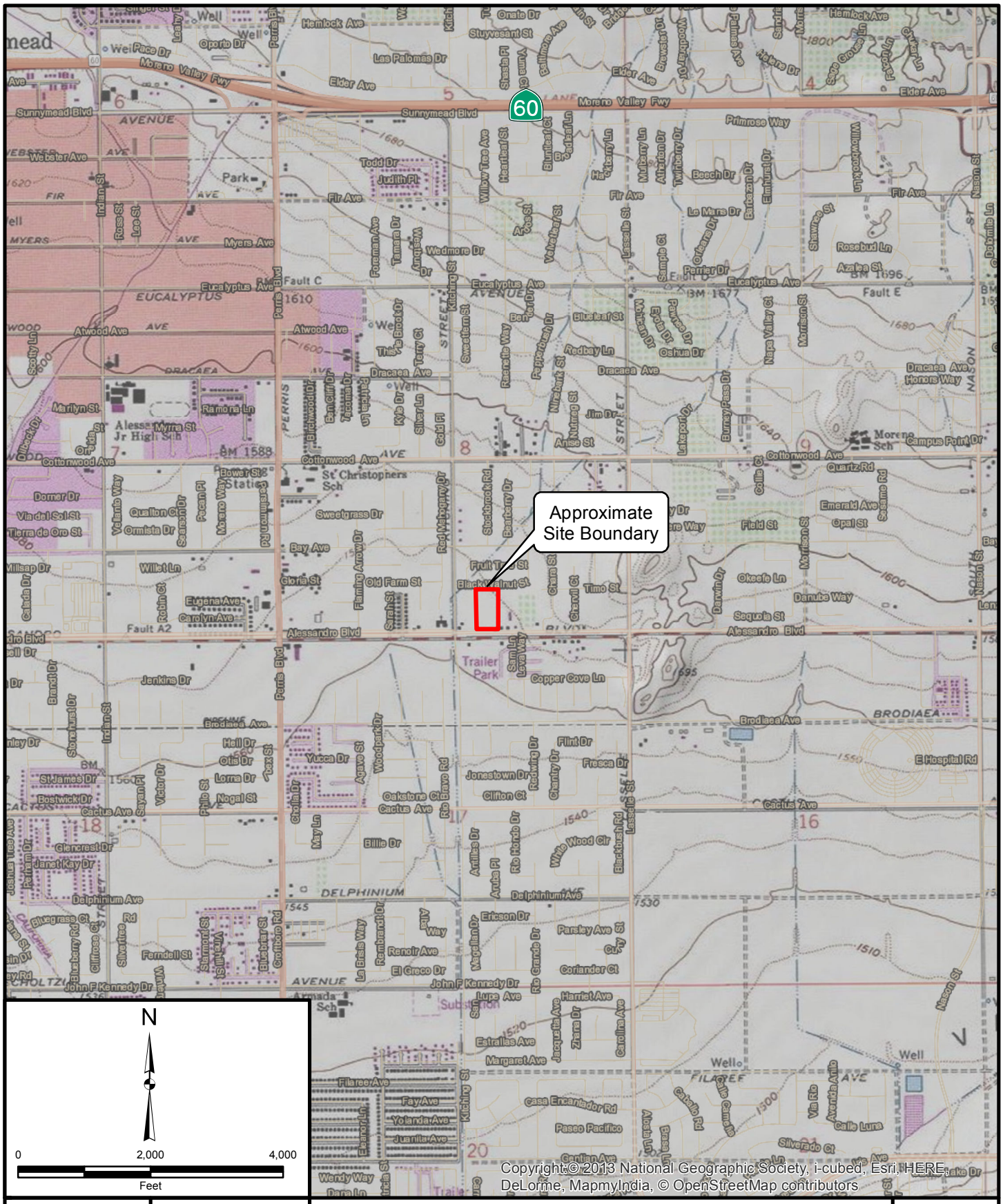
The qualifications of the Project Manager and the other Leighton environmental professionals involved in this Phase I and Limited Phase II ESA meet the Leighton corporate requirements for performing Phase I ESAs as specified by ASTM E1527-13. In addition, Mr. Richard L. Orr is an Environmental Professional as identified by ASTM E1527-13.

13.3 Environmental Professional Statement

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional, as defined by §312.10 of 40 CFR Part 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 site. I have developed and performed all the appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

Richard L. Orr P.G
Associate Geologist



N

0 2,000 4,000

Feet

Project: 11888.002	Eng/Geol: RLO
Scale: 1 " = 2,000 '	Date: January 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton
Author: Leighton Geomatics (mmurphy)

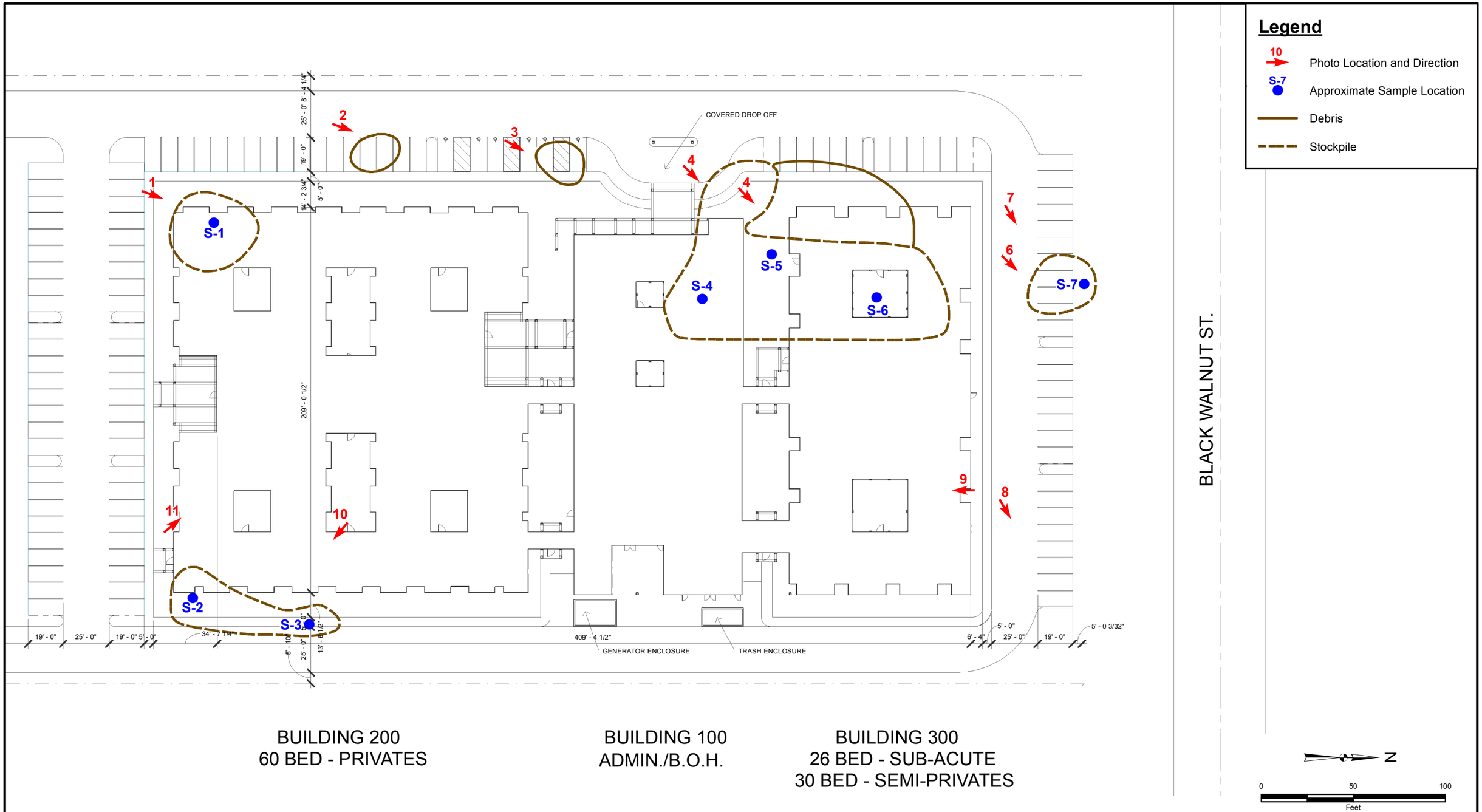
SITE LOCATION MAP

T&C Skilled Nursing Facility
Moreno Valley, California

Figure 1

Leighton

Map Saved as P:\Drafting\11888\002\Maps\11888-002_F01_SLM_2018-01-31.mxd on 1/31/2018 8:39:27 AM



Project: 11888.002	Eng/Geol: RLO
Scale: 1 " = 50 '	Date: January 2018
Base Map: Sheet SD-1 Overall Site Plan by Gregg Maedo & Associates, 12/22/2017.	
Author: (mmurphy)	

SITE PLAN

T&C Skilled Nursing Facility
Moreno Valley, California

Figure 2

Leighton

Map Saved as P:\Drafting\11888\002\Maps\11888-002_F02_SPPL_2018-01-30.mxd on 1/31/2018 8:36:39 AM

TABLE 1

Summary of Soil Analytical Results

25622 Alessandro Boulevard, Moreno Valley, Riverside County, California

Sample ID	Depth (feet bgs)	Sample Date	Matrix	Title 22 Metals (mg/kg)																	SVOCs (mg/kg)	OCPs (ug/kg)
				Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (Total)	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Bis(2-Ethylhexyl) Phthalate	4,4'-DDE
Stockpile Soil Samples																						
SS1	0.5	1/15/2018	soil	<1.0	**1.23**	**69.7**	<0.5	<0.5	**11.6**	**5.46**	**7.73**	**2.35**	<0.01	<5.0	**4.34**	<1.0	<1.0	<1.0	**25.5**	**30.8**	<0.50	**0.001**
SS2	0.5	1/15/2018	soil	<1.0	**0.991**	**95.2**	<0.5	<0.5	**11.6**	**6.41**	**7.82**	**2.37**	<0.01	<5.0	**2.34J**	<1.0	<1.0	<1.0	**28.6**	**32.1**	<0.50	**0.008**
SS3	0.5	1/15/2018	soil	<1.0	**1.10**	**105**	<0.5	<0.5	**12.8**	**6.78**	**9.48**	**6.30**	<0.01	<5.0	**2.60**	<1.0	<1.0	<1.0	**31.2**	**49.0**	<0.50	**0.025**
SS4	0.5	1/15/2018	soil	<1.0	**1.86**	**155**	<0.5	<0.5	**20**	**9.62**	**12.7**	**3.66**	<0.01	<5.0	**5.9**	<1.0	<1.0	<1.0	**46.2**	**56.7**	<0.50	**0.002**
SS5	0.5	1/15/2018	soil	<1.0	**1.76**	**93.2**	<0.5	<0.5	**14.8**	**7.32**	**9.97**	**4.46**	<0.01	<5.0	**0.018**	<1.0	<1.0	<1.0	**36.2**	**43.5**	**0.459J**	<0.001
SS6	0.5	1/15/2018	soil	<1.0	**0.833**	**66.4**	<0.5	<0.5	**9.07**	**4.94**	**5.53**	**2.31**	**0.032**	<5.0	**2.59**	<1.0	<1.0	<1.0	**21.9**	**24.1**	<0.50	<0.001
SS7	0.5	1/15/2018	soil	<1.0	**1.77**	**135**	<0.5	<0.5	**19.5**	**9.09**	**11.7**	**5.82**	**0.02**	<5.0	**4.98**	<1.0	<1.0	<1.0	**43.8**	**49.6**	**0.341J**	<0.001
Screening Criteria																						
DTSC HERO Note 3				--	--	--	--	--	--	--	--	80*	--	--	--	--	--	--	--	--	--	--	--
EPA Region 9 Residential RSL				31	0.68	15,000	160	71	120,000***	23	3,100	400	11	390	15,000	390	390	0.78	390	23,000	39	2.0
Southern California Background Concentration				--	12**	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

RSL = USEPA Regional Screening Level (November 2017)

TPH = Total Petroleum Hydrocarbons by EPA Method 8015

OCP = Organochlorine Pesticides by EPA Method 8081A

* = DTSC Office of Human and Ecological Risk (HERO) Note Number 3 (DTSC, 2017)

** = DTSC Determination of a Southern California Regional Background Arsenic Concentration in Soil (DTSC, 2008)

*** = RSL for Chromium III

Hightlight concentrations are above regulatory screening criteria for residential use

ug/kg= micrograms per kilogram

bgs = below ground surface

<2.0 = Not detected above laboratory reporting limit as shown

-- = Not analyzed or not applicable

Bold concentrations are detected above laboratory reporting limit

mg/kg = milligrams per kilogram

APPENDIX A - REFERENCES

APPENDIX A

References

ASTM International, 2013, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, Designation E1527-13, dated November 6, 2013.

California Department of Conservation, Division of Oil, Gas, and Geothermal Resources, 2017, Online Mapping System, Accessed January 12, 2018.

California Regional Water Quality Control Board, Santa Ana Region (SARWQCB), 1995, Water Quality Control Plan for the Santa Ana River Basin, dated January 24, updated February 2008.

Department of Toxic Substance Control, 2008, Determination of a Southern California Regional Background Arsenic Concentration in Soil, 2008.

Department of Toxic Substances Control, 2009, Use of the Northern and Southern California Polynuclear Aromatic Hydrocarbon (PAH) Studies in the Manufactured Gas Plant Site Cleanup Process, dated July 1, 2009.

Department of Toxic Substances Control, Human and Ecological Risk Office, 2016, Human Health Risk Assessment Note Number 3, DTSC-modified Screening Levels, dated June 2016.

Department of Toxic Substances Control, 2017, Envirostor Online Database, Accessed January 12, 2018.

EDR Aerial Photo Decade Package, January 12, 2018.

EDR Certified Sanborn Map Report, January 12, 2018.

EDR City Directory Abstract, January 12, 2018.

EDR Historical Topographic Map Report, January 12, 2018.

EDR Radius Map Report with GeoCheck®, January 12, 2018.

EDR Property Tax Map Report, January 12, 2018.

EDR Building Permit Report, January 12, 2018.

EDR Environmental Lien and AUL Search Report, January 16, 2018.

Leighton and Associates, 2018, Draft Geotechnical Engineering and Geologic Hazard Report, Proposed Skilled Nursing Facility, Moreno Valley, California, Project No. 11888.001, dated January 30, 2018.

State Water Resources Control Board, 2017, Geotracker Online Database, Accessed January 12, 2018.

United States Environmental Protection Agency, 2017, Region 9 Residential Regional Screening Levels, November 2017.

APPENDIX B - SITE RECONNAISSANCE PHOTOS

Leighton Consulting, Inc.

PHOTOGRAPHIC RECORD
January 15, 2018

Client Name: T & C International Healthcare, Inc.	Site Location: 25622 Alessandro Boulevard, Moreno Valley, CA	Project No. 11888.001

Photo No. 1	
View of Direction of Photo: North	
Description: View of the soil stockpiles observed in the southwestern area of the subject site.	

Photo No. 2	
View of Direction of Photo: Northeast	
Description: View of debris stockpile observed in the western area of the subject site.	

Leighton Consulting, Inc.

PHOTOGRAPHIC RECORD
January 15, 2018

Client Name: T & C International Healthcare, Inc.	Site Location: 25622 Alessandro Boulevard, Moreno Valley, CA	Project No. 11888.001

Photo No. 3

View of Direction of Photo:
Northeast

Description:
View of additional debris stockpile observed in the western area of the subject site.

Photo No. 4

View of Direction of Photo:
Northeast

Description:
View of the debris and soil stockpiles observed in the northwestern area of the subject site

Leighton Consulting, Inc.

PHOTOGRAPHIC RECORD
January 15, 2018

Client Name: T & C International Healthcare, Inc.	Site Location: 25622 Alessandro Boulevard, Moreno Valley, CA	Project No. 11888.001

Photo No. 5	
View of Direction of Photo: Northeast	
Description: View of the larger soil stockpile observed in the northwestern area of the subject site.	

Photo No. 6	
View of Direction of Photo: Northeast	
Description: View of the soil stockpile observed in the northern area of the subject site.	

Leighton Consulting, Inc.

PHOTOGRAPHIC RECORD
January 15, 2018

Client Name: T & C International Healthcare, Inc.	Site Location: 25622 Alessandro Boulevard, Moreno Valley, CA	Project No. 11888.001

Photo No. 7	
View of Direction of Photo: Northeast	
Description: View of concrete debris observed next to the soil stockpile observed in the northern area of the subject site.	

Photo No. 8	
View of Direction of Photo: East	
Description: View of the northeastern corner of the subject site.	

Leighton Consulting, Inc.

PHOTOGRAPHIC RECORD
January 15, 2018

Client Name: T & C International Healthcare, Inc.	Site Location: 25622 Alessandro Boulevard, Moreno Valley, CA	Project No. 11888.001

Photo No. 9 **View of Direction of Photo:** South **Description**: View of the northern area of the subject site.	

Photo No. 10 **View of Direction of Photo:** Southeast **Description**: View of the stockpile observed in the southeastern area of the subject site.	

Leighton Consulting, Inc.

PHOTOGRAPHIC RECORD
January 15, 2018

Client Name: T & C International Healthcare, Inc.	Site Location: 25622 Alessandro Boulevard, Moreno Valley, CA	Project No. 11888.001

Photo No. 11	
View of Direction of Photo: Northwest	
Description: View of the southeastern area of the subject site.	

APPENDIX C - CLIENT SUPPLIED DOCUMENTATION

Phase I ESA Users Questionnaire

Project Name: SNF Moreno Valley	
Project Address or APN: 479-230-018-6	
Client (or user of the Phase I Environmental Site Assessment): T and C International Healthcare, Inc.	**Name/Title:** William Chu
Client Phone: 626-689-9393	

Reason Phase I is required:

Land Purchase and Development for SNF

Type of property:

Skilled Nursing Facilities

Type of property transaction (e.g., Sale, purchase, exchange):

Purchase

Complete and Correct Address of the property and APN(s):

25622 Alessandro Boulevard., Moreno Valley, CA

Any scope of services beyond the ASTM Practice E 1527:

N/A

All Parties that will rely on the Phase I report:

Name and Contact Information for Site Contact:

William Chu, 626-689-9393, williamchu18809@gmail.com

Any special terms or conditions:

N/A

Any other pertinent knowledge or experience with the property (e.g., prior reports, documents, correspondence concerning the environmental conditions of the property):

Soil Report MTC Engineering, Inc., dated 6-22-2006

(1). Environmental cleanup liens that are filed or recorded against the site (40 CFR 312.25).

Are you aware of any environmental cleanup liens against the property that are filed or recorded under federal, tribal, state or local law? ☐ Yes | ☑ No

If Yes, Describe:

(2). Activity and land use limitations (AULs) that are in place on the site or that have been filed or recorded in a registry (40 CFR 312.26).

Are you aware of any AULs, such as engineering controls, land use restrictions or institutional controls that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law? ☐ Yes | ☑ No

If Yes, Describe:

(3). Specialized knowledge or experience of the person seeking to qualify for the Landowners Liability Protections (LLP) (40 CFR 312.28).

As the user of this ESA do you have any specialized knowledge or experience related to the property or the property or nearby properties? For example, are you involved in the same line of business as the current or former occupants of the property or an adjoining property so that you would have specialized knowledge of the chemicals and processes used by this type of business? ☐ Yes | ☑ No

If Yes, Describe:

(4). Relationship of the purchase price to the fair market value of the property if it were not contaminated (40 DRF 312.29).

Does the purchase price being paid for this property reasonably reflect the fair market value of the property? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the property? ☐ Yes | ☑ No

If Yes, Describe:

(5). Commonly known or reasonable ascertainable information about the property (40 CFR 312.30).

Are you aware of commonly known or *reasonably ascertainable* information about the property that would help the *environmental professional* to identify conditions indicative of releases or threatened releases? For example, as user,

(a.) Do you know the past uses of the property? ☐ Yes | ☑ No

(b.) Do you know of specific chemicals that are present or once were present at the property? ☐ Yes | ☑ No

(c.) Do you know of spills or other chemical releases that have taken place at the property? ☐ Yes | ☑ No

(d.) Do you know of any environmental cleanups that have taken place at the property? ☐ Yes | ☑ No

If Yes, Describe:

(6). The degree of obviousness of the presence of likely presence of contamination at the property, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).

As the *user of this ESA,* based on your knowledge and experience related to the *property* are there any *obvious* indicators that point to the presence or likely presence of contamination at the *property?* ☐ Yes | ☑ No

If Yes, Describe:

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Phase I ESA Owner/Site Contact Interview Form

Interviewee Name: Wen Hua Title: _____

Address: 135 Marguerita Ave, Monterey Park, Ca 91754 Phone: 626-688-8311

Relationship to Property: 1/3 Owner

Name and Address of Owner of the Property: _____

Date of Ownership: 7/7/2005 Site Name: _____

Property Address: 25622 Alessandro Blvd, Moreno Valley

Previous Street Names/Numbers: _____

General Business Type/Present Property Use: Vacant Land

Assessor Parcel Number: 479-230-018 Total # of Buildings: N/A

Grand Total Square Footage: 4.54 acres Date Built: N/A

Past Property Uses (include dates): Vacant Land

Source of Potable Water Supply (municipal/groundwater wells): N/A

Sewage Disposal (municipal/septic) (provide name of utility): Eastern Municipal Water District

Means of Heating/Cooling (gas, electric, heating oil, etc.): N/A

Fuel Source for Heating/Air Conditioning (provide name of utility): N/A

Neighboring Property Types (commercial/industrial/residential): Office

Current Uses of Adjoining Properties:

North: Single Family House

South: Public Street

East: Moreno Valley School District Office

West: Church School

ARE THERE NOW, OR HAVE THERE BEEN IN THE PAST, ANY OF THESE ITEMS ONSITE OR ON ADJACENT PROPERTIES:

ITEM	YES	NO	UNK	ADJACENT PROPERTY
• Hazardous Materials			✓	
• Hazardous Waste			✓	
• MSDS Sheets			✓	
• Underground Storage Tanks			✓	
• Aboveground Storage Tanks			✓	
• Vent Pipes, fill pipes, or access ways indicating a fill pipe to an underground storage area			✓	
• Odors			✓	
• Drums			✓	
• Electrical or hydraulic equipment known to contain PCBs			✓	
• Stained soil or surfaces			✓	
• Drains			✓	
• Sumps			✓	
• Clarifier			✓	
• Pits, ponds, or lagoons			✓	
• Stressed vegetation			✓	
• Areas for dumping solid waste (landfill)			✓	
• Wastewater			✓	
• Wells (oil or gas)			✓	
• Septic Systems			✓	
• Fill Material (if fill material is on site, please state source of fill)			✓	

ADDITIONAL QUESTIONS:	YES	NO	UNK	REMARKS
Has the Site been used as any of the following: gas station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard, or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility? If so, state which type of facility.			✓	
Are you aware of any regulatory compliance audit reports, geotechnical reports, Phase I Environmental Site Assessments, or Phase II Environmental Site Assessments, or soil sampling reports prepared for the Site?			✓	
Do you know of any notices or correspondence from any government agency relating to past or current violations of environmental laws with respect to the Site or relating to environmental liens encumbering the Site?			✓	
Do you know of any pending, threatened, or past litigation or administrative proceedings relevant to hazardous substances or petroleum products in, on or from the Site?			✓	
Do you know of any notices from any governmental entity regarding any possible violation of environmental laws or possible liability relating to hazardous substances or petroleum products?			✓	
Do you know of any environmental concerns associated with the Site? If so please state in remarks column.			✓	
Do you know of any environmental concerns associated with any adjacent or nearby properties? If so please state in remarks column.			✓	

Current Property Owner's Time Period of Ownership: July 2005---Now

Property Utilization During Ownership: There is an approved Tentative Map for 39 detached homes. The project was approved in January of 2007 and the approval has been extended unitl January 2020.

Name and Address of Past Owners: Susan West, address unknown

Additional Comments:

Preparer presents that to the best of the preparer's knowledge the above statements and facts are true and correct and to the best of the preparer's actual knowledge no material facts have been suppressed or misstated.

Signature

1/30/2018

Date

APPENDIX D - ENVIRONMENTAL LIENS

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553

Inquiry Number: 5158048.7
January 16, 2018

EDR Environmental Lien and AUL Searc

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

EDR Environmental Lien and AUL Search

The EDR Environmental Lien and AUL Search Report provides results from a search of available current land title records for environmental cleanup liens and other activity and use limitations, such as engineering controls and institutional controls.

A network of professional, trained researchers, following established procedures, uses client supplied address information to:

- search for parcel information and/or legal description;
- search for ownership information;
- research official land title documents recorded at jurisdictional agencies such as recorders' offices, registries of deeds, county clerks' offices, etc.;
- access a copy of the deed;
- search for environmental encumbering instrument(s) associated with the deed;
- provide a copy of any environmental encumbrance(s) based upon a review of key words in the instrument(s) (title, parties involved, and description); and
- provide a copy of the deed or cite documents reviewed.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EDR Environmental Lien and AUL Search

TARGET PROPERTY INFORMATION

ADDRESS

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553

RESEARCH SOURCE

Source 1:

Riverside Recorder
Riverside, CA

PROPERTY INFORMATION

Deed 1:

Type of Deed:	deed
Title is vested in:	Wen Hua
Title received from:	Zixiong Ding
Deed Dated	7/7/2005
Deed Recorded:	7/20/2005
Book:	NA
Page:	na
Volume:	na
Instrument:	na
Docket:	NA
Land Record Comments:	
Miscellaneous Comments:	
Legal Description:	See Exhibit
Legal Current Owner:	Wen Hua
Parcel # / Property Identifier:	479-230-018
Comments:	See Exhibit

ENVIRONMENTAL LIEN

Environmental Lien: Found ☐ Not Found ☒

OTHER ACTIVITY AND USE LIMITATIONS (AULs)

AULs: Found ☐ Not Found ☒

Deed Exhibit 1

DOC # 2005-057[illegible]
07/20/2005 08:00A Fee:7.00
Page 1 of 1
Recorded in Official Records
County of Riverside
Larry W. Ward
Assessor, County Clerk & Recorder

M	S	U	PA

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RECORDING REQUESTED BY:
FIRST AMERICAN TITLE COMPANY

AND WHEN RECORDED MAIL TO:

WEN HUA
1319 S. Stevens Ave., Apt #C
San Gabriel, CA 91776

Title Order No.: NCS-93408-SA1 Escrow No.: 12160-TT

QUITCLAIM DEED

TIA: 021-023

T MH

THE UNDERSIGNED GRANTOR(S) DECLARE(S)
DOCUMENTARY TRANSFER TAX is $0.00 (**) SEE BELOW.
[X] computed on full value of property conveyed, or
[ ] computed on full value less value of liens or encumbrances remaining at time of sale.
[ ] Unincorporated area [X] City of MORENO VALLEY **AND**

FOR A VALUABLE CONSIDERATION, receipt of which is hereby acknowledged,

ZIXIONG DING, Husband of Grantee

do(es) hereby remise, release and forever quitclaim to:

WEN HUA, a Married Woman, as her sole and separate property

the real property in the City of MORENO VALLEY, County of Riverside, State of California, described as:

THE EAST 1/2 OF LOT 5, IN BLOCK 102, AS SHOWN BY MAP NO. 1 OF LANDS OF BEAR VALLEY AND ALESSANDRO DEVELOPMENT COMPANY, ON FILE IN BOOK 11, PAGE 10 OF MAPS, SAN BERNARDINO, COUNTY RECORDS.
Also Known as: VACANT LAND KNOWN AS : APN NO. 479-230-018, MORENO VALLEY, CA
A.P. # 479-230-018-6

(**) "This conveyance establishes sole and separate property of a spouse, R & T 11911".

DATED July 7, 2005

ZIXIONG DING

STATE OF CALIFORNIA
COUNTY OF Los Angeles
On July 13, 2005
Before me, Tracey Y. Okubo
A Notary Public in and for said State, personally appeared
Zixiong Ding

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.
WITNESS my hand and official seal.

TRACEY Y. OKUBO
COMM. # 1336731
NOTARY PUBLIC-CALIFORNIA
LOS ANGELES COUNTY
COMM. EXP. JAN. 26, 2006

Signature _____ (This area for official notarial seal)

MAIL TAX STATEMENTS TO PARTY SHOWN BELOW; IF NO PARTY SHOWN, MAIL AS DIRECTED ABOVE:

APPENDIX E - ENVIRONMENTAL RADIUS REPORT

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553

Inquiry Number: 5158048.2s
January 12, 2018

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

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 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

25622 ALESSANDRO BOULEVARD
MORENO VALLEY, CA 92553

COORDINATES

Latitude (North):	33.9183100 - 33° 55' 5.91''
Longitude (West):	117.2159820 - 117° 12' 57.53''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	480035.0
UTM Y (Meters):	3752925.2
Elevation:	1571 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5641326 SUNNYMEAD, CA
Version Date:	2012

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140603
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
25622 ALESSANDRO BOULEVARD
MORENO VALLEY, CA 92553

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & DIRECTIC
1	PROPOSED ALESSANDRO	ALESSANDRO BOULEVARD	ENVIROSTOR, SCH	Higher	708, 0.134,
A2	SUNNYMEAD DISTRICT M	25241 COTTONWOOD AVE	LUST	Higher	2524, 0.478
A3	SUNNYMEAD DISTRICT M	25241 COTTONWOOD	LUST, HIST CORTESE	Higher	2524, 0.478
4	MORENO VALLEY REGION	NEC PERRIS BOULEVARD	ENVIROSTOR, SCH	Higher	2802, 0.531
5	BAY AVENUE ELEMENTAR	24801 BAY AVENUE	ENVIROSTOR, SCH	Higher	4025, 0.762

EXECUTIVE SUMMARY

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
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

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

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-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System
US ENG CONTROLS ---------- Engineering Controls Sites List

EXECUTIVE SUMMARY

US INST CONTROL ..... Sites with Institutional Controls

Federal ERNS list

ERNS ..... Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE ..... State Response Sites

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ..... Solid Waste Information System

State and tribal leaking storage tank lists

INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land
SLIC ..... Statewide SLIC Cases

State and tribal registered storage tank lists

FEMA UST ..... Underground Storage Tank Listing
UST ..... Active UST Facilities
AST ..... Aboveground Petroleum Storage Tank Facilities
INDIAN UST ..... Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP ..... Voluntary Cleanup Priority Listing
VCP ..... Voluntary Cleanup Program Properties

State and tribal Brownfields sites

BROWNFIELDS ..... Considered Brownfieds Sites Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

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
DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
ODI ..... Open Dump Inventory
IHS OPEN DUMPS ..... Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ..... Delisted National Clandestine Laboratory Register

EXECUTIVE SUMMARY

HIST Cal-Sites	Historical Calsites Database
CDL	Clandestine Drug Labs
Toxic Pits	Toxic Pits Cleanup Act Sites
US CDL	National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

SWEEPS UST	SWEEPS UST Listing
HIST UST	Hazardous Substance Storage Container Database
CA FID UST	Facility Inventory Database

Local Land Records

LIENS	Environmental Liens Listing
LIENS 2	CERCLA Lien Information
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 / No Longer Regulated
FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program

EXECUTIVE SUMMARY

UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File
ABANDONED MINES	Abandoned Mines
FINDS	Facility Index System/Facility Registry System
UXO	Unexploded Ordnance Sites
ECHO	Enforcement & Compliance History Information
DOCKET HWC	Hazardous Waste Compliance Docket Listing
FUELS PROGRAM	EPA Fuels Program Registered Listing
CA BOND EXP. PLAN	Bond Expenditure Plan
Cortese	"Cortese" Hazardous Waste & Substances Sites List
CUPA Listings	CUPA Resources List
DRYCLEANERS	Cleaner Facilities
EMI	Emissions Inventory Data
ENF	Enforcement Action Listing
Financial Assurance	Financial Assurance Information Listing
HAZNET	Facility and Manifest Data
ICE	ICE
HWP	EnviroStor Permitted Facilities Listing
HWT	Registered Hazardous Waste Transporter Database
MINES	Mines Site Location Listing
MWMP	Medical Waste Management Program Listing
NPDES	NPDES Permits Listing
PEST LIC	Pesticide Regulation Licenses Listing
PROC	Certified Processors Database
Notify 65	Proposition 65 Records
UIC	UIC Listing
WASTEWATER PITS	Oil Wastewater Pits Listing
WDS	Waste Discharge System
WIP	Well Investigation Program Case List

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP	EDR Proprietary Manufactured Gas Plants
EDR Hist Auto	EDR Exclusive Historical Auto Stations
EDR Hist Cleaner	EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF	Recovered Government Archive Solid Waste Facilities List
RGA LUST	Recovered Government Archive Leaking Underground Storage Tank

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

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 10/30/2017 has revealed that there are 3 ENVIROSTOR sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PROPOSED ALESSANDRO	***ALESSANDRO BOULEVARD***	***E 1/8 - 1/4 (0.134 mi.)***	***1***	***8***
Facility Id: 60000944				
Status: No Further Action				
MORENO VALLEY REGION	***NEC PERRIS BOULEVARD***	***WNW 1/2 - 1 (0.531 mi.)***	***4***	***13***
Facility Id: 60000502				
Status: No Further Action				
BAY AVENUE ELEMENTAR	***24801 BAY AVENUE***	***WNW 1/2 - 1 (0.762 mi.)***	***5***	***15***
Facility Id: 33820010				
Status: No Further Action				

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

A review of the LUST list, as provided by EDR, has revealed that there are 2 LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SUNNYMEAD DISTRICT M	25241 COTTONWOOD AVE	NW 1/4 - 1/2 (0.478 mi.)	A2	10
Database: LUST REG 8, Date of Government Version: 02/14/2005				
Global ID: T0606500098				
Facility Status: Case Closed				
SUNNYMEAD DISTRICT M	***25241 COTTONWOOD***	***NW 1/4 - 1/2 (0.478 mi.)***	***A3***	***11***
Database: LUST, Date of Government Version: 12/11/2017				
Status: Completed - Case Closed				
Global Id: T0606500098				

EXECUTIVE SUMMARY

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Hazardous waste / Contaminated Sites

SCH: 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.

A review of the SCH list, as provided by EDR, and dated 10/30/2017 has revealed that there is 1 SCH site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
PROPOSED ALESSANDRO Facility Id: 60000944 Status: No Further Action	***ALESSANDRO BOULEVARD***	***E 1/8 - 1/4 (0.134 mi.)***	***1***	***8***

Other Ascertainable Records

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.

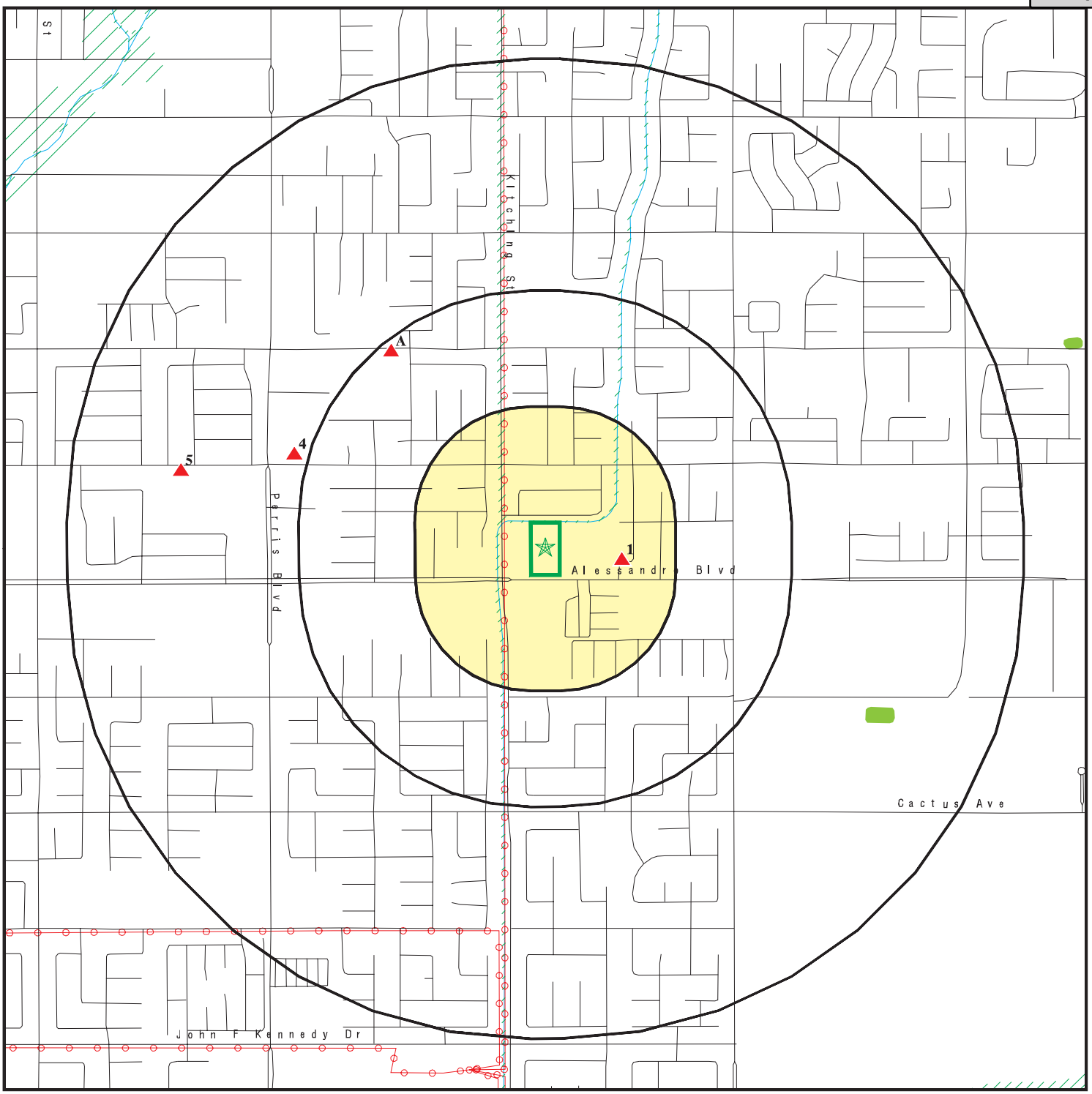
A review of the HIST CORTESE list, as provided by EDR, and dated 04/01/2001 has revealed that there is 1 HIST CORTESE site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SUNNYMEAD DISTRICT M Reg Id: 083300979T	***25241 COTTONWOOD***	***NW 1/4 - 1/2 (0.478 mi.)***	***A3***	***11***

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 5158048.2S

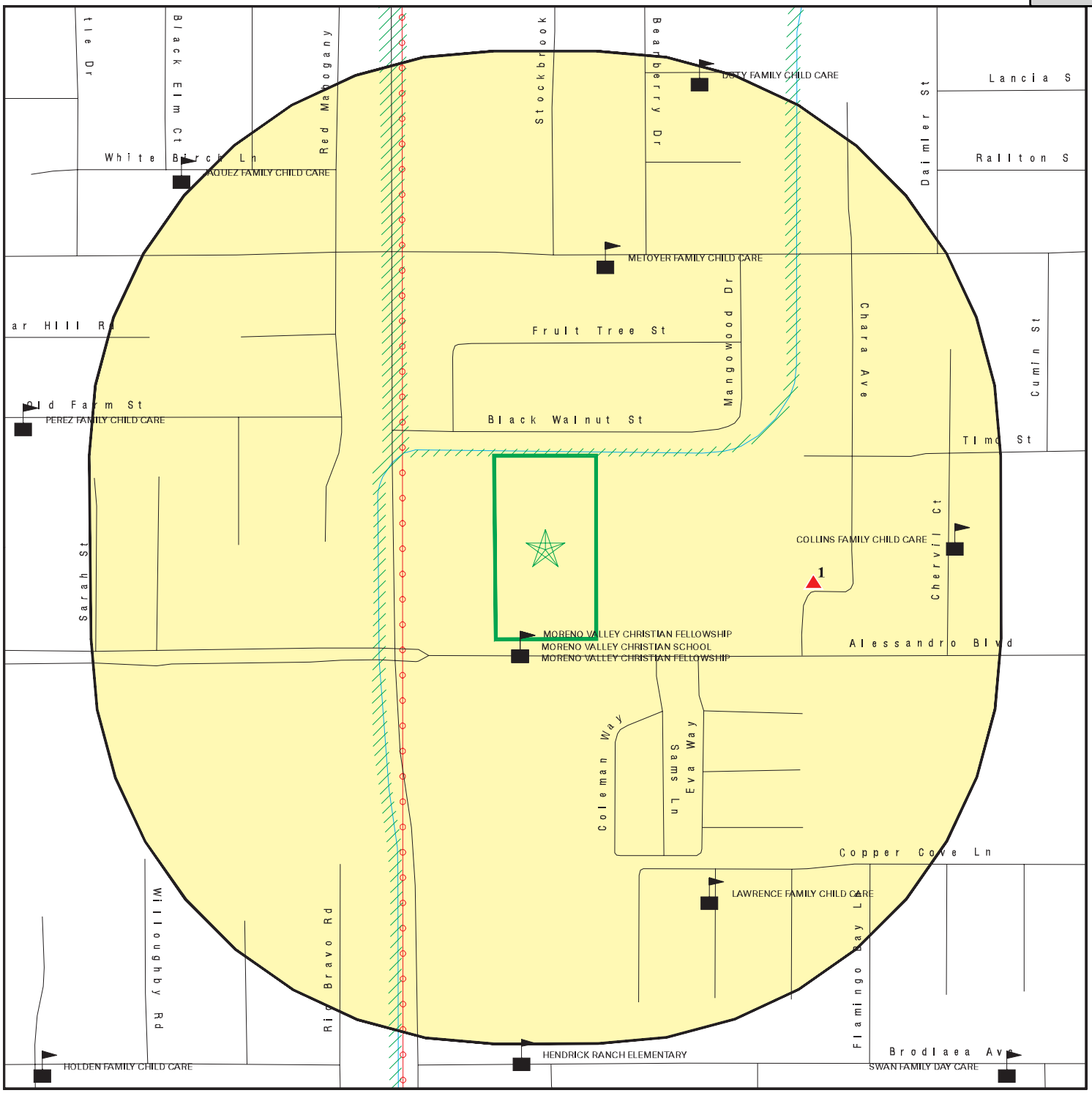


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Upgradient Area
- Areas of Concern

This report includes Interactive Map Layers display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 25622 Alessandro Boulevard	CLIENT: Leighton Consulting
ADDRESS: 25622 Alessandro Boulevard Moreno Valley CA 92553	CONTACT: Breeanna Copeland
LAT/LONG: 33.91831 / 117.215982	INQUIRY #: 5158048.2s DATE: January 12, 2018 3:15 pm

DETAIL MAP - 5158048.2S



- 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
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- Areas of Concern

This report includes Interactive Map Layers display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 25622 Alessandro Boulevard	CLIENT: Leighton Consulting
ADDRESS: 25622 Alessandro Boulevard Moreno Valley CA 92553	CONTACT: Breeanna Copeland
LAT/LONG: 33.91831 / 117.215982	INQUIRY #: 5158048.2s DATE: January 12, 2018 3:17 pm

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	0.001		0	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
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	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	1	0	2	NR	3
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	0	2	NR	NR	2

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
INDIAN LUST	0.500		0	0	0	NR	NR	0
SLIC	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
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
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	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								
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	0.001		0	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	1	NR	NR	NR	1
CDL	0.001		0	NR	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
SWEEPS UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
CA FID UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS	0.001		0	NR	NR	NR	NR	0
LIENS 2	0.001		0	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	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
CHMIRS	0.001		0	NR	NR	NR	NR	0
LDS	0.001		0	NR	NR	NR	NR	0
MCS	0.001		0	NR	NR	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	0.001		0	NR	NR	NR	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.001		0	NR	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
Cortese	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
EMI	0.001		0	NR	NR	NR	NR	0
ENF	0.001		0	NR	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
HAZNET	0.001		0	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
ICE	0.001		0	NR	NR	NR	NR	0
HIST CORTESE	0.500		0	0	1	NR	NR	1
HWP	1.000		0	0	0	0	NR	0
HWT	0.250		0	0	NR	NR	NR	0
MINES	0.001		0	NR	NR	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
PEST LIC	0.001		0	NR	NR	NR	NR	0
PROC	0.500		0	0	0	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
WASTEWATER PITS	0.500		0	0	0	NR	NR	0
WDS	0.001		0	NR	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	0	2	3	2	0	7

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
1 East 1/8-1/4 0.134 mi. 708 ft.	**PROPOSED ALESSANDRO ADMINISTRATION BLDG. EXPANSION ALESSANDRO BOULEVARD/CHARA STREET MORENO VALLEY, CA 92553**	**ENVIROSTOR SCH**	**S109149568 N/A**

Relative: Higher

Actual: 1580 ft.

ENVIROSTOR:

Facility ID:	60000944
Status:	No Further Action
Status Date:	11/06/2008
Site Code:	404810
Site Type:	School Investigation
Site Type Detailed:	School
Acres:	5.1
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Not reported
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Assembly:	61
Senate:	31
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	School District
Latitude:	33.918
Longitude:	-117.2131
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS
Potential COC:	Chlordane DDD DDE DDT Endrin Toxaphene
Confirmed COC:	30004-NO 30023-NO 30006-NO 30007-NO 30008-NO 30010-NO
Potential Description:	SOIL
Alias Name:	Alternative High School
Alias Type:	Alternate Name
Alias Name:	404810
Alias Type:	Project Code (Site Code)
Alias Name:	60000944
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	08/18/2008
Comments:	Signed agreement sent (FedEx) to District.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	09/10/2008
Comments:	DTSC approved the PEA with a Further Action determination
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Supplemental Site Investigation Report
Completed Date:	11/06/2008
Comments:	DTSC concurs with the SSI that No Further Action is required.
Completed Area Name:	PROJECT WIDE

PROPOSED ALESSANDRO ADMINISTRATION BLDG. EXPANSION - EAST PR (Continued) **S109149568**

Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	11/13/2008
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

SCH:

Facility ID:	60000944
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	5.1
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Not reported
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	404810
Assembly:	61
Senate:	31
Special Program Status:	Not reported
Status:	No Further Action
Status Date:	11/06/2008
Restricted Use:	NO
Funding:	School District
Latitude:	33.918
Longitude:	-117.2131
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS
Potential COC:	Chlordane, DDD, DDE, DDT, Endrin, Toxaphene
Confirmed COC:	30004-NO, 30023-NO, 30006-NO, 30007-NO, 30008-NO, 30010-NO
Potential Description:	SOIL
Alias Name:	Alternative High School
Alias Type:	Alternate Name
Alias Name:	404810
Alias Type:	Project Code (Site Code)
Alias Name:	60000944
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	08/18/2008
Comments:	Signed agreement sent (FedEx) to District.

PROPOSED ALESSANDRO ADMINISTRATION BLDG. EXPANSION - EAST PR (Continued) **S109149568**

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	09/10/2008
Comments:	DTSC approved the PEA with a Further Action determination
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Supplemental Site Investigation Report
Completed Date:	11/06/2008
Comments:	DTSC concurs with the SSI that No Further Action is required.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	11/13/2008
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

A2 **SUNNYMEAD DISTRICT MAINT. YARD** **LUST** **S104160749**
NW **25241 COTTONWOOD AVE** **N/A**
1/4-1/2 **MORENO VALLEY, CA 92388**
0.478 mi.
2524 ft. **Site 1 of 2 in cluster A**

Relative:
Higher

Actual:
1584 ft.

LUST REG 8:

Region:	8
County:	Riverside
Regional Board:	Santa Ana Region
Facility Status:	Case Closed
Case Number:	083300979T
Local Case Num:	Not reported
Case Type:	Soil only
Substance:	Diesel
Qty Leaked:	Not reported
Abate Method:	Not reported
Cross Street:	PERRIS
Enf Type:	Not reported
Funding:	Not reported
How Discovered:	Tank Closure
How Stopped:	Not reported
Leak Cause:	Overfill
Leak Source:	UNK
Global ID:	T0606500098
How Stopped Date:	Not reported
Enter Date:	8/1/1988
Date Confirmation of Leak Began:	Not reported
Date Preliminary Assessment Began:	Not reported
Discover Date:	6/9/1988

SUNNYMEAD DISTRICT MAINT. YARD (Continued) **S104160749**

Enforcement Date:	Not reported
Close Date:	11/14/1991
Date Prelim Assessment Workplan Submitted:	Not reported
Date Pollution Characterization Began:	8/15/1988
Date Remediation Plan Submitted:	Not reported
Date Remedial Action Underway:	Not reported
Date Post Remedial Action Monitoring:	Not reported
Enter Date:	8/1/1988
GW Qualifies:	Not reported
Soil Qualifies:	Not reported
Operator:	Not reported
Facility Contact:	Not reported
Interim:	Not reported
Oversite Program:	LUST
Latitude:	33.9244172
Longitude:	-117.2196525
MTBE Date:	Not reported
Max MTBE GW:	Not reported
MTBE Concentration:	0
Max MTBE Soil:	Not reported
MTBE Fuel:	0
MTBE Tested:	Not Required to be Tested.
MTBE Class:	*
Staff:	PAH
Staff Initials:	UNK
Lead Agency:	Local Agency
Local Agency:	33000L
Hydr Basin #:	SAN JACINTO (8-5)
Beneficial:	Not reported
Priority:	Not reported
Cleanup Fund Id:	Not reported
Work Suspended:	Not reported

Summary: Not reported

A3 **SUNNYMEAD DISTRICT MAINT.** **LUST** **S103646618**
NW **25241 COTTONWOOD** **HIST CORTESE** **N/A**
1/4-1/2 **MORENO, CA 92388**
0.478 mi.
2524 ft. **Site 2 of 2 in cluster A**

Relative:
Higher

Actual:
1584 ft.

LUST:

Lead Agency:	SANTA ANA RWQCB (REGION 8)
Case Type:	LUST Cleanup Site
Geo Track:	http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0606500098
Global Id:	T0606500098
Latitude:	33.9245703
Longitude:	-117.2181226
Status:	Completed - Case Closed
Status Date:	11/14/1991
Case Worker:	Not reported
RB Case Number:	083300979T
Local Agency:	RIVERSIDE COUNTY LOP
File Location:	Not reported
Local Case Number:	Not reported
Potential Media Affect:	Soil
Potential Contaminants of Concern:	Diesel
Site History:	Not reported

SUNNYMEAD DISTRICT MAINT. (Continued) **S103646618**

LUST:
Global Id: T0606500098
Contact Type: Local Agency Caseworker
Contact Name: Riverside County LOP
Organization Name: RIVERSIDE COUNTY LOP
Address: 3880 LEMON ST SUITE 200
City: RIVERSIDE
Email: Not reported
Phone Number: 9519558980

LUST:
Global Id: T0606500098
Action Type: Other
Date: 06/09/1988
Action: Leak Discovery

Global Id: T0606500098
Action Type: Other
Date: 06/17/1988
Action: Leak Reported

Global Id: T0606500098
Action Type: ENFORCEMENT
Date: 11/13/1991
Action: Other Report - #UST Sample Analytical Report

Global Id: T0606500098
Action Type: ENFORCEMENT
Date: 11/14/1991
Action: Closure/No Further Action Letter

LUST:
Global Id: T0606500098
Status: Open - Case Begin Date
Status Date: 06/09/1988

Global Id: T0606500098
Status: Open - Site Assessment
Status Date: 08/15/1988

Global Id: T0606500098
Status: Completed - Case Closed
Status Date: 11/14/1991

HIST CORTESE:
Region: CORTESE
Facility County Code: 33
Reg By: LTNKA
Reg Id: 083300979T

MAP FINDINGS

Map ID / Direction / Distance / Elevation	Site	Database(s)	EDR ID Number / EPA ID Number
4 WNW 1/2-1 0.531 mi. 2802 ft.	**MORENO VALLEY REGIONAL LEARNING CENTER** **NEC PERRIS BOULEVARD & BAY AVENUE** **MORENO VALLEY, CA 92553**	**ENVIROSTOR SCH**	**S108407586** **N/A**

Relative: Higher

Actual: 1580 ft.

ENVIROSTOR:

Facility ID:	60000502
Status:	No Further Action
Status Date:	05/21/2007
Site Code:	404729
Site Type:	School Investigation
Site Type Detailed:	School
Acres:	4.26
NPL:	NO
Regulatory Agencies:	SMBRP
Lead Agency:	SMBRP
Program Manager:	Not reported
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Assembly:	61
Senate:	31
Special Program:	Not reported
Restricted Use:	NO
Site Mgmt Req:	NONE SPECIFIED
Funding:	School District
Latitude:	33.9213
Longitude:	-117.2254
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS, RESIDENTIAL AREA
Potential COC:	Under Investigation
Confirmed COC:	Under Investigation
Potential Description:	SOIL
Alias Name:	404729
Alias Type:	Project Code (Site Code)
Alias Name:	60000502
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Workplan
Completed Date:	03/08/2007
Comments:	TM approved for implementation.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Report
Completed Date:	05/21/2007
Comments:	DTSC issued a "No Further Action determination" based on the preliminary Environmental Assessment report.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	06/07/2007
Comments:	Project Complete.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported

Map ID
Direction
Distance
Elevation | Site | MAP FINDINGS | Database(s) | EDR ID Number EPA ID Number

MORENO VALLEY REGIONAL LEARNING CENTER (Continued) **S108407586**

Completed Document Type:	Environmental Oversight Agreement
Completed Date:	12/11/2006
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

SCH:

Facility ID:	60000502
Site Type:	School Investigation
Site Type Detail:	School
Site Mgmt. Req.:	NONE SPECIFIED
Acres:	4.26
National Priorities List:	NO
Cleanup Oversight Agencies:	SMBRP
Lead Agency:	SMBRP
Lead Agency Description:	DTSC - Site Cleanup Program
Project Manager:	Not reported
Supervisor:	Shahir Haddad
Division Branch:	Southern California Schools & Brownfields Outreach
Site Code:	404729
Assembly:	61
Senate:	31
Special Program Status:	Not reported
Status:	No Further Action
Status Date:	05/21/2007
Restricted Use:	NO
Funding:	School District
Latitude:	33.9213
Longitude:	-117.2254
APN:	NONE SPECIFIED
Past Use:	AGRICULTURAL - ROW CROPS, RESIDENTIAL AREA
Potential COC:	Under Investigation
Confirmed COC:	Under Investigation
Potential Description:	SOIL
Alias Name:	404729
Alias Type:	Project Code (Site Code)
Alias Name:	60000502
Alias Type:	Envirostor ID Number

Completed Info:

Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Preliminary Endangerment Assessment Workplan
Completed Date:	03/08/2007
Comments:	TM approved for implementation.
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

MORENO VALLEY REGIONAL LEARNING CENTER (Continued) **S108407586**

Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 05/21/2007
Comments: DTSC issued a "No Further Action determination" based on the preliminary Environmental Assessment report.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 06/07/2007
Comments: Project Complete.

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 12/11/2006
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

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5 WNW 1/2-1 0.762 mi. 4025 ft.

Relative: Higher

Actual: 1583 ft.

BAY AVENUE ELEMENTARY SCHOOL **ENVIROSTOR SCH** **S105628794 N/A**
24801 BAY AVENUE
MORENO VALLEY, CA 92553

ENVIROSTOR:
Facility ID: 33820010
Status: No Further Action
Status Date: 08/19/2003
Site Code: 404308
Site Type: School Investigation
Site Type Detailed: School
Acres: 8
NPL: NO
Regulatory Agencies: DTSC
Lead Agency: DTSC
Program Manager: Not reported
Supervisor: Javier Hinojosa
Division Branch: Southern California Schools & Brownfields Outreach
Assembly: 61
Senate: 31
Special Program: Not reported
Restricted Use: NO
Site Mgmt Req: NONE SPECIFIED
Funding: School District
Latitude: 33.92047
Longitude: -117.2295
APN: NONE SPECIFIED
Past Use: * EDUCATIONAL SERVICES, AGRICULTURAL - ROW CROPS
Potential COC: DDD DDE DDT

BAY AVENUE ELEMENTARY SCHOOL (Continued) **S105628794**

Confirmed COC: 30006-NO 30007-NO 30008-NO
Potential Description: SOIL
Alias Name: AKA: RAMONA ELEM SCHOOL
Alias Type: Alternate Name
Alias Name: BAY AVENUE ELEMENTARY SCHOOL
Alias Type: Alternate Name
Alias Name: MORENO VALLEY UNIFIED SCHOOL DISTRICT
Alias Type: Alternate Name
Alias Name: MORENO VALLEY USD-BAY AVENUE ELEM SCHOOL
Alias Type: Alternate Name
Alias Name: 404308
Alias Type: Project Code (Site Code)
Alias Name: 33820010
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 08/19/2003
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 05/10/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: * Workplan
Completed Date: 12/24/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Cost Recovery Closeout Memo
Completed Date: 09/08/2003
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Environmental Oversight Agreement
Completed Date: 01/31/2002
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Site Inspections/Visit (Non LUR)
Completed Date: 03/14/2002
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

BAY AVENUE ELEMENTARY SCHOOL (Continued) **S105628794**

Schedule Document Type: Not reported
Schedule Due Date: Not reported
Schedule Revised Date: Not reported

SCH:

Facility ID: 33820010
Site Type: School Investigation
Site Type Detail: School
Site Mgmt. Req.: NONE SPECIFIED
Acres: 8
National Priorities List: NO
Cleanup Oversight Agencies: DTSC
Lead Agency: DTSC
Lead Agency Description: * DTSC
Project Manager: Not reported
Supervisor: Javier Hinojosa
Division Branch: Southern California Schools & Brownfields Outreach
Site Code: 404308
Assembly: 61
Senate: 31
Special Program Status: Not reported
Status: No Further Action
Status Date: 08/19/2003
Restricted Use: NO
Funding: School District
Latitude: 33.92047
Longitude: -117.2295
APN: NONE SPECIFIED
Past Use: * EDUCATIONAL SERVICES, AGRICULTURAL - ROW CROPS
Potential COC: DDD, DDE, DDT
Confirmed COC: 30006-NO, 30007-NO, 30008-NO
Potential Description: SOIL
Alias Name: AKA: RAMONA ELEM SCHOOL
Alias Type: Alternate Name
Alias Name: BAY AVENUE ELEMENTARY SCHOOL
Alias Type: Alternate Name
Alias Name: MORENO VALLEY UNIFIED SCHOOL DISTRICT
Alias Type: Alternate Name
Alias Name: MORENO VALLEY USD-BAY AVENUE ELEM SCHOOL
Alias Type: Alternate Name
Alias Name: 404308
Alias Type: Project Code (Site Code)
Alias Name: 33820010
Alias Type: Envirostor ID Number

Completed Info:
Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Preliminary Endangerment Assessment Report
Completed Date: 08/19/2003
Comments: Not reported

Completed Area Name: PROJECT WIDE
Completed Sub Area Name: Not reported
Completed Document Type: Technical Report
Completed Date: 05/10/2002

BAY AVENUE ELEMENTARY SCHOOL (Continued) **S105628794**

Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	* Workplan
Completed Date:	12/24/2002
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Cost Recovery Closeout Memo
Completed Date:	09/08/2003
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Environmental Oversight Agreement
Completed Date:	01/31/2002
Comments:	Not reported
Completed Area Name:	PROJECT WIDE
Completed Sub Area Name:	Not reported
Completed Document Type:	Site Inspections/Visit (Non LUR)
Completed Date:	03/14/2002
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

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

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: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
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: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
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: 12/11/2017
Date Data Arrived at EDR: 12/22/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 14

Source: EPA
Telephone: N/A
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

Federal CERCLIS list

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: 11/07/2016
Date Data Arrived at EDR: 01/05/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 92

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 01/05/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list 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). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 07/11/2017
Date Data Arrived at EDR: 07/21/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 77

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS 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 the 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. The 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 potential NPL site.

Date of Government Version: 07/11/2017
Date Data Arrived at EDR: 07/28/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 70

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 01/29/2018
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: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
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: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
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: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
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: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

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: 05/22/2017
Date Data Arrived at EDR: 06/13/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 94

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 11/08/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Varies

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: 08/10/2017
Date Data Arrived at EDR: 08/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/27/2017
Next Scheduled EDR Contact: 03/12/2018
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: 08/10/2017
Date Data Arrived at EDR: 08/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 11/27/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 09/18/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 22

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

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: 10/30/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
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: 10/30/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
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: 11/13/2017
Date Data Arrived at EDR: 11/14/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 23

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

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 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 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 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 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

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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 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: Leaking Underground Fuel Tank Report (GEOTRACKER)
Leaking Underground Storage Tank (LUST) Sites included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

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

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

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 04/25/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 31

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 11/07/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

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: 04/13/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 05/01/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
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: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
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: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
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: 04/26/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

SLIC: Statewide SLIC Cases (GEOTRACKER)
Cleanup Program Sites (CPS; also known as Site Cleanups [SC] and formerly known as Spills, Leaks, Investigations, and Cleanups [SLIC] sites) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 58

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 05/15/2017
Date Data Arrived at EDR: 05/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 136

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 01/09/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Varies

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 57

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Semi-Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 07/06/2016
Date Data Arrived at EDR: 07/12/2016
Date Made Active in Reports: 09/19/2016
Number of Days to Update: 69

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

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: 04/26/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
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: 04/24/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 134

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

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: 05/02/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

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: 05/01/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

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: 04/13/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 04/14/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 71

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
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: 10/14/2016
Date Data Arrived at EDR: 01/27/2017
Date Made Active in Reports: 05/05/2017
Number of Days to Update: 98

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Semi-Annually

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: 04/25/2017
Date Data Arrived at EDR: 07/27/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 78

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
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: 10/30/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
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: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 12/20/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

State and tribal Brownfields sites

BROWNFIELDS: Considered Brownfieds Sites Listing
A listing of sites the SWRCB considers to be Brownfields since these are sites have come to them through the MOA Process.

Date of Government Version: 09/21/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 49

Source: State Water Resources Control Board
Telephone: 916-323-7905
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

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: 08/21/2017
Date Data Arrived at EDR: 09/20/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

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: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: No Update Planned

SWRCY: Recycler Database
A listing of recycling facilities in California.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 9

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing
A listing of registered waste tire haulers.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 05/30/2017
Date Data Arrived at EDR: 05/31/2017
Date Made Active in Reports: 08/15/2017
Number of Days to Update: 76

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 11/09/2017
Next Scheduled EDR Contact: 02/26/2018
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: 10/30/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

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: 10/20/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 11/03/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 07/13/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 30

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: No Update Planned

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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 10/30/2017
Date Data Arrived at EDR: 10/31/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 45

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Quarterly

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: 06/30/2017
Date Data Arrived at EDR: 08/18/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 34

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 01/08/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Varies

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

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: 07/13/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 30

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Quarterly

Local Lists of Registered Storage Tanks

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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

UST MENDOCINO: Mendocino County UST Database
A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 11/27/2017
Date Data Arrived at EDR: 11/29/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 19

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
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

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

Local Land Records

LIENS: Environmental Liens Listing
A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 11/30/2017
Date Data Arrived at EDR: 12/01/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 41

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

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: 07/11/2017
Date Data Arrived at EDR: 07/26/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Semi-Annually

DEED: Deed Restriction Listing

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 12/04/2017
Date Data Arrived at EDR: 12/05/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 37

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
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: 09/21/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 22

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

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: 05/09/2017
Date Data Arrived at EDR: 07/26/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 57

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing (GEOTRACKER)

Land Disposal sites (Landfills) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 12/11/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 30

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing (GEOTRACKER)

Military sites (consisting of: Military UST sites; Military Privatized sites; and Military Cleanup sites [formerly known as DoD non UST]) included in GeoTracker. GeoTracker is the Water Boards data management system for sites that impact, or have the potential to impact, water quality in California, with emphasis on groundwater.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 58

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 12/12/2018
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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 / No Longer Regulated

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: 09/13/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 10

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

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: 01/31/2015
Date Data Arrived at EDR: 07/08/2015
Date Made Active in Reports: 10/13/2015
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 11/22/2017
Next Scheduled EDR Contact: 03/05/2018
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: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Semi-Annually

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: 10/11/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: N/A

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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 11/17/2017
Next Scheduled EDR Contact: 02/26/2018
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: 10/17/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

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: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

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: 04/22/2013
Date Data Arrived at EDR: 03/03/2015
Date Made Active in Reports: 03/09/2015
Number of Days to Update: 6

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 11/09/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

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: 12/31/2016
Date Data Arrived at EDR: 06/21/2017
Date Made Active in Reports: 01/05/2018
Number of Days to Update: 198

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Every 4 Years

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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 11/24/2015
Date Made Active in Reports: 04/05/2016
Number of Days to Update: 133

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 01/10/2018
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Annually

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: 10/27/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Annually

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: 09/27/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 8

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Annually

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: 11/02/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/08/2017
Number of Days to Update: 21

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

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

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 10/17/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 3

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 02/19/2018
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: 06/01/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 126

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
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: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 01/09/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Quarterly

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: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
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: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: Quarterly

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: 08/30/2016
Date Data Arrived at EDR: 09/08/2016
Date Made Active in Reports: 10/21/2016
Number of Days to Update: 43

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 11/20/2017
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Steam-Electric Plant 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: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
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: 07/01/2014
Date Data Arrived at EDR: 09/10/2014
Date Made Active in Reports: 10/20/2014
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 12/08/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 05/24/2017
Date Data Arrived at EDR: 11/30/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 15

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 10/26/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

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: 10/02/2017
Date Data Arrived at EDR: 10/05/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 8

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/16/2018
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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

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: 10/31/2017
Next Scheduled EDR Contact: 02/12/2018
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: 06/30/2017
Date Data Arrived at EDR: 08/03/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 78

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/02/2018
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: 12/31/2015
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 09/28/2017
Number of Days to Update: 218

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Biennially

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: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 01/09/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 12/23/2016
Date Data Arrived at EDR: 12/27/2016
Date Made Active in Reports: 02/17/2017
Number of Days to Update: 52

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 11/02/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/23/2017
Date Data Arrived at EDR: 10/11/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 23

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 11/22/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites
A listing of former lead smelter site locations.

Date of Government Version: 10/10/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/16/2018
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

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: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

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: 07/31/2017
Date Data Arrived at EDR: 08/30/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 44

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 11/28/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Semi-Annually

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing
This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/05/2005
Date Data Arrived at EDR: 02/29/2008
Date Made Active in Reports: 04/18/2008
Number of Days to Update: 49

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/01/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 12/01/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 09/25/2017
Date Data Arrived at EDR: 09/26/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 24

Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 03/26/2018
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: 07/23/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 9

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/02/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 10/20/2017
Number of Days to Update: 44

Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 02/13/2017
Date Data Arrived at EDR: 02/15/2017
Date Made Active in Reports: 11/03/2017
Number of Days to Update: 261

Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

UXO: Unexploded Ordnance Sites
A listing of unexploded ordnance site locations

Date of Government Version: 10/25/2016
Date Data Arrived at EDR: 06/02/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 133

Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 01/02/2018
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing
This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 08/17/2017
Date Data Arrived at EDR: 08/17/2017
Date Made Active in Reports: 09/15/2017
Number of Days to Update: 29

Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Quarterly

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

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: 09/21/2017
Date Data Arrived at EDR: 09/21/2017
Date Made Active in Reports: 10/13/2017
Number of Days to Update: 22

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 12/26/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

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: 08/02/2017
Date Data Arrived at EDR: 08/08/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 69

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/19/2018
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: 12/31/2015
Date Data Arrived at EDR: 03/21/2017
Date Made Active in Reports: 08/15/2017
Number of Days to Update: 147

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 12/22/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 11/01/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 34

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing

Financial Assurance information

Date of Government Version: 10/23/2017
Date Data Arrived at EDR: 10/24/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 52

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

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: 11/14/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 31

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 11/09/2017
Next Scheduled EDR Contact: 02/26/2018
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. This database begins with calendar year 1993.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/12/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 97

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 01/08/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Annually

ICE: ICE

Contains data pertaining to the Permitted Facilities with Inspections / Enforcements sites tracked in Envirostor.

Date of Government Version: 11/20/2017
Date Data Arrived at EDR: 11/20/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 37

Source: Department of Toxic Subsances Control
Telephone: 877-786-9427
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
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

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 11/20/2017
Date Data Arrived at EDR: 11/20/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 37
Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Quarterly

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: 10/10/2017
Date Data Arrived at EDR: 10/10/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 7
Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 01/09/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Quarterly

MINES: Mines Site Location Listing
A listing of mine site locations from the Office of Mine Reclamation.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 11/01/2017
Number of Days to Update: 50
Source: Department of Conservation
Telephone: 916-322-1080
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
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: 09/01/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 63
Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 11/13/2017
Date Data Arrived at EDR: 11/14/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 23
Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: Quarterly

PEST LIC: Pesticide Regulation Licenses Listing
A listing of licenses and certificates issued by the Department of Pesticide Regulation. The DPR issues licenses and/or certificates to: Persons and businesses that apply or sell pesticides; Pest control dealers and brokers; Persons who advise on agricultural pesticide applications.

Date of Government Version: 09/05/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 63
Source: Department of Pesticide Regulation
Telephone: 916-445-4038
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PROC: Certified Processors Database
A listing of certified processors.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 10/18/2017
Number of Days to Update: 36

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

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: 06/16/2017
Date Data Arrived at EDR: 06/20/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 119

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 12/13/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: No Update Planned

UIC: UIC Listing
A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 94

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 12/12/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Varies

WASTEWATER PITS: Oil Wastewater Pits Listing
Water officials discovered that oil producers have been dumping chemical-laden wastewater into hundreds of unlined pits that are operating without proper permits. Inspections completed by the Central Valley Regional Water Quality Control Board revealed the existence of previously unidentified waste sites. The water board?s review found that more than one-third of the region?s active disposal pits are operating without permission.

Date of Government Version: 04/15/2015
Date Data Arrived at EDR: 04/17/2015
Date Made Active in Reports: 06/23/2015
Number of Days to Update: 67

Source: RWQCB, Central Valley Region
Telephone: 559-445-5577
Last EDR Contact: 10/13/2017
Next Scheduled EDR Contact: 01/22/2018
Data Release Frequency: Varies

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: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Quarterly

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: 12/19/2017
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Varies

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 Hist Auto: EDR Exclusive Historical Auto 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 Hist Cleaner: EDR Exclusive Historical 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 RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
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: 09/22/2017
Date Data Arrived at EDR: 09/22/2017
Date Made Active in Reports: 10/10/2017
Number of Days to Update: 18

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 10/11/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 27

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/24/2047
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 12/08/2017
Date Data Arrived at EDR: 12/12/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 15

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing

Cupa facility list.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 04/21/2017
Date Data Arrived at EDR: 04/25/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 106

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 08/31/2017
Date Data Arrived at EDR: 09/05/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 64

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 12/20/2017
Next Scheduled EDR Contact: 10/09/2017
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 08/07/2017
Date Data Arrived at EDR: 08/08/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 69

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Semi-Annually

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 08/17/2017
Date Data Arrived at EDR: 08/22/2017
Date Made Active in Reports: 10/25/2017
Number of Days to Update: 64

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 10/30/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 10/31/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 11/14/2017
Number of Days to Update: 13

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 10/25/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/04/2017
Date Data Arrived at EDR: 12/06/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 21

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 10/30/2017
Next Scheduled EDR Contact: 02/12/2018
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: 10/03/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 40

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 01/10/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Semi-Annually

GLENN COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 10/25/2017
Date Data Arrived at EDR: 10/27/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 19

Source: Glenn County Air Pollution Control District
Telephone: 830-934-6500
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

HUMBOLDT COUNTY:

CUPA Facility List

CUPA facility list.

Date of Government Version: 08/03/2017
Date Data Arrived at EDR: 08/08/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 69

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Semi-Annually

IMPERIAL COUNTY:

CUPA Facility List

Cupa facility list.

Date of Government Version: 10/23/2017
Date Data Arrived at EDR: 10/24/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 22

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

INYO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/08/2017
Date Data Arrived at EDR: 06/09/2017
Date Made Active in Reports: 08/04/2017
Number of Days to Update: 56

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/20/2017
Number of Days to Update: 43

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
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: 11/14/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 28

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 11/09/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 5

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

LASSEN COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 07/24/2017
Date Data Arrived at EDR: 07/26/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 82

Source: Lassen County Environmental Health
Telephone: 530-251-8528
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

LOS ANGELES COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 12/13/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 10/11/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 5

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 10/16/2017
Date Data Arrived at EDR: 10/17/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 51

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 10/17/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

City of Los Angeles Landfills
Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 04/21/2017
Date Made Active in Reports: 10/09/2017
Number of Days to Update: 171

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 01/10/2018
Next Scheduled EDR Contact: 04/30/2018
Data Release Frequency: Varies

Site Mitigation List
Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/14/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 31

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank
Underground storage tank sites located in El Segundo city.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 04/19/2017
Date Made Active in Reports: 05/10/2017
Number of Days to Update: 21

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 01/10/2018
Next Scheduled EDR Contact: 04/30/2018
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: 03/09/2017
Date Data Arrived at EDR: 03/10/2017
Date Made Active in Reports: 05/03/2017
Number of Days to Update: 54

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

City of Torrance Underground Storage Tank
Underground storage tank sites located in the city of Torrance.

Date of Government Version: 07/11/2017
Date Data Arrived at EDR: 07/14/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 69

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/23/2018
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: 10/26/2017
Date Data Arrived at EDR: 10/27/2017
Date Made Active in Reports: 11/06/2017
Number of Days to Update: 10

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 09/28/2017
Date Data Arrived at EDR: 10/05/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 34

Source: Public Works Department Waste Management
Telephone: 415-473-6647
Last EDR Contact: 01/02/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 10/02/2017
Date Data Arrived at EDR: 10/03/2017
Date Made Active in Reports: 10/17/2017
Number of Days to Update: 14

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 11/21/2017
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 12/27/2017
Number of Days to Update: 30

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Varies

MONTEREY COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 09/11/2017
Date Data Arrived at EDR: 09/15/2017
Date Made Active in Reports: 11/28/2017
Number of Days to Update: 74

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 11/20/2017
Next Scheduled EDR Contact: 03/05/2018
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: 01/09/2017
Date Data Arrived at EDR: 01/11/2017
Date Made Active in Reports: 03/02/2017
Number of Days to Update: 50

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
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: 11/22/2017
Date Data Arrived at EDR: 11/27/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 22

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 8

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 10/25/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/09/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 28

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/09/2017
Date Made Active in Reports: 12/15/2017
Number of Days to Update: 36

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 42

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 11/07/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 09/05/2017
Date Data Arrived at EDR: 09/06/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 63

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 11/30/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Semi-Annually

PLUMAS COUNTY:

CUPA Facility List
Plumas County CUPA Program facilities.

Date of Government Version: 10/23/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 11/15/2017
Number of Days to Update: 12

Source: Plumas County Environmental Health
Telephone: 530-283-6355
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 10/11/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 28

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/15/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 10/12/2017
Date Data Arrived at EDR: 10/12/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 27

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 12/15/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 08/02/2017
Date Data Arrived at EDR: 10/03/2017
Date Made Active in Reports: 10/06/2017
Number of Days to Update: 3

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/03/2018
Next Scheduled EDR Contact: 04/16/2018
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: 08/02/2017
Date Data Arrived at EDR: 10/03/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 44

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 01/03/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Quarterly

SAN BENITO COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 11/17/2017
Number of Days to Update: 14

Source: San Benito County Environmental Health
Telephone: N/A
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

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: 08/31/2017
Date Data Arrived at EDR: 09/19/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 58

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 11/06/2017
Next Scheduled EDR Contact: 02/19/2018
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: 12/04/2017
Date Data Arrived at EDR: 12/05/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 37

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 12/05/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Solid Waste Facilities
San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2015
Date Data Arrived at EDR: 11/07/2015
Date Made Active in Reports: 01/04/2016
Number of Days to Update: 58

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
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: 11/29/2017
Next Scheduled EDR Contact: 03/19/2018
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: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Quarterly

Underground Storage Tank Information
Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/02/2017
Date Data Arrived at EDR: 11/07/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 42

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
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: 10/03/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 10/10/2017
Number of Days to Update: 4

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 12/13/2017
Next Scheduled EDR Contact: 04/02/2018
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 11/16/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 31

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

SAN MATEO COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 12/12/2017
Date Data Arrived at EDR: 12/14/2017
Date Made Active in Reports: 01/11/2018
Number of Days to Update: 28

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/06/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 09/15/2017
Date Data Arrived at EDR: 09/19/2017
Date Made Active in Reports: 11/09/2017
Number of Days to Update: 51

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 12/06/2017
Next Scheduled EDR Contact: 03/26/2018
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: 12/13/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 11/14/2017
Date Data Arrived at EDR: 11/16/2017
Date Made Active in Reports: 01/04/2018
Number of Days to Update: 49

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
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: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 11/21/2017
Next Scheduled EDR Contact: 03/12/2018
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Hazardous Material Facilities
Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/03/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 34

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List
CUPA facility listing.

Date of Government Version: 01/21/2017
Date Data Arrived at EDR: 02/22/2017
Date Made Active in Reports: 05/23/2017
Number of Days to Update: 90

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/15/2017
Date Data Arrived at EDR: 06/19/2017
Date Made Active in Reports: 08/09/2017
Number of Days to Update: 51

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 03/05/2018
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: 09/26/2017
Date Data Arrived at EDR: 09/27/2017
Date Made Active in Reports: 11/10/2017
Number of Days to Update: 44

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/08/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

Underground Storage Tanks
Underground storage tank sites located in Solano county.

Date of Government Version: 09/26/2017
Date Data Arrived at EDR: 09/27/2017
Date Made Active in Reports: 11/08/2017
Number of Days to Update: 42

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 12/08/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List
Cupa Facility list

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/25/2017
Date Data Arrived at EDR: 09/27/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 50

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 12/19/2017
Next Scheduled EDR Contact: 04/09/2018
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: 10/03/2017
Date Data Arrived at EDR: 10/06/2017
Date Made Active in Reports: 11/10/2017
Number of Days to Update: 35

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 01/04/2018
Next Scheduled EDR Contact: 04/09/2018
Data Release Frequency: Quarterly

STANISLAUS COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 11/01/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 6

Source: Stanislaus County Department of Ennvironmental Protection
Telephone: 209-525-6751
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Varies

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 12/01/2017
Date Data Arrived at EDR: 12/04/2017
Date Made Active in Reports: 12/19/2017
Number of Days to Update: 15

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 12/01/2017
Next Scheduled EDR Contact: 03/19/2018
Data Release Frequency: Semi-Annually

TEHAMA COUNTY:

CUPA Facility List

Cupa facilities

Date of Government Version: 11/16/2017
Date Data Arrived at EDR: 11/17/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 31

Source: Tehama County Department of Environmental Health
Telephone: 530-527-8020
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

TRINITY COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 10/23/2017
Date Data Arrived at EDR: 10/24/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 23

Source: Department of Toxic Substances Control
Telephone: 760-352-0381
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Varies

TULARE COUNTY:

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

CUPA Facility List
Cupa program facilities

Date of Government Version: 09/27/2017
Date Data Arrived at EDR: 09/28/2017
Date Made Active in Reports: 10/16/2017
Number of Days to Update: 18

Source: Tulare County Environmental Health Services Division
Telephone: 559-624-7400
Last EDR Contact: 12/18/2017
Next Scheduled EDR Contact: 02/19/2018
Data Release Frequency: Varies

TUOLUMNE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 10/24/2017
Date Data Arrived at EDR: 10/25/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 22

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
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: 09/26/2017
Date Data Arrived at EDR: 10/25/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 43

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
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: 12/26/2017
Next Scheduled EDR Contact: 04/16/2018
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: 11/08/2017
Next Scheduled EDR Contact: 02/26/2018
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: 09/26/2017
Date Data Arrived at EDR: 10/25/2017
Date Made Active in Reports: 12/07/2017
Number of Days to Update: 43

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 10/23/2017
Next Scheduled EDR Contact: 02/05/2018
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Underground Tank Closed Sites List
Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 08/28/2017
Date Data Arrived at EDR: 09/12/2017
Date Made Active in Reports: 09/21/2017
Number of Days to Update: 9

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 12/11/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report
Underground storage tank sites located in Yolo county.

Date of Government Version: 09/27/2017
Date Data Arrived at EDR: 10/02/2017
Date Made Active in Reports: 11/14/2017
Number of Days to Update: 43

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 01/02/2018
Next Scheduled EDR Contact: 04/16/2018
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 11/08/2017
Date Data Arrived at EDR: 11/10/2017
Date Made Active in Reports: 11/16/2017
Number of Days to Update: 6

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 10/25/2017
Next Scheduled EDR Contact: 02/12/2018
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: 11/11/2017
Date Data Arrived at EDR: 11/14/2017
Date Made Active in Reports: 12/18/2017
Number of Days to Update: 34

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 11/14/2017
Next Scheduled EDR Contact: 02/26/2018
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/11/2017
Date Made Active in Reports: 07/27/2017
Number of Days to Update: 107

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 01/05/2018
Next Scheduled EDR Contact: 04/23/2018
Data Release Frequency: Annually

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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: 10/01/2017
Date Data Arrived at EDR: 11/01/2017
Date Made Active in Reports: 11/13/2017
Number of Days to Update: 12

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 11/01/2017
Next Scheduled EDR Contact: 02/12/2018
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 07/25/2017
Date Made Active in Reports: 09/25/2017
Number of Days to Update: 62

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 10/16/2017
Next Scheduled EDR Contact: 01/29/2018
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 06/19/2015
Date Made Active in Reports: 07/15/2015
Number of Days to Update: 26

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 11/16/2017
Next Scheduled EDR Contact: 03/05/2018
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 04/13/2017
Date Made Active in Reports: 07/14/2017
Number of Days to Update: 92

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 12/11/2017
Next Scheduled EDR Contact: 03/26/2018
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: PennWell Corporation
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

Electric Power Transmission Line Data
Source: PennWell Corporation
This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

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.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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 was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

25622 ALESSANDRO BOULEVARD
25622 ALESSANDRO BOULEVARD
MORENO VALLEY, CA 92553

TARGET PROPERTY COORDINATES

Latitude (North):	33.91831 - 33° 55' 5.92''
Longitude (West):	117.215982 - 117° 12' 57.54''
Universal Tranverse Mercator:	Zone 11
UTM X (Meters):	480035.0
UTM Y (Meters):	3752925.2
Elevation:	1571 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5641326 SUNNYMEAD, CA
Version Date:	2012

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).

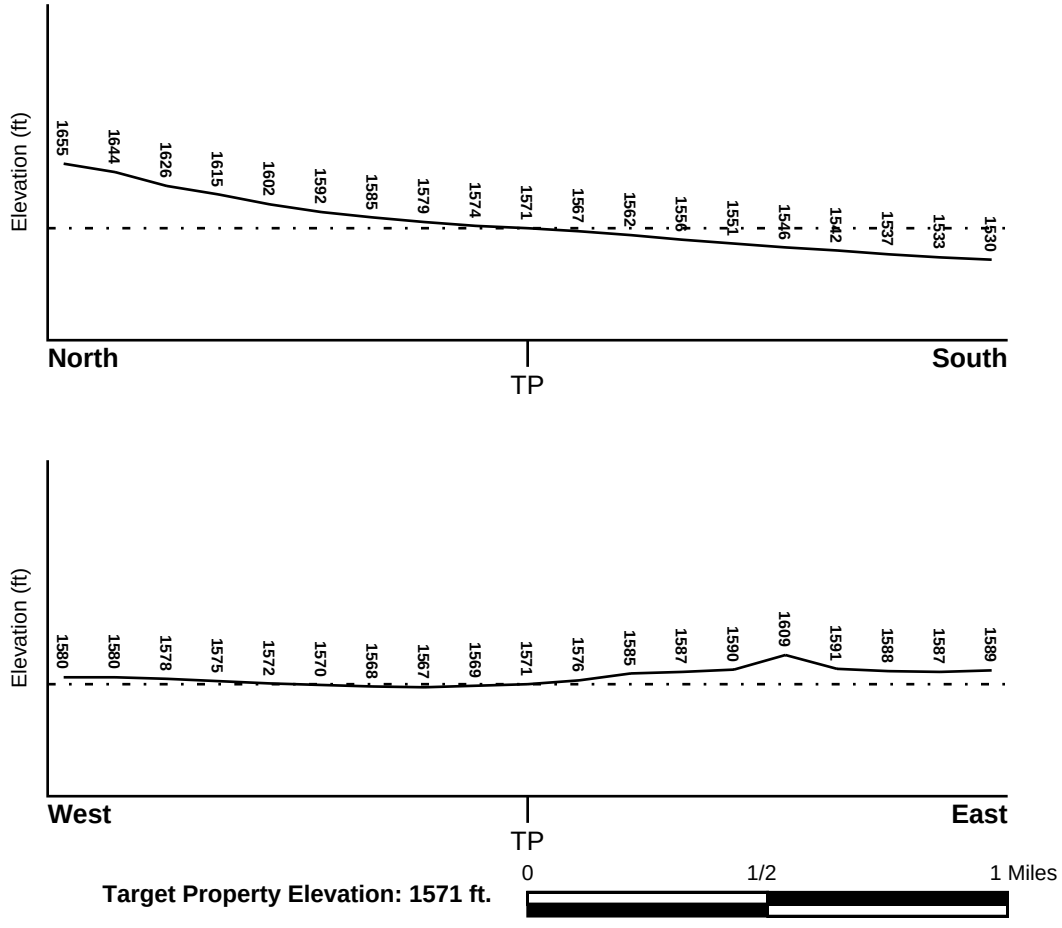
TOPOGRAPHIC INFORMATION

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 SW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Target Property Elevation: 1571 ft.

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

Flood Plain Panel at Target Property	FEMA Source Type
06065C0765G	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
06065C0761G	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	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
Status:	Not found

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
A1	1/2 - 1 Mile West	Not Reported
A2	1/2 - 1 Mile West	Not Reported
1G	1/2 - 1 Mile West	Not Reported
2G	1/2 - 1 Mile West	Not Reported

For additional site information, refer to Physical Setting Source Map Findings.

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

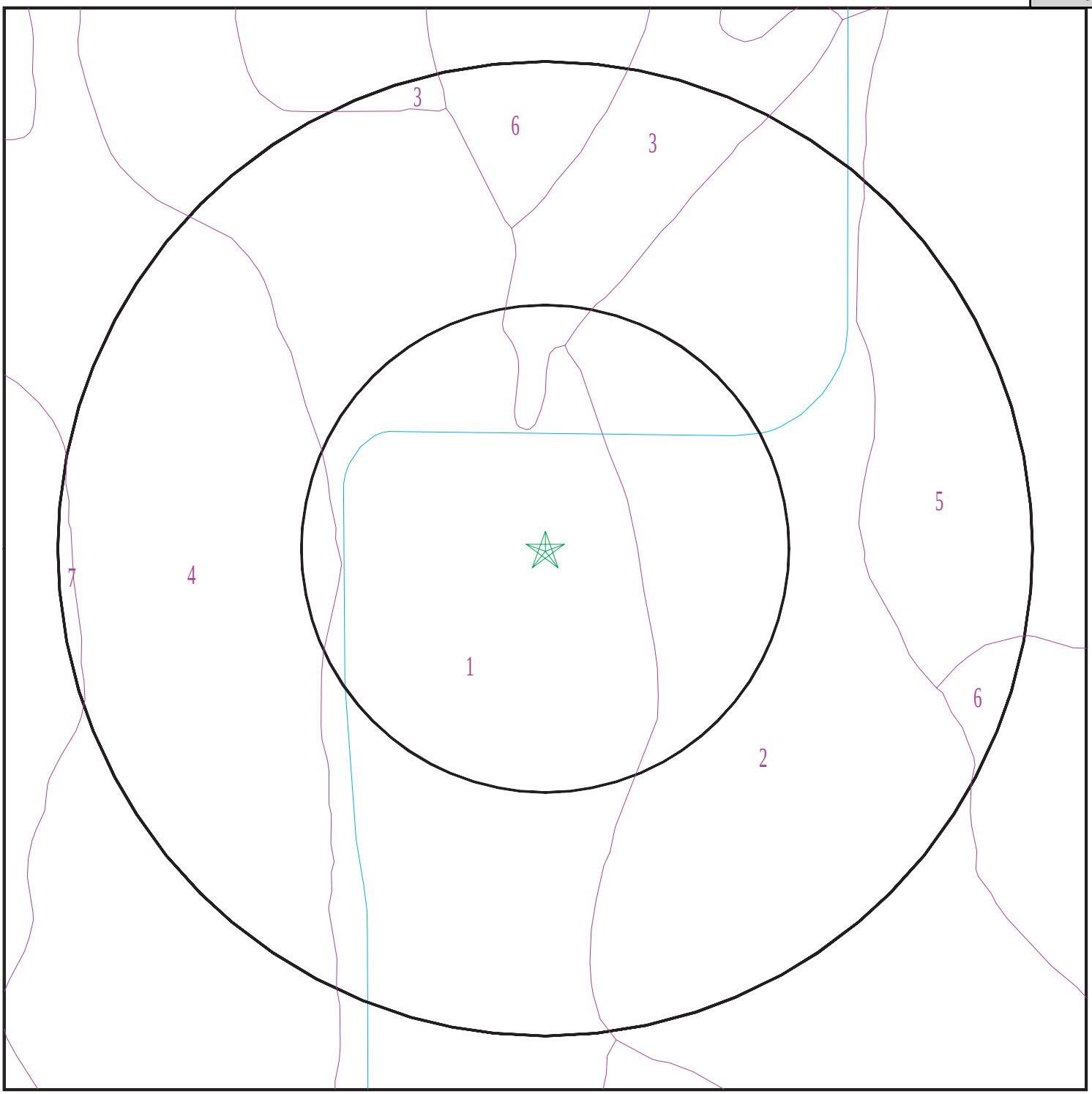
Era:	Mesozoic
System:	Cretaceous
Series:	Cretaceous granitic rocks
Code:	Kg *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

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 - 5158048.2s



SITE NAME:	25622 Alessandro Boulevard	CLIENT:	Leighton Consulting
ADDRESS:	25622 Alessandro Boulevard Moreno Valley CA 92553	CONTACT:	Breeanna Copeland
		INQUIRY #:	5158048.2s
LAT/LONG:	33.91831 / 117.215982	DATE:	January 12, 2018 3:17 pm

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: RAMONA

Soil Surface Texture: very fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 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	14 inches	very fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 7.3 Min: 5.6
2	14 inches	22 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 7.3 Min: 6.1
3	22 inches	68 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	68 inches	74 inches	gravelly sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Map ID: 2

Soil Component Name: GREENFIELD

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 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	25 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: 7.8 Min: 6.1

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

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	25 inches	42 inches	fine 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: 7.8 Min: 6.1
3	42 inches	59 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%), silt.	Max: 14 Min: 4	Max: 7.8 Min: 6.1
4	59 inches	72 inches	stratified loamy sand to 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: 6.6

Soil Map ID: 3

Soil Component Name: GREENFIELD

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

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	25 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: 7.8 Min: 6.1
2	25 inches	42 inches	fine 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: 7.8 Min: 6.1
3	42 inches	59 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%), silt.	Max: 14 Min: 4	Max: 7.8 Min: 6.1
4	59 inches	72 inches	stratified loamy sand to 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: 6.6

Soil Map ID: 4

Soil Component Name: EXETER

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

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	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 7.3 Min: 6.6
2	16 inches	37 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), Lean Clay	Max: 4 Min: 1.4	Max: 7.8 Min: 6.6
3	37 inches	50 inches	indurated	Not reported	Not reported	Max: 0.01 Min: 0	Max: Min:
4	50 inches	59 inches	stratified sandy loam to silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 4 Min: 1.4	Max: 8.4 Min: 7.4

Soil Map ID: 5

Soil Component Name: RAMONA

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

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	14 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: 14 Min: 4	Max: 7.3 Min: 5.6
2	14 inches	22 inches	fine sandy 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: 7.3 Min: 6.1
3	22 inches	68 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1
4	68 inches	74 inches	gravelly sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Map ID: 6

Soil Component Name: RAMONA

Soil Surface Texture: sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 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	14 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: 14 Min: 4	Max: 7.3 Min: 5.6
2	14 inches	22 inches	fine sandy 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: 7.3 Min: 6.1
3	22 inches	68 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 4 Min: 1.4	Max: 7.3 Min: 6.1
4	68 inches	74 inches	gravelly sandy loam	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 4 Min: 1.4	Max: 8.4 Min: 6.6

Soil Map ID: 7

Soil Component Name: PACHAPPA

Soil Surface Texture: fine sandy loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Low

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 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	20 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 7.8 Min: 6.1
2	20 inches	40 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	Max: 14 Min: 4	Max: 7.8 Min: 6.6
3	40 inches	62 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 8.4 Min: 6.6

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 0.001 miles
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

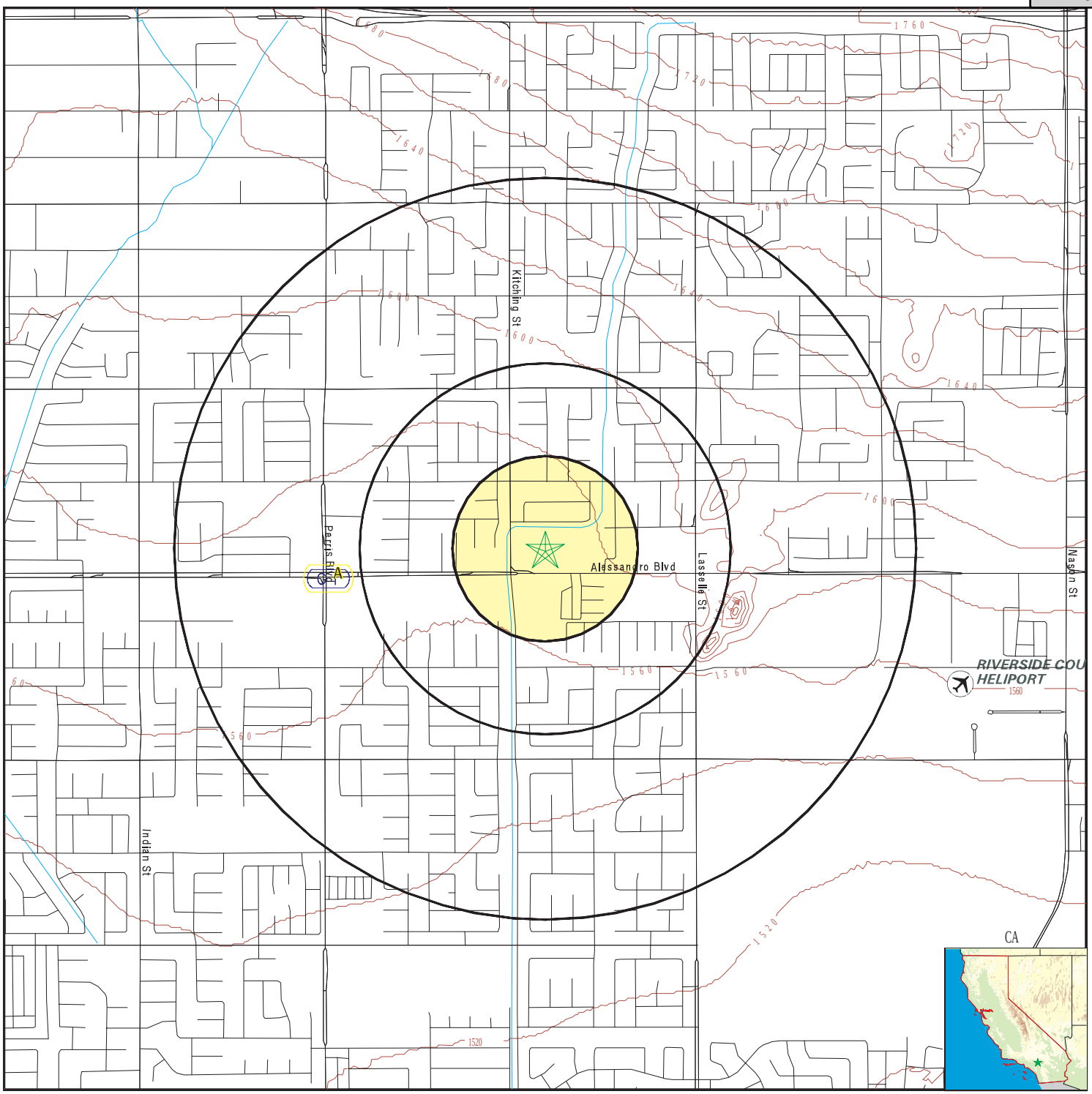
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 5158048.2s



- 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:	25622 Alessandro Boulevard	CLIENT:	Leighton Consulting
ADDRESS:	25622 Alessandro Boulevard Moreno Valley CA 92553	CONTACT:	Breeanna Copeland
LAT/LONG:	33.91831 / 117.215982	INQUIRY #:	5158048.2s
		DATE:	January 12, 2018 3:17 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID Direction Distance Elevation			Database	EDR ID Number
A1 **West** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	980609 Not Reported Not Reported Not Reported 50 ft 12/22/1998	**AQUIFLOW**	**50186**
A2 **West** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083303232T Not Reported Not Reported Not Reported 50 ft 12/22/1998	**AQUIFLOW**	**50185**
1G **West** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	980609 Not Reported Not Reported Not Reported 50 ft 12/22/1998	**AQUIFLOW**	**50186**
2G **West** **1/2 - 1 Mile** **Lower**	Site ID: Groundwater Flow: Shallow Water Depth: Deep Water Depth: Average Water Depth: Date:	083303232T Not Reported Not Reported Not Reported 50 ft 12/22/1998	**AQUIFLOW**	**50185**

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
92553	13	0

Federal EPA Radon Zone for RIVERSIDE County: 2

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 RIVERSIDE COUNTY, CA

Number of sites tested: 12

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.117 pCi/L	100%	0%	0%
Living Area - 2nd Floor	0.450 pCi/L	100%	0%	0%
Basement	1.700 pCi/L	100%	0%	0%

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.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: Department of Fish & Game
Telephone: 916-445-0411

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 Service (NRCS)
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 Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, 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 Public Health
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

VAPOR ENCROACHMENT SCREEN

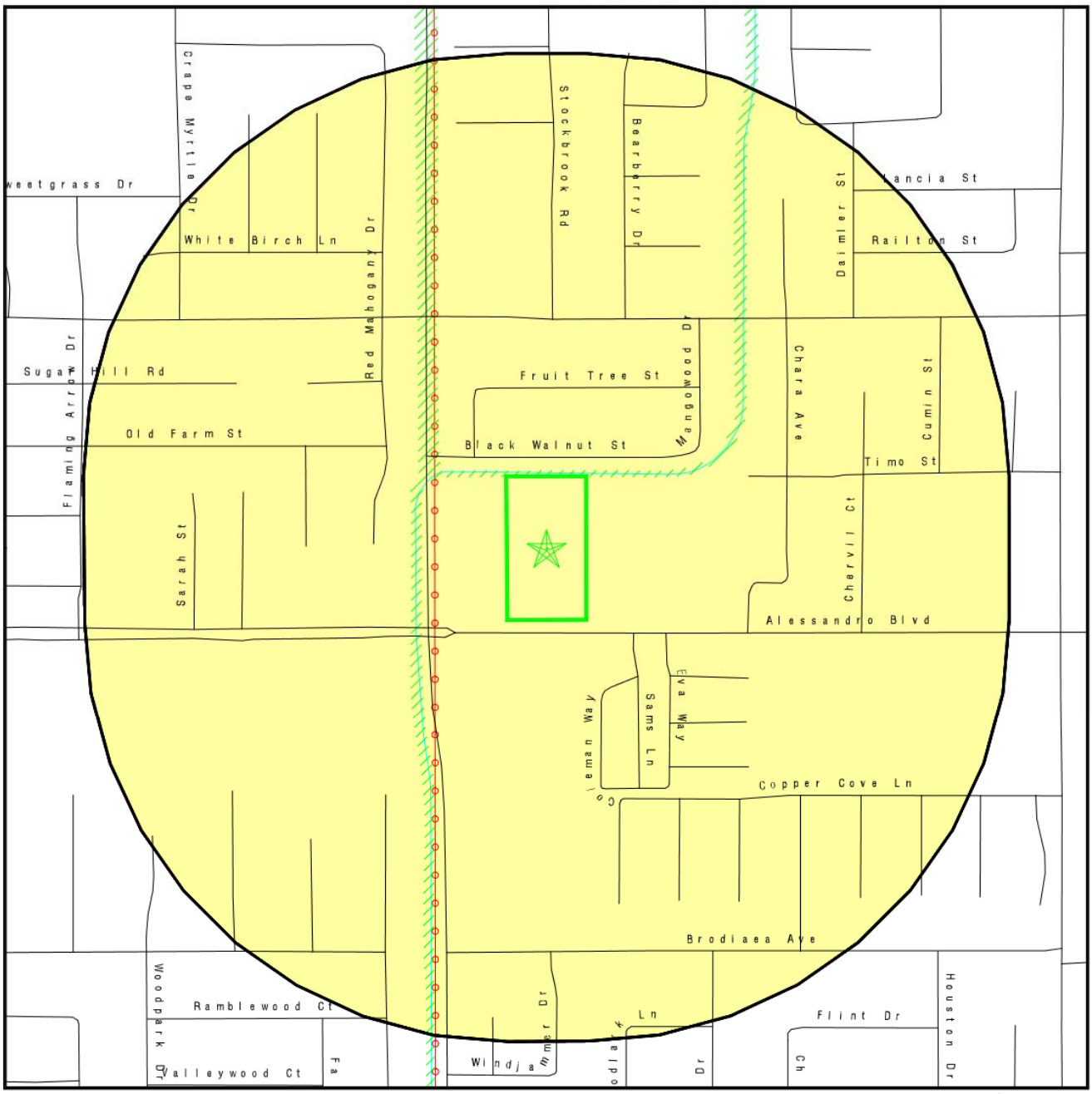
Prepared by: Leighton Consulting

1/24/2018

TABLE OF CONTENTS

EXECUTIVE SUMMARY

PRIMARY MAP - 5158048.2S



- 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
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- 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: 25622 Alessandro Boulevard ADDRESS: 25622 Alessandro Boulevard Moreno Valley CA 92553 LAT/LONG: 33.91831 / 117.215982	CLIENT: Leighton Consulting CONTACT: Breeanna Copeland INQUIRY #: 5158048.2s DATE: January 12, 2018 3:15 pm

MAP FINDINGS

APPENDIX F - REGULATORY DOCUMENTATION

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

January 12, 2018

Department of Toxic Substances Control
9211 Oakdale Avenue
Chatsworth, CA 91311-6505
818-717-6521 (Phone)
VIA EMAIL: Glenn.Castillo@dtsc.ca.gov, robert.hardison@dtsc.ca.gov

Subject: ***File Review***

Records Review Dept:

Leighton Consulting, Inc. (Leighton Consulting) is requesting information for the following address:

25622 Alessandro Blvd., Moreno Valley, CA 92553, APN 479-230-018.

We are requesting any information concerning hazardous waste/materials, underground storage tanks, leaking underground storage tanks cleanup, inspections, violations, or any other environmental sensitive spills, responses or concerns. Thank you for your assistance.

Sincerely

LEIGHTON CONSULTING, INC.

Breeanna Copeland

Breeanna Copeland, GIT
Staff Geologist
(909) 527-8770 (phone)
(909) 484-2170 (fax)
bcopeland@leightongroup.com

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

January 12, 2018

Department of Toxic Substances Control
5796 Corporate Avenue
Cypress, CA 90630
(714) 484-5300 (Phone)
VIA EMAIL: Julie.Johnson@dtsc.ca.gov, Jone.Barrio@dtsc.ca.gov

Subject: ***File Review***

Records Review Dept:

Leighton Consulting, Inc. (Leighton Consulting) is requesting information for the following address:

- ***25622 Alessandro Blvd., Moreno Valley, CA 92553, APN 479-230-018.***

We are requesting any information concerning hazardous waste/materials, underground storage tanks, leaking underground storage tanks cleanup, inspections, violations, or any other environmental sensitive spills, responses or concerns. Thank you for your assistance.

Sincerely

LEIGHTON CONSULTING, INC.

Breeanna Copeland, GIT
Staff Geologist
(909) 527-8770 (phone)
(909) 484-2170 (fax)
bcopeland@leightongroup.com

City of Moreno Valley
City Clerk's Office
Public Records Request
For records in the possession of the City of Moreno Valley

Requesting Party Information

Name: Breeanna Copeland

Mailing Address: 10532 Acacia Street, Suite B-6, Rancho Cucamonaga, CA 91730

Phone: 909-527-8770 Fax: 909-484-2170

E-Mail: bcopeland@leightongroup.com

Records Requested

I wish to: ☐ Review public records specified in this request
☑ Obtain copies of public records without prior inspection

Requested Records (Please be as specific as possible; provide dates when applicable):

25622 Alessandro Blvd. - 1930's - 1978 Current and Building Permits, documents concerning underground storage tanks, leaking underground storage tanks cleanup, inspections, violations or other environmental sensitive spills, responses or concerns,

Please note that a fee for each page copied will be charged in accordance with the current Council approved Fee Resolution. Payments shall be made prior to release of records requested.

If applicable, you will be advised within 10 days of the availability of the documents and whether disclosure of any of the documents is exempt under the provisions of the Public Records Act.

This area for staff use only

Received by (name/department): _____
Date Request Received: _____ Date Response Due: _____
(Respond by 10 calendar days)

Date Requested Document Provided _____; mailed ___; picked up ___; other _____
Copying fee: ____pages @ $ 0.__ /page = $_____ + _____postage = Total _____
(if applicable)

Records may be requested by email: cityclerk@moval.org, fax 951.413.3009, phone 951.413.3001 or in person at 14177 Frederick St., City Clerk's Department (2nd floor)

COUNTY OF RIVERSIDE

BUILDING AND SAFETY DEPARTMENT

ARCHIVED RECORDS REQUEST

A FEE WILL BE CHARGED FOR REQUESTS REQUIRING COPIES OR RESEARCH OF ARCHIVED RECORDS.

***REQUESTOR'S NAME:** Breeanna Copeland			
COMPANY: Leighton Consulting Inc.			
Current Mailing address: 10532 Acacia Street, Suite B-6			
***REQUESTOR'S PHONE NO.:** 909-527-8770			
EMAIL ADDRESS: bcopeland@leightongroup.com			
City: Rancho Cucamonaga	**State:** CA	**ZIP Code:** 91730	**YEAR BUILT:** unknown

* REQUESTING ALL PERMITS: ☑ YES ☐ NO

If not, specify type of Permit(s):

****ADDRESS TO BE RESEARCHED:**	25622 Alessandro Boulevard Moreno Valley CA
****ASSESSOR'S PARCEL NO.: (APN)** **MUST COMPLETE AT LEAST ONE OF THESE FIELDS	479230018

ADDITIONAL COMMENTS:

YOU WILL BE CONTACTED AT THE ABOVE-GIVEN PHONE NUMBER WHEN RESEARCH HAS BEEN COMPLETED

DEPARTMENT OF BUILDING AND SAFETY
RECORDS DIVISION
4080 LEMON ST., 9th FLOOR
P.O. BOX 1629
RIVERSIDE, CALIFORNIA 92502-1629
OUR TELEPHONE NO.: (951) 955-2018 or (951) 955-2017 FAX: (951) 955-2022

records@rctlma.org

Permits issued after July 1997 are available on our web site.
Permits issued before July 1997 are archived records and can be obtained only through a request for records.
Our oldest records date back to approximately 1963.

Print Form | Reset Form | Submit Form

Breeanna Copeland

From: WB-RB8-FileReview8 <FileReview8@waterboards.ca.gov>
Sent: Tuesday, January 16, 2018 10:55 AM
To: Breeanna Copeland
Subject: RE: Records request

Good morning,

After careful review of our records, we show we have no files for the following sites:
25622 Alessandro Blvd., Moreno Valley, CA 92553
If we can be of further assistance please don't hesitate to contact us again.

Paloma
File Review Desk

From: Breeanna Copeland [mailto:bcopeland@leightongroup.com]
Sent: Friday, January 12, 2018 3:30 PM
To: WB-RB8-FileReview8 <FileReview8@waterboards.ca.gov>
Subject: Records request

Good Afternoon,

Leighton Consulting, Inc. (Leighton Consulting) is requesting information for the following address:

- 25622 Alessandro Blvd., Moreno Valley, CA 92553, APN 479-230-018.

We are requesting any information concerning hazardous waste/materials, underground storage tanks, leaking underground storage tanks cleanup, inspections, violations, or any other environmental sensitive spills, responses or concerns. Thank you for your assistance.

Sincerely,

Breeanna Copeland, GIT
Senior Staff Geologist
Leighton Group Inc.
10532 Acacia Street, Suite B-6
Rancho Cucamonga, CA 91730
(909) 527-8770 Direct
(951) 258-4715 Cell
(909) 484-2170 FAX

Matthew Rodriquez
Secretary for
Environmental Protection

Department of Toxic Substances Control

Barbara A. Lee, Director
5796 Corporate Avenue
Cypress, California 90630

Edmund G. Brown J
Governor

January 29, 2018

Ms. Breeanna Copeland
Lighton
10532 Acacia St., Ste. B-6
Rancho Cucamonga, CA 91730
bcopeland@leightongroup.com

25622 Alessandro Blvd.,
Moreno Valley & 479-230-018
PR4-012918-04

Dear: Ms. Copeland:

We have received your Public Records Act Request for records from Department of Toxic Substances Control.

After a thorough review of our files we have found that, no such records exist at this office pertaining to the site/facility referenced above.

We would like to inform you about Envirostor, a database that provides information and documents on over 5,000 DTSC cleanup sites. Envirostor can be accessed at: http://www.envirostor.dtsc.ca.gov/public.

If you have any questions, would like further information regarding your request, please contact our Regional Records Coordinator at (714) 484-5336.

Sincerely,

Jone Barrio

Jone Barrio
Regional Records Coordinator
Cypress Administrative Services
jone.barrio@dtsc.ca.gov

APPENDIX G - HISTORICAL RESEARCH DOCUMENTATION

25622 Alessandro Boulevard

25622 Alessandro Boulevard

Moreno Valley, CA 92553

Inquiry Number: 5158048.12

January 12, 2018

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

01/12/18

Site Name:

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553
EDR Inquiry # 5158048.12

Client Name:

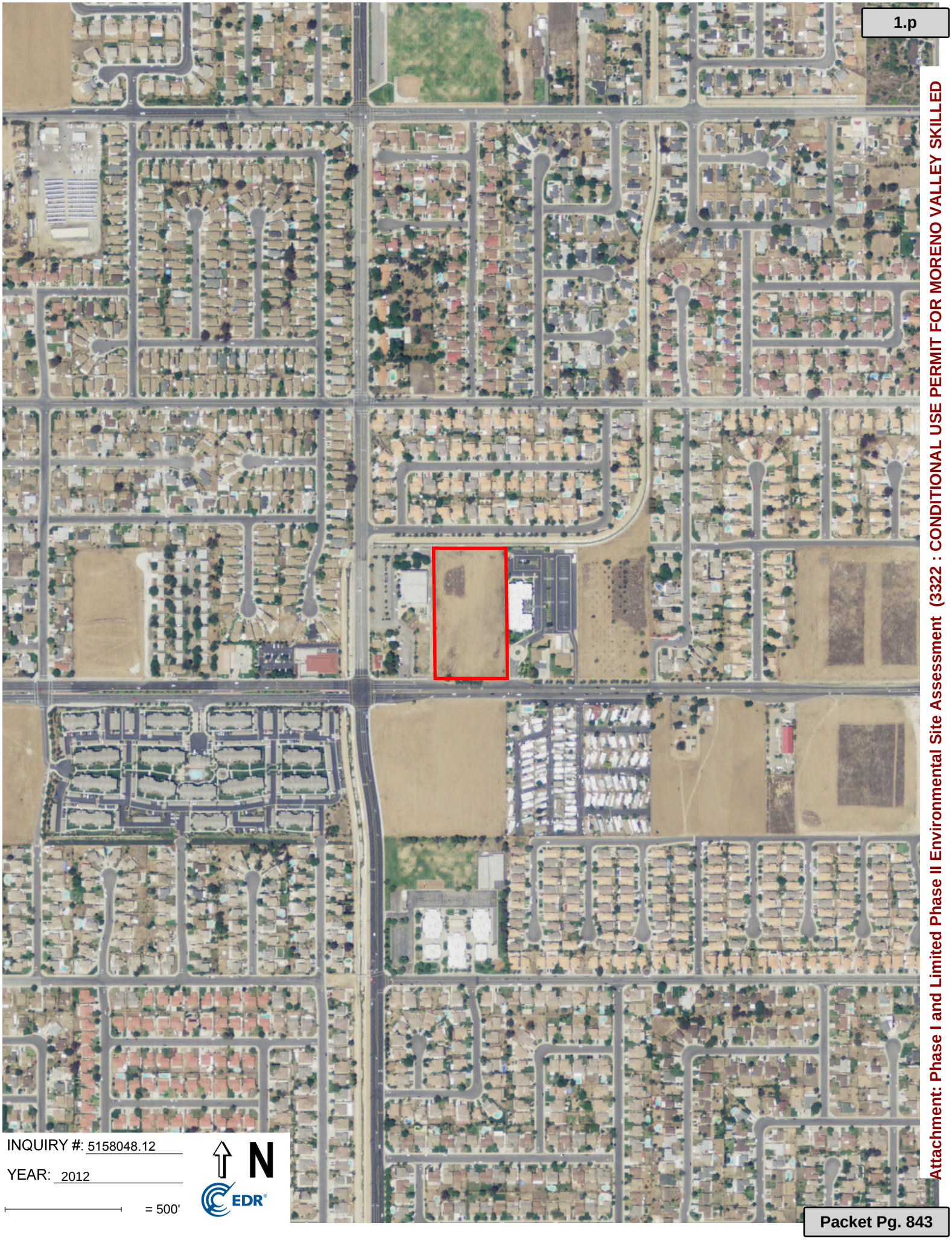
Leighton Consulting
17781 Cowan
Irvine, CA 92614
Contact: Breeanna Copeland

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.

Search Results:

Year	Scale	Details	Source
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2010	1"=500'	Flight Year: 2010	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
2005	1"=500'	Flight Year: 2005	USDA/NAIP
2002	1"=500'	Acquisition Date: June 06, 2002	USGS/DOQQ
1997	1"=500'	Flight Date: October 16, 1997	USGS
1989	1"=500'	Flight Date: August 15, 1989	USDA
1985	1"=500'	Flight Date: July 28, 1985	USDA
1978	1"=500'	Flight Date: September 20, 1978	USDA
1967	1"=500'	Flight Date: May 15, 1967	USDA
1953	1"=500'	Flight Date: August 28, 1953	USDA
1949	1"=500'	Flight Date: May 08, 1949	USDA
1938	1"=500'	Flight Date: June 14, 1938	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.



INQUIRY #: 5158048.12

YEAR: 2012

= 500'

N

EDR

INQUIRY #: 5158048.12

YEAR: 2010

= 500'

N

EDR

Attachment: Phase I and Limited Phase II Environmental Site Assessment (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED

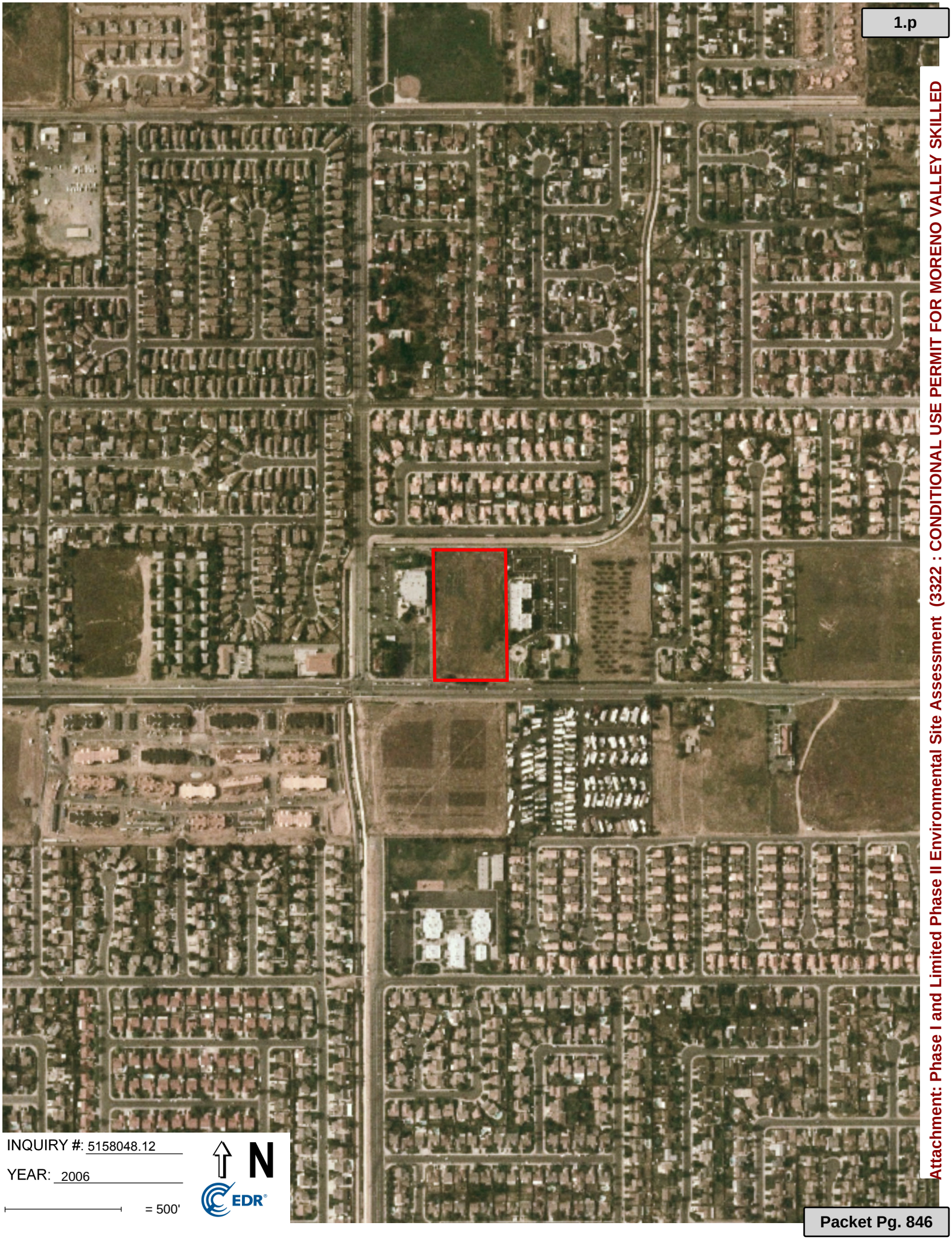
INQUIRY #: 5158048.12

YEAR: 2009

= 500'

N

EDR



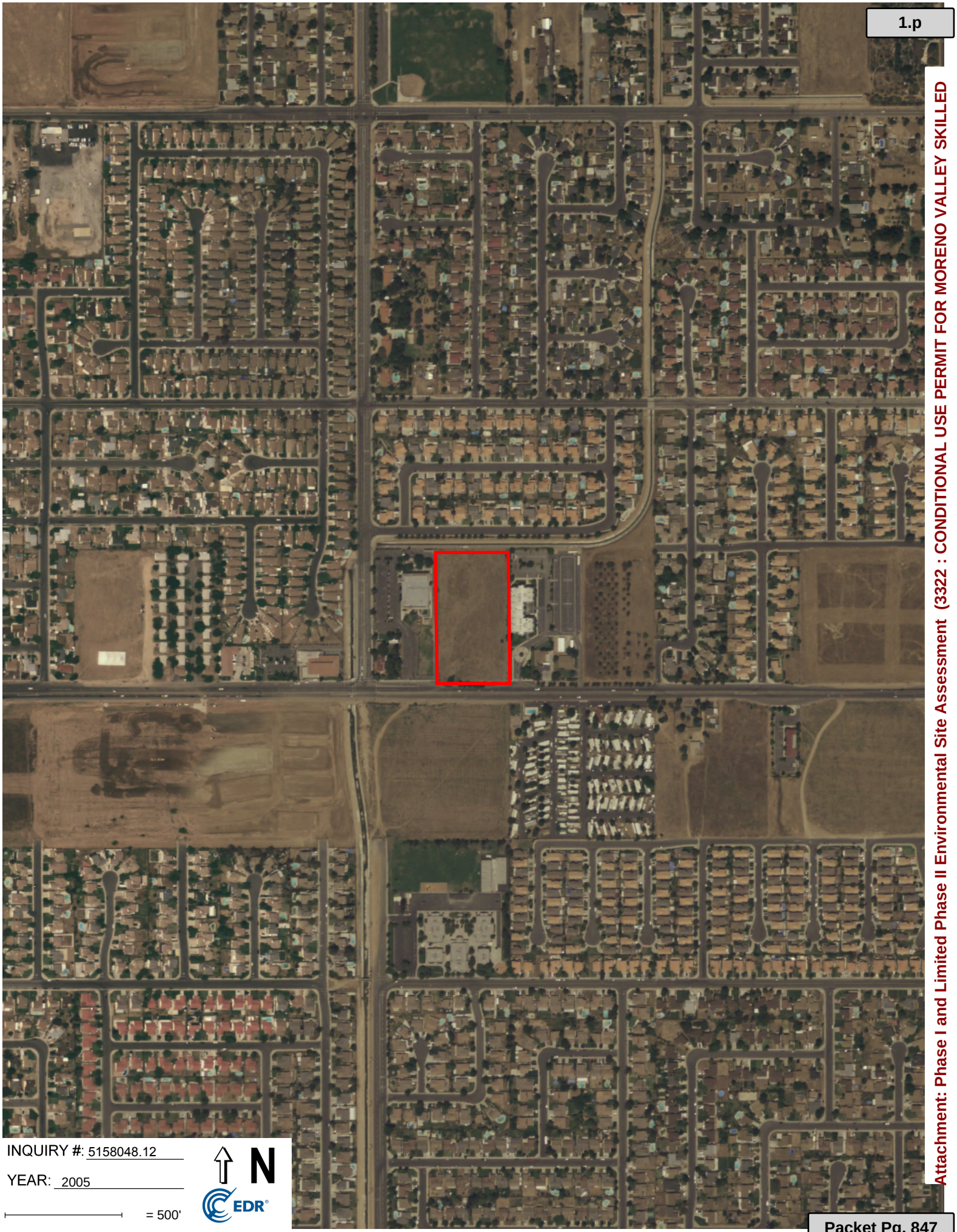
INQUIRY #: 5158048.12

YEAR: 2006

= 500'

N

EDR



INQUIRY #: 5158048.12

YEAR: 2005

= 500'

N

EDR

INQUIRY #: 5158048.12

YEAR: 2002

= 500'

N

EDR

INQUIRY #: 5158048.12

YEAR: 1997

= 500'

N

EDR

INQUIRY #: 5158048.12

YEAR: 1989

= 500'

N

EDR

INQUIRY #: 5158048.12

YEAR: 1985

= 500'

N

EDR

INQUIRY #: 5158048.12

YEAR: 1978

= 500'

N

EDR

INQUIRY #: 5158048.12

YEAR: 1967

= 500'

N

EDR

INQUIRY #: 5158048.12

YEAR: 1953

= 500'

N

EDR

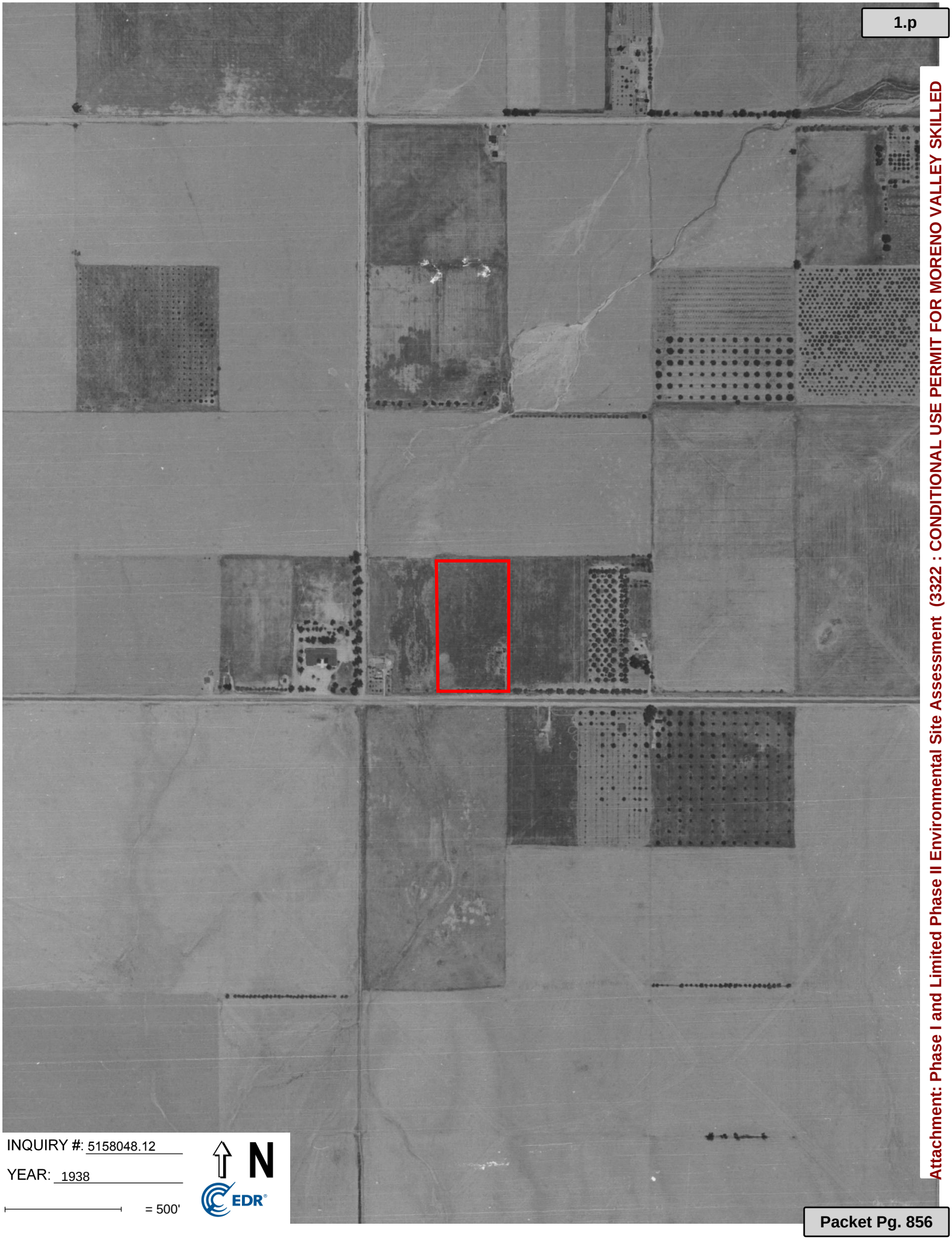
INQUIRY #: 5158048.12

YEAR: 1949

= 500'

N

EDR



INQUIRY #: 5158048.12

YEAR: 1938

= 500'

N

EDR

25622 Alessandro Boulevard

25622 Alessandro Boulevard

Moreno Valley, CA 92553

Inquiry Number: 5158048.4

January 12, 2018

EDR Historical Topo Map Repo

with QuadMatch

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Historical Topo Map Report

01/12/18

Site Name:

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553
EDR Inquiry # 5158048.4

Client Name:

Leighton Consulting
17781 Cowan
Irvine, CA 92614
Contact: Breeanna Copeland

EDR Topographic Map Library has been searched by EDR and maps covering the target property location as provided by Leighton Consulting were identified for the years listed below. EDR's Historical Topo Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topo Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the late 1800s.

Search Results:

P.O.# 11888.002
Project: NA

Coordinates:

Latitude:	33.91831 33° 55' 6" North
Longitude:	-117.215982 -117° 12' 58" West
UTM Zone:	Zone 11 North
UTM X Meters:	480035.44
UTM Y Meters:	3753119.41
Elevation:	1571.00' above sea level

Maps Provided:

2012
1980
1973
1967
1953
1943
1942
1901

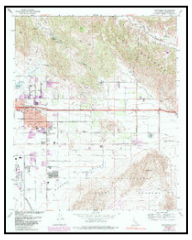
Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

2012 Source Sheets

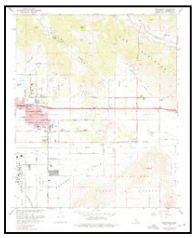
Sunnymead
2012
7.5-minute, 24000

1980 Source Sheets



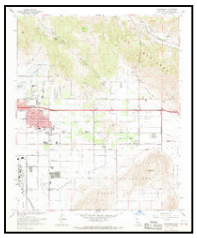
Sunnymead
1980
7.5-minute, 24000
Aerial Photo Revised 1978

1973 Source Sheets



Sunnymead
1973
7.5-minute, 24000
Aerial Photo Revised 1973

1967 Source Sheets

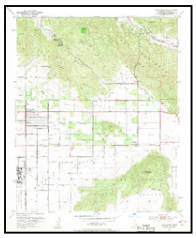


Sunnymead
1967
7.5-minute, 24000
Aerial Photo Revised 1966

Topo Sheet Key

This EDR Topo Map Report is based upon the following USGS topographic map sheets.

1953 Source Sheets



Sunnymead
1953
7.5-minute, 24000
Aerial Photo Revised 1951

1943 Source Sheets

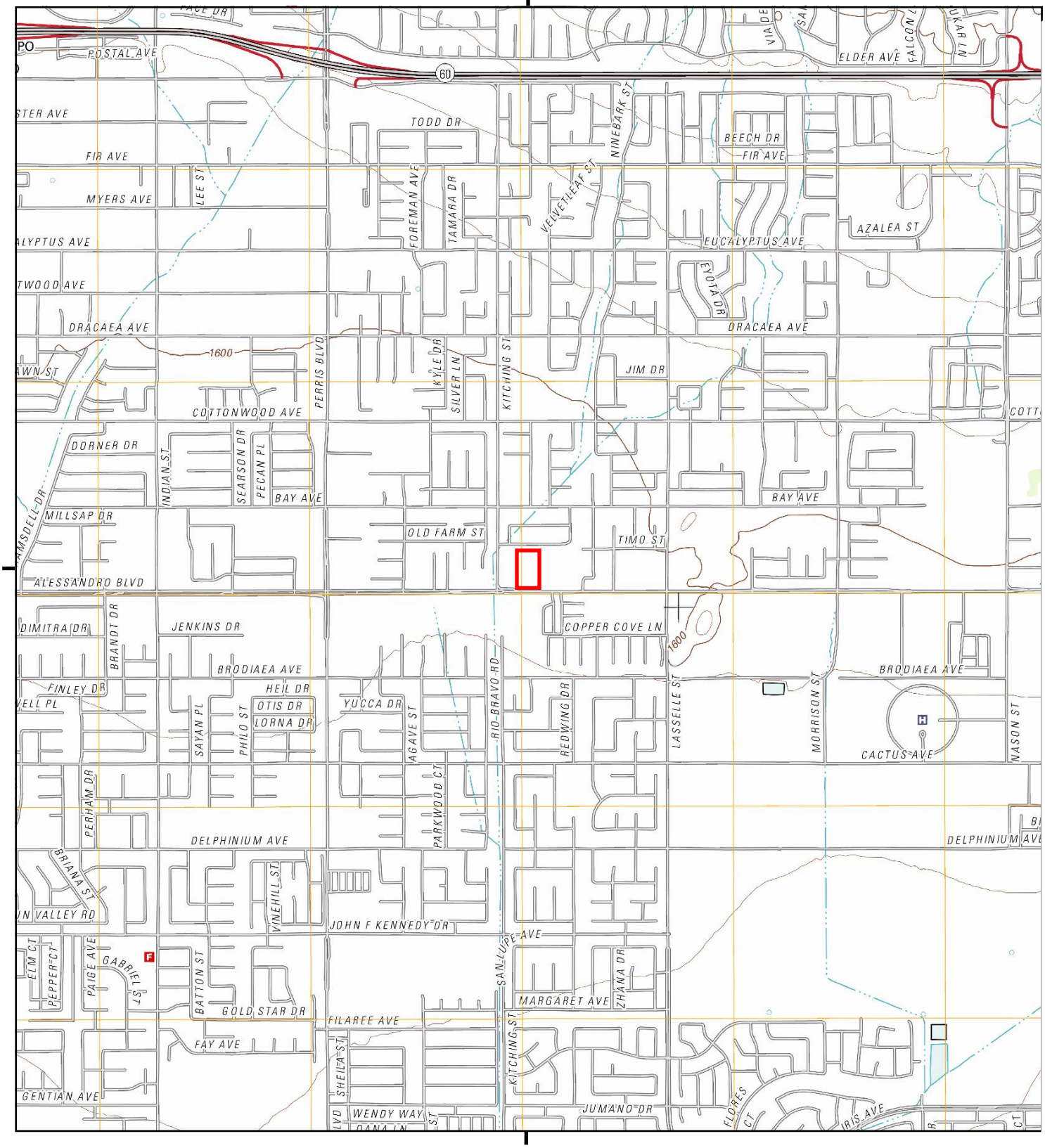
PERRIS
1943
15-minute, 62500

1942 Source Sheets

Perris
1942
15-minute, 62500
Aerial Photo Revised 1939

1901 Source Sheets

Elsinore
1901
30-minute, 125000



This report includes information from the following map sheet(s).

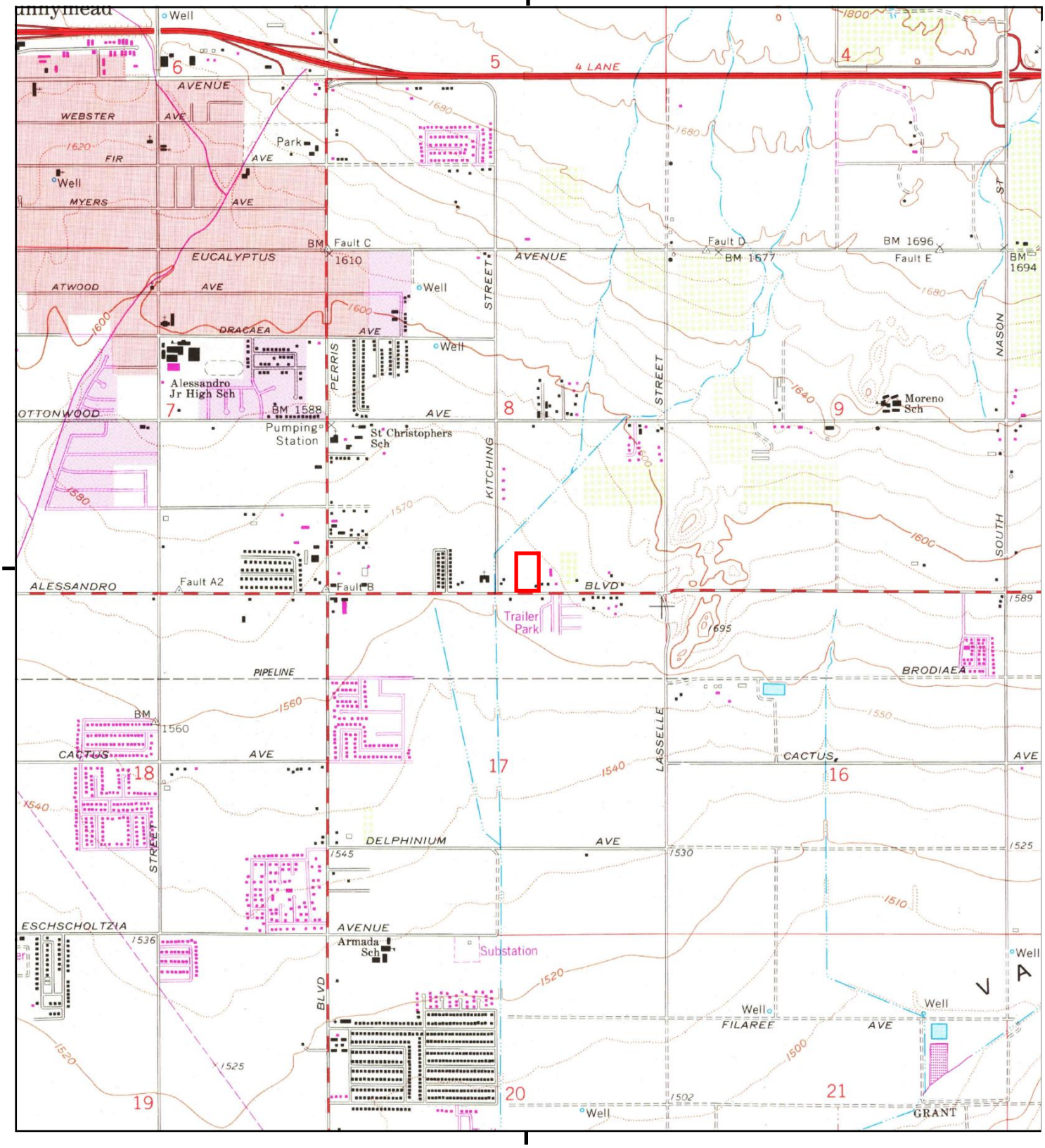
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sunnymead, 2012, 7.5-minute

SITE NAME: 25622 Alessandro Boulevard
ADDRESS: 25622 Alessandro Boulevard
Moreno Valley, CA 92553
CLIENT: Leighton Consulting

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

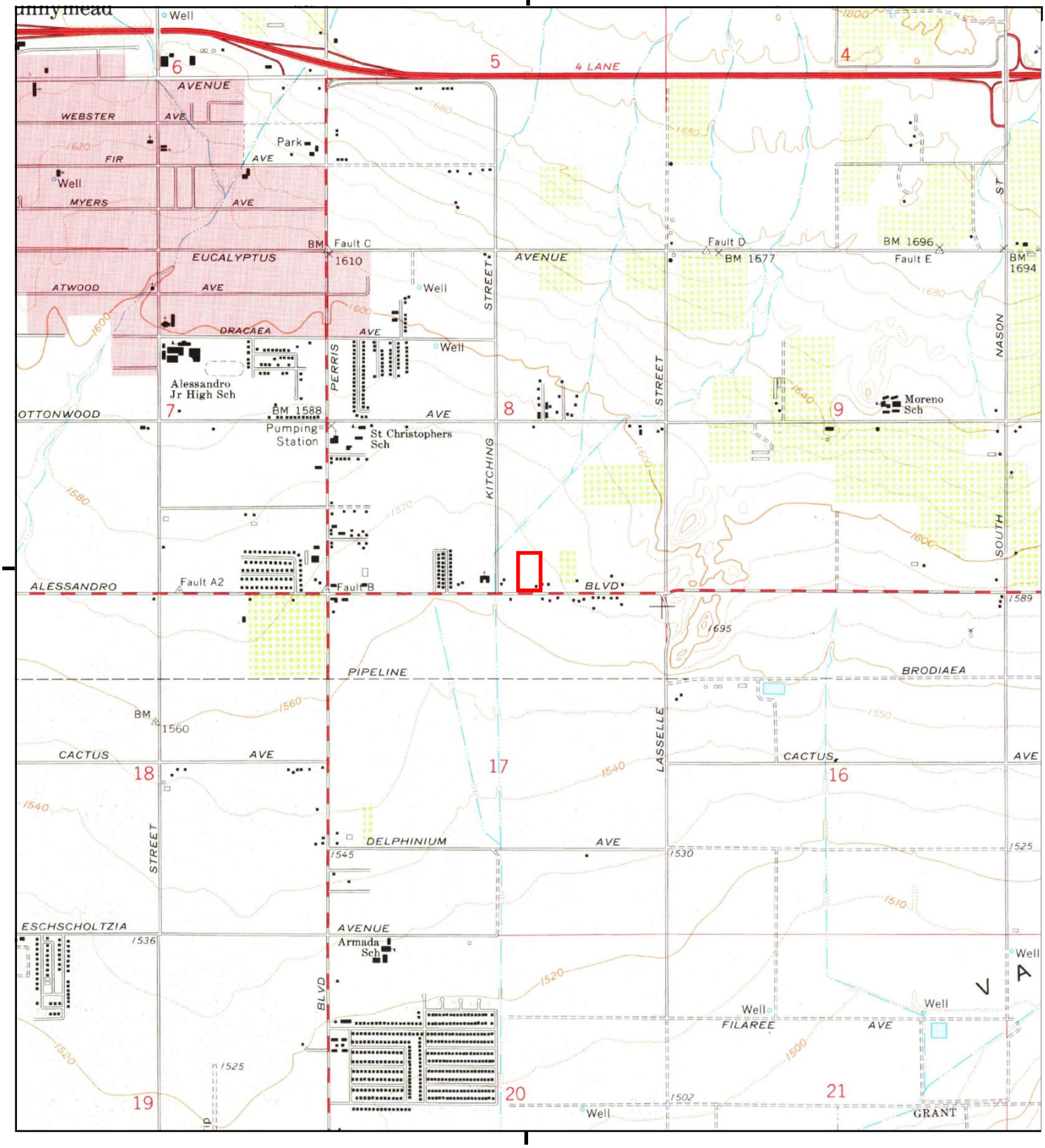
NW N NE
W E
SW S SE

TP, Sunnymead, 1980, 7.5-minute

SITE NAME: 25622 Alessandro Boulevard
ADDRESS: 25622 Alessandro Boulevard
Moreno Valley, CA 92553
CLIENT: Leighton Consulting

N

Historical Topo Map



This report includes information from the following map sheet(s).

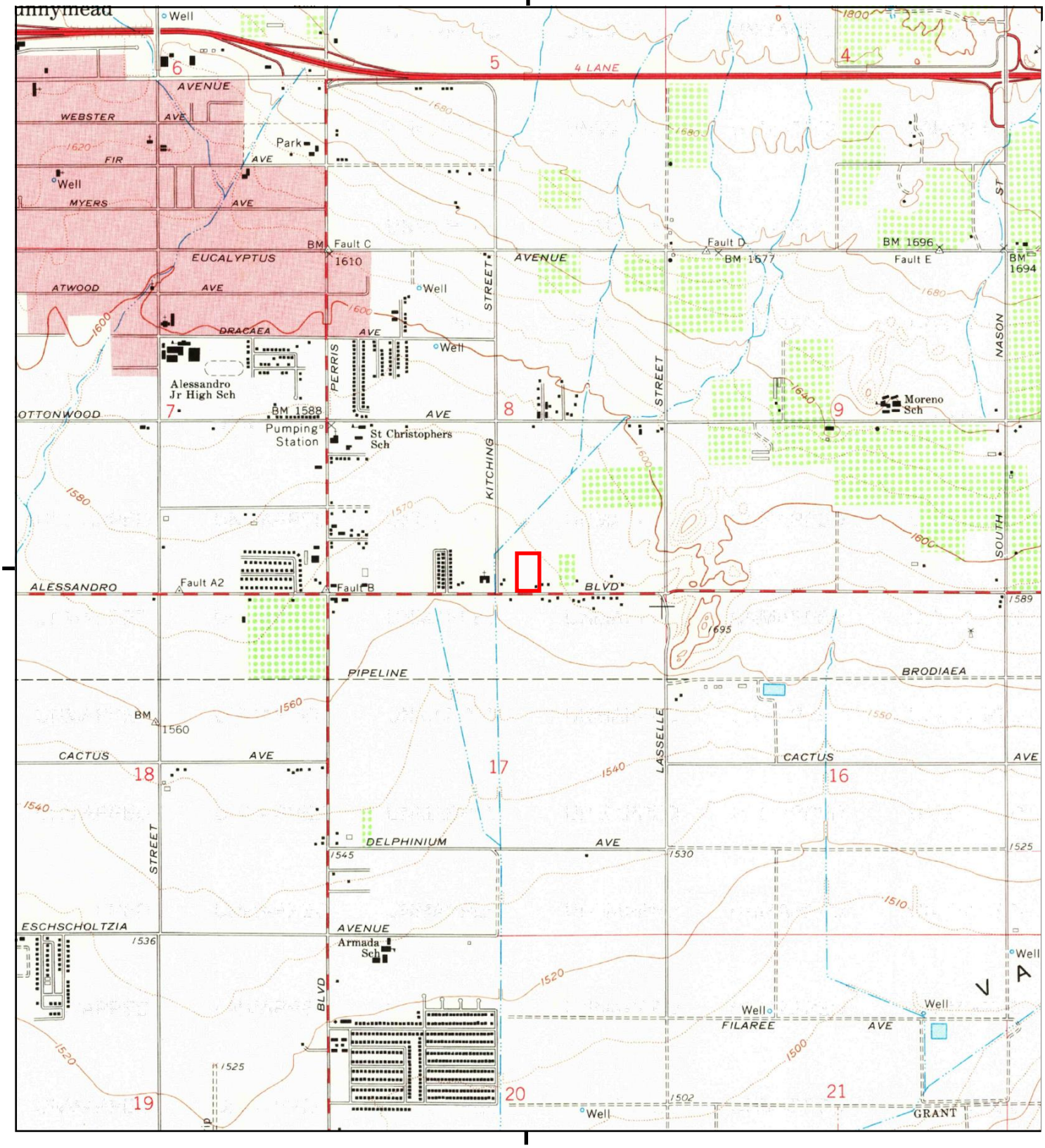
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sunnymead, 1973, 7.5-minute

SITE NAME: 25622 Alessandro Boulevard
ADDRESS: 25622 Alessandro Boulevard
Moreno Valley, CA 92553
CLIENT: Leighton Consulting

N



This report includes information from the following map sheet(s).

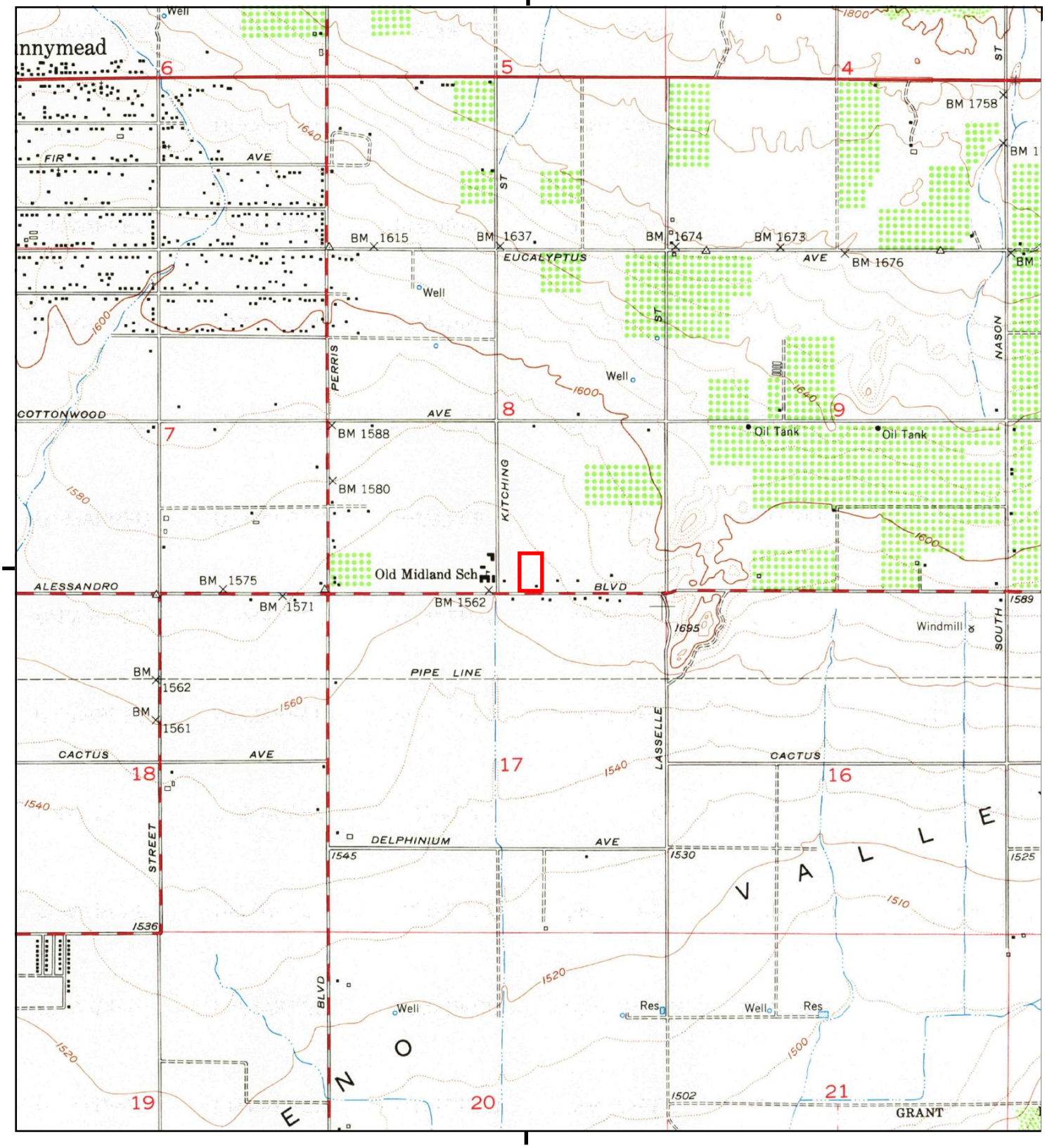
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sunnymead, 1967, 7.5-minute

SITE NAME: 25622 Alessandro Boulevard
ADDRESS: 25622 Alessandro Boulevard
Moreno Valley, CA 92553
CLIENT: Leighton Consulting

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Sunnymead, 1953, 7.5-minute

SITE NAME: 25622 Alessandro Boulevard
ADDRESS: 25622 Alessandro Boulevard
Moreno Valley, CA 92553
CLIENT: Leighton Consulting

N

Historical Topo Map

This report includes information from the following map sheet(s).

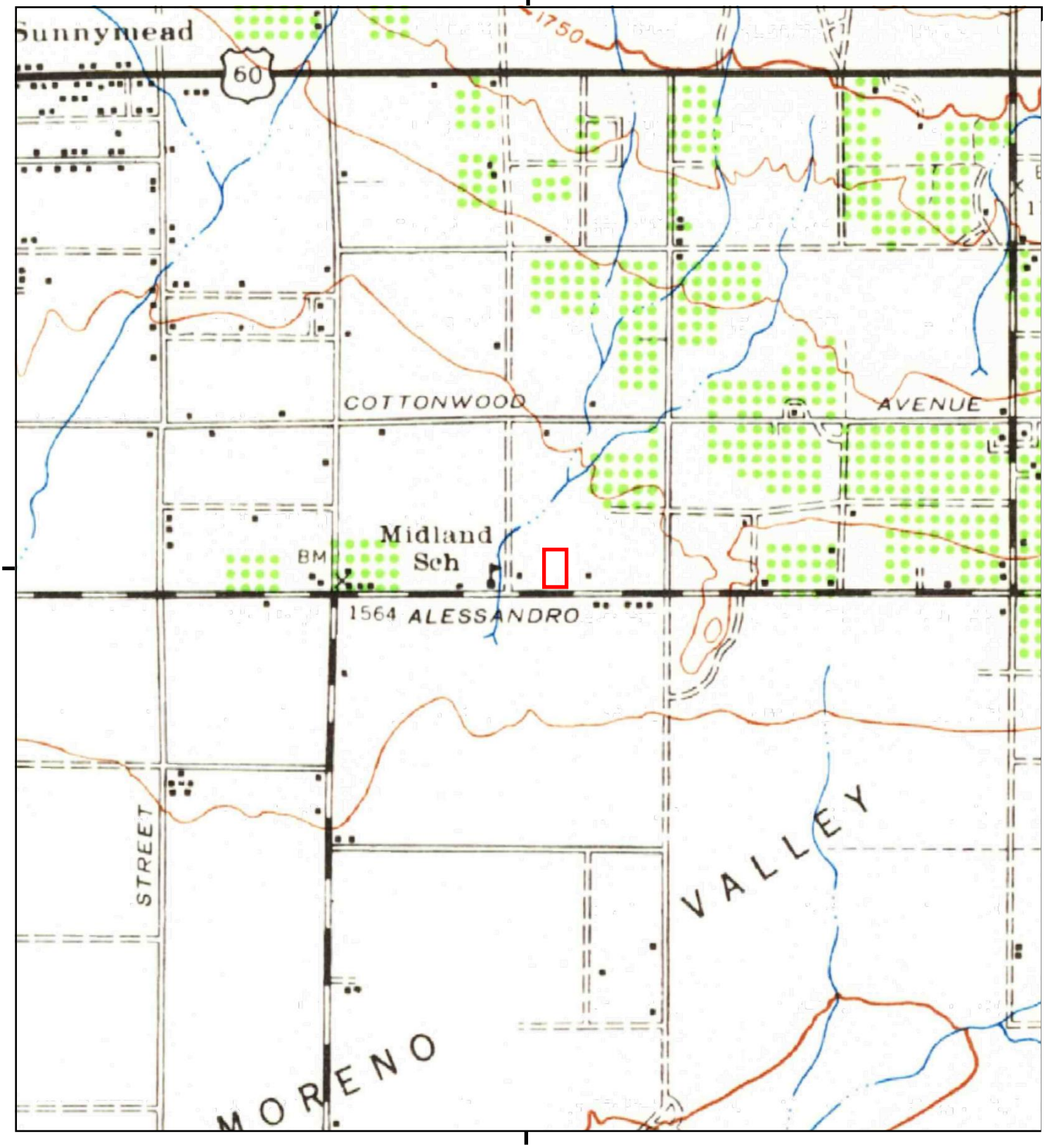
0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, PERRIS, 1943, 15-minute

SITE NAME: 25622 Alessandro Boulevard
ADDRESS: 25622 Alessandro Boulevard
Moreno Valley, CA 92553
CLIENT: Leighton Consulting

N



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

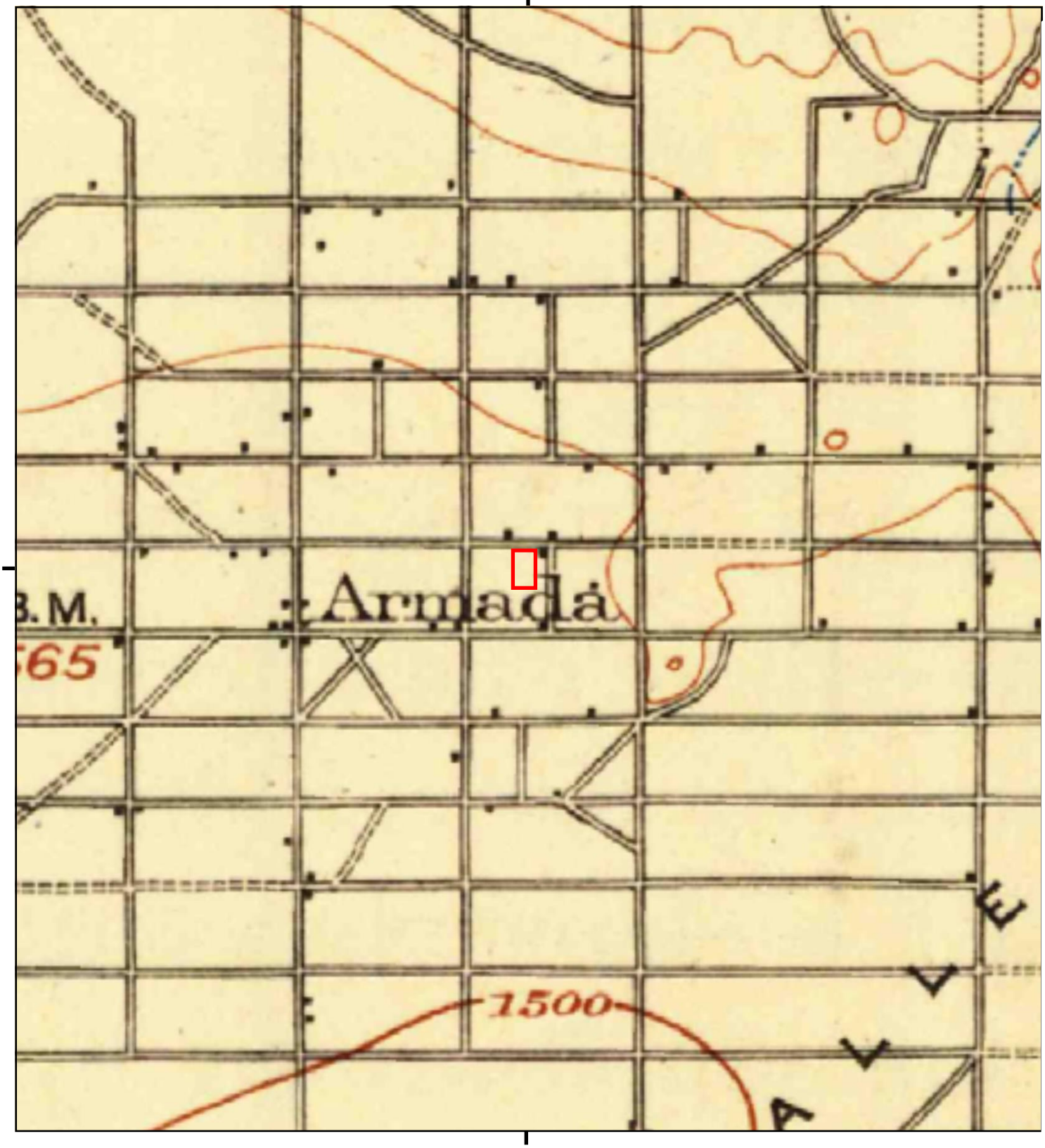
NW N NE
W E
SW S SE

TP, Perris, 1942, 15-minute

SITE NAME: 25622 Alessandro Boulevard
ADDRESS: 25622 Alessandro Boulevard
Moreno Valley, CA 92553
CLIENT: Leighton Consulting

N

Historical Topo Map



This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Elsinore, 1901, 30-minute

SITE NAME: 25622 Alessandro Boulevard
ADDRESS: 25622 Alessandro Boulevard
Moreno Valley, CA 92553
CLIENT: Leighton Consulting

N

25622 Alessandro Boulevard

25622 Alessandro Boulevard

Moreno Valley, CA 92553

Inquiry Number: 5158048.3

January 12, 2018

Certified Sanborn® Map Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

01/12/18

Site Name:

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553
EDR Inquiry # 5158048.3

Client Name:

Leighton Consulting
17781 Cowan
Irvine, CA 92614
Contact: Breeanna Copeland

The Sanborn Library has been searched by EDR and maps covering the target property location as provided by Leighton Consulting were identified for the years listed below. The Sanborn Library is the largest, most complete collection of fire insurance maps. The collection includes maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow, and others. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by the Sanborn Library LLC, the copyright holder for the collection. Results can be authenticated by visiting www.edrnet.com/sanborn.

The Sanborn Library is continually enhanced with newly identified map archives. This report accesses all maps in the collection as of the day this report was generated.

Certified Sanborn Results:

Certification # 68CA-473F-8CA7

PO # 11888.002

Project NA

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

Sanborn® Library search results

Certification #: 68CA-473F-8CA7

The Sanborn Library includes more than 1.2 million fire insurance maps from Sanborn, Bromley, Perris & Browne, Hopkins, Barlow and others which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ☑ Library of Congress
- ☑ University Publications of America
- ☑ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

Leighton Consulting (the client) is permitted to make up to FIVE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553

Inquiry Number: 5158048.5
January 16, 2018

The EDR-City Directory Image Repor

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

DESCRIPTION

Environmental Data Resources, Inc.'s (EDR) City Directory Report 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 Report includes a search of available city directory data at 5 year intervals.

RECORD SOURCES

EDR's Digital Archive combines historical directory listings from sources such as Cole Information and Dun & Bradstreet. These standard sources of property information complement and enhance each other to provide a more comprehensive report.

EDR is licensed to reproduce certain City Directory works by the copyright holders of those works. The purchaser of this EDR City Directory Report may include it in report(s) delivered to a customer. Reproduction of City Directories without permission of the publisher or licensed vendor may be a violation of copyright.

Data by infoUSA®

RESEARCH SUMMARY

The following research sources were consulted in the preparation of this report. A check mark indicates where information was identified in the source and provided in this report.

Year	Target Street	Cross Street	Source
2014	☑	☐	EDR Digital Archive
2010	☑	☐	EDR Digital Archive
2005	☑	☐	EDR Digital Archive
2000	☑	☐	EDR Digital Archive
1995	☑	☐	EDR Digital Archive
1992	☑	☐	EDR Digital Archive
1985	☑	☐	Haines Criss-Cross Directory
1980	☑	☐	Haines Criss-Cross Directory
1975	☑	☐	Haines Criss-Cross Directory

FINDINGS

TARGET PROPERTY STREET

25622 Alessandro Boulevard
Moreno Valley, CA 92553

Year	CD Image	Source
ALESSANDRO BLVD		
2014	pg A2	EDR Digital Archive
2010	pg A6	EDR Digital Archive
2005	pg A10	EDR Digital Archive
2000	pg A12	EDR Digital Archive
1995	pg A13	EDR Digital Archive
1992	pg A14	EDR Digital Archive
1985	pg A15	Haines Criss-Cross Directory
1985	pg A16	Haines Criss-Cross Directory
1980	pg A17	Haines Criss-Cross Directory
1975	pg A18	Haines Criss-Cross Directory

FINDINGS

CROSS STREETS

No Cross Streets Identified

City Directory Images

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ALESSANDRO BLVD 2014

25371	ALLEN, JUANITA L
	CHAIDEZ, DIONICIA
	FISHER, TREVON
	HERNANDEZ, LUIS E
	HERSHKOVITZ, DAYTON
	ODEN, DASHANAE
	RILEY, SHERRY
	SIMANDJUNTAK, SYLVIA D
	SMALL, KENNETHA
	TYSON, MARY
	WASHINGTON, MARION R
25383	ADAMS, GENE
	ALLEN, VINCENT
	ARZATE, VERONICA
	CONSTINE, RUFINA
	FARRIS, BRITTANY
	FUENTEZ, MELISSA M
	GAINES, EVYETTE C
	JIMENEZ, SHAMIKA
	KING, MALCOLM
	MERIWEATHER, NIKEA
	PETERS, TERRY J
	PRINCE, BREANNA
	ROBLERO, LUIS H
	VICTORIA, SILVIANO M
	VU, KATHY
25395	CHAVEZ, ANNA M
	GIX, LLOYD
	HALL, VINCENT M
	LINDSEY, SOJOURNER
	MASTERS, SHERYL A
	MUNOZ, RAYMOND
	PARRA, STEVEN R
	SHAW, SHAMBRIA S
25400	BURHARDT CHRISTINA
	QUINN AFRCAN MTHDST EPSCPAL CH
	QUINN COMMUNITY OUTREACH CORP
	SPRING MEADOW HOSPICE CARE INC
25407	ARIAS, JAMES
	BROOKS, DEVAUGHN
	CHOE, AMY
	ELLISON, DESHAWN
	HUTCHINSON, JOSEPH
	OLIVAS, SANTOS L
	WILLIAMS, KISHON
25416	MORRIS, GEMMA
25419	ARDON, KENDRA V
	AVELAR, CHRIS I
	BRIAN, COLLANDER
	BROTHERHOOD ENTERTAINMENT

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ALESSANDRO BLVD 2014 (Cont'd)

25419	CARDENAS, VINCENT
	CLARK, JOSEPHINE
	DAWSON, CYNTHIA L
	ESQUER, JACQUELINE
	FENNELL, ANDREW P
	GONZAGA, EMMERICH
	GREEN, NOAH R
	HARRIEL, CANDACE
	HARRIS, CARNISHA
	LYLES, DESMOND L
	MONTANEZ, ESMERALDA
	OSTIEN, PATRICK N
	PASSERI, ERNEST S
	PEREZ, MELISSA
	RONDELL RDM
	SHELTER, SCOTT
	TAPLIN, JOSEPH
	TUCKER, MARSHON
25431	BEAN, WANDA
	BROWN, CHEREE D
	CARRILLO, YVONNE
	CASTREJON, MARCELINO E
	GANCZAK, JOSH
	GERALD, D
	HERNANDEZ, OMAR
	JOHNSTON, VERLA
	LEAZENBY, JEANETTE A
	LOGAN-MURVINE, BARBARA
	MILLER, REGINA A
	MOSQUEDA, PAUL I
	SWIGER, NANCY A
	WILLIAMS, SYLIA
25445	ANDRES, JOCELYN
	BORDERS, ASHLEY
	COREAS, MOISES
	ECHO PLUMBING
	HOWARD, STEPHAN
	JONES, CHRISTINA
	MORALES, TANYA
	REESE, DEVIN
	RIVIERA, ALICIA
	SKAGGS, LESLEY
	WILLIAMS, DOMINIQUE
25480	MORENO VALLEY CITY OF
	PUBLIC LIBRARY MORENO VALLEY
25560	EXCEL PREP CHARTER SCHOOLS
	MORENO VALLEY CHRISTIAN CHURCH
	SHILOH CHRISTN WORSHIP CTR INC
25631	NGUYEN, NGOC Q
25634	ACCESS TO FUTURE

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ALESSANDRO BLVD 2014 (Cont'd)

25634 MORENO VALLEY UNIFIED SCHL DST
25652 T L JOHNSTON INSURANCE AGENCY
25660 REAL JOURNEY ACADEMIES INC
25681 ABREGU, CHRISTIAN A
ADAME, MARIA
ALVAREZ PAINTING
ALVAREZ, CLEMENTE
ANGLES, MARIO D
ASCUETA, DANTE L
BECERRA, GERMAN
BERNAL, RUBEN
BONILLA, JESUS M
BROWN, KENNETH K
CALLER, P
CALVILLO, JULIAN
CALVILLO, VANESSA
CANCHOLA, AGUSTIN
CANTRELL, JOEL
CERRO, ISABEL
CORDOBA, ADAING
CORTEZ, LUZ F
CREDIT, CAROLINA
DECELIS, MARK
DELAROSA, GUADALUPE
DEMESA, ROSARIO L
EDWARDS, RICHARD D
ESCALANTE, LUIS F
FLORES, ANSELMO
GALEANA, LILIA
GARCIA, SERGION
GOMEZ, MIGUEL
GONZALEZ, ABEL
GOODSON, CHARLOTTE E
GUILLEMETTE ROBIN
GUTIEREZ, GLORIA
GUTIERREZ, AVEL
HAMMER, MARSHALL
HERANDEZ, FELIX
HERNANDEZ, ANTHONY C
HOLIK, ANSORI
HOLT, SANDRA L
HUNTER, RODNEY
LAFON LEVA
LARA, MARIA
LOPEZ, JESUS
LUPIAN, JOSE A
MAGAN, GLORIA D
MARFORI, FELIXBERTO D
MARTINEZ, ROGELIO
MUNOZ, GLORIA

ALESSANDRO BLVD 2014 (Cont'd)

25681	MURPHY, TIMOTHY L
	NASSO, BERNARDO G
	OAJACA, ADOLFO E
	OAKS, MARY A
	OHARE, TRUDY
	OLSEN, PATY
	ORDORICA, FERNANDO
	ORTEGA, MARIA
	PEREZ, DELGADO B
	PRIETO, YOLANDA
	ROBLEDO, NANCY
	ROCHA, MARIANA A
	RODEN, HERMAN E
	ROLAND, SIDNEY
	RUBALCABA, MARIO
	SALCEDA, IRMA
	SANTOS, SONYA E
	SERRANO, GERARDO
	SPRAGUE, MICHAEL G
	TALAMANTES, LEONEL
	TATUM, ANTONETTE
	TUROCY, PATRICIA A
	VALDOVINOS, JESUS
	VEGA, GABRIELA
	VILLALOBOS, PEDRO
25791	GEORGE, SALINA
	WU, KAI L
25793	LOPEZ, RODRIGO
25807	JONES, SYLVIA

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ALESSANDRO BLVD 2010

25371	AYALA, PEDRO L
	GILLIAM, L
	MAGANA, CARRIE
	MARTINEZ, DIANA
	SIMANDJUNTAK, SYLVIA D
	SMITH, GERALDINE
25383	ADAMS, GENE
	BAILEY, ROSLAND
	COLBY, JEFFREY E
	CRUZ, LISA
	DITO, LAURA
	GAINES, E
	GEORGE, RAEISHA
	JACKSON, M
	MENDOZA, MELISSA C
	MILLER, GREGORY J
	STOVALL, LAWANDA L
25395	BROWN, TYREE
	CALVERLEY, LYNETTE R
	DAVIS, TRACEY
	HALL, VINCENT M
	LEFRIDGE, DANIELLE
	MITCHELL, ANTHONY
	MOORE, ERIC
	MURATALLA, MELISSA
	SHAW, SHAMBRIA S
	SLOAN, SIDNEY R
	SOLIS, LILLIAN
25400	ALFRED K QUINN AFRICAN METHOD
	CHIROPRACTIC ORTHOPEDISTS N
25407	AHN, DAE E
	BURGESS, MONIFA
	CERMENO, MARIA A
	DUENAS, MARIBEL
	GARRETT, G
	GONZALEZ, EFRAIN M
	MOROW, RASHONE
	OLIVOS SANTOS
	RHODES, KENNETH
	SAMYEE, MOMHAMMAD
25419	BIJALID, LYNET
	BROWN, TERRANCE
	CERVANTES, GLORIA
	CLARK, MARIA F
	EASON, TIFFANY N
	GARCIA, K
	HARRIS, SALENA
	IORIO, NICOLAS
	KNIGHT, MARSHAWN
	PASSERI, ERNEST

ALESSANDRO BLVD 2010 (Cont'd)

25419 SANDOVAL, LUZ
WILSON, CANDACE
YUN, Y
25431 ADMINS TO GO
BEAN, WANDA
COOK, DRITHA
CORRALES, APRIL
DAVIS, RONALD
GAMBOA, CORRINA
GANN, MARILYN M
GONZALEZ, RAMON A
KAWAI, DRENDA
LUCKETT, NATHANIEL M
MARTIN, KAYLA
MELLOR, DAVINA
OLIVAS, JACKY
STEPHENS, BRIAN S
TURNER, AMANDA
VASQUEZ, FRANCISCO
25445 AMAYA, CRYSTAL
CASTELLANOS, JACQUELINE B
COREAS, MOISES
FLORES, JESSUS
GILMORE, SUSAN
MALIC, MAYNARD
PHYLOW, SHEREE
25480 CITY OF MORENO VALLEY
MORENO VALLEY PUBLIC LIBRARY
PUBLIC LIBRARY MORENO VALLEY
RIVERSIDE COUNTY OF
25539 PIRIH, BORIS
25560 MORENO VALLEY CHRISTIAN CHURCH
25631 NGUYEN, NGOC Q
25634 ACCESS TO FUTURE
MORENO VALLEY UNIFIED SCHL DST
25652 ADVANTECH QULTY PDTS SVCS INC
T L JOHNSTON INSURANCE AGENCY
25681 ACH SERVICES
ADAME, MARITZA
ALANIS, MARIA V
ANGLES, MARIO D
ASCUETA, DANTE L
BARRERA, CEASAR
BERNAL, RUBEN
BRASSETT, LISA
BROWN, KENNETH K
BURTON, BARBARA A
CAMPOS, MARIA C
CANTRELL, JAMES L
CAO, CHUONG H

Target Street	Cross Street	Source
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ALESSANDRO BLVD 2010 (Cont'd)

25681 CASSEL, WILLIAM A
CASTELLANOS, JUAN R
CHAMARRO, MARIA E
CLARK, MARY
COBBOLD, CATHY
CORONA, SERGIO
DELA, ROSA
DELAROSA, GIA
DELEON, GILBERTO
DEMESA, ROSARIO L
DIAZ, EUSEBIO A
ECHENIQUE, WALDO
EDWARDS, RICHARD D
ESPINOZA, JULIO C
FANTASY PHOTO
FLORES, MARIA
GARCIA, HECTOR M
GONZALES, MARIA R
GONZALEZ, ABEL
GONZALEZ, JENNY
GOODSON, CHARLOTTE E
GREER, EDDIE G
GRUALVA, ALISHA
GUILLEMETTE ROBIN
GUTIERREZ, GLORIA
HAMMER, MARSHALL
HELMENDACH, DORLEEN L
HERNANDEZ, MIGUEL
HERNANDEZ, RAMON L
HINNAOUI, JAVIER
HOLT, SANDRA
HOME REPAIRS SERVICES
INIGUEZ, MARIA
LAFON LEVA
LOCKHART, EARL
MACIAS, ALEJANDRO
MANZO, NORBERTO
MARFORI, FELIXBERTO D
MARTINEZ, ANA L
MARTINEZ, ROGELIO
MECKLER, ANTHONY
MILLER, JENNIFER M
MUNOZ, GLORIA
MURPHY, TIMOTHY L
NASSO, BERNARDO G
NGUYEN, MY H
OAJACA, ADOLFO E
OHARE, TRUDY
OLIVOS, JISELLA
OLSEN, PATY

Target Street	Cross Street	Source
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ALESSANDRO BLVD 2010 (Cont'd)

25681 OMEGA CONSTRUCTION CO
PACHECO, LIDIA
PANEILINAN, YOLANDA
PEREZ, DELGADO B
PRICE, AMBER
RAMIREZ, M
REBOLLEDO, F
REYES, ELBA
ROBLEDO, NANCY
RODEN, HERMAN E
RODRIGUEZ, JOSE D
ROMERO, SYLVIA
RUBALCABA, MARIO
RUIZ, ELIZABETH
SPEARMAN-BLOUGH, CAROLYN J
SPRAGUE, MICHAEL G
TALAMANTES, ADELITA
TELAMANTES, JERONIMO
TORRES, JENNIFER
TUROCY, PATRICIA A
UGAY, NENA
ULLOA, RAQUEL
VAZQUEZ, SERGIO
VEGA, MARIA
VELASQUEZ, KRISTEN M
VENEGAS, ELIZABETH
25767 OCCUPANT UNKNOWN,
25791 WU, KAI L
25793 PATTERSON, LAUREL A
25807 OCCUPANT UNKNOWN,

Target Street	Cross Street	Source
✓	-	EDR Digital Archive

ALESSANDRO BLVD 2005

25400	ALESSANDRO CHIROPRACTIC
	ALESSANDRO ORTHODONTICS
	CHIROPRACTIC ORTHOPEDISTS N
	CORLEW, NORMAN D
	HIGHER GROUND LEARNING CENTER
	MENDOZA ROSA R DDS
	QUINN COMMUNITY OUTREACH CORP
	SOUTHERN CAL WITNESS PRJ
25480	RIVERSIDE COUNTY OF
25539	PIRIH, BORIS
25560	MORENO VALLEY CHRISTIAN CHURCH
25631	MILAGROS CENTER
	NGUYEN, MINH T
25634	MORENO VALLEY UNIFIED SCHL DST
25652	JOHNSTON T L INSURANCE AGENCY
25681	ACH SERVICES
	AGUIRRE, ROSARIO
	ALVAREZ, VICTOR M
	ANGLES, MARIO D
	AYALA, MARIA
	BARBOSA, ELIZABETH
	BARRERA, CEASAR
	BEEBE, EDITH
	BELL, ANNA E
	BERACHAH, CLARA N
	BERNAL, JOAQUIN B
	BERNAL, RUBEN
	BRADY, CHARLES J
	BRATZ, TRACY
	BROWN, KENNETH K
	CAMPOS, MARIA C
	CANTRELL, JAMES L
	CAVEN, MIKE
	CLARK, FRED L
	CORONA, SERGIO
	DIAZ, EUSEBIO A
	EDWARDS, RICHARD D
	FARRER, LOUISE
	FIGUEROA, LUCIA
	GARCIA, HECTOR M
	GONZALES, MARIA R
	GONZALEZ, JENNY
	GORDILLO, CLEMENTINA
	GUTIERREZ, GLORIA
	HAMMER, MARSHALL
	HAYES, D
	HELMENDACH, DORLEEN L
	HERNANDEZ, RAMON
	HICKS, GALE
	HIGGINS, ROBERT L

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ALESSANDRO BLVD 2005 (Cont'd)

25681	HURTADO, E
	JURGENSEN, MYRTLE M
	LAYDEN, NORMA D
	LONGAKER, DEBORA K
	LOPEZ, ROSARIO
	MAHONEY, ELEGENE
	MCCORKLE, EARL
	OCCUPANT UNKNOWN,
	OCHOA, MARIA
	OLIVOS, JISELLA
	PALAMANTES, ADELA
	PALAMANTES, GEROMINO
	PEREZ, DELGADO B
	REYES, JOSE L
	ROACH, JOHN E
	RODEN, HERMAN E
	RODRIGUEZ, JOSE D
	ROLAND, SIDNEY
	ROMERO, SYLVIA
	RUBALCABA, MARIO
	RUIZ, MARIA D
	SORIA, FRANCISCO B
	SPRAGUE, MICHAEL G
	VAUGHN, FRANK C
	VEGAS, REFUGIO
	VELASQUEZ, KRISTEN M
	WOMACK, JEANIE A
	WOOD, DONALD P
25767	OCCUPANT UNKNOWN,
25791	PURDUE, CAROLYN
25793	CRAIG, CLAYETTA F
25807	FERNALD, CHANA

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ALESSANDRO BLVD 2000

25400	ALESSANDRO CHIROPRACTIC
	ALESSANDRO ORTHODONTICS
	MENDOZA ROSA R DDS
	OCCUPANT UNKNOWN,
	QUINN COMMUNITY OUTREACH CORP
25480	RIVERSIDE COUNTY OF
25539	OCCUPANT UNKNOWN,
25560	MORENO VALLEY CHRISTIAN CHURCH
25631	FASSEL, MAXINE M
25652	OCCUPANT UNKNOWN,
	TL JOHNSON INSURANCE AGENCY
25681	BADGETT, J
	BARNES, DONALD H
	BEEBE, EDITH
	BERACHAH, CLARA
	BERNAL, JOAQUIN
	BROWN, ERNEST G
	CANTRELL, JAMES L
	CAVEN, MIKE
	CLARK, FRED
	DEWALT, RICK
	DOYLE, JOSHUA B
	FAILE, SHARON R
	FARRER, LOUISE
	GARCIA, CELIA
	GIEBRICH, DAVID W
	HAMMER, M
	HENRY, W B
	HICKS, GALE
	HIGGINS, ROBERT
	LAFON LEVA
	LAFON, LEVA
	LATTERI, VIC
	LAYDEN, BETTY
	MCCORKLE, EARL
	MCNEESE, RICKEY L
	MCNULTY, ROB
	MITCHELL, AIKO
	NETTO, F G
	PICKETT, TONY
	ROLAND, SIDNEY
	TREMBLAY, ROCKY
	VAUGHN, FRANK C
	VEGAS, REFUGIO
	WILSON, PAULA
	WOOD, DONALD P
	YOUNG, RUTH
25791	LAYCOCK, HELEN R
25807	FERNALD, CHANA

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ALESSANDRO BLVD 1995

25400	ALESSANDRO ORTHODONTICS
	CENTURY 21 GENERAL REALTY
25480	STUMP, RON
25560	MORENO VALLEY CHRISTIAN CHURCH
25625	HOUGH JACK W JR ATTRNEY AT LAW
25631	QUILTY, JOSEPH
25634	MORENO VALLEY UNIFIED SCHL DST
25652	FRANK S BUTLER INSURANCE
25681	ALCOX, JIM
	BAKER, FRANK C
	BARNES, DONALD H
	BERNAL, JOAQUIN
	BITTNER, BOB J
	CANTRELL, JAMES L
	CAVEN, MIKE
	CLARK, FRED
	FAILE, SHARON
	FARRER, LOUISE
	FICKES, C
	GARCIA, NELLIE I
	GEIGER, F
	HAMMER, M
	HAYNES, DOUGLAS R
	HIGGINS, ROBERT
	JARA, R
	JOHNSON, GARY J
	LAFON, LEVA
	LAFON, SAM
	LAYDEN, BETTY
	LEWIS, VIOLA
	MANN, JUDITH
	MITCHELL, AIKO
	OHAIR, T H
	OMER COMPUTING
	PARKHOUSE, BERTHA
	RHODES, OMER
	ROOK, JUNE
	STICKMAN, DAVID
	TREMBLAY, ROCKY
	WILSON, PAULA
	WOOD, E
	YOUNG, LAVERN
25767	OCCUPANT UNKNOWNN
25791	WEAVER, LILLIAN
25793	GILBERT, LILLIE

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ALESSANDRO BLVD 1992

25400	ALESSANDRO ORTHODONTICS
	ASSOCTED PSYCHLOGICAL SVCS MOR
	PETERSEN HUGH M PHD
	PETERSON, HUGH M
25480	SENIOR CITIZENS NTRTN PROGRAM
25560	MORENO VALLEY BAPTIST SCHOOL
25625	HOUGH JACK W JR ATTRNEY AT LAW
25634	MORENO VALLEY UNIFIED SCHL DST
25652	BUTLER, FRANK S
	FRANK S BUTLER INSURANCE
	HOUGH, JACK W JR
25681	AKIN, E
	BAKER, FRANK C
	BARNES, DONALD H
	BARWELL, R
	BERNAL, JOAQUIN
	CANTRELL, JAMES L
	CATANZARO, JOSEPH
	CAVEN, MIKE
	CLARK, FRED
	DAVIDSON, PAUL
	FAILE, SHARON
	FARRER, LOUISE
	FICKES, C
	GEIGER, F
	GRAVES, LOWELL
	HAMMER, M
	HIGGINS, ROBERT
	JOHNSON, SEAN P
	KEMMERER, VIOLA M
	LAFON, LEVA
	LAFON, SAM
	LAYDEN, B
	LEE, ALLEN
	MITCHELL, AIKO
	NOONAN, P
	OHAIR, T H
	PARKHOUSE, BERTHA
	PICKETT, TONY
	RHODES, O
	ROBISON, RANDY
	SALEM, SUSANNE
	SMITH, LOLA
	THOMAS, MAY A
	WILSON, P
	YOUNG, LAVERN
25791	WEAVER, LILLIAN

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ALESSANDRO BLVD 1985

5	25011	MIKES AUTO	653 [illegible]	+5
5	25019	A 1 LAWNMOWR SLS&SV	653-3879	2
	25020	XXXX	00	
	25021	DENNIS MCCLELLANS	653-4991	4
	25023	HAIRPORT	656-6336	+5
	25025	BABYS NEW&USED FURN	653-1236	+5
	25027	MORENO VLY MARKET	653-2810	
	25031	WORD LF CHRISTN CT	656-1188	+5
3	25037	ELDER DENTAL STUDIO	924-3555	+5
		NUMBER ONE NAILS	924-3383	+5
	25043	COMPETITION TV	653-4526	+5
5	25045	FIELD CABLEVISION	656-3489	+5
5		FIELD CABLEVISION	656-3488	+5
7	25120	XXXX	00	
5	25161	XXXX	00	
1	25400	KYKER SCOTT	653-1514	2
5	25508	MACIAS ADELLA	924-2834	+5
	25539	RENFRO PAUL	653-5863	+5
1	25560	MORENO VLY BAPT CH	924-1977	+5
5		MORENO VLY BAPT SC	924-1979	+5
5	25622	TAYLOR C K	653-4759	0
9	25631	KING ROLAND	653-6280	
9	25634	HANSEN DIANE R	924-5344	+5
	25652	XXXX	00	
	25676	BLECKERT ROY SR	653-5919	9
1	25681	NEW HORIZN TRLR VLG		
		ALLISON PHILLIP	653-0012	0
1		AUVIL S A	653-0692	0
9	17	BARWELL REGINALD	653-3966	7
1	18	BEACHAM MAUDIE	653-1916	8
5		BEHL BARBARA ANN	653-3571	0
5		BEHL CLARENCE E	653-3571	
5		BROWN COLLEEN	653-6635	+5
5		CANTRELL JAS	656-5756	4
3		CARNER RICK	924-4684	+5
		CLARK FRED	653-3539	2
5		CLINEDINST DENNIS	924-2406	+5
2		COOPER RONALD	656-2697	3
2		CRABTREE RONALD	924-3981	+5
1		DAVIDSON SARA	653-4396	0
		DESCH GREG	653-6426	4
5		ELLIS TERRY	656-3341	4
5	36	EVANS DOROTHY P	653-5473	6
9		FICKES C	653-5300	1
1	56	FORD THOS N	653-3488	
9		HALSTEAD F K	924-3468	+5
2		HAMILTON EUGENE	653-8519	3

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ALESSANDRO BLVD 1985

ALESSANDRO BLVD		92388 CONT	
	HAMMER MARSHALL	656-5747	+5
	HARPER CARL C	656-3827	+5
	HARRYS REFRIGERATN	656-5222	+5
	HOBBS RUTH	653-6490	3
	JACKSON DAVID W	653-5783	0
	JONES ROBERT L	653-8695	8
	KELLEY V	653-5342	0
	KELLY O A	656-1767	3
	LAFON LEVA	924-3517	+5
	LATTIN VOIL	924-5100	+5
	LEDBETTER WM	924-3807	+5
	MOORE IRA	656-3058	+5
	MULRINE MYRTIE ELLA	924-3948	+5
44	NEALE B	653-3430	6
	NEW HORIZON TRL VLG	653-2991	
	ONATIVIA JEANETTE D	653-4785	0
	PAQUIN EDGAR J	656-2740	2
	PHILLIPS RUTH E	653-0095	4
	PICKETT ANTHONEY	656-7026	+5
	RHODES O	656-7037	+5
	RIDDLE JACK	656-5105	3
	ROOK RICHARD	653-0652	1
	SANDOVAL JOE M	924-1366	+5
	SCOTT JIM L	924-4635	+5
	SMITH LOLA	653-3655	2
	STARR LAWRENCE	653-9757	1
	THOMAS ARTHUR	653-3483	
	THOMAS LOUISE	924-1460	+5
	THOMAS MARY B	924-1460	+5
	WIED J H	653-2973	+5
	WILSON P	653-4763	0
	YODER DEAN	924-3554	+5
25681			
25687	XXXX	00	
25733	XXXX	00	
25767	XXXX	00	
25780	BARTON GLEN	924-5368	+5
25791	WEAVER LILLIAN	653-3654	

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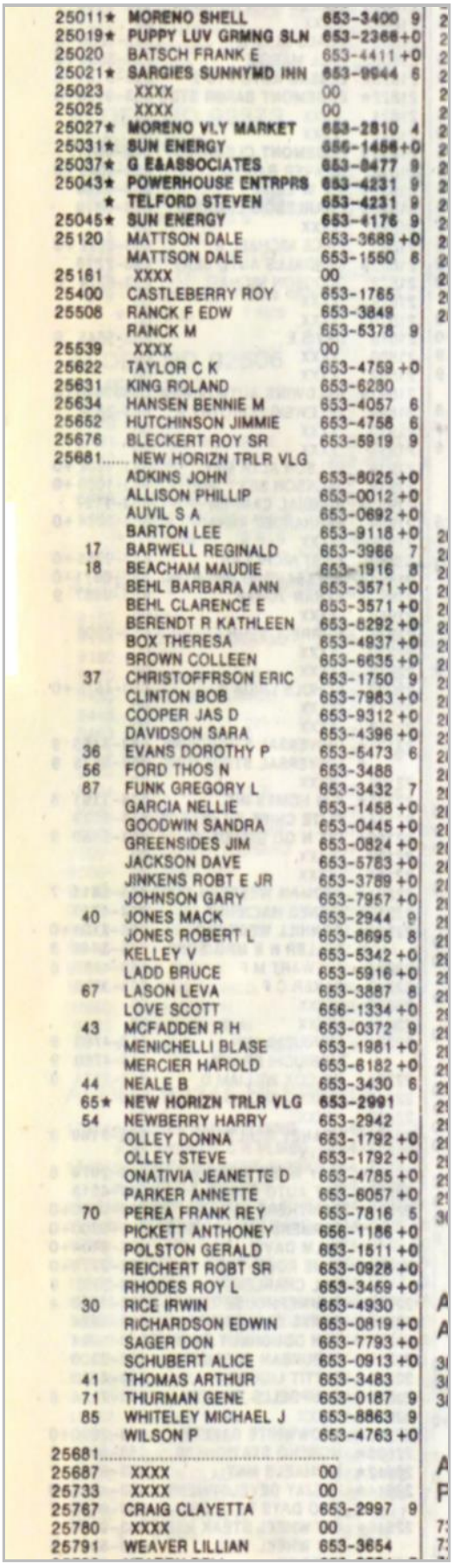
ALESSANDRO BLVD 1980



25011★	MORENO SHELL	653-3400	9
25019★	PUPPY LUV GRMNG SLN	653-2366	+0
25020	BATSCH FRANK E	653-4411	+0
25021★	SARGIES SUNNYMD INN	653-9944	6
25023	XXXX	00	
25025	XXXX	00	
25027★	MORENO VLY MARKET	653-2810	4
25031★	SUN ENERGY	656-1486	+0
25037★	G E&ASSOCIATES	653-8477	9
25043★	POWERHOUSE ENTRPRS	653-4231	9
★	TELFORD STEVEN	653-4231	9
25045★	SUN ENERGY	653-4176	9
25120	MATTSON DALE	653-3689	+0
	MATTSON DALE	653-1550	6
25161	XXXX	00	
25400	CASTLEBERRY ROY	653-1765	
25508	RANCK F EDW	653-3848	
	RANCK M	653-5378	9
25539	XXXX	00	
25622	TAYLOR C K	653-4759	+0
25631	KING ROLAND	653-6280	
25634	HANSEN BENNIE M	653-4057	6
25652	HUTCHINSON JIMMIE	653-4758	6
25676	BLECKERT ROY SR	653-5919	9
25681.....	NEW HORIZN TRLR VLG		
	ADKINS JOHN	653-8025	+0
	ALLISON PHILLIP	653-0012	+0
	AUVIL S A	653-0692	+0
	BARTON LEE	653-9118	+0
17	BARWELL REGINALD	653-3966	7
18	BEACHAM MAUDIE	653-1916	8
	BEHL BARBARA ANN	653-3571	+0
	BEHL CLARENCE E	653-3571	+0
	BERENDT R KATHLEEN	653-8292	+0
	BOX THERESA	653-4937	+0
	BROWN COLLEEN	653-6635	+0
37	CHRISTOFFRSON ERIC	653-1750	9
	CLINTON BOB	653-7983	+0
	COOPER JAS D	653-9312	+0
	DAVIDSON SARA	653-4396	+0
36	EVANS DOROTHY P	653-5473	6
56	FORD THOS N	653-3488	
87	FUNK GREGORY L	653-3432	7
	GARCIA NELLIE	653-1458	+0
	GOODWIN SANDRA	653-0445	+0
	GREENSIDES JIM	653-0824	+0
	JACKSON DAVE	653-5783	+0
	JINKENS ROBT E JR	653-3789	+0
	JOHNSON GARY	653-7957	+0
40	JONES MACK	653-2944	9
	JONES ROBERT L	653-8695	8
	KELLEY V	653-5342	+0
	LADD BRUCE	653-5916	+0
67	LASON LEVA	653-3887	8
	LOVE SCOTT	656-1334	+0
43	MCFADDEN R H	653-0372	9
	MENICHELLI BLASE	653-1981	+0
	MERCIER HAROLD	653-8182	+0
44	NEALE B	653-3430	6
65★	NEW HORIZN TRLR VLG	653-2991	
54	NEWBERRY HARRY	653-2942	
	OLLEY DONNA	653-1792	+0
	OLLEY STEVE	653-1792	+0
	ONATIVIA JEANETTE D	653-4785	+0
	PARKER ANNETTE	653-6057	+0
70	PEREA FRANK REY	653-7816	5
	PICKETT ANTHONEY	656-1186	+0
	POLSTON GERALD	653-1511	+0
	REICHERT ROBT SR	653-0928	+0
	RHODES ROY L	653-3459	+0
30	RICE IRWIN	653-4930	
	RICHARDSON EDWIN	653-0819	+0
	SAGER DON	653-7793	+0
	SCHUBERT ALICE	653-0913	+0
41	THOMAS ARTHUR	653-3483	
71	THURMAN GENE	653-0187	9
85	WHITELEY MICHAEL J	653-8863	9
	WILSON P	653-4763	+0
25681.....			
25687	XXXX	00	
25733	XXXX	00	
25767	CRAIG CLAYETTA	653-2997	9
25780	XXXX	00	
25791	WEAVER LILLIAN	653-3654	

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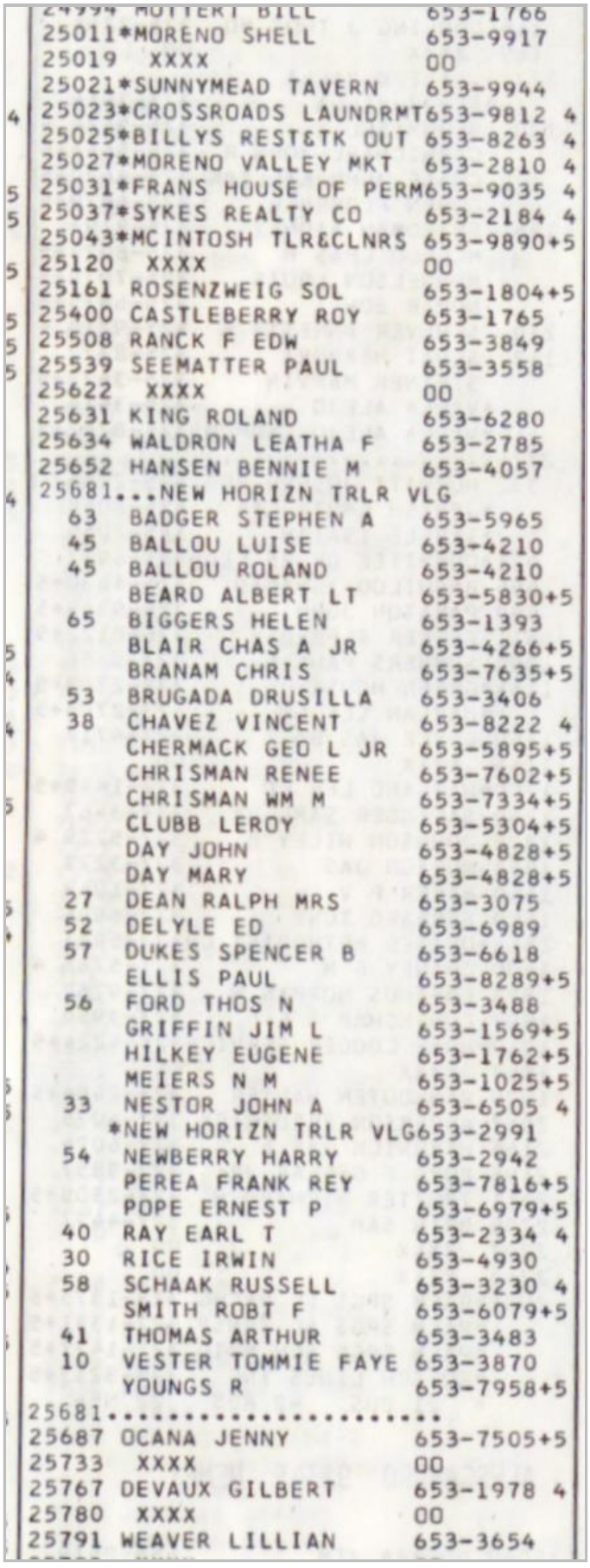
✓	-	Haines Criss-Cross Directory

ALESSANDRO BLVD 1975



```
24994 MOTTERT BILL          653-1766
25011*MORENO SHELL          653-9917
25019  XXXX                 00
25021*SUNNYMEAD TAVERN      653-9944
25023*CROSSROADS LAUNDRMT   653-9812 4
25025*BILLYS REST&TK OUT    653-8263 4
25027*MORENO VALLEY MKT     653-2810 4
25031*FRANS HOUSE OF PERM   653-9035 4
25037*SYKES REALTY CO       653-2184 4
25043*MCINTOSH TLR&CLNRS    653-9890+5
25120  XXXX                 00
25161 ROSENZWEIG SOL        653-1804+5
25400 CASTLEBERRY ROY       653-1765
25508 RANCK F EDW           653-3849
25539 SEEMATTER PAUL        653-3558
25622  XXXX                 00
25631 KING ROLAND           653-6280
25634 WALDRON LEATHA F      653-2785
25652 HANSEN BENNIE M       653-4057
25681...NEW HORIZN TRLR VLG
   63  BADGER STEPHEN A     653-5965
   45  BALLOU LUISE         653-4210
   45  BALLOU ROLAND        653-4210
       BEARD ALBERT LT      653-5830+5
   65  BIGGERS HELEN        653-1393
       BLAIR CHAS A JR      653-4266+5
       BRANAM CHRIS         653-7635+5
   53  BRUGADA DRUSILLA     653-3406
   38  CHAVEZ VINCENT       653-8222 4
       CHERMACK GEO L JR    653-5895+5
       CHRISMAN RENEE       653-7602+5
       CHRISMAN WM M        653-7334+5
       CLUBB LEROY          653-5304+5
       DAY JOHN             653-4828+5
       DAY MARY             653-4828+5
   27  DEAN RALPH MRS       653-3075
   52  DELYLE ED            653-6989
   57  DUKES SPENCER B      653-6618
       ELLIS PAUL           653-8289+5
   56  FORD THOS N          653-3488
       GRIFFIN JIM L        653-1569+5
       HILKEY EUGENE        653-1762+5
       MEIERS N M           653-1025+5
   33  NESTOR JOHN A        653-6505 4
      *NEW HORIZN TRLR VLG  653-2991
   54  NEWBERRY HARRY       653-2942
       PEREA FRANK REY      653-7816+5
       POPE ERNEST P        653-6979+5
   40  RAY EARL T           653-2334 4
   30  RICE IRWIN           653-4930
   58  SCHAAK RUSSELL       653-3230 4
       SMITH ROBT F         653-6079+5
   41  THOMAS ARTHUR        653-3483
   10  VESTER TOMMIE FAYE   653-3870
       YOUNGS R             653-7958+5
25681.....................
25687 OCANA JENNY           653-7505+5
25733  XXXX                 00
25767 DEVAUX GILBERT        653-1978 4
25780  XXXX                 00
25791 WEAVER LILLIAN        653-3654
```

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553

Inquiry Number: 5158048.6
January 12, 2018

The EDR Property Tax Map Repor

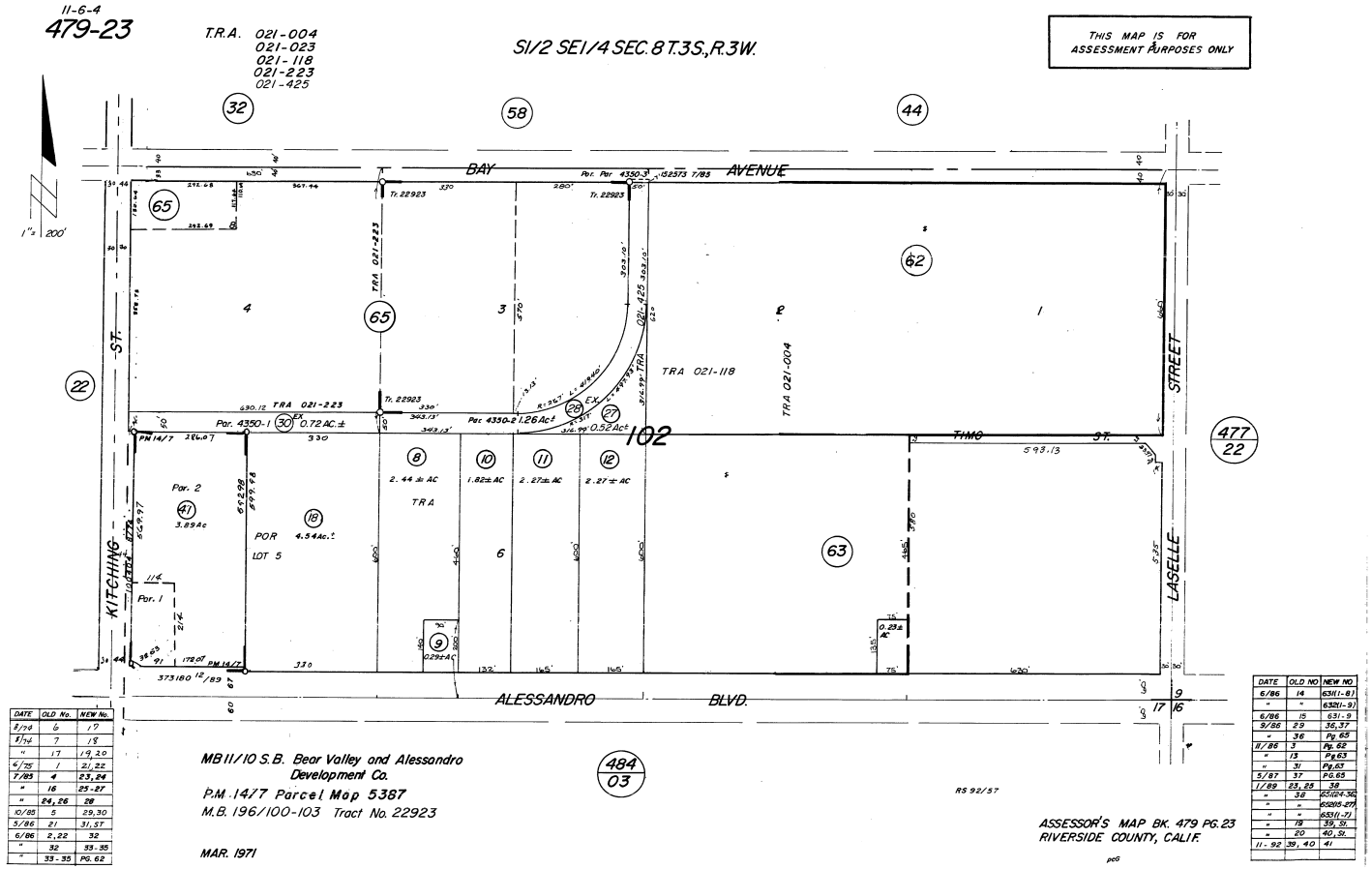
EDR® Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

EDR Property Tax Map Report

Environmental Data Resources, Inc.'s EDR Property Tax Map Report is designed to assist environmental professionals in evaluating potential environmental conditions on a target property by understanding property boundaries and other characteristics. The report includes a search of available property tax maps, which include information on boundaries for the target property and neighboring properties, addresses, parcel identification numbers, as well as other data typically used in property location and identification.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.



DATE	OLD No.	NEW No.
8/76	6	17
8/74	7	18
"	17	19,20
4/75	1	21,22
7/83	4	23,24
"	16	25-27
"	24,26	28
10/85	5	29,30
5/86	21	31,37
6/86	2,22	32
"	32	33-35
"	33-35	PG. 62

DATE	OLD NO	NEW NO.
6/86	14	6321(-8)
"	"	6321(-9)
6/86	15	631-9
9/86	29	36,37
"	36	Pg. 63
11/86	3	Pg. 63
"	13	Pg 63
"	31	Pg.63
5/87	37	PG.65
1/89	23, 25	38
"	38	6321(4-36
"	"	6321(6-37
"	"	6321(-7)
"	19	39, 51
"	20	40, 51
11-92	39, 40	41

25622 Alessandro Boulevard
25622 Alessandro Boulevard
Moreno Valley, CA 92553

Inquiry Number: 5158048.8
January 12, 2018

EDR Building Permit Repor

Target Property and Adjoining Propertie

Environmental Data Resources Inc

6 Armstrong Road
Shelton, CT 06484
800.352.0050
www.edrnet.com

TABLE OF CONTENTS

SECTION

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EDR BUILDING PERMIT REPORT

About This Report

The EDR Building Permit Report provides a practical and efficient method to search building department records for indications of environmental conditions. Generated via a search of municipal building permit records gathered from more than 1,600 cities nationwide, this report will assist you in meeting 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 1527-13), or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

Building permit data can be used to identify current and/or former operations and structures/features of environmental concern. The data can provide information on a target property and adjoining properties such as the presence of underground storage tanks, pump islands, sumps, drywells, etc., as well as information regarding water, sewer, natural gas, electrical connection dates, and current/former septic tanks.

ASTM and EPA Requirements

ASTM E 1527-13 lists building department records as a "standard historical source," as detailed in § 8.3.4.7: "Building Department Records - The term building department records means those records of the local government in which the property is located indicating permission of the local government to construct, alter, or demolish improvements on the property." ASTM also states that "Uses in the area surrounding the property shall be identified in the report, but this task is required only to the extent that this information is revealed in the course of researching the property itself."

EPA's Standards and Practices for All Appropriate Inquires (AAI) states: "§312.24: Reviews of historical sources of information. (a) Historical documents and records must be reviewed for the purposes of achieving the objectives and performance factors of §312.20(e) and (f). Historical documents and records may include, but are not limited to, aerial photographs, fire insurance maps, building department records, chain of title documents, and land use records."

Methodology

EDR has developed the EDR Building Permit Report through our partnership with BuildFax, the nation's largest repository of building department records. BuildFax collects, updates, and manages building department records from local municipal governments. The database now includes 30 million permits, on more than 10 million properties across 1,600 cities in the United States.

The EDR Building Permit Report comprises local municipal building permit records, gathered directly from local jurisdictions, including both target property and adjoining properties. Years of coverage vary by municipality. Data reported includes (where available): date of permit, permit type, permit number, status, valuation, contractor company, contractor name, and description.

Incoming permit data is checked at seven stages in a regimented quality control process, from initial data source interview, to data preparation, through final auditing. To ensure the building department is accurate, each of the seven quality control stages contains, on average, 15 additional quality checks, resulting in a process of approximately 105 quality control "touch points."

For more information about the EDR Building Permit Report, please contact your EDR Account Executive at (800) 352-0050.

EDR® Environmental Data Resources Inc

BUILD FAX® PROPERTY HISTORY

EXECUTIVE SUMMARY: SEARCH DOCUMENTATION

A search of building department records was conducted by Environmental Data Resources, Inc (EDR) on behalf of Leighton Consulting on Jan 12, 2018.

TARGET PROPERTY

25622 Alessandro Boulevard
Moreno Valley, CA 92553

SEARCH METHODS

EDR searches available lists for both the Target Property and Surrounding Properties.

RESEARCH SUMMARY

Building permits identified: **YES**

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.

Moreno Valley

Year	*Source*	*TP*	*Adjoining*
2017	City of Moreno Valley, Building and Safety Division		
2016	City of Moreno Valley, Building and Safety Division		X
2015	City of Moreno Valley, Building and Safety Division		
2014	City of Moreno Valley, Building and Safety Division		X
2013	City of Moreno Valley, Building and Safety Division		X
2012	City of Moreno Valley, Building and Safety Division		
2011	City of Moreno Valley, Building and Safety Division		
2010	City of Moreno Valley, Building and Safety Division		
2009	City of Moreno Valley, Building and Safety Division		
2008	City of Moreno Valley, Building and Safety Division		X
2007	City of Moreno Valley, Building and Safety Division		
2006	City of Moreno Valley, Building and Safety Division		
2005	City of Moreno Valley, Building and Safety Division		
2004	City of Moreno Valley, Building and Safety Division		
2003	City of Moreno Valley, Building and Safety Division		
2002	City of Moreno Valley, Building and Safety Division		
2001	City of Moreno Valley, Building and Safety Division		
2000	City of Moreno Valley, Building and Safety Division		X

Riverside County

Year	*Source*	*TP*	*Adjoining*
2017	Riverside County, Building and Safety		
2016	Riverside County, Building and Safety		
2015	Riverside County, Building and Safety		
2014	Riverside County, Building and Safety		
2013	Riverside County, Building and Safety		
2012	Riverside County, Building and Safety		
2011	Riverside County, Building and Safety		

EXECUTIVE SUMMARY: SEARCH DOCUMENTATION

Year	Source	TP	Adjoining
2010	Riverside County, Building and Safety		
2009	Riverside County, Building and Safety		
2008	Riverside County, Building and Safety		
2007	Riverside County, Building and Safety		
2006	Riverside County, Building and Safety		
2005	Riverside County, Building and Safety		
2004	Riverside County, Building and Safety		
2003	Riverside County, Building and Safety		X
2002	Riverside County, Building and Safety		
2001	Riverside County, Building and Safety		
2000	Riverside County, Building and Safety		
1999	Riverside County, Building and Safety		
1998	Riverside County, Building and Safety		
1997	Riverside County, Building and Safety		
1996	Riverside County, Building and Safety		
1995	Riverside County, Building and Safety		
1994	Riverside County, Building and Safety		
1993	Riverside County, Building and Safety		
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1985	Riverside County, Building and Safety		
1984	Riverside County, Building and Safety		
1983	Riverside County, Building and Safety		
1982	Riverside County, Building and Safety		
1981	Riverside County, Building and Safety		
1980	Riverside County, Building and Safety		X
1979	Riverside County, Building and Safety		X
1978	Riverside County, Building and Safety		
1977	Riverside County, Building and Safety		X
1976	Riverside County, Building and Safety		X
1975	Riverside County, Building and Safety		
1974	Riverside County, Building and Safety		
1973	Riverside County, Building and Safety		

BUILDING DEPARTMENT RECORDS SEARCHED

Name: Moreno Valley
Years: 2000-2017
Source: City of Moreno Valley, Building and Safety Division, MORENO VALLEY, CA
Phone: (951) 413-3350

Name: Riverside County
Years: 1973-2017
Source: Riverside County, Building and Safety, MORENO VALLEY, CA
Phone: (951) 955-6742

TARGET PROPERTY FINDINGS

TARGET PROPERTY DETAIL

25622 Alessandro Boulevard
Moreno Valley, CA 92553

No Permits Found

ADJOINING PROPERTY FINDINGS

ADJOINING PROPERTY DETAIL

The following Adjoining Property addresses were researched for this report. Detailed findings are provided for each address.

ALESSANDRO BLVD

25560 ALESSANDRO BLVD

Date:	**1/26/2016**
Permit Type:	
Description:	**REPAIR WATER DAMAGED WALL UNDER CATWALK**
Permit Description:	**Commercial Combination**
Work Class:	
Proposed Use:	
Permit Number:	B1600195
Status:	ISSUED
Valuation:	$3,235,258.00
Contractor Company:	
Contractor Name:	

Date:	**9/12/2014**
Permit Type:	**COMCOMBO**
Description:	**INSTALLATION OF (2) TEMPORARY PORTABLE CLASSROOMS FOR EXCEL PREP**
Permit Description:	**Commercial (New Construction)**
Work Class:	Commercial Additions/Alterations
Proposed Use:	
Permit Number:	B1402279
Status:	FINAL
Valuation:	$25,000.00
Contractor Company:	
Contractor Name:	

ADJOINING PROPERTY FINDINGS

Date:	**12/23/2013**
Permit Type:	**DEMO**
Description:	**DEMO OF TWO PORTABLE BUILDINGS AT CHARTER SCHOOL CAPITAL**
Permit Description:	**DEMO**
Work Class:	
Proposed Use:	
Permit Number:	B1302710
Status:	FINAL
Valuation:	$0.00
Contractor Company:	
Contractor Name:	DEMOLITION SPECIALIST, INC

Date:	**7/9/2013**
Permit Type:	**COFO_B**
Description:	**C/O FOR EXCEL PREP CHARTER SCHOOL, NO CHANGES, 34,000 SF**
Permit Description:	**COFO_B**
Work Class:	
Proposed Use:	
Permit Number:	B1301380
Status:	COFO
Valuation:	$0.00
Contractor Company:	
Contractor Name:	

ADJOINING PROPERTY FINDINGS

25681 ALESSANDRO BLVD

Date:	**6/4/2008**
Permit Type:	**BUILD**
Description:	**REPAIR/REBUILD OF EXISTING FREE STANDING BLOCK WALL PER CITY STANDARD, 306 SF (WALL PREVIOUSLY PERMITTED UNDER PERMIT NO. 034198)**
Permit Description:	**One Type of Work (Commercial Only)**
Work Class:	Other Structures
Proposed Use:	
Permit Number:	B0801097
Status:	FINAL
Valuation:	$2,472.48
Contractor Company:	
Contractor Name:	BLUE PACIFIC GENERAL CONSTRUCTINO

Date:	**1/31/2003**
Permit Type:	
Description:	**VOID**
Permit Description:	
Work Class:	
Proposed Use:	
Permit Number:	BZH12791
Status:	VOID
Valuation:	$0.00
Contractor Company:	
Contractor Name:	

ADJOINING PROPERTY FINDINGS

Date:	**6/15/2000**
Permit Type:	**PLUM**
Description:	**REPLACE SEPTIC SYSTEM**
Permit Description:	**Plumbing Work Only**
Work Class:	Miscellaneous
Proposed Use:	
Permit Number:	B0027737
Status:	FINAL
Valuation:	$1,500.00
Contractor Company:	
Contractor Name:	BLOOMINGTON CESSPOOL

Date:	**3/17/2000**
Permit Type:	**PLUM**
Description:	**REPLACE SEPTIC SYSTEM FOR COUTRY SQUIRE MH PARK**
Permit Description:	**Plumbing Work Only**
Work Class:	Miscellaneous
Proposed Use:	
Permit Number:	B0026993
Status:	FINAL
Valuation:	$4,200.00
Contractor Company:	
Contractor Name:	BLOOMINGTON CESSPOOL

Date:	**8/29/1980**
Permit Type:	
Description:	**SP#66 M/H INSTL(12X60 FLEETWOOD)**
Permit Description:	
Work Class:	
Proposed Use:	
Permit Number:	BZA013254
Status:	CANCELED
Valuation:	$0.00
Contractor Company:	
Contractor Name:	

ADJOINING PROPERTY FINDINGS

Date: **6/26/1979**
Permit Type:
Description: **SP#83 M/H INSTL(12X62 FLEETWOOD)**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZA008429
Status: CANCELED
Valuation: $0.00
Contractor Company:
Contractor Name:

Date: **6/28/1977**
Permit Type:
Description: **SPACE 80 M/H INSTALLATION (12X56 SKYLINE)**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZH10331
Status: CANCELED
Valuation: $0.00
Contractor Company:
Contractor Name:

Date: **6/20/1977**
Permit Type:
Description: **SPACE 107 M/H INSTALLATION (12X60 FLEETWOOD)**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZH10272
Status: CANCELED
Valuation: $0.00
Contractor Company:
Contractor Name:

ADJOINING PROPERTY FINDINGS

Date: **2/10/1977**
Permit Type:
Description: **SPACE 38 M/H INSTALLATION (10X57 CHALET)**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZH09323
Status: CANCELED
Valuation: $0.00
Contractor Company:
Contractor Name:

Date: **3/10/1976**
Permit Type:
Description: **ON SIGHT SIGN 48 SF.**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZ274208
Status: CANCELED
Valuation: $0.00
Contractor Company:
Contractor Name:

Date: **2/26/1976**
Permit Type:
Description: **SP#7 M/H INSTL (LAKEWWOD 10*55)**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZH04972
Status: CANCELED
Valuation: $0.00
Contractor Company:
Contractor Name:

ADJOINING PROPERTY FINDINGS

Date: **11/2/1972**
Permit Type:
Description: **SPACE 103 TRAILER AWNING**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZ219258
Status: EXPIRED
Valuation: $0.00
Contractor Company:
Contractor Name:

Date: **3/16/1972**
Permit Type:
Description: **ELECTRICAL SERVICE TO TRAILER PARK**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZ206779
Status: EXPIRED
Valuation: $0.00
Contractor Company:
Contractor Name:

Date: **5/18/1971**
Permit Type:
Description: **10X43 TRAILER AWNING (SPACE 1)**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZ193272
Status: CANCELED
Valuation: $0.00
Contractor Company:
Contractor Name:

ADJOINING PROPERTY FINDINGS

Date: **5/5/1971**
Permit Type:
Description: **RECREATION BLDG PLAN CHECK**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZ193006
Status: CANCELED
Valuation: $0.00
Contractor Company:
Contractor Name:

Date: **9/29/1970**
Permit Type:
Description: **AWNING TO TRAILER**

Permit Description:
Work Class:
Proposed Use:
Permit Number: BZ185160
Status: EXPIRED
Valuation: $0.00
Contractor Company:
Contractor Name:

GLOSSARY

General Building Department concepts

- **ICC:** The International Code Council. The governing body for the building/development codes used by all jurisdictions who've adopted the ICC guidelines. MOST of the US has done this. Canada, Mexico, and other countries use ICC codes books and guides as well. There are a few states who have added guidelines to the ICC codes to better fit their needs. For example, California has added seismic retrofit requirements for most commercial structures.
- **Building Department (Permitting Authority, Building Codes, Inspections Department, Building and Inspections):** This is the department in a jurisdiction where an owner or contractor goes to obtain permits and inspections for building, tearing down, remodeling, adding to, re-roofing, moving or otherwise making changes to any structure, Residential or Commercial.
- **Jurisdiction:** This is the geographic area representing the properties over which a Permitting Authority has responsibility.
- **GC:** General Contractor. Usually the primary contractor hired for any Residential or Commercial construction work.
- **Sub:** Subordinate contracting companies or subcontractors. Usually a "trades" contractor working for the GC. These contractors generally have an area of expertise in which they are licensed like Plumbing, Electrical, Heating and Air systems, Gas Systems, Pools etc. (called "trades").
- **Journeymen:** Sub contractors who have their own personal licenses in one or more trades and work for different contracting companies, wherever they are needed or there is work.
- **HVAC (Mechanical, Heating & Air companies):** HVAC = Heating, Ventilation, and Air Conditioning.
- **ELEC (Electrical, TempPole, TPole, TPower, Temporary Power, Panel, AMP Change, Power Release):** Electrical permits can be pulled for many reasons. The most common reason is to increase the AMPs of power in an electrical power panel. This requires a permit in almost every jurisdiction. Other commons reason for Electrical permits is to insert a temporary power pole at a new construction site. Construction requires electricity, and in a new development, power has yet to be run to the lot. The temporary power pole is usually the very first permit pulled for new development. The power is released to the home owner when construction is complete and this sometimes takes the form of a Power Release permit or inspection.
- **"Pull" a permit:** To obtain and pay for a building permit.
- **CBO:** Chief Building Official
- **Planning Department:** The department in the development process where the building /structural plans are reviewed for their completeness and compliance with building codes
- **Zoning Department:** The department in the development process where the site plans are reviewed for their compliance with the regulations associated with the zoning district in which they are situated.
- **Zoning District:** A pre-determined geographic boundary within a jurisdiction where certain types of structures are permitted / prohibited. Examples are Residential structure, Commercial/Retail structures, Industrial/Manufacturing structures etc. Each zoning district has regulations associated with it like the sizes of the lots, the density of the structures on the lots, the number of parking spaces required for certain types of structures on the lots etc.
- **PIN (TMS, GIS ID, Parcel#):** Property Identification Number and Tax Map System number.
- **State Card (Business license):** A license card issued to a contractor to conduct business.
- **Building Inspector (Inspector):** The inspector is a building department employee that inspects building construction for compliance to codes.
- **C.O.:** Certificate of Occupancy. This is the end of the construction process and designates that the owners now have permission to occupy a structure after its building is complete. Sometimes also referred to as a Certificate of Compliance.

GLOSSARY

Permit Content Definitions

- Permit Number: The alphanumerical designation assigned to a permit for tracking within the building department system. Sometimes the permit number gives clues to its role, e.g. a "PL" prefix may designate a plumbing permit.
- Description: A field on the permit form that allows the building department to give a brief description of the work being done. More often than not, this is the most important field for EP's to find clues to the prior use(s) of the property.
- Permit Type: Generally a brief designation of the type of job being done. For example BLDG-RES, BLDG-COM, ELEC, MECH etc.

Sample Building Permit Data

Date: Nov 09, 2000
Permit Type: Bldg -
New Permit Number: 101000000405
Status: Valuation: $1,000,000.00
Contractor Company: OWNER-BUILDER
Contractor Name:

Description: New one store retail (SAV-ON) with drive-thru pharmacy. Certificate of Occupancy.

APPENDIX H - LABORATORY REPORT

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

Date: January 22, 2018

Mr. Richard Orr
Leighton Consulting, Inc.
41715 Enterprise Circle N. Suite 103
Temecula, CA 92590
Tel(909)484-2205 E-Mail: rorr@leightongroup.com

Project: **T + C Skilled Nursing Facility**
Project No.: **11888.001**
Lab I.D.: **180115-63 through -69**

Dear Mr. Orr:

The **analytical results** for the soil samples, received by our lab on January 15, 2018, are attached. The samples were received chilled, intact and with chain of custody record.

Trace concentrations between the MDL and the PQL have been reported with a "J" flag indicator.

Enviro-Chem appreciates the opportunity to provide you and your company this and other services. Please do not hesitate to call us if you have any questions.

Sincerely,

Curtis Desilets
Vice President/Program Manger

Andy Wang
Laboratory Manager

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: **Leighton Consulting**
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001**
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/16&18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-1** LAB I.D.: 180115-63

TOTAL THRESHOLD LIMIT CONCENTRATION ANALYSIS
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

ELEMENT ANALYZED	SAMPLE RESULT	PQL	MDL	DF	TTLC LIMIT	STLC LIMIT	EPA METHOD
Antimony(Sb)	ND	1.0	0.250	1	500	15	6010B
Arsenic(As)	1.23	0.3	0.248	1	500	5.0	6010B
Barium(Ba)	69.7	5.0	0.143	1	10,000	100	6010B
Beryllium(Be)	ND	0.5	0.180	1	75	0.75	6010B
Cadmium(Cd)	ND	0.5	0.119	1	100	1.0	6010B
Chromium Total(Cr)	11.6	0.5	0.138	1	2,500	560/5@	6010B
Chromium VI (Cr6)	--	0.2	0.0156	-	500	5.0	7196A
Cobalt(Co)	5.46	1.0	0.156	1	8,000	80	6010B
Copper(Cu)	7.73	1.0	0.203	1	2,500	25	6010B
Lead(Pb)	2.35	0.5	0.192	1	1,000	5.0	6010B
Mercury(Hg)	ND	0.01	0.0062	1	20	0.2	7471A
Molybdenum(Mo)	ND	5.0	0.274	1	3,500	350	6010B
Nickel(Ni)	4.34	2.5	0.165	1	2,000	20	6010B
Selenium(Se)	ND	1.0	0.234	1	100	1.0	6010B
Silver(Ag)	ND	1.0	0.414	1	500	5.0	6010B
Thallium(Tl)	ND	1.0	0.432	1	700	7.0	6010B
Vanadium(V)	25.5	5.0	0.171	1	2,400	24	6010B
Zinc(Zn)	30.8	0.5	0.131	1	5,000	250	6010B

COMMENTS
DF = Dilution Factor
MDL = Method Detection Limit
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
@ = Must meet both the STLC Limit at 560 and EPA-TCLP Limit at 5
* = STLC analysis for the metal is recommended (if marked)
** = Additional Analysis required, please call to discuss (if marked)
*** = The concentration exceeds the TTLC Limit, and the sample is defined as hazardous waste as per CCR-TITLE 22 (if marked)
-- = Not analyzed/not requested

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: **Leighton Consulting**
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001**
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/16&18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-2** LAB I.D.: 180115-64

TOTAL THRESHOLD LIMIT CONCENTRATION ANALYSIS
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

ELEMENT ANALYZED	SAMPLE RESULT	PQL	MDL	DF	TTLC LIMIT	STLC LIMIT	EPA METHOD
Antimony(Sb)	ND	1.0	0.250	1	500	15	6010B
Arsenic(As)	0.991	0.3	0.248	1	500	5.0	6010B
Barium(Ba)	95.2	5.0	0.143	1	10,000	100	6010B
Beryllium(Be)	ND	0.5	0.180	1	75	0.75	6010B
Cadmium(Cd)	ND	0.5	0.119	1	100	1.0	6010B
Chromium Total(Cr)	11.6	0.5	0.138	1	2,500	560/5@	6010B
Chromium VI (Cr6)	--	0.2	0.0156	-	500	5.0	7196A
Cobalt(Co)	6.41	1.0	0.156	1	8,000	80	6010B
Copper(Cu)	7.82	1.0	0.203	1	2,500	25	6010B
Lead(Pb)	2.37	0.5	0.192	1	1,000	5.0	6010B
Mercury(Hg)	ND	0.01	0.0062	1	20	0.2	7471A
Molybdenum(Mo)	ND	5.0	0.274	1	3,500	350	6010B
Nickel(Ni)	2.34J	2.5	0.165	1	2,000	20	6010B
Selenium(Se)	ND	1.0	0.234	1	100	1.0	6010B
Silver(Ag)	ND	1.0	0.414	1	500	5.0	6010B
Thallium(Tl)	ND	1.0	0.432	1	700	7.0	6010B
Vanadium(V)	28.6	5.0	0.171	1	2,400	24	6010B
Zinc(Zn)	32.1	0.5	0.131	1	5,000	250	6010B

COMMENTS
DF = Dilution Factor
MDL = Method Detection Limit
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
@ = Must meet both the STLC Limit at 560 and EPA-TCLP Limit at 5
* = STLC analysis for the metal is recommended (if marked)
** = Additional Analysis required, please call to discuss (if marked)
*** = The concentration exceeds the TTLC Limit, and the sample is defined as hazardous waste as per CCR-TITLE 22 (if marked)
-- = Not analyzed/not requested

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: **Leighton Consulting**
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001**
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/16&18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-3** LAB I.D.: 180115-65

TOTAL THRESHOLD LIMIT CONCENTRATION ANALYSIS
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

ELEMENT ANALYZED	SAMPLE RESULT	PQL	MDL	DF	TTLC LIMIT	STLC LIMIT	EPA METHOD
Antimony(Sb)	ND	1.0	0.250	1	500	15	6010B
Arsenic(As)	1.10	0.3	0.248	1	500	5.0	6010B
Barium(Ba)	105	5.0	0.143	1	10,000	100	6010B
Beryllium(Be)	ND	0.5	0.180	1	75	0.75	6010B
Cadmium(Cd)	ND	0.5	0.119	1	100	1.0	6010B
Chromium Total(Cr)	12.8	0.5	0.138	1	2,500	560/5@	6010B
Chromium VI (Cr6)	--	0.2	0.0156	-	500	5.0	7196A
Cobalt(Co)	6.78	1.0	0.156	1	8,000	80	6010B
Copper(Cu)	9.48	1.0	0.203	1	2,500	25	6010B
Lead(Pb)	6.30	0.5	0.192	1	1,000	5.0	6010B
Mercury(Hg)	ND	0.01	0.0062	1	20	0.2	7471A
Molybdenum(Mo)	ND	5.0	0.274	1	3,500	350	6010B
Nickel(Ni)	2.60	2.5	0.165	1	2,000	20	6010B
Selenium(Se)	ND	1.0	0.234	1	100	1.0	6010B
Silver(Ag)	ND	1.0	0.414	1	500	5.0	6010B
Thallium(Tl)	ND	1.0	0.432	1	700	7.0	6010B
Vanadium(V)	31.2	5.0	0.171	1	2,400	24	6010B
Zinc(Zn)	49.0	0.5	0.131	1	5,000	250	6010B

COMMENTS
DF = Dilution Factor
MDL = Method Detection Limit
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
@ = Must meet both the STLC Limit at 560 and EPA-TCLP Limit at 5
* = STLC analysis for the metal is recommended (if marked)
** = Additional Analysis required, please call to discuss (if marked)
*** = The concentration exceeds the TTLC Limit, and the sample is defined as hazardous waste as per CCR-TITLE 22 (if marked)
-- = Not analyzed/not requested

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: **Leighton Consulting**
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001**
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/16&18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-4** LAB I.D.: 180115-66

TOTAL THRESHOLD LIMIT CONCENTRATION ANALYSIS
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

ELEMENT ANALYZED	SAMPLE RESULT	PQL	MDL	DF	TTLC LIMIT	STLC LIMIT	EPA METHOD
Antimony(Sb)	ND	1.0	0.250	1	500	15	6010B
Arsenic(As)	1.86	0.3	0.248	1	500	5.0	6010B
Barium(Ba)	155	5.0	0.143	1	10,000	100	6010B
Beryllium(Be)	ND	0.5	0.180	1	75	0.75	6010B
Cadmium(Cd)	ND	0.5	0.119	1	100	1.0	6010B
Chromium Total(Cr)	20.0	0.5	0.138	1	2,500	560/5@	6010B
Chromium VI (Cr6)	--	0.2	0.0156	-	500	5.0	7196A
Cobalt(Co)	9.62	1.0	0.156	1	8,000	80	6010B
Copper(Cu)	12.7	1.0	0.203	1	2,500	25	6010B
Lead(Pb)	3.66	0.5	0.192	1	1,000	5.0	6010B
Mercury(Hg)	0.016	0.01	0.0062	1	20	0.2	7471A
Molybdenum(Mo)	ND	5.0	0.274	1	3,500	350	6010B
Nickel(Ni)	5.90	2.5	0.165	1	2,000	20	6010B
Selenium(Se)	ND	1.0	0.234	1	100	1.0	6010B
Silver(Ag)	ND	1.0	0.414	1	500	5.0	6010B
Thallium(Tl)	ND	1.0	0.432	1	700	7.0	6010B
Vanadium(V)	46.2	5.0	0.171	1	2,400	24	6010B
Zinc(Zn)	56.7	0.5	0.131	1	5,000	250	6010B

COMMENTS
DF = Dilution Factor
MDL = Method Detection Limit
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
@ = Must meet both the STLC Limit at 560 and EPA-TCLP Limit at 5
* = STLC analysis for the metal is recommended (if marked)
** = Additional Analysis required, please call to discuss (if marked)
*** = The concentration exceeds the TTLC Limit, and the sample is defined as hazardous waste as per CCR-TITLE 22 (if marked)
-- = Not analyzed/not requested

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
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LABORATORY REPORT

CUSTOMER: **Leighton Consulting**
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001**
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/16&18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-5** LAB I.D.: 180115-67

TOTAL THRESHOLD LIMIT CONCENTRATION ANALYSIS
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

ELEMENT ANALYZED	SAMPLE RESULT	PQL	MDL	DF	TTLC LIMIT	STLC LIMIT	EPA METHOD
Antimony(Sb)	ND	1.0	0.250	1	500	15	6010B
Arsenic(As)	1.76	0.3	0.248	1	500	5.0	6010B
Barium(Ba)	93.2	5.0	0.143	1	10,000	100	6010B
Beryllium(Be)	ND	0.5	0.180	1	75	0.75	6010B
Cadmium(Cd)	ND	0.5	0.119	1	100	1.0	6010B
Chromium Total(Cr)	14.8	0.5	0.138	1	2,500	560/5@	6010B
Chromium VI (Cr6)	--	0.2	0.0156	-	500	5.0	7196A
Cobalt(Co)	7.32	1.0	0.156	1	8,000	80	6010B
Copper(Cu)	9.97	1.0	0.203	1	2,500	25	6010B
Lead(Pb)	4.46	0.5	0.192	1	1,000	5.0	6010B
Mercury(Hg)	0.018	0.01	0.0062	1	20	0.2	7471A
Molybdenum(Mo)	ND	5.0	0.274	1	3,500	350	6010B
Nickel(Ni)	4.71	2.5	0.165	1	2,000	20	6010B
Selenium(Se)	ND	1.0	0.234	1	100	1.0	6010B
Silver(Ag)	ND	1.0	0.414	1	500	5.0	6010B
Thallium(Tl)	ND	1.0	0.432	1	700	7.0	6010B
Vanadium(V)	36.2	5.0	0.171	1	2,400	24	6010B
Zinc(Zn)	43.5	0.5	0.131	1	5,000	250	6010B

COMMENTS
DF = Dilution Factor
MDL = Method Detection Limit
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
@ = Must meet both the STLC Limit at 560 and EPA-TCLP Limit at 5
* = STLC analysis for the metal is recommended (if marked)
** = Additional Analysis required, please call to discuss (if marked)
*** = The concentration exceeds the TTLC Limit, and the sample is defined as hazardous waste as per CCR-TITLE 22 (if marked)
-- = Not analyzed/not requested

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
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LABORATORY REPORT

CUSTOMER: **Leighton Consulting**
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001**
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/16&18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-6** LAB I.D.: 180115-68

TOTAL THRESHOLD LIMIT CONCENTRATION ANALYSIS
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

ELEMENT ANALYZED	SAMPLE RESULT	PQL	MDL	DF	TTLC LIMIT	STLC LIMIT	EPA METHOD
Antimony(Sb)	ND	1.0	0.250	1	500	15	6010B
Arsenic(As)	0.833	0.3	0.248	1	500	5.0	6010B
Barium(Ba)	66.4	5.0	0.143	1	10,000	100	6010B
Beryllium(Be)	ND	0.5	0.180	1	75	0.75	6010B
Cadmium(Cd)	ND	0.5	0.119	1	100	1.0	6010B
Chromium Total(Cr)	9.07	0.5	0.138	1	2,500	560/5@	6010B
Chromium VI (Cr6)	--	0.2	0.0156	-	500	5.0	7196A
Cobalt(Co)	4.94	1.0	0.156	1	8,000	80	6010B
Copper(Cu)	5.53	1.0	0.203	1	2,500	25	6010B
Lead(Pb)	2.31	0.5	0.192	1	1,000	5.0	6010B
Mercury(Hg)	0.032	0.01	0.0062	1	20	0.2	7471A
Molybdenum(Mo)	ND	5.0	0.274	1	3,500	350	6010B
Nickel(Ni)	2.59	2.5	0.165	1	2,000	20	6010B
Selenium(Se)	ND	1.0	0.234	1	100	1.0	6010B
Silver(Ag)	ND	1.0	0.414	1	500	5.0	6010B
Thallium(Tl)	ND	1.0	0.432	1	700	7.0	6010B
Vanadium(V)	21.9	5.0	0.171	1	2,400	24	6010B
Zinc(Zn)	24.1	0.5	0.131	1	5,000	250	6010B

COMMENTS
DF = Dilution Factor
MDL = Method Detection Limit
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
@ = Must meet both the STLC Limit at 560 and EPA-TCLP Limit at 5
* = STLC analysis for the metal is recommended (if marked)
** = Additional Analysis required, please call to discuss (if marked)
*** = The concentration exceeds the TTLC Limit, and the sample is defined as hazardous waste as per CCR-TITLE 22 (if marked)
-- = Not analyzed/not requested

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
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LABORATORY REPORT

CUSTOMER: **Leighton Consulting**
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001**
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/16&18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-7** LAB I.D.: 180115-69

TOTAL THRESHOLD LIMIT CONCENTRATION ANALYSIS
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

ELEMENT ANALYZED	SAMPLE RESULT	PQL	MDL	DF	TTLC LIMIT	STLC LIMIT	EPA METHOD
Antimony(Sb)	ND	1.0	0.250	1	500	15	6010B
Arsenic(As)	1.77	0.3	0.248	1	500	5.0	6010B
Barium(Ba)	135	5.0	0.143	1	10,000	100	6010B
Beryllium(Be)	ND	0.5	0.180	1	75	0.75	6010B
Cadmium(Cd)	ND	0.5	0.119	1	100	1.0	6010B
Chromium Total(Cr)	19.5	0.5	0.138	1	2,500	560/5@	6010B
Chromium VI (Cr6)	--	0.2	0.0156	-	500	5.0	7196A
Cobalt(Co)	9.09	1.0	0.156	1	8,000	80	6010B
Copper(Cu)	11.7	1.0	0.203	1	2,500	25	6010B
Lead(Pb)	5.82	0.5	0.192	1	1,000	5.0	6010B
Mercury(Hg)	0.020	0.01	0.0062	1	20	0.2	7471A
Molybdenum(Mo)	ND	5.0	0.274	1	3,500	350	6010B
Nickel(Ni)	4.98	2.5	0.165	1	2,000	20	6010B
Selenium(Se)	ND	1.0	0.234	1	100	1.0	6010B
Silver(Ag)	ND	1.0	0.414	1	500	5.0	6010B
Thallium(Tl)	ND	1.0	0.432	1	700	7.0	6010B
Vanadium(V)	43.8	5.0	0.171	1	2,400	24	6010B
Zinc(Zn)	49.6	0.5	0.131	1	5,000	250	6010B

COMMENTS
DF = Dilution Factor
MDL = Method Detection Limit
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
@ = Must meet both the STLC Limit at 560 and EPA-TCLP Limit at 5
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** = Additional Analysis required, please call to discuss (if marked)
*** = The concentration exceeds the TTLC Limit, and the sample is defined as hazardous waste as per CCR-TITLE 22 (if marked)
-- = Not analyzed/not requested

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
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METHOD BLANK REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/16&18/18
DATE REPORTED: 01/22/18

METHOD BLANK FOR LAB I.D.: 180115-63 THROUGH -69

TOTAL THRESHOLD LIMIT CONCENTRATION ANALYSIS
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

ELEMENT ANALYZED	SAMPLE RESULT	PQL	MDL	DF	TTLC LIMIT	STLC LIMIT	EPA METHOD
Antimony(Sb)	ND	1.0	0.250	1	500	15	6010B
Arsenic(As)	ND	0.3	0.248	1	500	5.0	6010B
Barium(Ba)	ND	5.0	0.143	1	10,000	100	6010B
Beryllium(Be)	ND	0.5	0.180	1	75	0.75	6010B
Cadmium(Cd)	ND	0.5	0.119	1	100	1.0	6010B
Chromium Total(Cr)	ND	0.5	0.138	1	2,500	560/5@	6010B
Chromium VI (Cr6)	--	0.2	0.0156	-	500	5.0	7196A
Cobalt(Co)	ND	1.0	0.156	1	8,000	80	6010B
Copper(Cu)	ND	1.0	0.203	1	2,500	25	6010B
Lead(Pb)	ND	0.5	0.192	1	1,000	5.0	6010B
Mercury(Hg)	ND	0.01	0.0062	1	20	0.2	7471A
Molybdenum(Mo)	ND	5.0	0.274	1	3,500	350	6010B
Nickel(Ni)	ND	2.5	0.165	1	2,000	20	6010B
Selenium(Se)	ND	1.0	0.234	1	100	1.0	6010B
Silver(Ag)	ND	1.0	0.414	1	500	5.0	6010B
Thallium(Tl)	ND	1.0	0.432	1	700	7.0	6010B
Vanadium(V)	ND	5.0	0.171	1	2,400	24	6010B
Zinc(Zn)	ND	0.5	0.131	1	5,000	250	6010B

COMMENTS
DF = Dilution Factor
MDL = Method Detection Limit
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
Actual Detection Limit = PQL X DF
ND = Below the Actual Detection Limit or non-detected
TTLC = Total Threshold Limit Concentration
STLC = Soluble Threshold Limit Concentration
@ = Must meet both the STLC Limit at 560 and EPA-TCLP Limit at 5
* = STLC analysis for the metal is recommended (if marked)
** = Additional Analysis required, please call to discuss (if marked)
*** = The concentration exceeds the TTLC Limit, and the sample is defined as hazardous waste as per CCR-TITLE 22 (if marked)
-- = Not analyzed/not requested

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

QA/QC for Metals Analysis --TTLC--SOLID/SOIL MATRIX

Matrix Spike/ Matrix Spike Duplicate/ LCS :

Metals Analysis Date : 1/18/2018

Mercury Analysis Date : 1/16/2018

Unit : mg/Kg(ppm)

Analysis	Spk.Sample ID	LCS CONC.	LCS %Rec.	LCS STATUS	Sample Result	Spike Conc.	MS	% Rec MS	MSD	% Rec MSD	% RPD
Antimony (Sb)	180117-3	50.0	105	PASS	0	50	50.4	101%	51.6	103%	2%
Arsenic (As)	180117-3	50.0	106	PASS	3.06	50	57.9	110%	59.2	112%	2%
Barium (Ba)	180117-3	50.0	103	PASS	57.3	50	109	103%	112	109%	6%
Beryllium (Be)	180117-3	50.0	100	PASS	0	50	58.1	116%	58.8	118%	1%
Cadmium (Cd)	180117-3	50.0	112	PASS	0.825	50	56.1	111%	57.6	114%	3%
Chromium (Cr)	180117-3	50.0	103	PASS	13.0	50	66.9	108%	67.8	110%	2%
Cobalt (Co)	180117-3	50.0	104	PASS	3.55	50	51.8	97%	53.0	99%	2%
Copper (Cu)	180117-3	50.0	99	PASS	8.69	50	64.6	112%	65.4	113%	1%
Lead (Pb)	180117-3	50.0	105	PASS	3.41	50	52.4	98%	53.0	99%	1%
Mercury (Hg)	180116-1	0.125	93	PASS	0	0.125	0.107	86%	0.106	85%	1%
Molybdenum(Mo)	180117-3	50.0	101	PASS	0	50	50.8	102%	51.8	104%	2%
Nickel (Ni)	180117-3	50.0	105	PASS	7.84	50	61.1	107%	62.6	110%	3%
Selenium (Se)	180117-3	50.0	105	PASS	0	50	55.0	110%	55.9	112%	2%
Silver (Ag)	180117-3	5.0	505	FAIL	0	5.0	5.42	108%	5.46	109%	1%
Thallium (Tl)	180117-3	50.0	101	PASS	0	50	46.3	93%	47.5	95%	3%
Vanadium (V)	180117-3	50.0	100	PASS	23.5	50	79.1	111%	79.9	113%	1%
Zinc (Zn)	180117-3	50.0	112	PASS	27.6	50	78.0	101%	80.3	105%	4%

*=Fail due to matrix interference

Note:LCS is in control therefore results are in control

ANALYST: _____

FINAL REVIEWER: _____

Enviro – Chem, Inc.
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LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR

DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

EPA 5035/8260B FOR FUEL OXYGENATES
UNITS: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

SAMPLE I.D.	LAB I.D.	ETBE	DIPE	MTBE	TAME	TBA	DF
S-1	180115-63	ND	ND	ND	ND	ND	1
S-2	180115-64	ND	ND	ND	ND	ND	1
S-3	180115-65	ND	ND	ND	ND	ND	1
S-4	180115-66	ND	ND	ND	ND	ND	1
S-5	180115-67	ND	ND	ND	ND	ND	1
S-6	180115-68	ND	ND	ND	ND	ND	1
S-7	180115-69	ND	ND	ND	ND	ND	1
Method Blank		ND	ND	ND	ND	ND	1
MDL		0.005	0.005	0.002	0.005	0.02	
PQL		0.01	0.01	0.005	0.01	0.05	

COMMENTS:
DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = DF X PQL
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
ETBE = ETHYL tert-BUTYL ETHER DIPE = ISOPROPYL ETHER
MTBE = METHYL tert-BUTYL ETHER TAME = TERT-AMYL METHYL ETHER
TBA = TERTIARY BUTYL ALCOHOL

Data Reviewed and Approved by: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

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LABORATORY REPORT

CUSTOMER: Leighton Consulting
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Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-1
LAB I.D.: 180115-63

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
ACETONE	ND	0.020	0.010	1
BENZENE	ND	0.005	0.002	1
BROMOBENZENE	ND	0.005	0.002	1
BROMOCHLOROMETHANE	ND	0.005	0.002	1
BROMODICHLOROMETHANE	ND	0.005	0.002	1
BROMOFORM	ND	0.005	0.002	1
BROMOMETHANE	ND	0.005	0.002	1
2-BUTANONE (MEK)	ND	0.020	0.010	1
N-BUTYLBENZENE	ND	0.005	0.002	1
SEC-BUTYLBENZENE	ND	0.005	0.002	1
TERT-BUTYLBENZENE	ND	0.005	0.002	1
CARBON DISULFIDE	ND	0.010	0.005	1
CARBON TETRACHLORIDE	ND	0.005	0.002	1
CHLOROBENZENE	ND	0.005	0.002	1
CHLOROETHANE	ND	0.005	0.002	1
CHLOROFORM	ND	0.005	0.002	1
CHLOROMETHANE	ND	0.005	0.002	1
2-CHLOROTOLUENE	ND	0.005	0.002	1
4-CHLOROTOLUENE	ND	0.005	0.002	1
DIBROMOCHLOROMETHANE	ND	0.005	0.002	1
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.005	0.002	1
1,2-DIBROMOETHANE	ND	0.005	0.002	1
DIBROMOMETHANE	ND	0.005	0.002	1
1,2-DICHLOROBENZENE	ND	0.005	0.002	1
1,3-DICHLOROBENZENE	ND	0.005	0.002	1
1,4-DICHLOROBENZENE	ND	0.005	0.002	1
DICHLORODIFLUOROMETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHANE	ND	0.005	0.002	1
1,2-DICHLOROETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHENE	ND	0.005	0.002	1
CIS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
TRANS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
1,2-DICHLOROPROPANE	ND	0.005	0.002	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

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Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001**
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-1**
LAB I.D.: 180115-63

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1,3-DICHLOROPROPANE	ND	0.005	0.002	1
2,2-DICHLOROPROPANE	ND	0.005	0.002	1
1,1-DICHLOROPROPENE	ND	0.005	0.002	1
CIS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
TRANS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
ETHYLBENZENE	ND	0.005	0.002	1
2-HEXANONE	ND	0.020	0.010	1
HEXACHLOROBUTADIENE	ND	0.005	0.002	1
ISOPROPYLBENZENE	ND	0.005	0.002	1
4-ISOPROPYLTOLUENE	ND	0.005	0.002	1
4-METHYL-2-PENTANONE (MIBK)	ND	0.020	0.010	1
METHYL tert-BUTYL ETHER (MTBE)	ND	0.005	0.002	1
METHYLENE CHLORIDE	ND	0.010	0.005	1
NAPHTHALENE	ND	0.005	0.002	1
N-PROPYLBENZENE	ND	0.005	0.002	1
STYRENE	ND	0.005	0.002	1
1,1,1,2-TETRACHLOROETHANE	ND	0.005	0.002	1
1,1,2,2-TETRACHLOROETHANE	ND	0.005	0.002	1
TETRACHLOROETHENE (PCE)	ND	0.005	0.002	1
TOLUENE	ND	0.005	0.002	1
1,2,3-TRICHLOROBENZENE	ND	0.005	0.002	1
1,2,4-TRICHLOROBENZENE	ND	0.005	0.002	1
1,1,1-TRICHLOROETHANE	ND	0.005	0.002	1
1,1,2-TRICHLOROETHANE	ND	0.005	0.002	1
TRICHLOROETHENE (TCE)	ND	0.005	0.002	1
TRICHLOROFLUOROMETHANE	ND	0.005	0.002	1
1,2,3-TRICHLOROPROPANE	ND	0.005	0.002	1
1,2,4-TRIMETHYLBENZENE	ND	0.005	0.002	1
1,3,5-TRIMETHYLBENZENE	ND	0.005	0.002	1
VINYL CHLORIDE	ND	0.005	0.002	1
M/P-XYLENE	ND	0.010	0.005	1
O-XYLENE	ND	0.005	0.002	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
ACTUAL DETECTION LIMIT = PQL X DF
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL and PQL
ND = BELOW THE ACTUAL DETECTION LIMIT OR NON-DETECTED
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL — DATE RECEIVED: 01/15/18
SAMPLING DATE: 01/15/18 — DATE ANALYZED: 01/17/18
REPORT TO: Mr. RICHARD ORR — DATE REPORTED: 01/22/18

SAMPLE I.D.: S-2 — LAB I.D.: 180115-64

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
ACETONE	ND	0.020	0.010	1
BENZENE	ND	0.005	0.002	1
BROMOBENZENE	ND	0.005	0.002	1
BROMOCHLOROMETHANE	ND	0.005	0.002	1
BROMODICHLOROMETHANE	ND	0.005	0.002	1
BROMOFORM	ND	0.005	0.002	1
BROMOMETHANE	ND	0.005	0.002	1
2-BUTANONE (MEK)	ND	0.020	0.010	1
N-BUTYLBENZENE	ND	0.005	0.002	1
SEC-BUTYLBENZENE	ND	0.005	0.002	1
TERT-BUTYLBENZENE	ND	0.005	0.002	1
CARBON DISULFIDE	ND	0.010	0.005	1
CARBON TETRACHLORIDE	ND	0.005	0.002	1
CHLOROBENZENE	ND	0.005	0.002	1
CHLOROETHANE	ND	0.005	0.002	1
CHLOROFORM	ND	0.005	0.002	1
CHLOROMETHANE	ND	0.005	0.002	1
2-CHLOROTOLUENE	ND	0.005	0.002	1
4-CHLOROTOLUENE	ND	0.005	0.002	1
DIBROMOCHLOROMETHANE	ND	0.005	0.002	1
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.005	0.002	1
1,2-DIBROMOETHANE	ND	0.005	0.002	1
DIBROMOMETHANE	ND	0.005	0.002	1
1,2-DICHLOROBENZENE	ND	0.005	0.002	1
1,3-DICHLOROBENZENE	ND	0.005	0.002	1
1,4-DICHLOROBENZENE	ND	0.005	0.002	1
DICHLORODIFLUOROMETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHANE	ND	0.005	0.002	1
1,2-DICHLOROETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHENE	ND	0.005	0.002	1
CIS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
TRANS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
1,2-DICHLOROPROPANE	ND	0.005	0.002	1

----- TO BE CONTINUED ON PAGE #2 -----

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-2
LAB I.D.: 180115-64

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1,3-DICHLOROPROPANE	ND	0.005	0.002	1
2,2-DICHLOROPROPANE	ND	0.005	0.002	1
1,1-DICHLOROPROPENE	ND	0.005	0.002	1
CIS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
TRANS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
ETHYLBENZENE	ND	0.005	0.002	1
2-HEXANONE	ND	0.020	0.010	1
HEXACHLOROBUTADIENE	ND	0.005	0.002	1
ISOPROPYLBENZENE	ND	0.005	0.002	1
4-ISOPROPYLTOLUENE	ND	0.005	0.002	1
4-METHYL-2-PENTANONE (MIBK)	ND	0.020	0.010	1
METHYL tert-BUTYL ETHER (MTBE)	ND	0.005	0.002	1
METHYLENE CHLORIDE	ND	0.010	0.005	1
NAPHTHALENE	ND	0.005	0.002	1
N-PROPYLBENZENE	ND	0.005	0.002	1
STYRENE	ND	0.005	0.002	1
1,1,1,2-TETRACHLOROETHANE	ND	0.005	0.002	1
1,1,2,2-TETRACHLOROETHANE	ND	0.005	0.002	1
TETRACHLOROETHENE (PCE)	ND	0.005	0.002	1
TOLUENE	ND	0.005	0.002	1
1,2,3-TRICHLOROBENZENE	ND	0.005	0.002	1
1,2,4-TRICHLOROBENZENE	ND	0.005	0.002	1
1,1,1-TRICHLOROETHANE	ND	0.005	0.002	1
1,1,2-TRICHLOROETHANE	ND	0.005	0.002	1
TRICHLOROETHENE (TCE)	ND	0.005	0.002	1
TRICHLOROFLUOROMETHANE	ND	0.005	0.002	1
1,2,3-TRICHLOROPROPANE	ND	0.005	0.002	1
1,2,4-TRIMETHYLBENZENE	ND	0.005	0.002	1
1,3,5-TRIMETHYLBENZENE	ND	0.005	0.002	1
VINYL CHLORIDE	ND	0.005	0.002	1
M/P-XYLENE	ND	0.010	0.005	1
O-XYLENE	ND	0.005	0.002	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
ACTUAL DETECTION LIMIT = PQL X DF
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL and PQL
ND = BELOW THE ACTUAL DETECTION LIMIT OR NON-DETECTED
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CAL-DHS CERTIFICATE # 1555

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
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DATE REPORTED: 01/22/18

SAMPLE I.D.: S-3
LAB I.D.: 180115-65

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
ACETONE	ND	0.020	0.010	1
BENZENE	ND	0.005	0.002	1
BROMOBENZENE	ND	0.005	0.002	1
BROMOCHLOROMETHANE	ND	0.005	0.002	1
BROMODICHLOROMETHANE	ND	0.005	0.002	1
BROMOFORM	ND	0.005	0.002	1
BROMOMETHANE	ND	0.005	0.002	1
2-BUTANONE (MEK)	ND	0.020	0.010	1
N-BUTYLBENZENE	ND	0.005	0.002	1
SEC-BUTYLBENZENE	ND	0.005	0.002	1
TERT-BUTYLBENZENE	ND	0.005	0.002	1
CARBON DISULFIDE	ND	0.010	0.005	1
CARBON TETRACHLORIDE	ND	0.005	0.002	1
CHLOROBENZENE	ND	0.005	0.002	1
CHLOROETHANE	ND	0.005	0.002	1
CHLOROFORM	ND	0.005	0.002	1
CHLOROMETHANE	ND	0.005	0.002	1
2-CHLOROTOLUENE	ND	0.005	0.002	1
4-CHLOROTOLUENE	ND	0.005	0.002	1
DIBROMOCHLOROMETHANE	ND	0.005	0.002	1
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.005	0.002	1
1,2-DIBROMOETHANE	ND	0.005	0.002	1
DIBROMOMETHANE	ND	0.005	0.002	1
1,2-DICHLOROBENZENE	ND	0.005	0.002	1
1,3-DICHLOROBENZENE	ND	0.005	0.002	1
1,4-DICHLOROBENZENE	ND	0.005	0.002	1
DICHLORODIFLUOROMETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHANE	ND	0.005	0.002	1
1,2-DICHLOROETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHENE	ND	0.005	0.002	1
CIS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
TRANS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
1,2-DICHLOROPROPANE	ND	0.005	0.002	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY:

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LABORATORY REPORT

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Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-3
LAB I.D.: 180115-65

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1,3-DICHLOROPROPANE	ND	0.005	0.002	1
2,2-DICHLOROPROPANE	ND	0.005	0.002	1
1,1-DICHLOROPROPENE	ND	0.005	0.002	1
CIS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
TRANS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
ETHYLBENZENE	ND	0.005	0.002	1
2-HEXANONE	ND	0.020	0.010	1
HEXACHLOROBUTADIENE	ND	0.005	0.002	1
ISOPROPYLBENZENE	ND	0.005	0.002	1
4-ISOPROPYLTOLUENE	ND	0.005	0.002	1
4-METHYL-2-PENTANONE (MIBK)	ND	0.020	0.010	1
METHYL tert-BUTYL ETHER (MTBE)	ND	0.005	0.002	1
METHYLENE CHLORIDE	ND	0.010	0.005	1
NAPHTHALENE	ND	0.005	0.002	1
N-PROPYLBENZENE	ND	0.005	0.002	1
STYRENE	ND	0.005	0.002	1
1,1,1,2-TETRACHLOROETHANE	ND	0.005	0.002	1
1,1,2,2-TETRACHLOROETHANE	ND	0.005	0.002	1
TETRACHLOROETHENE (PCE)	ND	0.005	0.002	1
TOLUENE	ND	0.005	0.002	1
1,2,3-TRICHLOROBENZENE	ND	0.005	0.002	1
1,2,4-TRICHLOROBENZENE	ND	0.005	0.002	1
1,1,1-TRICHLOROETHANE	ND	0.005	0.002	1
1,1,2-TRICHLOROETHANE	ND	0.005	0.002	1
TRICHLOROETHENE (TCE)	ND	0.005	0.002	1
TRICHLOROFLUOROMETHANE	ND	0.005	0.002	1
1,2,3-TRICHLOROPROPANE	ND	0.005	0.002	1
1,2,4-TRIMETHYLBENZENE	ND	0.005	0.002	1
1,3,5-TRIMETHYLBENZENE	ND	0.005	0.002	1
VINYL CHLORIDE	ND	0.005	0.002	1
M/P-XYLENE	ND	0.010	0.005	1
O-XYLENE	ND	0.005	0.002	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
ACTUAL DETECTION LIMIT = PQL X DF
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL and PQL
ND = BELOW THE ACTUAL DETECTION LIMIT OR NON-DETECTED
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel (909) 484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-4
LAB I.D.: 180115-66

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
ACETONE	ND	0.020	0.010	1
BENZENE	ND	0.005	0.002	1
BROMOBENZENE	ND	0.005	0.002	1
BROMOCHLOROMETHANE	ND	0.005	0.002	1
BROMODICHLOROMETHANE	ND	0.005	0.002	1
BROMOFORM	ND	0.005	0.002	1
BROMOMETHANE	ND	0.005	0.002	1
2-BUTANONE (MEK)	ND	0.020	0.010	1
N-BUTYLBENZENE	ND	0.005	0.002	1
SEC-BUTYLBENZENE	ND	0.005	0.002	1
TERT-BUTYLBENZENE	ND	0.005	0.002	1
CARBON DISULFIDE	ND	0.010	0.005	1
CARBON TETRACHLORIDE	ND	0.005	0.002	1
CHLOROBENZENE	ND	0.005	0.002	1
CHLOROETHANE	ND	0.005	0.002	1
CHLOROFORM	ND	0.005	0.002	1
CHLOROMETHANE	ND	0.005	0.002	1
2-CHLOROTOLUENE	ND	0.005	0.002	1
4-CHLOROTOLUENE	ND	0.005	0.002	1
DIBROMOCHLOROMETHANE	ND	0.005	0.002	1
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.005	0.002	1
1,2-DIBROMOETHANE	ND	0.005	0.002	1
DIBROMOMETHANE	ND	0.005	0.002	1
1,2-DICHLOROBENZENE	ND	0.005	0.002	1
1,3-DICHLOROBENZENE	ND	0.005	0.002	1
1,4-DICHLOROBENZENE	ND	0.005	0.002	1
DICHLORODIFLUOROMETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHANE	ND	0.005	0.002	1
1,2-DICHLOROETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHENE	ND	0.005	0.002	1
CIS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
TRANS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
1,2-DICHLOROPROPANE	ND	0.005	0.002	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

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LABORATORY REPORT

CUSTOMER: Leighton Consulting
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Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-4
LAB I.D.: 180115-66

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1,3-DICHLOROPROPANE	ND	0.005	0.002	1
2,2-DICHLOROPROPANE	ND	0.005	0.002	1
1,1-DICHLOROPROPENE	ND	0.005	0.002	1
CIS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
TRANS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
ETHYLBENZENE	ND	0.005	0.002	1
2-HEXANONE	ND	0.020	0.010	1
HEXACHLOROBUTADIENE	ND	0.005	0.002	1
ISOPROPYLBENZENE	ND	0.005	0.002	1
4-ISOPROPYLTOLUENE	ND	0.005	0.002	1
4-METHYL-2-PENTANONE (MIBK)	ND	0.020	0.010	1
METHYL tert-BUTYL ETHER (MTBE)	ND	0.005	0.002	1
METHYLENE CHLORIDE	ND	0.010	0.005	1
NAPHTHALENE	ND	0.005	0.002	1
N-PROPYLBENZENE	ND	0.005	0.002	1
STYRENE	ND	0.005	0.002	1
1,1,1,2-TETRACHLOROETHANE	ND	0.005	0.002	1
1,1,2,2-TETRACHLOROETHANE	ND	0.005	0.002	1
TETRACHLOROETHENE (PCE)	ND	0.005	0.002	1
TOLUENE	ND	0.005	0.002	1
1,2,3-TRICHLOROBENZENE	ND	0.005	0.002	1
1,2,4-TRICHLOROBENZENE	ND	0.005	0.002	1
1,1,1-TRICHLOROETHANE	ND	0.005	0.002	1
1,1,2-TRICHLOROETHANE	ND	0.005	0.002	1
TRICHLOROETHENE (TCE)	ND	0.005	0.002	1
TRICHLOROFLUOROMETHANE	ND	0.005	0.002	1
1,2,3-TRICHLOROPROPANE	ND	0.005	0.002	1
1,2,4-TRIMETHYLBENZENE	ND	0.005	0.002	1
1,3,5-TRIMETHYLBENZENE	ND	0.005	0.002	1
VINYL CHLORIDE	ND	0.005	0.002	1
M/P-XYLENE	ND	0.010	0.005	1
O-XYLENE	ND	0.005	0.002	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
ACTUAL DETECTION LIMIT = PQL X DF
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL and PQL
ND = BELOW THE ACTUAL DETECTION LIMIT OR NON-DETECTED
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

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LABORATORY REPORT

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-5
LAB I.D.: 180115-67

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
ACETONE	ND	0.020	0.010	1
BENZENE	ND	0.005	0.002	1
BROMOBENZENE	ND	0.005	0.002	1
BROMOCHLOROMETHANE	ND	0.005	0.002	1
BROMODICHLOROMETHANE	ND	0.005	0.002	1
BROMOFORM	ND	0.005	0.002	1
BROMOMETHANE	ND	0.005	0.002	1
2-BUTANONE (MEK)	ND	0.020	0.010	1
N-BUTYLBENZENE	ND	0.005	0.002	1
SEC-BUTYLBENZENE	ND	0.005	0.002	1
TERT-BUTYLBENZENE	ND	0.005	0.002	1
CARBON DISULFIDE	ND	0.010	0.005	1
CARBON TETRACHLORIDE	ND	0.005	0.002	1
CHLOROBENZENE	ND	0.005	0.002	1
CHLOROETHANE	ND	0.005	0.002	1
CHLOROFORM	ND	0.005	0.002	1
CHLOROMETHANE	ND	0.005	0.002	1
2-CHLOROTOLUENE	ND	0.005	0.002	1
4-CHLOROTOLUENE	ND	0.005	0.002	1
DIBROMOCHLOROMETHANE	ND	0.005	0.002	1
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.005	0.002	1
1,2-DIBROMOETHANE	ND	0.005	0.002	1
DIBROMOMETHANE	ND	0.005	0.002	1
1,2-DICHLOROBENZENE	ND	0.005	0.002	1
1,3-DICHLOROBENZENE	ND	0.005	0.002	1
1,4-DICHLOROBENZENE	ND	0.005	0.002	1
DICHLORODIFLUOROMETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHANE	ND	0.005	0.002	1
1,2-DICHLOROETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHENE	ND	0.005	0.002	1
CIS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
TRANS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
1,2-DICHLOROPROPANE	ND	0.005	0.002	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

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LABORATORY REPORT

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41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel (909) 484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL DATE RECEIVED: 01/15/18
SAMPLING DATE: 01/15/18 DATE ANALYZED: 01/17/18
REPORT TO: Mr. RICHARD ORR DATE REPORTED: 01/22/18

SAMPLE I.D.: S-5 LAB I.D.: 180115-67

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1,3-DICHLOROPROPANE	ND	0.005	0.002	1
2,2-DICHLOROPROPANE	ND	0.005	0.002	1
1,1-DICHLOROPROPENE	ND	0.005	0.002	1
CIS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
TRANS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
ETHYLBENZENE	ND	0.005	0.002	1
2-HEXANONE	ND	0.020	0.010	1
HEXACHLOROBUTADIENE	ND	0.005	0.002	1
ISOPROPYLBENZENE	ND	0.005	0.002	1
4-ISOPROPYLTOLUENE	ND	0.005	0.002	1
4-METHYL-2-PENTANONE (MIBK)	ND	0.020	0.010	1
METHYL tert-BUTYL ETHER (MTBE)	ND	0.005	0.002	1
METHYLENE CHLORIDE	ND	0.010	0.005	1
NAPHTHALENE	ND	0.005	0.002	1
N-PROPYLBENZENE	ND	0.005	0.002	1
STYRENE	ND	0.005	0.002	1
1,1,1,2-TETRACHLOROETHANE	ND	0.005	0.002	1
1,1,2,2-TETRACHLOROETHANE	ND	0.005	0.002	1
TETRACHLOROETHENE (PCE)	ND	0.005	0.002	1
TOLUENE	ND	0.005	0.002	1
1,2,3-TRICHLOROBENZENE	ND	0.005	0.002	1
1,2,4-TRICHLOROBENZENE	ND	0.005	0.002	1
1,1,1-TRICHLOROETHANE	ND	0.005	0.002	1
1,1,2-TRICHLOROETHANE	ND	0.005	0.002	1
TRICHLOROETHENE (TCE)	ND	0.005	0.002	1
TRICHLOROFLUOROMETHANE	ND	0.005	0.002	1
1,2,3-TRICHLOROPROPANE	ND	0.005	0.002	1
1,2,4-TRIMETHYLBENZENE	ND	0.005	0.002	1
1,3,5-TRIMETHYLBENZENE	ND	0.005	0.002	1
VINYL CHLORIDE	ND	0.005	0.002	1
M/P-XYLENE	ND	0.010	0.005	1
O-XYLENE	ND	0.005	0.002	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
ACTUAL DETECTION LIMIT = PQL X DF
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL and PQL
ND = BELOW THE ACTUAL DETECTION LIMIT OR NON-DETECTED
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

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LABORATORY REPORT

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-6
LAB I.D.: 180115-68

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
ACETONE	ND	0.020	0.010	1
BENZENE	ND	0.005	0.002	1
BROMOBENZENE	ND	0.005	0.002	1
BROMOCHLOROMETHANE	ND	0.005	0.002	1
BROMODICHLOROMETHANE	ND	0.005	0.002	1
BROMOFORM	ND	0.005	0.002	1
BROMOMETHANE	ND	0.005	0.002	1
2-BUTANONE (MEK)	ND	0.020	0.010	1
N-BUTYLBENZENE	ND	0.005	0.002	1
SEC-BUTYLBENZENE	ND	0.005	0.002	1
TERT-BUTYLBENZENE	ND	0.005	0.002	1
CARBON DISULFIDE	ND	0.010	0.005	1
CARBON TETRACHLORIDE	ND	0.005	0.002	1
CHLOROBENZENE	ND	0.005	0.002	1
CHLOROETHANE	ND	0.005	0.002	1
CHLOROFORM	ND	0.005	0.002	1
CHLOROMETHANE	ND	0.005	0.002	1
2-CHLOROTOLUENE	ND	0.005	0.002	1
4-CHLOROTOLUENE	ND	0.005	0.002	1
DIBROMOCHLOROMETHANE	ND	0.005	0.002	1
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.005	0.002	1
1,2-DIBROMOETHANE	ND	0.005	0.002	1
DIBROMOMETHANE	ND	0.005	0.002	1
1,2-DICHLOROBENZENE	ND	0.005	0.002	1
1,3-DICHLOROBENZENE	ND	0.005	0.002	1
1,4-DICHLOROBENZENE	ND	0.005	0.002	1
DICHLORODIFLUOROMETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHANE	ND	0.005	0.002	1
1,2-DICHLOROETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHENE	ND	0.005	0.002	1
CIS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
TRANS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
1,2-DICHLOROPROPANE	ND	0.005	0.002	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

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LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL DATE RECEIVED: 01/15/18
SAMPLING DATE: 01/15/18 DATE ANALYZED: 01/17/18
REPORT TO: Mr. RICHARD ORR DATE REPORTED: 01/22/18

SAMPLE I.D.: S-6 LAB I.D.: 180115-68

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1,3-DICHLOROPROPANE	ND	0.005	0.002	1
2,2-DICHLOROPROPANE	ND	0.005	0.002	1
1,1-DICHLOROPROPENE	ND	0.005	0.002	1
CIS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
TRANS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
ETHYLBENZENE	ND	0.005	0.002	1
2-HEXANONE	ND	0.020	0.010	1
HEXACHLOROBUTADIENE	ND	0.005	0.002	1
ISOPROPYLBENZENE	ND	0.005	0.002	1
4-ISOPROPYLTOLUENE	ND	0.005	0.002	1
4-METHYL-2-PENTANONE (MIBK)	ND	0.020	0.010	1
METHYL tert-BUTYL ETHER (MTBE)	ND	0.005	0.002	1
METHYLENE CHLORIDE	ND	0.010	0.005	1
NAPHTHALENE	ND	0.005	0.002	1
N-PROPYLBENZENE	ND	0.005	0.002	1
STYRENE	ND	0.005	0.002	1
1,1,1,2-TETRACHLOROETHANE	ND	0.005	0.002	1
1,1,2,2-TETRACHLOROETHANE	ND	0.005	0.002	1
TETRACHLOROETHENE (PCE)	ND	0.005	0.002	1
TOLUENE	ND	0.005	0.002	1
1,2,3-TRICHLOROBENZENE	ND	0.005	0.002	1
1,2,4-TRICHLOROBENZENE	ND	0.005	0.002	1
1,1,1-TRICHLOROETHANE	ND	0.005	0.002	1
1,1,2-TRICHLOROETHANE	ND	0.005	0.002	1
TRICHLOROETHENE (TCE)	ND	0.005	0.002	1
TRICHLOROFLUOROMETHANE	ND	0.005	0.002	1
1,2,3-TRICHLOROPROPANE	ND	0.005	0.002	1
1,2,4-TRIMETHYLBENZENE	ND	0.005	0.002	1
1,3,5-TRIMETHYLBENZENE	ND	0.005	0.002	1
VINYL CHLORIDE	ND	0.005	0.002	1
M/P-XYLENE	ND	0.010	0.005	1
O-XYLENE	ND	0.005	0.002	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
ACTUAL DETECTION LIMIT = PQL X DF
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL and PQL
ND = BELOW THE ACTUAL DETECTION LIMIT, OR NON-DETECTED
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-7
LAB I.D.: 180115-69

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
ACETONE	ND	0.020	0.010	1
BENZENE	ND	0.005	0.002	1
BROMOBENZENE	ND	0.005	0.002	1
BROMOCHLOROMETHANE	ND	0.005	0.002	1
BROMODICHLOROMETHANE	ND	0.005	0.002	1
BROMOFORM	ND	0.005	0.002	1
BROMOMETHANE	ND	0.005	0.002	1
2-BUTANONE (MEK)	ND	0.020	0.010	1
N-BUTYLBENZENE	ND	0.005	0.002	1
SEC-BUTYLBENZENE	ND	0.005	0.002	1
TERT-BUTYLBENZENE	ND	0.005	0.002	1
CARBON DISULFIDE	ND	0.010	0.005	1
CARBON TETRACHLORIDE	ND	0.005	0.002	1
CHLOROBENZENE	ND	0.005	0.002	1
CHLOROETHANE	ND	0.005	0.002	1
CHLOROFORM	ND	0.005	0.002	1
CHLOROMETHANE	ND	0.005	0.002	1
2-CHLOROTOLUENE	ND	0.005	0.002	1
4-CHLOROTOLUENE	ND	0.005	0.002	1
DIBROMOCHLOROMETHANE	ND	0.005	0.002	1
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.005	0.002	1
1,2-DIBROMOETHANE	ND	0.005	0.002	1
DIBROMOMETHANE	ND	0.005	0.002	1
1,2-DICHLOROBENZENE	ND	0.005	0.002	1
1,3-DICHLOROBENZENE	ND	0.005	0.002	1
1,4-DICHLOROBENZENE	ND	0.005	0.002	1
DICHLORODIFLUOROMETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHANE	ND	0.005	0.002	1
1,2-DICHLOROETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHENE	ND	0.005	0.002	1
CIS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
TRANS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
1,2-DICHLOROPROPANE	ND	0.005	0.002	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

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LABORATORY REPORT

CUSTOMER: Leighton Consulting
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Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE ANALYZED: 01/17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-7
LAB I.D.: 180115-69

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1,3-DICHLOROPROPANE	ND	0.005	0.002	1
2,2-DICHLOROPROPANE	ND	0.005	0.002	1
1,1-DICHLOROPROPENE	ND	0.005	0.002	1
CIS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
TRANS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
ETHYLBENZENE	ND	0.005	0.002	1
2-HEXANONE	ND	0.020	0.010	1
HEXACHLOROBUTADIENE	ND	0.005	0.002	1
ISOPROPYLBENZENE	ND	0.005	0.002	1
4-ISOPROPYLTOLUENE	ND	0.005	0.002	1
4-METHYL-2-PENTANONE (MIBK)	ND	0.020	0.010	1
METHYL tert-BUTYL ETHER (MTBE)	ND	0.005	0.002	1
METHYLENE CHLORIDE	ND	0.010	0.005	1
NAPHTHALENE	ND	0.005	0.002	1
N-PROPYLBENZENE	ND	0.005	0.002	1
STYRENE	ND	0.005	0.002	1
1,1,1,2-TETRACHLOROETHANE	ND	0.005	0.002	1
1,1,2,2-TETRACHLOROETHANE	ND	0.005	0.002	1
TETRACHLOROETHENE (PCE)	ND	0.005	0.002	1
TOLUENE	ND	0.005	0.002	1
1,2,3-TRICHLOROBENZENE	ND	0.005	0.002	1
1,2,4-TRICHLOROBENZENE	ND	0.005	0.002	1
1,1,1-TRICHLOROETHANE	ND	0.005	0.002	1
1,1,2-TRICHLOROETHANE	ND	0.005	0.002	1
TRICHLOROETHENE (TCE)	ND	0.005	0.002	1
TRICHLOROFLUOROMETHANE	ND	0.005	0.002	1
1,2,3-TRICHLOROPROPANE	ND	0.005	0.002	1
1,2,4-TRIMETHYLBENZENE	ND	0.005	0.002	1
1,3,5-TRIMETHYLBENZENE	ND	0.005	0.002	1
VINYL CHLORIDE	ND	0.005	0.002	1
M/P-XYLENE	ND	0.010	0.005	1
O-XYLENE	ND	0.005	0.002	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
ACTUAL DETECTION LIMIT = PQL X DF
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL and PQL
ND = BELOW THE ACTUAL DETECTION LIMIT OR NON-DETECTED
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

METHOD BLANK REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL — DATE RECEIVED: 01/15/18
SAMPLING DATE: 01/15/18 — DATE ANALYZED: 01/17/18
REPORT TO: Mr. RICHARD ORR — DATE REPORTED: 01/22/18

METHOD BLANK FOR LAB I.D.: 180115-63 THROUGH -69

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
ACETONE	ND	0.020	0.010	1
BENZENE	ND	0.005	0.002	1
BROMOBENZENE	ND	0.005	0.002	1
BROMOCHLOROMETHANE	ND	0.005	0.002	1
BROMODICHLOROMETHANE	ND	0.005	0.002	1
BROMOFORM	ND	0.005	0.002	1
BROMOMETHANE	ND	0.005	0.002	1
2-BUTANONE (MEK)	ND	0.020	0.010	1
N-BUTYLBENZENE	ND	0.005	0.002	1
SEC-BUTYLBENZENE	ND	0.005	0.002	1
TERT-BUTYLBENZENE	ND	0.005	0.002	1
CARBON DISULFIDE	ND	0.010	0.005	1
CARBON TETRACHLORIDE	ND	0.005	0.002	1
CHLOROBENZENE	ND	0.005	0.002	1
CHLOROETHANE	ND	0.005	0.002	1
CHLOROFORM	ND	0.005	0.002	1
CHLOROMETHANE	ND	0.005	0.002	1
2-CHLOROTOLUENE	ND	0.005	0.002	1
4-CHLOROTOLUENE	ND	0.005	0.002	1
DIBROMOCHLOROMETHANE	ND	0.005	0.002	1
1,2-DIBROMO-3-CHLOROPROPANE	ND	0.005	0.002	1
1,2-DIBROMOETHANE	ND	0.005	0.002	1
DIBROMOMETHANE	ND	0.005	0.002	1
1,2-DICHLOROBENZENE	ND	0.005	0.002	1
1,3-DICHLOROBENZENE	ND	0.005	0.002	1
1,4-DICHLOROBENZENE	ND	0.005	0.002	1
DICHLORODIFLUOROMETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHANE	ND	0.005	0.002	1
1,2-DICHLOROETHANE	ND	0.005	0.002	1
1,1-DICHLOROETHENE	ND	0.005	0.002	1
CIS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
TRANS-1,2-DICHLOROETHENE	ND	0.005	0.002	1
1,2-DICHLOROPROPANE	ND	0.005	0.002	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

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METHOD BLANK REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL — DATE RECEIVED: 01/15/18
SAMPLING DATE: 01/15/18 — DATE ANALYZED: 01/17/18
REPORT TO: Mr. RICHARD ORR — DATE REPORTED: 01/22/18

METHOD BLANK FOR LAB I.D.: 180115-63 THROUGH -69

ANALYSIS: VOLATILE ORGANICS, EPA METHOD 5035/8260B, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1,3-DICHLOROPROPANE	ND	0.005	0.002	1
2,2-DICHLOROPROPANE	ND	0.005	0.002	1
1,1-DICHLOROPROPENE	ND	0.005	0.002	1
CIS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
TRANS-1,3-DICHLOROPROPENE	ND	0.005	0.002	1
ETHYLBENZENE	ND	0.005	0.002	1
2-HEXANONE	ND	0.020	0.010	1
HEXACHLOROBUTADIENE	ND	0.005	0.002	1
ISOPROPYLBENZENE	ND	0.005	0.002	1
4-ISOPROPYLTOLUENE	ND	0.005	0.002	1
4-METHYL-2-PENTANONE (MIBK)	ND	0.020	0.010	1
METHYL tert-BUTYL ETHER (MTBE)	ND	0.005	0.002	1
METHYLENE CHLORIDE	ND	0.010	0.005	1
NAPHTHALENE	ND	0.005	0.002	1
N-PROPYLBENZENE	ND	0.005	0.002	1
STYRENE	ND	0.005	0.002	1
1,1,1,2-TETRACHLOROETHANE	ND	0.005	0.002	1
1,1,2,2-TETRACHLOROETHANE	ND	0.005	0.002	1
TETRACHLOROETHENE (PCE)	ND	0.005	0.002	1
TOLUENE	ND	0.005	0.002	1
1,2,3-TRICHLOROBENZENE	ND	0.005	0.002	1
1,2,4-TRICHLOROBENZENE	ND	0.005	0.002	1
1,1,1-TRICHLOROETHANE	ND	0.005	0.002	1
1,1,2-TRICHLOROETHANE	ND	0.005	0.002	1
TRICHLOROETHENE (TCE)	ND	0.005	0.002	1
TRICHLOROFLUOROMETHANE	ND	0.005	0.002	1
1,2,3-TRICHLOROPROPANE	ND	0.005	0.002	1
1,2,4-TRIMETHYLBENZENE	ND	0.005	0.002	1
1,3,5-TRIMETHYLBENZENE	ND	0.005	0.002	1
VINYL CHLORIDE	ND	0.005	0.002	1
M/P-XYLENE	ND	0.010	0.005	1
O-XYLENE	ND	0.005	0.002	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT
ACTUAL DETECTION LIMIT = PQL X DF
PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL and PQL
ND = BELOW THE ACTUAL DETECTION LIMIT OR NON-DETECTED
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

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8260B QA/QC Report

Date Analyzed: 1/17/2018
Machine: C

Matrix: Solid/Soil/Liquid
Unit: mg/Kg (PPM)

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)
Spiked Sample Lab I.D.: 180117-10 MS/MSD

Analyte	S.R.	spk conc	MS	%RC	MSD	%RC	%RPD	ACP %RC	ACP RPD
Benzene	0	0.050	0.059	118%	0.058	116%	2%	75-125	0-20
Chlorobenzene	0	0.050	0.058	116%	0.058	116%	0%	75-125	0-20
1,1-Dichloroethene	0	0.050	0.048	96%	0.044	88%	8%	75-125	0-20
Toluene	0	0.050	0.056	112%	0.057	114%	2%	75-125	0-20
Trichloroethene (TCE)	0	0.050	0.055	110%	0.058	116%	6%	75-125	0-20

Lab Control Spike (LCS):

Analyte	spk conc	LCS	%RC	ACP %RC
Benzene	0.050	0.058	116%	75-125
Chlorobenzene	0.050	0.054	108%	75-125
Chloroform	0.050	0.057	114%	75-125
1,1-Dichlorothene	0.050	0.045	90%	75-125
Ethylbenzene	0.050	0.059	118%	75-125
o-Xylene	0.050	0.057	114%	75-125
m,p-Xylene	0.100	0.115	115%	75-125
Toluene	0.050	0.057	114%	75-125
1,1,1-Trichloroethane	0.050	0.057	114%	75-125
Trichloroethene (TCE)	0.050	0.059	118%	75-125

Surrogate Recovery	spk conc	ACP %RC	MB %RC	%RC	%RC	%RC	%RC	%RC	%RC
Sample I.D.			M-BLK	180117-8	180117-10	180115-17	180115-19	180115-20	180115-21
Dibromofluoromethane	50.0	70-130	94%	109%	108%	89%	85%	94%	91%
Toluene-d8	50.0	70-130	91%	95%	78%	97%	95%	95%	89%
4-Bromofluorobenzene	50.0	70-130	93%	88%	72%	89%	84%	87%	91%

Surrogate Recovery	spk conc	ACP %RC	%RC	%RC	%RC	%RC	%RC	%RC	%RC
Sample I.D.			180115-22	180115-23	180115-24	180115-25	180115-63	180115-64	180115-65
Dibromofluoromethane	50.0	70-130	92%	85%	101%	117%	124%	106%	111%
Toluene-d8	50.0	70-130	92%	89%	100%	99%	88%	94%	89%
4-Bromofluorobenzene	50.0	70-130	94%	91%	93%	102%	105%	167*%	84%

Surrogate Recovery	spk conc	ACP %RC	%RC	%RC	%RC	%RC	%RC	%RC	%RC
Sample I.D.			180115-66	180115-67	180115-68	180115-69			
Dibromofluoromethane	50.0	70-130	88%	126%	125%	121%			
Toluene-d8	50.0	70-130	99%	85%	92%	103%			
4-Bromofluorobenzene	50.0	70-130	104%	84%	90%	159*%			

** = Surrogate fail due to matrix interference; LCS, MS, MSD are in control therefore the analysis is in control.*
S.R. = Sample Results
spk conc = Spike Concentration
MS = Matrix Spike
%RC = Percent Recovery
ACP %RC = Accepted Percent Recovery
MSD = Matrix Spike Duplicate

Analyzed/Reviewed By: _____

Final Reviewer: _____

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LABORATORY REPORT

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR

DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/16/18
DATE ANALYZED: 01/16&17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-1
LAB I.D.: 180115-63

Organochlorine Pesticides & PCBs Analysis
Method: EPA 8081A/8082
Unit: mg/Kg = Milligram per Kilogram = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Aldrin	ND	0.001	0.0001	1
alpha-BHC	ND	0.001	0.0002	1
beta-BHC	ND	0.001	0.0001	1
gamma-BHC (Lindane)	ND	0.001	0.0001	1
delta-BHC	ND	0.001	0.0002	1
alpha-Chlordane	ND	0.001	0.0002	1
gamma-Chlordane	ND	0.001	0.0001	1
Technical Chlordane	ND	0.005	0.0005	1
4,4'-DDD	ND	0.001	0.0003	1
4,4'-DDE	0.001	0.001	0.0003	1
4,4'-DDT	ND	0.001	0.0001	1
Dieldrin	ND	0.001	0.0003	1
Endosulfan I	ND	0.001	0.0002	1
Endosulfan II	ND	0.001	0.0001	1
Endosulfan Sulfate	ND	0.001	0.0001	1
Endrin	ND	0.001	0.0004	1
Endrin Aldehyde	ND	0.001	0.0001	1
Endrin Ketone	ND	0.001	0.0001	1
Heptachlor Epoxide	ND	0.001	0.0003	1
Heptachlor	ND	0.001	0.0001	1
Methoxyclor	ND	0.001	0.0001	1
Toxaphene	ND	0.020	0.0100	1
PCB-1016	ND	0.010	0.0050	1
PCB-1221	ND	0.010	0.0050	1
PCB-1232	ND	0.010	0.0050	1
PCB-1242	ND	0.010	0.0050	1
PCB-1248	ND	0.010	0.0050	1
PCB-1254	ND	0.010	0.0050	1
PCB-1260	ND	0.010	0.0050	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

Data Reviewed and Approved by:
CAL-DHS CERTIFICATE # 1555

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LABORATORY REPORT

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/16/18
DATE ANALYZED: 01/16&17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-2
LAB I.D.: 180115-64

Organochlorine Pesticides & PCBs Analysis
Method: EPA 8081A/8082
Unit: mg/Kg = Milligram per Kilogram = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Aldrin	ND	0.001	0.0001	5
alpha-BHC	ND	0.001	0.0002	5
beta-BHC	ND	0.001	0.0001	5
gamma-BHC (Lindane)	ND	0.001	0.0001	5
delta-BHC	ND	0.001	0.0002	5
alpha-Chlordane	ND	0.001	0.0002	5
gamma-Chlordane	ND	0.001	0.0001	5
Technical Chlordane	ND	0.005	0.0005	5
4,4'-DDD	ND	0.001	0.0003	5
4,4'-DDE	0.008	0.001	0.0003	5
4,4'-DDT	ND	0.001	0.0001	5
Dieldrin	ND	0.001	0.0003	5
Endosulfan I	ND	0.001	0.0002	5
Endosulfan II	ND	0.001	0.0001	5
Endosulfan Sulfate	ND	0.001	0.0001	5
Endrin	ND	0.001	0.0004	5
Endrin Aldehyde	ND	0.001	0.0001	5
Endrin Ketone	ND	0.001	0.0001	5
Heptachlor Epoxide	ND	0.001	0.0003	5
Heptachlor	ND	0.001	0.0001	5
Methoxyclor	ND	0.001	0.0001	5
Toxaphene	ND	0.020	0.0100	5
PCB-1016	ND	0.010	0.0050	1
PCB-1221	ND	0.010	0.0050	1
PCB-1232	ND	0.010	0.0050	1
PCB-1242	ND	0.010	0.0050	1
PCB-1248	ND	0.010	0.0050	1
PCB-1254	ND	0.010	0.0050	1
PCB-1260	ND	0.010	0.0050	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

Data Reviewed and Approved by:
CAL-DHS CERTIFICATE # 1555

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LABORATORY REPORT

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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/16/18
DATE ANALYZED: 01/16/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-3
LAB I.D.: 180115-65

Organochlorine Pesticides & PCBs Analysis
Method: EPA 8081A/8082
Unit: mg/Kg = Milligram per Kilogram = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Aldrin	ND	0.001	0.0001	10
alpha-BHC	ND	0.001	0.0002	10
beta-BHC	ND	0.001	0.0001	10
gamma-BHC (Lindane)	ND	0.001	0.0001	10
delta-BHC	ND	0.001	0.0002	10
alpha-Chlordane	ND	0.001	0.0002	10
gamma-Chlordane	ND	0.001	0.0001	10
Technical Chlordane	ND	0.005	0.0005	10
4,4'-DDD	ND	0.001	0.0003	10
4,4'-DDE	0.025	0.001	0.0003	10
4,4'-DDT	ND	0.001	0.0001	10
Dieldrin	ND	0.001	0.0003	10
Endosulfan I	ND	0.001	0.0002	10
Endosulfan II	ND	0.001	0.0001	10
Endosulfan Sulfate	ND	0.001	0.0001	10
Endrin	ND	0.001	0.0004	10
Endrin Aldehyde	ND	0.001	0.0001	10
Endrin Ketone	ND	0.001	0.0001	10
Heptachlor Epoxide	ND	0.001	0.0003	10
Heptachlor	ND	0.001	0.0001	10
Methoxyclor	ND	0.001	0.0001	10
Toxaphene	ND	0.020	0.0100	10
PCB-1016	ND	0.010	0.0050	1
PCB-1221	ND	0.010	0.0050	1
PCB-1232	ND	0.010	0.0050	1
PCB-1242	ND	0.010	0.0050	1
PCB-1248	ND	0.010	0.0050	1
PCB-1254	ND	0.010	0.0050	1
PCB-1260	ND	0.010	0.0050	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

Data Reviewed and Approved by:
CAL-DHS CERTIFICATE # 1555

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LABORATORY REPORT

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Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR

DATE RECEIVED: 01/15/18
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DATE REPORTED: 01/22/18

SAMPLE I.D.: S-4
LAB I.D.: 180115-66

Organochlorine Pesticides & PCBs Analysis
Method: EPA 8081A/8082
Unit: mg/Kg = Milligram per Kilogram = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Aldrin	ND	0.001	0.0001	1
alpha-BHC	ND	0.001	0.0002	1
beta-BHC	ND	0.001	0.0001	1
gamma-BHC (Lindane)	ND	0.001	0.0001	1
delta-BHC	ND	0.001	0.0002	1
alpha-Chlordane	ND	0.001	0.0002	1
gamma-Chlordane	ND	0.001	0.0001	1
Technical Chlordane	ND	0.005	0.0005	1
4,4'-DDD	ND	0.001	0.0003	1
4,4'-DDE	0.002	0.001	0.0003	1
4,4'-DDT	ND	0.001	0.0001	1
Dieldrin	ND	0.001	0.0003	1
Endosulfan I	ND	0.001	0.0002	1
Endosulfan II	ND	0.001	0.0001	1
Endosulfan Sulfate	ND	0.001	0.0001	1
Endrin	ND	0.001	0.0004	1
Endrin Aldehyde	ND	0.001	0.0001	1
Endrin Ketone	ND	0.001	0.0001	1
Heptachlor Epoxide	ND	0.001	0.0003	1
Heptachlor	ND	0.001	0.0001	1
Methoxyclor	ND	0.001	0.0001	1
Toxaphene	ND	0.020	0.0100	1
PCB-1016	ND	0.010	0.0050	1
PCB-1221	ND	0.010	0.0050	1
PCB-1232	ND	0.010	0.0050	1
PCB-1242	ND	0.010	0.0050	1
PCB-1248	ND	0.010	0.0050	1
PCB-1254	ND	0.010	0.0050	1
PCB-1260	ND	0.010	0.0050	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

Data Reviewed and Approved by:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/16/18
DATE ANALYZED: 01/16&17/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-5 LAB I.D.: 180115-67

Organochlorine Pesticides & PCBs Analysis
Method: EPA 8081A/8082
Unit: mg/Kg = Milligram per Kilogram = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Aldrin	ND	0.001	0.0001	1
alpha-BHC	ND	0.001	0.0002	1
beta-BHC	ND	0.001	0.0001	1
gamma-BHC (Lindane)	ND	0.001	0.0001	1
delta-BHC	ND	0.001	0.0002	1
alpha-Chlordane	ND	0.001	0.0002	1
gamma-Chlordane	ND	0.001	0.0001	1
Technical Chlordane	ND	0.005	0.0005	1
4,4'-DDD	ND	0.001	0.0003	1
4,4'-DDE	ND	0.001	0.0003	1
4,4'-DDT	ND	0.001	0.0001	1
Dieldrin	ND	0.001	0.0003	1
Endosulfan I	ND	0.001	0.0002	1
Endosulfan II	ND	0.001	0.0001	1
Endosulfan Sulfate	ND	0.001	0.0001	1
Endrin	ND	0.001	0.0004	1
Endrin Aldehyde	ND	0.001	0.0001	1
Endrin Ketone	ND	0.001	0.0001	1
Heptachlor Epoxide	ND	0.001	0.0003	1
Heptachlor	ND	0.001	0.0001	1
Methoxyclor	ND	0.001	0.0001	1
Toxaphene	ND	0.020	0.0100	1
PCB-1016	ND	0.010	0.0050	1
PCB-1221	ND	0.010	0.0050	1
PCB-1232	ND	0.010	0.0050	1
PCB-1242	ND	0.010	0.0050	1
PCB-1248	ND	0.010	0.0050	1
PCB-1254	ND	0.010	0.0050	1
PCB-1260	ND	0.010	0.0050	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

Data Reviewed and Approved by:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
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LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/16/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/16&17/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-6 LAB I.D.: 180115-68

Organochlorine Pesticides & PCBs Analysis
Method: EPA 8081A/8082
Unit: mg/Kg = Milligram per Kilogram = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Aldrin	ND	0.001	0.0001	1
alpha-BHC	ND	0.001	0.0002	1
beta-BHC	ND	0.001	0.0001	1
gamma-BHC (Lindane)	ND	0.001	0.0001	1
delta-BHC	ND	0.001	0.0002	1
alpha-Chlordane	ND	0.001	0.0002	1
gamma-Chlordane	ND	0.001	0.0001	1
Technical Chlordane	ND	0.005	0.0005	1
4,4'-DDD	ND	0.001	0.0003	1
4,4'-DDE	ND	0.001	0.0003	1
4,4'-DDT	ND	0.001	0.0001	1
Dieldrin	ND	0.001	0.0003	1
Endosulfan I	ND	0.001	0.0002	1
Endosulfan II	ND	0.001	0.0001	1
Endosulfan Sulfate	ND	0.001	0.0001	1
Endrin	ND	0.001	0.0004	1
Endrin Aldehyde	ND	0.001	0.0001	1
Endrin Ketone	ND	0.001	0.0001	1
Heptachlor Epoxide	ND	0.001	0.0003	1
Heptachlor	ND	0.001	0.0001	1
Methoxyclor	ND	0.001	0.0001	1
Toxaphene	ND	0.020	0.0100	1
PCB-1016	ND	0.010	0.0050	1
PCB-1221	ND	0.010	0.0050	1
PCB-1232	ND	0.010	0.0050	1
PCB-1242	ND	0.010	0.0050	1
PCB-1248	ND	0.010	0.0050	1
PCB-1254	ND	0.010	0.0050	1
PCB-1260	ND	0.010	0.0050	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

Data Reviewed and Approved by:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
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LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/16/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/17/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-7 LAB I.D.: 180115-69

Organochlorine Pesticides & PCBs Analysis
Method: EPA 8081A/8082
Unit: mg/Kg = Milligram per Kilogram = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Aldrin	ND	0.001	0.0001	1
alpha-BHC	ND	0.001	0.0002	1
beta-BHC	ND	0.001	0.0001	1
gamma-BHC (Lindane)	ND	0.001	0.0001	1
delta-BHC	ND	0.001	0.0002	1
alpha-Chlordane	ND	0.001	0.0002	1
gamma-Chlordane	ND	0.001	0.0001	1
Technical Chlordane	ND	0.005	0.0005	1
4,4'-DDD	ND	0.001	0.0003	1
4,4'-DDE	ND	0.001	0.0003	1
4,4'-DDT	ND	0.001	0.0001	1
Dieldrin	ND	0.001	0.0003	1
Endosulfan I	ND	0.001	0.0002	1
Endosulfan II	ND	0.001	0.0001	1
Endosulfan Sulfate	ND	0.001	0.0001	1
Endrin	ND	0.001	0.0004	1
Endrin Aldehyde	ND	0.001	0.0001	1
Endrin Ketone	ND	0.001	0.0001	1
Heptachlor Epoxide	ND	0.001	0.0003	1
Heptachlor	ND	0.001	0.0001	1
Methoxyclor	ND	0.001	0.0001	1
Toxaphene	ND	0.020	0.0100	1
PCB-1016	ND	0.010	0.0050	1
PCB-1221	ND	0.010	0.0050	1
PCB-1232	ND	0.010	0.0050	1
PCB-1242	ND	0.010	0.0050	1
PCB-1248	ND	0.010	0.0050	1
PCB-1254	ND	0.010	0.0050	1
PCB-1260	ND	0.010	0.0050	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

Data Reviewed and Approved by:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
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METHOD BLANK REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR

DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/16/18
DATE ANALYZED: 01/16/18
DATE REPORTED: 01/22/18

METHOD BLANK FOR LAB I.D.: 180115-63 THROUGH -69

Organochlorine Pesticides & PCBs Analysis
Method: EPA 8081A/8082
Unit: mg/Kg = Milligram per Kilogram = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Aldrin	ND	0.001	0.0001	1
alpha-BHC	ND	0.001	0.0002	1
beta-BHC	ND	0.001	0.0001	1
gamma-BHC (Lindane)	ND	0.001	0.0001	1
delta-BHC	ND	0.001	0.0002	1
alpha-Chlordane	ND	0.001	0.0002	1
gamma-Chlordane	ND	0.001	0.0001	1
Technical Chlordane	ND	0.005	0.0005	1
4,4'-DDD	ND	0.001	0.0003	1
4,4'-DDE	ND	0.001	0.0003	1
4,4'-DDT	ND	0.001	0.0001	1
Dieldrin	ND	0.001	0.0003	1
Endosulfan I	ND	0.001	0.0002	1
Endosulfan II	ND	0.001	0.0001	1
Endosulfan Sulfate	ND	0.001	0.0001	1
Endrin	ND	0.001	0.0004	1
Endrin Aldehyde	ND	0.001	0.0001	1
Endrin Ketone	ND	0.001	0.0001	1
Heptachlor Epoxide	ND	0.001	0.0003	1
Heptachlor	ND	0.001	0.0001	1
Methoxyclor	ND	0.001	0.0001	1
Toxaphene	ND	0.020	0.0100	1
PCB-1016	ND	0.010	0.0050	1
PCB-1221	ND	0.010	0.0050	1
PCB-1232	ND	0.010	0.0050	1
PCB-1242	ND	0.010	0.0050	1
PCB-1248	ND	0.010	0.0050	1
PCB-1254	ND	0.010	0.0050	1
PCB-1260	ND	0.010	0.0050	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

Data Reviewed and Approved by:
CAL-DHS CERTIFICATE # 1555

Enviro-Chem, Inc.

1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909)590-5905 Fax (909)590-5907

EPA 8081 QA/QC Report

Matrix: **Soil/Solid/Liquid(Oil)** Date Analyzed: **1/16-17/2018**

Unit: **mg/Kg (ppm)**

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Spiked Sample Lab I.D.: **180116-LCS1/2**

Analyte	S.R.	spk conc	MS	%REC	MSD	%REC	%RPD	ACP %RPD	ACP %RE
Gamma-BHC	0.000	0.00500	0.00495	**99%**	0.00434	**87%**	**13%**	**0-20%**	**70-130**
Aldrin	0.000	0.00500	0.00570	**114%**	0.00504	**101%**	**12%**	**0-20%**	**70-130**
4,4-DDE	0.000	0.00500	0.00519	**104%**	0.00446	**89%**	**15%**	**0-20%**	**70-130**

Lab Control Spike (LCS) Recovery:

Analyte	spk conc	LCS	% REC	ACP %REC
Gamma-BHC	0.00500	0.00491	**98%**	**75-125**
Aldrin	0.00500	0.00560	**112%**	**75-125**
4,4-DDE	0.00500	0.00506	**101%**	**75-125**
Dieldrin	0.00500	0.00508	**102%**	**75-125**

Surrogate Recovery	ACP%	%REC	%REC	%REC	%REC	%REC	%REC	%REC
Sample I.D.		MB	180115-63	180115-64	180115-65	180115-66	180115-67	180115-6
Tetra-chloro-meta-xylene	50-150	125%	76%	107%	126%	74%	115%	108%
Decachlorobiphenyl	50-150	62%	61%	51%	92%	63%	90%	61%

Surrogate Recovery	ACP%	%REC	%REC	%REC	%REC	%REC	%REC	%REC
Sample I.D.		180115-69						
Tetra-chloro-meta-xylene	50-150	113%						
Decachlorobiphenyl	50-150	55%						

Surrogate Recovery	ACP%	%REC	%REC	%REC	%REC	%REC	%REC	%REC
Sample I.D.								
Tetra-chloro-meta-xylene	50-150							
Decachlorobiphenyl	50-150							

S.R. = Sample Result

spk conc = Spike Concentration

%REC = Percent Recovery

ACP %RPD = Acceptable Percent RPD Range

ACP %REC = Acceptable Percent Recovery Range

** = Surrogate fail due to matrix interference (If Marked)*

Note: *LCS, MS, MSD are in control therefore results are in control.*

Analyzed and Reviewed By: _____

Final Reviewer: _____

Enviro-Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909)590-5905 Fax (909)590-5907

QA/QC Report

Analysis: EPA 8082 (PCB)

Matrix: **Soil/Solid/Liquid/Sludge** Date Analyzed: 1/16-17/2018

Unit: mg/Kg (PPM)

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Spiked Sample Lab I.D.: 180116-LCS1/2

Analyte	S.R.	spk conc	MS	%REC	MSD	%REC	%RPD	ACP % RPD	ACP %REC
PCB (1016+1260)	0.00	0.100	0.094	**94%**	0.097	**97%**	**3%**	**0-20%**	**70-130**

LCS STD RECOVERY:

Analyte	spk conc	LCS	% REC	ACP %REC
PCB (1016+1260)	0.100	0.103	**103%**	**75-125**

S.R. = Sample Result
spk conc = Spike Concentration
%REC = Percent Recovery
ACP %RPD = Acceptable Percent RPD Range
ACP %REC = Acceptable Percent Recovery Range

Analyzed and Reviewed By: AV

Final Reviewer: E

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR

DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/18/18
DATE ANALYZED: 01/19/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-1
LAB I.D.: 180115-63

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 1 OF 2

UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Acenaphthene	ND	0.50	0.017	1
Acenaphthylene	ND	0.50	0.028	1
Anthracene	ND	0.50	0.028	1
Benzo(a)anthracene	ND	0.50	0.080	1
Benzo(b)fluoranthene	ND	0.50	0.104	1
Benzo(a)pyrene	ND	0.50	0.049	1
Benzo(g,h,i)perylene	ND	0.50	0.044	1
Benzo(k)fluoranthene	ND	0.50	0.150	1
Benzoic Acid	ND	0.50	0.387	1
Benzyl Alcohol	ND	0.50	0.021	1
Bis(2-Chloroethoxy)methane	ND	0.50	0.026	1
Bis(2-Chloroethyl)ether	ND	0.50	0.015	1
Bis(2-Chloroisopropyl)ether	ND	0.50	0.044	1
Bis(2-Ethylhexyl)Phthalate	ND	0.50	0.037	1
4-Bromophenyl Phenyl Ether	ND	0.50	0.061	1
Butylbenzylphthalate	ND	0.50	0.031	1
4-Chloro-3-Methylphenol	ND	0.50	0.035	1
4-Chloroaniline	ND	0.50	0.043	1
2-Chloronaphthalene	ND	0.50	0.038	1
2-Chlorophenol	ND	0.50	0.024	1
4-Chlorophenyl Phenyl Ether	ND	0.50	0.027	1
Chrysene	ND	0.50	0.036	1
Di-n-butylphthalate	ND	0.50	0.028	1
Di-n-octylphthalate	ND	0.50	0.037	1
Dibenzo(a,h)anthracene	ND	0.50	0.047	1
Dibenzofuran	ND	0.50	0.041	1
1,2-Dichlorobenzene	ND	0.50	0.039	1
1,3-Dichlorobenzene	ND	0.50	0.039	1
1,4-Dichlorobenzene	ND	0.50	0.029	1
3,3-Dichlorobenzidine	ND	0.50	0.075	1
2,4-Dichlorophenol	ND	0.50	0.028	1
Diethyl Phthalate	ND	0.50	0.029	1
2,4-Dimethylphenol	ND	0.50	0.023	1
Dimethyl Phthalate	ND	0.50	0.018	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

Enviro – Chem, Inc.
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LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/19/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-1 LAB I.D.: 180115-63

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
4,6-Dinitro-2-methylphenol	ND	0.50	0.045	1
2,4-Dinitrophenol	ND	0.50	0.047	1
2,4-Dinitrotoluene	ND	0.50	0.024	1
2,6-Dinitrotoluene	ND	0.50	0.050	1
Fluoranthene	ND	0.50	0.022	1
Fluorene	ND	0.50	0.026	1
Hexachlorobenzene	ND	0.50	0.031	1
Hexachlorobutadiene	ND	0.50	0.022	1
Hexachlorocyclopentadiene	ND	0.50	0.041	1
Hexachloroethane	ND	0.50	0.030	1
Indeno(1,2,3-cd)pyrene	ND	0.50	0.046	1
Isophorone	ND	0.50	0.026	1
2-Methyl Phenol	ND	0.50	0.042	1
3/4-Methyl Phenol	ND	0.50	0.037	1
2-Methylnaphthalene	ND	0.50	0.036	1
N-Nitroso-di-n-dipropylamine	ND	0.50	0.024	1
N-Nitrosodimethylamine	ND	0.50	0.015	1
N-Nitrosodiphenylamine	ND	0.50	0.042	1
Naphthalene	ND	0.50	0.014	1
2-Nitroaniline	ND	0.50	0.026	1
3-Nitroaniline	ND	0.50	0.043	1
4-Nitroaniline	ND	0.50	0.052	1
Nitrobenzene	ND	0.50	0.157	1
2-Nitrophenol	ND	0.50	0.031	1
4-Nitrophenol	ND	0.50	0.040	1
Pentachlorophenol	ND	0.50	0.048	1
Phenanthrene	ND	0.50	0.036	1
Phenol	ND	0.50	0.031	1
Pyrene	ND	0.50	0.043	1
1,2,4-Trichlorobenzene	ND	0.50	0.030	1
2,4,5-Trichlorophenol	ND	0.50	0.054	1
2,4,6-Trichlorophenol	ND	0.50	0.041	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT / PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = PQL X DF
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel (909) 484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR

DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/18/18
DATE ANALYZED: 01/19/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-2
LAB I.D.: 180115-64

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 1 OF 2

UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Acenaphthene	ND	0.50	0.017	1
Acenaphthylene	ND	0.50	0.028	1
Anthracene	ND	0.50	0.028	1
Benzo(a)anthracene	ND	0.50	0.080	1
Benzo(b)fluoranthene	ND	0.50	0.104	1
Benzo(a)pyrene	ND	0.50	0.049	1
Benzo(g,h,i)perylene	ND	0.50	0.044	1
Benzo(k)fluoranthene	ND	0.50	0.150	1
Benzoic Acid	ND	0.50	0.387	1
Benzyl Alcohol	ND	0.50	0.021	1
Bis(2-Chloroethoxy)methane	ND	0.50	0.026	1
Bis(2-Chloroethyl)ether	ND	0.50	0.015	1
Bis(2-Chloroisopropyl)ether	ND	0.50	0.044	1
Bis(2-Ethylhexyl)Phthalate	ND	0.50	0.037	1
4-Bromophenyl Phenyl Ether	ND	0.50	0.061	1
Butylbenzylphthalate	ND	0.50	0.031	1
4-Chloro-3-Methylphenol	ND	0.50	0.035	1
4-Chloroaniline	ND	0.50	0.043	1
2-Chloronaphthalene	ND	0.50	0.038	1
2-Chlorophenol	ND	0.50	0.024	1
4-Chlorophenyl Phenyl Ether	ND	0.50	0.027	1
Chrysene	ND	0.50	0.036	1
Di-n-butylphthalate	ND	0.50	0.028	1
Di-n-octylphthalate	ND	0.50	0.037	1
Dibenzo(a,h)anthracene	ND	0.50	0.047	1
Dibenzofuran	ND	0.50	0.041	1
1,2-Dichlorobenzene	ND	0.50	0.039	1
1,3-Dichlorobenzene	ND	0.50	0.039	1
1,4-Dichlorobenzene	ND	0.50	0.029	1
3,3-Dichlorobenzidine	ND	0.50	0.075	1
2,4-Dichlorophenol	ND	0.50	0.028	1
Diethyl Phthalate	ND	0.50	0.029	1
2,4-Dimethylphenol	ND	0.50	0.023	1
Dimethyl Phthalate	ND	0.50	0.018	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/19/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-2 LAB I.D.: 180115-64

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
4,6-Dinitro-2-methylphenol	ND	0.50	0.045	1
2,4-Dinitrophenol	ND	0.50	0.047	1
2,4-Dinitrotoluene	ND	0.50	0.024	1
2,6-Dinitrotoluene	ND	0.50	0.050	1
Fluoranthene	ND	0.50	0.022	1
Fluorene	ND	0.50	0.026	1
Hexachlorobenzene	ND	0.50	0.031	1
Hexachlorobutadiene	ND	0.50	0.022	1
Hexachlorocyclopentadiene	ND	0.50	0.041	1
Hexachloroethane	ND	0.50	0.030	1
Indeno(1,2,3-cd)pyrene	ND	0.50	0.046	1
Isophorone	ND	0.50	0.026	1
2-Methyl Phenol	ND	0.50	0.042	1
3/4-Methyl Phenol	ND	0.50	0.037	1
2-Methylnaphthalene	ND	0.50	0.036	1
N-Nitroso-di-n-dipropylamine	ND	0.50	0.024	1
N-Nitrosodimethylamine	ND	0.50	0.015	1
N-Nitrosodiphenylamine	ND	0.50	0.042	1
Naphthalene	ND	0.50	0.014	1
2-Nitroaniline	ND	0.50	0.026	1
3-Nitroaniline	ND	0.50	0.043	1
4-Nitroaniline	ND	0.50	0.052	1
Nitrobenzene	ND	0.50	0.157	1
2-Nitrophenol	ND	0.50	0.031	1
4-Nitrophenol	ND	0.50	0.040	1
Pentachlorophenol	ND	0.50	0.048	1
Phenanthrene	ND	0.50	0.036	1
Phenol	ND	0.50	0.031	1
Pyrene	ND	0.50	0.043	1
1,2,4-Trichlorobenzene	ND	0.50	0.030	1
2,4,5-Trichlorophenol	ND	0.50	0.054	1
2,4,6-Trichlorophenol	ND	0.50	0.041	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT / PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = PQL X DF
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/19/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-3 LAB I.D.: 180115-65

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Acenaphthene	ND	0.50	0.017	1
Acenaphthylene	ND	0.50	0.028	1
Anthracene	ND	0.50	0.028	1
Benzo(a)anthracene	ND	0.50	0.080	1
Benzo(b)fluoranthene	ND	0.50	0.104	1
Benzo(a)pyrene	ND	0.50	0.049	1
Benzo(g,h,i)perylene	ND	0.50	0.044	1
Benzo(k)fluoranthene	ND	0.50	0.150	1
Benzoic Acid	ND	0.50	0.387	1
Benzyl Alcohol	ND	0.50	0.021	1
Bis(2-Chloroethoxy)methane	ND	0.50	0.026	1
Bis(2-Chloroethyl)ether	ND	0.50	0.015	1
Bis(2-Chloroisopropyl)ether	ND	0.50	0.044	1
Bis(2-Ethylhexyl)Phthalate	ND	0.50	0.037	1
4-Bromophenyl Phenyl Ether	ND	0.50	0.061	1
Butylbenzylphthalate	ND	0.50	0.031	1
4-Chloro-3-Methylphenol	ND	0.50	0.035	1
4-Chloroaniline	ND	0.50	0.043	1
2-Chloronaphthalene	ND	0.50	0.038	1
2-Chlorophenol	ND	0.50	0.024	1
4-Chlorophenyl Phenyl Ether	ND	0.50	0.027	1
Chrysene	ND	0.50	0.036	1
Di-n-butylphthalate	ND	0.50	0.028	1
Di-n-octylphthalate	ND	0.50	0.037	1
Dibenzo(a,h)anthracene	ND	0.50	0.047	1
Dibenzofuran	ND	0.50	0.041	1
1,2-Dichlorobenzene	ND	0.50	0.039	1
1,3-Dichlorobenzene	ND	0.50	0.039	1
1,4-Dichlorobenzene	ND	0.50	0.029	1
3,3-Dichlorobenzidine	ND	0.50	0.075	1
2,4-Dichlorophenol	ND	0.50	0.028	1
Diethyl Phthalate	ND	0.50	0.029	1
2,4-Dimethylphenol	ND	0.50	0.023	1
Dimethyl Phthalate	ND	0.50	0.018	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/19/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-3 LAB I.D.: 180115-65

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
4,6-Dinitro-2-methylphenol	ND	0.50	0.045	1
2,4-Dinitrophenol	ND	0.50	0.047	1
2,4-Dinitrotoluene	ND	0.50	0.024	1
2,6-Dinitrotoluene	ND	0.50	0.050	1
Fluoranthene	ND	0.50	0.022	1
Fluorene	ND	0.50	0.026	1
Hexachlorobenzene	ND	0.50	0.031	1
Hexachlorobutadiene	ND	0.50	0.022	1
Hexachlorocyclopentadiene	ND	0.50	0.041	1
Hexachloroethane	ND	0.50	0.030	1
Indeno(1,2,3-cd)pyrene	ND	0.50	0.046	1
Isophorone	ND	0.50	0.026	1
2-Methyl Phenol	ND	0.50	0.042	1
3/4-Methyl Phenol	ND	0.50	0.037	1
2-Methylnaphthalene	ND	0.50	0.036	1
N-Nitroso-di-n-dipropylamine	ND	0.50	0.024	1
N-Nitrosodimethylamine	ND	0.50	0.015	1
N-Nitrosodiphenylamine	ND	0.50	0.042	1
Naphthalene	ND	0.50	0.014	1
2-Nitroaniline	ND	0.50	0.026	1
3-Nitroaniline	ND	0.50	0.043	1
4-Nitroaniline	ND	0.50	0.052	1
Nitrobenzene	ND	0.50	0.157	1
2-Nitrophenol	ND	0.50	0.031	1
4-Nitrophenol	ND	0.50	0.040	1
Pentachlorophenol	ND	0.50	0.048	1
Phenanthrene	ND	0.50	0.036	1
Phenol	ND	0.50	0.031	1
Pyrene	ND	0.50	0.043	1
1,2,4-Trichlorobenzene	ND	0.50	0.030	1
2,4,5-Trichlorophenol	ND	0.50	0.054	1
2,4,6-Trichlorophenol	ND	0.50	0.041	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT / PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = PQL X DF
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel (909) 484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED: 01/15/18
MATRIX: SOIL DATE EXTRACTED: 01/18/18
SAMPLING DATE: 01/15/18 DATE ANALYZED: 01/19/18
REPORT TO: Mr. RICHARD ORR DATE REPORTED: 01/22/18

SAMPLE I.D.: S-4 LAB I.D.: 180115-66

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Acenaphthene	ND	0.50	0.017	1
Acenaphthylene	ND	0.50	0.028	1
Anthracene	ND	0.50	0.028	1
Benzo(a)anthracene	ND	0.50	0.080	1
Benzo(b)fluoranthene	ND	0.50	0.104	1
Benzo(a)pyrene	ND	0.50	0.049	1
Benzo(g,h,i)perylene	ND	0.50	0.044	1
Benzo(k)fluoranthene	ND	0.50	0.150	1
Benzoic Acid	ND	0.50	0.387	1
Benzyl Alcohol	ND	0.50	0.021	1
Bis(2-Chloroethoxy)methane	ND	0.50	0.026	1
Bis(2-Chloroethyl)ether	ND	0.50	0.015	1
Bis(2-Chloroisopropyl)ether	ND	0.50	0.044	1
Bis(2-Ethylhexyl)Phthalate	ND	0.50	0.037	1
4-Bromophenyl Phenyl Ether	ND	0.50	0.061	1
Butylbenzylphthalate	ND	0.50	0.031	1
4-Chloro-3-Methylphenol	ND	0.50	0.035	1
4-Chloroaniline	ND	0.50	0.043	1
2-Chloronaphthalene	ND	0.50	0.038	1
2-Chlorophenol	ND	0.50	0.024	1
4-Chlorophenyl Phenyl Ether	ND	0.50	0.027	1
Chrysene	ND	0.50	0.036	1
Di-n-butylphthalate	ND	0.50	0.028	1
Di-n-octylphthalate	ND	0.50	0.037	1
Dibenzo(a,h)anthracene	ND	0.50	0.047	1
Dibenzofuran	ND	0.50	0.041	1
1,2-Dichlorobenzene	ND	0.50	0.039	1
1,3-Dichlorobenzene	ND	0.50	0.039	1
1,4-Dichlorobenzene	ND	0.50	0.029	1
3,3-Dichlorobenzidine	ND	0.50	0.075	1
2,4-Dichlorophenol	ND	0.50	0.028	1
Diethyl Phthalate	ND	0.50	0.029	1
2,4-Dimethylphenol	ND	0.50	0.023	1
Dimethyl Phthalate	ND	0.50	0.018	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

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LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/19/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-4 LAB I.D.: 180115-66

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
4,6-Dinitro-2-methylphenol	ND	0.50	0.045	1
2,4-Dinitrophenol	ND	0.50	0.047	1
2,4-Dinitrotoluene	ND	0.50	0.024	1
2,6-Dinitrotoluene	ND	0.50	0.050	1
Fluoranthene	ND	0.50	0.022	1
Fluorene	ND	0.50	0.026	1
Hexachlorobenzene	ND	0.50	0.031	1
Hexachlorobutadiene	ND	0.50	0.022	1
Hexachlorocyclopentadiene	ND	0.50	0.041	1
Hexachloroethane	ND	0.50	0.030	1
Indeno(1,2,3-cd)pyrene	ND	0.50	0.046	1
Isophorone	ND	0.50	0.026	1
2-Methyl Phenol	ND	0.50	0.042	1
3/4-Methyl Phenol	ND	0.50	0.037	1
2-Methylnaphthalene	ND	0.50	0.036	1
N-Nitroso-di-n-dipropylamine	ND	0.50	0.024	1
N-Nitrosodimethylamine	ND	0.50	0.015	1
N-Nitrosodiphenylamine	ND	0.50	0.042	1
Naphthalene	ND	0.50	0.014	1
2-Nitroaniline	ND	0.50	0.026	1
3-Nitroaniline	ND	0.50	0.043	1
4-Nitroaniline	ND	0.50	0.052	1
Nitrobenzene	ND	0.50	0.157	1
2-Nitrophenol	ND	0.50	0.031	1
4-Nitrophenol	ND	0.50	0.040	1
Pentachlorophenol	ND	0.50	0.048	1
Phenanthrene	ND	0.50	0.036	1
Phenol	ND	0.50	0.031	1
Pyrene	ND	0.50	0.043	1
1,2,4-Trichlorobenzene	ND	0.50	0.030	1
2,4,5-Trichlorophenol	ND	0.50	0.054	1
2,4,6-Trichlorophenol	ND	0.50	0.041	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT / PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = PQL X DF
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/19/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-5 LAB I.D.: 180115-67

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Acenaphthene	ND	0.50	0.017	1
Acenaphthylene	ND	0.50	0.028	1
Anthracene	ND	0.50	0.028	1
Benzo(a)anthracene	ND	0.50	0.080	1
Benzo(b)fluoranthene	ND	0.50	0.104	1
Benzo(a)pyrene	ND	0.50	0.049	1
Benzo(g,h,i)perylene	ND	0.50	0.044	1
Benzo(k)fluoranthene	ND	0.50	0.150	1
Benzoic Acid	ND	0.50	0.387	1
Benzyl Alcohol	ND	0.50	0.021	1
Bis(2-Chloroethoxy)methane	ND	0.50	0.026	1
Bis(2-Chloroethyl)ether	ND	0.50	0.015	1
Bis(2-Chloroisopropyl)ether	ND	0.50	0.044	1
Bis(2-Ethylhexyl)Phthalate	0.459J	0.50	0.037	1
4-Bromophenyl Phenyl Ether	ND	0.50	0.061	1
Butylbenzylphthalate	ND	0.50	0.031	1
4-Chloro-3-Methylphenol	ND	0.50	0.035	1
4-Chloroaniline	ND	0.50	0.043	1
2-Chloronaphthalene	ND	0.50	0.038	1
2-Chlorophenol	ND	0.50	0.024	1
4-Chlorophenyl Phenyl Ether	ND	0.50	0.027	1
Chrysene	ND	0.50	0.036	1
Di-n-butylphthalate	ND	0.50	0.028	1
Di-n-octylphthalate	ND	0.50	0.037	1
Dibenzo(a,h)anthracene	ND	0.50	0.047	1
Dibenzofuran	ND	0.50	0.041	1
1,2-Dichlorobenzene	ND	0.50	0.039	1
1,3-Dichlorobenzene	ND	0.50	0.039	1
1,4-Dichlorobenzene	ND	0.50	0.029	1
3,3-Dichlorobenzidine	ND	0.50	0.075	1
2,4-Dichlorophenol	ND	0.50	0.028	1
Diethyl Phthalate	ND	0.50	0.029	1
2,4-Dimethylphenol	ND	0.50	0.023	1
Dimethyl Phthalate	ND	0.50	0.018	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

Enviro – Chem, Inc.
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LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel (909) 484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED: 01/15/18
MATRIX: SOIL DATE EXTRACTED: 01/18/18
SAMPLING DATE: 01/15/18 DATE ANALYZED: 01/19/18
REPORT TO: Mr. RICHARD ORR DATE REPORTED: 01/22/18

SAMPLE I.D.: S-5 LAB I.D.: 180115-67

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
4,6-Dinitro-2-methylphenol	ND	0.50	0.045	1
2,4-Dinitrophenol	ND	0.50	0.047	1
2,4-Dinitrotoluene	ND	0.50	0.024	1
2,6-Dinitrotoluene	ND	0.50	0.050	1
Fluoranthene	ND	0.50	0.022	1
Fluorene	ND	0.50	0.026	1
Hexachlorobenzene	ND	0.50	0.031	1
Hexachlorobutadiene	ND	0.50	0.022	1
Hexachlorocyclopentadiene	ND	0.50	0.041	1
Hexachloroethane	ND	0.50	0.030	1
Indeno(1,2,3-cd)pyrene	ND	0.50	0.046	1
Isophorone	ND	0.50	0.026	1
2-Methyl Phenol	ND	0.50	0.042	1
3/4-Methyl Phenol	ND	0.50	0.037	1
2-Methylnaphthalene	ND	0.50	0.036	1
N-Nitroso-di-n-dipropylamine	ND	0.50	0.024	1
N-Nitrosodimethylamine	ND	0.50	0.015	1
N-Nitrosodiphenylamine	ND	0.50	0.042	1
Naphthalene	ND	0.50	0.014	1
2-Nitroaniline	ND	0.50	0.026	1
3-Nitroaniline	ND	0.50	0.043	1
4-Nitroaniline	ND	0.50	0.052	1
Nitrobenzene	ND	0.50	0.157	1
2-Nitrophenol	ND	0.50	0.031	1
4-Nitrophenol	ND	0.50	0.040	1
Pentachlorophenol	ND	0.50	0.048	1
Phenanthrene	ND	0.50	0.036	1
Phenol	ND	0.50	0.031	1
Pyrene	ND	0.50	0.043	1
1,2,4-Trichlorobenzene	ND	0.50	0.030	1
2,4,5-Trichlorophenol	ND	0.50	0.054	1
2,4,6-Trichlorophenol	ND	0.50	0.041	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT / PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = PQL X DF
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/19/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-6 LAB I.D.: 180115-68

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Acenaphthene	ND	0.50	0.017	1
Acenaphthylene	ND	0.50	0.028	1
Anthracene	ND	0.50	0.028	1
Benzo(a)anthracene	ND	0.50	0.080	1
Benzo(b)fluoranthene	ND	0.50	0.104	1
Benzo(a)pyrene	ND	0.50	0.049	1
Benzo(g,h,i)perylene	ND	0.50	0.044	1
Benzo(k)fluoranthene	ND	0.50	0.150	1
Benzoic Acid	ND	0.50	0.387	1
Benzyl Alcohol	ND	0.50	0.021	1
Bis(2-Chloroethoxy)methane	ND	0.50	0.026	1
Bis(2-Chloroethyl)ether	ND	0.50	0.015	1
Bis(2-Chloroisopropyl)ether	ND	0.50	0.044	1
Bis(2-Ethylhexyl)Phthalate	ND	0.50	0.037	1
4-Bromophenyl Phenyl Ether	ND	0.50	0.061	1
Butylbenzylphthalate	ND	0.50	0.031	1
4-Chloro-3-Methylphenol	ND	0.50	0.035	1
4-Chloroaniline	ND	0.50	0.043	1
2-Chloronaphthalene	ND	0.50	0.038	1
2-Chlorophenol	ND	0.50	0.024	1
4-Chlorophenyl Phenyl Ether	ND	0.50	0.027	1
Chrysene	ND	0.50	0.036	1
Di-n-butylphthalate	ND	0.50	0.028	1
Di-n-octylphthalate	ND	0.50	0.037	1
Dibenzo(a,h)anthracene	ND	0.50	0.047	1
Dibenzofuran	ND	0.50	0.041	1
1,2-Dichlorobenzene	ND	0.50	0.039	1
1,3-Dichlorobenzene	ND	0.50	0.039	1
1,4-Dichlorobenzene	ND	0.50	0.029	1
3,3-Dichlorobenzidine	ND	0.50	0.075	1
2,4-Dichlorophenol	ND	0.50	0.028	1
Diethyl Phthalate	ND	0.50	0.029	1
2,4-Dimethylphenol	ND	0.50	0.023	1
Dimethyl Phthalate	ND	0.50	0.018	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel (909) 484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED: 01/15/18
MATRIX: SOIL DATE EXTRACTED: 01/18/18
SAMPLING DATE: 01/15/18 DATE ANALYZED: 01/19/18
REPORT TO: Mr. RICHARD ORR DATE REPORTED: 01/22/18

SAMPLE I.D.: S-6 LAB I.D.: 180115-68

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
4,6-Dinitro-2-methylphenol	ND	0.50	0.045	1
2,4-Dinitrophenol	ND	0.50	0.047	1
2,4-Dinitrotoluene	ND	0.50	0.024	1
2,6-Dinitrotoluene	ND	0.50	0.050	1
Fluoranthene	ND	0.50	0.022	1
Fluorene	ND	0.50	0.026	1
Hexachlorobenzene	ND	0.50	0.031	1
Hexachlorobutadiene	ND	0.50	0.022	1
Hexachlorocyclopentadiene	ND	0.50	0.041	1
Hexachloroethane	ND	0.50	0.030	1
Indeno(1,2,3-cd)pyrene	ND	0.50	0.046	1
Isophorone	ND	0.50	0.026	1
2-Methyl Phenol	ND	0.50	0.042	1
3/4-Methyl Phenol	ND	0.50	0.037	1
2-Methylnaphthalene	ND	0.50	0.036	1
N-Nitroso-di-n-dipropylamine	ND	0.50	0.024	1
N-Nitrosodimethylamine	ND	0.50	0.015	1
N-Nitrosodiphenylamine	ND	0.50	0.042	1
Naphthalene	ND	0.50	0.014	1
2-Nitroaniline	ND	0.50	0.026	1
3-Nitroaniline	ND	0.50	0.043	1
4-Nitroaniline	ND	0.50	0.052	1
Nitrobenzene	ND	0.50	0.157	1
2-Nitrophenol	ND	0.50	0.031	1
4-Nitrophenol	ND	0.50	0.040	1
Pentachlorophenol	ND	0.50	0.048	1
Phenanthrene	ND	0.50	0.036	1
Phenol	ND	0.50	0.031	1
Pyrene	ND	0.50	0.043	1
1,2,4-Trichlorobenzene	ND	0.50	0.030	1
2,4,5-Trichlorophenol	ND	0.50	0.054	1
2,4,6-Trichlorophenol	ND	0.50	0.041	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT / PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = PQL X DF
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR

DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/18/18
DATE ANALYZED: 01/19/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-7
LAB I.D.: 180115-69

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 1 OF 2

UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Acenaphthene	ND	0.50	0.017	1
Acenaphthylene	ND	0.50	0.028	1
Anthracene	ND	0.50	0.028	1
Benzo(a)anthracene	ND	0.50	0.080	1
Benzo(b)fluoranthene	ND	0.50	0.104	1
Benzo(a)pyrene	ND	0.50	0.049	1
Benzo(g,h,i)perylene	ND	0.50	0.044	1
Benzo(k)fluoranthene	ND	0.50	0.150	1
Benzoic Acid	ND	0.50	0.387	1
Benzyl Alcohol	ND	0.50	0.021	1
Bis(2-Chloroethoxy)methane	ND	0.50	0.026	1
Bis(2-Chloroethyl)ether	ND	0.50	0.015	1
Bis(2-Chloroisopropyl)ether	ND	0.50	0.044	1
Bis(2-Ethylhexyl)Phthalate	0.341J	0.50	0.037	1
4-Bromophenyl Phenyl Ether	ND	0.50	0.061	1
Butylbenzylphthalate	ND	0.50	0.031	1
4-Chloro-3-Methylphenol	ND	0.50	0.035	1
4-Chloroaniline	ND	0.50	0.043	1
2-Chloronaphthalene	ND	0.50	0.038	1
2-Chlorophenol	ND	0.50	0.024	1
4-Chlorophenyl Phenyl Ether	ND	0.50	0.027	1
Chrysene	ND	0.50	0.036	1
Di-n-butylphthalate	ND	0.50	0.028	1
Di-n-octylphthalate	ND	0.50	0.037	1
Dibenzo(a,h)anthracene	ND	0.50	0.047	1
Dibenzofuran	ND	0.50	0.041	1
1,2-Dichlorobenzene	ND	0.50	0.039	1
1,3-Dichlorobenzene	ND	0.50	0.039	1
1,4-Dichlorobenzene	ND	0.50	0.029	1
3,3-Dichlorobenzidine	ND	0.50	0.075	1
2,4-Dichlorophenol	ND	0.50	0.028	1
Diethyl Phthalate	ND	0.50	0.029	1
2,4-Dimethylphenol	ND	0.50	0.023	1
Dimethyl Phthalate	ND	0.50	0.018	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/19/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-7 LAB I.D.: 180115-69

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
4,6-Dinitro-2-methylphenol	ND	0.50	0.045	1
2,4-Dinitrophenol	ND	0.50	0.047	1
2,4-Dinitrotoluene	ND	0.50	0.024	1
2,6-Dinitrotoluene	ND	0.50	0.050	1
Fluoranthene	ND	0.50	0.022	1
Fluorene	ND	0.50	0.026	1
Hexachlorobenzene	ND	0.50	0.031	1
Hexachlorobutadiene	ND	0.50	0.022	1
Hexachlorocyclopentadiene	ND	0.50	0.041	1
Hexachloroethane	ND	0.50	0.030	1
Indeno(1,2,3-cd)pyrene	ND	0.50	0.046	1
Isophorone	ND	0.50	0.026	1
2-Methyl Phenol	ND	0.50	0.042	1
3/4-Methyl Phenol	ND	0.50	0.037	1
2-Methylnaphthalene	ND	0.50	0.036	1
N-Nitroso-di-n-dipropylamine	ND	0.50	0.024	1
N-Nitrosodimethylamine	ND	0.50	0.015	1
N-Nitrosodiphenylamine	ND	0.50	0.042	1
Naphthalene	ND	0.50	0.014	1
2-Nitroaniline	ND	0.50	0.026	1
3-Nitroaniline	ND	0.50	0.043	1
4-Nitroaniline	ND	0.50	0.052	1
Nitrobenzene	ND	0.50	0.157	1
2-Nitrophenol	ND	0.50	0.031	1
4-Nitrophenol	ND	0.50	0.040	1
Pentachlorophenol	ND	0.50	0.048	1
Phenanthrene	ND	0.50	0.036	1
Phenol	ND	0.50	0.031	1
Pyrene	ND	0.50	0.043	1
1,2,4-Trichlorobenzene	ND	0.50	0.030	1
2,4,5-Trichlorophenol	ND	0.50	0.054	1
2,4,6-Trichlorophenol	ND	0.50	0.041	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT / PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = PQL X DF
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

METHOD BLANK REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/18/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

METHOD BLANK FOR LAB I.D.: 180115-63 THROUGH -69

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 1 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
Acenaphthene	ND	0.50	0.017	1
Acenaphthylene	ND	0.50	0.028	1
Anthracene	ND	0.50	0.028	1
Benzo(a)anthracene	ND	0.50	0.080	1
Benzo(b)fluoranthene	ND	0.50	0.104	1
Benzo(a)pyrene	ND	0.50	0.049	1
Benzo(g,h,i)perylene	ND	0.50	0.044	1
Benzo(k)fluoranthene	ND	0.50	0.150	1
Benzoic Acid	ND	0.50	0.387	1
Benzyl Alcohol	ND	0.50	0.021	1
Bis(2-Chloroethoxy)methane	ND	0.50	0.026	1
Bis(2-Chloroethyl)ether	ND	0.50	0.015	1
Bis(2-Chloroisopropyl)ether	ND	0.50	0.044	1
Bis(2-Ethylhexyl)Phthalate	ND	0.50	0.037	1
4-Bromophenyl Phenyl Ether	ND	0.50	0.061	1
Butylbenzylphthalate	ND	0.50	0.031	1
4-Chloro-3-Methylphenol	ND	0.50	0.035	1
4-Chloroaniline	ND	0.50	0.043	1
2-Chloronaphthalene	ND	0.50	0.038	1
2-Chlorophenol	ND	0.50	0.024	1
4-Chlorophenyl Phenyl Ether	ND	0.50	0.027	1
Chrysene	ND	0.50	0.036	1
Di-n-butylphthalate	ND	0.50	0.028	1
Di-n-octylphthalate	ND	0.50	0.037	1
Dibenzo(a,h)anthracene	ND	0.50	0.047	1
Dibenzofuran	ND	0.50	0.041	1
1,2-Dichlorobenzene	ND	0.50	0.039	1
1,3-Dichlorobenzene	ND	0.50	0.039	1
1,4-Dichlorobenzene	ND	0.50	0.029	1
3,3-Dichlorobenzidine	ND	0.50	0.075	1
2,4-Dichlorophenol	ND	0.50	0.028	1
Diethyl Phthalate	ND	0.50	0.029	1
2,4-Dimethylphenol	ND	0.50	0.023	1
Dimethyl Phthalate	ND	0.50	0.018	1

----- TO BE CONTINUED ON PAGE #2 -----

DATA REVIEWED AND APPROVED BY: _____

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

METHOD BLANK REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/18/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

METHOD BLANK FOR LAB I.D.: 180115-63 THROUGH -69

SEMI-VOLATILE ORGANICS, EPA 8270C, PAGE 2 OF 2
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
4,6-Dinitro-2-methylphenol	ND	0.50	0.045	1
2,4-Dinitrophenol	ND	0.50	0.047	1
2,4-Dinitrotoluene	ND	0.50	0.024	1
2,6-Dinitrotoluene	ND	0.50	0.050	1
Fluoranthene	ND	0.50	0.022	1
Fluorene	ND	0.50	0.026	1
Hexachlorobenzene	ND	0.50	0.031	1
Hexachlorobutadiene	ND	0.50	0.022	1
Hexachlorocyclopentadiene	ND	0.50	0.041	1
Hexachloroethane	ND	0.50	0.030	1
Indeno(1,2,3-cd)pyrene	ND	0.50	0.046	1
Isophorone	ND	0.50	0.026	1
2-Methyl Phenol	ND	0.50	0.042	1
3/4-Methyl Phenol	ND	0.50	0.037	1
2-Methylnaphthalene	ND	0.50	0.036	1
N-Nitroso-di-n-dipropylamine	ND	0.50	0.024	1
N-Nitrosodimethylamine	ND	0.50	0.015	1
N-Nitrosodiphenylamine	ND	0.50	0.042	1
Naphthalene	ND	0.50	0.014	1
2-Nitroaniline	ND	0.50	0.026	1
3-Nitroaniline	ND	0.50	0.043	1
4-Nitroaniline	ND	0.50	0.052	1
Nitrobenzene	ND	0.50	0.157	1
2-Nitrophenol	ND	0.50	0.031	1
4-Nitrophenol	ND	0.50	0.040	1
Pentachlorophenol	ND	0.50	0.048	1
Phenanthrene	ND	0.50	0.036	1
Phenol	ND	0.50	0.031	1
Pyrene	ND	0.50	0.043	1
1,2,4-Trichlorobenzene	ND	0.50	0.030	1
2,4,5-Trichlorophenol	ND	0.50	0.054	1
2,4,6-Trichlorophenol	ND	0.50	0.041	1

COMMENTS DF = DILUTION FACTOR
MDL = METHOD DETECTION LIMIT / PQL = PRACTICAL QUANTITATION LIMIT
J = TRACE CONCENTRATION BETWEEN MDL AND PQL
ACTUAL DETECTION LIMIT = PQL X DF
ND = NON-DETECTED OR BELOW THE ACTUAL DETECTION LIMIT
DATA REVIEWED AND APPROVED BY:
CAL-DHS CERTIFICATE # 1555

Enviro-Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909)590-5905 Fax (909)590-5907

8270C QA/QC Report

Matrix: **Soil/Solid/Sludge/Oil** Unit: mg/Kg (PPM)
Date Analyzed: 1/18-19/2018

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Spiked Sample Lab I.D.: **180115-63 MS/MSD**

Analyte	SR	spk conc	MS	%MS	MSD	%MSD	%RPD	ACP %MS	ACP RPI
Phenol	0.0	2.00	2.01	**100%**	2.05	**103%**	**2%**	50-150	0-20
Pyrene	0.0	2.00	2.46	**123%**	2.15	**107%**	**14%**	50-150	0-20

Laboratory Control Spike (LCS):

Analyte	spk conc	LCS	% RC	ACP %RC
Phenol	2.00	1.96	**98%**	75-125
1,4-Dichlorobenzene	2.00	2.09	**105%**	75-125
2,4-Dichlorophenol	2.00	2.26	**113%**	75-125
Hexachlorobutadiene	2.00	2.16	**108%**	75-125
4-Chloro-3-methylphenol	2.00	2.17	**109%**	75-125
Fluoranthene	2.00	2.17	**109%**	75-125

Surrogate Recovery	spk conc	ACP%	%RC	%RC	%RC	%RC	%RC	%RC	%RC
Sample I.D.			**MB**	**180115-63**	**180115-64**	**180115-65**	**180115-66**	**180115-67**	**180115-6**
2-Fluorophenol	40	25-121	95%	90%	88%	91%	92%	95%	90%
Phenol-d5	40	24-113	88%	83%	81%	85%	86%	89%	85%
Nitrobenzene-d5	40	23-120	99%	94%	90%	94%	96%	96%	94%
2-Fluorobiphenyl	40	30-115	106%	99%	94%	100%	101%	96%	100%
2,4,6-Tribromophenol	40	19-122	72%	71%	71%	72%	76%	103%	72%
Terphenyl-d14	40	18-137	100%	93%	89%	95%	96%	108%	94%

Surrogate Recovery	spk conc	ACP%	%RC	%RC	%RC	%RC	%RC	%RC	%RC
Sample I.D.			**180115-69**	**180117-17**					
2-Fluorophenol	40	25-121	86%	103%					
Phenol-d5	40	24-113	80%	96%					
Nitrobenzene-d5	40	23-120	89%	100%					
2-Fluorobiphenyl	40	30-115	96%	95%					
2,4,6-Tribromophenol	40	19-122	71%	94%					
Terphenyl-d14	40	18-137	89%	122%					

Surrogate Recovery	spk conc	ACP%	%RC	%RC	%RC	%RC	%RC	%RC	%RC
Sample I.D.									
2-Fluorophenol	40	25-121							
Phenol-d5	40	24-113							
Nitrobenzene-d5	40	23-120							
2-Fluorobiphenyl	40	30-115							
2,4,6-Tribromophenol	40	19-122							
Terphenyl-d14	40	18-137							

* = *Surrogate fail due to matrix interference*

Note: ***LCS, MS, MSD are in control therefore results are in control.***

Analyzed and Reviewed By: _____

Final Reviewer: _____

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: **Leighton Consulting**
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel (909) 484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: **T&C Skilled Nursing Facility**
PROJECT No.: **11888.001** DATE RECEIVED: 01/15/18
MATRIX: SOIL DATE EXTRACTED: 01/18/18
SAMPLING DATE: 01/15/18 DATE ANALYZED: 01/18/18
REPORT TO: Mr. RICHARD ORR DATE REPORTED: 01/22/18

SAMPLE I.D.: **S-1** LAB I.D.: 180115-63

ANALYSIS: POLYNUCLEAR AROMATIC HYDROCARBONS, EPA METHOD 8270C-SIM
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1-METHYLNAPHTHALENE	ND	0.02	0.01	1
2-METHYLNAPHTHALENE	ND	0.02	0.01	1
ACENAPHTHENE	ND	0.02	0.01	1
ACENAPHTHYLENE	ND	0.02	0.01	1
ANTHRACENE	ND	0.02	0.01	1
BENZO(a)ANTHRACENE	ND	0.02	0.01	1
BENZO(a)PYRENE	ND	0.02	0.01	1
BENZO(b)FLUORANTHENE	ND	0.02	0.01	1
BENZO(g,h,i)PERYLENE	ND	0.02	0.01	1
BENZO(k)FLUORANTHENE	ND	0.02	0.01	1
CHRYSENE	ND	0.02	0.01	1
DIBENZO(a,h)ANTHRACENE	ND	0.02	0.01	1
FLUORANTHENE	ND	0.02	0.01	1
FLUORENE	ND	0.02	0.01	1
INDENO(1,2,3-cd)PYRENE	ND	0.02	0.01	1
NAPHTHALENE	ND	0.02	0.01	1
PHENANTHRENE	ND	0.02	0.01	1
PYRENE	ND	0.02	0.01	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

DATA REVIEWED AND APPROVED BY: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/18/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-2 LAB I.D.: 180115-64

ANALYSIS: POLYNUCLEAR AROMATIC HYDROCARBONS, EPA METHOD 8270C-SIM
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1-METHYLNAPHTHALENE	ND	0.02	0.01	1
2-METHYLNAPHTHALENE	ND	0.02	0.01	1
ACENAPHTHENE	ND	0.02	0.01	1
ACENAPHTHYLENE	ND	0.02	0.01	1
ANTHRACENE	ND	0.02	0.01	1
BENZO(a)ANTHRACENE	ND	0.02	0.01	1
BENZO(a)PYRENE	ND	0.02	0.01	1
BENZO(b)FLUORANTHENE	ND	0.02	0.01	1
BENZO(g,h,i)PERYLENE	ND	0.02	0.01	1
BENZO(k)FLUORANTHENE	ND	0.02	0.01	1
CHRYSENE	ND	0.02	0.01	1
DIBENZO(a,h)ANTHRACENE	ND	0.02	0.01	1
FLUORANTHENE	ND	0.02	0.01	1
FLUORENE	ND	0.02	0.01	1
INDENO(1,2,3-cd)PYRENE	ND	0.02	0.01	1
NAPHTHALENE	ND	0.02	0.01	1
PHENANTHRENE	ND	0.02	0.01	1
PYRENE	ND	0.02	0.01	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

DATA REVIEWED AND APPROVED BY: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909) 590-5905 Fax (909) 590-5907

LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/18/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-3 LAB I.D.: 180115-65

ANALYSIS: POLYNUCLEAR AROMATIC HYDROCARBONS, EPA METHOD 8270C-SIM
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1-METHYLNAPHTHALENE	ND	0.02	0.01	1
2-METHYLNAPHTHALENE	ND	0.02	0.01	1
ACENAPHTHENE	ND	0.02	0.01	1
ACENAPHTHYLENE	ND	0.02	0.01	1
ANTHRACENE	ND	0.02	0.01	1
BENZO(a)ANTHRACENE	ND	0.02	0.01	1
BENZO(a)PYRENE	ND	0.02	0.01	1
BENZO(b)FLUORANTHENE	ND	0.02	0.01	1
BENZO(g,h,i)PERYLENE	ND	0.02	0.01	1
BENZO(k)FLUORANTHENE	ND	0.02	0.01	1
CHRYSENE	ND	0.02	0.01	1
DIBENZO(a,h)ANTHRACENE	ND	0.02	0.01	1
FLUORANTHENE	ND	0.02	0.01	1
FLUORENE	ND	0.02	0.01	1
INDENO(1,2,3-cd)PYRENE	ND	0.02	0.01	1
NAPHTHALENE	ND	0.02	0.01	1
PHENANTHRENE	ND	0.02	0.01	1
PYRENE	ND	0.02	0.01	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

DATA REVIEWED AND APPROVED BY:
CAL-DHS ELAP CERTIFICATE No.: 1555

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LABORATORY REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/18/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-4 LAB I.D.: 180115-66

ANALYSIS: POLYNUCLEAR AROMATIC HYDROCARBONS, EPA METHOD 8270C-SIM
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1-METHYLNAPHTHALENE	ND	0.02	0.01	1
2-METHYLNAPHTHALENE	ND	0.02	0.01	1
ACENAPHTHENE	ND	0.02	0.01	1
ACENAPHTHYLENE	ND	0.02	0.01	1
ANTHRACENE	ND	0.02	0.01	1
BENZO(a)ANTHRACENE	ND	0.02	0.01	1
BENZO(a)PYRENE	ND	0.02	0.01	1
BENZO(b)FLUORANTHENE	ND	0.02	0.01	1
BENZO(g,h,i)PERYLENE	ND	0.02	0.01	1
BENZO(k)FLUORANTHENE	ND	0.02	0.01	1
CHRYSENE	ND	0.02	0.01	1
DIBENZO(a,h)ANTHRACENE	ND	0.02	0.01	1
FLUORANTHENE	ND	0.02	0.01	1
FLUORENE	ND	0.02	0.01	1
INDENO(1,2,3-cd)PYRENE	ND	0.02	0.01	1
NAPHTHALENE	ND	0.02	0.01	1
PHENANTHRENE	ND	0.02	0.01	1
PYRENE	ND	0.02	0.01	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

DATA REVIEWED AND APPROVED BY:
CAL-DHS ELAP CERTIFICATE No.: 1555

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LABORATORY REPORT

CUSTOMER: Leighton Consulting
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PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/18/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

SAMPLE I.D.: S-5 LAB I.D.: 180115-67

ANALYSIS: POLYNUCLEAR AROMATIC HYDROCARBONS, EPA METHOD 8270C-SIM
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1-METHYLNAPHTHALENE	ND	0.02	0.01	1
2-METHYLNAPHTHALENE	ND	0.02	0.01	1
ACENAPHTHENE	ND	0.02	0.01	1
ACENAPHTHYLENE	ND	0.02	0.01	1
ANTHRACENE	ND	0.02	0.01	1
BENZO(a)ANTHRACENE	ND	0.02	0.01	1
BENZO(a)PYRENE	ND	0.02	0.01	1
BENZO(b)FLUORANTHENE	ND	0.02	0.01	1
BENZO(g,h,i)PERYLENE	ND	0.02	0.01	1
BENZO(k)FLUORANTHENE	ND	0.02	0.01	1
CHRYSENE	ND	0.02	0.01	1
DIBENZO(a,h)ANTHRACENE	ND	0.02	0.01	1
FLUORANTHENE	ND	0.02	0.01	1
FLUORENE	ND	0.02	0.01	1
INDENO(1,2,3-cd)PYRENE	ND	0.02	0.01	1
NAPHTHALENE	ND	0.02	0.01	1
PHENANTHRENE	ND	0.02	0.01	1
PYRENE	ND	0.02	0.01	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit, or non-detected

DATA REVIEWED AND APPROVED BY: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

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PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/18/18
DATE ANALYZED: 01/18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-6
LAB I.D.: 180115-68

ANALYSIS: POLYNUCLEAR AROMATIC HYDROCARBONS, EPA METHOD 8270C-SIM
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1-METHYLNAPHTHALENE	ND	0.02	0.01	1
2-METHYLNAPHTHALENE	ND	0.02	0.01	1
ACENAPHTHENE	ND	0.02	0.01	1
ACENAPHTHYLENE	ND	0.02	0.01	1
ANTHRACENE	ND	0.02	0.01	1
BENZO(a)ANTHRACENE	ND	0.02	0.01	1
BENZO(a)PYRENE	ND	0.02	0.01	1
BENZO(b)FLUORANTHENE	ND	0.02	0.01	1
BENZO(g,h,i)PERYLENE	ND	0.02	0.01	1
BENZO(k)FLUORANTHENE	ND	0.02	0.01	1
CHRYSENE	ND	0.02	0.01	1
DIBENZO(a,h)ANTHRACENE	ND	0.02	0.01	1
FLUORANTHENE	ND	0.02	0.01	1
FLUORENE	ND	0.02	0.01	1
INDENO(1,2,3-cd)PYRENE	ND	0.02	0.01	1
NAPHTHALENE	ND	0.02	0.01	1
PHENANTHRENE	ND	0.02	0.01	1
PYRENE	ND	0.02	0.01	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

DATA REVIEWED AND APPROVED BY: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

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LABORATORY REPORT

CUSTOMER: Leighton Consulting
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Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001
MATRIX: SOIL
SAMPLING DATE: 01/15/18
REPORT TO: Mr. RICHARD ORR
DATE RECEIVED: 01/15/18
DATE EXTRACTED: 01/18/18
DATE ANALYZED: 01/18/18
DATE REPORTED: 01/22/18

SAMPLE I.D.: S-7
LAB I.D.: 180115-69

ANALYSIS: POLYNUCLEAR AROMATIC HYDROCARBONS, EPA METHOD 8270C-SIM
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1-METHYLNAPHTHALENE	ND	0.02	0.01	1
2-METHYLNAPHTHALENE	ND	0.02	0.01	1
ACENAPHTHENE	ND	0.02	0.01	1
ACENAPHTHYLENE	ND	0.02	0.01	1
ANTHRACENE	ND	0.02	0.01	1
BENZO(a)ANTHRACENE	ND	0.02	0.01	1
BENZO(a)PYRENE	ND	0.02	0.01	1
BENZO(b)FLUORANTHENE	ND	0.02	0.01	1
BENZO(g,h,i)PERYLENE	ND	0.02	0.01	1
BENZO(k)FLUORANTHENE	ND	0.02	0.01	1
CHRYSENE	ND	0.02	0.01	1
DIBENZO(a,h)ANTHRACENE	ND	0.02	0.01	1
FLUORANTHENE	ND	0.02	0.01	1
FLUORENE	ND	0.02	0.01	1
INDENO(1,2,3-cd)PYRENE	ND	0.02	0.01	1
NAPHTHALENE	ND	0.02	0.01	1
PHENANTHRENE	ND	0.02	0.01	1
PYRENE	ND	0.02	0.01	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

DATA REVIEWED AND APPROVED BY: _____
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro – Chem, Inc.
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METHOD BLANK REPORT

CUSTOMER: Leighton Consulting
41715 Enterprise Circle N. Suite 103, Temecula, CA 92590
Tel(909)484-2205 E-Mail: ROrr@leightongroup.com
PROJECT: T&C Skilled Nursing Facility
PROJECT No.: 11888.001 DATE RECEIVED:01/15/18
MATRIX:SOIL DATE EXTRACTED:01/18/18
SAMPLING DATE:01/15/18 DATE ANALYZED:01/18/18
REPORT TO:Mr. RICHARD ORR DATE REPORTED:01/22/18

METHOD BLANK FOR LAB I.D.: 180115-63 THROUGH -69

ANALYSIS: POLYNUCLEAR AROMATIC HYDROCARBONS, EPA METHOD 8270C-SIM
UNIT: mg/Kg = MILLIGRAM PER KILOGRAM = PPM

PARAMETER	SAMPLE RESULT	PQL	MDL	DF
1-METHYLNAPHTHALENE	ND	0.02	0.01	1
2-METHYLNAPHTHALENE	ND	0.02	0.01	1
ACENAPHTHENE	ND	0.02	0.01	1
ACENAPHTHYLENE	ND	0.02	0.01	1
ANTHRACENE	ND	0.02	0.01	1
BENZO(a)ANTHRACENE	ND	0.02	0.01	1
BENZO(a)PYRENE	ND	0.02	0.01	1
BENZO(b)FLUORANTHENE	ND	0.02	0.01	1
BENZO(g,h,i)PERYLENE	ND	0.02	0.01	1
BENZO(k)FLUORANTHENE	ND	0.02	0.01	1
CHRYSENE	ND	0.02	0.01	1
DIBENZO(a,h)ANTHRACENE	ND	0.02	0.01	1
FLUORANTHENE	ND	0.02	0.01	1
FLUORENE	ND	0.02	0.01	1
INDENO(1,2,3-cd)PYRENE	ND	0.02	0.01	1
NAPHTHALENE	ND	0.02	0.01	1
PHENANTHRENE	ND	0.02	0.01	1
PYRENE	ND	0.02	0.01	1

COMMENTS:
DF = Dilution Factor
MDL = Method Detection Limit
Actual Detection Limit = PQL X DF
PQL = Practical Quantitation Limit
J = Trace Concentration between MDL and PQL
ND = Below the Actual Detection Limit or non-detected

DATA REVIEWED AND APPROVED BY:
CAL-DHS ELAP CERTIFICATE No.: 1555

Enviro-Chem, Inc.
1214 E. Lexington Avenue, Pomona, CA 91766 Tel (909)590-5905 Fax (909)590-5907

8270C SIMS QA/QC Report

Matrix: **Soil/Solid/Sludge/Oil** Unit: mg/Kg (PPM)

Date Analyzed: 1/18/2018

Matrix Spike (MS)/Matrix Spike Duplicate (MSD)

Spiked Sample Lab I.D.: **180115-63 MS/MSD**

Analyte	SR	spk conc	MS	%MS	MSD	%MSD	%RPD	ACP %MS	ACP RPD
1-Methylnaphthalene	0.0	0.05	0.05	94%	0.04	87%	8%	70-130	0-20
2-Methylnaphthalene	0.0	0.05	0.05	90%	0.04	80%	12%	70-130	0-20
Acenaphthene	0.0	0.05	0.05	90%	0.04	80%	12%	70-130	0-20
Acenaphthylene	0.0	0.05	0.05	94%	0.04	84%	11%	70-130	0-20
Anthracene	0.0	0.05	0.05	104%	0.05	101%	3%	70-130	0-20
Benz(a)anthracene	0.0	0.05	0.06	115%	0.05	99%	15%	70-130	0-20
Benzo(a)pyrene	0.0	0.05	0.04	73%	0.04	76%	4%	70-130	0-20
Benzo(b)fluoranthene	0.0	0.05	0.04	80%	0.04	78%	3%	70-130	0-20
Benzo(g,h,i)perylene	0.0	0.05	0.06	118%	0.06	123%	4%	70-130	0-20
Benzo(k)fluoranthene	0.0	0.05	0.04	76%	0.04	84%	10%	70-130	0-20
Chrysene	0.0	0.05	0.05	99%	0.04	89%	11%	70-130	0-20
Dibenz(a,h)anthracene	0.0	0.05	0.05	96%	0.05	104%	8%	70-130	0-20
Fluoranthrene	0.0	0.05	0.04	82%	0.04	71%	14%	70-130	0-20
Fluorene	0.0	0.05	0.05	97%	0.04	81%	18%	70-130	0-20
Indeno(1,2,3-cd)pyrene	0.0	0.05	0.04	80%	0.04	87%	8%	70-130	0-20
Naphthalene	0.0	0.05	0.04	83%	0.04	75%	10%	70-130	0-20
Phenanthrene	0.0	0.05	0.05	97%	0.04	86%	12%	70-130	0-20
Pyrene	0.0	0.05	0.04	72%	0.04	83%	14%	70-130	0-20

Laboratory Control Spike (LCS):

Analyte	spk conc	LCS	% RC	ACP %RC
1-Methylnaphthalene	0.05	0.05	96%	70-130
2-Methylnaphthalene	0.05	0.04	80%	70-130
Acenaphthene	0.05	0.05	101%	70-130
Acenaphthylene	0.05	0.05	99%	70-130
Anthracene	0.05	0.05	94%	70-130
Benz(a)anthracene	0.05	0.05	107%	70-130
Benzo(a)pyrene	0.05	0.04	86%	70-130
Benzo(b)fluoranthene	0.05	0.04	89%	70-130
Benzo(g,h,i)perylene	0.05	0.06	114%	70-130
Benzo(k)Fluoranthene	0.05	0.04	76%	70-130
Chrysene	0.05	0.06	120%	70-130
Dibenz(a,h)anthracene	0.05	0.06	124%	70-130
Fluoranthrene	0.05	0.05	104%	70-130
Fluorene	0.05	0.04	83%	70-130
Indeno(1,2,3-cd)pyrene	0.05	0.06	117%	70-130
Naphthalene	0.05	0.04	78%	70-130
Phenathrene	0.05	0.05	108%	70-130
Pyrene	0.05	0.05	96%	70-130

Surrogate Recovery	spk conc	ACP%	%RC	%RC	%RC	%RC	%RC	%RC	%RC
Sample I.D.			MB	180115-63	180115-64	180115-65	180115-66	180115-67	180115-68
Nitrobenzene-d5	40	23-120	88%	83%	88%	73%	73%	83%	85%
2-Fluorobiphenyl	40	30-115	115%	118*%	115%	110%	103%	100%	110%
Terphenyl-d14	40	18-127	118%	108%	125%	118%	125%	108%	110%
Sample I.D.			180115-69						
Nitrobenzene-d5	40	23-120	90%						
2-Fluorobiphenyl	40	30-115	103%						
Terphenyl-d14	40	18-127	120%						

Analyzed and Reviewed By: AND

Final Reviewer:

* = *Surrogate fail due to matrix interference*

Note: *LCS, MS, MSD are in control therefore results are in co*

Enviro-Chem, Inc. Laboratories
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Pomona, CA 91766
Tel: (909) 590-5905 Fax: (909) 590-5907
CA-DHS ELAP CERTIFICATE #1555

Turnaround Time
0 Same Day
0 24 Hours
0 48 Hours
0 72 Hours
(0) 1 Week (Standard)
Other:

SAMPLE ID	LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	No. OF CONTAINERS	TEMPERATURE	PRESERVATION	Analysis Required	COMMENTS
S-1	18015-63	1-15-18	8:20	Soil	1		Ice	OCP's 8081A / PCB's 8082 / EPA 8082 / PAH's EPA 8270C / CAM-17 Metals EPA 6010B/7471B / VOC's EPA 5035/8260B / SVOC's EPA 8270C	
S-2	-64		8:23						
S-3	-65		8:30						
S-4	-66		8:35						
S-5	-67		8:40						
S-6	-68		8:50						
S-7	-69		9:00						
					8oz				

Misc./PO#

Company Name: Leighton Consulting Inc
Address: 41715 Enterprise Circle North #103
City/State/Zip: Temecula CA 92590

Project Contact: Richard Orr
Tel: 909-527-8782
Fax:

Sampler's Signature:
Project Name/ID: T+C Skilled Nursing Facility
11888.001

Relinquished by:
Relinquished by:
Relinquished by:

Received by:
Received by:
Received by:

Date & Time: 1-15-18 14:50
Date & Time: 1/15/18 16:00
Date & Time:

Instructions for Sample Storage After Anal
O Dispose of O Return to Client X Store (30
O Other:

CHAIN OF CUSTODY RECORD

Date: 1-15-18

WHITE WITH SAMPLE • YELLOW TO CLIENT

APPENDIX I - GBA GEOENVIRONMENTAL REPORT

Important Information about This Geoenvironmental Report

Geoenvironmental studies are commissioned to gain information about environmental conditions on and beneath the surface of a site. The more comprehensive the study, the more reliable the assessment is likely to be. But remember: Any such assessment is to a greater or lesser extent based on professional opinions about conditions that cannot be seen or tested. Accordingly, no matter how many data are developed, risks created by unanticipated conditions will always remain. *Have realistic expectations.* Work with your geoenvironmental consultant to manage known and unknown risks. Part of that process should already have been accomplished, through the risk allocation provisions you and your geoenvironmental professional discussed and included in your contract's general terms and conditions. This document is intended to explain some of the concepts that may be included in your agreement, and to pass along information and suggestions to help you manage your risk.

Beware of Change; Keep Your Geoenvironmental Professional Advised

The design of a geoenvironmental study considers a variety of factors that are subject to change. Changes can undermine the applicability of a report's findings, conclusions, and recommendations. *Advise your geoenvironmental professional about any changes you become aware of.* Geoenvironmental professionals cannot accept responsibility or liability for problems that occur because a report fails to consider conditions that did not exist when the study was designed. Ask your geoenvironmental professional about the types of changes you should be particularly alert to. Some of the most common include:

- modification of the proposed development or ownership group,
- sale or other property transfer,
- replacement of or additions to the financing entity,
- amendment of existing regulations or introduction of new ones, or
- changes in the use or condition of adjacent property.

Should you become aware of any change, *do not rely on a geoenvironmental report.* Advise your geoenvironmental professional immediately; follow the professional's advice.

Recognize the Impact of Time

A geoenvironmental professional's findings, recommendations, and conclusions cannot remain valid indefinitely. The more time that passes, the more likely it is that important latent changes will occur. *Do not rely on a geoenvironmental report if too much time has elapsed since it was completed.* Ask your environmental professional to define "too much time." In the case of Phase I Environmental Site Assessments (ESAs), for example, more than 180 days after submission is generally considered "too much."

Prepare To Deal with Unanticipated Conditions

The findings, recommendations, and conclusions of a Phase I ESA report typically are based on a review of historical information, interviews, a site "walkover," and other forms of noninvasive research. When site subsurface conditions are not sampled in any way, the risk of unanticipated conditions is higher than it would otherwise be.

While borings, installation of monitoring wells, and similar invasive test methods can help reduce the risk of unanticipated conditions, *do not overvalue the effectiveness of testing.* Testing provides information about actual conditions only at the precise locations where samples are taken, and only when they are taken. Your geoenvironmental

professional has applied that specific information to develop a general opinion about environmental conditions. *Actual conditions in areas not sampled may differ (sometimes sharply) from those predicted in a report.* For example, a site may contain an unregistered underground storage tank that shows no surface trace of its existence. *Even conditions in areas that were tested can change*, sometimes suddenly, due to any number of events, not the least of which include occurrences at adjacent sites. Recognize, too, that *even some conditions in tested areas may go undiscovered,* because the tests or analytical methods used were designed to detect only those conditions assumed to exist.

Manage your risks by retaining your geoenvironmental professional to work with you as the project proceeds. Establish a contingency fund or other means to enable your geoenvironmental professional to respond rapidly, in order to limit the impact of unforeseen conditions. And to help prevent any misunderstanding, identify those empowered to authorize changes and the administrative procedures that should be followed.

Do Not Permit Any Other Party To Rely on the Report

Geoenvironmental professionals design their studies and prepare their reports to meet the specific needs of the clients who retain them, in light of the risk management methods that the client and geoenvironmental professional agree to, and the statutory, regulatory, or other requirements that apply. The study designed for a developer may differ sharply from one designed for a lender, insurer, public agency...or even another developer. *Unless the report specifically states otherwise, it was developed for you and only you.* Do not unilaterally permit any other party to rely on it. The report and the study underlying it may not be adequate for another party's needs, and you could be held liable for shortcomings your geoenvironmental professional was powerless to prevent or anticipate. Inform your geoenvironmental professional when you know or expect that someone else—a third-party—will want to use or rely on the report. *Do not permit third-party use or reliance until you first confer with the geoenvironmental professional who prepared the report.* Additional testing, analysis, or study may be required and, in any event, appropriate terms and conditions should be agreed to so both you and your geoenvironmental professional are protected from third-party risks. *Any party who relies on a geoenvironmental report without the express written permission of the professional who prepared it and the client for whom it was prepared may be solely liable for any problems that arise.*

Avoid Misinterpretation of the Report

Design professionals and other parties may want to rely on the report in developing plans and specifications. They need to be advised, in writing, that their needs may not have been considered when the study's scope was developed, and, even if their needs were considered, they might misinterpret geoenvironmental findings, conclusions, and recommendations. *Commission your geoenvironmental professional to explain pertinent elements of the report to others who are permitted to rely on it, and to review any plans, specifications or other instruments of professional service that incorporate any of the report's findings, conclusions, or recommendations.* Your geoenvironmental professional has the best understanding of the issues involved, including the fundamental assumptions that underpinned the study's scope.

Give Contractors Access to the Report

Reduce the risk of delays, claims, and disputes by giving contractors access to the full report, *providing that it is accompanied by a letter of transmittal that can protect you* by making it unquestionably clear that: 1) the study was not conducted and the report was not prepared for purposes of bid development, and 2) the findings, conclusions, and recommendations included in the report are based on a variety of opinions, inferences, and assumptions and are subject to interpretation. Use the letter to also advise contractors to consult with your geoenvironmental professional to obtain clarifications, interpretations, and guidance (a fee may be required for this service), and that—in any event—they should conduct additional studies to obtain the specific type and extent of information each prefers for preparing a bid or cost estimate. Providing access to the full report, with the appropriate caveats, helps prevent formation of adversarial attitudes and claims of concealed or differing conditions. If a contractor elects to ignore the warnings and advice in the letter of transmittal, it would do so at its own risk. Your geoenvironmental professional should be able to help you prepare an effective letter.

Do Not Separate Documentation from the Report

Geoenvironmental reports often include supplemental documentation, such as maps and copies of regulatory files, permits, registrations, citations, and correspondence with regulatory agencies. If subsurface explorations were performed, the report may contain final boring logs and copies of laboratory data. If remediation activities occurred on site, the report may include: copies of daily field reports; waste manifests; and information about the disturbance of subsurface materials, the type and thickness of any fill placed on site, and fill placement practices, among other types of documentation. *Do not separate supplemental documentation from the report. Do not, and do not permit any other party to redraw or modify any of the supplemental documentation for incorporation into other professionals' instruments of service.*

Understand the Role of Standards

Unless they are incorporated into statutes or regulations, standard practices and standard guides developed by the American Society for Testing and Materials (ASTM) and other recognized standards-developing organizations (SDOs) are little more than aspirational methods agreed to by a consensus of a committee. The committees that develop standards may not comprise those best-qualified to establish methods and, no matter what, no standard method can possibly consider the infinite client- and project-specific variables that fly in the face of the theoretical "standard conditions" to which standard practices and standard guides apply. In fact, these variables can be so pronounced that geoenvironmental professionals who comply with every directive of an ASTM or other standard procedure could run afoul of local custom and practice, thus violating the standard of care. Accordingly, when geoenvironmental professionals indicate in their reports that they have performed a service "in general compliance" with one standard or another, it means they have applied professional judgement in creating and implementing a scope of service designed for the specific client and project involved, and which follows some of the general precepts laid out in the referenced standard. To the extent that a report indicates "general compliance" with a standard, you may wish to speak with your geoenvironmental professional to learn more about what was and was not done. *Do not assume a given standard was followed to the letter.* Research indicates that that seldom is the case.

Realize That Recommendations May Not Be Final

The technical recommendations included in a geoenvironmental report are based on assumptions about actual conditions, and so are preliminary or tentative. Final recommendations can be prepared only by observing actual conditions as they are exposed. For that reason, you should retain the geoenvironmental professional of record to observe construction and/or remediation activities on site, to permit rapid response to unanticipated conditions. *The geoenvironmental professional who prepared the report cannot assume responsibility or liability for the report's recommendations if that professional is not retained to observe relevant site operations.*

Understand That Geotechnical Issues Have Not Been Addressed

Unless geotechnical engineering was specifically included in the scope of professional service, a report is not likely to relate any findings, conclusions, or recommendations about the suitability of subsurface materials for construction purposes, especially when site remediation has been accomplished through the removal, replacement, encapsulation, or chemical treatment of on-site soils. The equipment, techniques, and testing used by geotechnical engineers differ markedly from those used by geoenvironmental professionals; their education, training, and experience are also significantly different. If you plan to build on the subject site, but have not yet had a geotechnical engineering study conducted, your geoenvironmental professional should be able to provide guidance about the next steps you should take. The same firm may provide the services you need.

Read Responsibility Provisions Closely

Geoenvironmental studies cannot be exact; they are based on professional judgement and opinion. Nonetheless, some clients, contractors, and others assume geoenvironmental reports are or certainly should be unerringly precise. Such assumptions have created unrealistic expectations that have led to wholly unwarranted claims and disputes. To help prevent such problems, geoenvironmental professionals have developed a number of report provisions and contract terms that explain who is responsible for what, and how risks are to be allocated. Some people mistake these for "exculpatory clauses," that is, provisions whose purpose is to transfer one party's rightful responsibilities and liabilities to someone else. Read the responsibility provisions included in a report and in the contract you and your geoenvironmental professional agreed to. *Responsibility provisions are not "boilerplate."* They are important.

Rely on Your Geoenvironmental Professional for Additional Assistance

Membership in the Geoprofessional Business Association exposes geoenvironmental professionals to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a geoenvironmental project. Confer with your GBA-member geoenvironmental professional for more information.

GEOPROFESSIONAL BUSINESS ASSOCIATION

8811 Colesville Road/Suite G106, Silver Spring, MD 20910
Telephone: 301/565-2733 Facsimile: 301/589-2017
e-mail: info@geoprofessional.org www.geoprofessional.org

PRELIMINARY HYDROLOGY & HYDRAULIC STUDY

FOR

SKILLED NURSING FACILITY
(PA18-XXXX, 18-XXXX)

NE CORNER OF ALESSANDRO BLVD
CITY OF MORENO VALLEY
COUNTY OF RIVERSIDE, CALIFORNIA

Prepared For Owner/Developer:

T & C INTERNATIONAL HEALTH, INC
1961 SCENIC RIDGE DR.
CHINO HILLS, CA 91709
CONTACT: STEVE L'HOMMEDIEU
(314) 502-3479

Prepared By:

W&W LAND DESIGN CONSULTANTS
2335 W. Foothill Blvd., Suite #1
Upland, CA 91786
Ph: (909) 608-7118
Fax: (909) 946-1137

April 16, 2018
Project job No. 1801

PRELIMINARY HYDROLOGY & HYDRAULIC STUDY

FOR

SKILLED NURSING FACILITY
(PA18-XXXX, 18-XXXX)

NE CORNER OF ALESSANDRO BLVD
CITY OF MORENO VALLEY
COUNTY OF RIVERSIDE, CALIFORNIA

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April 17, 2018
Project job No. 1801

TABLE OF CONTENTS

Section I Introduction

The following hydrology study has been prepared for commercial development skilled nursing facility project, which is located at the North side of Alessandro Blvd, in the City of Moreno Valley, County of Riverside, California. The subject site is approximately 4.50 acres' site. An onsite storm drain systems including multiple swales, HPDE pipes and curb gutters will be constructed to convey the runoff produced by the proposed development project. Two onsite storm water quality bioretentions with pretreatment will be constructed to treat onsite storm water runoffs. The general location of the site is illustrated on the Vicinity Map in the Appendix A of this report.

Section II Methodology

For both, the existing and proposed conditions, the peak storm discharge for the drainage sub-areas (see hydrology maps in the Appendix C of this report) was calculated using the Riverside County Hydrology Manual (1978 April). The rational Method Equation, using CIVILD Software, was used to calculate the 10-year and 100-year storm event. The peak 10-year storm runoff is calculated to size the catch basin; parkway culverts and storm drain pipes. The peak 100-year storm runoff is calculated to demonstrate the runoff from 100-year storm event is contained within the street right-of-way. The street capacities calculations are calculated by using Flowmaster software. The stormwater Quality BMPs was calculated by using Riverside County Storm Water Quality Best Management Practice Design Handbook (2006, July)

Section III Project Description

Existing Site Conditions

The existing tributary area is approximately 4.5-acre site tributary area of natural dirt area. Most of the site (subarea E-1) drains overland towards southwesterly sheet flow to Alessandro Blvd. Refer to the "Existing Hydrology Map" in Appendix C for an illustration of the existing drainage zones.

The following table illustrates the data and results for the existing 10-year and 100-year storm events. All calculations can be found in Appendix D of this report.

Drainage Area	Area (Ac.)	10 Year Peak Flow (CFS)	100 Year Peak Flow (CFS)	Time of Concentration (Min.)
E-1	4.50	4.65	8.00	19.31
Total	4.50	4.65	8.00	

Proposed site Conditions

In the proposed condition, the project site can be broken down into two distinct drainage zones with total 4.50 acres of disturbed areas. Sub area A-1 to A-3 will drain to proposed water quality bioretention #1 through a proposed onsite drainage system. Subarea B-1 to B-4 will drain to proposed water quality bioretention #2 through another proposed onsite drainage system. Both of bioretentions will be connected through a storm drain pipe to RCFC&WCD M-16B and M-16 along Alessandro Blvd. Refer to the "Proposed Hydrology Map" in Appendix C for an illustration of the proposed drainage zones.

The following table illustrates the data and results for the proposed 10-year and100-year storm events. All calculations can be found in Appendix E of this report.

Drainage Area	Area (Ac.)	10 Year Peak Flow (CFS)	100 Year Peak Flow (CFS)	Time of Concentration (Min.)
A-1	0.95	2.00	2.98	6.9 Min.
A-1 & A-3	1.27	2.58	3.85	9.5 Min.
B-1	0.84	1.84	2.75	6.4 Min.
B-1, B-2 & B-3	2.57	5.56	8.31	6.0 Min.
B-4	0.83	---	---	----
Subtotal B-1 through B-4	3.23	6.85	10.28	---
Total Area	4.50	8.99	13.44	8.0 Min.

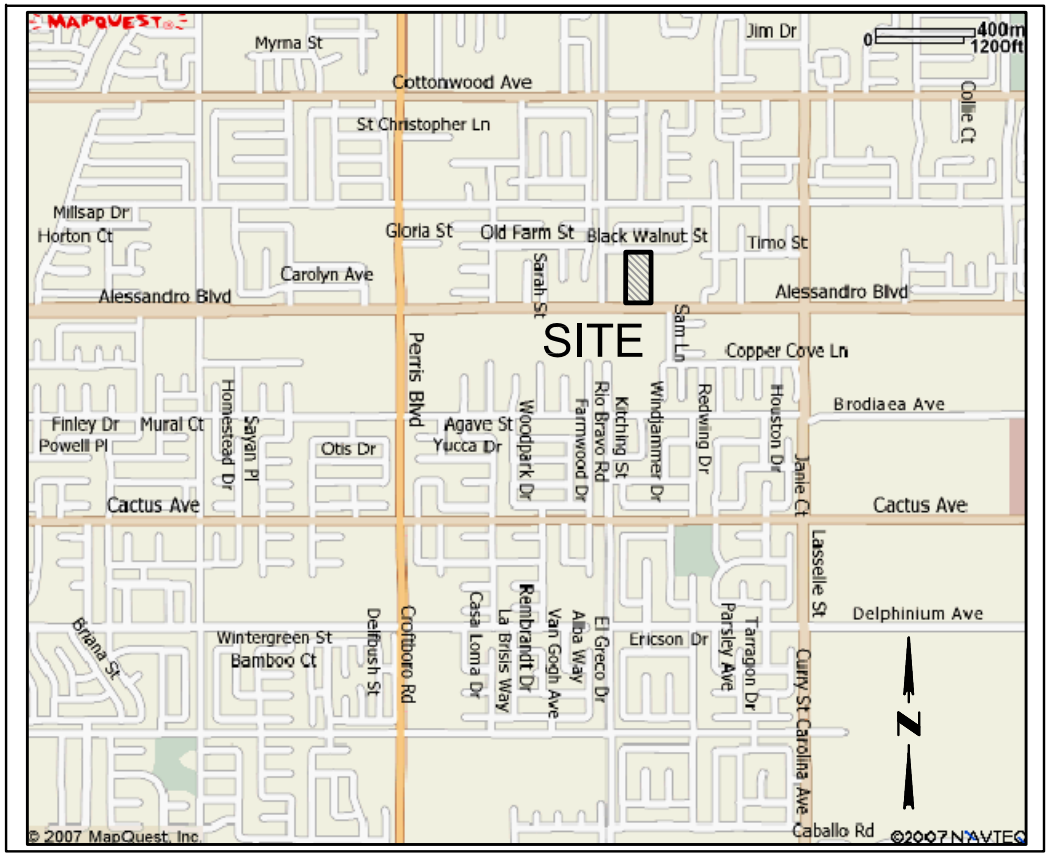
In summary, total runoff will be increased after project development. After development, about 4.34 cfs will be increased per 10-year storm event and 5.44 cfs will be increased per 100-year storm event; all run off onsite will drain to the proposed storm drain system per RCFC&WCD M-16B and M-16 along Alessandro Blvd.

Findings

After development, more impervious surface will cover the proposed site than before. Two proposed onsite storm drain systems will be constructed to convey the runoff produced by the proposed development project. Two onsite storm water quality bioretentions will be constructed; it will treat the first flush of runoff. Calculation of bioretentions can be found in P-WQMP report. The calculations within this report substantiate that the development can be constructed as shown on the proposed plans with no detrimental effect to surrounding properties.

APPENDIX A

VICINITY MAP

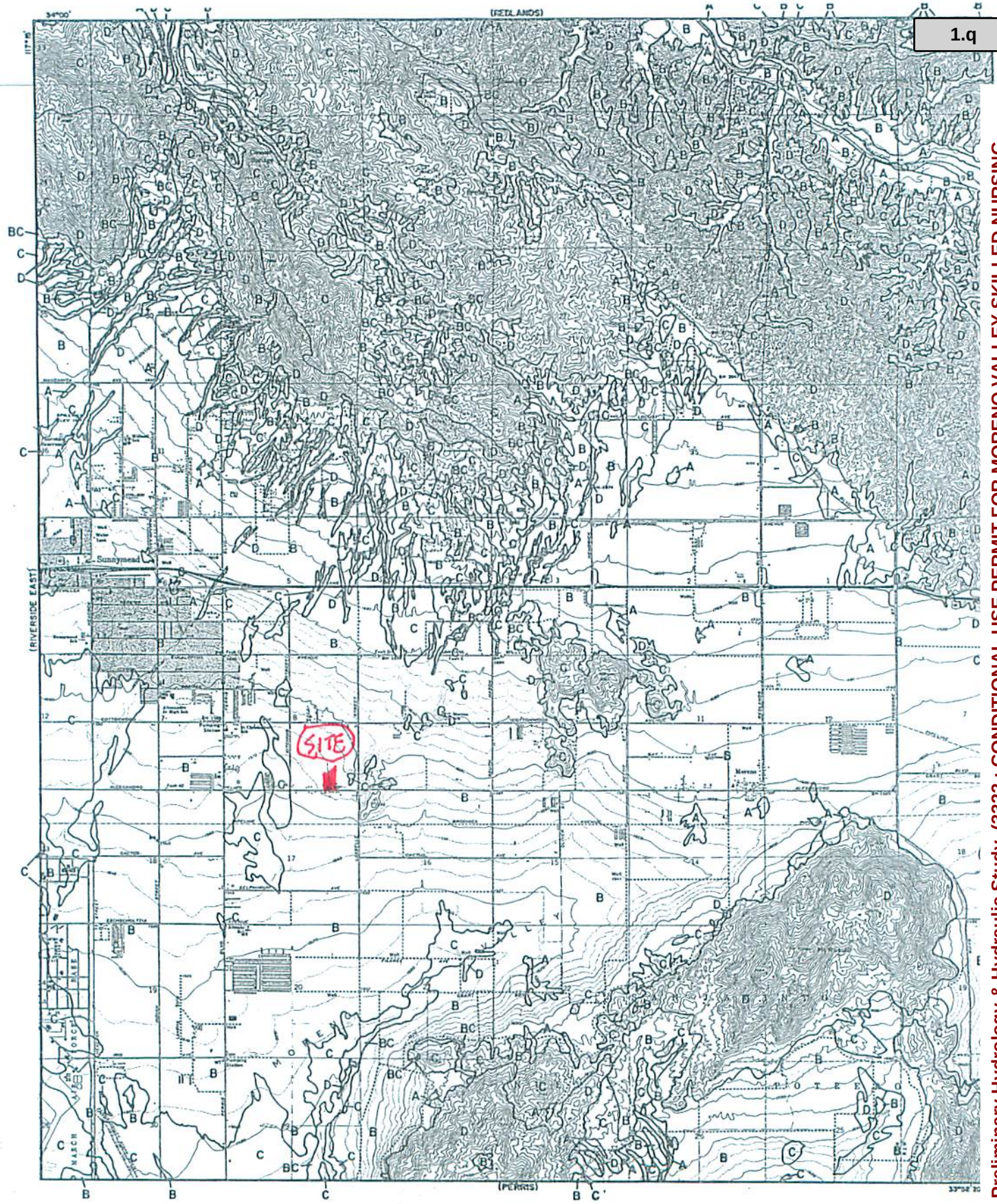


VICINITY MAP

N.T.S.

APPENDIX B

Reference (Based on RCFC & WCD Hydrology Manual):
Hydrology Soils Group Map for Sunnymead (C1.17)
100-year, - hour Precipitation Plate (D-4.4)
Soil Group B-Runoff Coefficient Curves Plate (D-5.2)



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

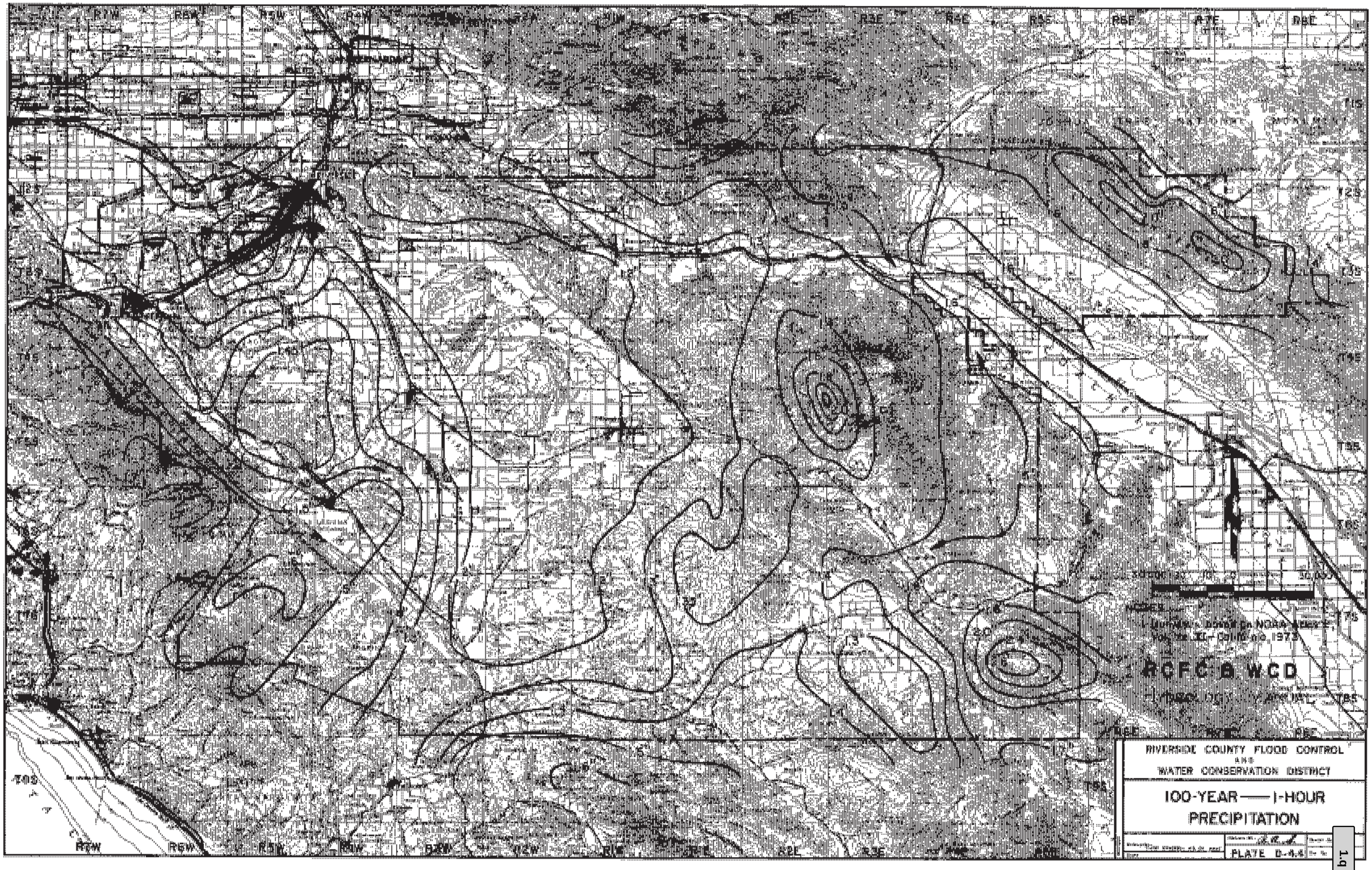
HYDROLOGY MANUAL

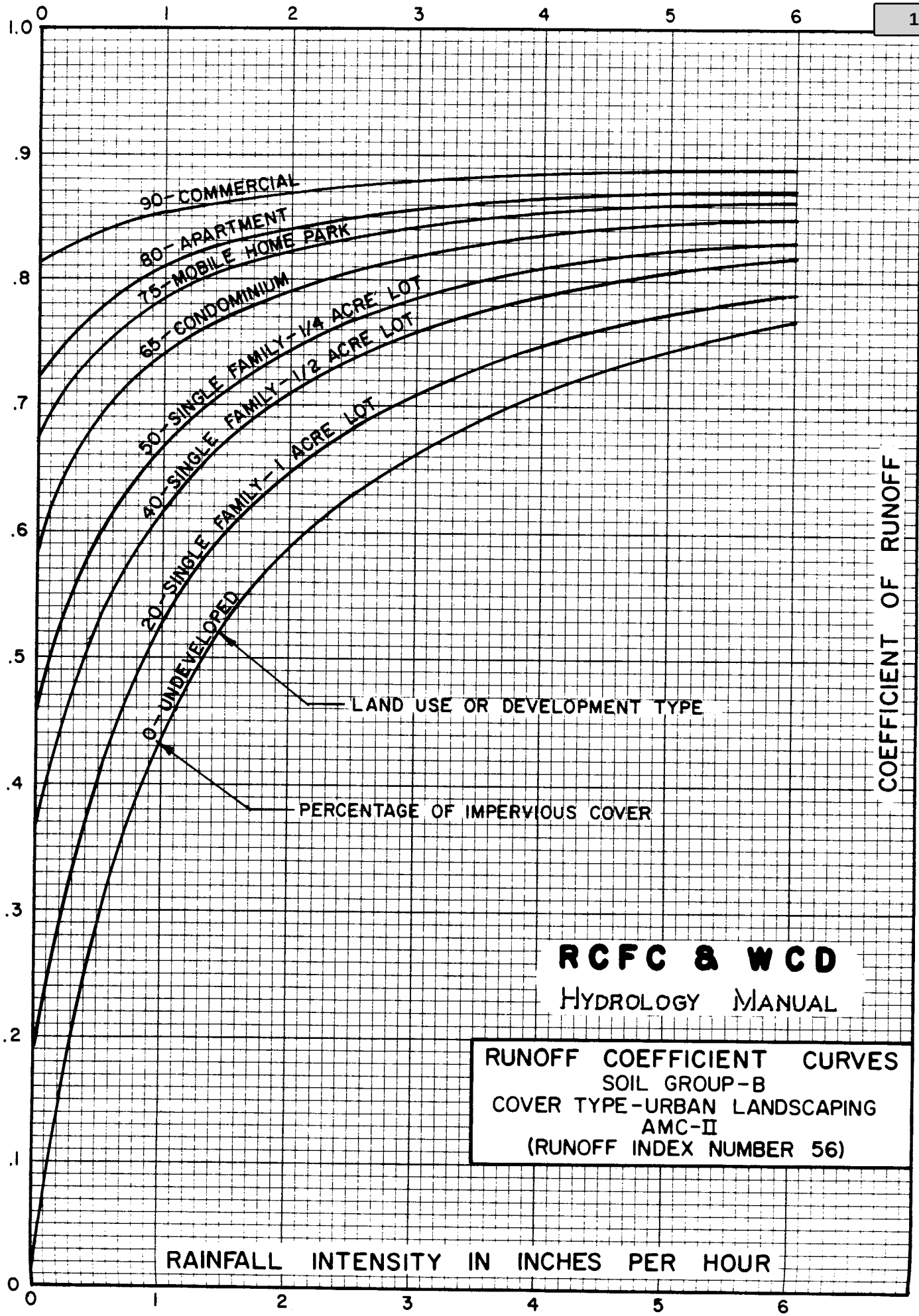
N

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR SUNNYMEAD

PLAT


RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR
PRECIPITATION
PLATE D-5.6
RCFC & WCD



RCFC & WCD

HYDROLOGY MANUAL

RUNOFF COEFFICIENT CURVES
SOIL GROUP-B
COVER TYPE-URBAN LANDSCAPING
AMC-II
(RUNOFF INDEX NUMBER 56)

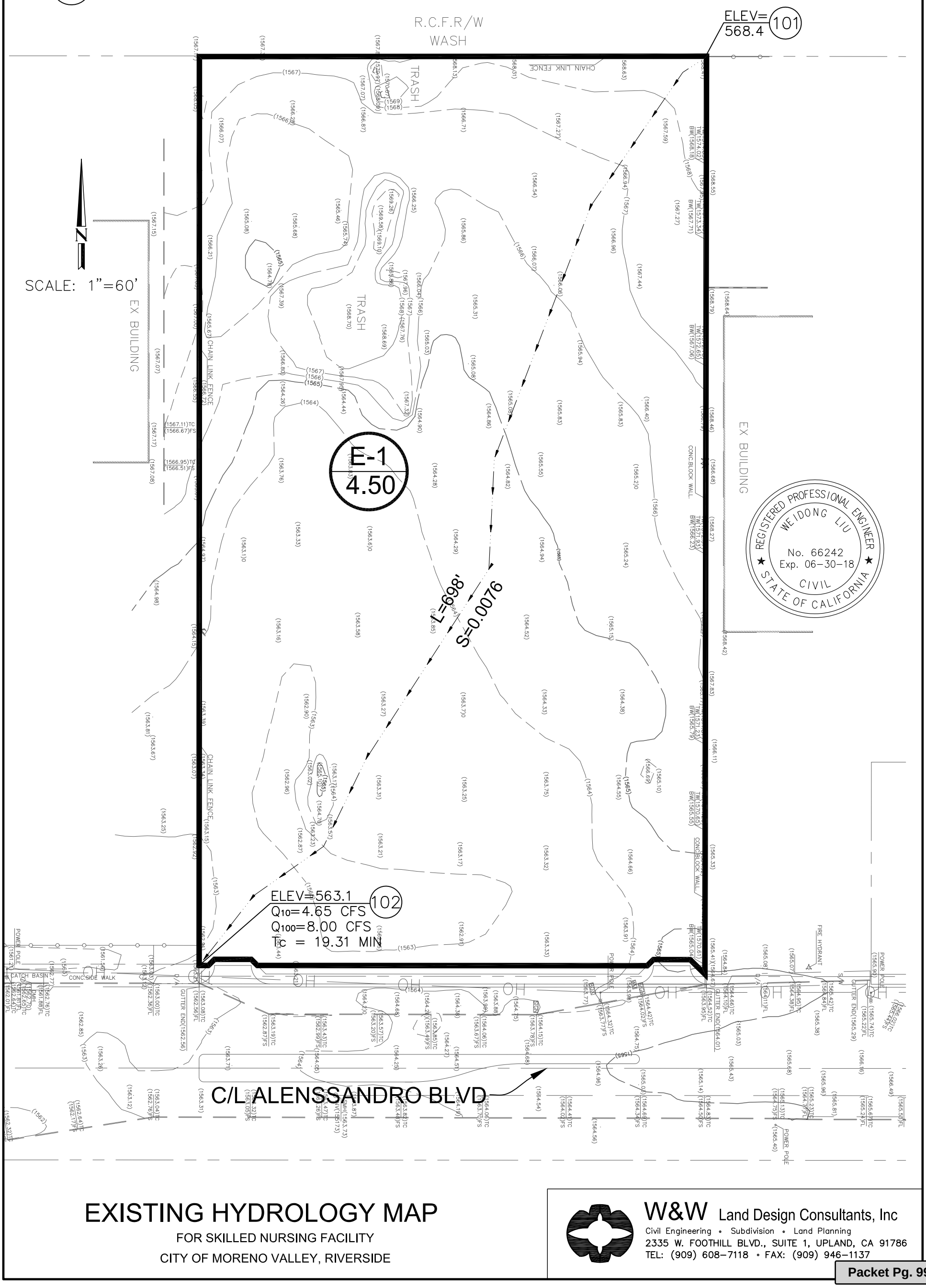
PLATE

APPENDIX C

Existing Hydrology Map
Proposed Hydrology Map

LEGEND

- TRACT BOUNDARY
- DRAINAGE AREA BOUNDARY
- DRAINAGE SUBAREA BOUNDARY
- (10) NODE NUMBER
- Q_{100} 100 YEAR STORM EVENT
- Q_{10} 10 YEAR STORM EVENT
- Tc TIME OF CONCENTRATION
- CB #2 CATCH BASIN #2
- B-1 / 10.3 DRAINAGE AREA NUMBER / DRAINAGE AREA ACREAGE



EXISTING HYDROLOGY MAP

FOR SKILLED NURSING FACILITY

CITY OF MORENO VALLEY, RIVERSIDE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

CITY OF MORENO VALLEY

PROPOSED HYDROLOGY MAP

FOR SKILLED NURSING FACILITY

N

GRAPHIC SCALE

30 0 15 30 60 120

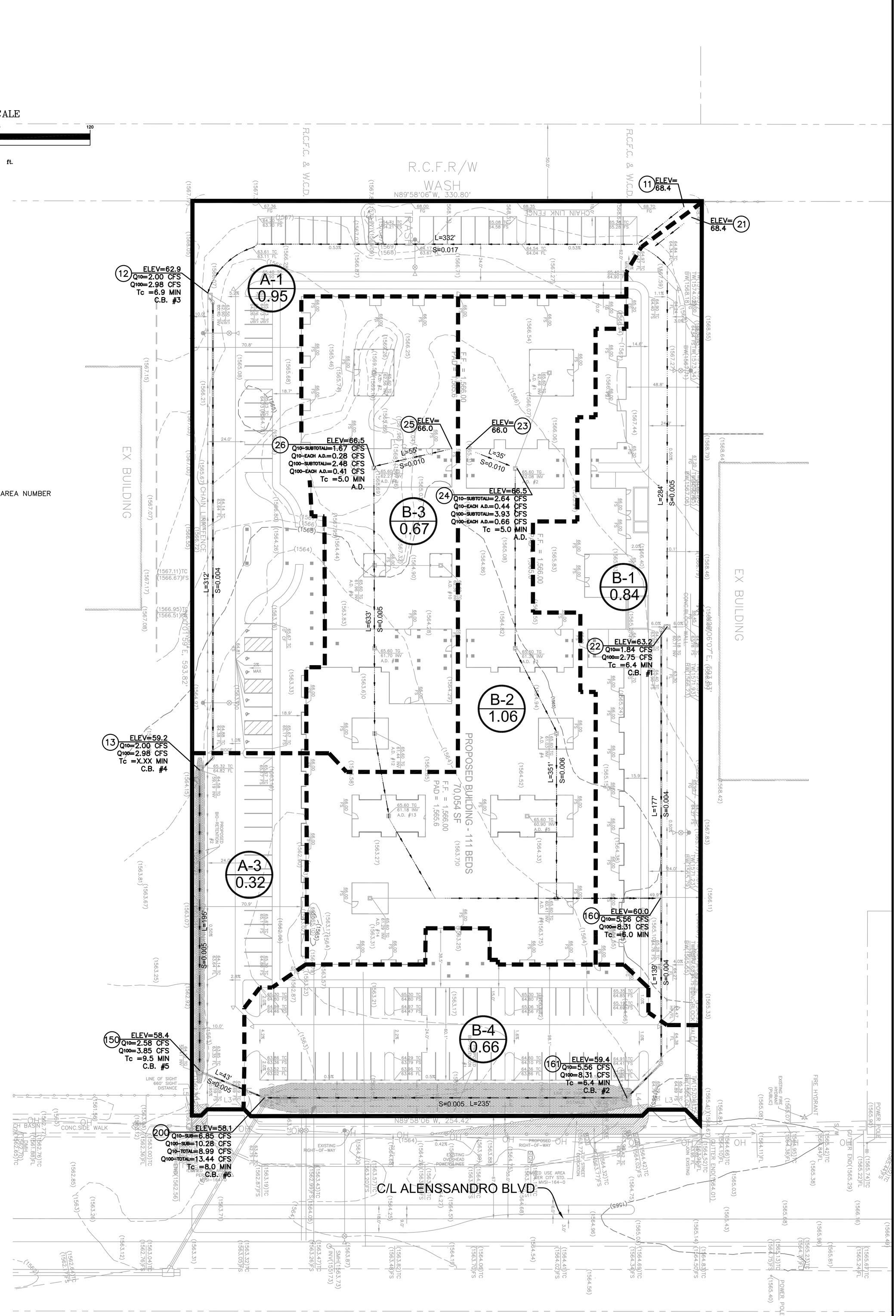
(IN FEET)
1 inch = 30 ft.

LEGEND

- PROJECT BOUNDARY
- DRAINAGE BOUNDARY FOR EACH BMP
- FLOW LINE
- (10) NODE NUMBER
- Q_{100} 100 YEAR STORM EVENT
- Q_{10} 10 YEAR STORM EVENT
- Tc TIME OF CONCENTRATION
- CB #2 CATCH BASIN #2
- A-2 / 0.83 DRAINAGE MANAGEMENT AREA NUMBER / DRAINAGE AREA ACRAGE

OWNER/DEVELOPER:

T & C INTERNATIONAL HEALTH, INC
1961 SCENIC RIDGE DR.
CHINO HILLS, CA 91709
CONTACT: STEVE L'HOMMEDIEU
(314) 502-3479



PA18-XXXX, XXXX DATE: 04-17-2018
APN: 479-230-018

REGISTERED PROFESSIONAL ENGINEER
WEIDONG LIU
No. 66242
Exp. 06-30-18
CIVIL
STATE OF CALIFORNIA

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

CITY OF MORENO VALLEY
SKILLED NURSING FACILITY
NORTHWEST CORNER SIDE OF ALESSANDRA BLVD. AND CHARA STREET
PROPOSED HYDROLOGY MAP

APPENDIX D

Hydrology Study

Existing Conditions-10 Year Storm Event
Existing Conditions-100 Year Storm Event

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 04/17/18 File:1801E.out

1801 SKILLED NURSING FACILITY
EXISTING CONDITION
10 YEAR STORM EVENT
SUBAREA E

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6069

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Sunnymead-Moreno] area used.
10 year storm 10 minute intensity = 2.010(In/Hr)
10 year storm 60 minute intensity = 0.820(In/Hr)
100 year storm 10 minute intensity = 2.940(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.820(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 698.000(Ft.)
Top (of initial area) elevation = 568.400(Ft.)
Bottom (of initial area) elevation = 563.100(Ft.)

```
Difference in elevation =     5.300(Ft.)
Slope =    0.00759  s(percent)=       0.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.308 min.
Rainfall intensity =      1.446(In/Hr) for a    10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.714
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  78.00
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      4.646(CFS)
Total initial stream area =        4.500(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            4.50 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

100E.out

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 04/17/18 File:100E.out

1801 SKILLED NURSING FACILITY
EXISTING CONDITION
100 YEAR STORM EVENT
SUBAREA E

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6069

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [Sunnymead-Moreno] area used.
10 year storm 10 minute intensity = 2.010(In/Hr)
10 year storm 60 minute intensity = 0.820(In/Hr)
100 year storm 10 minute intensity = 2.940(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 101.000 to Point/Station 102.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 698.000(Ft.)

100E.out

```
Top (of initial area) elevation =   568.400(Ft.)
Bottom (of initial area) elevation =   563.100(Ft.)
Difference in elevation =     5.300(Ft.)
Slope =    0.00759  s(percent)=       0.76
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   19.308 min.
Rainfall intensity =      2.115(In/Hr) for a   100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.840
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  89.80
Pervious area fraction =  1.000; Impervious fraction =  0.000
Initial subarea runoff =      7.995(CFS)
Total initial stream area =        4.500(Ac.)
Pervious area fraction = 1.000
End of computations, total study area =            4.50 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number =  78.0
```

APPENDIX E

Hydrology Study

Proposed Conditions-10 Year Storm Event
Proposed Conditions-100 Year Storm Event

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 04/17/18 File:10A.out

1801 SKILLED NURSING FACILITY
PROPOSED CONDITION
10 YEAR STORM EVENT
SUBAREA A & B

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6069

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Sunnymead-Moreno] area used.
10 year storm 10 minute intensity = 2.010(In/Hr)
10 year storm 60 minute intensity = 0.820(In/Hr)
100 year storm 10 minute intensity = 2.940(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.820(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 11.000 to Point/Station 12.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 332.000(Ft.)

```
Top (of initial area) elevation =    68.400(Ft.)
Bottom (of initial area) elevation =    62.900(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.01657  s(percent)=       1.66
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.946 min.
Rainfall intensity =      2.410(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.873
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.998(CFS)
Total initial stream area =        0.950(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       12.000 to Point/Station       13.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    62.900(Ft.)
Downstream point/station elevation =    59.200(Ft.)
Pipe length  =   312.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.998(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.998(CFS)
Normal flow depth in pipe =    6.11(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    7.24(In.)
Pipe flow velocity =      4.98(Ft/s)
Travel time through pipe =    1.04 min.
Time of concentration (TC) =     7.99 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station      150.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =    59.200(Ft.)
Downstream point elevation =    58.400(Ft.)
Channel length thru subarea  =   195.000(Ft.)
Channel base width      =    4.000(Ft.)
Slope or 'Z' of left channel bank =   3.000
Slope or 'Z' of right channel bank =   3.000
```

```
Estimated mean flow rate at midpoint of channel =      2.335(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    0.500(Ft.)
Flow(q) thru subarea =      2.335(CFS)
Depth of flow =   0.231(Ft.), Average velocity =   2.157(Ft/s)
Channel flow top width =    5.384(Ft.)
Flow Velocity =    2.16(Ft/s)
Travel time  =    1.51 min.
Time of concentration =    9.50 min.

Sub-Channel No. 1 Critical depth =      0.207(Ft.)
  '     '       '     Critical flow top width =      5.242(Ft.)
  '     '       '     Critical flow velocity=    2.440(Ft/s)
  '     '       '     Critical flow area =      0.957(Sq.Ft)

 Adding area flow to channel
COMMERCIAL subarea type
Runoff Coefficient = 0.870
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.061(In/Hr) for a    10.0 year storm
Subarea runoff =      0.574(CFS) for      0.320(Ac.)
Total runoff =      2.572(CFS)  Total area =       1.270(Ac.)
Depth of flow =   0.244(Ft.), Average velocity =   2.229(Ft/s)

Sub-Channel No. 1 Critical depth =      0.221(Ft.)
  '     '       '     Critical flow top width =      5.324(Ft.)
  '     '       '     Critical flow velocity=    2.499(Ft/s)
  '     '       '     Critical flow area =      1.029(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      150.000 to Point/Station      200.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    58.400(Ft.)
Downstream point/station elevation =    58.100(Ft.)
Pipe length  =    43.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.572(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.572(CFS)
Normal flow depth in pipe =    8.61(In.)
Flow top width inside pipe =   10.80(In.)
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Critical Depth =    8.24(In.)
Pipe flow velocity =      4.26(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =     9.67 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      150.000 to Point/Station      200.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      1.270(Ac.)
Runoff from this stream =      2.572(CFS)
Time of concentration =    9.67 min.
Rainfall intensity =     2.043(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       21.000 to Point/Station       22.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   284.000(Ft.)
Top (of initial area) elevation =    68.400(Ft.)
Bottom (of initial area) elevation =    63.200(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01831  s(percent)=       1.83
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.396 min.
Rainfall intensity =      2.512(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.843(CFS)
Total initial stream area =        0.840(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station       22.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
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Upstream point/station elevation =    63.200(Ft.)
Downstream point/station elevation =    60.000(Ft.)
Pipe length  =   177.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.843(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.843(CFS)
Normal flow depth in pipe =    6.25(In.)
Flow top width inside pipe =    8.29(In.)
Critical Depth =    7.45(In.)
Pipe flow velocity =      5.63(Ft/s)
Travel time through pipe =    0.52 min.
Time of concentration (TC) =     6.92 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       22.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.840(Ac.)
Runoff from this stream =      1.843(CFS)
Time of concentration =    6.92 min.
Rainfall intensity =     2.415(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       23.000 to Point/Station       24.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =    35.000(Ft.)
Top (of initial area) elevation =    66.000(Ft.)
Bottom (of initial area) elevation =    65.500(Ft.)
Difference in elevation =     0.500(Ft.)
Slope =    0.01429  s(percent)=       1.43
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.841(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.637(CFS)
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Total initial stream area =        1.060(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station       24.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    65.500(Ft.)
Downstream point/station elevation =    60.000(Ft.)
Pipe length  =   351.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.637(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.637(CFS)
Normal flow depth in pipe =    6.64(In.)
Flow top width inside pipe =   11.93(In.)
Critical Depth =    8.35(In.)
Pipe flow velocity =      5.91(Ft/s)
Travel time through pipe =    0.99 min.
Time of concentration (TC) =     5.99 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       24.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      1.060(Ac.)
Runoff from this stream =      2.637(CFS)
Time of concentration =    5.99 min.
Rainfall intensity =     2.595(In/Hr)


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Process from Point/Station       25.000 to Point/Station       26.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =    55.000(Ft.)
Top (of initial area) elevation =    66.000(Ft.)
Bottom (of initial area) elevation =    65.500(Ft.)
Difference in elevation =     0.500(Ft.)
Slope =    0.00909  s(percent)=       0.91
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      2.841(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
```

```
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.667(CFS)
Total initial stream area =        0.670(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station       26.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    65.500(Ft.)
Downstream point/station elevation =    60.000(Ft.)
Pipe length  =   633.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.667(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.667(CFS)
Normal flow depth in pipe =    6.01(In.)
Flow top width inside pipe =   12.00(In.)
Critical Depth =    6.58(In.)
Pipe flow velocity =      4.23(Ft/s)
Travel time through pipe =    2.49 min.
Time of concentration (TC) =     7.49 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       26.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      0.670(Ac.)
Runoff from this stream =      1.667(CFS)
Time of concentration =    7.49 min.
Rainfall intensity =     2.320(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        1.843      6.92                2.415
2        2.637      5.99                2.595
3        1.667      7.49                2.320
```

```
Largest stream flow has longer or shorter time of concentration
Qp =      2.637 + sum of
          Qa          Tb/Ta
           1.843 *    0.865 =      1.595
          Qa          Tb/Ta
           1.667 *    0.799 =      1.332
Qp =      5.564

Total of 3 streams to confluence:
Flow rates before confluence point:
       1.843       2.637       1.667
Area of streams before confluence:
        0.840        1.060        0.670
Results of confluence:
Total flow rate =      5.564(CFS)
Time of concentration =     5.989 min.
Effective stream area after confluence =      2.570(Ac.)


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Process from Point/Station      160.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    60.000(Ft.)
Downstream point/station elevation =    59.400(Ft.)
Pipe length  =   139.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.564(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     5.564(CFS)
Normal flow depth in pipe =   12.25(In.)
Flow top width inside pipe =   16.79(In.)
Critical Depth =   10.91(In.)
Pipe flow velocity =      4.34(Ft/s)
Travel time through pipe =    0.53 min.
Time of concentration (TC) =     6.52 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      161.000 to Point/Station      200.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =    59.400(Ft.)
Downstream point elevation =    58.100(Ft.)
Channel length thru subarea  =   235.000(Ft.)
Channel base width      =   10.000(Ft.)
Slope or 'Z' of left channel bank =   3.000
Slope or 'Z' of right channel bank =   3.000
Estimated mean flow rate at midpoint of channel =      6.243(CFS)
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```
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =      6.243(CFS)
Depth of flow =   0.225(Ft.), Average velocity =   2.603(Ft/s)
Channel flow top width =   11.348(Ft.)
Flow Velocity =    2.60(Ft/s)
Travel time  =    1.50 min.
Time of concentration =    8.03 min.

Sub-Channel No. 1 Critical depth =      0.225(Ft.)
  '     '       '     Critical flow top width =     11.348(Ft.)
  '     '       '     Critical flow velocity=    2.604(Ft/s)
  '     '       '     Critical flow area =      2.397(Sq.Ft)

 Adding area flow to channel
COMMERCIAL subarea type
Runoff Coefficient = 0.871
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      2.242(In/Hr) for a    10.0 year storm
Subarea runoff =      1.289(CFS) for      0.660(Ac.)
Total runoff =      6.853(CFS)  Total area =       3.230(Ac.)
Depth of flow =   0.237(Ft.), Average velocity =   2.694(Ft/s)

Sub-Channel No. 1 Critical depth =      0.238(Ft.)
  '     '       '     Critical flow top width =     11.430(Ft.)
  '     '       '     Critical flow velocity=    2.684(Ft/s)
  '     '       '     Critical flow area =      2.553(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      161.000 to Point/Station      200.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.230(Ac.)
Runoff from this stream =      6.853(CFS)
Time of concentration =    8.03 min.
Rainfall intensity =     2.242(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
```

```
 No.       (CFS)       (min)                (In/Hr)


1        2.572      9.67                2.043
2        6.853      8.03                2.242
Largest stream flow has longer or shorter time of concentration
Qp =      6.853 + sum of
          Qa          Tb/Ta
           2.572 *    0.830 =      2.136
Qp =      8.989

Total of 2 main streams to confluence:
Flow rates before confluence point:
       2.572       6.853
Area of streams before confluence:
        1.270        3.230


Results of confluence:
Total flow rate =      8.989(CFS)
Time of concentration =     8.027 min.
Effective stream area after confluence  =      4.500(Ac.)
End of computations, total study area =            4.50 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.0
```

100A.out

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 04/17/18 File:100A.out

1801 SKILLED NURSING FACILITY
PROPOSED CONDITION
100 YEAR STORM EVENT
SUBAREA A & B

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6069

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

Standard intensity-duration curves data (Plate D-4.1)
For the [Sunnymead-Moreno] area used.
10 year storm 10 minute intensity = 2.010(In/Hr)
10 year storm 60 minute intensity = 0.820(In/Hr)
100 year storm 10 minute intensity = 2.940(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5000

++

Process from Point/Station 11.000 to Point/Station 12.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 332.000(Ft.)

```
Top (of initial area) elevation =    68.400(Ft.)
Bottom (of initial area) elevation =    62.900(Ft.)
Difference in elevation =     5.500(Ft.)
Slope =    0.01657  s(percent)=       1.66
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.946 min.
Rainfall intensity =      3.527(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.890
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.981(CFS)
Total initial stream area =        0.950(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station       12.000 to Point/Station       13.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    62.900(Ft.)
Downstream point/station elevation =    59.200(Ft.)
Pipe length  =   312.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.981(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.981(CFS)
Normal flow depth in pipe =    7.89(In.)
Flow top width inside pipe =   11.39(In.)
Critical Depth =    8.88(In.)
Pipe flow velocity =      5.45(Ft/s)
Travel time through pipe =    0.95 min.
Time of concentration (TC) =     7.90 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       13.000 to Point/Station      150.000
**** IMPROVED CHANNEL TRAVEL TIME ****
______________________________________________________________________________
Upstream point elevation =    59.200(Ft.)
Downstream point elevation =    58.400(Ft.)
Channel length thru subarea  =   195.000(Ft.)
Channel base width      =    4.000(Ft.)
Slope or 'Z' of left channel bank =   3.000
Slope or 'Z' of right channel bank =   3.000
```

```
Estimated mean flow rate at midpoint of channel =      3.450(CFS)
Manning's 'N'    = 0.015
Maximum depth of channel  =    0.500(Ft.)
Flow(q) thru subarea =      3.450(CFS)
Depth of flow =   0.289(Ft.), Average velocity =   2.457(Ft/s)
Channel flow top width =    5.731(Ft.)
Flow Velocity =    2.46(Ft/s)
Travel time  =    1.32 min.
Time of concentration =    9.22 min.

Sub-Channel No. 1 Critical depth =      0.266(Ft.)
  '     '       '     Critical flow top width =      5.594(Ft.)
  '     '       '     Critical flow velocity=    2.708(Ft/s)
  '     '       '     Critical flow area =      1.274(Sq.Ft)

 Adding area flow to channel
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      3.061(In/Hr) for a   100.0 year storm
Subarea runoff =      0.870(CFS) for      0.320(Ac.)
Total runoff =      3.852(CFS)  Total area =       1.270(Ac.)
Depth of flow =   0.307(Ft.), Average velocity =   2.548(Ft/s)

Sub-Channel No. 1 Critical depth =      0.285(Ft.)
  '     '       '     Critical flow top width =      5.711(Ft.)
  '     '       '     Critical flow velocity=    2.782(Ft/s)
  '     '       '     Critical flow area =      1.385(Sq.Ft)



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Process from Point/Station      150.000 to Point/Station      200.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    58.400(Ft.)
Downstream point/station elevation =    58.100(Ft.)
Pipe length  =    43.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.852(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.852(CFS)
Normal flow depth in pipe =    9.38(In.)
Flow top width inside pipe =   14.52(In.)
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Critical Depth =    9.53(In.)
Pipe flow velocity =      4.78(Ft/s)
Travel time through pipe =    0.15 min.
Time of concentration (TC) =     9.37 min.


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Process from Point/Station      150.000 to Point/Station      200.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      1.270(Ac.)
Runoff from this stream =      3.852(CFS)
Time of concentration =    9.37 min.
Rainfall intensity =     3.036(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station       21.000 to Point/Station       22.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   284.000(Ft.)
Top (of initial area) elevation =    68.400(Ft.)
Bottom (of initial area) elevation =    63.200(Ft.)
Difference in elevation =     5.200(Ft.)
Slope =    0.01831  s(percent)=       1.83
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    6.396 min.
Rainfall intensity =      3.675(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.890
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.748(CFS)
Total initial stream area =        0.840(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station       22.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
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Upstream point/station elevation =    63.200(Ft.)
Downstream point/station elevation =    60.000(Ft.)
Pipe length  =   177.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.748(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.748(CFS)
Normal flow depth in pipe =    6.52(In.)
Flow top width inside pipe =   11.96(In.)
Critical Depth =    8.52(In.)
Pipe flow velocity =      6.31(Ft/s)
Travel time through pipe =    0.47 min.
Time of concentration (TC) =     6.86 min.


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Process from Point/Station       22.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 1
Stream flow area =      0.840(Ac.)
Runoff from this stream =      2.748(CFS)
Time of concentration =    6.86 min.
Rainfall intensity =     3.548(In/Hr)


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Process from Point/Station       23.000 to Point/Station       24.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =    35.000(Ft.)
Top (of initial area) elevation =    66.000(Ft.)
Bottom (of initial area) elevation =    65.500(Ft.)
Difference in elevation =     0.500(Ft.)
Slope =    0.01429  s(percent)=       1.43
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      4.157(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.891
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      3.927(CFS)
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Total initial stream area =        1.060(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station       24.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =    65.500(Ft.)
Downstream point/station elevation =    60.000(Ft.)
Pipe length  =   351.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.927(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     3.927(CFS)
Normal flow depth in pipe =    8.74(In.)
Flow top width inside pipe =   10.67(In.)
Critical Depth =   10.10(In.)
Pipe flow velocity =      6.41(Ft/s)
Travel time through pipe =    0.91 min.
Time of concentration (TC) =     5.91 min.


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Process from Point/Station       24.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 2 in normal stream number 2
Stream flow area =      1.060(Ac.)
Runoff from this stream =      3.927(CFS)
Time of concentration =    5.91 min.
Rainfall intensity =     3.823(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       25.000 to Point/Station       26.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =    55.000(Ft.)
Top (of initial area) elevation =    66.000(Ft.)
Bottom (of initial area) elevation =    65.500(Ft.)
Difference in elevation =     0.500(Ft.)
Slope =    0.00909  s(percent)=       0.91
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration =    5.000 min.
Rainfall intensity =      4.157(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
```

```
Runoff Coefficient = 0.891
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.482(CFS)
Total initial stream area =        0.670(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       26.000 to Point/Station      160.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    65.500(Ft.)
Downstream point/station elevation =    60.000(Ft.)
Pipe length  =   633.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.482(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.482(CFS)
Normal flow depth in pipe =    7.73(In.)
Flow top width inside pipe =   11.49(In.)
Critical Depth =    8.09(In.)
Pipe flow velocity =      4.64(Ft/s)
Travel time through pipe =    2.28 min.
Time of concentration (TC) =     7.28 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station       26.000 to Point/Station      160.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 2 in normal stream number 3
Stream flow area =      0.670(Ac.)
Runoff from this stream =      2.482(CFS)
Time of concentration =    7.28 min.
Rainfall intensity =     3.446(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1        2.748      6.86                 3.548
2        3.927      5.91                 3.823
3        2.482      7.28                 3.446
```

```
Largest stream flow has longer or shorter time of concentration
Qp =      3.927 + sum of
          Qa          Tb/Ta
           2.748 *    0.861 =      2.368
          Qa          Tb/Ta
           2.482 *    0.813 =      2.017
Qp =      8.312

Total of 3 streams to confluence:
Flow rates before confluence point:
       2.748       3.927       2.482
Area of streams before confluence:
        0.840       1.060       0.670
Results of confluence:
Total flow rate =      8.312(CFS)
Time of concentration =     5.913 min.
Effective stream area after confluence =      2.570(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      160.000 to Point/Station      161.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =    60.000(Ft.)
Downstream point/station elevation =    59.400(Ft.)
Pipe length  =   139.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.312(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     8.312(CFS)
Normal flow depth in pipe =   14.18(In.)
Flow top width inside pipe =   19.67(In.)
Critical Depth =   12.85(In.)
Pipe flow velocity =      4.81(Ft/s)
Travel time through pipe =    0.48 min.
Time of concentration (TC) =     6.39 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      161.000 to Point/Station      200.000
**** IMPROVED CHANNEL TRAVEL TIME ****
________________________________________________________________________
Upstream point elevation =    59.400(Ft.)
Downstream point elevation =    58.100(Ft.)
Channel length thru subarea  =   235.000(Ft.)
Channel base width      =   10.000(Ft.)
Slope or 'Z' of left channel bank =   3.000
Slope or 'Z' of right channel bank =   3.000
Estimated mean flow rate at midpoint of channel =      9.338(CFS)
```

```
Manning's 'N'    = 0.015
Maximum depth of channel  =    1.000(Ft.)
Flow(q) thru subarea =      9.338(CFS)
Depth of flow =   0.285(Ft.), Average velocity =   3.018(Ft/s)
Channel flow top width =   11.710(Ft.)
Flow Velocity =    3.02(Ft/s)
Travel time  =    1.30 min.
Time of concentration =    7.69 min.

Sub-Channel No. 1 Critical depth =      0.293(Ft.)
  '     '       '     Critical flow top width =     11.758(Ft.)
  '     '       '     Critical flow velocity=    2.930(Ft/s)
  '     '       '     Critical flow area =      3.187(Sq.Ft)

 Adding area flow to channel
COMMERCIAL subarea type
Runoff Coefficient = 0.889
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3)  =  74.80
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      3.351(In/Hr) for a   100.0 year storm
Subarea runoff =      1.967(CFS) for      0.660(Ac.)
Total runoff =     10.279(CFS)  Total area =       3.230(Ac.)
Depth of flow =   0.302(Ft.), Average velocity =   3.125(Ft/s)

Sub-Channel No. 1 Critical depth =      0.309(Ft.)
  '     '       '     Critical flow top width =     11.852(Ft.)
  '     '       '     Critical flow velocity=    3.049(Ft/s)
  '     '       '     Critical flow area =      3.372(Sq.Ft)



++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      161.000 to Point/Station      200.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.230(Ac.)
Runoff from this stream =     10.279(CFS)
Time of concentration =    7.69 min.
Rainfall intensity =     3.351(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
```

```
 No.       (CFS)       (min)                  (In/Hr)


1        3.852      9.37                 3.036
2       10.279      7.69                 3.351
Largest stream flow has longer or shorter time of concentration
Qp =     10.279 + sum of
          Qa          Tb/Ta
           3.852 *    0.821 =      3.161
Qp =     13.440

Total of 2 main streams to confluence:
Flow rates before confluence point:
       3.852      10.279
Area of streams before confluence:
        1.270        3.230


Results of confluence:
Total flow rate =     13.440(CFS)
Time of concentration =     7.693 min.
Effective stream area after confluence  =      4.500(Ac.)
End of computations, total study area =            4.50 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  56.0
```

Moreno Valley Skilled Nursing Facility

NOISE IMPACT ANALYSIS

CITY OF MORENO VALLEY

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JULY 17, 2018

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
ANSI	American National Standards Institute
Calveno	California Vehicle Noise
CEQA	California Environmental Quality Act
CNEL	Community Noise Equivalent Level
dBA	A-weighted decibels
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
Hz	Hertz
I-215	Interstate 215
INCE	Institute of Noise Control Engineering
L_{eq}	Equivalent continuous (average) sound level
L_{max}	Maximum level measured over the time interval
L_{min}	Minimum level measured over the time interval
MARB/IPA	March Air Reserve Base/Inland Port Airport
mph	Miles per hour
OPR	Office of Planning and Research
PPV	Peak particle velocity
Project	Moreno Valley Skilled Nursing Facility
REMEL	Reference Energy Mean Emission Level
RMS	Root-mean-square
VdB	Vibration Decibels

EXECUTIVE SUMMARY

Urban Crossroads, Inc. has prepared this noise study to determine the noise exposure and the necessary noise mitigation measures for the proposed Moreno Valley Skilled Nursing Facility development ("Project"). The Project site is located on the north side of Alessandro Boulevard, west of Kitching Street in the City of Moreno Valley. The Project proposes the development of an 88 dwelling unit assisted living facility on a 4.54-acre parcel. This study has been prepared to satisfy the City of Moreno Valley noise standards and thresholds of significance based on guidance in Appendix G of the California Environmental Quality Act (CEQA) Guidelines. (1)

OFF-SITE TRAFFIC NOISE ANALYSIS

The *Trip Generation Analysis for Proposed Skilled Nursing Facility*, prepared by EPD Solutions, Inc., indicates that the Project will generate 38 AM peak hour and 41 PM peak hour trips, which is fewer than the 100 peak hour trips per day threshold which would require the preparation of a traffic impact analysis based on City of Moreno Valley's traffic study guidelines. Based on traffic count data taken on September 12th, 2017, the existing PM peak hour traffic volume on Alessandro Boulevard east of Heacock Street is 1,383, which would increase under future year without Project conditions as additional development takes place in the Project study area. (2) As such, Project traffic represents an approximate 3-percent increase to the existing roadway volumes, which will not generate a barely perceptible noise level increase of 3 dBA CNEL at nearby sensitive land uses adjacent to study area roadways, since a doubling of the existing traffic volumes would be required to generate a 3 dBA CNEL increase. (3) Due to the low traffic volumes generated by the Project, the off-site traffic noise levels generated by the Project are considered to be *less than significant* and no further analysis is required.

ON-SITE TRAFFIC NOISE ANALYSIS

A noise impact analysis has been completed to determine the noise exposure levels that would result from off-site transportation noise sources, and to identify potential noise mitigation measures that would achieve acceptable Project exterior and interior noise levels. The primary source of traffic noise affecting the Project site is anticipated to be from Alessandro Boulevard. The Project will also experience some background traffic noise impacts from Black Walnut Street and Kitching Street, however, due to the lower traffic volume and speeds of vehicles transiting on these roadways, and intervening structures, traffic noise from these roadways will not make a significant contribution to the noise environment at the Project site.

EXTERIOR NOISE LEVELS

The future unmitigated on-site traffic noise levels in the closest outdoor common area to Alessandro Boulevard are shown to approach 56.1 dBA CNEL and represent *normally acceptable* exterior noise levels for nursing home land use. (4) Therefore, no exterior noise mitigation is required. The Project outdoor common areas benefit from the site design of the Project building which shields the outdoor common areas from traffic noise sources in the Project study area. Further, exterior noise levels at the Project building façade, approaching 66.0 dBA CNEL,

represent *conditionally acceptable* nursing home lane use requiring an interior noise level analysis. Therefore, based on the future exterior traffic noise levels, Project interior noise levels are analyzed herein to identify the necessary interior noise reduction measures to satisfy the City of Moreno Valley General Plan Noise Element 45 dBA CNEL interior noise level standard.

INTERIOR NOISE LEVELS

This noise study evaluates the interior noise levels at the Project building based on the City of Moreno Valley 45 dBA CNEL residential interior noise level standard. The Project buildings are shown to require a Noise Reduction (NR) of up to 21 dBA and a windows-closed condition requiring a means of mechanical ventilation (e.g. air conditioning). To meet the City of Moreno Valley 45 dBA CNEL interior noise standards the following on-site standard construction measures are required:

- Windows/Glass Doors: All units require windows and sliding glass doors that have well-fitted, well-weather-stripped assemblies, and minimum sound transmission class (STC) ratings of 27.
- Exterior Doors (Non-Glass): All exterior doors shall be well weather-stripped and have well-sealed perimeter gaps to achieve minimum sound transmission class (STC) ratings of 27. (5)
- Exterior Walls: At any penetrations of exterior walls by pipes, ducts, or conduits, the space between the wall and pipes, ducts, or conduits shall be caulked or filled with mortar to form an airtight seal.
- Roof: Roof sheathing of wood construction shall be per manufacturer's specification or caulked plywood of at least one-half inch thick. Ceilings shall be per manufacturer's specification or well-sealed gypsum board of at least one-half inch thick. Insulation with at least a rating of R-19 shall be used in the attic space.
- Ventilation: Arrangements for any habitable room shall be such that any exterior door or window can be kept closed when the room is in use and still receive circulated air. A forced air circulation system (e.g. air conditioning) or active ventilation system (e.g. fresh air supply) shall be provided which satisfies the requirements of the Uniform Building Code.

Based on the results of this analysis, the Project will satisfy the 45 dBA CNEL interior noise level standard with standard building construction. Exhibit ES-A shows the on-site recommendations.

OPERATIONAL NOISE ANALYSIS

Using reference noise levels to represent the expected noise sources from the Moreno Valley Skilled Nursing Facility site, this analysis estimates the Project-related stationary-source noise levels at nearby sensitive receiver locations. The normal activities associated with the proposed Moreno Valley Skilled Nursing Facility are anticipated to include roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements. The operational noise analysis shows that the Project-related stationary-source noise levels due to the roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements will satisfy the City of Moreno Valley noise level standards at 200 feet from the property line of the noise source (Project site) and at all nearby receiver locations.

In addition, this analysis demonstrates that the Project will contribute *less than significant* operational noise level contributions to the existing ambient noise environment during the daytime and nighttime hours at all of the sensitive receiver locations. Therefore, the operational noise level impacts associated with the proposed Project activities, such as the roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements, will be *less than significant*.

CONSTRUCTION NOISE ANALYSIS

Construction-related noise impacts are expected to create temporary and intermittent high-level noise conditions at receivers surrounding the Project site when certain activities occur at the closest point to the nearby receiver locations from primary Project construction activity. Using sample reference noise levels to represent the planned construction activities of the Moreno Valley Skilled Nursing Facility site, this analysis estimates the Project-related construction noise levels at nearby receiver locations. Based on the analysis, the Project-related short-term construction noise levels are shown to exceed the City of Moreno Valley Municipal Code 60 dBA L_{eq} daytime noise level threshold at noise-sensitive receiver locations R1 and R4 to R7, and 65 dBA L_{eq} daytime threshold at non-noise-sensitive receiver location R2. Therefore, the unmitigated Project-related construction noise level impacts at R1, R2, and R4 to R7 are considered a *potentially significant* temporary noise impact.

Temporary construction noise mitigation measures are therefore required to reduce the impacts at receiver locations R1, R2, and R4 to R7. This includes mitigation in the form of a minimum 10-foot high temporary noise barrier at the western Project site boundary for the Excel Prep Academy, engine compartment sound dampening mats or blankets for large mobile equipment (greater than 80,000 pounds), and a 50-foot buffer for large mobile equipment (greater than 80,000 pounds) and loaded trucks, as shown on Exhibit ES-B. Further, mobile equipment construction activities should be scheduled to time periods when the adjacent Excel Prep Academy school is not in session (e.g., holiday or other breaks). The construction noise mitigation measures are outlined below. With the mitigation measures identified herein, the noise impact due to Project construction is considered a *less than significant* impact with mitigation for receiver locations R1, R2, and R4 to R7.

CONSTRUCTION VIBRATION ANALYSIS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from temporary Project construction activities would cause only intermittent, localized intrusion. The analysis shows that the unmitigated Project-construction vibration levels will exceed the Federal Transit Administration (FTA) 80 VdB threshold at receiver locations R2, R6, and R7 which are adjacent to the Project site, and are therefore, considered a *potentially significant* impact. Therefore, the use of large mobile equipment (greater than 80,000 pounds) and loaded trucks within 50 feet of nearby land uses shall be prohibited unless the vibration levels are shown to be less than the 80 VdB FTA threshold. With the recommended mitigation measures in this study, the Project-related vibration impacts at the nearby receiver

locations represents a *less than significant* impact during the worst-case construction activities at the Project site.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating at the Project site perimeter.

CONSTRUCTION NOISE AND VIBRATION MITIGATION MEASURES

The following mitigation measures are required to reduce construction noise and vibration levels produced by the construction equipment to the nearby sensitive residential land uses.

- Mobile equipment construction activities (e.g., site preparation, grading, paving) should be scheduled, to the extent feasible, to time periods when the adjacent Excel Prep Academy school is not in session (e.g., holiday or other breaks). If mobile equipment construction activities cannot be scheduled outside of school hours, then the following mitigation measures shall be required as they relate to the Excel Prep Academy west of the Project site, as shown on Exhibit ES-B.
- Install a minimum 10-foot high temporary construction noise barrier at the Project's western site boundary adjacent to sensitive receiver locations R6 and R7 (Excel Prep Academy), shown on Exhibit ES-B, for the duration of Project construction. The noise control barriers must have a solid face from top to bottom. The noise control barrier must meet the minimum height and be constructed as follows:
    - The temporary noise barrier shall provide a minimum transmission loss of 20 dBA (Federal Highway Administration, Noise Barrier Design Handbook). The noise barrier shall be constructed using an acoustical blanket (e.g. vinyl acoustic curtains or quilted blankets) attached to the construction site perimeter fence or equivalent temporary fence posts. Example photos are provided in Appendix 11.2.;
    - The noise barrier must be maintained, and any damage promptly repaired. Gaps, holes, or weaknesses in the barrier or openings between the barrier and the ground shall be promptly repaired;
    - The noise control barrier and associated elements shall be completely removed, and the site appropriately restored upon the conclusion of the construction activity.
- Large loaded trucks and mobile equipment (greater than or equal to 80,000 pounds) (6) shall not be used within 50 feet of receiver locations R2, R6, and R7 if occupied at the time of Project construction, as shown on Exhibit ES-B. Instead, smaller, rubber-tired mobile equipment (less than 80,000 pounds) or equivalent alternative equipment shall be used within this area during Project construction to reduce vibration effects.
- Install sound dampening mats or blankets to the engine compartments of Large mobile equipment (greater than or equal to 80,000 pounds) which are capable of a minimum 5 dBA noise reduction (FHWA, Construction Noise Special Report). (7) The dampening materials must be capable of the minimum 5 dBA noise reduction and can be made of commercially-available sound dampening materials, including but not limited to polyurethane foam and vinyl sheeting (University of Massachusetts Lowell The Use of Noise Dampening Mats to Reduce Heavy-Equipment Noise). (8)

- Prior to approval of grading plans and/or issuance of building permits, plans shall include a note indicating that Project construction activities shall comply with the City of Moreno Valley Municipal Code requirements. (9)
- During all Project site construction, the construction contractors shall equip all construction equipment, fixed or mobile, with properly operating and maintained mufflers, consistent with manufacturers' standards. The construction contractor shall place all stationary construction equipment so that emitted noise is directed away from the noise sensitive receptors nearest the Project site.
- The construction contractor shall locate equipment staging in areas that will create the greatest distance between construction-related noise sources and noise-sensitive receivers nearest the Project site during all Project construction (i.e., to the center).
- The contractor shall design delivery routes to minimize the exposure of sensitive land uses or residential dwellings to delivery truck-related noise.

SUMMARY OF SIGNIFICANCE FINDINGS

The results of this Moreno Valley Skilled Nursing Facility Noise Impact Analysis are summarized below based on the significance criteria in Section 4 of this report. Table ES-1 shows the findings of significance for each potential noise and/or vibration impact before and after any required mitigation measures.

TABLE ES-1: SUMMARY OF SIGNIFICANCE FINDINGS

Analysis	Report Section	Significance Findings	
		Unmitigated	Mitigated
Off-Site Traffic Noise	7	*Less Than Significant*	*n/a*
On-Site Traffic Noise	8	*Less Than Significant*	*n/a*
Operational Noise	10	*Less Than Significant*	*n/a*
Construction Noise	11	*Potentially Significant*	*Less Than Significant*
Construction Vibration		*Potentially Significant*	*Less Than Significant*

"n/a" = No mitigation is required.

EXHIBIT ES-A: SUMMARY OF ON-SITE RECOMMENDATIONS

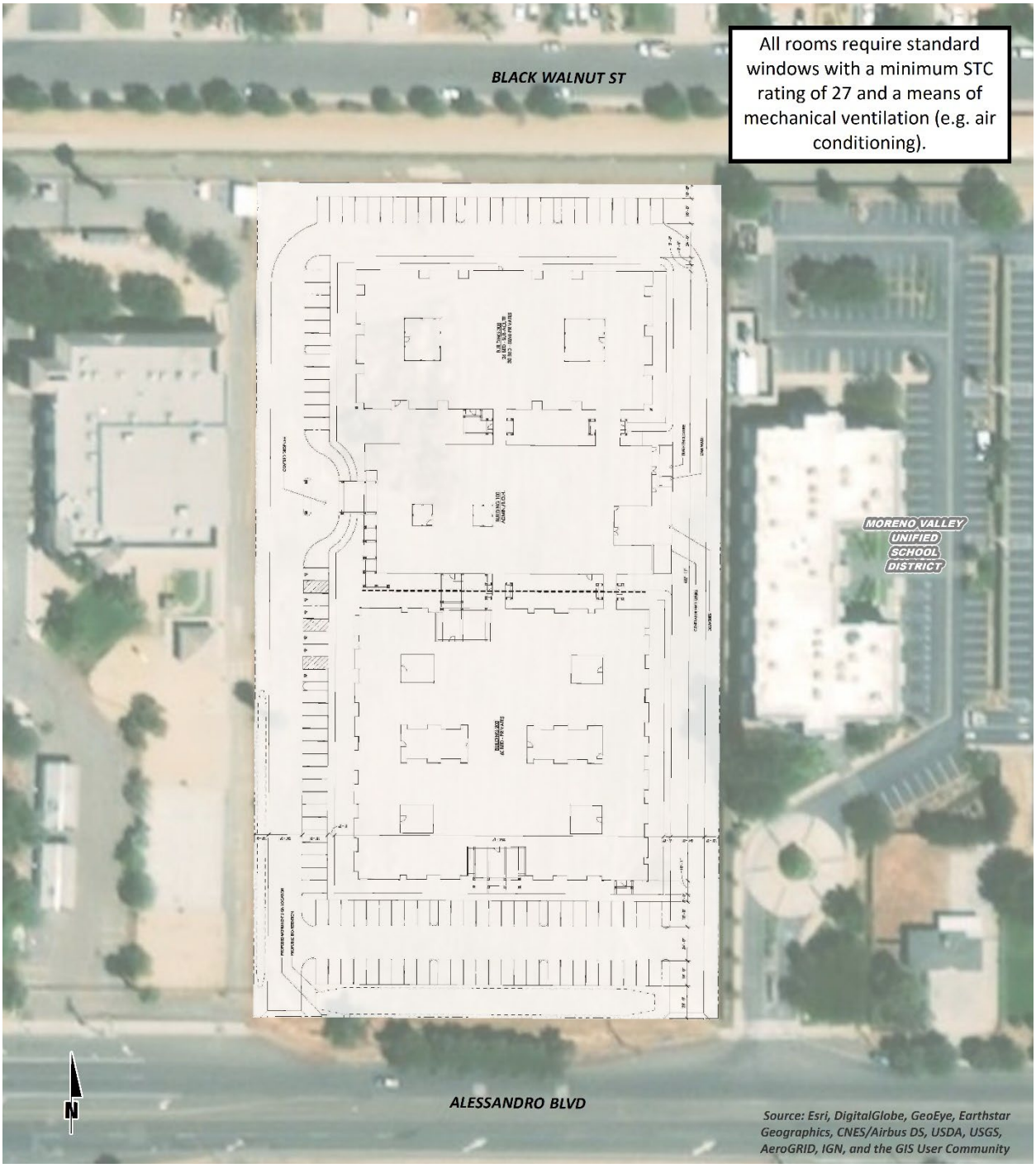
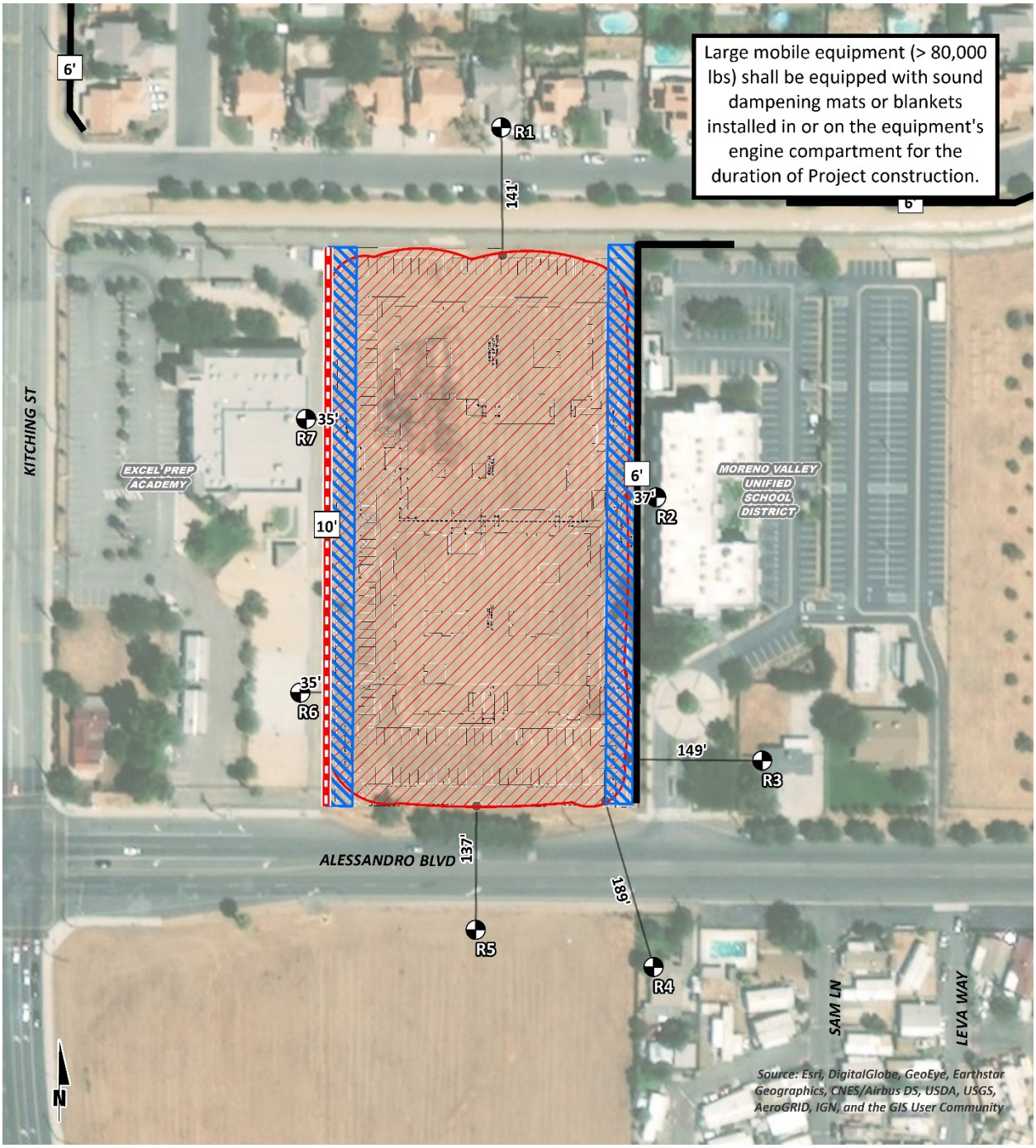


EXHIBIT ES-B: SUMMARY OF CONSTRUCTION MITIGATION MEASURES



LEGEND:

- Receiver Locations
- 10' Barrier Height (in feet)
- Existing Barrier
- Distance from receiver to construction activity (in feet)
- Construction Activity
- Temporary Noise Barrier
- 50-foot buffer for large mobile equipment (> 80,000 lbs) and loaded trucks

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1 INTRODUCTION

This noise analysis has been completed to determine the noise impacts associated with the development of the proposed Moreno Valley Skilled Nursing Facility ("Project"). This noise study briefly describes the proposed Project, provides information regarding noise fundamentals, describes the local regulatory setting, provides the study methods and procedures for traffic noise analysis, and evaluates the future exterior noise environment. In addition, this study includes an analysis of the potential Project-related long-term operational and short-term construction noise impacts.

1.1 SITE LOCATION

The proposed Moreno Valley Skilled Nursing Facility site is located on the north side of Alessandro Boulevard, west of Kitching Street in the City of Moreno Valley, as shown on Exhibit 1-A. Existing uses in the Project study area include existing residential homes north, southeast, west, and east of the Project site, the Excel Prep Academy school use west of the Project site, and office uses including the Moreno Valley Unified School District east of the Project site.

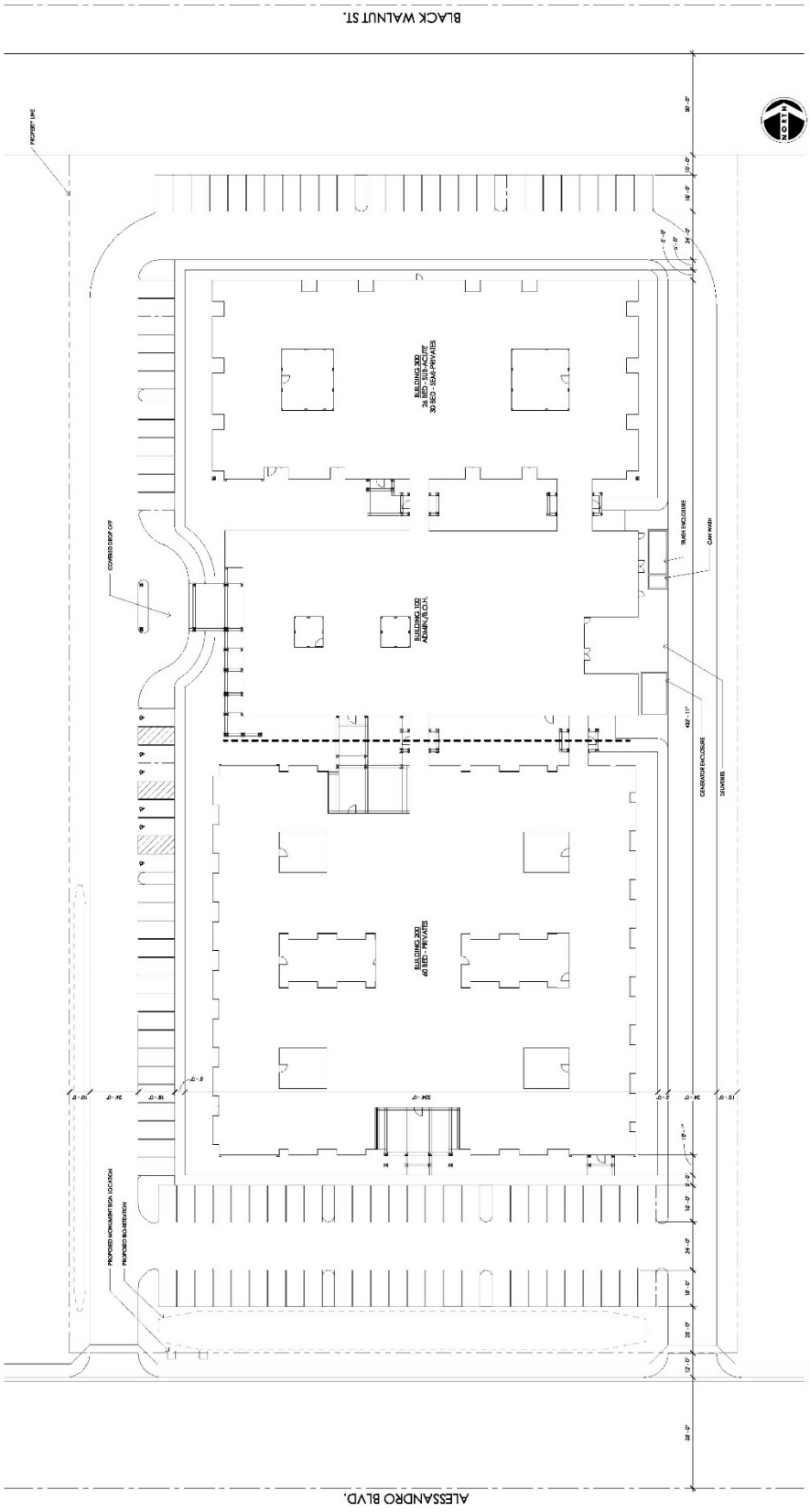
The March Air Reserve Base/Inland Port Airport (MARB/IPA) runway is located approximately 3.4 miles southwest of the Project site, and Interstate 215 (I-215) is located roughly 3.6 miles southwest of the Project site.

1.2 PROJECT DESCRIPTION

The Project proposes the development of an 88 dwelling unit assisted living facility on a 4.54-acre parcel, as shown on Exhibit 1-B. The on-site Project-related noise sources are expected to include: roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements.

EXHIBIT 1-A: LOCATION MAP

EXHIBIT 1-B: SITE PLAN



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2 FUNDAMENTALS

Noise has been simply defined as "unwanted sound." Sound becomes unwanted when it interferes with normal activities, when it causes actual physical harm or when it has adverse effects on health. Noise is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A-weighted decibels (dBA) approximate the subjective response of the human ear to broad frequency noise source by discriminating against very low and very high frequencies of the audible spectrum. They are adjusted to reflect only those frequencies which are audible to the human ear. Exhibit 2-A presents a summary of the typical noise levels and their subjective loudness and effects that are described in more detail below.

EXHIBIT 2-A: TYPICAL NOISE LEVELS

COMMON OUTDOOR ACTIVITIES	COMMON INDOOR ACTIVITIES	A - WEIGHTED SOUND LEVEL dBA	SUBJECTIVE LOUDNESS	EFFECTS OF NOISE
THRESHOLD OF PAIN		140	INTOLERABLE OR DEAFENING	HEARING LOSS
NEAR JET ENGINE		130		
		120		
JET FLY-OVER AT 300m (1000 ft)	ROCK BAND	110		
LOUD AUTO HORN		100	VERY NOISY	
GAS LAWN MOWER AT 1m (3 ft)		90		
DIESEL TRUCK AT 15m (50 ft), at 80 km/hr (50 mph)	FOOD BLENDER AT 1m (3 ft)	80		SPEECH INTERFERENCE
NOISY URBAN AREA, DAYTIME	VACUUM CLEANER AT 3m (10 ft)	70	LOUD	
HEAVY TRAFFIC AT 90m (300 ft)	NORMAL SPEECH AT 1m (3 ft)	60		
QUIET URBAN DAYTIME	LARGE BUSINESS OFFICE	50	MODERATE	SLEEP DISTURBANCE
QUIET URBAN NIGHTTIME	THEATER, LARGE CONFERENCE ROOM (BACKGROUND)	40		
QUIET SUBURBAN NIGHTTIME	LIBRARY	30	FAINT	NO EFFECT
QUIET RURAL NIGHTTIME	BEDROOM AT NIGHT, CONCERT HALL (BACKGROUND)	20		
	BROADCAST/RECORDING STUDIO	10	VERY FAINT	
LOWEST THRESHOLD OF HUMAN HEARING	LOWEST THRESHOLD OF HUMAN HEARING	0		

Source: Environmental Protection Agency Office of Noise Abatement and Control, Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety (EPA/ONAC 550/9-74-004) March 1974.

2.1 RANGE OF NOISE

Since the range of intensities that the human ear can detect is so large, the scale frequently used to measure intensity is a scale based on multiples of 10, the logarithmic scale. The scale for measuring intensity is the decibel scale. Each interval of 10 decibels indicates a sound energy ten times greater than before, which is perceived by the human ear as being roughly twice as loud. (10) The most common sounds vary between 40 dBA (very quiet) to 100 dBA (very loud). Normal conversation at three feet is roughly at 60 dBA, while loud jet engine noises equate to 110 dBA

at approximately 100 feet, which can cause serious discomfort. (11) Another important aspect of noise is the duration of the sound and the way it is described and distributed in time.

2.2 NOISE DESCRIPTORS

Environmental noise descriptors are generally based on averages, rather than instantaneous, noise levels. The most commonly used figure is the equivalent level (L_{eq}). Equivalent sound levels are not measured directly but are calculated from sound pressure levels typically measured in A-weighted decibels (dBA). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period and is commonly used to describe the "average" noise levels within the environment.

Peak hour or average noise levels, while useful, do not completely describe a given noise environment. Noise levels lower than peak hour may be disturbing if they occur during times when quiet is most desirable, namely evening and nighttime (sleeping) hours. To account for this, the Day-Night Average Noise Level (LDN) and the Community Noise Equivalent Level (CNEL), representing a composite 24-hour noise level is utilized. The LDN and CNEL are weighted averages of the intensity of a sound, with corrections for time of day, and averaged over 24 hours. The LDN time of day corrections include the addition of 10 decibels to dBA L_{eq} sound levels at night between 10:00 p.m. and 7:00 a.m. The CNEL time of day corrections require the addition of 5 decibels to dBA L_{eq} sound levels in the evening from 7:00 p.m. to 10:00 p.m., in addition to the corrections for the LDN. These additions are made to account for the noise sensitive time periods during the evening and night hours when sound appears louder. LDN and CNEL do not represent the actual sound level heard at any particular time, but rather represent the total sound exposure. The City of Moreno Valley relies on the 24-hour CNEL level to assess land use compatibility with transportation related noise sources, and therefore, this analysis uses the CNEL noise level to apply the more conservative evening hour corrections to the 24-hour noise levels.

2.3 SOUND PROPAGATION

When sound propagates over a distance, it changes in level and frequency content. The manner in which noise reduces with distance depends on the following factors.

2.3.1 GEOMETRIC SPREADING

Sound from a localized source (i.e., a stationary point source) propagates uniformly outward in a spherical pattern. The sound level attenuates (or decreases) at a rate of 6 dB for each doubling of distance from a point source. Highways consist of several localized noise sources on a defined path and hence can be treated as a line source, which approximates the effect of several point sources. Noise from a line source propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of 3 dB for each doubling of distance from a line source. (10)

2.3.2 Ground Absorption

The propagation path of noise from a highway to a receptor is usually very close to the ground. Noise attenuation from ground absorption and reflective wave canceling adds to the attenuation associated with geometric spreading. Traditionally, the excess attenuation has also been expressed in terms of attenuation per doubling of distance. This approximation is usually sufficiently accurate for distances of less than 200 ft. For acoustically hard sites (i.e., sites with a reflective surface between the source and the receptor, such as a parking lot or body of water), no excess ground attenuation is assumed. For acoustically absorptive or soft sites (i.e., those sites with an absorptive ground surface between the source and the receptor such as soft dirt, grass, or scattered bushes and trees), an excess ground attenuation value of 1.5 dB per doubling of distance is normally assumed. When added to the cylindrical spreading, the excess ground attenuation results in an overall drop-off rate of 4.5 dB per doubling of distance from a line source. (3)

2.3.3 Atmospheric Effects

Receptors located downwind from a source can be exposed to increased noise levels relative to calm conditions, whereas locations upwind can have lowered noise levels. Sound levels can be increased at large distances (e.g., more than 500 feet) due to atmospheric temperature inversion (i.e., increasing temperature with elevation). Other factors such as air temperature, humidity, and turbulence can also have significant effects. (10)

2.3.4 Shielding

A large object or barrier in the path between a noise source and a receptor can substantially attenuate noise levels at the receptor. The amount of attenuation provided by shielding depends on the size of the object and the frequency content of the noise source. Shielding by trees and other such vegetation typically only has an “out of sight, out of mind” effect. That is, the perception of noise impact tends to decrease when vegetation blocks the line-of-sight to nearby resident. However, for vegetation to provide a substantial, or even noticeable, noise reduction, the vegetation area must be at least 15 feet in height, 100 feet wide and dense enough to completely obstruct the line-of sight between the source and the receiver. This size of vegetation may provide up to 5 dBA of noise reduction. The FHWA does not consider the planting of vegetation to be a noise abatement measure. (3)

2.4 Noise Control

Noise control is the process of obtaining an acceptable noise environment for a particular observation point or receptor by controlling the noise source, transmission path, receptor, or all three. This concept is known as the source-path-receptor concept. In general, noise control measures can be applied to any and all of these three elements.

2.5 Noise Barrier Attenuation

Effective noise barriers can reduce noise levels by 10 to 15 dBA, cutting the loudness of traffic noise in half. A noise barrier is most effective when placed close to the noise source or receptor.

Noise barriers, however, do have limitations. For a noise barrier to work, it must be high enough and long enough to block the path of the noise source. (3)

2.6 LAND USE COMPATIBILITY WITH NOISE

Some land uses are more tolerant of noise than others. For example, schools, hospitals, churches, and residences are more sensitive to noise intrusion than are commercial or industrial developments and related activities. As ambient noise levels affect the perceived amenity or livability of a development, so too can the mismanagement of noise impacts impair the economic health and growth potential of a community by reducing the area's desirability as a place to live, shop and work. For this reason, land use compatibility with the noise environment is an important consideration in the planning and design process. The FHWA encourages State and Local government to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that the developments are planned, designed, and constructed in such a way that noise impacts are minimized. (12)

2.7 COMMUNITY RESPONSE TO NOISE

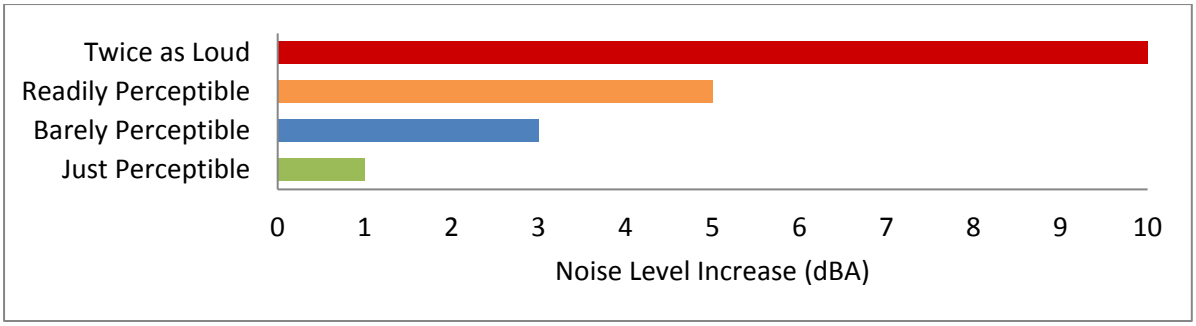
Community responses to noise may range from registering a complaint by telephone or letter, to initiating court action, depending upon each individual's susceptibility to noise and personal attitudes about noise. Several factors are related to the level of community annoyance including:

- Fear associated with noise producing activities;
- Socio-economic status and educational level;
- Perception that those affected are being unfairly treated;
- Attitudes regarding the usefulness of the noise-producing activity;
- Belief that the noise source can be controlled.

Approximately ten percent of the population has a very low tolerance for noise and will object to any noise not of their making. Consequently, even in the quietest environment, some complaints will occur. Another twenty-five percent of the population will not complain even in very severe noise environments. Thus, a variety of reactions can be expected from people exposed to any given noise environment. (13) Surveys have shown that about ten percent of the people exposed to traffic noise of 60 dBA will report being highly annoyed with the noise, and each increase of one dBA is associated with approximately two percent more people being highly annoyed. When traffic noise exceeds 60 dBA or aircraft noise exceeds 55 dBA, people may begin to complain. (13)

Despite this variability in behavior on an individual level, the population as a whole can be expected to exhibit the following responses to changes in noise levels as shown on Exhibit 2-B. An increase or decrease of 1 dBA cannot be perceived except in carefully controlled laboratory experiments, a change of 3 dBA are considered *barely perceptible*, and changes of 5 dBA are considered *readily perceptible*. (3)

EXHIBIT 2-B: NOISE LEVEL INCREASE PERCEPTION



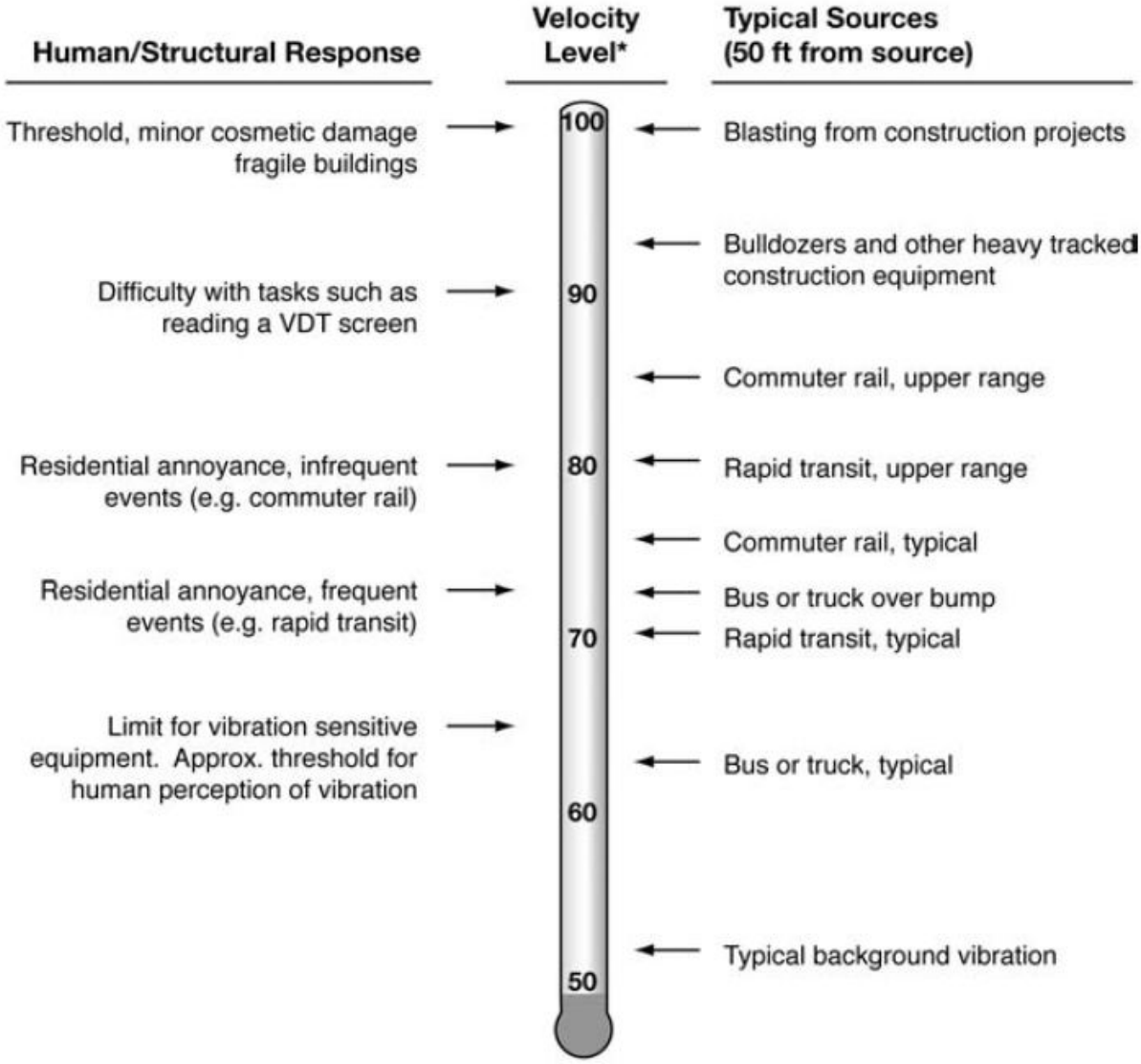
2.8 VIBRATION

According to the Federal Transit Administration (FTA) *Transit Noise Impact and Vibration Assessment* (14), vibration is the periodic oscillation of a medium or object. The rumbling sound caused by the vibration of room surfaces is called structure-borne noise. Sources of ground-borne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or human-made causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous, such as factory machinery, or transient, such as explosions. As is the case with airborne sound, ground-borne vibrations may be described by amplitude and frequency.

There are several different methods that are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe vibration impacts to buildings but is not always suitable for evaluating human response (annoyance) because it takes some time for the human body to respond to vibration signals. Instead, the human body responds to average vibration amplitude often described as the root mean square (RMS). The RMS amplitude is defined as the average of the squared amplitude of the signal and is most frequently used to describe the effect of vibration on the human body. Decibel notation (VdB) is commonly used to measure RMS. Decibel notation (VdB) serves to reduce the range of numbers used to describe human response to vibration. Typically, ground-borne vibration generated by man-made activities attenuates rapidly with distance from the source of the vibration. Sensitive receivers for vibration include structures (especially older masonry structures), people (especially residents, the elderly, and sick), and vibration-sensitive equipment.

The background vibration-velocity level in residential areas is generally 50 VdB. Ground-borne vibration is normally perceptible to humans at approximately 65 VdB. For most people, a vibration-velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels. Typical outdoor sources of perceptible ground-borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the ground-borne vibration is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration-velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings. Exhibit 2-C illustrates common vibration sources and the human and structural response to ground-borne vibration.

EXHIBIT 2-C: TYPICAL LEVELS OF GROUND-BORNE VIBRATION



** RMS Vibration Velocity Level in VdB relative to 10^{-6} inches/second*

Source: Federal Transit Administration (FTA) Transit Noise Impact and Vibration Assessment.

3 REGULATORY SETTING

To limit population exposure to physically and/or psychologically damaging as well as intrusive noise levels, the federal government, the State of California, various county governments, and most municipalities in the state have established standards and ordinances to control noise. In most areas, automobile and truck traffic is the major source of environmental noise. Traffic activity generally produces an average sound level that remains fairly constant with time. Air and rail traffic, and commercial and industrial activities are also major sources of noise in some areas. Federal, state, and local agencies regulate different aspects of environmental noise. Federal and state agencies generally set noise standards for mobile sources such as aircraft and motor vehicles, while regulation of stationary sources is left to local agencies.

3.1 STATE OF CALIFORNIA NOISE REQUIREMENTS

The State of California regulates freeway noise, sets standards for sound transmission, provides occupational noise control criteria, identifies noise standards, and provides guidance for local land use compatibility. State law requires that each county and city adopt a General Plan that includes a Noise Element which is to be prepared according to guidelines adopted by the Governor's Office of Planning and Research (OPR). (15) The purpose of the Noise Element is to *limit the exposure of the community to excessive noise levels*.

3.2 STATE OF CALIFORNIA GREEN BUILDING STANDARDS CODE

The State of California's noise insulation standards are codified in the California Code of Regulations, Title 24, Building Standards Administrative Code, Part 2, and the California Building Code. These noise standards are applied to new construction in California for the purpose of controlling interior noise levels resulting from exterior noise sources. The regulations specify that acoustical studies must be prepared when noise-sensitive structures, such as residential buildings, schools, or hospitals, are developed near major transportation noise sources, and where such noise sources create an exterior noise level of 60 dBA CNEL or higher. Acoustical studies that accompany building plans for noise-sensitive land uses must demonstrate that the structure has been designed to limit interior noise in habitable rooms to acceptable noise levels. For new residential buildings, schools, and hospitals, the acceptable interior noise limit for new construction is 45 dBA CNEL.

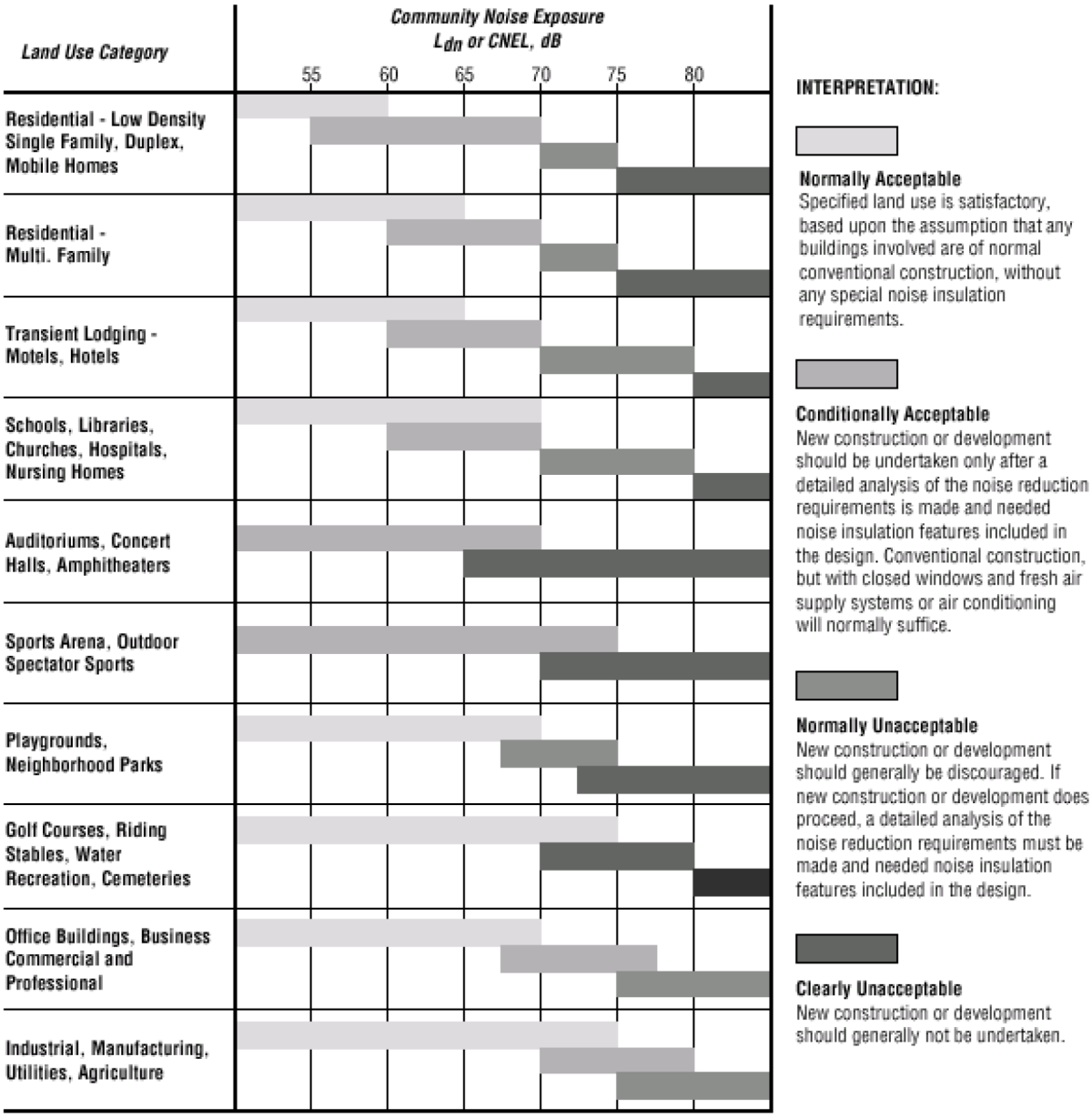
3.3 CITY OF MORENO VALLEY GENERAL PLAN

The City of Moreno Valley Noise Element typically provides the standards for land use compatibility for community noise exposure. However, the City of Moreno Valley General Plan does not include a noise element or specific transportation-related noise standards. Rather, noise is considered in the Environmental Safety section of the General Plan Safety Element. (16) While the General Plan provides background and noise fundamentals, it does not identify criteria to assess the impacts associated with off-site transportation-related noise impacts. Therefore, for this analysis, the transportation noise criteria are derived from standards contained in the California Office of Planning and Research (OPR) *General Plan Guidelines*.

The OPR land use/noise compatibility standards are used by many California cities and counties and specify the maximum noise levels allowable for new developments impacted by transportation noise sources. The OPR land use/noise compatibility criteria, found in Figure 2 of the *General Plan Guidelines, Appendix C: Noise Element Guidelines,* identify the criteria for nursing home land uses such as the Project, as shown on Exhibit 3-A. When the unmitigated exterior noise levels approach 60 dBA CNEL Project land use is considered *normally acceptable*. With exterior noise levels range from 60 to 70 dBA CNEL, nursing home land uses are considered *conditionally acceptable*, and with exterior noise levels greater than 70 dBA CNEL, they are considered *normally unacceptable*. For *normally unacceptable* land use, *new construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.* (15)

The purpose of the transportation noise criteria is to protect, create, and maintain an environment free from noise and vibration that may jeopardize the health or welfare of sensitive receptors, or degrade quality of life. City General Policies (City of Moreno Valley General Plan, pp.9-31, 9-32) act to ensure that when exterior noise levels exceed 65 dBA CNEL at sensitive receptors, mitigation is provided to ensure that interior noise levels of 45 dBA CNEL are maintained. General Plan Policies in this regard are consistent with, and support, the California Building Code interior noise standards.

EXHIBIT 3-A: LAND USE NOISE COMPATIBILITY CRITERIA



Source: OPR General Plan Guidelines, Appendix C: Noise Element Guidelines, Figure 2.

3.4 OPERATIONAL NOISE STANDARDS

To analyze noise impacts originating from a designated fixed location or private property such as the Moreno Valley Skilled Nursing Facility Project, stationary-source (operational) noise such as the expected roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements are typically evaluated against standards established under a City's Municipal Code.

The City of Moreno Valley Municipal Code, Chapter 11.80 *Noise Regulation*, provides performance standards and noise control guidelines for determining and mitigating non-transportation or stationary-source noise impacts from operations at private properties. The City of Moreno Valley Municipal Code defines *Maximum Sound Levels (in dB(A)) for Source Land Uses* in Table 11.80.030-2 for *Residential* and *Commercial* land uses. As defined by the Municipal Code, Section 11.80.020 *Definitions*, *Residential* land use *means all uses of land primarily for dwelling units, as well as hospitals, schools, colleges and universities, and places of religious assembly.* (9) For the purpose of this analysis, the Moreno Valley Skilled Nursing Facility Project is considered *Residential* land use. Based on this standard, the operational noise level limits for residential land use, from Table 11.80.030-2, of 60 dBA L_{eq} during the daytime (8:00 a.m. to 10:00 p.m.) hours and 55 dBA L_{eq} during the nighttime (10:01 p.m. to 7:59 a.m.) hours shall apply to the operational noise from the Project.

Further, Section 11.80.030 (C) *Prohibited Acts*, *Nonimpulsive Sound Decibel Limits*, states: *No person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any nonimpulsive sound which exceeds the limits set forth for the source land use category (as defined in Section 11.80.020) in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on a privately owned property…* (9) Therefore, at a distance of 200 feet from the property line, the Project's operational noise levels shall not exceed the 60 dBA L_{eq} daytime and 50 dBA L_{eq} nighttime noise level standards for residential land uses, as shown on Table 3-1.

The City of Moreno Valley Municipal Code also identifies continuous sound level limits in Table 11.80.030-1 based on the Center for Disease Control and Prevention and the National Institute for Occupational Safety and Health (NIOSH) noise exposure guidelines. A division of the U.S. Department of Health and Human Services, NIOSH identifies a noise level threshold based on the duration of exposure to the source. The City of Moreno Valley noise level threshold starts at 90 dBA for more than eight hours per day, and for every increase, the exposure time is reduced. The City of Moreno Valley identifies noise level thresholds of 92 dBA for more than 6 hours per day, 95 dBA for more than 4 hour per day, 97 dBA for more than 3 hours per day, and up to 100 dBA for more than 2 hours per day. However, this noise study uses the more restrictive City of Moreno Valley noise level limits identified on Table 11.80.030-2 for source land uses in the Municipal Code, shown on Table 3-1 of this report, to evaluate the potential operational noise levels due to the operation of the Project.

TABLE 3-1: OPERATIONAL NOISE STANDARDS AT 200 FEET FROM THE SOURCE

Jurisdiction	Source Land Use	Time Period	Maximum Noise Level for Source Land Uses @ 200' (dBA L_{eq})[2]
City of Moreno Valley[1]	Residential	Daytime (8:00 a.m. - 10:00 p.m.)	60
		Nighttime (10:01 p.m. - 7:59 a.m.)	55

[1] Source: City of Moreno Valley Municipal Code, Chapter 11.80 Noise Regulation, Table 11.80.030-2 Maximum Sound Levels (in dB(A)) for Source Land Uses when measured at a distance of 200 feet from the property line of the source land use (Appendix 3.1).
[2] L_{eq} represents a steady state sound level containing the same total energy as a time varying signal over a given sample period.

3.5 CONSTRUCTION NOISE STANDARDS

To analyze noise impacts originating from the construction of the Moreno Valley Skilled Nursing Facility site, noise from construction activities are typically evaluated against standards established under a City's Municipal Code. The Municipal Code noise standards for construction are described below for the City of Moreno Valley to determine the potential noise impacts at nearby receiver locations. The construction-related noise standards are shown on Table 3-2.

The Municipal Code noise standards for construction are described below for the City of Moreno Valley to determine the potential noise impacts at nearby sensitive receiver locations. As a subset of its stationary-source noise regulations, the City Municipal Code establishes permitted hours of construction activity. More specifically, Municipal Code Section 11.80.030 (D) (7), *Construction and Demolition*, provides the following:

> *No person shall operate, or cause operation of any tools or equipment used in construction, drilling, repair, alteration, or demolition work between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee.*

Therefore, based on the Section 11.80.030 (D) (7) construction regulations, a construction-related *noise disturbance* occurs if Project construction activity occurs outside of the permitted hours. However, for this analysis, the stationary-source noise level limits of 60 dBA L_{eq} (daytime) for residential uses, and 65 dBA L_{eq} (daytime) for commercial uses are used as appropriate thresholds for the land uses (e.g. residential homes and office buildings, respectively) in the Project study area. In addition, grading operations shall be limited to the hours identified in Section 8.21.050 (O) of 7:00 a.m. to 6:00 p.m., Monday through Friday, and 8:00 a.m. to 4:00 p.m. on weekends and holidays or as approved by the City Engineer. The City of Moreno Valley construction noise standards are shown on Table 3-2 and included in Appendix 3.1. As previously discussed in Section 3.4, the construction noise level threshold used in this noise study represents a conservative approach, since it is more restrictive than the continuous sound level limits of Table 11.80.030-1 of the City of Moreno Valley Municipal Code.

TABLE 3-2: CONSTRUCTION NOISE STANDARDS FROM THE SOURCE LAND USE

Jurisdiction	Permitted Hours of Construction Activity	Construction Noise Level Standards (dBA L_{eq})[2]	
		Residential	Commercial
City of Moreno Valley[1]	General Activity: 7:00 a.m. to 8:00 p.m. on any day. Grading is limited to 7:00 a.m. to 6:00 p.m. Monday to Friday; 8:00 a.m. to 4:00 p.m. on weekends and holidays.	60	65

[1] Source: City of Moreno Valley Municipal Code, Section 11.80.030 (D) (7) and Section 8.21.050 (O) (Appendix 3.1).
[2] Acceptable threshold for determining the relative significance of short-term Project construction noise levels, based on the City of Moreno Valley stationary noise standards by land use type.
"Daytime" = 8:00 a.m. to 10:00 p.m.; "Nighttime" = 10:01 p.m. to 7:59 a.m.

3.6 VIBRATION STANDARDS

The City of Moreno Valley has not identified or adopted specific vibration level standards. However, the United States Department of Transportation Federal Transit Administration (FTA) provides guidelines for maximum-acceptable vibration criteria for different types of land uses. These guidelines allow 80 VdB for residential uses and buildings where people normally sleep. (14) Operational and construction activities can result in varying degrees of ground-borne vibration, depending on the equipment and methods used, distance to the affected structures and soil type. Construction vibration is generally associated with pile driving and rock blasting. Other construction equipment such as air compressors, light trucks, hydraulic loaders, etc., generates little or no ground vibration. Large bulldozers and loaded trucks can cause perceptible vibration levels proximate receptors. The FTA guidelines of 80 VdB for sensitive land uses provide a substantiated basis for determining the relative significance of potential Project-related vibration impacts due to on-site operational and construction activities.

4 SIGNIFICANCE CRITERIA

The following significance criteria are based on guidance provided by Appendix G of the California Environmental Quality Act (CEQA) Guidelines. For the purposes of this report, impacts would be potentially significant if the Project results in or causes:

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 ground-borne vibration or ground-borne noise levels.

C. A substantial permanent increase in ambient noise levels in the Project vicinity above existing levels without the proposed Project; or

D. A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above noise levels existing without the proposed 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, expose people residing or working in the Project area to excessive noise levels.

F. For a project within the vicinity of a private airstrip, expose people residing or working in the Project area to excessive noise levels.

While the CEQA Guidelines and the City of Moreno Valley General Plan Guidelines provide direction on noise compatibility and establish noise standards by land use type that are sufficient to assess the significance of noise impacts under CEQA Guideline A, they do not define the levels at which increases are considered substantial for use under Guidelines B, C, and D. CEQA Guidelines E and F apply to nearby public and private airports, if any, and the Project's land use compatibility. The closest airport which would require additional noise analysis under CEQA guidelines E and F is the MARB/IPA. The closest airport to the Project site is MARB/IPA which is located approximately 3.4 miles southwest of the Project site, and therefore, the Project site is not located within two miles of a public airport or within an airport land use plan; nor is the Project within the vicinity of a private airstrip. As such, the Project site would not be exposed to excessive noise levels from airport operations, and therefore, impacts are considered *less than significant,* and no further noise analysis is conducted in relation to Guidelines E and F.

Noise level increases resulting from the Project are evaluated based on the Appendix G CEQA Guidelines described above at the closest sensitive receiver locations. Under CEQA, consideration must be given to the magnitude of the increase, the existing ambient noise levels and the location of noise-sensitive receivers in order to determine if a noise increase represents a significant adverse environmental impact. This approach recognizes *that there is no single noise increase that renders the noise impact significant.* (17)

Unfortunately, there is no completely satisfactory way to measure the subjective effects of noise or of the corresponding human reactions of annoyance and dissatisfaction. This is primarily because of the wide variation in individual thresholds of annoyance and differing individual experiences with noise. Thus, an important way of determining a person's subjective reaction to a new noise is the comparison of it to the existing environment to which one has adapted—the so-called *ambient* environment.

In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will typically be judged. The Federal Interagency Committee on Noise (FICON) (18) developed guidance to be used for the assessment of project-generated increases in noise levels that consider the ambient noise level. The FICON recommendations are based on studies that relate aircraft noise levels to the percentage of persons highly annoyed by aircraft noise. Although the FICON recommendations were specifically developed to assess aircraft noise impacts, these recommendations are often used in environmental noise impact assessments involving the use of cumulative noise exposure metrics, such as the average-daily noise level (i.e., CNEL) or energy average noise level (i.e., L_{eq}).

For example, if the ambient noise environment is quiet (<60 dBA) and the new noise source greatly increases the noise levels, an impact may occur if the noise criteria may be exceeded. Therefore, for this analysis, FICON identifies a *readily perceptible* 5 dBA or greater project-related noise level increase is considered a significant impact when the noise criteria for a given land use is exceeded. According to the FICON, in areas where the without project noise levels range from 60 to 65 dBA, a 3 dBA *barely perceptible* noise level increase appears to be appropriate for most people. When the without project noise levels already exceed 65 dBA, any increase in community noise louder than 1.5 dBA or greater is considered a significant impact if the noise criteria for a given land use is exceeded, since it likely contributes to an existing noise exposure exceedance. Table 4-1 below provides a summary of the potential noise impact significance criteria, based on guidance from FICON.

TABLE 4-1: SIGNIFICANCE OF NOISE IMPACTS AT NOISE-SENSITIVE RECEIVERS

Without Project Noise Level	Potential Significant Impact
< 60 dBA	5 dBA or more
60 - 65 dBA	3 dBA or more
> 65 dBA	1.5 dBA or more

Federal Interagency Committee on Noise (FICON), 1992.

4.1 SIGNIFICANCE CRITERIA SUMMARY

Noise impacts shall be considered significant if any of the following occur as a direct result of the proposed development. Table 4-2 shows the significance criteria summary matrix.

OFF-SITE TRAFFIC NOISE

- When the noise levels at existing and future noise-sensitive land uses (e.g. residential, etc.):
    - are less than 60 dBA CNEL and the Project creates a *readily perceptible* 5 dBA CNEL or greater Project-related noise level increase; or
    - range from 60 to 65 dBA CNEL and the Project creates a *barely perceptible* 3 dBA CNEL or greater Project-related noise level increase; or
    - already exceed 65 dBA CNEL, and the Project creates a community noise level impact of greater than 1.5 dBA CNEL (FICON, 1992).

ON-SITE TRAFFIC NOISE

- If the on-site traffic noise levels exceed the 70 dBA CNEL *normally unacceptable* land use compatibility criteria and interior noise levels exceed 45 dBA CNEL (Figure 2 of the OPR *General Plan Guidelines, Appendix C: Noise Element Guidelines*).

OPERATIONAL NOISE

- If Project-related operational (stationary source) noise levels:
    - exceed the 60 dBA L_{eq} daytime or 55 dBA L_{eq} nighttime noise level standards at 200 feet from the property line of the noise source (City of Moreno Valley Municipal Code, Table 11.80.030-2); or
    - exceed the 60 dBA L_{eq} daytime or 55 dBA L_{eq} nighttime noise level standards at residential receivers in the City of Moreno Valley (City of Moreno Valley Municipal Code, Table 11.80.030-2).
- If the existing ambient noise levels at the nearby noise-sensitive receivers near the Project site:
    - are less than 60 dBA L_{eq} and the Project creates a *readily perceptible* 5 dBA L_{eq} or greater Project-related noise level increase; or
    - range from 60 to 65 dBA L_{eq} and the Project creates a *barely perceptible* 3 dBA L_{eq} or greater Project-related noise level increase; or
    - already exceed 65 dBA L_{eq}, and the Project creates a community noise level increase of greater than 1.5 dBA L_{eq} (FICON, 1992).

CONSTRUCTION NOISE AND VIBRATION

- If Project-related construction activities:
    - create noise levels at sensitive residential receivers in the City of Moreno Valley which exceed the short-term daytime construction noise level threshold of 60 dBA L_{eq} at noise-sensitive residential receiver locations or 65 dBA L_{eq} at non-noise-sensitive commercial receiver locations, or the continuous noise level limit of 90 dBA L_{eq} at any land use (based on the City of Moreno Valley Municipal Code, Table 11.80.030-2 noise level limits, and the Table 11.80.030-1 continuous noise level limits).

- If short-term project generated construction source vibration levels could exceed the FTA maximum acceptable vibration standard of 80 vibration decibels (VdB) at noise-sensitive receiver locations.

TABLE 4-2: SIGNIFICANCE CRITERIA SUMMARY

Analysis	Receiving Land Use	Condition(s)	Significance Criteria	
			Daytime	Nighttime
Off-Site	Noise-Sensitive[1]	if ambient is < 60 dBA CNEL	≥ 5 dBA CNEL Project increase	
		if ambient is 60 - 65 dBA CNEL	≥ 3 dBA CNEL Project increase	
		if ambient is > 65 dBA CNEL	≥ 1.5 dBA CNEL Project increase	
Operational	Noise-Sensitive	At 200' from the property line of the source[2]	60 dBA L_{eq}	55 dBA L_{eq}
		At residential land use[2]	60 dBA L_{eq}	55 dBA L_{eq}
		if ambient is < 60 dBA L_{eq}[1]	≥ 5 dBA L_{eq} Project increase	
		if ambient is 60 - 65 dBA L_{eq}[1]	≥ 3 dBA L_{eq} Project increase	
		if ambient is > 65 dBA L_{eq}[1]	≥ 1.5 dBA L_{eq} Project increase	
		Vibration Level Threshold[3]	80 VdB	n/a
Construction	Noise-Sensitive	At residential land use[2]	60 dBA L_{eq}	n/a
		At commercial land use[2]	65 dBA L_{eq}	n/a
		At any land use	90 dBA L_{eq}	n/a
		Vibration Level Threshold[3]	80 VdB	n/a

[1] Source: FICON, 1992.
[2] Source: City of Moreno Valley Municipal Code, Chapter 11.80 Noise Regulation (Appendix 3.1).
[3] Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.
"Daytime" = 8:00 a.m. - 10:00 p.m.; "Nighttime" = 10:01 p.m. - 7:59 a.m.

5 EXISTING NOISE LEVEL MEASUREMENTS

To assess the existing noise level environment, five 24-hour noise level measurements were taken at potential receiver locations in the Project study area. The receiver locations were selected to describe and document the existing noise environment within the Project study area. Exhibit 5-A provides the boundaries of the Project study area and the noise level measurement locations. To fully describe the existing noise conditions, noise level measurements were collected by Urban Crossroads, Inc. on Wednesday, July 11th, 2018. Appendix 5.1 includes study area photos.

5.1 MEASUREMENT PROCEDURE AND CRITERIA

To describe the existing noise environment, the hourly noise levels were measured during typical weekday conditions over a 24-hour period. By collecting individual hourly noise level measurements, it is possible to describe the daytime and nighttime hourly noise levels and calculate the 24-hour CNEL. The long-term noise readings were recorded using Piccolo Type 2 integrating sound level meter and dataloggers. The Piccolo sound level meters were calibrated using a Larson-Davis calibrator, Model CAL 150. All noise meters were programmed in "slow" mode to record noise levels in "A" weighted form. The sound level meters and microphones were equipped with a windscreen during all measurements. All noise level measurement equipment satisfies the American National Standards Institute (ANSI) standard specifications for sound level meters ANSI S1.4-2014/IEC 61672-1:2013. (19)

5.2 NOISE MEASUREMENT LOCATIONS

The long-term noise level measurements were positioned as close to the nearest sensitive receiver locations as possible to assess the existing ambient hourly noise levels surrounding the Project site. Both Caltrans and the FTA recognize that it is not reasonable to collect noise level measurements that can fully represent every part of a private yard, patio, deck, or balcony normally used for human activity when estimating impacts for new development projects. This is demonstrated in the Caltrans general site location guidelines which indicate that, *sites must be free of noise contamination by sources other than sources of interest. Avoid sites located near sources such as barking dogs, lawnmowers, pool pumps, and air conditioners unless it is the express intent of the analyst to measure these sources*. (10) Further, FTA guidance states, t*hat it is not necessary nor recommended that existing noise exposure be determined by measuring at every noise-sensitive location in the project area. Rather, the recommended approach is to characterize the noise environment for clusters of sites based on measurements or estimates at representative locations in the community*. (14)

Based on recommendations of Caltrans and the FTA, it is not necessary to collect measurements at each individual building or residence, because each receiver measurement represents a group of buildings that share acoustical equivalence. (14) In other words, the area represented by the receiver shares similar shielding, terrain, and geometric relationship to the reference noise source. Receivers represent a location of noise sensitive areas and are used to estimate the future noise level impacts. Collecting reference ambient noise level measurements at the nearby

sensitive receiver locations allows for a comparison of the before and after Project noise levels and is necessary to assess potential noise impacts due to the Project's contribution to the ambient noise levels.

5.3 Noise Measurement Results

The noise measurements presented below focus on the average or equivalent sound levels (L_{eq}). The equivalent sound level (L_{eq}) represents a steady state sound level containing the same total energy as a time varying signal over a given sample period. Table 5-1 identifies the hourly daytime (8:00 a.m. to 10:00 p.m.) and nighttime (10:01 p.m. to 7:59 a.m.) noise levels at each noise level measurement location consistent with the City of Moreno Valley Municipal Code. Appendix 5.2 provides a summary of the existing hourly ambient noise levels described below:

- Location L1 represents the north of the Project site on Black Walnut Street near existing residential homes and the Excel Prep Academy. The noise level measurements collected show an overall 24-hour exterior noise level of 57.4 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 54.6 dBA L_{eq} with an average nighttime noise level of 49.6 dBA L_{eq}.
- Location L2 represents the noise levels west of the Project site on Alessandro Boulevard near the Moreno Valley Library and existing residential homes. The noise level measurements collected show an overall 24-hour exterior noise level of 73.0 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 69.3 dBA L_{eq} with an average nighttime noise level of 65.8 dBA L_{eq}.
- Location L3 represents the noise levels near the southwestern Project site boundaries adjacent to the Excel Prep Academy on Alessandro Boulevard. The noise level measurements collected show an overall 24-hour exterior noise level of 73.6 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 69.3 dBA L_{eq} with an average nighttime noise level of 66.9 dBA L_{eq}.
- Location L4 represents the noise levels near the eastern Project site boundary adjacent to Moreno Valley Unified School District and Allstate office uses. The noise level measurements collected show an overall 24-hour exterior noise level of 59.4 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 55.7 dBA L_{eq} with an average nighttime noise level of 52.7 dBA L_{eq}.
- Location L5 represents the noise levels southwest of the Project site on Kitching Street near an existing residential apartment community. The noise level measurements collected show an overall 24-hour exterior noise level of 73.1 dBA CNEL. The energy (logarithmic) average daytime noise level was calculated at 69.6 dBA L_{eq} with an average nighttime noise level of 65.9 dBA L_{eq}.

Table 5-1 provides the (energy average) noise levels used to describe the daytime and nighttime ambient conditions. These daytime and nighttime energy average noise levels represent the average of all hourly noise levels observed during these time periods expressed as a single number. Appendix 5.2 provides summary worksheets of the noise levels for each hour as well as the minimum, maximum, L_1, L_2, L_5, L_8, L_{25}, L_{50}, L_{90}, L_{95}, and L_{99} percentile noise levels observed during the daytime and nighttime periods.

The background ambient noise levels in the Project study area are dominated by the transportation-related noise associated with the arterial roadway network. This includes the auto and heavy truck activities near the noise level measurement locations. Additional background noise sources in the Project study area include aircraft overflight noise from the MARB/IPA. The 24-hour existing noise level measurements are shown on Table 5-1.

TABLE 5-1: 24-HOUR AMBIENT NOISE LEVEL MEASUREMENTS

Location[1]	Distance to Project Boundary (Feet)	Description	Energy Average Noise Level (dBA L_{eq})[2]		CNEL
			Daytime	Nighttime	
L1	70'	Located north of the Project site on Black Walnut Street near existing residential homes and the Excel Prep Academy.	54.6	49.6	57.4
L2	420'	Located west of the Project site on Alessandro Boulevard near the Moreno Valley Library and existing residential homes.	69.3	65.8	73.0
L3	0'	Located near the southwestern Project site boundaries adjacent to the Excel Prep Academy on Alessandro Boulevard.	69.3	66.9	73.6
L4	10'	Located near the eastern Project site boundary adjacent to Moreno Valley Unified School District and Allstate office uses.	55.7	52.7	59.4
L5	470'	Located southwest of the Project site on Kitching Street near an existing residential apartment community.	69.6	65.9	73.1

[1] See Exhibit 5-A for the noise level measurement locations.
[2] Energy (logarithmic) average hourly levels. The long-term 24-hour measurement worksheets are included in Appendix 5.2. "Daytime" = 8:00 a.m. to 10:00 p.m.; "Nighttime" = 10:01 p.m. to 7:59 a.m.

EXHIBIT 5-A: NOISE MEASUREMENT LOCATIONS

6 METHODS AND PROCEDURES

The following section outlines the methods and procedures used to model and analyze the future traffic noise environment.

6.1 FHWA TRAFFIC NOISE PREDICTION MODEL

The expected roadway noise level increases from vehicular traffic were calculated by Urban Crossroads, Inc. using a computer program that replicates the Federal Highway Administration (FHWA) Traffic Noise Prediction Model- FHWA-RD-77-108. (20) The FHWA Model arrives at a predicted noise level through a series of adjustments to the Reference Energy Mean Emission Level (REMEL). In California the national REMELs are substituted with the California Vehicle Noise (Calveno) Emission Levels. (21) Adjustments are then made to the REMEL to account for: the roadway classification (e.g., collector, secondary, major or arterial), the roadway active width (i.e., the distance between the center of the outermost travel lanes on each side of the roadway), the total average daily traffic (ADT), the travel speed, the percentages of automobiles, medium trucks, and heavy trucks in the traffic volume, the roadway grade, the angle of view (e.g., whether the roadway view is blocked), the site conditions ("hard" or "soft" relates to the absorption of the ground, pavement, or landscaping), and the percentage of total ADT which flows each hour throughout a 24-hour period.

6.2 ON-SITE TRAFFIC NOISE PREDICTION MODEL INPUTS

The on-site roadway parameters including the ADT volumes used for this analysis are presented on Table 6-1. Based on the City of Moreno Valley General Plan Environmental Impact Report, Alessandro Road is classified as a 6-lane Divided Major Arterial. (22) To predict the future on-site noise environment at the Project site, the City of Moreno Valley General Plan Environmental Impact Report *Daily Capacity Volumes* were used. The traffic volumes shown on Table 6-1 reflect future long-range traffic conditions needed to assess the future on-site traffic noise environment and to identify potential mitigation measures (if any) that address the worst-case future conditions. For the purposes of this analysis, soft site conditions were used to analyze the on-site traffic noise impacts for the Project study area. Soft site conditions account for the sound propagation loss over natural surfaces such as normal earth and ground vegetation. Research conducted by Caltrans has shown that the use of soft site conditions is appropriate for the application of the FHWA traffic noise prediction model used in this analysis. (23)

TABLE 6-1: ON-SITE ROADWAY PARAMETERS

Roadway	Lanes	Classification[1]	Design Capacity Volume[1]	Speed Limit (mph)[2]	Site Conditions
Alessandro Bl.	6	Divided Major Arterial	50,625	45	Soft

[1] Source: City of Moreno Valley General Plan Environmental Impact Report, Section 5.2 Traffic/Circulation, Tables 5.2-5 to 5.2-7.
[2] Posted speed limit on Alessandro Boulevard.

Table 6-2 presents the time of day vehicle splits by vehicle type, and Table 6-3 presents the total traffic flow distributions (vehicle mixes) used for this analysis. The vehicle mix provides the hourly distribution percentages of automobile, medium trucks and heavy trucks for input into the FHWA Model based on roadway types.

TABLE 6-2: TIME OF DAY VEHICLE SPLITS

Vehicle Type	Time of Day Splits[1]			Total of Time of Day Splits
	Daytime	Evening	Nighttime	
Autos	77.50%	12.90%	9.60%	100.00%
Medium Trucks	84.80%	4.90%	10.30%	100.00%
Heavy Trucks	86.50%	2.70%	10.80%	100.00%

[1] Source: Typical Southern California vehicle mix.
"Daytime" = 7:00 a.m. to 7:00 p.m.; "Evening" = 7:00 p.m. to 10:00 p.m.; "Nighttime" = 10:00 p.m. to 7:00 a.m.

TABLE 6-3: DISTRIBUTION OF TRAFFIC FLOW BY VEHICLE TYPE (VEHICLE MIX)

Classification	Total % Traffic Flow			Total
	Autos	Medium Trucks	Heavy Trucks	
All Roadways[1]	97.42%	1.84%	0.74%	100.00%

[1] Source: Typical Southern California vehicle mix.

To predict the future noise environment at the assisted living facility building within the Project site, coordinate information was collected to identify the noise transmission path between the noise source and receiver. The coordinate information is based on the Project site plan showing the plotting of the building in relationship to Alessandro Boulevard. The exterior noise level impacts at the first-floor building facade were placed five feet above the pad elevation.

6.3 VIBRATION ASSESSMENT

This analysis focuses on the potential ground-borne vibration associated with vehicular traffic and construction activities. Ground-borne vibration levels from automobile traffic are generally overshadowed by vibration generated by heavy trucks that roll over the same uneven roadway surfaces. However, due to the rapid drop-off rate of ground-borne vibration and the short duration of the associated events, vehicular traffic-induced ground-borne vibration is rarely perceptible beyond the roadway right-of-way, and rarely results in vibration levels that cause damage to buildings in the vicinity.

However, while vehicular traffic is rarely perceptible, construction has the potential to result in varying degrees of temporary ground vibration, depending on the specific construction activities and equipment used. Ground vibration levels associated with various types of construction equipment are summarized on Table 6-4. Based on the representative vibration levels presented for various construction equipment types, it is possible to estimate the human response (annoyance) using the following vibration assessment methods defined by the FTA. To describe

the human response (annoyance) associated with vibration impacts the FTA provides the following equation: $L_{VdB}(D) = L_{VdB}(25\ ft) - 30\log(D/25)$

TABLE 6-4: VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT

Equipment	Vibration Decibels (VdB) at 25 feet[1]
Small bulldozer	58
Jackhammer	79
Loaded Trucks	86
Large bulldozer	87

Source: Federal Transit Administration, Transit Noise and Vibration Impact Assessment, May 2006.

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7 OFF-SITE TRAFFIC NOISE IMPACTS

The *Trip Generation Analysis for Proposed Skilled Nursing Facility*, prepared by EPD Solutions, Inc., indicates that the Project will generate 38 AM peak hour and 41 PM peak hour trips, which is fewer than the 100 peak hour trips per day threshold which requires preparation of a traffic impact analysis based on City of Moreno Valley's traffic study guidelines. As such, further detailed traffic evaluation (e.g., traffic study), in addition to the trip generation evaluation, is not required based on the proposed Project. (24) Based on traffic count data taken on September 12th, 2017, the existing PM peak hour traffic volume on Alessandro Boulevard east of Heacock Street is 1,383, which would increase under future year without Project conditions as additional development takes place in the Project study area. (2) As such, Project traffic represents a 3-percent increase to the existing roadway volumes, which will not generate a barely perceptible noise level increase of 3 dBA CNEL at nearby sensitive land uses adjacent to study area roadways, since a doubling of the existing traffic volumes would be required to generate a 3 dBA CNEL increase. (3) Due to the low traffic volumes generated by the Project, the off-site traffic noise levels generated by the Project are considered to be *less than significant* and no further analysis is required.

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8 ON-SITE TRAFFIC NOISE IMPACTS

A noise impact analysis has been completed to determine the noise exposure levels that would result from off-site transportation noise sources, and to identify potential noise mitigation measures that would achieve acceptable Project exterior and interior noise levels. The primary source of traffic noise affecting the Project site is anticipated to be from Alessandro Boulevard. The Project will also experience some background traffic noise impacts from Black Walnut Street and Kitching Street, however, due to the lower traffic volume and speeds of vehicles transiting on these roadways, and intervening structures, traffic noise from these roadways will not make a significant contribution to the noise environment at the Project site.

8.1 EXTERIOR NOISE ANALYSIS

Using the FHWA traffic noise prediction model, and the parameters outlined in Section 6, the expected future exterior noise levels are calculated at the building façade and the closest outdoor common area to the adjacent roadway. Table 8-1 presents a summary of future exterior noise levels at the first-floor receiver locations. The on-site transportation noise level impacts indicate that the unmitigated exterior noise levels will approach 56.1 dBA CNEL at the outdoor common area and 66.0 dBA CNEL at the building façade. The on-site traffic noise analysis calculations are provided in Appendix 8.1.

As shown on Table 8-1, future unmitigated on-site traffic noise levels in the closest outdoor common area to Alessandro Boulevard are shown to approach 56.1 dBA CNEL and represent *normally acceptable* exterior noise levels for nursing home land use. Therefore, no exterior noise mitigation is required. The Project outdoor common areas benefit from the site design of the Project building which shields the outdoor common areas from traffic noise sources in the Project study area. Further, exterior noise levels at the Project building façade, approaching 66.0 dBA CNEL, represent *conditionally acceptable* nursing home lane use requiring an interior noise level analysis. Therefore, based on the future exterior traffic noise levels, Project interior noise levels are analyzed herein to identify the necessary interior noise reduction measures to satisfy the City of Moreno Valley General Plan Noise Element 45 dBA CNEL interior noise level standard.

TABLE 8-1: UNMITIGATED EXTERIOR TRAFFIC NOISE LEVELS

Building	Roadway	Unmitigated Noise Level (dBA CNEL)	Threshold (dBA CNEL)	Land Use Compatibility
Building 200 Courtyard	Alessandro Bl.	56.1	< 60 dBA CNEL	*Normally Acceptable*
Building 200 Façade	Alessandro Bl.	66.0	60 - 70 dBA CNEL	*Conditionally Acceptable*

8.2 INTERIOR NOISE ANALYSIS

To ensure that the interior noise levels comply with the City of Moreno Valley interior noise level standards, future noise levels were calculated at the first-floor building façade.

8.2.1 NOISE REDUCTION METHODOLOGY

The interior noise level is the difference between the predicted exterior noise level at the building facade and the noise reduction of the structure. Typical building construction will provide a Noise Reduction (NR) of approximately 12 dBA with "windows open" and a minimum 25 dBA noise reduction with "windows closed." (3; 25) However, sound leaks, cracks and openings within the window assembly can greatly diminish its effectiveness in reducing noise. Several methods are used to improve interior noise reduction, including: (1) weather-stripped solid core exterior doors; (2) upgraded dual glazed windows; (3) mechanical ventilation/air conditioning; and (4) exterior wall/roof assembles free of cut outs or openings.

8.2.2 INTERIOR NOISE LEVEL ASSESSMENT

Table 8-2 shows that the units within the Project building will require a windows-closed condition and a means of mechanical ventilation (e.g. air conditioning). Table 8-2 shows that the future exterior noise levels at the first-floor building façade are expected to approach 66.0 dBA CNEL. The first-floor interior noise level analysis shows that the City of Moreno Valley 45 dBA CNEL interior noise level standard can be satisfied using standard windows and sliding glass doors with minimum STC ratings of 27.

TABLE 8-2: FIRST-FLOOR INTERIOR NOISE IMPACTS (CNEL)

Building	Roadway	Noise Level at Façade[1]	Required Interior NR[2]	Estimated Interior NR[3]	Upgraded Windows[4]	Interior Noise Level[5]	Threshold	Threshold Exceeded?
Building 200	Alessandro Bl.	66.0	21.0	25	No	41.0	45	No

[1] Exterior noise level at the facade with a windows closed condition requiring a means of mechanical ventilation (e.g. air conditioning).
[2] Noise reduction to satisfy the interior noise standard of 45 dBA CNEL.
[3] Minimum interior noise reduction with standard building construction.
[4] Does the required interior noise reduction trigger upgraded windows with a minimum STC rating of greater than 27?
[5] Estimated interior noise level with minimum STC rating for all windows.
"NR" = Noise Reduction

9 RECEIVER LOCATIONS

To assess the potential for long-term operational and short-term construction noise impacts, the following seven receiver locations, as shown on Exhibit 8-A, were identified as representative locations for analysis. Sensitive receivers are generally defined as locations where people reside or where the presence of unwanted sound could otherwise adversely affect the use of the land. Noise-sensitive land uses are generally considered to include: schools, hospitals, single-family dwellings, mobile home parks, churches, libraries, and recreation areas. Moderately noise-sensitive land uses typically include: multi-family dwellings, hotels, motels, dormitories, out-patient clinics, cemeteries, golf courses, country clubs, athletic/tennis clubs, and equestrian clubs. Land uses that are considered relatively insensitive to noise include business, commercial, and professional developments. Land uses that are typically not affected by noise include: industrial, manufacturing, utilities, agriculture, natural open space, undeveloped land, parking lots, warehousing, liquid and solid waste facilities, salvage yards, and transit terminals.

Noise-sensitive receivers near the Project site include existing residential homes, Excel Prep Academy, and future residential-designated land use; non-noise-sensitive receivers near the Project site include the Moreno Valley Unified School District building and office uses, as described below. Other sensitive land uses in the Project study area that are located at greater distances than those identified in this noise study will experience lower noise levels than those presented in this report due to the additional attenuation from distance and the shielding of intervening structures.

R1: Located approximately 128 feet north of the Project site, R1 represents existing residential homes on Black Walnut Street. A 24-hour noise level measurement was taken near this location, L1, to describe the existing ambient noise environment.

R2: Location R2 represents existing Moreno Valley Unified School District offices at roughly 20 feet east of the Project site. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.

R3: Location R3 represents the existing office located east of the Project site at approximately 133 feet on Alessandro Boulevard. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.

R4: Located approximately 171 feet south of the Project site, R4 represents the existing mobile home park south of Alessandro Boulevard. A 24-hour noise level measurement was taken near this location, L4, to describe the existing ambient noise environment.

R5: Location R5 represents existing vacant land designated as residential/office land use at roughly 131 feet south of the Project site. A 24-hour noise level measurement was taken near this location, L3, to describe the existing ambient noise environment.

R6: Location R6 represents the existing outdoor basketball court of the Excel Prep Academy located west of the Project site at approximately 27 feet. A 24-hour noise level measurement was taken near this location, L3, to describe the existing ambient noise environment.

R7: Located approximately 22 feet west of the Project site, R7 represents the existing Excel Prep Academy building. A long-term noise measurement was taken near this location, L1, to describe the existing ambient noise environment.

EXHIBIT 9-A: RECEIVER LOCATIONS

10 OPERATIONAL NOISE IMPACTS

This section analyzes the potential stationary-source operational noise impacts at the nearby receiver locations, identified in Section 9, resulting from operation of the proposed Moreno Valley Skilled Nursing Facility Project. Exhibit 10-A identifies the representative receiver locations and noise source locations used to assess the operational noise levels.

10.1 OPERATIONAL NOISE SOURCES

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 10-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements all operating continuously. These noise level impacts will likely vary throughout the day.

10.2 REFERENCE NOISE LEVELS

To estimate the Project operational noise impacts, reference noise level measurements were collected from similar types of activities to represent the noise levels expected with the development of the proposed Project. This section provides a detailed description of the reference noise level measurements shown on Table 10-1 used to estimate the Project operational noise impacts. It is important to note that the following projected noise levels assume the worst-case noise environment with the roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements all operating continuously. These noise level impacts will likely vary throughout the day.

10.2.1 ROOF-TOP AIR CONDITIONING UNITS

To assess the noise levels created by the roof-top air conditioning units at the Project site, reference noise levels measurements were taken at the Santee Walmart on July 27th, 2015. Located at 170 Town Center Parkway in the City of Santee, the noise level measurements describe a mechanical roof-top air conditioning unit on the roof of an existing Walmart store, with additional units operating in the background. The reference noise level represents a Lennox SCA120 series 10-ton model packaged air conditioning unit. Using a uniform reference distance of 50 feet, the reference noise level is 57.2 dBA L_{eq}. The operating conditions of the reference noise level measurement reflect peak summer cooling requirements with measured temperatures approaching 96 degrees Fahrenheit (°F) with average daytime temperatures of 82°F. The noise attenuation provided by a parapet wall is not reflected in this reference noise level measurement.

10.2.2 TRASH ENCLOSURE ACTIVITY

To describe the noise levels associated with a trash enclosure, Urban Crossroads collected a reference noise level measurement on May 3rd, 2018 at an existing commercial and office park trash enclosure within a parking lot on the northeast corner of Baker Street and Red Hill Avenue in the City of Costa Mesa. The measured reference noise level at the uniform 50-foot reference distance is 57.3 dBA L_{eq} for the trash enclosure activity. The trash enclosure activity noise levels include two metal gates opening and closing, the metal gates scraping against a concrete floor, dumpster movement on metal wheels, trash dropping into the metal dumpster, and background parking lot vehicle movements. Noise associated with trash enclosure activities is expected to occur for 60 minutes per hour to represent worst-case conditions.

10.2.3 BACKUP GENERATOR

To describe the noise levels associated with the planned backup generator at the Project site, Urban Crossroads collected a reference noise level measurement on July 14th, 2012 of a 336 kilowatt (kW) diesel generator. The measured reference noise level at the uniform 50-foot reference distance is 64.9 dBA L_{eq}. Based on information provided by the Project Applicant, the generator at the Project site is expected to be roughly 300 kW, and as such, the reference noise level used in this analysis for a 336 kW generator may conservatively overstate the operational noise levels. Further, this reference noise level does not account for the planned enclosure of the Project backup generator which would extend to the height of the generator itself. In addition, this analysis assumes the generator would operate for 60 minutes per hour, when in reality, the backup generator would only be used in emergencies or when being tested for maintenance.

10.2.4 PARKING LOT VEHICLE MOVEMENTS

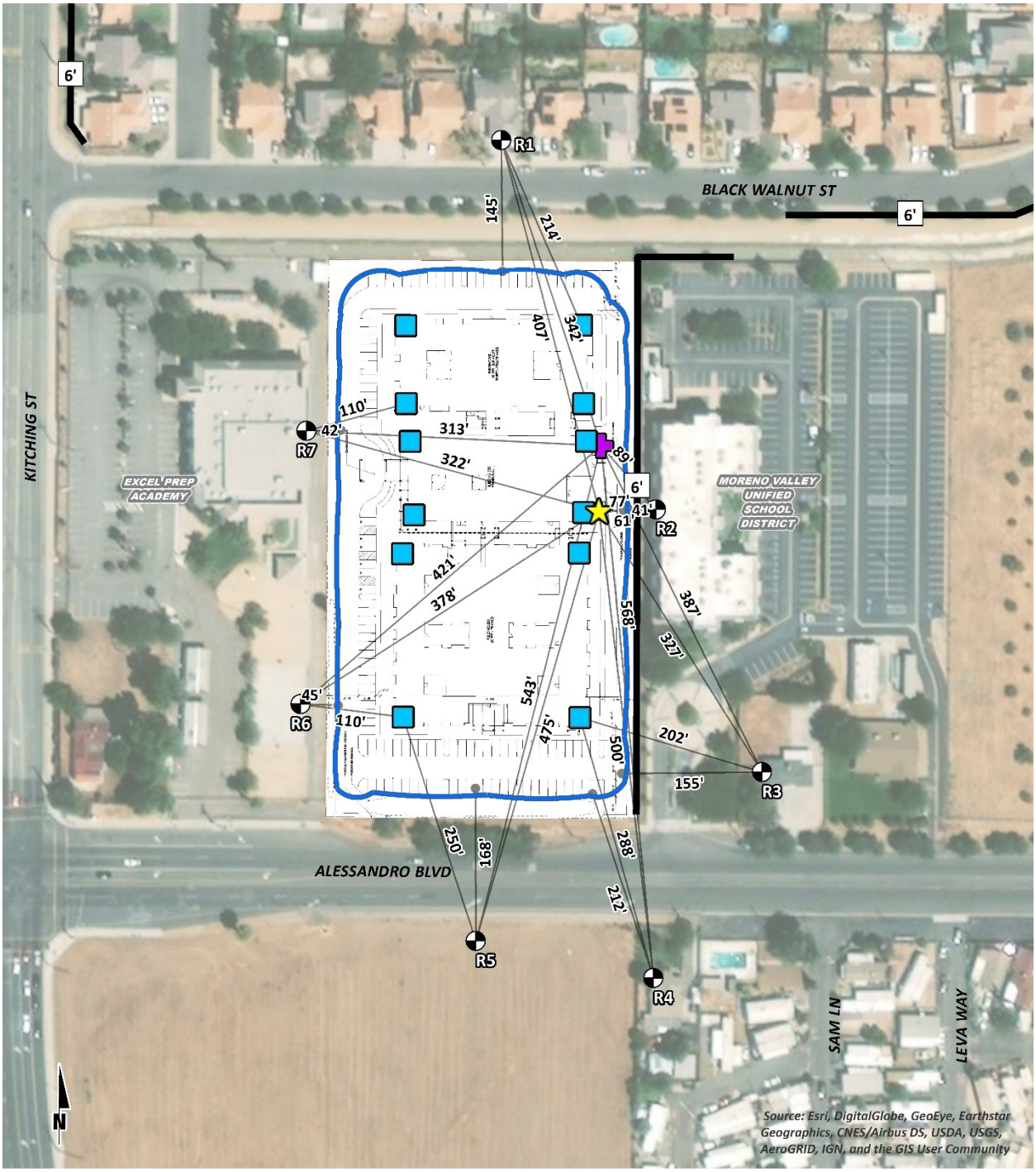
To determine the noise levels associated with parking lot vehicle movements, Urban Crossroads collected reference noise level measurements over a 24-hour period on May 17th, 2017 at the parking lot for the Panasonic Avionics Corporation in the City of Lake Forest. The peak hour of activity measured over the 24-hour noise level measurement period occurred between 12:00 p.m. to 1:00 p.m., or the typical lunch hour for employees working in the area. The measured reference noise level at 50 feet from parking lot vehicle movements was measured at 41.7 dBA L_{eq}. The parking lot noise levels are mainly due to cars pulling in and out of spaces during peak lunch hour activity and employees talking. Noise associated with parking lot vehicle movements is expected to operate for the entire hour (60 minutes).

TABLE 10-1: REFERENCE NOISE LEVEL MEASUREMENTS

Noise Source	Duration (hh:mm:ss)	Ref. Distance (Feet)	Noise Source Height (Feet)	Hourly Activity (Mins)[5]	Reference Noise Level (dBA L_{eq})	
					@ Ref. Dist.	@ 50 Feet
Roof-Top Air Conditioning Units[1]	96:00:00	5'	5'	39	77.2	57.2
Trash Enclosure Activity[2]	00:00:32	5'	5'	20	77.3	57.3
Generator[3]	00:15:00	50'	6'	60	64.9	64.9
Parking Lot Vehicle Movements[4]	01:00:00	10'	5'	60	52.2	41.7

[1] As measured by Urban Crossroads, Inc. on 7/27/2015 at the Santee Walmart located at 170 Town Center Parkway.
[2] As measured by Urban Crossroads, Inc. on 5/3/2018 at a commercial and office park trash enclosure on the northeast corner of Baker Street and Redhill Avenue in the City of Costa Mesa.
[3] As measured by Urban Crossroads, Inc. on 7/14/2012 for a 336kW diesel standby generator.
[4] As measured by Urban Crossroads, Inc. on 5/17/2017 at the Panasonic Avionics Corporation parking lot in the City of Lake Forest.
[5] Anticipated duration (minutes within the hour) of noise activity during typical hourly conditions expected at the Project site based on the reference noise level measurement activity.

EXHIBIT 10-A: OPERATIONAL NOISE SOURCE LOCATIONS



LEGEND:

- Receiver Locations
- 6' Existing Barrier Height (in feet)
- Existing Barrier
- Roof-Top Air Conditioning Unit
- Trash Enclosure
- Generator (Enclosed)
- Parking Lot Vehicle Movements
- Distance from receiver to noise source (in feet)

10.3 PROJECT OPERATIONAL NOISE LEVELS

Using the reference noise levels to represent the proposed Project operations that include roof-top air conditioning units, trash enclosure activity, a backup generator, and parking lot vehicle movements, Urban Crossroads, Inc. calculated the operational source noise levels that are expected to be generated at the Project site and the Project-related noise level increases that would be experienced at each of the sensitive receiver locations. The operational noise level calculations, shown on Table 10-2, account for the distance attenuation provided due to geometric spreading when sound from a localized stationary source (i.e., a point source) propagates uniformly outward in a spherical pattern. With geometric spreading, sound levels attenuate (or decrease) at a rate of 6 dB for each doubling of distance from a point source or 3 dB for a line source.

Table 10-2 presents the combined total operational noise level projections at 200 feet consistent with the City of Moreno Valley Municipal Code. The Project operational noise levels at 200 feet are estimated at 53.7 dBA L_{eq}. Based on the results of this analysis, the Project operational noise levels associated with the Moreno Valley Skilled Nursing Facility will satisfy the City of Moreno Valley Municipal Code 60 dBA L_{eq} daytime and 55 dBA L_{eq} nighttime exterior noise level standards at 200 feet from the source land use.

TABLE 10-2: OPERATIONAL NOISE LEVEL PROJECTIONS AT 200 FEET

Noise Source	Ref. Noise Level (dBA L_{eq})	Ref. Distance (Feet)	Distance Atten. @ 200' (dBA L_{eq})[1]	Hourly Activity (Mins.)[2]	Hourly Activity Adjustment (dBA L_{eq})	Noise Level @ 200' (dBA L_{eq})
Roof-Top Air Conditioning Units	77.2	5'	-32.0	39	-1.9	43.3
Trash Enclosure Activity	77.3	5'	-32.0	20	-4.8	40.5
Generator	64.9	50'	-12.0	60	0.0	52.9
Parking Lot Vehicle Movements	52.2	10'	-13.0	60	0.0	39.2
					Combined Total:	53.7

[1] Drop off rate of 6 dBA per doubling of distance from point sources and 3 dBA per doubling of distance from line sources.
[2] Anticipated duration (minutes within the hour) of noise activity during peak hourly conditions expected at the Project site.

Table 10-3 indicates that the unmitigated hourly noise levels associated with the Moreno Valley Skilled Nursing Facility Project at the nearby sensitive receiver locations are expected to range from 43.6 to 58.4 dBA L_{eq}. The Project-related operational noise levels, as shown on Table 10-3, will satisfy the City of Moreno Valley 60 dBA L_{eq} daytime and 55 dBA L_{eq} nighttime exterior noise level standards at all nearby sensitive receiver locations. The operational noise level calculations are included in Appendix 10.1.

TABLE 10-3: UNMITIGATED OPERATIONAL NOISE LEVEL PROJECTIONS AT RECEIVER LOCATIONS

Receiver Location[1]	Land Use	Noise Levels by Noise Source (dBA L_{eq})[2]				Combined Operational Noise Levels (dBA L_{eq})[3]	Threshold Exceeded?[4]	
		Roof-Top Air Conditioning Units	Trash Enclosure Activity	Generator	Parking Lot Vehicle Movements		Daytime (60 dBA L_{eq})	Nighttime (55 dBA L_{eq})
R1	Residential	42.7	28.1	39.7	34.8	45.0	No	No
R2	Office	45.7	42.3	58.0	37.5	58.4	No	n/a
R3	Office	35.3	29.6	43.7	28.8	44.5	No	n/a
R4	Residential	40.1	31.4	44.9	30.3	46.4	No	No
R5	Future Res.	41.3	23.7	38.2	33.8	43.6	No	No
R6	School	48.5	23.7	37.6	42.4	49.7	No	n/a
R7	School	48.5	25.9	39.0	42.9	49.9	No	n/a

[1] See Exhibit 10-A for the receiver and noise source locations.
[2] Reference noise sources as shown on Table 10-1.
[3] Calculations for each noise source are provided in Appendix 10.1.
[4] Do the Project operational noise levels exceed the standards (Table 3-1)?
"n/a" = office and school uses do not represent sensitive receiver locations during the nighttime hours when they are unoccupied.

10.4 PROJECT OPERATIONAL NOISE CONTRIBUTION

To describe the Project operational noise level contributions, the Project operational noise levels are combined with the existing ambient noise levels measurements for the nearby receiver locations potentially impacted by Project operational noise sources. Since the units used to measure noise, decibels (dB), are logarithmic units, the Project-operational and existing ambient noise levels cannot be combined using standard arithmetic equations. (10) Instead, they must be logarithmically added using the following base equation:

$$SPL_{Total} = 10\log_{10}[10^{SPL1/10} + 10^{SPL2/10} + \ldots 10^{SPLn/10}]$$

Where "SPL1," "SPL2," etc. are equal to the sound pressure levels being combined, or in this case, the Project-operational and existing ambient noise levels. The difference between the combined Project and ambient noise levels describe the Project noise level contributions to the existing ambient noise environment. Noise levels that would be experienced at receiver locations when Project-source noise is added to the ambient daytime and nighttime conditions are presented on Tables 10-4 and 10-5.

As indicated on Tables 10-4 and 10-5, the Project will contribute a daytime operational noise level increase of up to 4.6 dBA L_{eq} and a nighttime operational noise level increase of up to 1.3 dBA L_{eq} at the sensitive receiver locations. Since the Project-related operational noise level contributions will satisfy the significance criteria discussed in Section 4, the increases at the sensitive receiver locations will be *less than significant*.

TABLE 10-4: PROJECT DAYTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]	Threshold Exceeded?[7]
R1	45.0	L1	54.6	55.1	0.5	No
R2	58.4	L4	55.7	60.3	4.6	No
R3	44.5	L4	55.7	56.0	0.3	No
R4	46.4	L4	55.7	56.2	0.5	No
R5	43.6	L3	69.3	69.3	0.0	No
R6	49.7	L3	69.3	69.3	0.0	No
R7	49.9	L1	54.6	55.9	1.3	No

[1] See Exhibit 10-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 10-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed daytime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.

TABLE 10-5: PROJECT NIGHTTIME NOISE LEVEL CONTRIBUTIONS

Receiver Location[1]	Total Project Operational Noise Level[2]	Measurement Location[3]	Reference Ambient Noise Levels[4]	Combined Project and Ambient[5]	Project Contribution[6]	Threshold Exceeded?[7]
R1	45.0	L1	49.6	50.9	1.3	No
R2	-[8]	-[8]	-[8]	-[8]	-[8]	-[8]
R3	-[8]	-[8]	-[8]	-[8]	-[8]	-[8]
R4	46.4	L4	52.7	53.6	0.9	No
R5	43.6	L3	66.9	66.9	0.0	No
R6	-[8]	-[8]	-[8]	-[8]	-[8]	-[8]
R7	-[8]	-[8]	-[8]	-[8]	-[8]	-[8]

[1] See Exhibit 10-A for the sensitive receiver locations.
[2] Total Project operational noise levels as shown on Table 10-3.
[3] Reference noise level measurement locations as shown on Exhibit 5-A.
[4] Observed nighttime ambient noise levels as shown on Table 5-1.
[5] Represents the combined ambient conditions plus the Project activities.
[6] The noise level increase expected with the addition of the proposed Project activities.
[7] Significance Criteria as defined in Section 4.
[8] Office and school uses do not represent sensitive receiver locations during the nighttime hours when they are unoccupied.

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11 CONSTRUCTION IMPACTS

This section analyzes potential impacts resulting from the short-term construction activities associated with the development of the Project. Exhibit 11-A shows the construction noise source locations in relation to the nearby receiver locations previously described in Section 9.

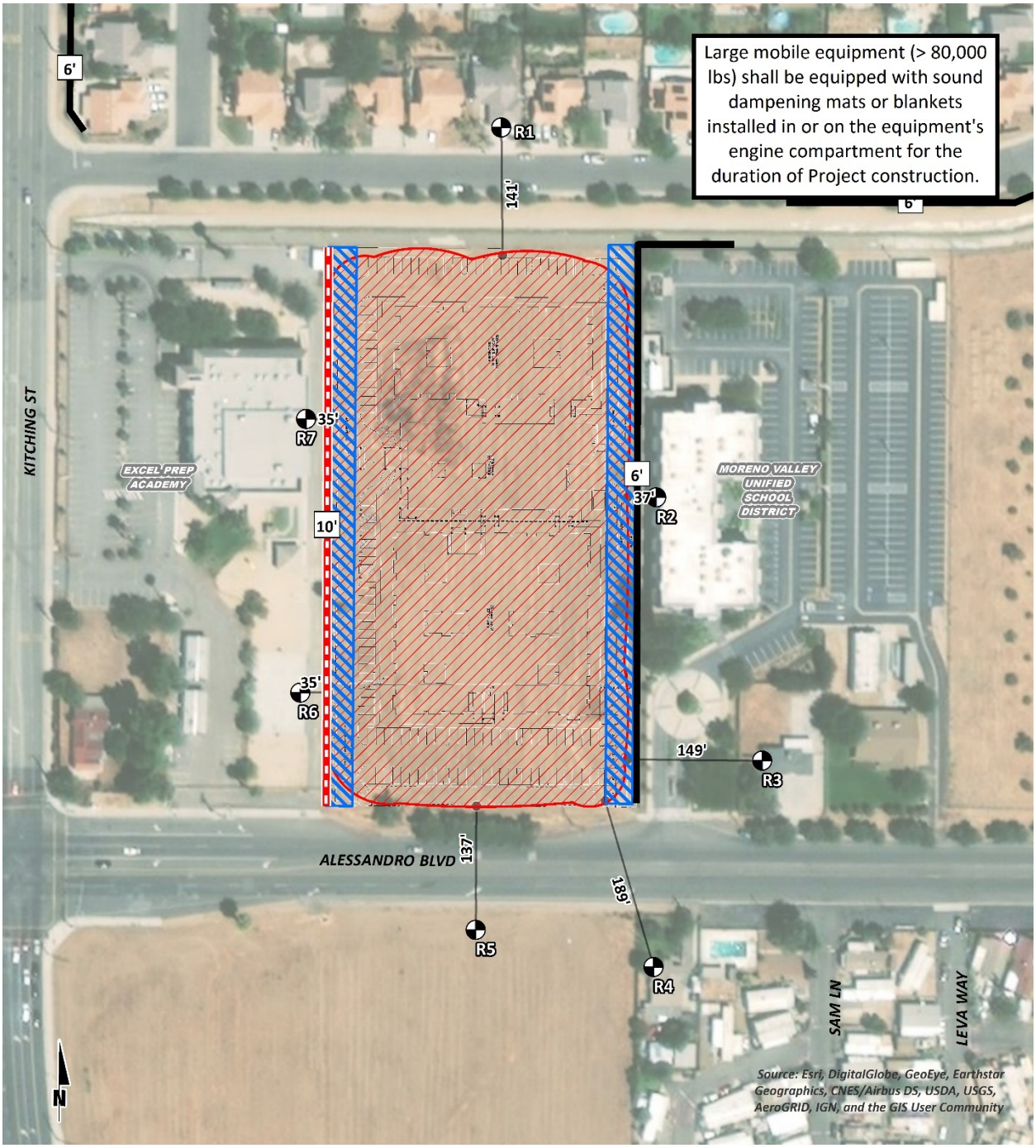
11.1 CONSTRUCTION NOISE LEVELS

Noise generated by the Project construction equipment will include a combination of trucks, power tools, concrete mixers and portable generators that when combined can reach high levels. The number and mix of construction equipment is expected to occur in the following stages:

- Site Preparation
- Grading
- Building Construction
- Paving
- Architectural Coating

This construction noise analysis was prepared using reference noise level measurements taken by Urban Crossroads, Inc. to describe the typical construction activity noise levels for each stage of Project construction. The construction reference noise level measurements represent a list of typical construction activity noise levels. Noise levels generated by heavy construction equipment can range from approximately 68 dBA to in excess of 80 dBA when measured at 50 feet. However, these noise levels diminish with distance from the construction site at a rate of 6 dBA per doubling of distance. For example, a noise level of 80 dBA measured at 50 feet from the noise source to the receiver would be reduced to 74 dBA at 100 feet from the source to the receiver and would be further reduced to 68 dBA at 200 feet from the source to the receiver. The construction stages are based on the *Moreno Valley Skilled Nursing Facility Air Quality Impact Analysis* prepared by Urban Crossroads, Inc. (26)

EXHIBIT 11-A: CONSTRUCTION NOISE SOURCE LOCATIONS



LEGEND:

- Receiver Locations
- 10' Barrier Height (in feet)
- Existing Barrier
- Distance from receiver to construction activity (in feet)
- Construction Activity
- Temporary Noise Barrier
- 50-foot buffer for large mobile equipment (> 80,000 lbs) and loaded trucks

11.2 CONSTRUCTION REFERENCE NOISE LEVELS

To describe the Project construction noise levels, measurements were collected for similar activities at several construction sites. Table 11-1 provides a summary of the construction reference noise level measurements. Since the reference noise levels were collected at varying distances of 30 feet and 50 feet, all construction noise level measurements presented on Table 11-1 have been adjusted for consistency to describe a common reference distance of 50 feet.

TABLE 11-1: CONSTRUCTION REFERENCE NOISE LEVELS

ID	Noise Source	Reference Distance From Source (Feet)	Reference Noise Levels @ Reference Distance (dBA L_{eq})	Reference Noise Levels @ 50 Feet (dBA L_{eq})[4]
1	Truck Pass-Bys & Dozer Activity[1]	30'	63.6	59.2
2	Dozer Activity[1]	30'	68.6	64.2
3	Construction Vehicle Maintenance Activities[2]	30'	71.9	67.5
4	Foundation Trenching[2]	30'	72.6	68.2
5	Rough Grading Activities[2]	30'	77.9	73.5
6	Framing[2]	30'	66.7	62.3
7	Concrete Mixer Truck Movements[3]	50'	71.2	71.2
8	Concrete Paver Activities[3]	30'	70.0	65.6
9	Concrete Mixer Pour & Paving Activities[3]	30'	70.3	65.9
10	Concrete Mixer Backup Alarms & Air Brakes[3]	50'	71.6	71.6
11	Concrete Mixer Pour Activities[3]	50'	67.7	67.7

[1] As measured by Urban Crossroads, Inc. on 10/14/15 at a business park construction site located at the northwest corner of Barranca Parkway and Alton Parkway in the City of Irvine.
[2] As measured by Urban Crossroads, Inc. on 10/20/15 at a construction site located in Rancho Mission Viejo.
[3] Reference noise level measurements were collected from a nighttime concrete pour at an industrial construction site, located at 27334 San Bernardino Avenue in the City of Redlands, between 1:00 a.m. to 2:00 a.m. on 7/1/15.
[4] Reference noise levels are calculated at 50 feet using a drop off rate of 6 dBA per doubling of distance (point source).

11.3 CONSTRUCTION NOISE ANALYSIS

Using the reference construction equipment noise levels, calculations of the Project construction noise level impacts at the nearby receiver locations were completed. Tables 11-2 to 11-6 present the short-term construction noise levels for each stage of construction. Table 11-7 provides a summary of the construction noise levels by stage at the noise receiver locations. Based on the stages of construction, the noise impacts associated with the proposed Project are expected to create temporarily high noise levels at the nearby receiver locations. To assess the peak construction noise levels, this analysis shows the highest noise impacts when the equipment with the highest reference noise level is operating at the closest point from the primary construction activity to each receiver location.

TABLE 11-2: SITE PREPARATION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	59.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	141'	-9.0	0.0	50.2
R2	37'	2.6	-5.2	56.6
R3	149'	-9.5	-5.1	44.6
R4	189'	-11.5	0.0	47.6
R5	137'	-8.8	0.0	50.4
R6	35'	3.1	0.0	62.3
R7	35'	3.1	0.0	62.3

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Calculated barrier attenuation (if any) from existing barriers in the Project study area (Appendix 10.1).

TABLE 11-3: GRADING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Truck Pass-Bys & Dozer Activity	59.2
Dozer Activity	64.2
Rough Grading Activities	73.5
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	73.5

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	141'	-9.0	0.0	64.5
R2	37'	2.6	-5.2	70.9
R3	149'	-9.5	-5.1	58.9
R4	189'	-11.5	0.0	61.9
R5	137'	-8.8	0.0	64.7
R6	35'	3.1	0.0	76.6
R7	35'	3.1	0.0	76.6

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Calculated barrier attenuation (if any) from existing barriers in the Project study area (Appendix 10.1).

TABLE 11-4: BUILDING CONSTRUCTION EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Construction Vehicle Maintenance Activities	67.5
Foundation Trenching	68.2
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	68.2

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	141'	-9.0	0.0	59.2
R2	37'	2.6	-5.2	65.6
R3	149'	-9.5	-5.1	53.6
R4	189'	-11.5	0.0	56.6
R5	137'	-8.8	0.0	59.4
R6	35'	3.1	0.0	71.3
R7	35'	3.1	0.0	71.3

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Calculated barrier attenuation (if any) from existing barriers in the Project study area (Appendix 10.1).

TABLE 11-5: PAVING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Concrete Mixer Truck Movements	71.2
Concrete Paver Activities	65.6
Concrete Mixer Pour & Paving Activities	65.9
Concrete Mixer Backup Alarms & Air Brakes	71.6
Concrete Mixer Pour Activities	67.7
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	71.6

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	141'	-9.0	0.0	62.6
R2	37'	2.6	-5.2	69.0
R3	149'	-9.5	-5.1	57.0
R4	189'	-11.5	0.0	60.1
R5	137'	-8.8	0.0	62.8
R6	35'	3.1	0.0	74.7
R7	35'	3.1	0.0	74.7

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Calculated barrier attenuation (if any) from existing barriers in the Project study area (Appendix 10.1).

TABLE 11-6: ARCHITECTURAL COATING EQUIPMENT NOISE LEVELS

Reference Construction Activity[1]	Reference Noise Level @ 50 Feet (dBA L_{eq})
Framing	62.3
Highest Reference Noise Level at 50 Feet (dBA L_{eq}):	62.3

Receiver Location	Distance to Construction Activity (Feet)[2]	Distance Attenuation (dBA L_{eq})[3]	Calculated Noise Barrier Attenuation (dBA L_{eq})[4]	Construction Noise Level (dBA L_{eq})
R1	141'	-9.0	0.0	53.3
R2	37'	2.6	-5.2	59.7
R3	149'	-9.5	-5.1	47.7
R4	189'	-11.5	0.0	50.7
R5	137'	-8.8	0.0	53.5
R6	35'	3.1	0.0	65.4
R7	35'	3.1	0.0	65.4

[1] Reference construction noise level measurements taken by Urban Crossroads, Inc.
[2] Distance from the nearest point of construction activity to the nearest receiver.
[3] Point (stationary) source drop off rate of 6.0 dBA per doubling of distance.
[4] Calculated barrier attenuation (if any) from existing barriers in the Project study area (Appendix 10.1).

11.5 CONSTRUCTION NOISE THRESHOLDS OF SIGNIFICANCE

The construction noise analysis shows that the highest construction noise levels will occur when equipment is operating at the closest point from primary construction activity to each sensitive receiver location. As shown on Table 11-7, the highest unmitigated construction noise levels are expected to range from 58.9 to 76.6 dBA L_{eq} at the nearby receiver locations.

As shown on Table 11-8, the unmitigated Project construction noise levels exceed the 60 dBA L_{eq} noise-sensitive (i.e., residential, school) and 65 dBA L_{eq} non-noise-sensitive (i.e., office) City of Moreno Valley Municipal Code construction noise level thresholds at noise-sensitive receiver locations R1, and R4 to R7, and at non-noise-sensitive receiver location R2. Therefore, the unmitigated Project-related construction noise level impacts at R1, R2, and R4 to R7 are considered a *potentially significant* temporary noise impact.

Temporary construction noise mitigation measures are therefore required to reduce the impacts at receiver locations R1, R2, and R4 to R7. This includes mitigation in the form of a minimum 10-foot high temporary noise barrier at the western Project site boundary for the Excel Prep Academy, engine compartment sound dampening mats or blankets for large mobile equipment (greater than 80,000 pounds), and a 50-foot buffer for large mobile equipment (greater than 80,000 pounds) and loaded trucks, as shown on Exhibit 11-A. Further, mobile equipment construction activities should be scheduled to time periods when the adjacent Excel Prep

Academy school is not in session (e.g., holiday or other breaks). The construction noise mitigation measures are outlined in the Executive Summary.

The construction noise analysis presents a conservative approach with the highest noise-level-producing equipment for each stage of Project construction operating at the closest point from primary construction activity to the nearby sensitive receiver locations. This scenario is unlikely to occur during typical construction activities and likely overstates the construction noise levels which will be experienced at each receiver location. With the construction noise mitigation measures identified in this noise study, shown on Exhibit 11-A, the worst-case construction noise level increases at the nearby residential receivers would be reduced.

The noise attenuation provided through temporary noise barriers depends on many factors including cost, wind loading, the location of the receiver, and the ability to place barriers such that the line-of-sight of the receiver is blocked to the noise source, among others. This analysis assumes a temporary noise barrier constructed using frame-mounted materials such as vinyl acoustic curtains or quilted blankets attached to the construction site perimeter fence.

As shown on Table 11-8, the temporary construction noise mitigation measures will reduce the construction noise levels at the potentially impacted receiver locations to range from 53.9 to 63.3 dBA L_{eq} and satisfy the thresholds for noise-sensitive and non-noise-sensitive receiver locations. Therefore, the noise impact due to Project construction is considered a *less than significant* impact with mitigation for receiver locations R1, R2, and R4 to R7. Appendix 11.1 includes the temporary construction noise barrier attenuation calculations. Sample temporary noise barrier photos are provided in Appendix 11.2 for reference.

TABLE 11-7: UNMITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location	Distance to Receiver (Feet)	Land Use	Construction Noise Levels (dBA L_{eq})[1]					
			Site Preparation	Grading	Building Construction	Paving	Architectural Coating	Highest Construction Noise Levels
R1	141'	Residential	50.2	64.5	59.2	62.6	53.3	64.5
R2	37'	Office	56.6	70.9	65.6	69.0	59.7	70.9
R3	149'	Office	44.6	58.9	53.6	57.0	47.7	58.9
R4	189'	Residential	47.6	61.9	56.6	60.1	50.7	61.9
R5	137'	Future Res.	50.4	64.7	59.4	62.8	53.5	64.7
R6	35'	School	62.3	76.6	71.3	74.7	65.4	76.6
R7	35'	School	62.3	76.6	71.3	74.7	65.4	76.6

[1] Construction noise levels as shown on Tables 11-2 to 11-6.

TABLE 11-8: MITIGATED CONSTRUCTION EQUIPMENT NOISE LEVEL SUMMARY

Receiver Location	Distance to Receiver (Feet)	Land Use	Threshold	Highest Const. Noise Levels	Threshold Exceeded?	Attenuation from Mitigation Measures[1]			Mitigated Const. Noise Levels (Highest)[2]	Threshold Exceeded?[3]
						Engine Mats/ Blankets	Temporary Noise Barriers	50-Foot Buffer		
R1	141'	Residential	60	64.5	Yes	-5.0	-	-	59.5	No
R2	37'	Office	65	70.9	Yes	-5.0	-	-2.6	63.3	No
R3	149'	Office	65	58.9	No	-5.0	-	-	53.9	No
R4	189'	Residential	60	61.9	Yes	-5.0	-	-	56.9	No
R5	137'	Future Res.	60	64.7	Yes	-5.0	-	-	59.7	No
R6	35'	School	60	76.6	Yes	-5.0	-8.7	-3.1	59.8	No
R7	35'	School	60	76.6	Yes	-5.0	-8.7	-3.1	59.8	No

[1] Minimum 5 dBA of attenuation provided by engine compartment mats or blankets. Temporary noise barrier attenuation calculations are provided in Appendix 11.1. Additional distance attenuation is provided by the 50-foot buffer zone.

[2] Mitigated construction noise levels with the required mitigation measures for each receiver location, based on the highest unmitigated construction noise levels shown on Table 11-7.

[3] Do the construction noise levels exceed their respective, applicable construction noise level thresholds?

11.6 CONSTRUCTION VIBRATION IMPACTS

Construction activity can result in varying degrees of ground vibration, depending on the equipment and methods used, distance to the affected structures and soil type. It is expected that ground-borne vibration from Project construction activities would cause only intermittent, localized intrusion. The proposed Project's construction activities most likely to cause vibration impacts are:

- Heavy Construction Equipment: Although all heavy mobile construction equipment has the potential of causing at least some perceptible vibration while operating close to buildings, the vibration is usually short-term and is not of sufficient magnitude to cause building damage.
- Trucks: Trucks hauling building materials to construction sites can be sources of vibration intrusion if the haul routes pass through residential neighborhoods on streets with bumps or potholes. Repairing the bumps and potholes generally eliminates the problem.

Ground-borne vibration levels resulting from construction activities occurring within the Project site were estimated by data published by the Federal Transit Administration. Construction activities that would have the potential to generate low levels of ground-borne vibration within the Project site include grading. Using the vibration source level of construction equipment provided on Table 6-4 and the construction vibration assessment methodology published by the FTA, it is possible to estimate the Project vibration impacts. Table 11-9 presents the expected Project related vibration levels at the nearby receiver locations.

Based on the reference vibration levels provided by the FTA, a large bulldozer represents the peak source of vibration with a reference level of 87 VdB at 25 feet. At distances ranging from 35 to 189 feet from primary Project construction activities, construction vibration levels are expected to range from 60.6 to 82.6 VdB, as shown on Table 11-9. Using the construction vibration assessment methods provided by the FTA, Project construction vibration levels will exceed the FTA 80 VdB threshold three of the seven sensitive receiver locations, R2, and R6 and R7, and therefore, is considered a *potentially significant* impact.

TABLE 11-9: UNMITIGATED CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance to Construction Activity (Feet)	Receiver Vibration Levels (VdB)[2]					Threshold Exceeded?[3]
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level	
R1	141'	35.5	56.5	63.5	64.5	64.5	No
R2	37'	52.9	73.9	80.9	81.9	81.9	Yes
R3	149'	34.7	55.7	62.7	63.7	63.7	No
R4	189'	31.6	52.6	59.6	60.6	60.6	No
R5	137'	35.8	56.8	63.8	64.8	64.8	No
R6	35'	53.6	74.6	81.6	82.6	82.6	Yes
R7	35'	53.6	74.6	81.6	82.6	82.6	Yes

[1] Noise receiver locations are shown on Exhibit 11-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-4.
[3] Does the peak vibration exceed the FTA maximum acceptable vibration standard of 80 VdB?

Therefore, the use of large mobile equipment (greater than 80,000 pounds) and loaded trucks within 50 feet of nearby land uses shall be prohibited unless the vibration levels are shown to be less than the 80 VdB FTA threshold. The 50-foot buffer zone for large mobile equipment (greater than 80,000 pounds) and loaded trucks is shown on Exhibit 11-A and outlined in the Executive Summary. Table 11-10 shows the mitigation Project construction vibration levels with the 50-foot buffer zone. With the recommended mitigation measures in this study, the Project-related vibration impacts at the nearby receiver locations represents a *less than significant* impact during the worst-case construction activities at the Project site.

Further, vibration levels at the site of the closest sensitive receiver are unlikely to be sustained during the entire construction period but will occur rather only during the times that heavy construction equipment is operating at the Project site perimeter.

TABLE 11-10: MITIGATED CONSTRUCTION EQUIPMENT VIBRATION LEVELS

Receiver Location[1]	Distance to Construction Activity (Feet)	Mitigated Vibration Levels (VdB)[2]					Threshold Exceeded?[3]
		Small Bulldozer	Jackhammer	Loaded Trucks	Large Bulldozer	Highest Vibration Level	
R2	50'	49.0	70.0	77.0	78.0	78.0	No
R6	50'	49.0	70.0	77.0	78.0	78.0	No
R7	50'	49.0	70.0	77.0	78.0	78.0	No

[1] Noise receiver locations are shown on Exhibit 11-A.
[2] Based on the Vibration Source Levels of Construction Equipment included on Table 6-4.
[3] Does the peak vibration exceed the FTA maximum acceptable vibration standard of 80 VdB?

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23. **California Department of Transportation.** *Traffic Noise Attenuation as a Function of Ground and Vegetation Final Report.* June 1995. FHWA/CA/TL-95/23.

24. **EPD Solutions, Inc.** *Trip Generation Analysis for Proposed Skilled Nursing Facility.* April 2018.

25. **California Department of Transportation.** *Traffic Noise Analysis Protocol.* May 2011.

26. **Urban Crossroads, Inc.** *Moreno Valley Skilled Nursing Facility Air Quality Impact Analysis.* June 2018.

12 CERTIFICATION

The contents of this noise study report represent an accurate depiction of the noise environment and impacts associated with the proposed Moreno Valley Skilled Nursing Facility Project. The information contained in this noise study report is based on the best available data at the time of preparation. If you have any questions, please contact me directly at (949) 336-5979.

Bill Lawson, P.E., INCE
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EDUCATION

Master of Science in Civil and Environmental Engineering
California Polytechnic State University, San Luis Obispo • December, 1993

Bachelor of Science in City and Regional Planning
California Polytechnic State University, San Luis Obispo • June, 1992

PROFESSIONAL REGISTRATIONS

PE – Registered Professional Traffic Engineer – TR 2537 • January, 2009
AICP – American Institute of Certified Planners – 013011 • June, 1997–January 1, 2012
PTP – Professional Transportation Planner • May, 2007 – May, 2013
INCE – Institute of Noise Control Engineering • March, 2004

PROFESSIONAL AFFILIATIONS

ASA – Acoustical Society of America
ITE – Institute of Transportation Engineers

PROFESSIONAL CERTIFICATIONS

Certified Acoustical Consultant – County of Orange • February, 2011
FHWA-NHI-142051 Highway Traffic Noise Certificate of Training • February, 2013

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APPENDIX 3.1:

CITY OF MORENO VALLEY MUNICIPAL CODE

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Chapter 11.80 NOISE REGULATION

11.80.010 Legislative findings.

It is found and declared that:

A. Excessive sound within the limits of the city is a condition which has existed for some time, and the amount and intensity of such sound is increasing.

B. Such excessive sound is a detriment to the public health, safety, and welfare and quality of life of the residents of the city.

C. The necessity in the public interest for the provisions and prohibitions hereinafter contained and enacted is declared as a matter of legislative determination and public policy, and it is further declared that the provisions and prohibitions hereinafter contained and enacted are in pursuance of and for the purpose of securing and promoting the public health, safety, welfare and quality of life of the city and its inhabitants. (Ord. 740 § 1.2, 2007)

11.80.020 Definitions.

For purposes of this chapter, certain words and phrases used herein are defined as follows:

"A-weighted sound level" means the sound pressure level in decibels as measured with a sound level meter using the A-weighting network. The unit of measurement is the dB(A).

"Commercial" means all uses of land not otherwise classified as residential, as defined in this section.

"Construction" means any site preparation, and/or any assembly, erection, repair, or alteration, excluding demolition, of any structure, or improvements to real property.

"Continuous airborne sound" means sound that is measured by the slow-response setting of a meter manufactured to the specifications of ANSI Section 1.4-1983 (R2006) "Specification for Sound Level Meters," or its successor.

"Daytime" means eight a.m. to ten p.m. the same day.

"Decibel" (dB) means a unit for measuring the amplitude of sound, equal to twenty (20) times the logarithm to the base ten (10) of the ratio of the pressure of the sound measured to the reference pressure, which is twenty (20) microPascals (twenty (20) microNewtons per square meter.)

"Demolition" means any dismantling, intentional destruction or removal of structures or other improvements to real property.

"Disturb" means to interrupt, interfere with, or hinder the enjoyment of peace or quiet or the normal listening activities or the sleep, rest or mental concentration of the hearer.

"Emergency" means any occurrence or set of circumstances involving actual or imminent physical trauma or significant property damage which necessitates immediate action. Economic loss alone shall not constitute an emergency. It shall be the burden of an alleged violator to prove an "emergency."

"Emergency work" means any work made necessary to restore property to a safe condition following an emergency, or to protect persons or property threatened by an imminent emergency, to the extent such work is, in fact, necessary to protect persons or property from exposure to imminent danger or damage.

"Frequency" means the number of complete oscillation cycles per unit of time.

"Impulsive sound" means sound of short duration, usually less than one second, with an abrupt onset and rapid decay. Examples of sources of impulsive sound include explosions, drop forge impacts, and discharge of firearms.

"Nighttime" means 10:01 p.m. to 7:59 a.m. the following day.

"Noise disturbance" means any sound which:

1. Disturbs a reasonable person of normal sensitivities;

2. Exceeds the sound level limits set forth in this chapter; or

3. Is plainly audible as defined in this section. Where no specific distance is set forth for the determination of audibility, references to noise disturbance shall be deemed to mean plainly audible at a distance of two hundred (200) feet from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right of way, public space or other publicly owned property.

"Person" means any person, person's firm, association, copartnership, joint venture, corporation, or any entity public or private in nature.

"Plainly audible" means that the sound or noise produced or reproduced by any particular source, can be clearly distinguished from ambient noise by a person using his/her normal hearing faculties.

"Public right-of-way" means any street, avenue, boulevard, sidewalk, bike path or alley, or similar place normally accessible to the public which is owned or controlled by a governmental entity.

"Public space" means any park, recreational or community facility, or lot which contains at least one building that is open to the general public during its hours of operation.

"Residential" means all uses of land primarily for dwelling units, as well as hospitals, schools, colleges and universities, and places of religious assembly.

"Sound" means an oscillation in pressure, particle displacement, particle velocity or other physical parameter, in a medium with internal forces that causes compression and rarefaction of that medium capable of producing an auditory impression. The description of sound may include any characteristic of such sound, including duration, intensity and frequency.

"Sound level" means the weighted sound pressure level as measured in dB(A) by a sound level meter and as specified in American National Standards Institute (ANSI) specifications for sound-level meters (ANSI Section 1.4-1971 (R1976)). If the frequency weighting employed is not indicated, the A-weighting shall apply.

"Sound level meter" means an instrument, demonstrably capable of accurately measuring sound levels as defined above.

All technical definitions not defined above shall be in accordance with applicable publications and standards of the American National Standards Institute (ANSI). (Ord. 740 § 1.2, 2007)

11.80.030 Prohibited acts.

A. General Prohibition. It is unlawful and a violation of this chapter to maintain, make, cause, or allow the making of any sound that causes a noise disturbance, as defined in Section 11.80.020.

B. Sound causing permanent hearing loss.

1. Sound level limits. Based on statistics from the Center for Disease Control and Prevention and the National Institute for Occupational Safety and Health, Table 1 and Table 1-A specify sound level limits which, if exceeded, will have a high probability of producing permanent hearing loss in anyone in the area where the sound levels are being exceeded. No sound shall be permitted within the city which exceeds the parameters set forth in Tables 11.80.030-1 and 11.80.030-1-A of this chapter:

Table 11.80.030-1

MAXIMUM CONTINUOUS SOUND LEVELS*

Duration per Day Continuous Hours	Sound level [db(A)]
8	90
6	92

4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25	115

* When the daily sound exposure is composed of two or more periods of sound exposure at different levels, the combined effect of all such periods shall constitute a violation of this section if the sum of the percent of allowed period of sound exposure at each level exceeds 100 percent

Table 11.80.030-1A

MAXIMUM IMPULSIVE SOUND LEVELS

Number of Repetitions per 24-Hour Period	Sound level [dB(A)]
1	145
10	135
100	125

2. Exemptions. No violation shall exist if the only persons exposed to sound levels in excess of those listed in Tables 11.80.030-1 and 11.80.030-1A are exposed as a result of:

a. Trespass;

b. Invitation upon private property by the person causing or permitting the sound; or

c. Employment by the person or a contractor of the person causing or permitting the sound.

C. Nonimpulsive Sound Decibel Limits. No person shall maintain, create, operate or cause to be operated on private property any source of sound in such a manner as to create any nonimplusive sound which exceeds the limits set forth for the source land use category (as defined in Section 11.80.020) in Table 11.80.030-2 when measured at a distance of two hundred (200) feet or more from the real property line of the source of the sound, if the sound occurs on privately owned property, or from the source of the sound, if the sound occurs on public right-of-way, public space or other publicly owned property. Any source of sound in violation of this subsection shall be deemed prima facie to be a noise disturbance.

Table 11.80.030-2

MAXIMUM SOUND LEVELS (IN dB(A)) FOR SOURCE LAND USES

Residential		Commercial	
Daytime	Nighttime	Daytime	Nighttime
60	55	65	60

D. Specific Prohibitions. In addition to the general prohibitions set out in subsection A of this section, and unless otherwise exempted by this chapter, the following specific acts, or the causing or permitting thereof, are regulated as follows:

1. Motor Vehicles. No person shall operate or cause to be operated a public or private motor vehicle, or combination of vehicles towed by a motor vehicle, that creates a sound exceeding the sound level limits in Table 11.80.030-2 when the vehicle(s) are not otherwise subject to noise regulations provided for by the California Vehicle Code.

2. Radios, Televisions, Electronic Audio Equipment, Musical Instruments or Similar Devices from a Stationary Source. No person shall operate, play or permit the operation or playing of any radio, tape player, television, electronic audio equipment, musical instrument, sound amplifier or other mechanical or electronic sound making device that produces, reproduces or amplifies sound in such a manner as to create a noise disturbance. However, this subsection shall not apply to any use or activity exempted in subsection E of this section and any use or activity for which a special permit has been issued pursuant to Section 11.80.040.

3. Radios, Electronic Audio Equipment, or Similar Devices from a Mobile Source Such as a Motor Vehicle. Sound amplification or reproduction equipment on or in a motor vehicle is subject to regulation in accordance with the California Vehicle Code when upon the public right-of-way. When upon public space or publicly owned property other than the public right-of-way or upon private property open to the public, sound amplification or reproduction equipment shall not be operated in such a manner that it is plainly audible at a distance of fifty (50) feet in any direction from the vehicle.

4. Portable, Hand-Held Music or Sound Amplification or Reproduction Equipment. Such equipment shall not be operated on a public right-of-way, public space or other publicly owned property in such a manner as to be plainly audible at a distance of fifty (50) feet in any direction from the operator.

5. Loudspeakers and Public Address Systems.

a. Except as permitted by Section 11.80.040, no person shall operate, or permit the operation of, any loudspeaker, public address system or similar device, for any commercial purpose:

1. Which produces, reproduces or amplifies sound in such a manner as to create a noise disturbance; or

2. During nighttime hours on a public right-of-way, public space or other publicly owned property.

b. No person shall operate, or permit the operation of, any loudspeaker, public address system or similar device, for any noncommercial purpose, during nighttime hours in such a manner as to create a noise disturbance.

6. Animals. No person shall own, possess or harbor an animal or bird that howls, barks, meows, squawks, or makes other sounds that:

a. Create a noise disturbance;

b. Are of frequent or continued duration for ten (10) or more consecutive minutes and are plainly audible at a distance of fifty (50) feet from the real property line of the source of the sound; or

c. Are intermittent for a period of thirty (30) or more minutes and are plainly audible at a distance of fifty (50) feet from the real property line of the source of the sound.

7. Construction and Demolition. No person shall operate or cause the operation of any tools or equipment used in construction, drilling, repair, alteration or demolition work between the hours of eight p.m. and seven a.m. the following day such that the sound there from creates a noise disturbance, except for emergency work by public service utilities or for other work approved by the city manager or designee. This section shall not apply to the use of power tools as provided in subsection (D)(9) of this section.

8. Emergency Signaling Devices. No person shall intentionally sound or permit the sounding outdoors of any fire, burglar or civil defense alarm, siren or whistle, or similar stationary emergency signaling device, except for emergency purposes or for testing as follows:

a. Testing of a stationary emergency signaling device shall not occur between seven p.m. and seven a.m. the following day;

b. Testing of a stationary emergency signaling device shall use only the minimum cycle test time, in no case to exceed sixty (60) seconds;

c. Testing of a complete emergency signaling system, including the functioning of the signaling device and the personnel response to the signaling device, shall not occur more than once in each calendar month. Such testing shall only occur only on weekdays between seven a.m. and seven p.m. and shall be exempt from the time limit specified in subsection (D)(8)(2) of this

section.

9. Power Tools. No person shall operate or permit the operation of any mechanically, electrically or gasoline motor-driven tool during nighttime hours so as to cause a noise disturbance across a residential real property boundary.

10. Pumps, Air Conditioners, Air-Handling Equipment and Other Continuously Operating Equipment. Notwithstanding the general prohibitions of subsection a of this section, no person shall operate or permit the operation of any pump, air conditioning, air-handling or other continuously operating motorized equipment in a state of disrepair or in a manner which otherwise creates a noise disturbance distinguishable from normal operating sounds.

E. Exemptions. The following uses and activities shall be exempt from the sound level regulations except the maximum sound levels provided in Tables 11.80.030-1 and 11.80.030-1A:

1. Sounds resulting from any authorized emergency vehicle when responding to an emergency call or acting in time of an emergency.

2. Sounds resulting from emergency work as defined in Section 11.80.020

3. Any aircraft operated in conformity with, or pursuant to, federal law, federal air regulations and air traffic control instruction used pursuant to and within the duly adopted federal air regulations; and any aircraft operating under technical difficulties in any kind of distress, under emergency orders of air traffic control, or being operated pursuant to and subsequent to the declaration of an emergency under federal air regulations.

4. All sounds coming from the normal operations of interstate motor and rail carriers, to the extent that local regulation of sound levels of such vehicles has been preempted by the Noise Control Act of 1972 (42 U.S.C. § 4901 et seq.) or other applicable federal laws or regulations

5. Sounds from the operation of motor vehicles, to the extent they are regulated by the California Vehicle Code.

6. Any constitutionally protected noncommercial speech or expression conducted within or upon a any public right-of-way, public space or other publicly owned property constituting an open or a designated public forum in compliance with any applicable reasonable time, place and manner restrictions on such speech or expression or otherwise pursuant to legal authority.

7. Sounds produced at otherwise lawful and permitted city-sponsored events, organized sporting events, school assemblies, school playground activities, by permitted fireworks, and by permitted parades on public right-of-way, public space or other publicly owned property.

8. An event for which a temporary use permit or special event permit has been issued under other provisions of this code, where the provisions of Section 11.80.040 are met, the permit granted expressly grants an exemption from specific standards contained in this chapter, and the permittee and all persons under the permittee's reasonable control actually comply with all conditions of such permit. Violation of any condition of such a permit related to sound or sound equipment shall be a violation of this chapter and punishable as such.

F. Nothing in this chapter shall be construed to limit, modify or repeal any other regulation elsewhere in this code relating to the regulation of noise sources, nor shall any such other regulation be read to permit the emission of noise in violation of any provision of this chapter. (Ord. 740 § 1.2, 2007)

11.80.040 Special provisions for temporary use and special event permits.

The exemption by permit set forth in Section 11.80.030(E)(8) shall be subject to the following requirements and conditions:

A. The permit application shall include the name, address and telephone number of the permit applicant; the date, hours and location for which the permit is requested; and the nature of the event or activity. It shall also specify the types of sounds and/or sound equipment to be permitted, the proposed duration of such sound, the specific standards from which the sound is to be exempted, and the reasons for each requested exemption.

B. The permit shall be issued provided the proposed activity meets the requirements of this section and the issuing official determines that the sound to be emitted at the event as proposed would not be detrimental to the public health, safety or welfare, that the event cannot reasonably achieve its legitimate aims and purposes without the exemption and that the sound levels proposed will not unreasonably damage the peace and quiet enjoyment of the lawful users of surrounding properties, nor constitute a public nuisance.

C. The official issuing the permit may prescribe any reasonable conditions or requirements he/she deems necessary to minimize noise disturbances upon the community or the surrounding neighborhood, and/or to protect the health, safety or welfare of the public, including participants in the permitted event, including use of mufflers, screens or other sound-attenuating devices.

D. Any permit granted must be in writing and shall contain all conditions upon which the permit shall be effective.

E. No more than six events requiring a sound limit exemption may be held at any particular location upon privately owned or controlled property per calendar year, provided further that the number of events shall not exceed the number permitted under the regulations for the type of permit issued. For purposes of this subsection, "location" means a legal parcel of real property or a complete shopping or commercial center or mall sharing common parking and access even if comprised of multiple legal parcels.

F. The exemption from sound limits under such permit shall not exceed maximum period of four hours in one twenty-four (24) hour day.

G. The permit will only be granted for hours between nine a.m. and ten p.m. on all days other than Friday and Saturday; and, on Friday and Saturday, between the hours of nine a.m. and one a.m. of the following day, except in the following circumstances:

1. A permit may be granted for hours between nine a.m. on New Year's Eve and one a.m. the following day (New Year's Day).

2. A permit may be granted for hours between nine a.m. and two a.m. the following day if there are no residences, hospitals, or nursing homes within a 0.5 mile radius of the property where the function is taking place.

H. Functions for which the permits are issued shall be limited to a continuous airborne sound level not to exceed seventy (70) dB(A), as measured two hundred (200) feet from the real property boundary of the source property if on private property, or from the source if on public right of way, public space or other publicly owned property. (Ord. 740 § 1.2, 2007)

11.80.050 Measurement or assessment of sound.

A. Measurement With Sound Meter.

1. The measurement of sound shall be made with a sound level meter meeting the standards prescribed by ANSI Section 1.4-1983 (R2006). The instruments shall be maintained in calibration and good working order. A calibration check shall be made of the system at the time of any sound level measurement. Measurements recorded shall be taken so as to provide a proper representation of the source of the sound. The microphone during measurement shall be positioned so as not to create any unnatural enhancement or diminution of the measured sound. A windscreen for the microphone shall be used at all times. However, a violation of this chapter may occur without the occasion of the measurements being made as otherwise provided.

2. The slow meter response of the sound level meter shall be used in order to best determine the average amplitude.

3. The measurement shall be made at any point on the property into which the sound is being transmitted and shall be made at least three feet away from any ground, wall, floor, ceiling, roof and other plane surface.

4. In case of multiple occupancy of a property, the measurement may be made at any point inside the premises to which any complainant has right of legal private occupancy; provided that the measurement shall not be made within three feet of any ground, wall, floor, ceiling, roof or other plane surface.

5. All measurements of sound provided for in this chapter will be made by qualified officials of the city who are designated by the city manger or designee to operate the apparatus used to make the measurements.

B. Assessment Without Sound Level Meter. Any police officer, code enforcement officer, or other official designated by the city manager or designee who hears a noise or sound that is plainly audible, as defined in Section 11.80.020, in violation of this chapter, may enforce this chapter and shall assess the noise or sound according to the following standards:

1. The primary means of detection shall be by means of the official's normal hearing faculties, not artificially enhanced.

2. The official shall first attempt to have a direct line of sight and hearing to the vehicle or real property from which the sound or noise emanates so that the official can readily identify the offending source of the sound or noise and the distance involved. If the official is unable to have a direct line of sight and hearing to the vehicle or real property from which the sound or noise emanates, then the official shall confirm the source of the sound or noise by approaching the suspected vehicle or real property until the official is able to obtain a direct line of sight and hearing, and confirm the source of the sound or noise that was heard at the place of the original assessment of the sound or noise.

3. The official need not be required to identify song titles, artists, or lyrics in order to establish a violation. (Ord. 740 § 1.2, 2007)

11.80.060 Violation.

A. Violation of Sound Level Limits. Any person violating any of the provisions of this chapter shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punishable by a fine not to exceed one thousand dollars ($1,000.00) and/or six months in the county jail, or both. Notwithstanding the foregoing, any violation of the provisions of this chapter may, in the discretion of the citing officer or the city attorney, be cited and/or prosecuted as an infraction or be subject to civil citation pursuant to Chapter 1.10.

B. Joint and Several Responsibility. In addition to the person causing the offending sound, the owner, tenant or lessee of property, or a manager, overseer or agent, or any other person lawfully entitled to possess the property from which the offending sound is emitted at the time the offending sound is emitted, shall be responsible for compliance with this chapter if the additionally responsible party knows or should have known of the offending noise disturbance. It shall not be a lawful defense to assert that some other person caused the sound. The lawful possessor or operator of the premises shall be responsible for operating or maintaining the premises in compliance with this chapter and may be cited regardless of whether or not the person actually causing the sound is also cited.

C. Violation May be Declared a Public Nuisance. The operation or maintenance of any device, equipment, instrument, vehicle or machinery in violation of any provisions of this chapter which endangers the public health, safety and quality of life of residents in the area is declared to be a public nuisance, and may be subject to abatement summarily or by a restraining order or injunction issued

by a court of competent jurisdiction. (Ord. 824 § 1.2, 2011; Ord. 740 § 1.2, 2007)

APPENDIX 5.1:

STUDY AREA PHOTOS

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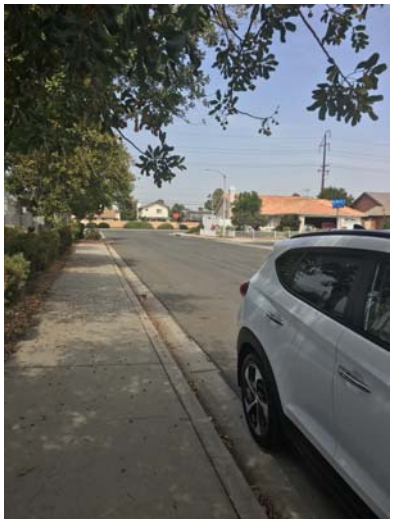
JN:11550

L1_E

L1_SW



L1_W

L2_E

L2_N

L2_S

JN:11550

L3_E

L3_S

L3_SW

L3_SW2

L4_E

L4_W

JN:11550

L5_N

L5_NE

L5_S

L5_W

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APPENDIX 5.2:

NOISE LEVEL MEASUREMENT WORKSHEETS

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24-Hour Noise Level Measurement Summary

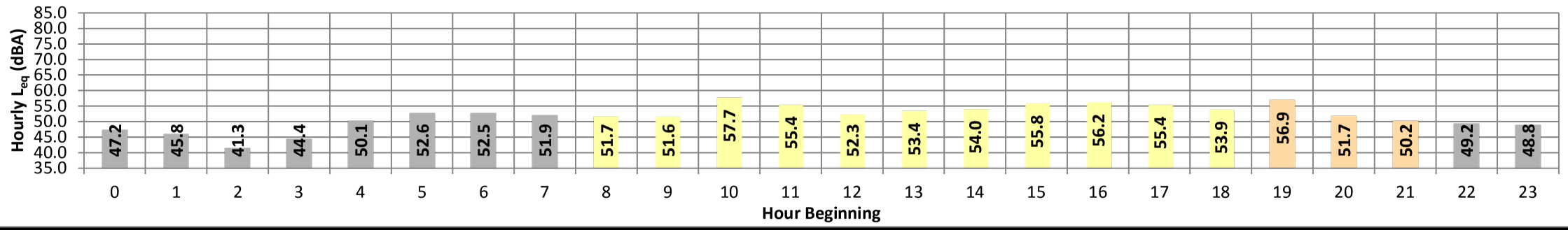
Date: Wednesday, July 11, 2018
Project: Moreno Valley Skilled Nursing

Location: L1 - Located north of the Project site on Black Walnut Street near existing residential homes and the Excel Prep Academy.

Meter: Piccolo I

JN: 11550
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	47.2	72.0	36.2	55.0	52.0	47.0	45.0	40.2	39.0	38.0	36.0	36.0	47.2	10.0	57.2
	1	45.8	73.3	36.2	53.0	51.0	48.0	45.0	40.0	39.0	36.0	36.0	36.0	45.8	10.0	55.8
	2	41.3	56.2	36.2	52.0	50.0	47.0	44.0	39.0	36.0	36.0	36.0	36.0	41.3	10.0	51.3
	3	44.4	65.9	36.2	55.0	53.0	49.0	48.0	42.0	39.0	36.0	36.0	36.0	44.4	10.0	54.4
	4	50.1	73.9	37.2	60.0	57.0	54.0	53.0	47.0	43.0	39.0	39.0	39.0	50.1	10.0	60.1
	5	52.6	77.7	39.5	64.0	60.0	56.0	54.0	49.0	46.0	42.0	42.0	41.0	52.6	10.0	62.6
	6	52.5	75.9	39.2	62.0	59.0	56.0	55.0	50.0	47.0	42.0	42.0	41.0	52.5	10.0	62.5
	7	51.9	71.0	39.2	62.0	59.0	56.0	54.0	51.0	48.0	43.0	42.0	41.0	51.9	0.0	51.9
Day	8	51.7	71.7	39.2	62.0	59.0	56.0	54.0	50.0	47.0	42.0	41.0	40.0	51.7	0.0	51.7
	9	51.6	74.6	39.2	62.0	60.0	56.0	54.0	50.0	46.0	42.0	41.0	40.0	51.6	0.0	51.6
	10	57.7	84.6	39.2	65.0	60.0	56.0	54.0	50.0	47.0	42.0	42.0	41.0	57.7	0.0	57.7
	11	55.4	77.3	40.9	64.0	61.0	59.0	58.0	54.0	49.0	44.0	43.0	42.0	55.4	0.0	55.4
	12	52.3	71.4	40.8	63.0	60.0	56.0	55.0	51.0	48.0	43.0	43.0	42.0	52.3	0.0	52.3
	13	53.4	75.5	41.0	64.0	62.0	57.0	55.0	51.0	49.0	44.0	44.0	43.0	53.4	0.0	53.4
	14	54.0	72.4	41.6	66.0	64.0	59.0	55.0	51.0	48.0	44.0	43.0	42.0	54.0	0.0	54.0
	15	55.8	80.0	43.1	65.0	62.0	59.0	57.0	55.0	52.0	46.0	45.0	44.0	55.8	0.0	55.8
	16	56.2	70.0	47.9	63.0	62.0	60.0	59.0	56.0	54.0	51.0	50.0	49.0	56.2	0.0	56.2
	17	55.4	70.8	46.3	62.0	61.0	59.0	58.0	56.0	54.0	50.0	49.0	48.0	55.4	0.0	55.4
	18	53.9	76.1	44.1	61.0	60.0	57.0	56.0	54.0	51.0	47.0	46.0	45.0	53.9	0.0	53.9
Evening	19	56.9	81.3	42.3	68.0	64.0	59.0	57.0	53.0	50.0	46.0	46.0	44.0	56.9	5.0	61.9
	20	51.7	76.6	40.4	61.0	58.0	55.0	53.0	50.0	47.0	43.0	43.0	42.0	51.7	5.0	56.7
	21	50.2	71.1	39.2	60.0	58.0	54.0	53.0	49.0	45.0	41.0	41.0	39.0	50.2	5.0	55.2
Night	22	49.2	74.3	36.2	59.0	56.0	53.0	51.0	46.0	42.0	39.0	39.0	37.0	49.2	10.0	59.2
	23	48.8	76.6	36.2	56.0	54.0	52.0	50.0	45.0	41.0	39.0	39.0	38.0	48.8	10.0	58.8

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	51.6	70.0	39.2	61.0	59.0	56.0	54.0	50.0	46.0	42.0	41.0	40.0
	Max	57.7	84.6	47.9	66.0	64.0	60.0	59.0	56.0	54.0	51.0	50.0	49.0
Energy Average		54.7	Average:		63.4	61.0	57.6	55.9	52.5	49.5	45.0	44.3	43.3
Evening	Min	50.2	71.1	39.2	60.0	58.0	54.0	53.0	49.0	45.0	41.0	41.0	39.0
	Max	56.9	81.3	42.3	68.0	64.0	59.0	57.0	53.0	50.0	46.0	46.0	44.0
Energy Average		53.9	Average:		63.0	60.0	56.0	54.3	50.7	47.3	43.3	43.3	41.7
Night	Min	41.3	56.2	36.2	52.0	50.0	47.0	44.0	39.0	36.0	36.0	36.0	36.0
	Max	52.6	77.7	39.5	64.0	60.0	56.0	55.0	51.0	48.0	43.0	42.0	41.0
Energy Average		49.6	Average:		57.8	55.1	51.8	49.9	44.9	42.0	39.0	38.7	38.1

24-Hour L_{eq} (dBA)

53.1

24-Hour CNEL (dBA)

57.4

24-Hour Noise Level Measurement Summary

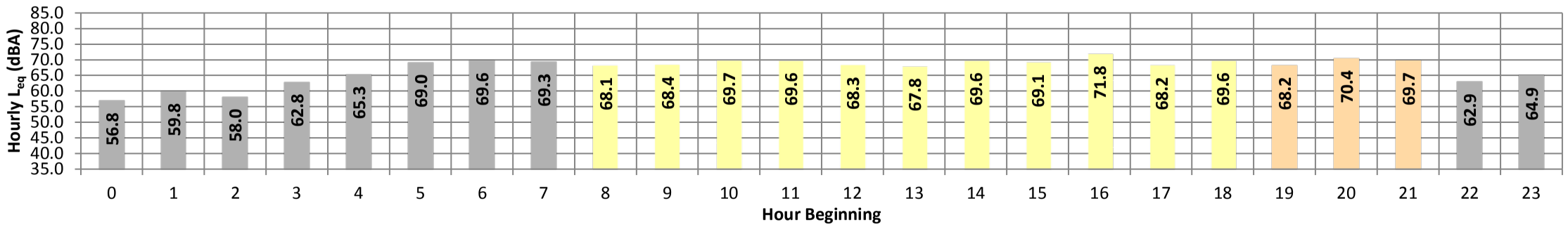
Date: Wednesday, July 11, 2018
Project: Moreno Valley Skilled Nursing

Location: L2 - Located west of the Project site on Alessandro Boulevard near the Moreno Valley Library and existing residential homes.

Meter: Piccolo I

JN: 11550
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	56.8	74.6	47.8	68.0	66.0	62.0	60.0	54.0	51.0	48.0	48.0	48.0	56.8	10.0	66.8
	1	59.8	83.2	40.6	70.0	68.0	64.0	62.0	55.0	51.0	47.0	42.0	40.0	59.8	10.0	69.8
	2	58.0	80.7	38.9	69.0	67.0	64.0	61.0	55.0	51.0	45.0	42.0	39.0	58.0	10.0	68.0
	3	62.8	82.3	40.1	73.0	71.0	68.0	67.0	61.0	55.0	48.0	47.0	42.0	62.8	10.0	72.8
	4	65.3	85.7	42.2	76.0	73.0	70.0	69.0	63.0	58.0	51.0	49.0	47.0	65.3	10.0	75.3
	5	69.0	91.8	47.4	79.0	77.0	74.0	72.0	68.0	63.0	55.0	54.0	51.0	69.0	10.0	79.0
	6	69.6	89.4	48.9	79.0	77.0	74.0	73.0	70.0	65.0	56.0	54.0	50.0	69.6	10.0	79.6
	7	69.3	89.6	49.5	78.0	76.0	74.0	73.0	69.0	65.0	57.0	55.0	52.0	69.3	0.0	69.3
Day	8	68.1	87.6	49.8	76.0	75.0	73.0	72.0	68.0	65.0	57.0	55.0	52.0	68.1	0.0	68.1
	9	68.4	89.9	50.0	78.0	75.0	73.0	72.0	68.0	63.0	57.0	55.0	53.0	68.4	0.0	68.4
	10	69.7	95.7	50.8	78.0	76.0	72.0	71.0	67.0	63.0	57.0	55.0	53.0	69.7	0.0	69.7
	11	69.6	94.7	51.1	79.0	77.0	73.0	71.0	67.0	63.0	57.0	55.0	53.0	69.6	0.0	69.6
	12	68.3	90.3	51.7	78.0	75.0	73.0	71.0	68.0	63.0	57.0	55.0	53.0	68.3	0.0	68.3
	13	67.8	87.2	51.9	76.0	74.0	72.0	71.0	68.0	64.0	58.0	56.0	54.0	67.8	0.0	67.8
	14	69.6	95.3	51.8	78.0	76.0	73.0	72.0	68.0	64.0	57.0	56.0	53.0	69.6	0.0	69.6
	15	69.1	93.1	51.6	77.0	74.0	73.0	72.0	68.0	65.0	58.0	56.0	53.0	69.1	0.0	69.1
	16	71.8	93.1	54.2	84.0	80.0	75.0	73.0	69.0	65.0	59.0	57.0	55.0	71.8	0.0	71.8
	17	68.2	84.4	53.5	76.0	75.0	73.0	72.0	68.0	65.0	59.0	57.0	55.0	68.2	0.0	68.2
	18	69.6	96.3	51.3	79.0	76.0	73.0	72.0	68.0	64.0	58.0	57.0	55.0	69.6	0.0	69.6
Evening	19	68.2	89.0	51.7	78.0	76.0	73.0	71.0	67.0	63.0	57.0	56.0	54.0	68.2	5.0	73.2
	20	70.4	99.0	51.0	78.0	75.0	71.0	70.0	65.0	61.0	56.0	54.0	53.0	70.4	5.0	75.4
	21	69.7	100.0	50.1	77.0	73.0	70.0	69.0	64.0	60.0	55.0	54.0	52.0	69.7	5.0	74.7
Night	22	62.9	86.2	48.2	72.0	69.0	67.0	66.0	62.0	57.0	51.0	49.0	48.0	62.9	10.0	72.9
	23	64.9	93.2	47.9	74.0	71.0	67.0	66.0	60.0	55.0	49.0	49.0	48.0	64.9	10.0	74.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	67.8	84.4	49.8	76.0	74.0	72.0	71.0	67.0	63.0	57.0	55.0	52.0
	Max	71.8	96.3	54.2	84.0	80.0	75.0	73.0	69.0	65.0	59.0	57.0	55.0
Energy Average		69.3	Average:		78.1	75.7	73.0	71.7	67.9	64.0	57.6	55.8	53.5
Evening	Min	68.2	89.0	50.1	77.0	73.0	70.0	69.0	64.0	60.0	55.0	54.0	52.0
	Max	70.4	100.0	51.7	78.0	76.0	73.0	71.0	67.0	63.0	57.0	56.0	54.0
Energy Average		69.5	Average:		77.7	74.7	71.3	70.0	65.3	61.3	56.0	54.7	53.0
Night	Min	56.8	74.6	38.9	68.0	66.0	62.0	60.0	54.0	51.0	45.0	42.0	39.0
	Max	69.6	93.2	49.5	79.0	77.0	74.0	73.0	70.0	65.0	57.0	55.0	52.0
Energy Average		65.8	Average:		73.8	71.5	68.4	66.9	61.7	57.1	50.7	48.9	46.5

24-Hour L_{eq} (dBA)

68.2

24-Hour CNEL (dBA)

73.0

24-Hour Noise Level Measurement Summary

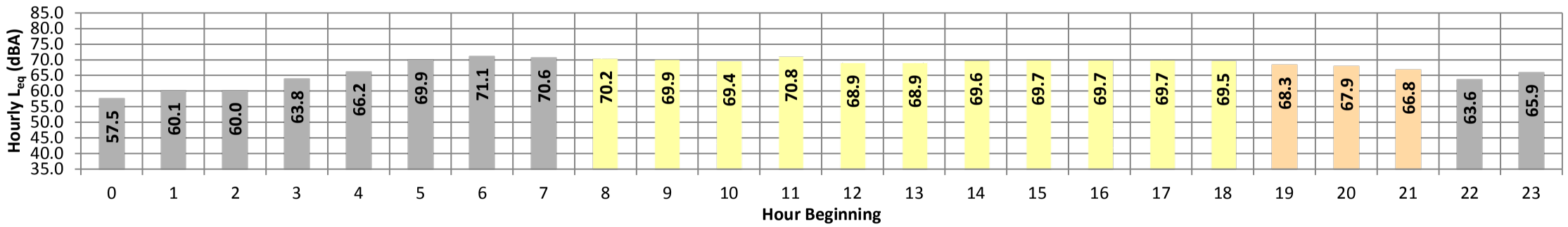
Date: Wednesday, July 11, 2018
Project: Moreno Valley Skilled Nursing

Location: L3 - Located near the southwestern Project site boundaries adjacent to the Excel Prep Academy on Alessandro Boulevard.

Meter: Piccolo I

JN: 11550
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	57.5	80.7	39.1	70.0	67.0	63.0	59.0	48.0	44.0	40.0	39.0	39.0	57.5	10.0	67.5
	1	60.1	85.6	36.4	72.0	70.0	65.0	61.0	48.0	44.0	39.0	39.0	37.0	60.1	10.0	70.1
	2	60.0	83.1	36.4	73.0	70.0	65.0	62.0	50.0	44.0	39.0	39.0	36.0	60.0	10.0	70.0
	3	63.8	86.9	39.0	75.0	74.0	70.0	68.0	58.0	50.0	42.0	41.0	39.0	63.8	10.0	73.8
	4	66.2	89.8	41.0	77.0	75.0	73.0	71.0	62.0	54.0	46.0	44.0	42.0	66.2	10.0	76.2
	5	69.9	91.2	43.7	80.0	78.0	76.0	74.0	69.0	61.0	49.0	48.0	46.0	69.9	10.0	79.9
	6	71.1	92.6	44.8	79.0	78.0	76.0	75.0	71.0	65.0	52.0	50.0	47.0	71.1	10.0	81.1
	7	70.6	90.8	44.3	79.0	78.0	76.0	75.0	71.0	65.0	53.0	50.0	47.0	70.6	0.0	70.6
Day	8	70.2	94.6	43.4	78.0	77.0	75.0	74.0	70.0	64.0	50.0	48.0	45.0	70.2	0.0	70.2
	9	69.9	93.2	44.1	78.0	77.0	75.0	74.0	70.0	64.0	50.0	48.0	45.0	69.9	0.0	69.9
	10	69.4	86.2	43.3	79.0	77.0	75.0	73.0	69.0	64.0	49.0	47.0	44.0	69.4	0.0	69.4
	11	70.8	99.6	43.8	78.0	76.0	74.0	73.0	69.0	63.0	49.0	47.0	45.0	70.8	0.0	70.8
	12	68.9	86.9	43.4	77.0	76.0	74.0	73.0	70.0	64.0	49.0	47.0	45.0	68.9	0.0	68.9
	13	68.9	81.3	43.3	77.0	76.0	74.0	73.0	70.0	65.0	51.0	48.0	46.0	68.9	0.0	68.9
	14	69.6	89.1	43.4	78.0	76.0	74.0	73.0	70.0	65.0	51.0	49.0	45.0	69.6	0.0	69.6
	15	69.7	84.6	45.8	78.0	76.0	75.0	74.0	70.0	66.0	53.0	50.0	48.0	69.7	0.0	69.7
	16	69.7	84.2	48.0	78.0	76.0	75.0	74.0	70.0	66.0	54.0	52.0	49.0	69.7	0.0	69.7
	17	69.7	89.0	47.5	78.0	76.0	75.0	74.0	70.0	66.0	53.0	52.0	50.0	69.7	0.0	69.7
	18	69.5	89.7	47.2	78.0	77.0	75.0	74.0	70.0	65.0	53.0	51.0	49.0	69.5	0.0	69.5
Evening	19	68.3	85.3	47.6	77.0	76.0	74.0	72.0	69.0	63.0	52.0	50.0	49.0	68.3	5.0	73.3
	20	67.9	89.5	44.8	77.0	75.0	73.0	72.0	67.0	61.0	49.0	48.0	46.0	67.9	5.0	72.9
	21	66.8	91.4	43.7	76.0	74.0	72.0	71.0	66.0	57.0	47.0	46.0	45.0	66.8	5.0	71.8
Night	22	63.6	85.9	38.2	74.0	72.0	70.0	68.0	61.0	50.0	43.0	42.0	40.0	63.6	10.0	73.6
	23	65.9	93.6	38.9	76.0	73.0	70.0	67.0	58.0	49.0	42.0	41.0	39.0	65.9	10.0	75.9

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	68.9	81.3	43.3	77.0	76.0	74.0	73.0	69.0	63.0	49.0	47.0	44.0
	Max	70.8	99.6	48.0	79.0	77.0	75.0	74.0	70.0	66.0	54.0	52.0	50.0
Energy Average		69.7	Average:		77.9	76.4	74.6	73.5	69.8	64.7	51.1	49.0	46.5
Evening	Min	66.8	85.3	43.7	76.0	74.0	72.0	71.0	66.0	57.0	47.0	46.0	45.0
	Max	68.3	91.4	47.6	77.0	76.0	74.0	72.0	69.0	63.0	52.0	50.0	49.0
Energy Average		67.7	Average:		76.7	75.0	73.0	71.7	67.3	60.3	49.3	48.0	46.7
Night	Min	57.5	80.7	36.4	70.0	67.0	63.0	59.0	48.0	44.0	39.0	39.0	36.0
	Max	71.1	93.6	44.8	80.0	78.0	76.0	75.0	71.0	65.0	53.0	50.0	47.0
Energy Average		66.9	Average:		75.5	73.5	70.4	68.0	59.6	52.6	44.5	43.3	41.2

24-Hour L_{eq} (dBA)

68.5

24-Hour CNEL (dBA)

73.6

24-Hour Noise Level Measurement Summary

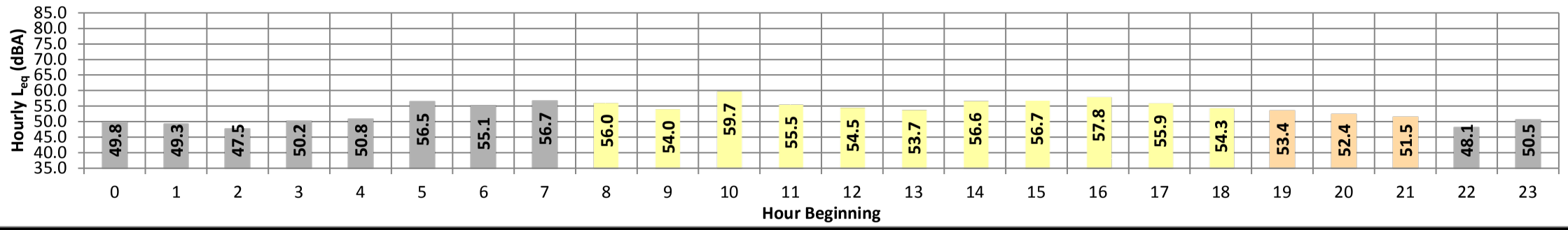
Date: Wednesday, July 11, 2018
Project: Moreno Valley Skilled Nursing

Location: L4 - Located near the eastern Project site boundary adjacent to Moreno Valley Unified School District and Allstate office uses.

Meter: Piccolo I

JN: 11550
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	49.8	64.4	40.3	62.0	55.0	52.0	51.0	49.0	48.0	44.0	44.0	41.0	49.8	10.0	59.8
	1	49.3	74.4	40.4	57.0	55.0	52.0	50.0	48.0	45.0	42.0	42.0	41.0	49.3	10.0	59.3
	2	47.5	68.9	41.7	56.0	55.0	52.0	50.0	45.0	44.0	42.0	42.0	42.0	47.5	10.0	57.5
	3	50.2	63.7	40.5	58.0	56.0	55.0	53.0	50.0	47.0	45.0	45.0	42.0	50.2	10.0	60.2
	4	50.8	65.7	41.1	59.0	58.0	56.0	54.0	50.0	48.0	43.0	42.0	41.0	50.8	10.0	60.8
	5	56.5	76.3	41.7	66.0	62.0	59.0	58.0	55.0	52.0	46.0	44.0	42.0	56.5	10.0	66.5
	6	55.1	72.3	42.3	62.0	60.0	59.0	58.0	56.0	53.0	48.0	46.0	44.0	55.1	10.0	65.1
	7	56.7	73.9	42.2	64.0	63.0	62.0	60.0	57.0	54.0	49.0	48.0	45.0	56.7	0.0	56.7
Day	8	56.0	82.5	44.0	63.0	61.0	58.0	57.0	55.0	52.0	47.0	46.0	45.0	56.0	0.0	56.0
	9	54.0	69.8	43.8	62.0	60.0	58.0	57.0	54.0	52.0	47.0	46.0	44.0	54.0	0.0	54.0
	10	59.7	79.4	43.4	70.0	68.0	66.0	64.0	56.0	53.0	48.0	47.0	46.0	59.7	0.0	59.7
	11	55.5	81.8	42.8	61.0	59.0	57.0	56.0	54.0	52.0	47.0	46.0	44.0	55.5	0.0	55.5
	12	54.5	70.0	43.9	61.0	60.0	58.0	57.0	55.0	52.0	49.0	47.0	45.0	54.5	0.0	54.5
	13	53.7	67.5	44.7	60.0	58.0	57.0	56.0	54.0	52.0	48.0	47.0	46.0	53.7	0.0	53.7
	14	56.6	76.1	44.6	67.0	65.0	60.0	58.0	55.0	53.0	49.0	48.0	46.0	56.6	0.0	56.6
	15	56.7	72.3	45.0	62.0	61.0	60.0	59.0	57.0	55.0	51.0	50.0	47.0	56.7	0.0	56.7
	16	57.8	74.2	48.9	65.0	63.0	61.0	60.0	58.0	56.0	52.0	51.0	50.0	57.8	0.0	57.8
	17	55.9	65.7	45.8	62.0	61.0	59.0	58.0	56.0	55.0	51.0	49.0	47.0	55.9	0.0	55.9
	18	54.3	69.0	45.0	61.0	60.0	58.0	57.0	55.0	52.0	48.0	48.0	46.0	54.3	0.0	54.3
Evening	19	53.4	74.7	44.3	61.0	58.0	56.0	55.0	53.0	51.0	47.0	46.0	45.0	53.4	5.0	58.4
	20	52.4	74.0	41.7	61.0	59.0	56.0	54.0	52.0	49.0	44.0	43.0	42.0	52.4	5.0	57.4
	21	51.5	72.6	41.1	59.0	57.0	55.0	54.0	51.0	49.0	44.0	42.0	41.0	51.5	5.0	56.5
Night	22	48.1	70.2	40.3	56.0	54.0	53.0	52.0	47.0	43.0	41.0	40.0	40.0	48.1	10.0	58.1
	23	50.5	74.9	40.5	60.0	56.0	52.0	51.0	46.0	43.0	41.0	40.0	40.0	50.5	10.0	60.5

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	53.7	65.7	42.8	60.0	58.0	57.0	56.0	54.0	52.0	47.0	46.0	44.0
	Max	59.7	82.5	48.9	70.0	68.0	66.0	64.0	58.0	56.0	52.0	51.0	50.0
Energy Average		56.3	Average:		63.1	61.5	59.3	58.1	55.4	53.1	48.8	47.7	46.0
Evening	Min	51.5	72.6	41.1	59.0	57.0	55.0	54.0	51.0	49.0	44.0	42.0	41.0
	Max	53.4	74.7	44.3	61.0	59.0	56.0	55.0	53.0	51.0	47.0	46.0	45.0
Energy Average		52.5	Average:		60.3	58.0	55.7	54.3	52.0	49.7	45.0	43.7	42.7
Night	Min	47.5	63.7	40.3	56.0	54.0	52.0	50.0	45.0	43.0	41.0	40.0	40.0
	Max	56.7	76.3	42.3	66.0	63.0	62.0	60.0	57.0	54.0	49.0	48.0	45.0
Energy Average		52.7	Average:		60.0	57.4	55.2	53.7	50.3	47.7	44.1	43.3	41.8

24-Hour L_{eq} (dBA)

54.7

24-Hour CNEL (dBA)

59.4

24-Hour Noise Level Measurement Summary

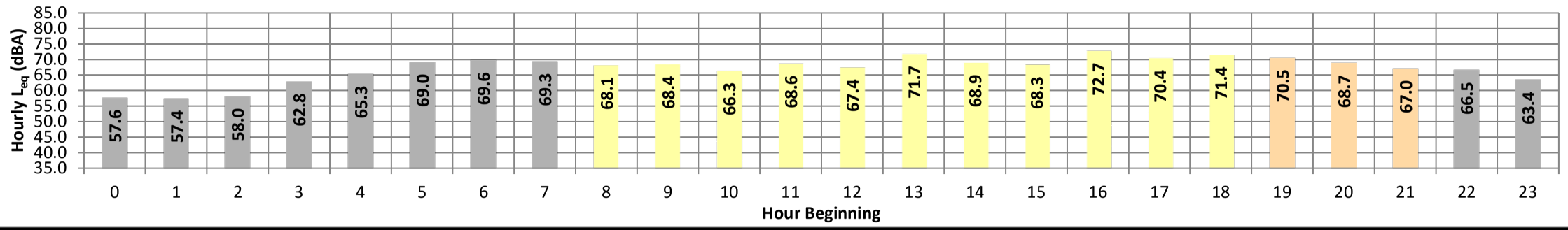
Date: Wednesday, July 11, 2018
Project: Moreno Valley Skilled Nursing

Location: L5 - Located southwest of the Project site on Kitching Street near an existing residential apartment community.

Meter: Piccolo I

JN: 11550
Analyst: A. Wolfe

Hourly L_{eq} dBA Readings (unadjusted)



Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%	L_{eq}	Adj.	Adj. L_{eq}
Night	0	57.6	80.6	42.2	70.0	67.0	63.0	59.0	50.0	47.0	44.0	44.0	43.0	57.6	10.0	67.6
	1	57.4	79.3	39.3	70.0	67.0	63.0	59.0	51.0	46.0	42.0	41.0	39.0	57.4	10.0	67.4
	2	58.0	80.7	38.9	69.0	67.0	64.0	61.0	55.0	51.0	45.0	42.0	39.0	58.0	10.0	68.0
	3	62.8	82.3	40.1	73.0	71.0	68.0	67.0	61.0	55.0	48.0	47.0	42.0	62.8	10.0	72.8
	4	65.3	85.7	42.2	76.0	73.0	70.0	69.0	63.0	58.0	51.0	49.0	47.0	65.3	10.0	75.3
	5	69.0	91.8	47.4	79.0	77.0	74.0	72.0	68.0	63.0	55.0	54.0	51.0	69.0	10.0	79.0
	6	69.6	89.4	48.9	79.0	77.0	74.0	73.0	70.0	65.0	56.0	54.0	50.0	69.6	10.0	79.6
	7	69.3	89.6	49.5	78.0	76.0	74.0	73.0	69.0	65.0	57.0	55.0	52.0	69.3	0.0	69.3
Day	8	68.1	87.6	49.8	76.0	75.0	73.0	72.0	68.0	65.0	57.0	55.0	52.0	68.1	0.0	68.1
	9	68.4	89.9	50.0	78.0	75.0	73.0	72.0	68.0	63.0	57.0	55.0	53.0	68.4	0.0	68.4
	10	66.3	90.2	45.3	76.0	73.0	71.0	69.0	63.0	58.0	50.9	49.0	47.0	66.3	0.0	66.3
	11	68.6	96.5	46.6	78.0	75.0	72.0	71.0	65.0	59.0	52.0	50.0	48.0	68.6	0.0	68.6
	12	67.4	90.7	45.7	77.0	75.0	72.0	71.0	63.0	57.0	51.0	50.0	48.0	67.4	0.0	67.4
	13	71.7	98.8	47.4	81.0	77.0	74.0	72.0	65.0	60.0	53.0	51.0	49.0	71.7	0.0	71.7
	14	68.9	92.0	46.1	79.0	76.0	74.0	72.0	66.0	61.0	54.0	52.0	49.0	68.9	0.0	68.9
	15	68.3	89.2	48.6	79.0	76.0	73.0	72.0	66.0	61.0	53.0	52.0	50.0	68.3	0.0	68.3
	16	72.7	102.0	48.5	82.0	78.0	75.0	73.0	67.0	62.0	56.0	54.0	52.0	72.7	0.0	72.7
	17	70.4	97.9	49.3	81.0	78.0	75.0	73.0	67.0	62.0	55.0	54.0	51.0	70.4	0.0	70.4
	18	71.4	99.4	48.1	82.0	77.0	73.0	72.0	66.0	61.0	55.0	53.0	51.0	71.4	0.0	71.4
Evening	19	70.5	94.7	48.5	82.0	77.0	74.0	72.0	65.0	60.0	53.0	52.0	50.0	70.5	5.0	75.5
	20	68.7	94.2	46.1	79.0	75.0	72.0	70.0	64.0	59.0	52.0	50.0	48.0	68.7	5.0	73.7
	21	67.0	92.1	45.3	76.0	74.0	71.0	70.0	64.0	58.0	50.0	48.0	47.0	67.0	5.0	72.0
Night	22	66.5	91.8	43.2	77.0	74.0	70.0	68.0	61.0	54.0	47.0	46.0	44.0	66.5	10.0	76.5
	23	63.4	89.2	42.2	73.0	71.0	69.0	67.0	58.0	51.0	45.0	44.0	43.0	63.4	10.0	73.4

Timeframe	Hour	L_{eq}	L_{max}	L_{min}	L1%	L2%	L5%	L8%	L25%	L50%	L90%	L95%	L99%
Day	Min	66.3	87.6	45.3	76.0	73.0	71.0	69.0	63.0	57.0	50.9	49.0	47.0
	Max	72.7	102.0	50.0	82.0	78.0	75.0	73.0	68.0	65.0	57.0	55.0	53.0
Energy Average		69.7	Average:		79.0	75.9	73.2	71.7	65.8	60.8	54.0	52.3	50.0
Evening	Min	67.0	92.1	45.3	76.0	74.0	71.0	70.0	64.0	58.0	50.0	48.0	47.0
	Max	70.5	94.7	48.5	82.0	77.0	74.0	72.0	65.0	60.0	53.0	52.0	50.0
Energy Average		69.0	Average:		79.0	75.3	72.3	70.7	64.3	59.0	51.7	50.0	48.3
Night	Min	57.4	79.3	38.9	69.0	67.0	63.0	59.0	50.0	46.0	42.0	41.0	39.0
	Max	69.6	91.8	49.5	79.0	77.0	74.0	73.0	70.0	65.0	57.0	55.0	52.0
Energy Average		65.9	Average:		74.4	72.0	68.9	66.8	60.6	55.5	49.0	47.6	45.0

24-Hour L_{eq} (dBA)

68.4

24-Hour CNEL (dBA)

73.1

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APPENDIX 8.1:

ON-SITE TRAFFIC NOISE CONTOURS

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FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Alessandro Bl.
Lot No: Building 200 Courtyard

Project Name: Moreno Valley Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	50,625	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	5,063	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	82	feet

Site Data

Barrier Height:	**10.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	166.0	feet
Centerline Dist. to Observer:	209.0	feet
Barrier Distance to Observer:	43.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	204.457
Medium Trucks:	204.331
Heavy Trucks:	204.159

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	5.09	-9.28	-1.20	*0.52*	-8.600	-11.600
Medium Trucks:	77.62	-12.15	-9.27	-1.20	*0.44*	-8.200	-11.200
Heavy Trucks:	82.14	-16.10	-9.27	-1.20	*0.27*	-7.290	-10.290

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	64.0	62.1	60.3	54.2	62.9	63.5
Medium Trucks:	55.0	53.5	47.1	45.6	54.0	54.3
Heavy Trucks:	55.6	54.2	45.1	46.4	54.7	54.8
Vehicle Noise:	65.0	63.2	60.6	55.4	64.0	64.5

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	55.4	53.5	51.7	45.6	54.3	54.9
Medium Trucks:	46.8	45.3	38.9	37.4	45.8	46.1
Heavy Trucks:	48.3	46.9	37.8	39.1	47.4	47.6
Vehicle Noise:	56.6	54.8	52.1	47.0	55.6	56.1

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	89	192	415	893

FHWA-RD-77-108 HIGHWAY NOISE PREDICTION MODEL (CALVENO) - 6/2/2013

Scenario: Backyard With Wall
Road Name: Alessandro Bl.
Lot No: Building 200 Façade

Project Name: Moreno Valley Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

SITE SPECIFIC INPUT DATA

Highway Data

Average Daily Traffic (Adt):	50,625	vehicles
Peak Hour Percentage:	10%	
Peak Hour Volume:	5,063	vehicles
Vehicle Speed:	45	mph
Near/Far Lane Distance:	82	feet

Site Data

Barrier Height:	**0.0**	**feet**
Barrier Type (0-Wall, 1-Berm):	0.0	
Centerline Dist. to Barrier:	166.0	feet
Centerline Dist. to Observer:	166.0	feet
Barrier Distance to Observer:	0.0	feet
Observer Height (Above Pad):	5.0	feet
Pad Elevation:	0.0	feet
Road Elevation:	0.0	feet
Barrier Elevation:	0.0	feet
Road Grade:	0.0%	

NOISE MODEL INPUTS

Site Conditions (Hard = 10, Soft = 15)

Autos:	15
Medium Trucks (2 Axles):	15
Heavy Trucks (3+ Axles):	15

Vehicle Mix

VehicleType	*Day*	*Evening*	*Night*	*Daily*
Autos:	77.5%	12.9%	9.6%	97.42%
Medium Trucks:	84.8%	4.9%	10.3%	1.84%
Heavy Trucks:	86.5%	2.7%	10.8%	0.74%

Noise Source Elevations (in feet)

Autos:	0.000		
Medium Trucks:	2.297		
Heavy Trucks:	8.006	*Grade Adjustment:*	0.0

Lane Equivalent Distance (in feet)

Autos:	160.935
Medium Trucks:	160.880
Heavy Trucks:	160.885

FHWA Noise Model Calculations

VehicleType	*REMEL*	*Traffic Flow*	*Distance*	*Finite Road*	*Fresnel*	*Barrier Atten*	*Berm Atten*
Autos:	69.34	5.09	-7.72	-1.20	*-4.82*	0.000	0.000
Medium Trucks:	77.62	-12.15	-7.72	-1.20	*-4.89*	0.000	0.000
Heavy Trucks:	82.14	-16.10	-7.72	-1.20	*-5.05*	0.000	0.000

Unmitigated Noise Levels (without Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.5	63.6	61.9	55.8	64.4	65.0
Medium Trucks:	56.6	55.1	48.7	47.1	55.6	55.8
Heavy Trucks:	57.1	55.7	46.7	47.9	56.3	56.4
Vehicle Noise:	66.6	64.8	62.2	56.9	65.5	66.0

Mitigated Noise Levels (with Topo and barrier attenuation)

VehicleType	*Leq Peak Hour*	*Leq Day*	*Leq Evening*	*Leq Night*	*Ldn*	*CNEL*
Autos:	65.5	63.6	61.9	55.8	64.4	65.0
Medium Trucks:	56.6	55.1	48.7	47.1	55.6	55.8
Heavy Trucks:	57.1	55.7	46.7	47.9	56.3	56.4
Vehicle Noise:	66.6	64.8	62.2	56.9	65.5	66.0

Centerline Distance to Noise Contour (in feet)	*70 dBA*	*65 dBA*	*60 dBA*	*55 dBA*
CNEL:	90	194	418	901

APPENDIX 10.1:

OPERATIONAL STATIONARY-SOURCE NOISE CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R1**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	214.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	214.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	10.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	214.0	-32.6	-32.6	-32.6	-32.6	-32.6	-32.6
Shielding (Barrier Attenuation)	214.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		44.6	-32.6	-32.6	-32.6	-32.6	-32.6
39 Minute Hourly Adjustment		**42.7**	**-34.5**	**-34.5**	**-34.5**	**-34.5**	**-34.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R1**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	342.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	40.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	302.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	342.0	-36.7	-36.7	-36.7	-36.7	-36.7	-36.7
Shielding (Barrier Attenuation)	40.0	-7.7	-7.7	-7.7	-7.7	-7.7	-7.7
Raw (Distance + Barrier)		32.9	-44.4	-44.4	-44.4	-44.4	-44.4
20 Minute Hourly Adjustment		**28.1**	**-49.2**	**-49.2**	**-49.2**	**-49.2**	**-49.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R1**
Source: Generator
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	407.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	40.0	feet	*Noise Source Height:*	6.0	feet
Barrier Distance to Observer:	367.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	64.9	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	407.0	-18.2	-18.2	-18.2	-18.2	-18.2	-18.2
Shielding (Barrier Attenuation)	40.0	-7.0	-7.0	-7.0	-7.0	-7.0	-7.0
Raw (Distance + Barrier)		39.7	-25.2	-25.2	-25.2	-25.2	-25.2
60 Minute Hourly Adjustment		**39.7**	**-25.2**	**-25.2**	**-25.2**	**-25.2**	**-25.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R1**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	145.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	145.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	145.0	-17.4	-17.4	-17.4	-17.4	-17.4	-17.4
Shielding (Barrier Attenuation)	145.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		34.8	-17.4	-17.4	-17.4	-17.4	-17.4
60 Minute Hourly Adjustment		**34.8**	**-17.4**	**-17.4**	**-17.4**	**-17.4**	**-17.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R2**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	77.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	57.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	20.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	10.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	77.0	-23.8	-23.8	-23.8	-23.8	-23.8	-23.8
Shielding (Barrier Attenuation)	57.0	-5.8	-5.8	-5.8	-5.8	-5.8	-5.8
Raw (Distance + Barrier)		47.6	-29.6	-29.6	-29.6	-29.6	-29.6
39 Minute Hourly Adjustment		**45.7**	**-31.5**	**-31.5**	**-31.5**	**-31.5**	**-31.5**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R2**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	89.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	57.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	32.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	89.0	-25.0	-25.0	-25.0	-25.0	-25.0	-25.0
Shielding (Barrier Attenuation)	57.0	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2
Raw (Distance + Barrier)		47.1	-30.2	-30.2	-30.2	-30.2	-30.2
20 Minute Hourly Adjustment		**42.3**	**-35.0**	**-35.0**	**-35.0**	**-35.0**	**-35.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R2**
Source: Generator
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	61.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	41.0 feet	*Noise Source Height:*	6.0 feet
Barrier Distance to Observer:	20.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	64.9	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	61.0	-1.7	-1.7	-1.7	-1.7	-1.7	-1.7
Shielding (Barrier Attenuation)	41.0	-5.2	-5.2	-5.2	-5.2	-5.2	-5.2
Raw (Distance + Barrier)		58.0	-6.9	-6.9	-6.9	-6.9	-6.9
60 Minute Hourly Adjustment		**58.0**	**-6.9**	**-6.9**	**-6.9**	**-6.9**	**-6.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R2**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	41.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	21.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	20.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	41.0	-9.2	-9.2	-9.2	-9.2	-9.2	-9.2
Shielding (Barrier Attenuation)	21.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		37.5	-14.7	-14.7	-14.7	-14.7	-14.7
60 Minute Hourly Adjustment		**37.5**	**-14.7**	**-14.7**	**-14.7**	**-14.7**	**-14.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R3**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	202.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	63.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	139.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	10.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	202.0	-32.1	-32.1	-32.1	-32.1	-32.1	-32.1
Shielding (Barrier Attenuation)	63.0	-7.9	-7.9	-7.9	-7.9	-7.9	-7.9
Raw (Distance + Barrier)		37.2	-40.0	-40.0	-40.0	-40.0	-40.0
39 Minute Hourly Adjustment		**35.3**	**-41.9**	**-41.9**	**-41.9**	**-41.9**	**-41.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R3**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	387.0 feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	86.0 feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	301.0 feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0 feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0 feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0 feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	387.0	-37.8	-37.8	-37.8	-37.8	-37.8	-37.8
Shielding (Barrier Attenuation)	86.0	-5.1	-5.1	-5.1	-5.1	-5.1	-5.1
Raw (Distance + Barrier)		34.4	-42.9	-42.9	-42.9	-42.9	-42.9
20 Minute Hourly Adjustment		**29.6**	**-47.7**	**-47.7**	**-47.7**	**-47.7**	**-47.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R3**
Source: Generator
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	327.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	76.0	feet	*Noise Source Height:*	6.0 feet
Barrier Distance to Observer:	251.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	64.9	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	327.0	-16.3	-16.3	-16.3	-16.3	-16.3	-16.3
Shielding (Barrier Attenuation)	76.0	-4.9	-4.9	-4.9	-4.9	-4.9	-4.9
Raw (Distance + Barrier)		43.7	-21.2	-21.2	-21.2	-21.2	-21.2
60 Minute Hourly Adjustment		**43.7**	**-21.2**	**-21.2**	**-21.2**	**-21.2**	**-21.2**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R3**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	155.0	feet	***Barrier Height:***	**6.0 feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	145.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	155.0	-17.9	-17.9	-17.9	-17.9	-17.9	-17.9
Shielding (Barrier Attenuation)	10.0	-5.5	-5.5	-5.5	-5.5	-5.5	-5.5
Raw (Distance + Barrier)		28.8	-23.4	-23.4	-23.4	-23.4	-23.4
60 Minute Hourly Adjustment		**28.8**	**-23.4**	**-23.4**	**-23.4**	**-23.4**	**-23.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R4**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	288.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	288.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	10.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	288.0	-35.2	-35.2	-35.2	-35.2	-35.2	-35.2
Shielding (Barrier Attenuation)	288.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		42.0	-35.2	-35.2	-35.2	-35.2	-35.2
39 Minute Hourly Adjustment		**40.1**	**-37.1**	**-37.1**	**-37.1**	**-37.1**	**-37.1**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R4**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	568.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	568.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	568.0	-41.1	-41.1	-41.1	-41.1	-41.1	-41.1
Shielding (Barrier Attenuation)	568.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		36.2	-41.1	-41.1	-41.1	-41.1	-41.1
20 Minute Hourly Adjustment		**31.4**	**-45.9**	**-45.9**	**-45.9**	**-45.9**	**-45.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R4**
Source: Generator
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	500.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	500.0	feet	*Noise Source Height:*	6.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	64.9	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	500.0	-20.0	-20.0	-20.0	-20.0	-20.0	-20.0
Shielding (Barrier Attenuation)	500.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		44.9	-20.0	-20.0	-20.0	-20.0	-20.0
60 Minute Hourly Adjustment		**44.9**	**-20.0**	**-20.0**	**-20.0**	**-20.0**	**-20.0**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R4**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	288.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	288.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	288.0	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9
Shielding (Barrier Attenuation)	288.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		30.3	-21.9	-21.9	-21.9	-21.9	-21.9
60 Minute Hourly Adjustment		**30.3**	**-21.9**	**-21.9**	**-21.9**	**-21.9**	**-21.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R5**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	250.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	250.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	10.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	250.0	-34.0	-34.0	-34.0	-34.0	-34.0	-34.0
Shielding (Barrier Attenuation)	250.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		43.2	-34.0	-34.0	-34.0	-34.0	-34.0
39 Minute Hourly Adjustment		**41.3**	**-35.9**	**-35.9**	**-35.9**	**-35.9**	**-35.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R5**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	543.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	30.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	513.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	543.0	-40.7	-40.7	-40.7	-40.7	-40.7	-40.7
Shielding (Barrier Attenuation)	30.0	-8.1	-8.1	-8.1	-8.1	-8.1	-8.1
Raw (Distance + Barrier)		28.5	-48.8	-48.8	-48.8	-48.8	-48.8
20 Minute Hourly Adjustment		**23.7**	**-53.6**	**-53.6**	**-53.6**	**-53.6**	**-53.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R5**
Source: Generator
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	475.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	35.0	feet	*Noise Source Height:*	6.0	feet
Barrier Distance to Observer:	440.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	64.9	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	475.0	-19.6	-19.6	-19.6	-19.6	-19.6	-19.6
Shielding (Barrier Attenuation)	35.0	-7.1	-7.1	-7.1	-7.1	-7.1	-7.1
Raw (Distance + Barrier)		38.2	-26.7	-26.7	-26.7	-26.7	-26.7
60 Minute Hourly Adjustment		**38.2**	**-26.7**	**-26.7**	**-26.7**	**-26.7**	**-26.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R5**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	168.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	168.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	168.0	-18.4	-18.4	-18.4	-18.4	-18.4	-18.4
Shielding (Barrier Attenuation)	168.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		33.8	-18.4	-18.4	-18.4	-18.4	-18.4
60 Minute Hourly Adjustment		**33.8**	**-18.4**	**-18.4**	**-18.4**	**-18.4**	**-18.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R6**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	110.0	feet	***Barrier Height:***	**0.0 feet**
Noise Distance to Barrier:	110.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	10.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	110.0	-26.8	-26.8	-26.8	-26.8	-26.8	-26.8
Shielding (Barrier Attenuation)	110.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		50.4	-26.8	-26.8	-26.8	-26.8	-26.8
39 Minute Hourly Adjustment		**48.5**	**-28.7**	**-28.7**	**-28.7**	**-28.7**	**-28.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R6**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	421.0	feet	***Barrier Height:***	**10.0 feet**
Noise Distance to Barrier:	12.0	feet	*Noise Source Height:*	5.0 feet
Barrier Distance to Observer:	409.0	feet	*Observer Height:*	5.0 feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0
Barrier Elevation:	0.0	feet		

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	421.0	-38.5	-38.5	-38.5	-38.5	-38.5	-38.5
Shielding (Barrier Attenuation)	12.0	-10.3	-10.3	-10.3	-10.3	-10.3	-10.3
Raw (Distance + Barrier)		28.5	-48.8	-48.8	-48.8	-48.8	-48.8
20 Minute Hourly Adjustment		**23.7**	**-53.6**	**-53.6**	**-53.6**	**-53.6**	**-53.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R6**
Source: Generator
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	378.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	6.0	feet
Barrier Distance to Observer:	368.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	64.9	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	378.0	-17.6	-17.6	-17.6	-17.6	-17.6	-17.6
Shielding (Barrier Attenuation)	10.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7
Raw (Distance + Barrier)		37.6	-27.3	-27.3	-27.3	-27.3	-27.3
60 Minute Hourly Adjustment		**37.6**	**-27.3**	**-27.3**	**-27.3**	**-27.3**	**-27.3**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R6**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	45.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	45.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	45.0	-9.8	-9.8	-9.8	-9.8	-9.8	-9.8
Shielding (Barrier Attenuation)	45.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		42.4	-9.8	-9.8	-9.8	-9.8	-9.8
60 Minute Hourly Adjustment		**42.4**	**-9.8**	**-9.8**	**-9.8**	**-9.8**	**-9.8**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R7**
Source: Roof-Top Air Conditioning Unit
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	110.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	110.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	10.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	110.0	-26.8	-26.8	-26.8	-26.8	-26.8	-26.8
Shielding (Barrier Attenuation)	110.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		50.4	-26.8	-26.8	-26.8	-26.8	-26.8
39 Minute Hourly Adjustment		**48.5**	**-28.7**	**-28.7**	**-28.7**	**-28.7**	**-28.7**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R7**
Source: Trash Enclosure Activity
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	313.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	303.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	5.0	77.3	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	313.0	-35.9	-35.9	-35.9	-35.9	-35.9	-35.9
Shielding (Barrier Attenuation)	10.0	-10.7	-10.7	-10.7	-10.7	-10.7	-10.7
Raw (Distance + Barrier)		30.7	-46.6	-46.6	-46.6	-46.6	-46.6
20 Minute Hourly Adjustment		**25.9**	**-51.4**	**-51.4**	**-51.4**	**-51.4**	**-51.4**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R7**
Source: Generator
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	322.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	6.0	feet
Barrier Distance to Observer:	312.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	64.9	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	322.0	-16.2	-16.2	-16.2	-16.2	-16.2	-16.2
Shielding (Barrier Attenuation)	10.0	-9.7	-9.7	-9.7	-9.7	-9.7	-9.7
Raw (Distance + Barrier)		39.0	-25.9	-25.9	-25.9	-25.9	-25.9
60 Minute Hourly Adjustment		**39.0**	**-25.9**	**-25.9**	**-25.9**	**-25.9**	**-25.9**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/12/2018

Observer Location: **R7**
Source: Parking Lot Vehicle Movements
Condition: Operational

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	42.0	feet	***Barrier Height:***	**0.0**	**feet**
Noise Distance to Barrier:	42.0	feet	*Noise Source Height:*	5.0	feet
Barrier Distance to Observer:	0.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	15.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	10.0	52.2	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	42.0	-9.3	-9.3	-9.3	-9.3	-9.3	-9.3
Shielding (Barrier Attenuation)	42.0	0.0	0.0	0.0	0.0	0.0	0.0
Raw (Distance + Barrier)		42.9	-9.3	-9.3	-9.3	-9.3	-9.3
60 Minute Hourly Adjustment		**42.9**	**-9.3**	**-9.3**	**-9.3**	**-9.3**	**-9.3**

APPENDIX 11.1:

TEMPORARY CONSTRUCTION NOISE BARRIER ATTENUATION CALCULATIONS

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STATIONARY SOURCE NOISE PREDICTION MODEL

7/16/2018

Observer Location: **R6**
Source: Highest Reference Const. Activity
Condition: Const. Mitigation

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	35.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	25.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	73.5	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	35.0	3.1	3.1	3.1	3.1	3.1	3.1
Shielding (Barrier Attenuation)	10.0	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7
Raw (Distance + Barrier)		67.9	-5.6	-5.6	-5.6	-5.6	-5.6
60 Minute Hourly Adjustment		**67.9**	**-5.6**	**-5.6**	**-5.6**	**-5.6**	**-5.6**

STATIONARY SOURCE NOISE PREDICTION MODEL

7/16/2018

Observer Location: **R7**
Source: Highest Reference Const. Activity
Condition: Const. Mitigation

Project Name: MV Skilled Nursing
Job Number: 11550
Analyst: A. Wolfe

NOISE MODEL INPUTS

Noise Distance to Observer	35.0	feet	***Barrier Height:***	**10.0**	**feet**
Noise Distance to Barrier:	10.0	feet	*Noise Source Height:*	8.0	feet
Barrier Distance to Observer:	25.0	feet	*Observer Height:*	5.0	feet
Observer Elevation:	0.0	feet	*Barrier Type (0-Wall, 1-Berm):*	0	
Noise Source Elevation:	0.0	feet	*Drop Off Coefficient:*	20.0	
Barrier Elevation:	0.0	feet			

20 = 6 dBA per doubling of distance
15 = 4.5 dBA per doubling of distance

NOISE MODEL PROJECTIONS

Noise Level	*Distance (feet)*	*Leq*	*L50*	*L25*	*L8*	*L2*	*Lmax*
Reference (Sample)	50.0	73.5	0.0	0.0	0.0	0.0	0.0
Distance Attenuation	35.0	3.1	3.1	3.1	3.1	3.1	3.1
Shielding (Barrier Attenuation)	10.0	-8.7	-8.7	-8.7	-8.7	-8.7	-8.7
Raw (Distance + Barrier)		67.9	-5.6	-5.6	-5.6	-5.6	-5.6
60 Minute Hourly Adjustment		**67.9**	**-5.6**	**-5.6**	**-5.6**	**-5.6**	**-5.6**

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APPENDIX 11.2:

SAMPLE TEMPORARY CONSTRUCTION NOISE BARRIER PHOTOS

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Temporary Construction Noise Barrier Examples

I-Beam & Acoustic Material 01

I-Beam & Acoustic Material 02

I-Beam & Acoustic Material 03

K-Rail Plywood & Acoustic Material

K-Rail Temporary Fence & Acoustic Material

K-Rail-Mounted Acoustic Material 01

Temporary Construction Noise Barrier Examples

Pillar & Acoustic Material

Straw Bales 01

Straw Bales 02

Temporary Fence & Acoustic Material 01

Temporary Fence & Acoustic Material 02

MORENO VALLEY SKILLED NURSING FACILITY

FOCUSED CIRCULATION ANALYSIS

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August 2, 2018

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1 INTRODUCTION

This focused Traffic Impact Analysis (TIA) evaluates the project access and potential traffic impacts of a proposed skilled nursing facility located on Alessandro Boulevard east of Kitching Street in the City of Moreno Valley (City). The focused TIA was prepared according to the methodologies and significance criteria provided in the City of Moreno Valley Traffic Impact Analysis Preparation Guide, and the goals and objectives provided in the Moreno Valley General Plan.

1.1 Project Description

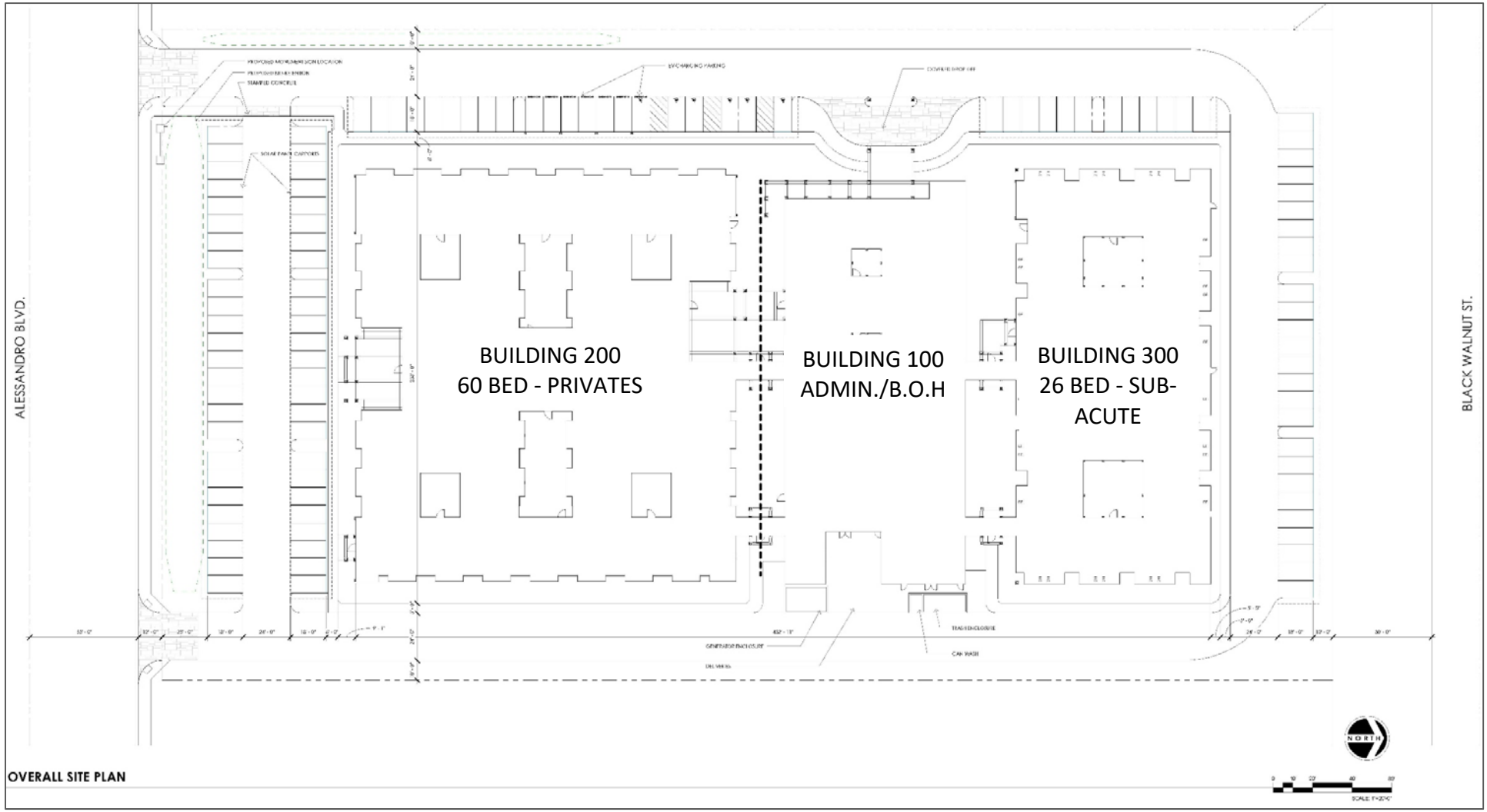
The proposed project is located on the north side of Alessandro Boulevard, approximately 300 feet east of Kitching Street in the City of Moreno Valley. Figures 1 and 2 show the project location. The proposed project would construct a 68,750 square-foot Skilled Nursing Facility comprised of three single story buildings on the 4.54-acre site. Each of the three buildings on the site would serve a different purpose to the facility. Building 100 would serve Administration whereas Building 200 would include 60 private beds and Building 300 would consist of a combination of 26 sub-acute beds and 30 semi-private beds. The project site plan is provided in Figure 3.

Access to the parking lot will be provided via two unsignalized driveways on Alessandro Boulevard. The driveways are located adjacent to the eastern and western property line of the project. Currently, a two-way left-turn lane on Alessandro Boulevard allows for left-turns into and out of the project from the eastern-most driveway. Left-turn access to the western-most driveway is currently prohibited by the roadway striping, due to its close proximity to the westbound left-turn lane at Kitching Street.

Figure 1: Regional Location

Figure 2: Project Location

Figure 3: Project Site Plan



Source: Gregg Maedo & Associates

1.2 Project Trip Generation

The project trip generation was prepared using trip rates from the Institute of Transportation Engineers (ITE) *Trip Generation*, 10th Edition (2017). *Trip Generation* provides trip rates based on square footage and number of beds. The Trip generation has been analyzed using both rates to determine the worst-case trip generation of the project. Table 1 presents the trip generation estimate for the proposed project.

As shown in Table 1, when calculated using square feet, the project is forecast to generate 457 daily trips including 38 trips during the AM peak hour and 41 trips during the PM peak hour. When calculated using beds, the project is forecast to generate 355 daily trips including 20 trips during the AM peak hour and 26 trips during the PM peak hour.

Table 1. Project Trip Generation

			AM Peak Hour			PM Peak Hour		
Land Use	**Units**	**Daily**	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Trip Rates								
Nursing Home (TSF)[1]	per TSF	6.640	0.429	0.121	0.550	0.242	0.348	0.590
Nursing Home (Beds)[1]	per Bed	3.060	0.122	0.048	0.170	0.073	0.147	0.220
Project Trip Generation								
Tripgen per TSF	68.750 TSF	457	30	8	38	17	24	41
Tripgen per Beds	116 Beds	355	14	6	20	9	17	26

TSF = Thousand Square Feet

[1] Trip rates from the Institute of Transportation Engineers, *Trip Generation, 10th Edition,* 2017. Land Use Code 620 - Nursing Home.

1.3 Scope of Work

According to Exhibit A of the City of Moreno Valley *Traffic Impact Analysis Preparation Guide*, projects that generate fewer than 100 vehicle trips during the peak hours are generally exempt from the requirement to prepare a traffic impact analysis. The worst case peak hour trip generation of the project is 41 PM peak hour trips, significantly fewer than 100 peak hour, trips and would therefore be exempt from the requirement to prepare a TIA. Therefore, this analysis has been prepared to provide a focused evaluation of the operation of the project driveways, and the adjacent intersection of Kitching Street/Alessandro Boulevard.

Alessandro Boulevard is classified as a Divided Major Arterial in the vicinity of the project. As such, Alessandro Boulevard adjacent to the project is planned to be widened from its existing two-lane cross section to a 6-lane roadway with a center median. When the widening project is implemented, it is likely that left-turn access to the site will be restricted. To account for the future construction of the median, project traffic has been evaluated for two scenarios: 1) with left-turn access at the east driveway and; 2) without left-turn access at the east driveway.

Study area intersections were evaluated during the AM and PM peak hours, which are defined as the hour with the highest traffic volumes during the 7 AM to 9 AM and 4 PM to 6 PM peak commute periods. AM and PM peak hour traffic operations were evaluated for the following scenarios:

- Existing Condition
- Existing plus Project Condition
- Existing plus Project without Left-turn Access
- Project Opening Year (2020)
- Opening Year plus project
- Opening Year plus project without Left-turn Access

Forecast traffic volumes for the Project Opening Year conditions were developed by applying a growth rate of two percent per year to the 2018 traffic counts, as directed by City of Moreno Valley Engineering staff.

1.4 Methodology

Intersection operations are evaluated using Level of Service (LOS), which is a measure of the delay experienced by drivers on a roadway facility. LOS A indicates free-flow traffic conditions and is generally the best operating conditions. LOS F is an extremely congested condition and is the worst operating condition from the driver's perspective. In this report, LOS at signalized and unsignalized intersections is calculated using the Highway Capacity Manual (HCM), 6th Edition methodology.

LOS at signalized intersections is defined in terms of the weighted average control delay for the intersection as a whole. Control delay is a measure of the increase in travel time that is experienced due to traffic signal control and is expressed in terms of average control delay per vehicle (in seconds). Control delay is determined based on the intersection geometry and volume, signal cycle length, phasing and coordination along the arterial corridor. Table 2 shows the relationship between control delay and LOS.

Table 2. Relationship between Control Delay and LOS at a Signalized Intersection

LOS	Delay (Seconds per Vehicle)
A	≤ 10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	>80

Unsignalized intersections are categorized as either all-way stop control (AWSC) or two-way stop control (TWSC). LOS at AWSC intersections is determined by the weighted average control delay of the overall intersection. The HCM TWSC intersection methodology calculates LOS based on the delay experienced by drivers on the minor (stop-controlled) approaches to the intersection. For TWSC intersections, LOS is determined for each minor-street movement, as well as the major-street left-turns. The relationship between delay and LOS at Unsignalized intersections is shown in Table 3.

Table 3. Relationship between Delay and LOS an Unsignalized Intersection

LOS	Delay (seconds)
A	0-10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

1.5 Significance Criteria

The City of Moreno Valley General Plan Figure 9-2 – LOS Standards, prescribes a LOS standard of LOS C for all intersections in the City, except for intersections adjacent to freeway on/off ramps, intersections adjacent to employment generating land uses, and intersections on the City Boundary. The study area is adjacent to residential land uses and some employment generating land uses (Moreno Valley Unified School District, Excel Charter School, Moreno Valley Library). However, since these are also residential serving uses, a LOS standard of LOS C has been used in the analysis. An impact would occur if the project causes an intersection to deteriorate from acceptable LOS (LOS C or better) to an unacceptable LOS (LOS D, E or F). At an intersection already operating at LOS D, E or F in the baseline condition, a project impact would occur if the project adds measurable delay (5 seconds or more) to an intersection already operating at an unacceptable LOS.

2 Focused Traffic Analysis

This section discusses the baseline (without project) and with project conditions. Baseline conditions are those conditions that exist within the study area in the existing condition and that are forecast to occur in the future, without the proposed project.

2.1 Existing Transportation System

Access to the project site is provided by Alessandro Boulevard. Alessandro Boulevard is classified as a Divided Major Arterial adjacent to the project on the City of Moreno Valley General Plan circulation plan. Alessandro Boulevard has a speed limit of 45 mph near the project site. Sidewalks are present intermittently along Alessandro Boulevard east of Kitching Street. There is currently no sidewalk adjacent to the project, however a sidewalk will be built as part of the project improvements. A bus stop is located on Alessandro Boulevard, adjacent to the project site and is served by Riverside Transit Agency Route 20. Route 20 provides service 7 days a week between Riverside Plaza in the City of Riverside and Moreno Valley College.

2.2 Traffic Volumes and Levels of Service

Traffic counts at the intersection of Alessandro Boulevard/Kitching Street were collected on Thursday May 10, 2018. The counts were taken on a typical weekday when schools were in session. The intersection turn movement count sheet is provided in Appendix A. As noted in the methodology section, traffic volumes were increased by 2 percent per year to forecast Opening Year traffic volumes.

Project trips were distributed to and from the project site based on the observed distribution of existing traffic at the adjacent intersection of Alessandro Boulevard/Kitching Street. The distribution utilized for project traffic was as follows:

- 15 percent to/from the north via Kitching Street
- 45 percent to/from the west via Alessandro Boulevard
- 10 percent to/from the south via Kitching Street
- 30 percent to/from the east via Alessandro Boulevard

The project trip distribution was prepared for the existing condition and for the future condition, assuming no left-turn access to and from the project site. The Existing, Opening Year, Project only, Existing plus Project, and Opening Year plus Project traffic volumes are illustrated in Figure 4. All traffic volumes, assuming no left-turn access to and from the project site, are illustrated in Figure 5.

The Levels of Service at Alessandro Boulevard/Kitching Street and both project driveways were determined using the HCM methodology, described previously in section 1.4. Table 4 shows the AM and PM peak hour levels of service at study intersections for all scenarios. All LOS calculations are provided in Appendix B. As shown in Table 4, all study intersections operate at satisfactory LOS C or better during the AM and PM peak hours in all analysis conditions. With the restriction of left-turn access, conditions at Alessandro Boulevard/Kitching Street would be substantially the same as in the existing with project condition. Levels of service at the project driveways would improve slightly without left-turn access, however it is important to note that even with the allowance of left-turns into and out of the project, the project driveways would operate with satisfactory LOS C or better. The project would not cause any significant traffic impacts in any analyzed condition.

2.3 Summary and Conclusion

The proposed project would construct a 68,750 square-foot Skilled Nursing Facility on the north side of Alessandro Boulevard, approximately 300 feet east of Kitching Street in the City of Moreno Valley. Access to the parking lot will be provided from two unsignalized driveways on Alessandro Boulevard. Currently, a two-way left-turn lane on Alessandro Boulevard allows for left-turns into and out of the project from the eastern-most driveway. Left-turn access to the western-most driveway is currently prohibited by the roadway striping, due to its close proximity to the westbound left-turn lane at Kitching Street. The worst case peak hour trip generation of the project is 41 PM peak hour trips, significantly fewer than the City's 100 peak hour threshold for preparation of a traffic impact analysis. Therefore, this analysis was prepared to provide a focused evaluation of the operation of the project driveways, and the adjacent intersection of Kitching Street/Alessandro Boulevard.

The Levels of Service at Alessandro Boulevard/Kitching Street and both project driveways were determined using the HCM methodology. All study intersections operate at satisfactory LOS C or better during the AM and PM peak hours in all analysis conditions. With the restriction of left-turn access, conditions at Alessandro Boulevard/Kitching Street would be substantially the same as in the existing with project condition. Levels of service at the project driveways would improve slightly without left-turn access, however it is important to note that even with the allowance of left-turns into and out of the project, the project driveways would operate with satisfactory LOS C or better. The project would not cause any significant traffic impacts in any analyzed condition.

Figure 4: AM and PM Peak Hour Traffic Volumes (With Project Left-Turn Access)

Existing	Opening Year	Project Only	Existing plus Project	Opening Year plus Project
150/121 ↖ 159/237 ← 46/55 ↙ 0/0 ⊂ 0/0 ⊂ 4/3 ⊂ 16/25 ↖ 708/492 ← 90/96 ↖ 14/30 ⊂ 119/103 ↗ 417/654 → 124/194 ↘ 0/0 ⊂ 202/157 ↗ 229/194 → 35/13 ↘	156/126 ↖ 166/247 ← 48/58 ↙ 0/0 ⊂ 5/4 ⊂ 17/26 ↖ 737/512 ← 94/100 ↖ 15/32 ⊂ 124/108 ↗ 434/681 → 129/202 ↘ 0/0 ⊂ 211/164 ↗ 239/202 → 37/14 ↘	5/3 ↙ 1/2 ↖ 4/11 ← 1/4 ↗ 14/8 → 3/2 ↘	150/121 ↖ 159/237 ← 51/58 ↙ 0/0 ⊂ 4/3 ⊂ 17/27 ↖ 712/503 ← 91/100 ↖ 14/30 ⊂ 119/103 ↗ 431/662 → 124/194 ↘ 0/0 ⊂ 202/157 ↗ 229/194 → 38/15 ↘	156/126 ↖ 166/247 ← 53/61 ↙ 0/0 ⊂ 5/4 ⊂ 18/28 ↖ 741/523 ← 95/104 ↖ 15/32 ⊂ 124/108 ↗ 448/689 → 129/202 ↘ 0/0 ⊂ 211/164 ↗ 239/202 → 40/16 ↘
1. Kitching St/Alessandro Blvd	1. Kitching St/Alessandro Blvd	1. Kitching St/Alessandro Blvd	1. Kitching St/Alessandro Blvd	1. Kitching St/Alessandro Blvd
← 818/616 498/722 →	← 853/642 519/753 →	3/8 ↙ 5/3 ← 3/8 ↗ 22/12 →	3/8 ↙ 5/3 ← 821/624 ↗ 520/734 →	3/8 ↙ 5/3 ← 856/650 ↗ 541/765 →
2. W Driveway/Alessandro Blvd	2. W Driveway/Alessandro Blvd	2. W Driveway/Alessandro Blvd	2. W Driveway/Alessandro Blvd	2. W Driveway/Alessandro Blvd
← 818/616 498/722 →	← 853/642 519/753 →	3/8 ↙ 2/7 ↙ 5/3 ← 5/3 ↗ 22/12 ↗	3/8 ↙ 2/7 ↙ 5/3 ← 823/619 ↗ 22/12 ↗ 498/722 →	3/8 ↙ 2/7 ↙ 5/3 ← 858/645 ↗ 22/12 ↗ 519/753 →
3. E Driveway/Alessandro Blvd	3. E Driveway/Alessandro Blvd	3. E Driveway/Alessandro Blvd	3. E Driveway/Alessandro Blvd	3. E Driveway/Alessandro Blvd

xx/yy = AM/PM Peak Hour Traffic Volume

❶ = Project Study Area Intersection

Figure 5: AM and PM Peak Hour Traffic Volumes (No Project Left-Turn Access)

Existing	Opening Year	Project Only	Existing plus Project	Opening Year plus Project
150/121 ↖ 159/237 ← 46/55 ↙ 0/0 ⊂ 0/0 ⊂ 4/3 ⊂ 14/30 119/103 ↗ 417/654 → 124/194 ↘ 90/96 ↑ 708/492 ← 16/25 ↖ 202/157 ↑ 229/194 → 35/13 ↗	156/126 ↖ 166/247 ← 48/58 ↙ 0/0 ⊂ 0/0 ⊂ 15/32 124/108 ↗ 434/681 → 129/202 ↘ 94/100 ↑ 737/512 ← 17/26 ↖ 5/4 ⊂ 211/164 ↑ 239/202 → 37/14 ↗	5/3 ↙ 14/8 → 3/2 ↘ 1/4 ↑ 4/11 ← 1/2 ↖ 2/7 ⊂	150/121 ↖ 159/237 ← 51/58 ↙ 0/0 ⊂ 0/0 ⊂ 14/30 119/103 ↗ 431/662 → 124/194 ↘ 91/100 ↑ 712/503 ← 17/27 ↖ 6/10 ⊂ 202/157 ↑ 229/194 → 38/15 ↗	156/126 ↖ 166/247 ← 53/61 ↙ 0/0 ⊂ 0/0 ⊂ 15/32 124/108 ↗ 448/689 → 129/202 ↘ 95/104 ↑ 741/523 ← 18/28 ↖ 7/11 ⊂ 211/164 ↑ 239/202 → 40/16 ↗
1. Kitching St/Alessandro Blvd	1. Kitching St/Alessandro Blvd	1. Kitching St/Alessandro Blvd	1. Kitching St/Alessandro Blvd	1. Kitching St/Alessandro Blvd
498/722 → ← 818/616	519/753 → ← 853/642	3/8 ↙ 24/19 → ↑ 5/3 ← 5/15	3/8 ↙ 522/741 → ↑ 5/3 ← 823/631	3/8 ↙ 543/772 → ↑ 5/3 ← 858/657
2. W Driveway/Alessandro Blvd	2. W Driveway/Alessandro Blvd	2. W Driveway/Alessandro Blvd	2. W Driveway/Alessandro Blvd	2. W Driveway/Alessandro Blvd
498/722 → ← 818/616	519/753 → ← 853/642	5/15 ↖ 0/0 ↙ 24/19 → ↑ 27/15 ← 5/3	5/15 ↖ 0/0 ↙ 522/741 → ↑ 27/15 ← 823/619	5/15 ↖ 0/0 ↙ 543/772 → ↑ 27/15 ← 858/645
3. E Driveway/Alessandro Blvd	3. E Driveway/Alessandro Blvd	3. E Driveway/Alessandro Blvd	3. E Driveway/Alessandro Blvd	3. E Driveway/Alessandro Blvd

xx/yy = AM/PM Peak Hour Traffic Volume

❶ = Project Study Area Intersection

Table 4. Without and With Project AM and PM Peak Hour Levels of Service

Intersection	Existing				Existing plus Project (with Left-Turn Access)				Existing plus Project (No Left-Turn Access)			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. Kitching St/Alessandro Blvd	27.9	C	25.2	C	28.0	C	25.3	C	28.0	C	25.3	C
2. West Driveway/Alessandro Blvd	-	-	-	-	15.7	C	13.1	B	15.8	C	13.3	B
3. East Driveway/Alessandro Blvd	-	-	-	-	22.7	C	23.0	C	16.0	C	13.3	B
Intersection	**Opening Year**				**Opening Year plus Project (with Left-Turn Access)**				**Opening Year plus Project (No Left-Turn Access)**			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]	Delay[1]	LOS[2]
1. Kitching St/Alessandro Blvd	28.9	C	25.6	C	29.0	C	25.7	C	29.0	C	25.7	C
2. West Driveway/Alessandro Blvd	-	-	-	-	16.3	C	13.5	B	16.4	C	13.6	B
3. East Driveway/Alessandro Blvd	-	-	-	-	24.1	C	24.5	C	16.6	C	13.6	B

[1] Delay (in secconds)
[2] Level of Service

APPENDIX A – TRAFFIC COUNTS

INTERSECTION TURNING MOVEMENT COUNTS

T218

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, May 10, 18

LOCATION: Moreno Valley
NORTH & SOUTH: Kitching
EAST & WEST: Alessandro

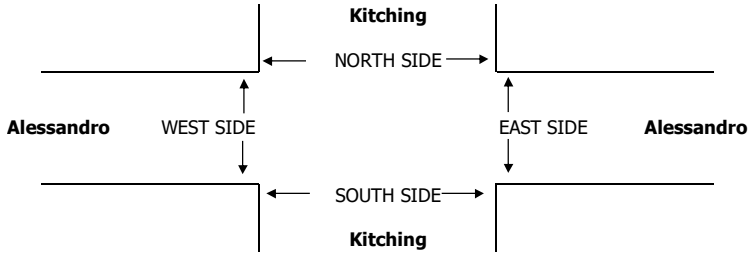
PROJECT #: SC1717
LOCATION #:
CONTROL: SIGNAL

NOTES:

AM / PM / MD / OTHER / OTHER — ◄ W — ▲ N — S ▼ — E ►

☑ Add U-Turns to Left Turns

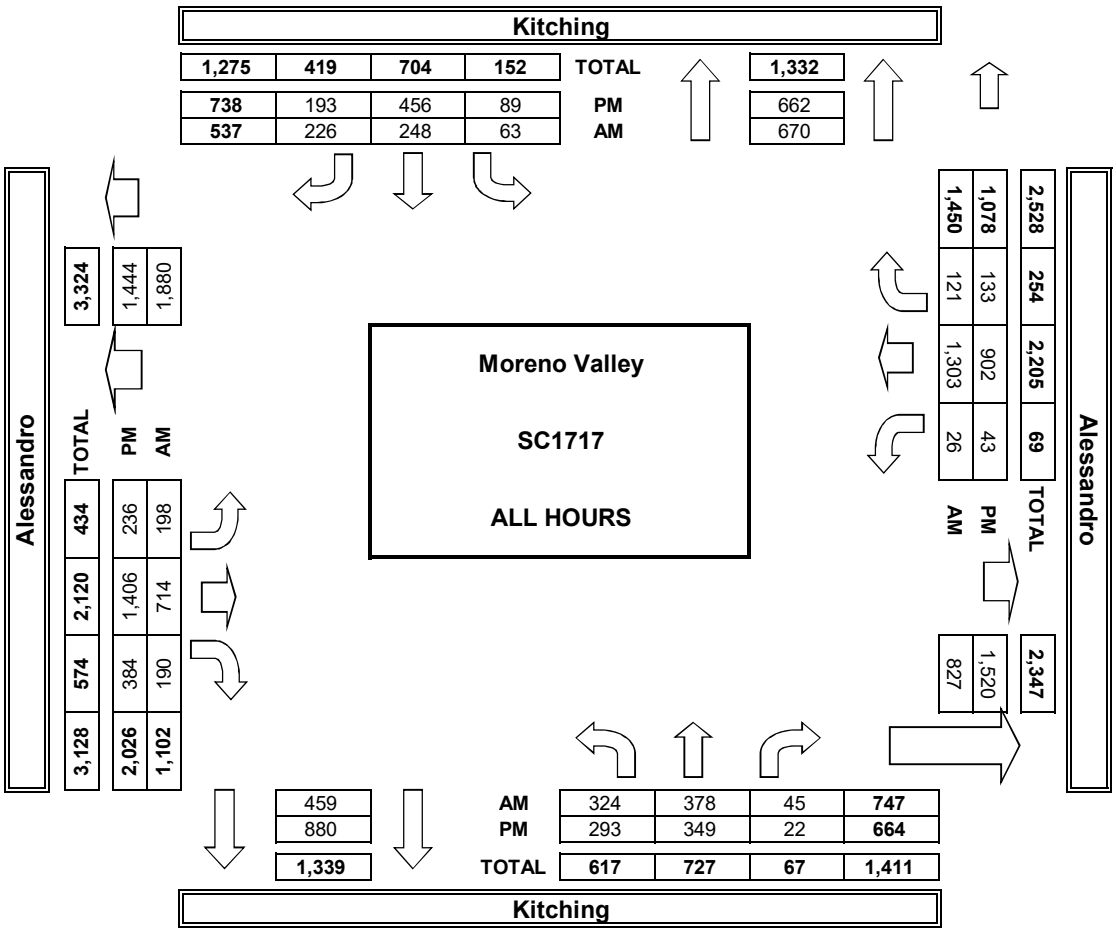
		NORTHBOUND Kitching			SOUTHBOUND Kitching			EASTBOUND Alessandro			WESTBOUND Alessandro				U-TURNS				
	LANES:	NL 2	NT 1	NR 0	SL 1	ST 2	SR 0	EL 1	ET 2	ER 1	WL 1	WT 2	WR 1	TOTAL	NB 0	SB 0	EB 0	WB 0	TTL
AM	7:00 AM	31	37	1	5	20	21	16	55	14	1	158	2	361	0	0	2	0	2
	7:15 AM	38	44	4	6	28	20	22	79	28	3	162	17	451	0	0	4	0	4
	7:30 AM	57	64	11	16	44	36	36	123	31	0	183	26	627	0	0	4	0	4
	7:45 AM	49	56	17	10	49	52	59	130	38	17	181	32	690	0	0	4	4	8
	8:00 AM	58	65	3	14	38	42	16	85	27	0	182	15	545	0	0	2	0	2
	8:15 AM	37	28	5	5	20	20	11	97	20	2	155	11	411	0	0	3	0	3
	8:30 AM	30	39	1	4	30	18	18	76	10	2	136	10	374	0	0	3	1	4
	8:45 AM	24	45	3	3	19	17	20	69	22	1	146	8	377	0	0	5	0	5
	VOLUMES	324	378	45	63	248	226	198	714	190	26	1,303	121	3,836	0	0	27	5	32
	APPROACH %	43%	51%	6%	12%	46%	42%	18%	65%	17%	2%	90%	8%						
	APP/DEPART	747	/	670	537	/	459	1,102	/	827	1,450	/	1,880	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	202	229	35	46	159	150	133	417	124	20	708	90	2,313					
	APPROACH %	43%	49%	8%	13%	45%	42%	20%	62%	18%	2%	87%	11%						
	PEAK HR FACTOR		0.883			0.800			0.742			0.889		0.838					
	APP/DEPART	466	/	438	355	/	299	674	/	502	818	/	1,074	0					
PM	4:00 PM	40	51	6	19	59	28	41	146	41	6	125	39	601	0	0	8	1	9
	4:15 PM	45	42	3	17	49	41	36	137	46	12	120	22	570	0	0	6	2	8
	4:30 PM	35	52	2	13	71	26	36	173	62	7	130	22	629	0	0	11	0	11
	4:45 PM	37	49	2	6	58	26	20	198	45	3	117	13	574	0	0	5	0	5
	5:00 PM	39	38	2	10	59	23	20	199	48	6	107	14	565	0	0	3	0	3
	5:15 PM	48	38	1	11	48	21	30	185	49	4	104	10	549	0	0	10	0	10
	5:30 PM	23	50	4	7	51	12	27	190	49	3	102	4	522	0	0	5	0	5
	5:45 PM	26	29	2	6	61	16	26	178	44	2	97	9	496	0	0	8	0	8
	VOLUMES	293	349	22	89	456	193	236	1,406	384	43	902	133	4,506	0	0	56	3	59
	APPROACH %	44%	53%	3%	12%	62%	26%	12%	69%	19%	4%	84%	12%						
	APP/DEPART	664	/	662	738	/	880	2,026	/	1,520	1,078	/	1,444	0					
	BEGIN PEAK HR		4:00 PM																
	VOLUMES	157	194	13	55	237	121	133	654	194	28	492	96	2,374					
	APPROACH %	43%	53%	4%	13%	57%	29%	14%	67%	20%	5%	80%	16%						
	PEAK HR FACTOR		0.938			0.939			0.905			0.906		0.944					
	APP/DEPART	364	/	393	413	/	456	981	/	725	616	/	800	0					

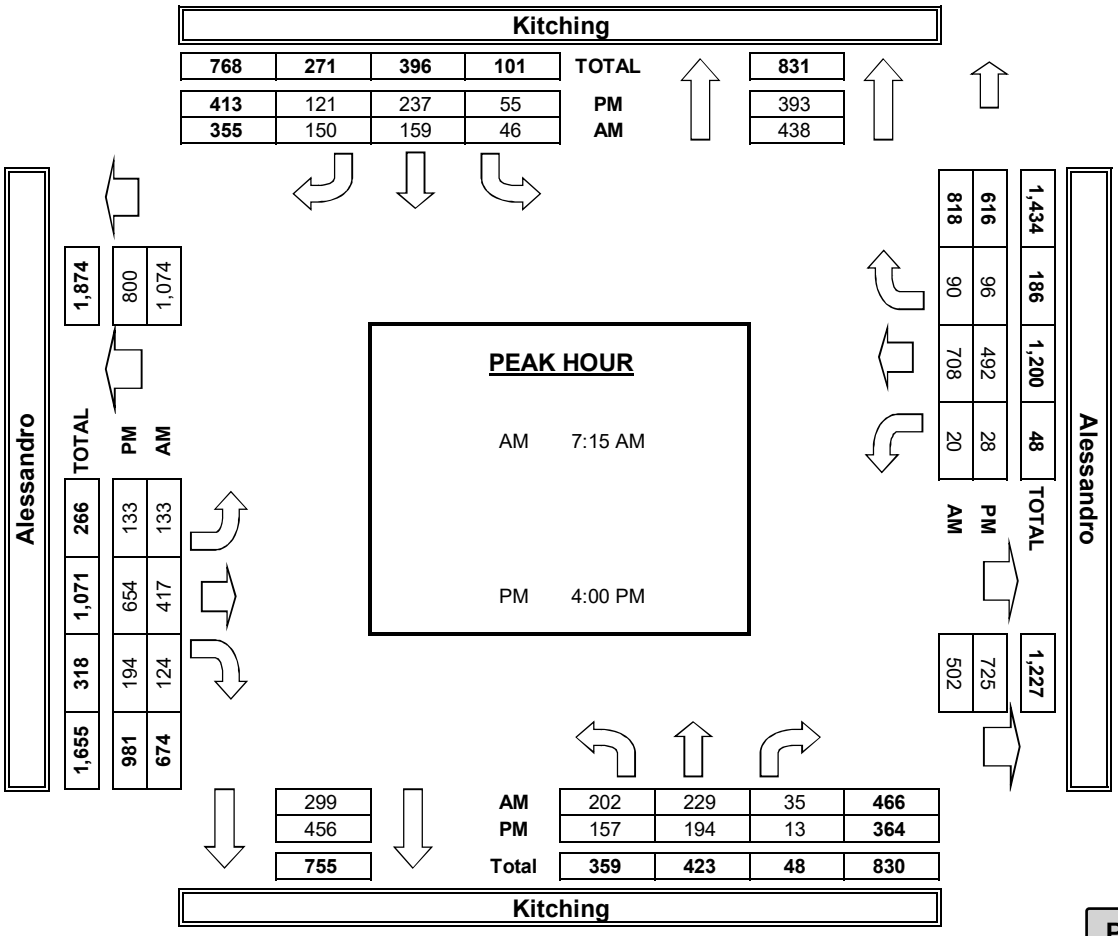


		PEDESTRIAN + BIKE CROSSINGS					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM	0	1	4	0	5	0	0	2	0	2	0	1	2	0	3
	7:15 AM	3	13	4	3	23	3	13	3	3	22	0	0	1	0	1
	7:30 AM	0	2	4	1	7	0	1	4	0	5	0	1	0	1	2
	7:45 AM	0	9	6	1	16	0	9	6	0	15	0	0	0	1	1
	8:00 AM	0	1	1	0	2	0	1	1	0	2	0	0	0	0	0
	8:15 AM	2	1	0	0	3	2	0	0	0	2	0	1	0	0	1
	8:30 AM	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOTAL	5	28	19	5	57	5	25	16	3	49	0	3	3	2	8
	AM BEGIN PEAK HR			7:15 AM			3	24	14	3	44					
PM	4:00 PM	7	5	0	4	16	7	2	0	4	13	0	3	0	0	3
	4:15 PM	0	0	3	1	4	0	0	3	0	3	0	0	0	1	1
	4:30 PM	2	3	7	0	12	2	3	7	0	12	0	0	0	0	0
	4:45 PM	4	2	1	0	7	4	2	1	0	7	0	0	0	0	0
	5:00 PM	2	2	1	0	5	2	2	1	0	5	0	0	0	0	0
	5:15 PM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	5:30 PM	1	4	0	2	7	1	4	0	0	5	0	0	0	2	2
	5:45 PM	1	0	1	0	2	1	0	1	0	2	0	0	0	0	0
	TOTAL	17	16	14	7	54	17	13	14	4	48	0	3	0	3	6
	PM BEGIN PEAK HR			4:00 PM			13	7	11	4	35					

AimTD LLC

TURNING MOVEMENT COUNTS





APPENDIX B – LEVEL OF SERVICE WORKSHEETS

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing AM
07/24/2018

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	14	119	417	124	4	16	708	90	202	229	35	46
Future Volume (veh/h)	14	119	417	124	4	16	708	90	202	229	35	46
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		129	453	135		17	770	98	220	249	38	50
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	794	119	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3089	465	1781
Grp Volume(v), veh/h		129	453	135		17	770	98	220	142	145	50
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1777	1781
Q Serve(g_s), s		4.6	7.0	4.5		0.6	14.4	3.5	4.3	4.5	4.6	1.8
Cycle Q Clear(g_c), s		4.6	7.0	4.5		0.6	14.4	3.5	4.3	4.5	4.6	1.8
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.26	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	457	178
V/C Ratio(X)		0.46	0.41	0.27		0.10	0.84	0.25	0.64	0.31	0.32	0.28
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	457	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.8	18.9	18.0		28.6	24.7	20.6	30.3	21.0	21.0	29.2
Incr Delay (d2), s/veh		5.4	1.1	1.3		1.1	9.3	1.5	8.7	1.8	1.8	3.9
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.3	2.9	1.7		0.3	6.9	1.4	2.1	2.0	2.1	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		32.2	20.0	19.3		29.7	34.0	22.1	38.9	22.7	22.9	33.1
LnGrp LOS		C	B	B		C	C	C	D	C	C	C
Approach Vol, veh/h			717				885			507		
Approach Delay, s/veh			22.0				32.6			29.8		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	3.8	6.6	2.6	9.0	6.3	8.0	6.6	16.4
Green Ext Time (p_c), s	0.0	1.2	0.0	2.9	0.1	1.4	0.1	0.9

Intersection Summary	
HCM 6th Ctrl Delay	27.9
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing AM
07/24/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	159	150
Future Volume (veh/h)	159	150
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	173	163
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	459	403
Arrive On Green	0.26	0.26
Sat Flow, veh/h	1785	1569
Grp Volume(v), veh/h	172	164
Grp Sat Flow(s),veh/h/ln	1777	1577
Q Serve(g_s), s	5.6	6.0
Cycle Q Clear(g_c), s	5.6	6.0
Prop In Lane		0.99
Lane Grp Cap(c), veh/h	457	406
V/C Ratio(X)	0.38	0.40
Avail Cap(c_a), veh/h	457	406
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.4	21.6
Incr Delay (d2), s/veh	2.4	3.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	2.4
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	23.7	24.5
LnGrp LOS	C	C
Approach Vol, veh/h	386	
Approach Delay, s/veh	25.3	
Approach LOS	C	
Timer - Assigned Phs		

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing PM
07/24/2018

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	30	103	654	194	3	25	492	96	157	194	13	55
Future Volume (veh/h)	30	103	654	194	3	25	492	96	157	194	13	55
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		112	711	211		27	535	104	171	211	14	60
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	869	57	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3380	223	1781
Grp Volume(v), veh/h		112	711	211		27	535	104	171	110	115	60
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1826	1781
Q Serve(g_s), s		4.0	12.0	7.4		1.0	9.2	3.8	3.3	3.4	3.5	2.2
Cycle Q Clear(g_c), s		4.0	12.0	7.4		1.0	9.2	3.8	3.3	3.4	3.5	2.2
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.12	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	469	178
V/C Ratio(X)		0.40	0.64	0.42		0.15	0.59	0.26	0.49	0.24	0.24	0.34
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	469	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.5	20.6	19.0		28.8	22.7	20.7	29.8	20.6	20.6	29.3
Incr Delay (d2), s/veh		4.2	2.8	2.6		1.8	2.7	1.6	5.0	1.2	1.2	5.0
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.9	5.1	2.9		0.5	4.0	1.5	1.6	1.5	1.6	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		30.8	23.3	21.6		30.6	25.5	22.3	34.8	21.8	21.8	34.4
LnGrp LOS		C	C	C		C	C	C	C	C	C	C
Approach Vol, veh/h			1034				666			396		
Approach Delay, s/veh			23.8				25.2			27.4		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.2	5.5	3.0	14.0	5.3	8.8	6.0	11.2
Green Ext Time (p_c), s	0.0	0.9	0.0	3.5	0.1	1.6	0.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

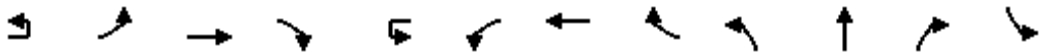
HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing PM
07/24/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	237	121
Future Volume (veh/h)	237	121
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	258	132
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	591	293
Arrive On Green	0.26	0.26
Sat Flow, veh/h	2297	1138
Grp Volume(v), veh/h	198	192
Grp Sat Flow(s),veh/h/ln	1777	1658
Q Serve(g_s), s	6.5	6.8
Cycle Q Clear(g_c), s	6.5	6.8
Prop In Lane		0.69
Lane Grp Cap(c), veh/h	457	426
V/C Ratio(X)	0.43	0.45
Avail Cap(c_a), veh/h	457	426
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.7	21.8
Incr Delay (d2), s/veh	3.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	2.9
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	24.7	25.3
LnGrp LOS	C	C
Approach Vol, veh/h	450	
Approach Delay, s/veh	26.2	
Approach LOS	C	
Timer - Assigned Phs		

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Opening Year AM
07/24/2018



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	15	124	434	129	5	17	737	94	211	239	37	48
Future Volume (veh/h)	15	124	434	129	5	17	737	94	211	239	37	48
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		135	472	140		18	801	102	229	260	40	52
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	793	120	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3085	468	1781
Grp Volume(v), veh/h		135	472	140		18	801	102	229	148	152	52
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1776	1781
Q Serve(g_s), s		4.8	7.4	4.7		0.6	15.1	3.7	4.5	4.7	4.9	1.9
Cycle Q Clear(g_c), s		4.8	7.4	4.7		0.6	15.1	3.7	4.5	4.7	4.9	1.9
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.26	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	457	178
V/C Ratio(X)		0.48	0.42	0.28		0.10	0.88	0.26	0.66	0.32	0.33	0.29
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	457	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.9	19.0	18.1		28.6	24.9	20.7	30.4	21.1	21.1	29.2
Incr Delay (d2), s/veh		5.8	1.2	1.4		1.1	11.6	1.6	9.6	1.9	1.9	4.1
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.4	3.0	1.8		0.3	7.4	1.4	2.3	2.1	2.2	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		32.7	20.2	19.5		29.8	36.5	22.3	40.0	23.0	23.1	33.3
LnGrp LOS		C	C	B		C	D	C	D	C	C	C
Approach Vol, veh/h			747				921			529		
Approach Delay, s/veh			22.3				34.8			30.4		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	3.9	6.9	2.6	9.4	6.5	8.3	6.8	17.1
Green Ext Time (p_c), s	0.0	1.2	0.0	2.9	0.0	1.4	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	28.9
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Opening Year AM
07/24/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	166	156
Future Volume (veh/h)	166	156
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	180	170
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	458	405
Arrive On Green	0.26	0.26
Sat Flow, veh/h	1780	1573
Grp Volume(v), veh/h	180	170
Grp Sat Flow(s),veh/h/ln	1777	1576
Q Serve(g_s), s	5.8	6.3
Cycle Q Clear(g_c), s	5.8	6.3
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	457	405
V/C Ratio(X)	0.39	0.42
Avail Cap(c_a), veh/h	457	405
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.5	21.7
Incr Delay (d2), s/veh	2.5	3.2
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.6
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	24.0	24.8
LnGrp LOS	C	C
Approach Vol, veh/h	402	
Approach Delay, s/veh	25.6	
Approach LOS	C	
Timer - Assigned Phs		

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Opening Year PM
07/24/2018

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	32	108	681	202	4	26	512	100	164	202	14	58
Future Volume (veh/h)	32	108	681	202	4	26	512	100	164	202	14	58
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		117	740	220		28	557	109	178	220	15	63
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	867	59	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3373	228	1781
Grp Volume(v), veh/h		117	740	220		28	557	109	178	115	120	63
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1824	1781
Q Serve(g_s), s		4.1	12.6	7.8		1.0	9.7	4.0	3.4	3.6	3.7	2.3
Cycle Q Clear(g_c), s		4.1	12.6	7.8		1.0	9.7	4.0	3.4	3.6	3.7	2.3
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.13	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	469	178
V/C Ratio(X)		0.42	0.66	0.44		0.16	0.61	0.28	0.52	0.25	0.26	0.35
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	469	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.6	20.8	19.1		28.8	22.9	20.8	29.9	20.7	20.7	29.4
Incr Delay (d2), s/veh		4.5	3.1	2.8		1.9	3.0	1.7	5.4	1.3	1.3	5.4
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.0	5.4	3.1		0.5	4.2	1.5	1.6	1.6	1.7	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		31.2	23.9	22.0		30.7	25.9	22.5	35.3	22.0	22.0	34.8
LnGrp LOS		C	C	C		C	C	C	D	C	C	C
Approach Vol, veh/h			1077				694			413		
Approach Delay, s/veh			24.3				25.6			27.7		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.3	5.7	3.0	14.6	5.4	9.1	6.1	11.7
Green Ext Time (p_c), s	0.0	1.0	0.0	3.4	0.1	1.6	0.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Opening Year PM
07/24/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	247	126
Future Volume (veh/h)	247	126
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	268	137
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	590	293
Arrive On Green	0.26	0.26
Sat Flow, veh/h	2296	1138
Grp Volume(v), veh/h	206	199
Grp Sat Flow(s),veh/h/ln	1777	1658
Q Serve(g_s), s	6.8	7.1
Cycle Q Clear(g_c), s	6.8	7.1
Prop In Lane		0.69
Lane Grp Cap(c), veh/h	457	426
V/C Ratio(X)	0.45	0.47
Avail Cap(c_a), veh/h	457	426
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.8	22.0
Incr Delay (d2), s/veh	3.2	3.7
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	25.0	25.6
LnGrp LOS	C	C
Approach Vol, veh/h	468	
Approach Delay, s/veh	26.6	
Approach LOS	C	
Timer - Assigned Phs		

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing + Project AM
07/26/2018

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	14	119	431	124	4	17	712	91	202	229	38	51
Future Volume (veh/h)	14	119	431	124	4	17	712	91	202	229	38	51
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		129	468	135		18	774	99	220	249	41	55
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	785	127	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3053	495	1781
Grp Volume(v), veh/h		129	468	135		18	774	99	220	143	147	55
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1771	1781
Q Serve(g_s), s		4.6	7.3	4.5		0.6	14.5	3.6	4.3	4.6	4.7	2.0
Cycle Q Clear(g_c), s		4.6	7.3	4.5		0.6	14.5	3.6	4.3	4.6	4.7	2.0
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.28	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	455	178
V/C Ratio(X)		0.46	0.42	0.27		0.10	0.85	0.25	0.64	0.31	0.32	0.31
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	455	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.8	19.0	18.0		28.6	24.7	20.6	30.3	21.0	21.1	29.3
Incr Delay (d2), s/veh		5.4	1.2	1.3		1.1	9.6	1.5	8.7	1.8	1.9	4.5
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.3	3.0	1.7		0.3	6.9	1.4	2.1	2.0	2.1	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		32.2	20.1	19.3		29.8	34.3	22.2	38.9	22.8	22.9	33.7
LnGrp LOS		C	C	B		C	C	C	D	C	C	C
Approach Vol, veh/h			732				891			510		
Approach Delay, s/veh			22.1				32.8			29.8		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.0	6.7	2.6	9.3	6.3	8.0	6.6	16.5
Green Ext Time (p_c), s	0.0	1.2	0.0	2.9	0.1	1.4	0.1	0.8

Intersection Summary	
HCM 6th Ctrl Delay	28.0
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing + Project AM
07/26/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	159	150
Future Volume (veh/h)	159	150
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	173	163
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	459	403
Arrive On Green	0.26	0.26
Sat Flow, veh/h	1785	1569
Grp Volume(v), veh/h	172	164
Grp Sat Flow(s),veh/h/ln	1777	1577
Q Serve(g_s), s	5.6	6.0
Cycle Q Clear(g_c), s	5.6	6.0
Prop In Lane		0.99
Lane Grp Cap(c), veh/h	457	406
V/C Ratio(X)	0.38	0.40
Avail Cap(c_a), veh/h	457	406
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.4	21.6
Incr Delay (d2), s/veh	2.4	3.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	2.4
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	23.7	24.5
LnGrp LOS	C	C
Approach Vol, veh/h	391	
Approach Delay, s/veh	25.5	
Approach LOS	C	
Timer - Assigned Phs		

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↱			↱
Traffic Vol, veh/h	0	520	821	5	0	3
Future Vol, veh/h	0	520	821	5	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	565	892	5	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	895
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	0	339
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	339
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.7
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	339
HCM Lane V/C Ratio	-	-	-	0.01
HCM Control Delay (s)	-	-	-	15.7
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	498	823	5	2	3
Future Vol, veh/h	22	498	823	5	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	541	895	5	2	3

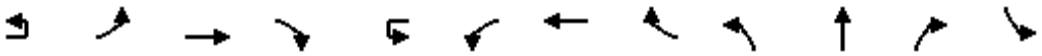
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	900	0	-	0	1487	898
Stage 1	-	-	-	-	898	-
Stage 2	-	-	-	-	589	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	755	-	-	-	137	338
Stage 1	-	-	-	-	398	-
Stage 2	-	-	-	-	554	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	755	-	-	-	133	338
Mov Cap-2 Maneuver	-	-	-	-	133	-
Stage 1	-	-	-	-	385	-
Stage 2	-	-	-	-	554	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	22.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	755	-	-	-	209
HCM Lane V/C Ratio	0.032	-	-	-	0.026
HCM Control Delay (s)	9.9	-	-	-	22.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing + Proj PM
07/26/2018



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	30	103	662	194	3	27	503	100	157	194	15	58
Future Volume (veh/h)	30	103	662	194	3	27	503	100	157	194	15	58
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		112	720	211		29	547	109	171	211	16	63
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	860	65	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3345	252	1781
Grp Volume(v), veh/h		112	720	211		29	547	109	171	111	116	63
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1820	1781
Q Serve(g_s), s		4.0	12.2	7.4		1.0	9.5	4.0	3.3	3.5	3.5	2.3
Cycle Q Clear(g_c), s		4.0	12.2	7.4		1.0	9.5	4.0	3.3	3.5	3.5	2.3
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.14	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	468	178
V/C Ratio(X)		0.40	0.64	0.42		0.16	0.60	0.28	0.49	0.24	0.25	0.35
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	468	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.5	20.6	19.0		28.8	22.8	20.8	29.8	20.6	20.6	29.4
Incr Delay (d2), s/veh		4.2	2.9	2.6		2.0	2.9	1.7	5.0	1.3	1.3	5.4
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.9	5.2	2.9		0.5	4.1	1.5	1.6	1.5	1.6	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		30.8	23.5	21.6		30.8	25.7	22.5	34.8	21.9	21.9	34.8
LnGrp LOS		C	C	C		C	C	C	C	C	C	C
Approach Vol, veh/h			1043				685			398		
Approach Delay, s/veh			23.9				25.4			27.4		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.3	5.5	3.0	14.2	5.3	8.8	6.0	11.5
Green Ext Time (p_c), s	0.0	0.9	0.0	3.4	0.1	1.6	0.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing + Proj PM
07/26/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	237	121
Future Volume (veh/h)	237	121
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	258	132
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	591	293
Arrive On Green	0.26	0.26
Sat Flow, veh/h	2297	1138
Grp Volume(v), veh/h	198	192
Grp Sat Flow(s),veh/h/ln	1777	1658
Q Serve(g_s), s	6.5	6.8
Cycle Q Clear(g_c), s	6.5	6.8
Prop In Lane		0.69
Lane Grp Cap(c), veh/h	457	426
V/C Ratio(X)	0.43	0.45
Avail Cap(c_a), veh/h	457	426
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.7	21.8
Incr Delay (d2), s/veh	3.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	2.9
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	24.7	25.3
LnGrp LOS	C	C
Approach Vol, veh/h	453	
Approach Delay, s/veh	26.4	
Approach LOS	C	
Timer - Assigned Phs		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	734	624	3	0	8
Future Vol, veh/h	0	734	624	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	798	678	3	0	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	681	0	-	0	-	680
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.12	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.218	-	-	-	-	3.318
Pot Cap-1 Maneuver	912	-	-	-	0	451
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	912	-	-	-	-	451
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	912	-	-	-	451
HCM Lane V/C Ratio	-	-	-	-	0.019
HCM Control Delay (s)	0	-	-	-	13.1
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	722	619	3	7	8
Future Vol, veh/h	12	722	619	3	7	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	785	673	3	8	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	676	0	-	0	1486	675
Stage 1	-	-	-	-	675	-
Stage 2	-	-	-	-	811	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	915	-	-	-	137	454
Stage 1	-	-	-	-	506	-
Stage 2	-	-	-	-	437	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	915	-	-	-	135	454
Mov Cap-2 Maneuver	-	-	-	-	135	-
Stage 1	-	-	-	-	499	-
Stage 2	-	-	-	-	437	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	23
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	915	-	-	-	216
HCM Lane V/C Ratio	0.014	-	-	-	0.075
HCM Control Delay (s)	9	-	-	-	23
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.2

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Opening Year AM plus Project
07/26/2018

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	15	124	448	129	5	18	741	95	211	239	40	53
Future Volume (veh/h)	15	124	448	129	5	18	741	95	211	239	40	53
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		135	487	140		20	805	103	229	260	43	58
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	784	128	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3050	497	1781
Grp Volume(v), veh/h		135	487	140		20	805	103	229	150	153	58
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1770	1781
Q Serve(g_s), s		4.8	7.6	4.7		0.7	15.2	3.7	4.5	4.8	4.9	2.1
Cycle Q Clear(g_c), s		4.8	7.6	4.7		0.7	15.2	3.7	4.5	4.8	4.9	2.1
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.28	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	455	178
V/C Ratio(X)		0.48	0.44	0.28		0.11	0.88	0.26	0.66	0.33	0.34	0.33
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	455	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.9	19.1	18.1		28.7	25.0	20.7	30.4	21.1	21.1	29.3
Incr Delay (d2), s/veh		5.8	1.2	1.4		1.3	11.9	1.6	9.6	1.9	2.0	4.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.4	3.1	1.8		0.4	7.5	1.4	2.3	2.1	2.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		32.7	20.3	19.5		29.9	36.9	22.3	40.0	23.0	23.1	34.1
LnGrp LOS		C	C	B		C	D	C	D	C	C	C
Approach Vol, veh/h			762				928			532		
Approach Delay, s/veh			22.4				35.1			30.4		
Approach LOS			C				D			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.1	6.9	2.7	9.6	6.5	8.3	6.8	17.2
Green Ext Time (p_c), s	0.0	1.3	0.0	3.0	0.0	1.4	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	166	156
Future Volume (veh/h)	166	156
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	180	170
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	458	405
Arrive On Green	0.26	0.26
Sat Flow, veh/h	1780	1573
Grp Volume(v), veh/h	180	170
Grp Sat Flow(s),veh/h/ln	1777	1576
Q Serve(g_s), s	5.8	6.3
Cycle Q Clear(g_c), s	5.8	6.3
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	457	405
V/C Ratio(X)	0.39	0.42
Avail Cap(c_a), veh/h	457	405
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.5	21.7
Incr Delay (d2), s/veh	2.5	3.2
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.6
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	24.0	24.8
LnGrp LOS	C	C
Approach Vol, veh/h	408	
Approach Delay, s/veh	25.8	
Approach LOS	C	
Timer - Assigned Phs		

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑			↱
Traffic Vol, veh/h	0	541	856	5	0	3
Future Vol, veh/h	0	541	856	5	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	588	930	5	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	933
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	0	322
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	322
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.3
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	322
HCM Lane V/C Ratio	-	-	-	0.01
HCM Control Delay (s)	-	-	-	16.3
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	22	519	858	5	2	3
Future Vol, veh/h	22	519	858	5	2	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	564	933	5	2	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	938	0	-	0	1548	936
Stage 1	-	-	-	-	936	-
Stage 2	-	-	-	-	612	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	730	-	-	-	126	321
Stage 1	-	-	-	-	382	-
Stage 2	-	-	-	-	541	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	730	-	-	-	122	321
Mov Cap-2 Maneuver	-	-	-	-	122	-
Stage 1	-	-	-	-	369	-
Stage 2	-	-	-	-	541	-

Approach	EB	WB	SB
HCM Control Delay, s	0.4	0	24.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	730	-	-	-	194
HCM Lane V/C Ratio	0.033	-	-	-	0.028
HCM Control Delay (s)	10.1	-	-	-	24.1
HCM Lane LOS	B	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Opening Year PM + Project
07/26/2018

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	32	108	689	202	4	28	523	104	164	202	16	61
Future Volume (veh/h)	32	108	689	202	4	28	523	104	164	202	16	61
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		117	749	220		30	568	113	178	220	17	66
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	859	66	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3340	256	1781
Grp Volume(v), veh/h		117	749	220		30	568	113	178	116	121	66
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1819	1781
Q Serve(g_s), s		4.1	12.8	7.8		1.1	9.9	4.1	3.4	3.6	3.7	2.4
Cycle Q Clear(g_c), s		4.1	12.8	7.8		1.1	9.9	4.1	3.4	3.6	3.7	2.4
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.14	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	468	178
V/C Ratio(X)		0.42	0.67	0.44		0.17	0.62	0.29	0.52	0.25	0.26	0.37
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	468	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.6	20.9	19.1		28.8	23.0	20.8	29.9	20.7	20.7	29.4
Incr Delay (d2), s/veh		4.5	3.2	2.8		2.0	3.2	1.8	5.4	1.3	1.3	5.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.0	5.4	3.1		0.5	4.3	1.6	1.6	1.6	1.7	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		31.2	24.1	22.0		30.9	26.2	22.7	35.3	22.0	22.0	35.3
LnGrp LOS		C	C	C		C	C	C	D	C	C	D
Approach Vol, veh/h			1086				711			415		
Approach Delay, s/veh			24.4				25.8			27.7		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.4	5.7	3.1	14.8	5.4	9.1	6.1	11.9
Green Ext Time (p_c), s	0.0	1.0	0.0	3.4	0.1	1.6	0.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Opening Year PM + Project
07/26/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	247	126
Future Volume (veh/h)	247	126
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	268	137
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	590	293
Arrive On Green	0.26	0.26
Sat Flow, veh/h	2296	1138
Grp Volume(v), veh/h	206	199
Grp Sat Flow(s),veh/h/ln	1777	1658
Q Serve(g_s), s	6.8	7.1
Cycle Q Clear(g_c), s	6.8	7.1
Prop In Lane		0.69
Lane Grp Cap(c), veh/h	457	426
V/C Ratio(X)	0.45	0.47
Avail Cap(c_a), veh/h	457	426
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.8	22.0
Incr Delay (d2), s/veh	3.2	3.7
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	25.0	25.6
LnGrp LOS	C	C
Approach Vol, veh/h	471	
Approach Delay, s/veh	26.7	
Approach LOS	C	
Timer - Assigned Phs		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑			↱
Traffic Vol, veh/h	0	765	650	3	0	8
Future Vol, veh/h	0	765	650	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	832	707	3	0	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	709
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	0	433
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	433
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.5
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	433
HCM Lane V/C Ratio	-	-	-	0.02
HCM Control Delay (s)	-	-	-	13.5
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	753	645	3	7	8
Future Vol, veh/h	12	753	645	3	7	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	13	818	701	3	8	9

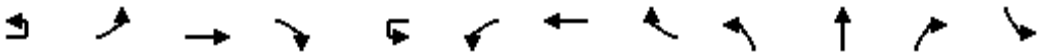
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	704	0	-	0	1547	703
Stage 1	-	-	-	-	703	-
Stage 2	-	-	-	-	844	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	894	-	-	-	126	438
Stage 1	-	-	-	-	491	-
Stage 2	-	-	-	-	422	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	894	-	-	-	124	438
Mov Cap-2 Maneuver	-	-	-	-	124	-
Stage 1	-	-	-	-	484	-
Stage 2	-	-	-	-	422	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	24.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	894	-	-	-	201
HCM Lane V/C Ratio	0.015	-	-	-	0.081
HCM Control Delay (s)	9.1	-	-	-	24.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.3

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing + Project AM No Left-Turn Access
07/26/2018



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	14	119	431	124	6	17	712	91	202	229	38	51
Future Volume (veh/h)	14	119	431	124	6	17	712	91	202	229	38	51
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		129	468	135		18	774	99	220	249	41	55
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	785	127	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3053	495	1781
Grp Volume(v), veh/h		129	468	135		18	774	99	220	143	147	55
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1771	1781
Q Serve(g_s), s		4.6	7.3	4.5		0.6	14.5	3.6	4.3	4.6	4.7	2.0
Cycle Q Clear(g_c), s		4.6	7.3	4.5		0.6	14.5	3.6	4.3	4.6	4.7	2.0
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.28	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	455	178
V/C Ratio(X)		0.46	0.42	0.27		0.10	0.85	0.25	0.64	0.31	0.32	0.31
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	455	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.8	19.0	18.0		28.6	24.7	20.6	30.3	21.0	21.1	29.3
Incr Delay (d2), s/veh		5.4	1.2	1.3		1.1	9.6	1.5	8.7	1.8	1.9	4.5
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.3	3.0	1.7		0.3	6.9	1.4	2.1	2.0	2.1	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		32.2	20.1	19.3		29.8	34.3	22.2	38.9	22.8	22.9	33.7
LnGrp LOS		C	C	B		C	C	C	D	C	C	C
Approach Vol, veh/h			732				891			510		
Approach Delay, s/veh			22.1				32.8			29.8		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.0	6.7	2.6	9.3	6.3	8.0	6.6	16.5
Green Ext Time (p_c), s	0.0	1.2	0.0	2.9	0.1	1.4	0.1	0.8

Intersection Summary	
HCM 6th Ctrl Delay	28.0
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	159	150
Future Volume (veh/h)	159	150
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	173	163
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	459	403
Arrive On Green	0.26	0.26
Sat Flow, veh/h	1785	1569
Grp Volume(v), veh/h	172	164
Grp Sat Flow(s),veh/h/ln	1777	1577
Q Serve(g_s), s	5.6	6.0
Cycle Q Clear(g_c), s	5.6	6.0
Prop In Lane		0.99
Lane Grp Cap(c), veh/h	457	406
V/C Ratio(X)	0.38	0.40
Avail Cap(c_a), veh/h	457	406
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.4	21.6
Incr Delay (d2), s/veh	2.4	3.0
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	2.4
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	23.7	24.5
LnGrp LOS	C	C
Approach Vol, veh/h	391	
Approach Delay, s/veh	25.5	
Approach LOS	C	
Timer - Assigned Phs		

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	522	823	5	0	3
Future Vol, veh/h	0	522	823	5	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	567	895	5	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	898
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	0	337
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	337
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	337
HCM Lane V/C Ratio	-	-	-	0.01
HCM Control Delay (s)	-	-	-	15.8
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	522	823	27	0	5
Future Vol, veh/h	0	522	823	27	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	567	895	29	0	5

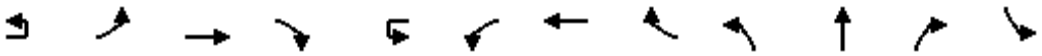
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	924	0	-	0	1477	910
Stage 1	-	-	-	-	910	-
Stage 2	-	-	-	-	567	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	739	-	-	-	139	333
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	568	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	739	-	-	-	139	333
Mov Cap-2 Maneuver	-	-	-	-	139	-
Stage 1	-	-	-	-	393	-
Stage 2	-	-	-	-	568	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	739	-	-	-	333
HCM Lane V/C Ratio	-	-	-	-	0.016
HCM Control Delay (s)	0	-	-	-	16
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th Signalized Intersection Summary
1: Kitching St & Alessandro Blvd

Existing + Proj PM No Left-Turn Access
07/26/2018



Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	30	103	662	194	10	27	503	100	157	194	15	58
Future Volume (veh/h)	30	103	662	194	10	27	503	100	157	194	15	58
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		112	720	211		29	547	109	171	211	16	63
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	860	65	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3345	252	1781
Grp Volume(v), veh/h		112	720	211		29	547	109	171	111	116	63
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1820	1781
Q Serve(g_s), s		4.0	12.2	7.4		1.0	9.5	4.0	3.3	3.5	3.5	2.3
Cycle Q Clear(g_c), s		4.0	12.2	7.4		1.0	9.5	4.0	3.3	3.5	3.5	2.3
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.14	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	468	178
V/C Ratio(X)		0.40	0.64	0.42		0.16	0.60	0.28	0.49	0.24	0.25	0.35
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	468	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.5	20.6	19.0		28.8	22.8	20.8	29.8	20.6	20.6	29.4
Incr Delay (d2), s/veh		4.2	2.9	2.6		2.0	2.9	1.7	5.0	1.3	1.3	5.4
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		1.9	5.2	2.9		0.5	4.1	1.5	1.6	1.5	1.6	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		30.8	23.5	21.6		30.8	25.7	22.5	34.8	21.9	21.9	34.8
LnGrp LOS		C	C	C		C	C	C	C	C	C	C
Approach Vol, veh/h			1043				685			398		
Approach Delay, s/veh			23.9				25.4			27.4		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.3	5.5	3.0	14.2	5.3	8.8	6.0	11.5
Green Ext Time (p_c), s	0.0	0.9	0.0	3.4	0.1	1.6	0.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	25.3
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	237	121
Future Volume (veh/h)	237	121
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	258	132
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	591	293
Arrive On Green	0.26	0.26
Sat Flow, veh/h	2297	1138
Grp Volume(v), veh/h	198	192
Grp Sat Flow(s),veh/h/ln	1777	1658
Q Serve(g_s), s	6.5	6.8
Cycle Q Clear(g_c), s	6.5	6.8
Prop In Lane		0.69
Lane Grp Cap(c), veh/h	457	426
V/C Ratio(X)	0.43	0.45
Avail Cap(c_a), veh/h	457	426
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.7	21.8
Incr Delay (d2), s/veh	3.0	3.4
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	2.9
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	24.7	25.3
LnGrp LOS	C	C
Approach Vol, veh/h	453	
Approach Delay, s/veh	26.4	
Approach LOS	C	
Timer - Assigned Phs		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↱			↗
Traffic Vol, veh/h	0	741	631	3	0	8
Future Vol, veh/h	0	741	631	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	805	686	3	0	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	688
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	0	445
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	445
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	445
HCM Lane V/C Ratio	-	-	-	0.02
HCM Control Delay (s)	-	-	-	13.3
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	741	619	15	0	15
Future Vol, veh/h	0	741	619	15	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	805	673	16	0	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	689	0	-	0	1486	681
Stage 1	-	-	-	-	681	-
Stage 2	-	-	-	-	805	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	905	-	-	-	137	450
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	440	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	905	-	-	-	137	450
Mov Cap-2 Maneuver	-	-	-	-	137	-
Stage 1	-	-	-	-	503	-
Stage 2	-	-	-	-	440	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	905	-	-	-	450
HCM Lane V/C Ratio	-	-	-	-	0.036
HCM Control Delay (s)	0	-	-	-	13.3
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th Signalized Intersection Summary Opening Year AM plus Project No Left-Turn Access
1: Kitching St & Alessandro Blvd

07/26/2018

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	15	124	448	129	7	18	741	95	211	239	40	53
Future Volume (veh/h)	15	124	448	129	7	18	741	95	211	239	40	53
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		135	487	140		20	805	103	229	260	43	58
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	784	128	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3050	497	1781
Grp Volume(v), veh/h		135	487	140		20	805	103	229	150	153	58
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1770	1781
Q Serve(g_s), s		4.8	7.6	4.7		0.7	15.2	3.7	4.5	4.8	4.9	2.1
Cycle Q Clear(g_c), s		4.8	7.6	4.7		0.7	15.2	3.7	4.5	4.8	4.9	2.1
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.28	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	455	178
V/C Ratio(X)		0.48	0.44	0.28		0.11	0.88	0.26	0.66	0.33	0.34	0.33
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	455	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.9	19.1	18.1		28.7	25.0	20.7	30.4	21.1	21.1	29.3
Incr Delay (d2), s/veh		5.8	1.2	1.4		1.3	11.9	1.6	9.6	1.9	2.0	4.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.4	3.1	1.8		0.4	7.5	1.4	2.3	2.1	2.2	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		32.7	20.3	19.5		29.9	36.9	22.3	40.0	23.0	23.1	34.1
LnGrp LOS		C	C	B		C	D	C	D	C	C	C
Approach Vol, veh/h			762				928			532		
Approach Delay, s/veh			22.4				35.1			30.4		
Approach LOS			C				D			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.1	6.9	2.7	9.6	6.5	8.3	6.8	17.2
Green Ext Time (p_c), s	0.0	1.3	0.0	3.0	0.0	1.4	0.1	0.5

Intersection Summary	
HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary Opening Year AM plus Project No Left-Turn Access
1: Kitching St & Alessandro Blvd

07/26/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	166	156
Future Volume (veh/h)	166	156
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	180	170
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	458	405
Arrive On Green	0.26	0.26
Sat Flow, veh/h	1780	1573
Grp Volume(v), veh/h	180	170
Grp Sat Flow(s),veh/h/ln	1777	1576
Q Serve(g_s), s	5.8	6.3
Cycle Q Clear(g_c), s	5.8	6.3
Prop In Lane		1.00
Lane Grp Cap(c), veh/h	457	405
V/C Ratio(X)	0.39	0.42
Avail Cap(c_a), veh/h	457	405
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.5	21.7
Incr Delay (d2), s/veh	2.5	3.2
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	2.6
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	24.0	24.8
LnGrp LOS	C	C
Approach Vol, veh/h	408	
Approach Delay, s/veh	25.8	
Approach LOS	C	
Timer - Assigned Phs		

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑			↱
Traffic Vol, veh/h	0	543	858	5	0	3
Future Vol, veh/h	0	543	858	5	0	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	590	933	5	0	3

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	936
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	0	320
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	320
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.4
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	320
HCM Lane V/C Ratio	-	-	-	0.01
HCM Control Delay (s)	-	-	-	16.4
HCM Lane LOS	-	-	-	C
HCM 95th %tile Q(veh)	-	-	-	0

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	543	858	27	0	5
Future Vol, veh/h	0	543	858	27	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	590	933	29	0	5

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	962	0	-	0	1538	948
Stage 1	-	-	-	-	948	-
Stage 2	-	-	-	-	590	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	715	-	-	-	127	316
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	554	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	715	-	-	-	127	316
Mov Cap-2 Maneuver	-	-	-	-	127	-
Stage 1	-	-	-	-	377	-
Stage 2	-	-	-	-	554	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	16.6
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	715	-	-	-	316
HCM Lane V/C Ratio	-	-	-	-	0.017
HCM Control Delay (s)	0	-	-	-	16.6
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th Signalized Intersection Summary Opening Year PM plus Project No Left-Turn Access
1: Kitching St & Alessandro Blvd

07/26/2018

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL
Lane Configurations												
Traffic Volume (veh/h)	32	108	689	202	11	28	523	104	164	202	16	61
Future Volume (veh/h)	32	108	689	202	11	28	523	104	164	202	16	61
Initial Q (Qb), veh		0	0	0		0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00		1.00		1.00		0.97	1.00		0.98	1.00
Parking Bus, Adj		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach			No				No			No		
Adj Sat Flow, veh/h/ln		1870	1870	1870		1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h		117	749	220		30	568	113	178	220	17	66
Peak Hour Factor		0.92	0.92	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %		2	2	2		2	2	2	2	2	2	2
Cap, veh/h		280	1117	497		178	914	396	346	859	66	178
Arrive On Green		0.16	0.31	0.31		0.10	0.26	0.26	0.10	0.26	0.26	0.10
Sat Flow, veh/h		1781	3554	1581		1781	3554	1539	3456	3340	256	1781
Grp Volume(v), veh/h		117	749	220		30	568	113	178	116	121	66
Grp Sat Flow(s),veh/h/ln		1781	1777	1581		1781	1777	1539	1728	1777	1819	1781
Q Serve(g_s), s		4.1	12.8	7.8		1.1	9.9	4.1	3.4	3.6	3.7	2.4
Cycle Q Clear(g_c), s		4.1	12.8	7.8		1.1	9.9	4.1	3.4	3.6	3.7	2.4
Prop In Lane		1.00		1.00		1.00		1.00	1.00		0.14	1.00
Lane Grp Cap(c), veh/h		280	1117	497		178	914	396	346	457	468	178
V/C Ratio(X)		0.42	0.67	0.44		0.17	0.62	0.29	0.52	0.25	0.26	0.37
Avail Cap(c_a), veh/h		280	1117	497		178	914	396	346	457	468	178
HCM Platoon Ratio		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)		1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh		26.6	20.9	19.1		28.8	23.0	20.8	29.9	20.7	20.7	29.4
Incr Delay (d2), s/veh		4.5	3.2	2.8		2.0	3.2	1.8	5.4	1.3	1.3	5.8
Initial Q Delay(d3),s/veh		0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln		2.0	5.4	3.1		0.5	4.3	1.6	1.6	1.6	1.7	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh		31.2	24.1	22.0		30.9	26.2	22.7	35.3	22.0	22.0	35.3
LnGrp LOS		C	C	C		C	C	C	D	C	C	D
Approach Vol, veh/h			1086				711			415		
Approach Delay, s/veh			24.4				25.8			27.7		
Approach LOS			C				C			C		

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	11.0	22.0	11.0	26.0	11.0	22.0	15.0	22.0
Change Period (Y+Rc), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Green Setting (Gmax), s	7.0	18.0	7.0	22.0	7.0	18.0	11.0	18.0
Max Q Clear Time (g_c+I1), s	4.4	5.7	3.1	14.8	5.4	9.1	6.1	11.9
Green Ext Time (p_c), s	0.0	1.0	0.0	3.4	0.1	1.6	0.1	2.2

Intersection Summary	
HCM 6th Ctrl Delay	25.7
HCM 6th LOS	C

Notes

User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary Opening Year PM plus Project No Left-Turn Access
1: Kitching St & Alessandro Blvd

07/26/2018

Movement	SBT	SBR
Lane Configurations		
Traffic Volume (veh/h)	247	126
Future Volume (veh/h)	247	126
Initial Q (Qb), veh	0	0
Ped-Bike Adj(A_pbT)		0.99
Parking Bus, Adj	1.00	1.00
Work Zone On Approach	No	
Adj Sat Flow, veh/h/ln	1870	1870
Adj Flow Rate, veh/h	268	137
Peak Hour Factor	0.92	0.92
Percent Heavy Veh, %	2	2
Cap, veh/h	590	293
Arrive On Green	0.26	0.26
Sat Flow, veh/h	2296	1138
Grp Volume(v), veh/h	206	199
Grp Sat Flow(s),veh/h/ln	1777	1658
Q Serve(g_s), s	6.8	7.1
Cycle Q Clear(g_c), s	6.8	7.1
Prop In Lane		0.69
Lane Grp Cap(c), veh/h	457	426
V/C Ratio(X)	0.45	0.47
Avail Cap(c_a), veh/h	457	426
HCM Platoon Ratio	1.00	1.00
Upstream Filter(I)	1.00	1.00
Uniform Delay (d), s/veh	21.8	22.0
Incr Delay (d2), s/veh	3.2	3.7
Initial Q Delay(d3),s/veh	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	3.0
Unsig. Movement Delay, s/veh		
LnGrp Delay(d),s/veh	25.0	25.6
LnGrp LOS	C	C
Approach Vol, veh/h	471	
Approach Delay, s/veh	26.7	
Approach LOS	C	
Timer - Assigned Phs		

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↱			↗
Traffic Vol, veh/h	0	772	657	3	0	8
Future Vol, veh/h	0	772	657	3	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	839	714	3	0	9

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	-	716
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.319
Pot Cap-1 Maneuver	0	-	-	-	0	429
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	429
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	429
HCM Lane V/C Ratio	-	-	-	0.02
HCM Control Delay (s)	-	-	-	13.6
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	772	645	15	0	15
Future Vol, veh/h	0	772	645	15	0	15
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	839	701	16	0	16

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	717	0	-	0	1548	709
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	839	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	884	-	-	-	126	434
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	424	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	884	-	-	-	126	434
Mov Cap-2 Maneuver	-	-	-	-	126	-
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	424	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	13.6
HCM LOS			B

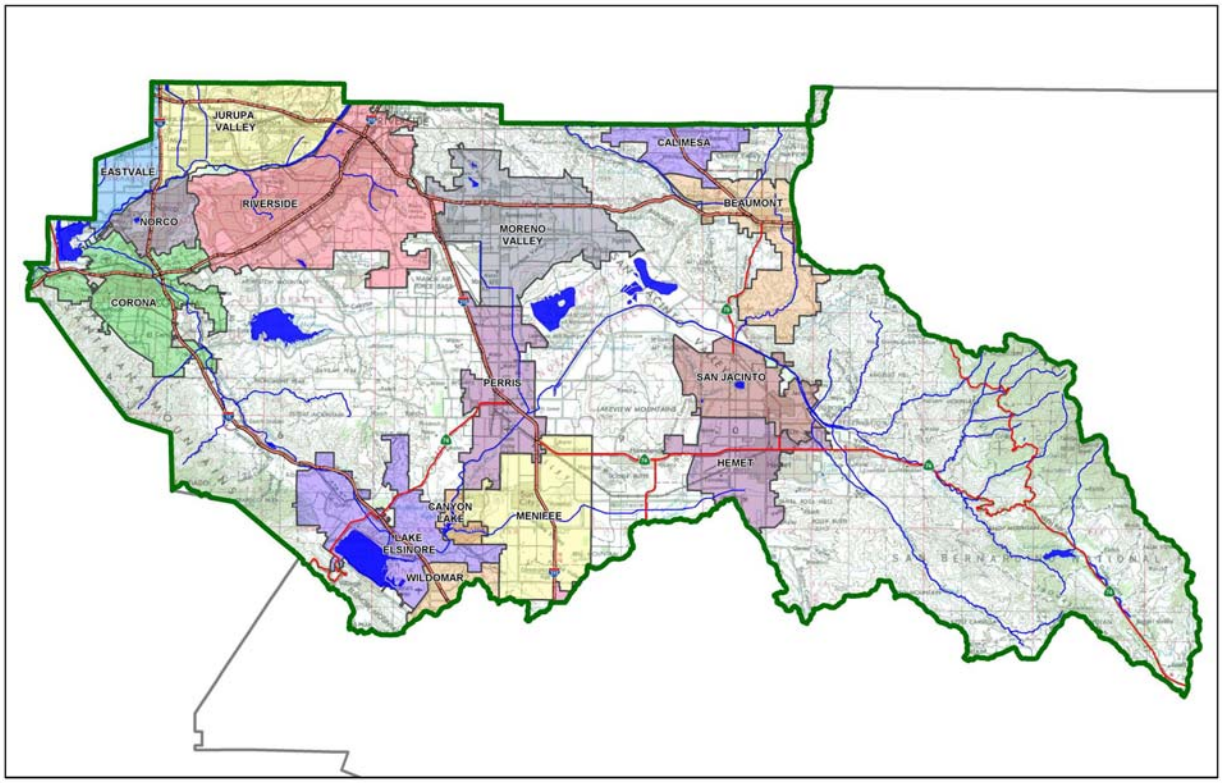
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	884	-	-	-	434
HCM Lane V/C Ratio	-	-	-	-	0.038
HCM Control Delay (s)	0	-	-	-	13.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Project Specific Water Quality Management Plan

Project Title: Skilled Nursing Facility

Development No: APN: 479-230-018-6

Design Review/Case No: PEN18-0082/LWQ18-0016



☒ **Preliminary**
☐ **Final**

Original Date Prepared: April 18, 2018

Revision Date(s): November 16, 2018

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

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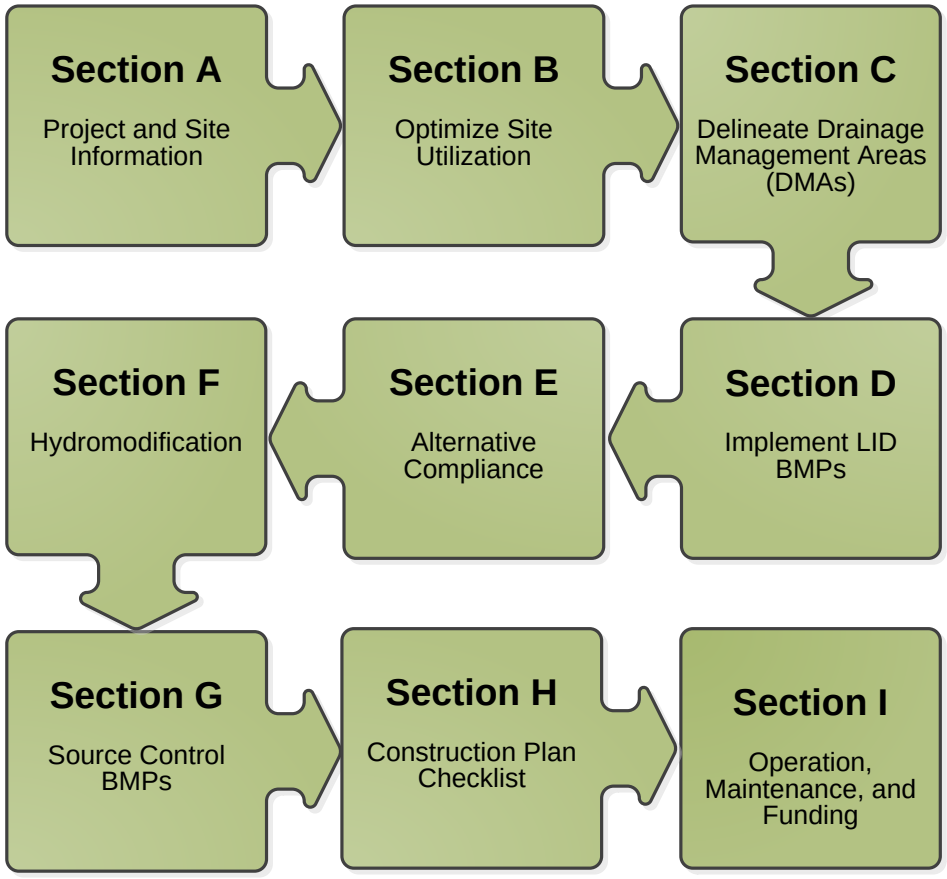
A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



ACKNOWLEDGMENT

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached and not the truthfulness, accuracy or validity of that document.

STATE OF CALIFORNIA }
COUNTY OF Los Angeles }

On November 13, 2018 before me, Jennifer Chen Notary Public,

personally appeared Zanwei Chen

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature

JENNIFER CHEN
COMM. # 2213987
NOTARY PUBLIC - CALIFORNIA
LOS ANGELES COUNTY
COMM. EXPIRES OCT. 3, 2021

Optional Information:

Title or Type of Document Owner's certification

Date of Document 11/13/2018

OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for **Mr. Zanwei Chen** by W&W **Land Design Consultants, Inc** for the **25622 Alessandro, Moreno Valley** project.

This WQMP is intended to comply with the requirements of **City of Moreno Valley**, **Riverside County** for **Ordinance N0. 827**, which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under **City of Moreno Valley** Water Quality Ordinance (**Municipal Code Section 8.10**).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

11/13/2018
Date

Zanwei Chen
Owner's Printed Name

president
Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Preparer's Signature

11/13/2018
Date

Winston Liu
Preparer's Printed Name

Principle Engineer
Preparer's Title/Position

Preparer's Licensure: C66242

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List of Appendices

Section A: Project and Site Information

The following Project-Specific Water Quality Management Plan (WQMP) has been prepared for commercial development skilled nursing facility project, which is located at the North side of Alessandro Blvd, in the City of Moreno Valley, County of Riverside, California. The subject site is approximately 4.54 acres' site. An onsite storm drain system including multiple area drains, HPDE pipes and curb gutters will be constructed to convey the runoff produced by the proposed development project. Two onsite storm water quality bioretentions with pretreatment will be constructed to treat onsite storm water runoffs. The general location of the site is illustrated on the Vicinity Map in the Appendix A of this report.

PROJECT INFORMATION	
Type of Project:	Newly proposed **Moreno Valley Skilled Nursing Facility** to include 88 Rooms and 116 Beds On a 4.54 acres site within the Residential 10 (R10) Zone, located on the North Side of Alessandro Blvd. East of Kitching Street
Planning Area:	4.54 acre
Community Name:	N/A
Development Name:	APN: 479-230-018-6, City of Moreno Valley
PROJECT LOCATION	
Latitude & Longitude (DMS): 33.918328, -117.215931	
Project Watershed and Sub-Watershed: Santa Ana River & San Jacinto River	
APN(s): 479-230-018-6	
Map Book and Page No.: 11-10	
PROJECT CHARACTERISTICS	
Proposed or Potential Land Use(s)	MDR
Proposed or Potential SIC Code(s)	8051
Area of Impervious Project Footprint (SF)	209, 887 SF
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement	209, 887 SF
Does the project consist of offsite road improvements?	☒ Y ☐ N
Does the project propose to construct unpaved roads?	☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?	☐ Y ☒ N
EXISTING SITE CHARACTERISTICS	
Total area of existing Impervious Surfaces within the project limits (SF)	0 SF
Is the project located within any MSHCP Criteria Cell?	☐ Y ☒ N
If so, identify the Cell number:	N/A
Are there any natural hydrologic features on the project site?	☐ Y ☒ N
Is a Geotechnical Report attached?	☒ Y ☐ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)	N/A
What is the Water Quality Design Storm Depth for the project?	0.65 Inches

A.1 Maps and Site Plans

Vicinity Map, WQMP Site Plan that includes the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Could be found in Appendix 1 of this report.

A.2 Identify Receiving Waters

A map of the receiving waters could be found in Appendix 1 of this report.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Perris Valley Storm Drain	None	None	Not a water body classified as RARE
San Jacinto River (Reach 3)	None	AGR/GWR REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
Canyon Lake	Pathogens, Nutrients	MUN/AGR/GWR REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
San Jacinto River (Reach 1)	None	MUN/AGR/GWR REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
Lake Elsinore	Nutrientssediment toxiaty, organic enrichment. Low dissolved oxygen, Unknown Toxicity, PCBs	REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
Temescal Creek (Reach 6)	Indicator Bacteria	GWR REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
Temescal Creek (Reach 5)	None	AGR/GWR/REC1/2 /WARM/WILD, RARE/MUN	Approx. 25 miles
Temescal Creek (Reach 4)	None	AGR/GWR/REC1/2/ WARM/WILD/RARE/MUN	Approx. 30 miles
Temescal Creek (Reach 3)	None	AGR//IND/GWR REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
Temescal Creek (Reach 2)	None	AGR//IND/GWR REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
Temescal Creek (Reach 1)	PH	REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
Santa Ana River (Reach 3)	Pathogens, Copper, Lead	AGR/GWR/REC1/2/ WARM/WILD/RARE/MUN/SPWN	Approx. 50 miles
Prado Basin Management Zone	Pathogen, Hythents,	RARE/ REC1/2/WARM/WILD/MUN	Approx. 54 miles
Santa Ana River – (Reach 2)	None	RARE/AGR/GWR REC1/2/WARM/WILD/MUN	Approx. 60 miles
Santa Ana River – (Reach 1)	None	REC1/2/WARM/WILD/MUN	Not a water body classified as RARE
Tidal Prism of Santa Ana River and Newport Slough	None	RARE/MAR/COMM/ REC1/2/WILD/MUN	Approx. 70 miles
Pacific Ocean Nearshore	None	BIOL/NAV/COMM /REC1/2/RARE/WILD /SPWN/MAR/SHEL/MUN	Approx. 90 miles
Offshore	None	IND/NAV/COMM /REC1/2/RARE/WILD /SPWN/MAR/MUN	Approx. 95 miles

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N

US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)* Building, Grading etc.	☒ Y	☐ N

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

Yes, through project development, post development will maintain existing drainage pattern to keep the runoff drain towards southwesterly to proposed storm drain system along Alessendro Blvd.

Did you identify and protect existing vegetation? If so, how? If not, why?

No, project will be fully developed and no existing vegetation needs to be protected;

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

Yes, project have been designed to use biofiltration planter with underdrain system;

Did you identify and minimize impervious area? If so, how? If not, why?

Yes, project has been designed into minimum width of proposed parking lots, drive aisles;

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes, most drainage areas drains along proposed curb and gutter and end at a rip-rap then flows to landscaping pervious areas;

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
D1	Concrete or Asphalt	25,265	D
D2	Concrete or Asphalt	46,174	D
D3	Concrete or Asphalt	29,148	D
D4	Concrete or Asphalt	40,075	D
D5	Concrete or Asphalt	41,179	D
D6	Concrete or Asphalt	13,827	D
P-1	Concrete or Asphalt	9,222	D

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)

Table C.3 Type 'B', Self-Retaining Areas

Self-Retaining Area				**Type 'C' DMAs that are draining to the Self-Retaining Area**		
DMA Name/ ID	Post-project surface type	Area (square feet)	Storm Depth (inches)	DMA Name / ID	[C] from Table C.4 =	Required Retention Depth (inches)
		[A]	[B]		[C]	[D]

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas

DMA					Receiving Self-Retaining DMA		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
D1	Bioretention with underdrains
D2	Bioretention with underdrains
D3	Bioretention with underdrains
D4	Bioretention with underdrains
D5	Bioretention with underdrains
D6	Bioretention with underdrains
P1	Bioretention with underdrains

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?		x
If Yes, list affected DMAs:		
…have any DMAs located within 100 feet of a water supply well?		x
If Yes, list affected DMAs:		
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?		x
If Yes, list affected DMAs:		
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	x	
If Yes, list affected DMAs:	ALL DMAs	
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?		x
If Yes, list affected DMAs:		
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?		x
Describe here:		

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

☐ Reclaimed water will be used for the non-potable water demands for the project.

☐ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).

☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

x None of the above.

Harvest and Use BMPs need to be assessed for the site.

Irrigation Use Feasibility

Step 1:

Total Area of Irrigated Landscape: 0.4

Type of Landscaping (Conservation Design or Active Turf): Native Grasses

Step 2:

Total Area of Impervious Surfaces: 4.1

Step 3:

The project EIATIA factor: 1.05

Step 4:

Minimum required irrigated area: 4.3

Step 5:

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
4.3	0.4

Harvesting stormwater runoff for irrigation use is not feasible for the project.

Toilet Use Feasibility

Step 1:

Projected Number of Daily Toilet Users: 88

Project Type: Commercial

Step 2:

Total Area of Impervious Surfaces: 4.1

Step 3:

The project TUTIA factor: 141

Step 4:

Minimum number of toilet users: 579

Step 5:

Minimum required Toilet Users (Step 4)	Projected number of toilet users (Step 1)
579	88

Other Non-Potable Use Feasibility

N/A.

Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

x LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).

☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5.

☐ None of the above

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
D1	☐	☐	☒	☐	☐
D2	☐	☐	☒	☐	☐
D3	☐	☐	☒	☐	☐
D4	☐	☐	☒	☐	☐
D5	☐	☐	☒	☐	☐
D6	☐	☐	☒	☐	☐
P1	☐	☐	☒	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First, calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second, design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet) [A]	Post-Project Surface Type	Effective Impervious Fraction, I_f [B]	DMA Runoff Factor [C]	DMA Areas x Runoff Factor [A] x [C]	*BMP #1*		
D1	25,265	Concrete or Asphalt	*1*	*0.89*	*22,485*	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D2	46,174	Concrete or Asphalt	*1*	*0.89*	*41,187*			
D3	29,148	Concrete or Asphalt	1	*0.89*	*26,000*			
D4	40,075	Concrete or Asphalt	*1*	*0.89*	*35,667*			
P1	9,222	Concrete or Asphalt	*1*	*0.89*	*8,226*			
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D] \times [E]}{12}$	[G]
	149,884				133, 565	0.65	7238	7965

DMA Type/ID	DMA Area (square feet) [A]	Post-Project Surface Type	Effective Impervious Fraction, I_f [B]	DMA Runoff Factor [C]	DMA Areas x Runoff Factor [A] x [C]	*BMP #2*		
D5	46,179	Concrete or Asphalt	*1*	*0.89*	*36,732*	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D6	13,827	Concrete or Asphalt	*1*	*0.89*	*12,334*			
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D] \times [E]}{12}$	[G]
	55,006				49, 066	0.65	2658	2664

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

X LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual

- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration			
Volume (Cubic Feet)			

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet.

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

Canyon Lake

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources*:** Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit*:** Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative*:** Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
A. On-site storm drain inlets	Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.	• Maintain and periodically repaint or replace inlet markings. • Provide stormwater pollution prevention information to new site owners, lessees, or operators. • See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA

		Stormwater Quality Handbooks at www.cabmphandbooks.com • Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."
D1. Need for future indoor & structural pest control	Note building design features that discourage entry of pests.	Provide Integrated Pest Management information to owners, lessees, and operators.
D2. Landscape/Outdoor Pesticide Use	• State that final landscape plans will accomplish all of the following. • Preserve existing native trees, shrubs, and ground cover to the maximum extent possible. • Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution. Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions. • Consider using pest-resistant plants, especially adjacent to hardscape. • To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.	• Maintain landscaping using minimum or no pesticides. • See applicable operational BMPs in "What you should know for…..Landscape and Gardening" at http://rcflood.org/stormwater/ • Provide IPM information to new owners, lessees and operators
E. Pools, spas, ponds, decorative fountains, and other water features.		See applicable operational BMPs in "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
G. Refuse areas	• State how site refuse will be	• State how the following will be

	handled and provide supporting detail to what is shown on plans. • State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.	implemented: Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
N. Fire Sprinkler Test Water	• Provide a means to drain fire sprinkler test water to the sanitary sewer	• See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com
O. Miscellaneous Drain or Wash Water or Other Sources • Boiler drain lines • Condensate drain lines • Rooftop equipment • Drainage sumps • Roofing, gutters, and trim. • Other sources	• Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system. • Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system. • Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment. • Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water. • Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff. • Include controls for other sources as specified by local	

	reviewer.	
P. Plazas, sidewalks, and parking lots		• Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism:

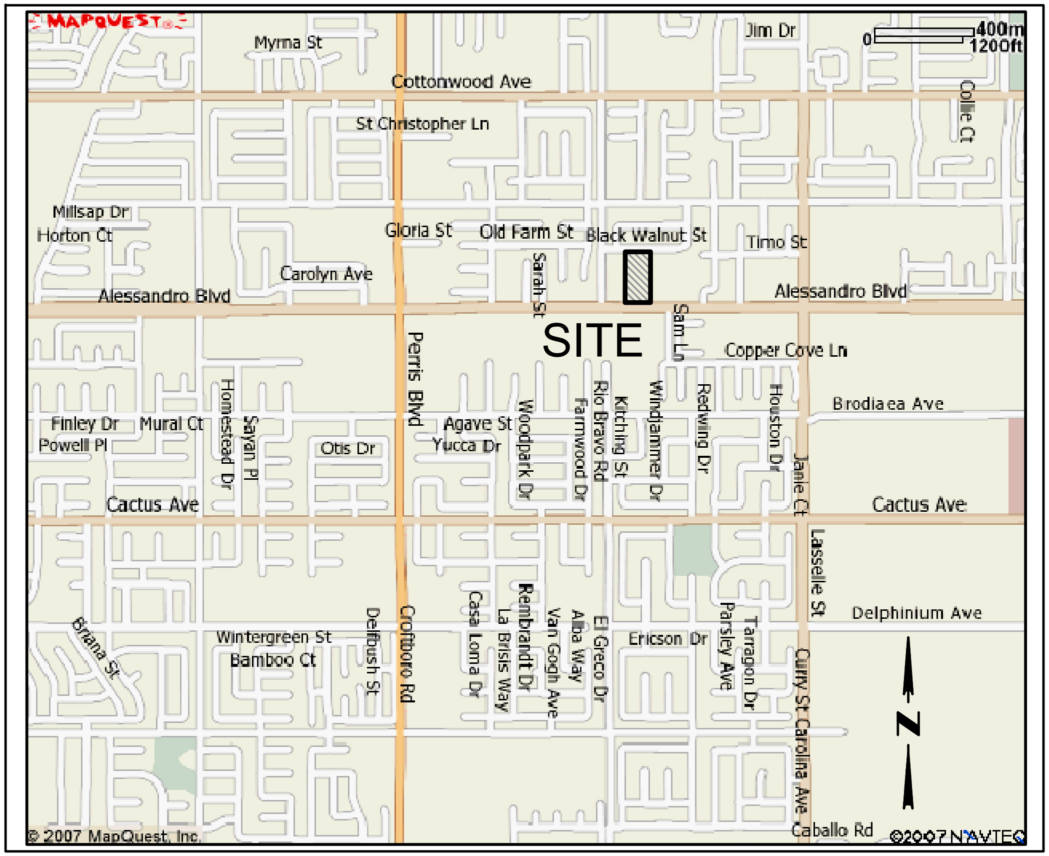
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☒ Y ☐ N

Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map



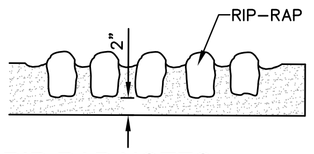
VICINITY MAP

N.T.S.

WQMP - SITE PLAN

IN CITY OF MORENO VALLEY, RIVERSIDE

SKILLED NURSING FACILITY



RIP-RAP NOTES:

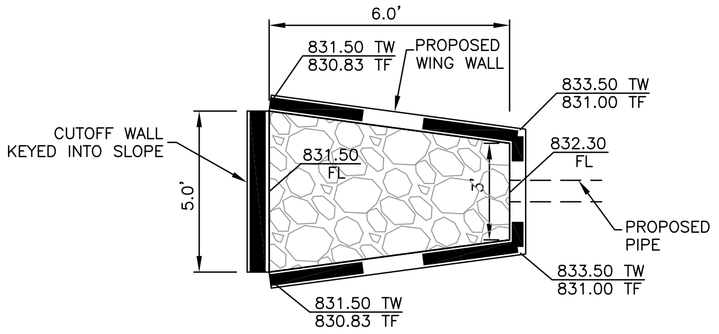
1.) ROCKS FOR GROUTED RIP RAP SHALL BE GOOD QUALITY BROKEN CONCRETE AND/OR RIVER RUN ROCK. THE SMALLEST DIMENSION SHALL EXCEED 8" MIN. AND THE LARGEST DIMENSION SHALL NOT EXCEED 12 INCHES, THE LARGEST DIMENSION SHALL NOT EXCEED 4 TIMES THE SMALLEST DIMENSION.

2.) THERE SHOULD BE A GROUT BED OF AT LEAST 2 INCHES BENEATH THE FIRST LAYER OF ROCK. ALL THE VOIDS BETWEEN THE ROCKS SHALL BE FILLED WITH GROUT. MAXIMUM SPACING BETWEEN ROCKS SHALL BE 2".

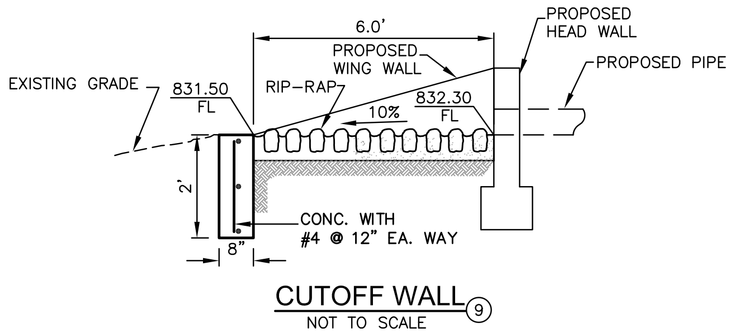
3.) SURFACE ROCKS SHALL BE IMBEDDED FROM 1/2 TO 2/3 OF THEIR MAXIMUM DIMENSION.

NOTE: CONCRETE MAY BE SUBSTITUTED FOR THE GROUT.

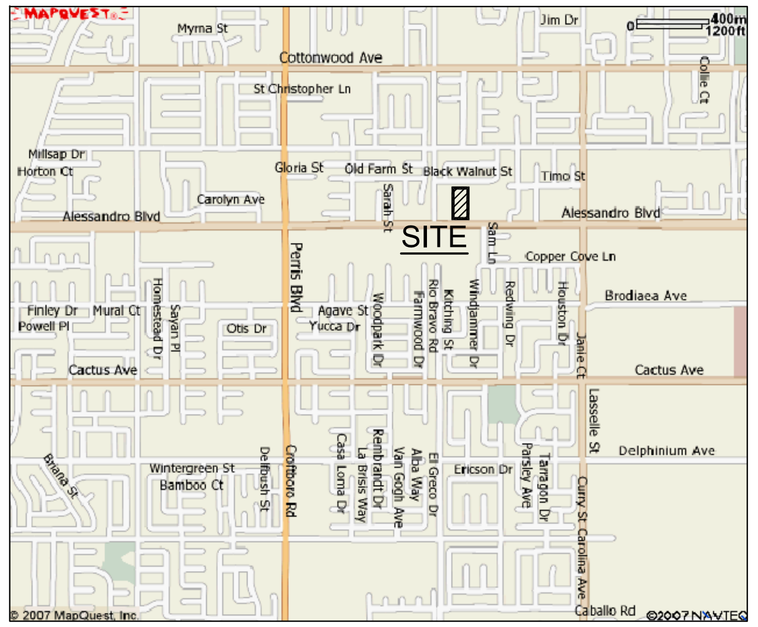
GROUTED RIP-RAP (9)
NOT TO SCALE



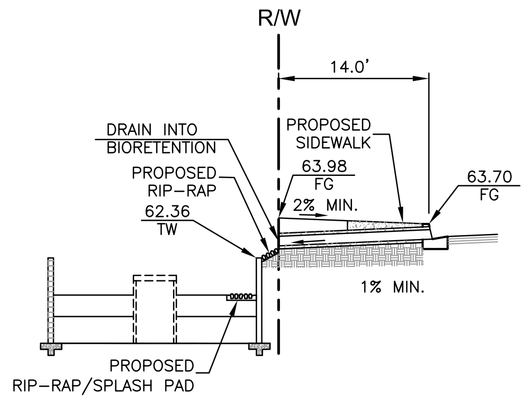
RIP-RAP PLAN VIEW
NOT TO SCALE



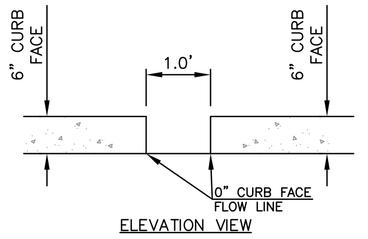
CUTOFF WALL (9)
NOT TO SCALE



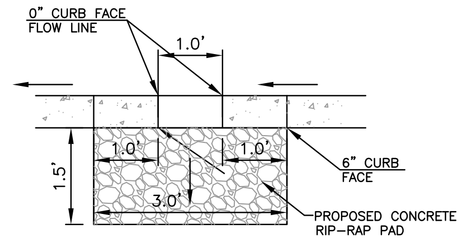
VICINITY MAP



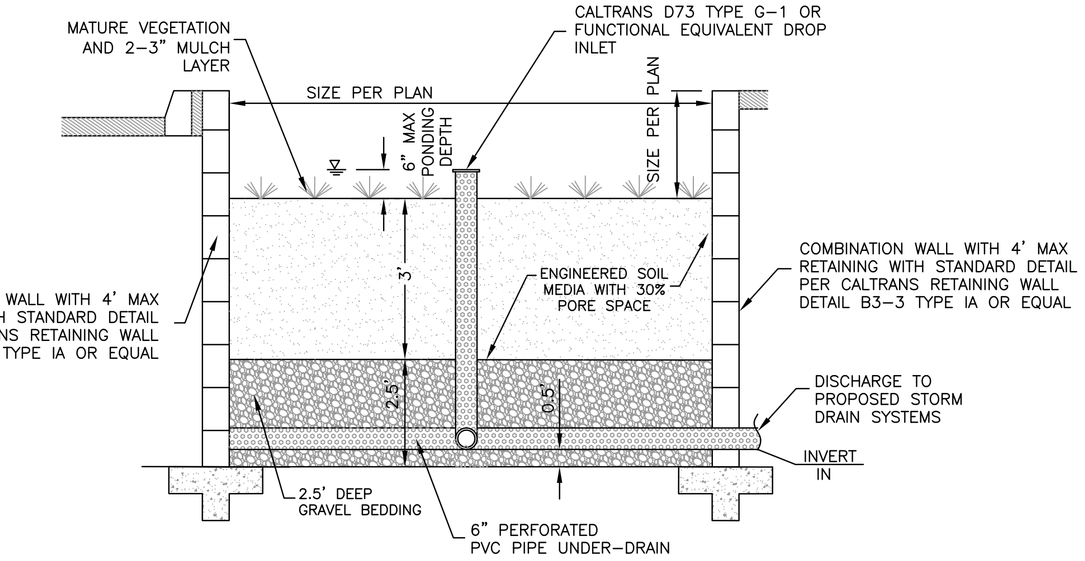
UNDER SIDEWALK DRAIN
N.T.S.



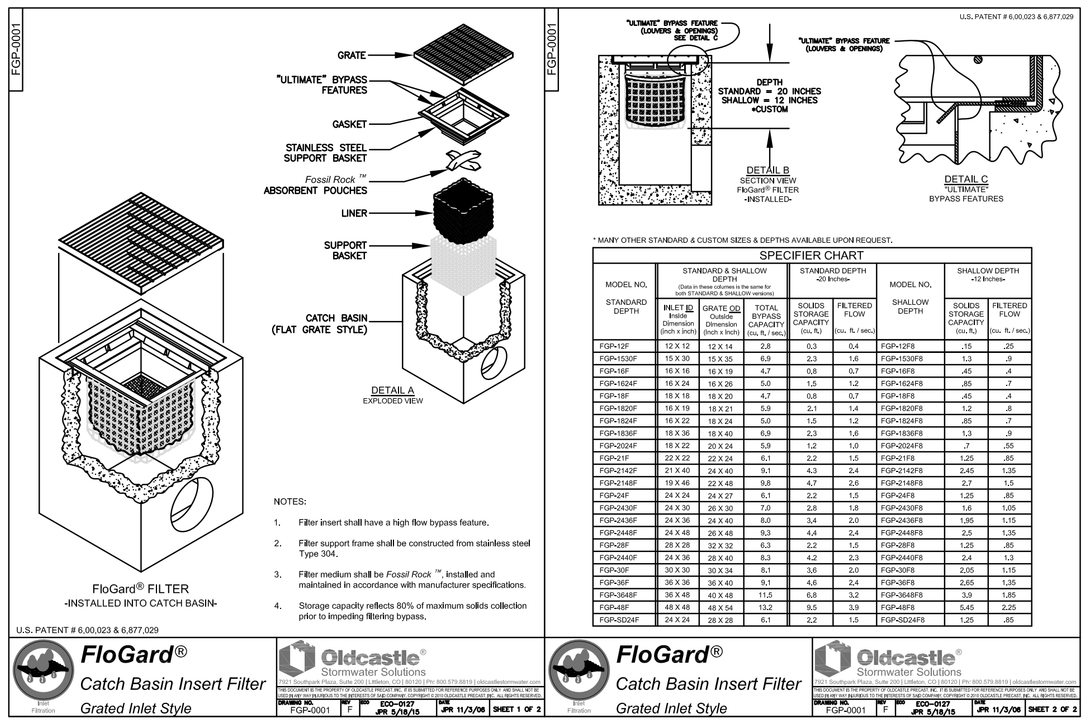
0" CURB DETAIL FOR DRAINAGE
NOT TO SCALE



(10) PLAN VIEW



BIORETENTION WITH UNDERDRAIN
NOT TO SCALE



* MANY OTHER STANDARD & CUSTOM SIZES & DEPTHS AVAILABLE UPON REQUEST.

SPECIFIER CHART

MODEL NO. STANDARD DEPTH	STANDARD & SHALLOW DEPTHS (Units in these columns is the same for both STANDARD & SHALLOW versions) FILTER ID Inside Dimension (inch x inch)	GRATE OD Outside Dimension (inch x inch)	TOTAL BYPASS CAPACITY (cu. ft./sec.)	STANDARD DEPTH •20 Inches• SOLIDS STORAGE CAPACITY (cu. ft.)	STANDARD DEPTH •20 Inches• FILTERED FLOW (cu. ft./sec.)	MODEL NO., SHALLOW DEPTH	SHALLOW DEPTH •12 Inches• SOLIDS STORAGE CAPACITY (cu. ft.)	SHALLOW DEPTH •12 Inches• FILTERED FLOW (cu. ft./sec.)
FGP-12F	12 X 12	12 X 14	2.8	0.3	0.4	FGP-12F8	.15	.25
FGP-1530F	15 X 30	15 X 35	6.9	2.3	1.6	FGP-1530F8	1.3	.9
FGP-16F	16 X 16	16 X 19	4.7	0.8	0.7	FGP-16F8	.45	.4
FGP-1624F	16 X 24	16 X 26	5.0	1.5	1.2	FGP-1624F8	.85	.7
FGP-18F	18 X 18	18 X 20	4.7	0.8	0.7	FGP-18F8	.45	.4
FGP-1820F	18 X 19	18 X 21	5.8	2.1	1.4	FGP-1820F8	1.2	.8
FGP-1824F	18 X 22	18 X 24	5.0	1.5	1.2	FGP-1824F8	.85	.7
FGP-1836F	18 X 36	18 X 40	6.9	2.3	1.6	FGP-1836F8	1.3	.9
FGP-2024F	19 X 22	20 X 24	5.9	1.2	1.0	FGP-2024F8	.7	.55
FGP-21F	22 X 22	22 X 24	6.1	2.2	1.5	FGP-21F8	1.25	.85
FGP-2142F	21 X 40	24 X 40	8.1	4.3	2.4	FGP-2142F8	2.45	1.35
FGP-2148F	19 X 46	22 X 48	9.8	4.7	2.6	FGP-2148F8	2.7	1.5
FGP-24F	24 X 24	24 X 27	6.1	2.2	1.5	FGP-24F8	1.25	.85
FGP-2430F	24 X 30	26 X 30	7.0	2.8	1.8	FGP-2430F8	1.6	1.05
FGP-2436F	24 X 36	24 X 40	8.0	3.4	2.0	FGP-2436F8	1.95	1.15
FGP-2448F	24 X 48	28 X 48	9.3	4.4	2.4	FGP-2448F8	2.5	1.35
FGP-26F	26 X 26	32 X 32	6.3	2.2	1.5	FGP-26F8	1.25	.85
FGP-2640F	24 X 36	28 X 40	8.3	4.2	2.3	FGP-2640F8	2.4	1.3
FGP-30F	30 X 30	32 X 36	8.1	3.6	2.0	FGP-30F8	2.05	1.15
FGP-36F	36 X 36	36 X 40	9.1	4.6	2.4	FGP-36F8	2.65	1.35
FGP-3648F	36 X 48	40 X 48	11.5	6.6	3.2	FGP-3648F8	3.9	1.85
FGP-48F	48 X 48	48 X 54	13.2	9.5	3.5	FGP-48F8	5.45	2.25
FGP-5024F	24 X 24	28 X 28	6.1	2.2	1.5	FGP-5024F8	1.25	.85

NOTES:
1. Filter insert shall have a high flow bypass feature.
2. Filter support frame shall be constructed from stainless steel Type 304.
3. Filter medium shall be *Fossil Rock ™*, installed and maintained in accordance with manufacturer specifications.
4. Storage capacity reflects 80% of maximum solids collection prior to impeding filtering bypass.

FloGard® Catch Basin Insert Filter — Grated Inlet Style — Oldcastle Stormwater Solutions — DRAWING NO. FGP-0001 — REV. F — ECO-0127 — DRN. JM 11/3/06 — SHEET 1 OF 2

FloGard® Catch Basin Insert Filter — Grated Inlet Style — Oldcastle Stormwater Solutions — DRAWING NO. FGP-0001 — REV. F — ECO-0127 — DRN. JM 11/3/06 — SHEET 2 OF 2

CATCH BASIN INSERT FILTER DETAIL
MODEL NO. FGP-12F8
NOT TO SCALE

PROJECT BOUNDARY
DRAINAGE BOUNDARY FOR EACH BMP
FLOW LINE

D-1 / 0.84 — DRAINAGE MANAGEMENT AREA NUMBER / DRAINAGE AREA ACER

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608–7118 • FAX: (909) 946–1137

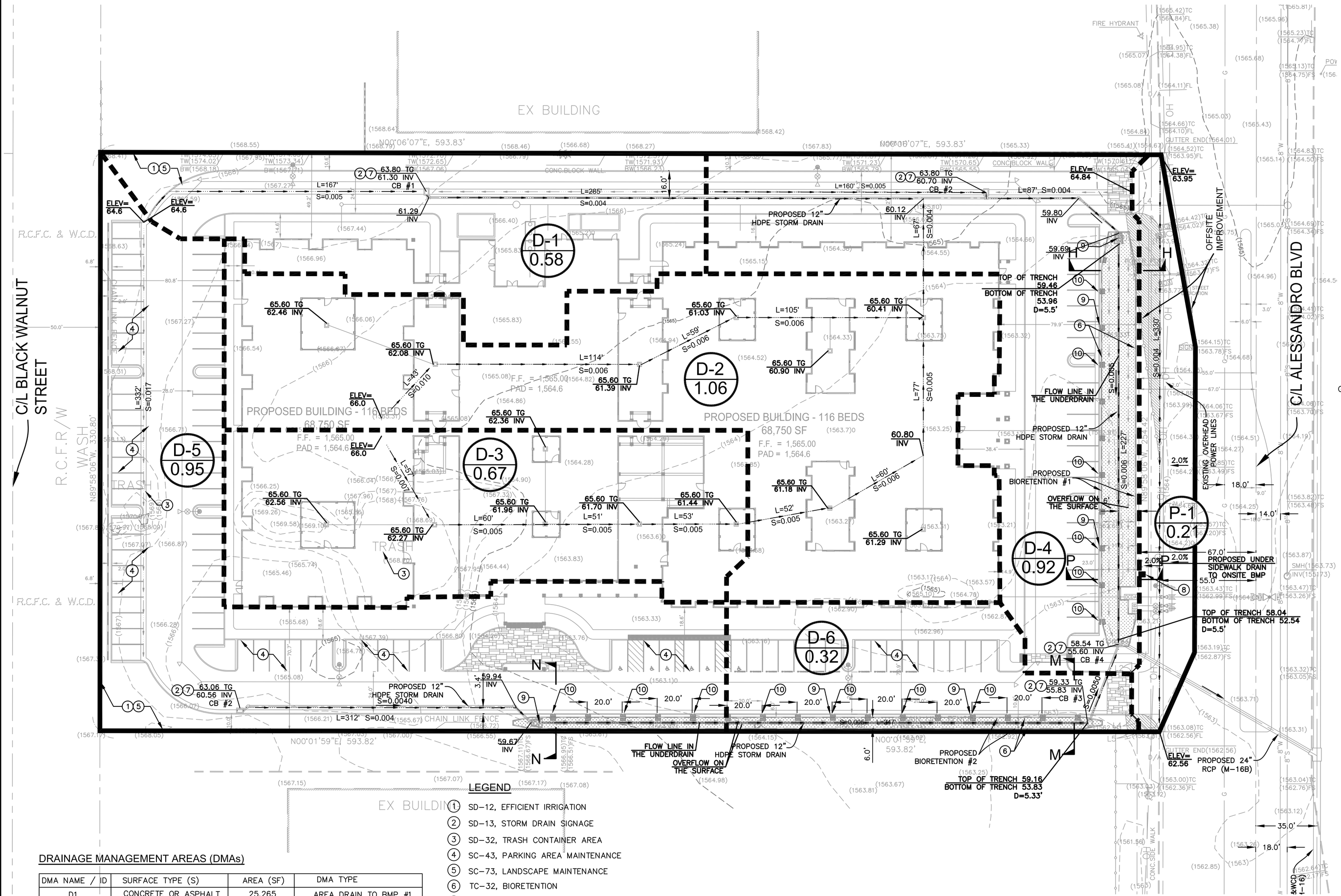
REGISTERED PROFESSIONAL ENGINEER — WEIDONG LIU — Exp. 06-30-20 — CIVIL — STATE OF CALIFORNIA

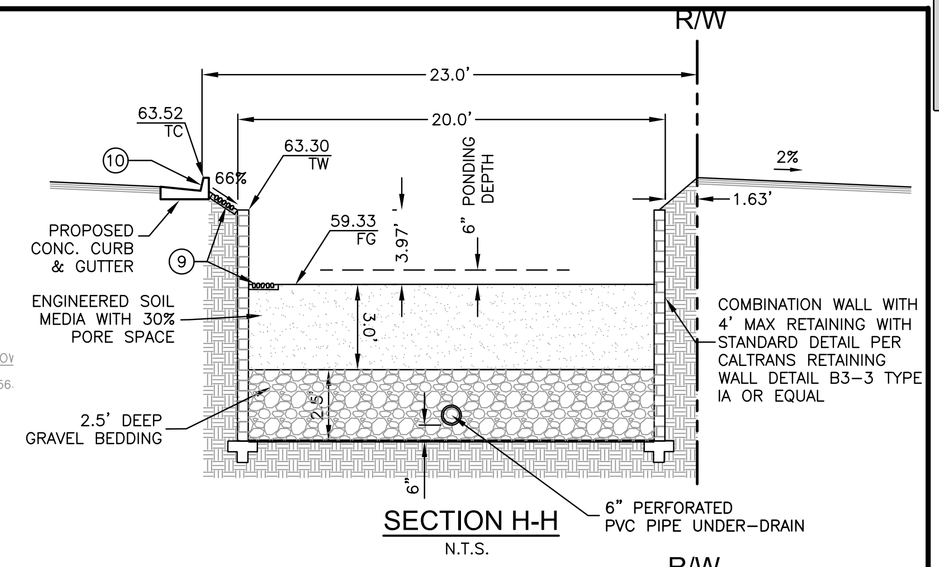
CITY OF MORENO VALLEY, CALIFORNIA
WATER QUALITY MANAGEMENT PLAN
SKILLED NURSING FACILITY
NORTH CORNER SIDE OF ALESSANDRA BLVD.
TITLE SHEET

DRAWN BY: WW STAFF
DESIGNED BY: WW STAFF
CHECKED BY: W.L.
APPROVED BY:
CITY ENGINEER R.C.E. DATE:
SCALE: AS SHOWN
DATE: 10/01/2018
DRAWING NO.: 1/2

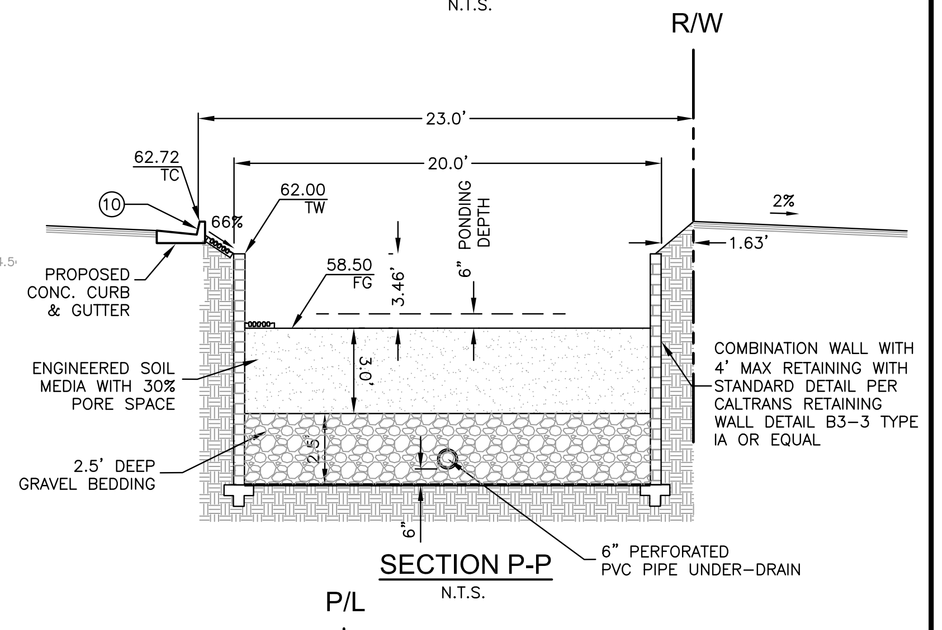
WQMP - SITE PLAN
IN CITY OF MORENO VALLEY, RIVERSIDE
SKILLED NURSING FACILITY

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1 inch =30 ft.

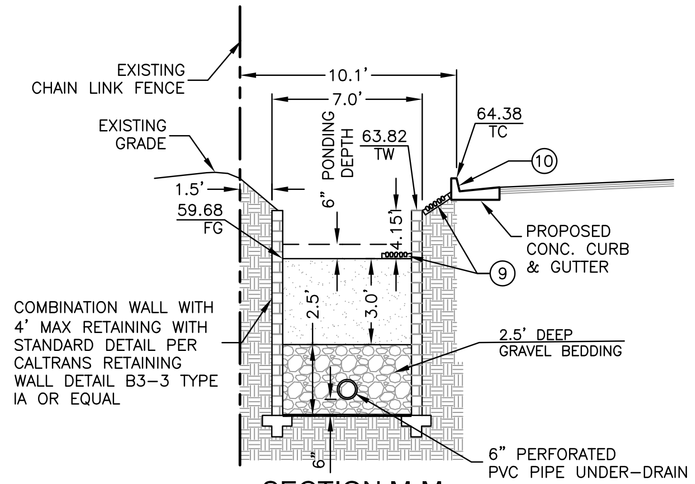




SECTION H-H
N.T.S.



SECTION P-P
N.T.S.



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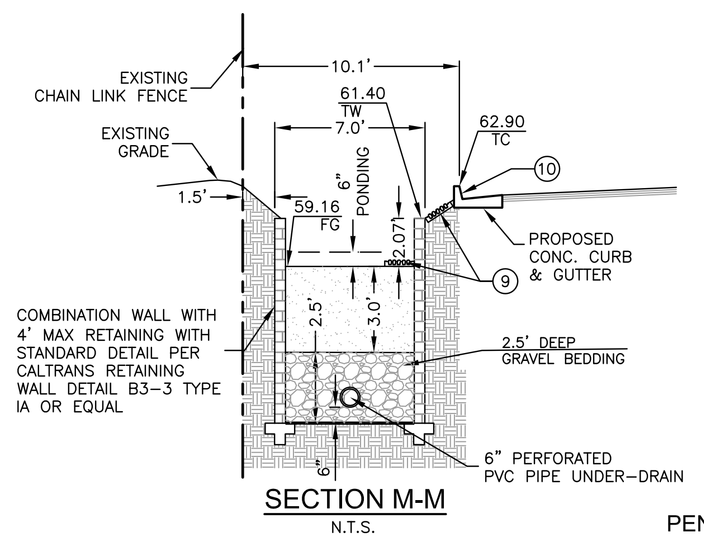


SECTION M-M
N.T.S.

PEN18-0082

LEGEND

1. SD-12, EFFICIENT IRRIGATION
2. SD-13, STORM DRAIN SIGNAGE
3. SD-32, TRASH CONTAINER AREA
4. SC-43, PARKING AREA MAINTENANCE
5. SC-73, LANDSCAPE MAINTENANCE
6. TC-32, BIORETENTION
7. SC-74, DRAINAGE SYSTEM MAINTENANCE
8. SWALEGARD PREFILTER (PRE-TREAMENT) FF-GS24-6. 6" DIAMETER
9. RIP-RAP
10. CONST 0" CURB FACE TO ALLOW DRAINAGE PASS THROUGH. SEE DETAIL ON SHEET 1.

PROJECT BOUNDARY
DRAINAGE BOUNDARY FOR EACH BMP
FLOW LINE

D-1 0.84 — DRAINAGE MANAGEMENT AREA NUMBER / DRAINAGE AREA ACER

DRAINAGE MANAGEMENT AREAS (DMAs)

DMA NAME / ID	SURFACE TYPE (S)	AREA (SF)	DMA TYPE
D1	CONCRETE OR ASPHALT	25,265	AREA DRAIN TO BMP #1
D2	CONCRETE OR ASPHALT	46,174	AREA DRAIN TO BMP #1
D3	CONCRETE OR ASPHALT	29,148	AREA DRAIN TO BMP #1
D4	CONCRETE OR ASPHALT	40,075	AREA DRAIN TO BMP #1
D5	CONCRETE OR ASPHALT	41,179	AREA DRAIN TO BMP #2
D6	CONCRETE OR ASPHALT	13,827	AREA DRAIN TO BMP #2
P1	CONCRETE OR ASPHALT	9,222	AREA DRAIN TO BMP #1

PROJECT SITE AREAS

TOTAL PROJECT SITE AREA (SF)	IMPERVIOUS AREA (SF)	PERVIOUS AREA A (SF)
209,887	209,887	0

NOTE:

ALL ONSITE DRAINAGE FACILITIES SUCH AS, CATCH BASIN INSERT, STORM DRAIN PIPES,BIORETENTION WILL BE OWNED, OPERATED, AND MAINTAINED BY PROPERTY OWNER.

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

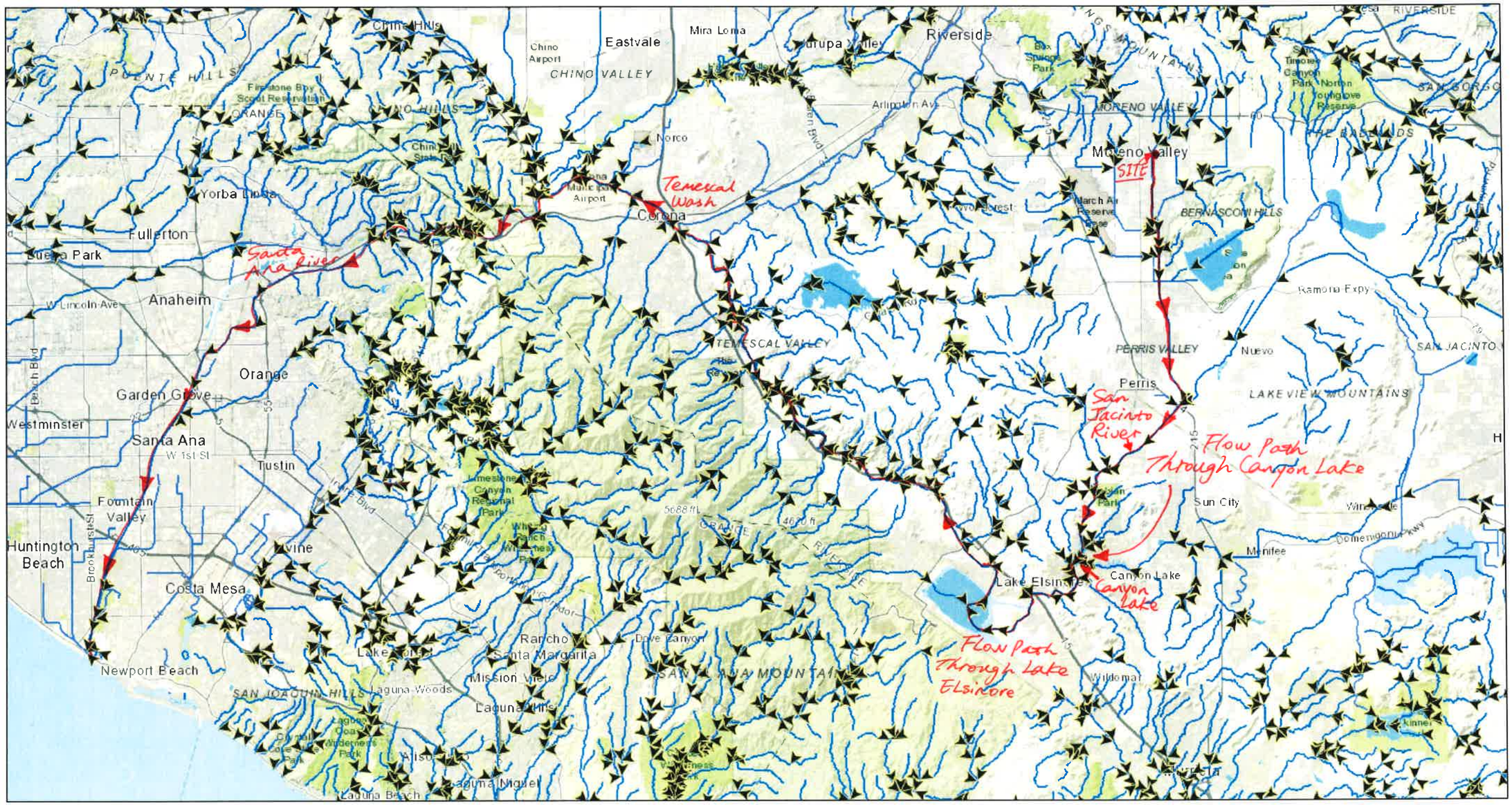
W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

REGISTERED PROFESSIONAL ENGINEER — WEIDONG LIU — No. 66242 Exp. 06-30-20 — CIVIL — STATE OF CALIFORNIA

CITY OF MORENO VALLEY, CALIFORNIA
WATER QUALITY MANAGEMENT PLAN

DRAWN BY: WW STAFF	SKILLED NURSING FACILITY NORTH CORNER SIDE OF ALESSANDRA BLVD.	SCALE: AS SHOWN
DESIGNED BY: WW STAFF	**WQMP - SITE PLAN**	DATE: 10/01/2018
CHECKED BY: W.L.	APPROVED BY: CITY ENGINEER R.C.E. DATE:	DRAWING NO.: 2/2

Receiving Water Map-Skilled Nursing Facility



7/12/2018 1:26:49 PM

- Waterbodies
- Canals
- Flow Direction
- Streams

1:240,387

0 3 6 12 mi

0 4.75 9.5 19 km

US EPA, Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User

US Environment Protection Agency
County of Riverside, Bureau of Land Management, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | US EPA

Appendix 2: Construction Plans

Grading and Drainage Plans

CONCEPTUAL GRADING & DRAINAGE PLAN

DETAILS & CROSS SECTIONS

IN CITY OF MORENO VALLEY, RIVERSIDE

SKILLED NURSING FACILITY

LEGAL DESCRIPTION:

THE LAND REFERRED TO IS SITUATED IN THE COUNTY OF RIVERSIDE, CITY OF MORENO VALLEY, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

THE EAST 1/2 OF LOT 5, IN BLOCK 102, IN THE CITY OF MORENO VALLEY, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP NO. 1 OF LANDS OF BEAR VALLEY AND ALLESSANDRO DEVELOPMENT COMPANY, ON FILE IN BOOK 11, PAGE 10 OF MAPS, SAN BERNARDINO COUNTY RECORDS.

APN: 479-230-018-6

BENCHMARK:

RIVERSIDE BM# M-79 ELEVATION: 1563.112
405 FEET SOUTH AND 43 FEET EAST OF PERRIS BOULEVARD AND ALESSANDRO BOULEVARD INTERSECTION. 5 FEET NORTH OF POWER POLE # 24828, A BRASS CAP IN CONCRETE POST 4" ABOVE GROUND AND STAMPED M-79 RESET 1972.

BASIS OF BEARING:

BEARINGS ARE BASSES ON ALESSANDRO BOULEVARD HAVE A BEARING OF EAST , PER PARCEL MAP NO.5387 PM 14/7

EARTHWORK QUANTITIES	
EXCAVATION (CUT)	6,860 CY
FILL	+5,540 CY
SHRINKAGE (18%) +	+1,000 CY
NET EXPORT	320 CY

EARTHWORK QUANTITIES SHOWN ON THIS PLAN ARE APPROXIMATE ESTIMATES SHOWN FOR AGENCY FEE PURPOSES ONLY, AND ARE BASED UPON THE PLAN ELEVATIONS SHOWN AND THE GROUND ELEVATIONS WHICH EXISTED AT THE TIME OF THE TOPOGRAPHIC SURVEY.

SHEET INDEX

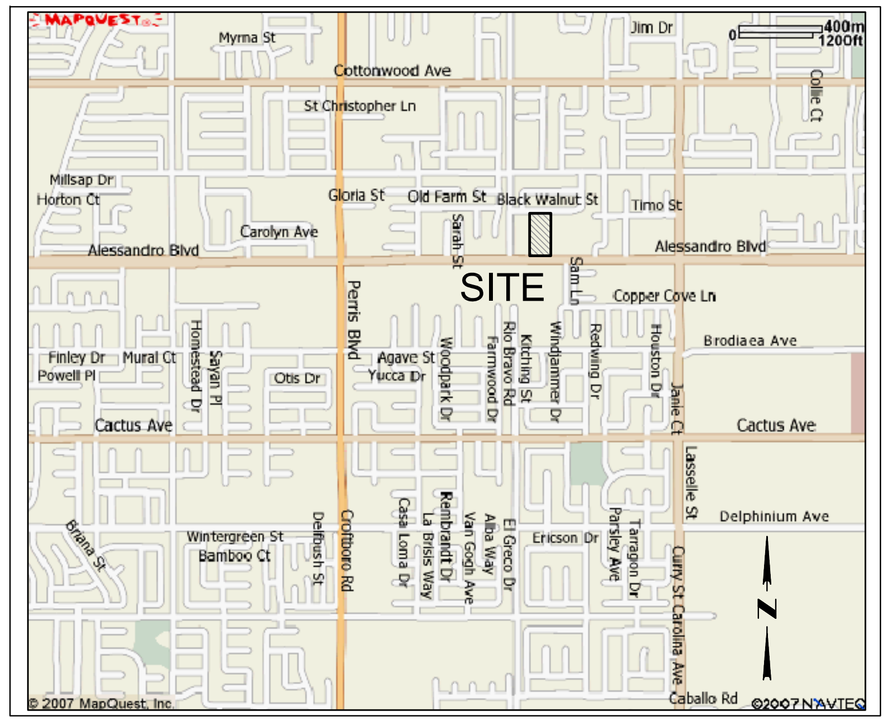
EASEMENT PLOTTED

PER TITLE REPORT BY OLD REPUBLIC TITLE COMPANY
DATED ON NOVEMBER 2, 2017
ORDER NUMBER: 2607163229-56

4. AN EASEMENT AFFECTING THAT PORTION OF SAID LAND AND FOR THE PURPOSES STATED HEREIN AND INCIDENTAL PURPOSES AS PROVIDED IN THE FOLLOWING

GRANTED TO : EASTERN MUNICIPAL WATER DISTRICT
FOR : CONDUITS, TOGETHER WTH RIGHT OF INGRESS AND EGRESS
RECORDED : MARCH 4, 1955 IN BOOK 1702 OF OFFICIAL RECORDS, PAGE 467, 552 AND 559, RESPECTIVELY. NOT PLOTTABLE.

AFFECTS : AS DESCRIBED THEREIN



VICINITY MAP

N.T.S.

GENERAL NOTES

PROJECT ADDRESS:	NORTH SIDE OF ALESSANDRA BLVD. AND CHARA STREET, CITY OF MORENO VALLEY
ASSESSORS PARCEL NUMBER:	479-230-018
EXISTING ZONE:	R-10
OCCUPANCY:	I-2, SKILLED NURSING FACILITY
DEVELOPMENT AREA:	GROSS AREA: 198,538 SF, 4.558 AC NET AREA: 196,003 SF, 4.500 AC
DATE MAP PREPARED:	MARCH, 2018
NUMBERED LOTS:	ONE (1) LOT COMMERCIAL
EXISTING TREES:	THERE ARE NO EXISTING TREES ON SITE, THERE ARE NO INDIGENOUS NATIVE OAK TREES ON SITE AS SHOWN
CONTOUR INTERVAL:	CONTOUR INTERVAL: 1 FEET

OWNER/DEVELOPER:

T AND C INTERNATIONAL HEALTH, INC
P.O. BOX 8070
ROWLAND HEIGHTS, CA 91748
CONTACT: STEVE L'HOMMEDIEU, WILLIAM CHU
(314) 502-3479, 626-689-9393
EMAIL: SLHOMMEDIEU@ARCO1.COM
WILLIAMCHU18809@GMAIL.COM

ENGINEER:

WINSTON LIU, PE
W&W LAND DESIGN CONSULTANTS
2335 W. FOOTHILL BLVD., SUITE #1
UPLAND, CA 91786
PHONE (909) 608-7118
FAX (909) 946-1137
EMAIL: WINSTONLIU@WWLDC.COM

UTILITY & SERVICE AGENCIES:

WATER/SEWER
EASTERN MUNICIPAL/WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CA 92572-8300
(951) 928-3777

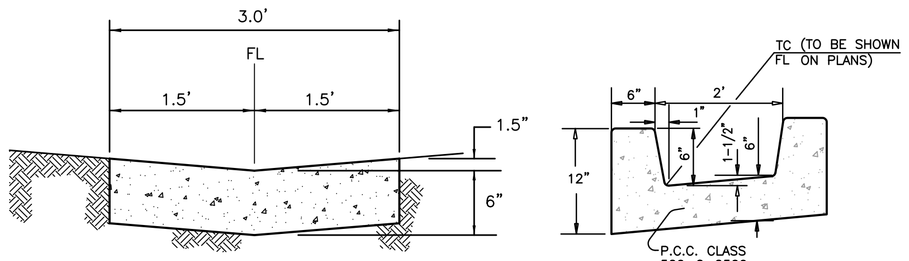
ELECTRIC
SOUTHERN CALIFORNIA EDISON
(800) 684-8123

TELEPHONE
VERIZON TELEPHONE

GAS
THE GAS COMPANY
(800) 427-2200

LEGEND:

	PROPERTY BOUNDARY
	LOT LINE
	CENTERLINE
	OFFSITE R/W
	EASEMENT LINE
-SD-	STORM DRAIN
-S-	SEWER LINE
-W-	WATER LINE
TC	TOP OF CURB
FL	FLOWLINE
BW	BACK OF WALK
HP	HIGH POINT
PE	PAD ELEVATION
FF	FINISH FLOOR
FS	FINISH SURFACE
GB	GRADE BREAK
BSL	BUILDING SETBACK LINE
FG	PROPOSED FINISH GROUND
NG	EXISTING NATURAL GROUND
TF	TOP OF BLOCK WALL FOOTING
TG	TOP OF GRATE
SW	SEWER
WA	WATER
INV	INVERT
EDF	EDGE OF DEEPENED FOOTING
BTM	BOTTOM
C/F	CUT FILL TRANSITION LINE
	PROPOSED DRAINAGE PATTERN
	EXISTING DRAINAGE PATTERN
	PROPOSED AC PAVEMENT
	PROPOSED BIO RETENTION



3' RIBBON GUTTER DETAIL

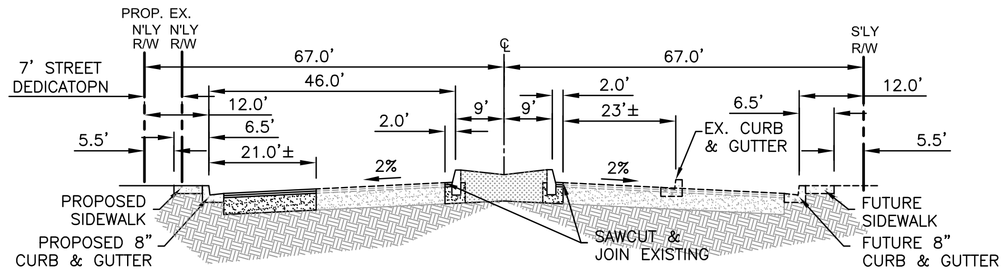
NOT TO SCALE

1. CONCRETE SHALL BE CLASS 520-C-2500 PER SECTION 201 S.S.P.W.C. CURING COMPOUND SHALL BE TYPE 1-D.
2. ALL EXPOSED CORNERS SHALL 1/2" RADIUS.

"U" CHANNEL DETAIL

NOT TO SCALE

SUBGRADE PREPARATION TO BE DONE PER SOIL ENGINEER'S RECOMMENDATION.



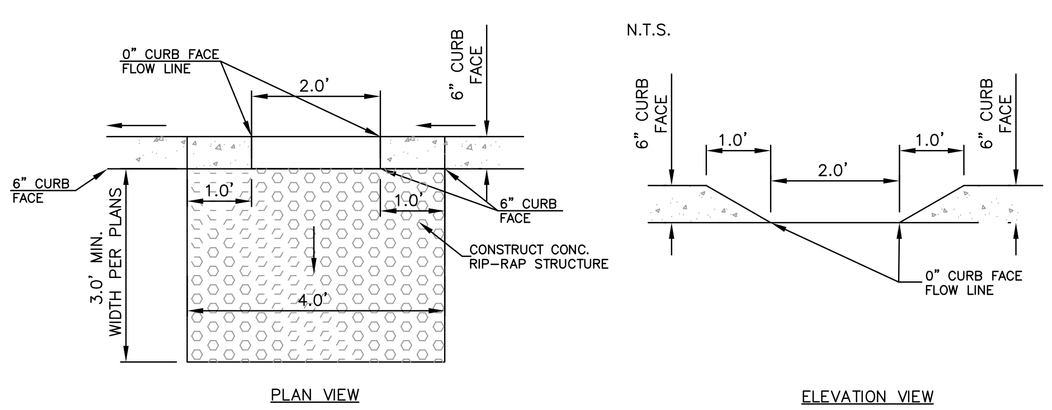
ALESSANDRO BLVD
DIVIDER MAJOR ARTERIAL-SECTION CITY STD. NO, MVSI-101A-0
N.T.S. T.I.=10.0

FLOOD ZONE

ACCORDING TO THE CITY OF MORENO VALLEY AND BASED UPON THE NATIONAL INSURANCE PROGRAM MAPS THIS SITE LIES WITHIN FLOOD ZONE X SHADED, COMMUNITY PANEL NO. 06505C0765G DATED AUGUST 08, 2008 AND PUBLISHED BY THE FEDERAL INSURANCE ADMINISTRATION.

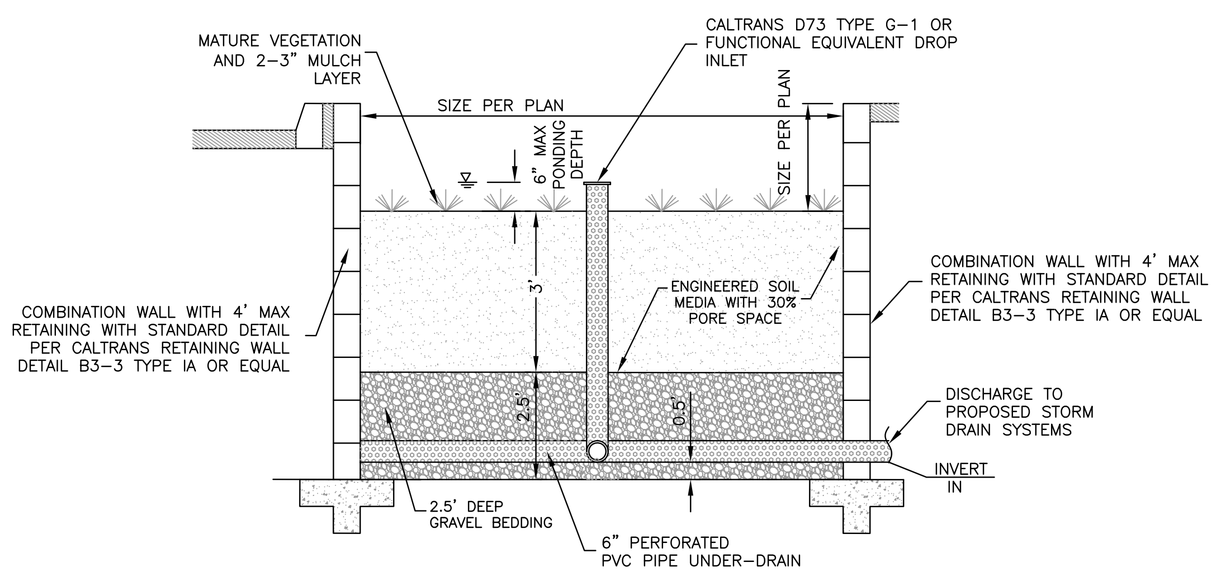
NOTE:

THE OWNER(S) OF PARCEL 1 HEREBY DEDICATES TO CITY OF MORENO VALLEY, A MUNICIPAL CORPORATION, A PERPETUAL NO-EXCLUSIVE EASEMENT FOR PUBLIC UTILITY PURPOSES INCLUDING INGRESS AND EGRESS FOR THE PURPOSE OF CONSTRUCTING, OPERATING, MAINTAINING AND REPARING MUNICIPAL SERVICE FACILITIES AND READING METERS OVER, UNDER, UPON, ACROSS AND WITHIN ALL COMMON AREAS OF THE REAL PROPERTY.



0" CURB DETAIL FOR DRAINAGE

NOT TO SCALE



BIORETENTION WITH UNDERDRAIN

NOT TO SCALE

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

REGISTERED PROFESSIONAL ENGINEER
WEIDONG LIU
No. 66242
Exp. 06-30-20
CIVIL
STATE OF CALIFORNIA

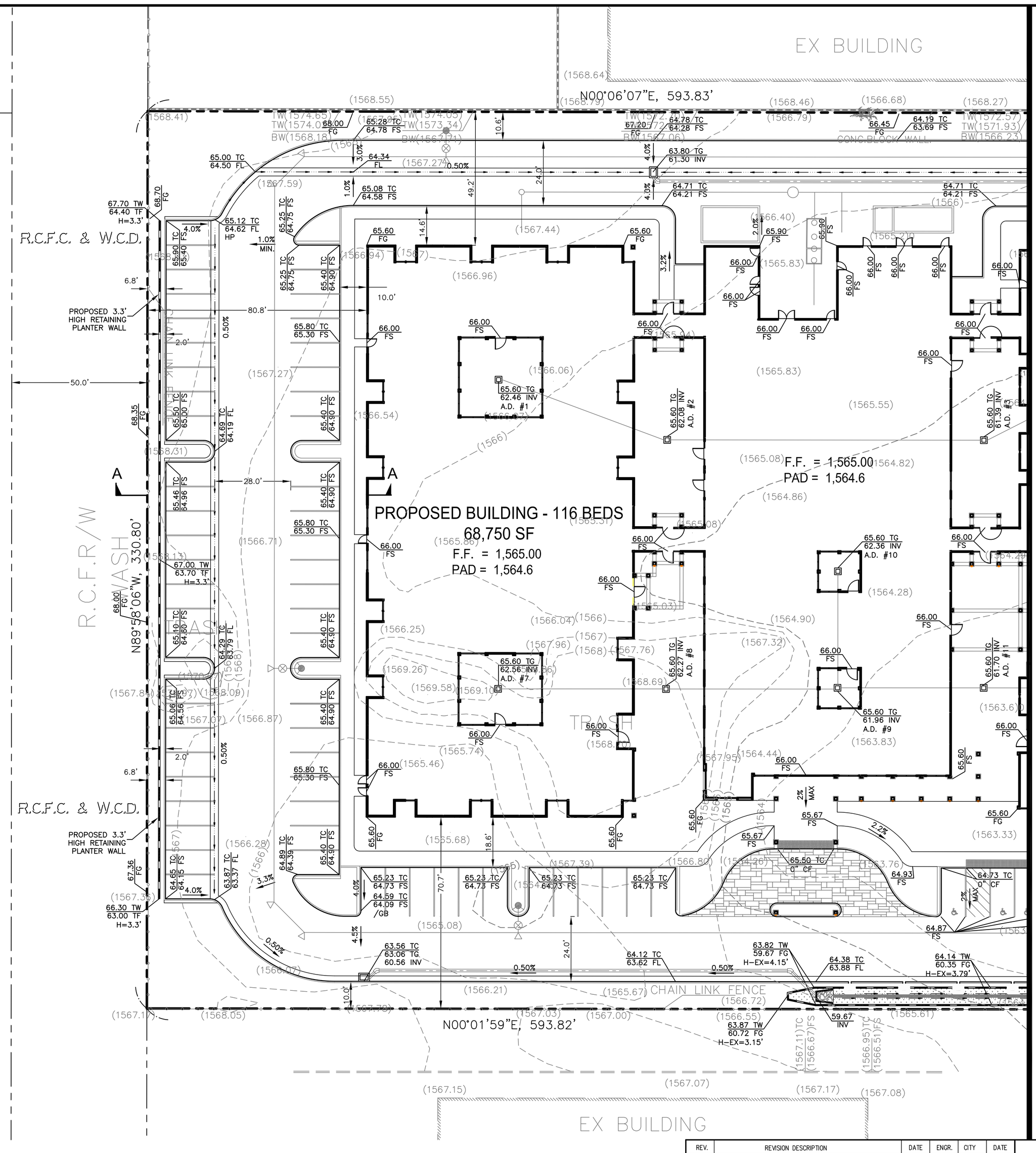
CITY OF MORENO VALLEY, CALIFORNIA
CONCEPTUAL GRADING & DRAINAGE PLAN

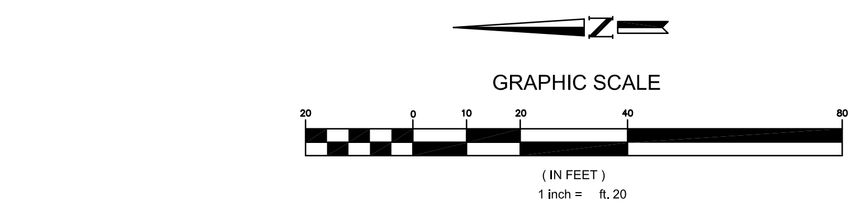
DRAWN BY: WW STAFF	SKILLED NURSING FACILITY NORTH CORNER SIDE OF ALESSANDRA BLVD.	SCALE: AS SHOWN
DESIGNED BY: WW STAFF	TITLE SHEET WITH DETAILS & CROSS SECTIONS	DATE: 03/15/2018
CHECKED BY: W.L.	APPROVED BY: CITY ENGINEER R.C.E. DATE:	DRAWING NO.: 1 / 4

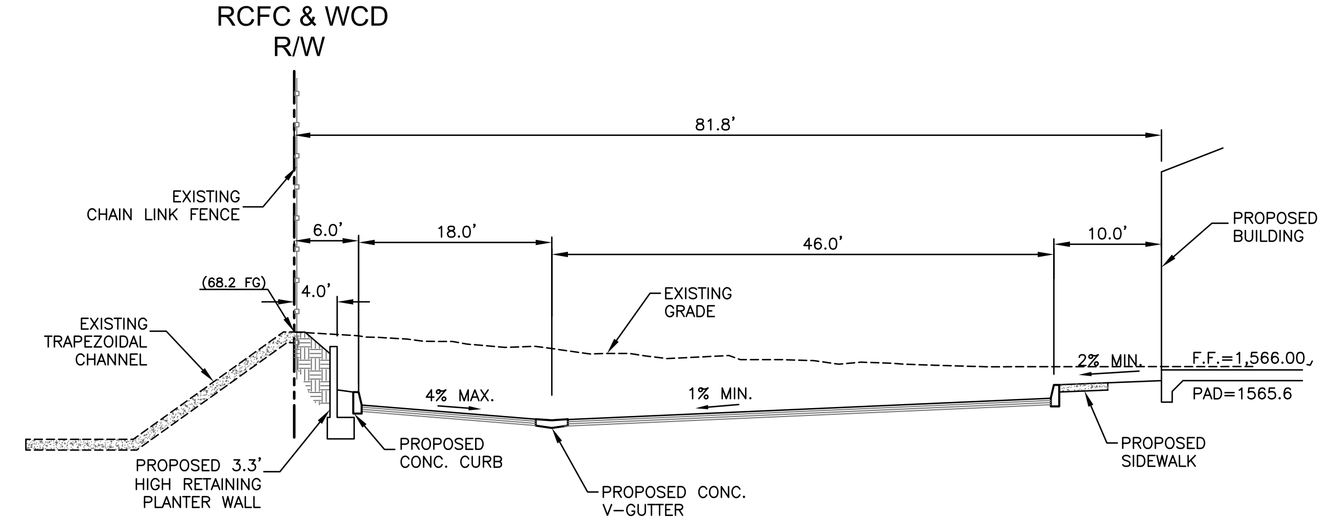
CONCEPTUAL GRADING & DRAINAGE PLAN

IN CITY OF MORENO VALLEY, RIVERSIDE

SKILLED NURSING FACILITY







SECTION A-A

N.T.S.

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

REGISTERED PROFESSIONAL ENGINEER — WEIDONG LIU — No. 66242 Exp. 06-30-20 — CIVIL — STATE OF CALIFORNIA

CITY OF MORENO VALLEY, CALIFORNIA

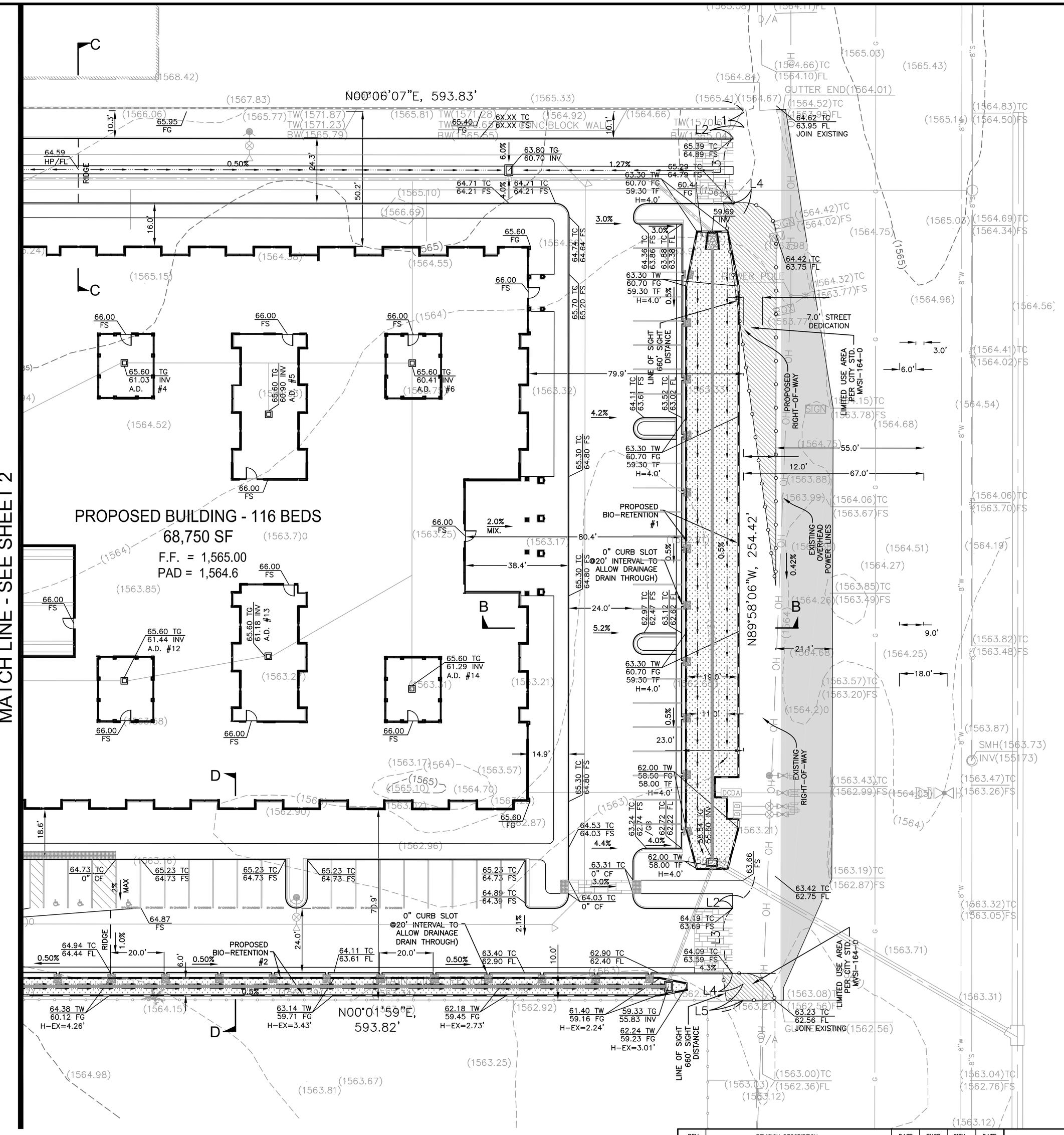
CONCEPTUAL GRADING & DRAINAGE PLAN

DRAWN BY: WW STAFF	SKILLED NURSING FACILITY NORTH CORNER SIDE OF ALESSANDRA BLVD.	SCALE: AS SHOWN
DESIGNED BY: WW STAFF	CONCEPTUAL GRADING & DRAINAGE PLAN	DATE: 03/15/2018
CHECKED BY: W.L.	APPROVED BY: CITY ENGINEER R.C.E. DATE:	DRAWING NO.: 2 / 4

CONCEPTUAL GRADING & DRAINAGE PLAN

IN CITY OF MORENO VALLEY, RIVERSIDE

SKILLED NURSING FACILITY



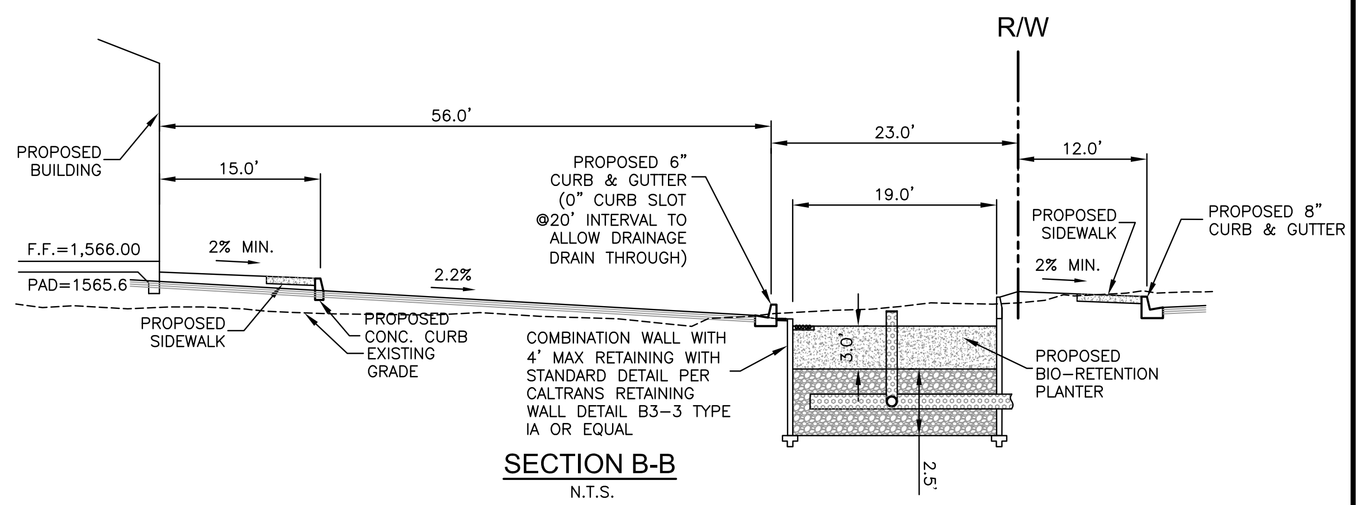
LINE TABLE

LINE	BEARING	LENGTH
L1	N89°58'06"W	5.65'
L2	N44°58'01"W	5.66'
L3	N89°58'06"W	24.00'
L4	N45°01'59"E	5.66'
L5	N89°58'06"W	6.01'

GRAPHIC SCALE

20 0 10 20 40 80

(IN FEET)
1 inch = ft. 20



SECTION B-B
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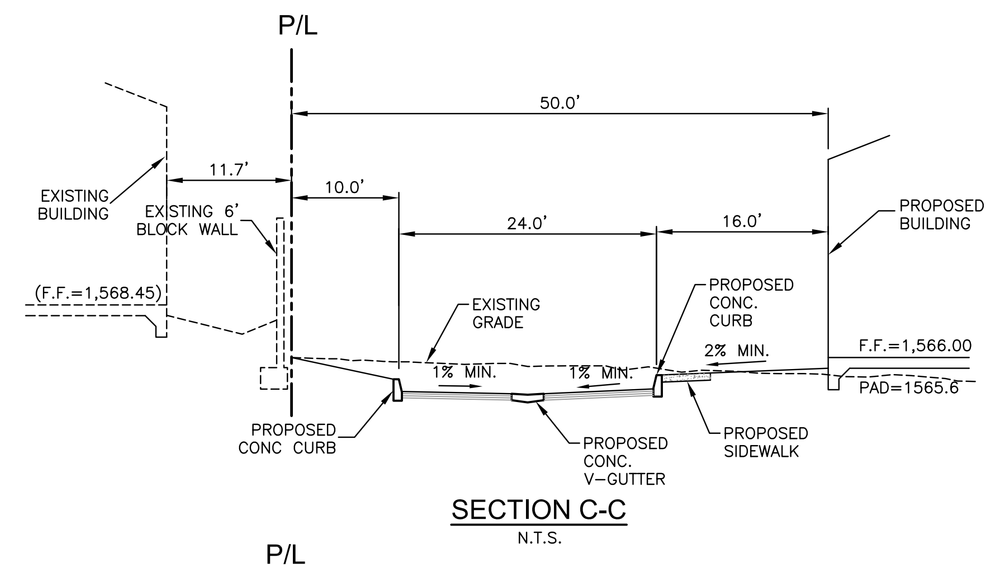

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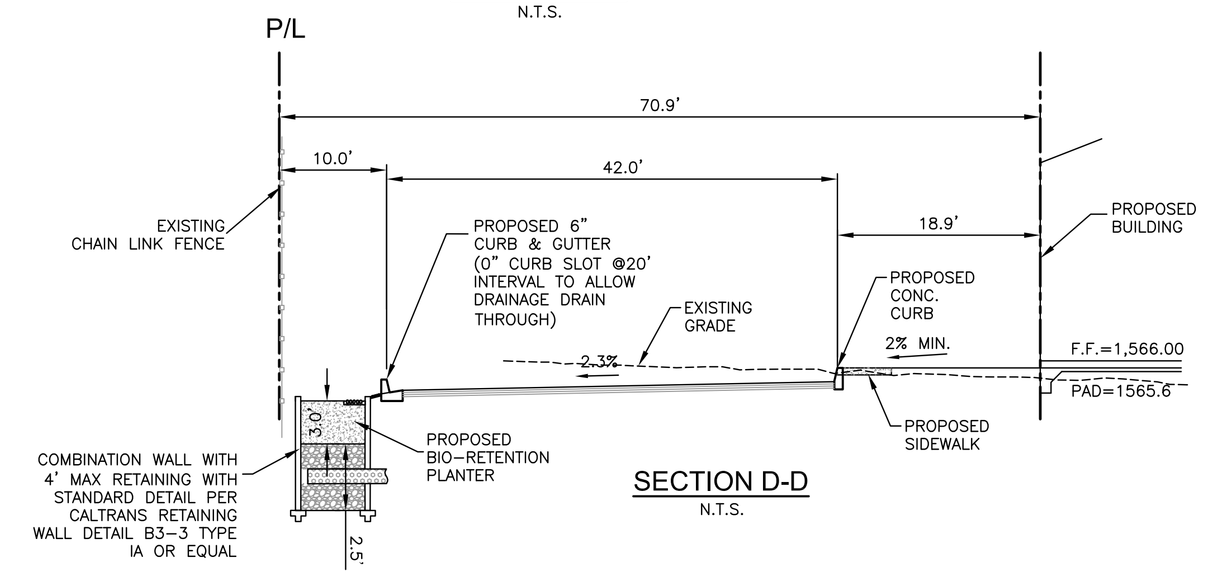


SECTION D-D
N.T.S.

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608-7118 • FAX: (909) 946-1137

REGISTERED PROFESSIONAL ENGINEER — WEIDONG LIU — No. 66242 Exp. 06-30-20 — CIVIL — STATE OF CALIFORNIA

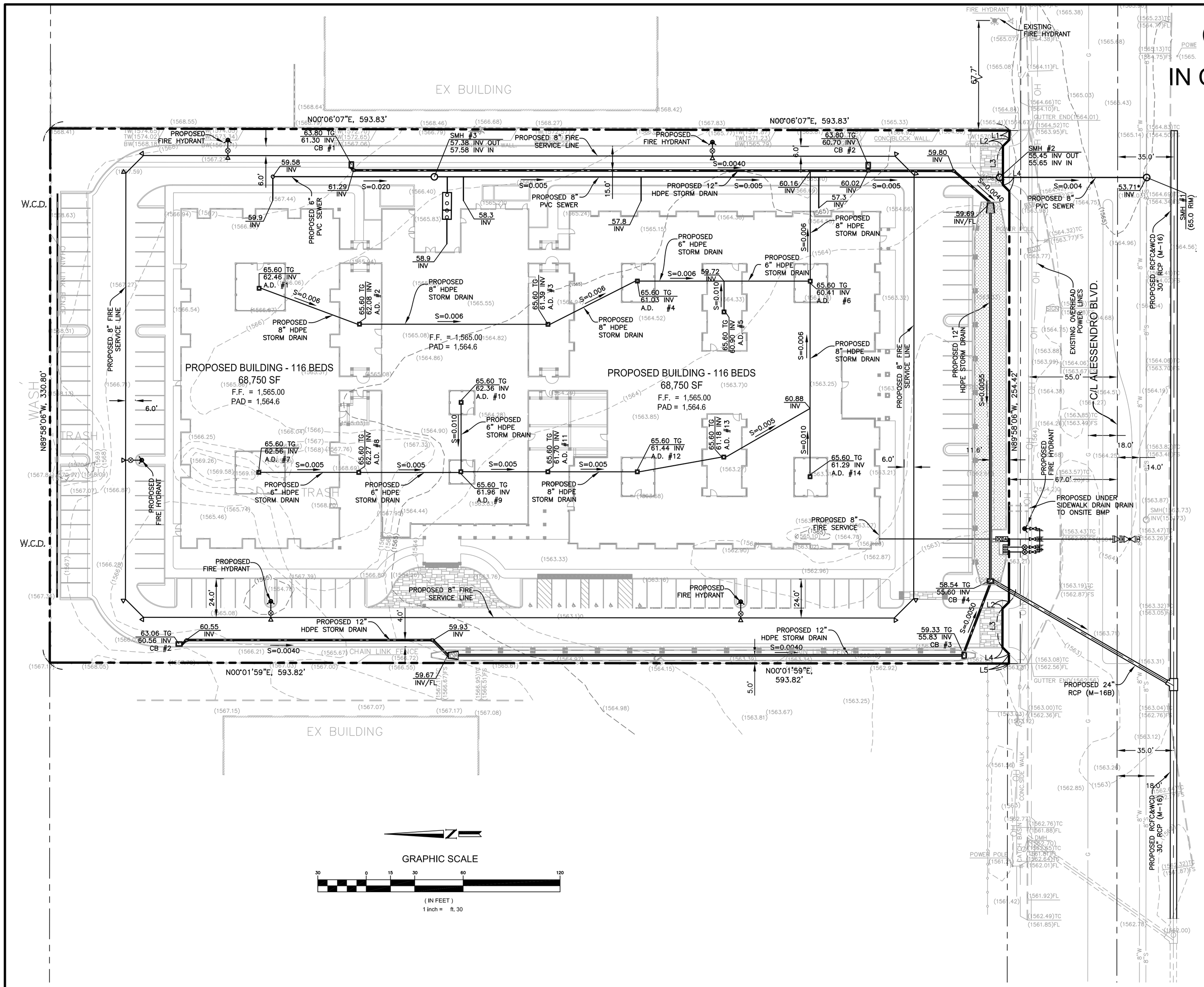
CITY OF MORENO VALLEY, CALIFORNIA

CONCEPTUAL GRADING & DRAINAGE PLAN

DRAWN BY: WW STAFF	SKILLED NURSING FACILITY NORTH CORNER SIDE OF ALESSANDRA BLVD.	SCALE: AS SHOWN
DESIGNED BY: WW STAFF	CONCEPTUAL GRADING & DRAINAGE PLAN	DATE: 03/15/2018
CHECKED BY: W.L.	APPROVED BY: CITY ENGINEER R.C.E. DATE:	DRAWING NO.: 3 / 4

CONCEPTUAL UTILITY PLAN

IN CITY OF MORENO VALLEY, RIVERSIDE
SKILLED NURSING FACILITY



LEGEND

- PROPERTY BOUNDARY
- LOT LINE
- CENTERLINE
- OFFSITE R/W
- EASEMENT LINE
- SD — STORM DRAIN
- S — SEWER LINE
- W — WATER LINE
- PROPOSED FIRE HYDRANT
- PROPOSED WATER
- PROPOSED SEWER
- EXISTING FIRE HYDRANT
- WV — WATER VALVE
- PP — POWER POLE
- WM — WATER METER
- PB — PULL–BOX
- CO — SEWER CLEAN–OUT
- EXISTING STREET SIGNAL
- PARKING LIGHT
- IRR. WM — IRRIGATION WATER METER
- DDC — DOUBLE DETECTOR CHECK VAVLE
- SMH — SEWER MANHOLE
- CB — CATCH BASIN
- FDC — FIRE DETECTOR CHECK VAVLE

UTILITY & SERVICE AGENCIES:

WATER/SEWER
EASTERN MUNICIPAL/WATER DISTRICT
2270 TRUMBLE ROAD
PERRIS, CA 92572–8300
(951) 928–3777

ELECTRIC
SOUTHERN CALIFORNIA EDISON
(800) 684–8123

TELEPHONE
VERIZON TELEPHONE

GAS
THE GAS COMPANY
(800) 427–2200

PEN18-0082

REV.	REVISION DESCRIPTION	DATE	ENGR.	CITY	DATE

W&W Land Design Consultants, Inc
Civil Engineering • Subdivision • Land Planning
2335 W. FOOTHILL BLVD., SUITE 1, UPLAND, CA 91786
TEL: (909) 608–7118 • FAX: (909) 946–1137

REGISTERED PROFESSIONAL ENGINEER — WEIDONG LIU — No. 66242 Exp. 06–30–20 — CIVIL — STATE OF CALIFORNIA

CITY OF MORENO VALLEY, CALIFORNIA
CONCEPTUAL GRADING & DRAINAGE PLAN

DRAWN BY: WW STAFF	SKILLED NURSING FACILITY NORTH CORNER SIDE OF ALESSANDRA BLVD.	SCALE: AS SHOWN
DESIGNED BY: WW STAFF	**CONCEPTUALAL UTILITY PLAN**	DATE: 03/15/2018
CHECKED BY: W.L.	APPROVED BY: _____ CITY ENGINEER R.C.E. DATE:	DRAWING NO.: 4 / 4

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

FINAL-DESIGN GEOTECHNICAL EXPLORATION
PROPOSED SKILLED NURSING FACILITY
25622 ALESSANDRO BOULEVARD
MORENO VALLEY, RIVERSIDE COUNTY, CALIFORNIA
APN 479-230-018-6

Prepared for:

T & C INTERNATIONAL HEALTHCARE, INC.
1961 Scenic Ridge Drive
Chino Hills, CA 91709-1004

Project No. 11888.001

February 14, 2018

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Wednesday, February 14, 2018

Project No. 11888.001

T & C International Healthcare, Inc.
1961 Scenic Ridge Drive
Chino Hills, CA 91709-1004

Attention: Mr. Zanwei Chen
President

Subject: Final Design-Phase Geotechnical Exploration
Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California
APN 479-230-018-6

In accordance with our December 28, 2017 proposal authorized on January 3, 2018, Leighton Consulting, Inc. is pleased to present results of our final-design geotechnical exploration for a proposed skilled nursing facility to be constructed at this undeveloped rectangular parcel located north of Alessandro Boulevard easterly of Kitching Street in Moreno Valley, Riverside County, California.

This site is relatively flat, so there are no slope stability issues. Also, this site is **not** located within a currently designated Alquist-Priolo Earthquake Fault Zone. However, as is the case for most of Southern California, strong ground shaking has and will occur at this site. Groundwater was encountered in three of our deeper borings at depths of 18- to 19-feet below existing grade on January 15, 2018. Encountered site soils consisted predominantly of dark-reddish-brown silty sands to clayey sands to the maximum depths explored in borings (26½ feet). We also pushed seven Cone Penetrometer Tests (CPTs) across the site, with the deepest hitting tip refusal (640 tons-per-square-foot) at a depth of 39 feet. These CPTs predominantly showed “very dense/stiff soils” at depths greater-than (>) 10 feet. Granitic outcrops are located approximately 2,000-feet due east of this site, so it is hypothesized that this very dense reddish-brown clayey sand is likely a residual soil, or at least older alluvium at depths greater-than 2½- to 5-feet below the existing disked ground surface. These deposits are also likely Pleistocene age. Based on age, density and clay content, this residual

soil at depths greater-than (>) 10 feet below the existing ground surface have **low** liquefaction potential.

There were concrete and other rubble piles across this site. This rubble cannot be used in compacted fill without pulverizing and removing organic or otherwise unsuitable material. These rubble piles should either be completely disposed of off-site, or pulverized and screened for use in new engineered compacted fill. A shallow bulk soil sample was also found to have an **Expansion Index (EI) of 30**, which is low but considered expansive. Some shallow sands on site were collapsible (moisture sensitive) and compressible. Generally, throughout this site, much of the area was recently disked for weed control. Although not specifically encountered, there is a potential for encountering buried manure in past agricultural areas in Moreno Valley. Therefore, organic soils (>2% organic content), if encountered, should not be used within engineered fill for structure support.

Overexcavation and recompaction of the upper 5-feet of expansive, compressible and collapsible (non-organic) soils is recommended within building pads, with these clays and sands blended as much as possible. Conventional spread footings founded on newly compacted fill are expected to be able to support one- to two-story structures on this site without any extraordinary geotechnical or structural remediation/mitigation.

We appreciate the opportunity to be of additional service to T & C. If you have any questions or if we can be of further service, then please contact us at your convenience at (951) 296-0530 or ***866-LEIGHTON***; specifically at the phone extensions and/or e-mail addresses listed below.

Respectfully submitted,

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1.0 INTRODUCTION

1.1 Site Location and Description

As depicted on Figure 1, *Vicinity Map*, this undeveloped rectangular parcel is Riverside County APN 479-230-018-6, fronted north of Alessandro Boulevard easterly of Kitching Street in Moreno Valley, Riverside County, California. Shown in more detail on Figure 2, *Exploration Location Map*, this site is a 4.54-acre rectangular parcel with plan dimension of roughly 600-feet north-south by 330-feet along Alessandro Boulevard; which is relatively flat and undeveloped. Site topography slopes gently down to the southwest, ranging from elevation 1570 feet at a "trash" (rubble) pile along the north property line, to elevation 1,563 feet in the southwestern portion of the site; as 7 feet of topographic relief across this site including rubble piles. There is a concrete-lined stormwater channel along the north property line, which appears to limit site access to solely Alessandro Boulevard on the south. There too is a short row of trees and overhead power lines along Alessandro Boulevard. The Moreno Valley Unified School District's administration building is located east of this site, and there is a charter school campus to the west.

1.2 Proposed Skilled Nursing Center

We understand that this site is to be developed as a skilled nursing facility as depicted on Gregg Maedo Architects' December 22, 2017 Sheet SD-1 titled "*Moreno Valley Skilled Nursing Facility*," prepared for T&C International Health, Inc. (reproduced as the base map for Figure 2). Three single-story Type V-A skilled nursing buildings, with rectangular footprints, are proposed with connecting hallways. Structure footprint areas are tabulated below:

Table 1. Proposed Skilled Nursing Buildings

Building	Footprint (square feet)
Building 100: Administration	16,970
Building 200: 60 private beds	33,440
Building 300: 56 sub-acute care/semi-private beds	18,340
TOTAL SKILLED NURSING:	**68,750**

*For an OSHPD 1 or 4 building in accordance with Section 1803A.3.1 of the 2016 CBC.

These buildings will have concrete slabs-on-grade, and will consist of wood and/or cold-formed-steel stud construction. Column and wall loads were

unavailable at the time we prepared this report, but column loads are not expected to exceed 100-kips since no large open interior spaces are proposed.

In addition to these three buildings, there will be asphalt pavements constructed around the site perimeter for fire lanes, driveways and parking for 113 autos. Conventional asphalt paving will be for auto parking and occasional three-axle trash trucks. A site grading plan was not yet available, but, for the purposes of this proposal, we assume finish grades will be within 4 feet of existing grades (excluding rubble pile removal). We have also assumed a building finish floor (FF) elevation at 1,565 feet (NAVD88).

1.3 Purpose and Scope of Exploration

Purpose of our exploration was to: (1) evaluate geologic and geotechnical conditions at this proposed skilled nursing facility site, (2) identify significant geotechnical or geologic issues that would impact this proposed building, and (3) provide geotechnical recommendations for design and construction of this proposed skilled nursing facility. In accordance with our December 28, 2017 proposal authorized on January 3, 2018, scope of our exploration included the following:

- **Research**: We reviewed readily available geotechnical literature, reports and aerial photographs relevant to this site. Pertinent geotechnical documents are referenced at the end of this report text.

- **Field Exploration**: First, on January 15, 2018, ten hollow-stem-auger borings were drilled, logged and sampled to depths of 5- to 26½-feet across this site. After sampling and logging, all borings were immediately backfilled with soil cuttings, except for Borings P-1, P-2 and P-3, where infiltration tests were performed. Then, on January 22, 2018, seven Cone Penetrometer Tests (CPT-1 through CPT-7) were pushed to depths ranging from 25- to 39-feet (tip refusal). Approximate boring and CPT locations are depicted on Figure 2, *Exploration Location Map*. A description of our field exploration, boring logs and CPT soundings are presented in Appendix A, *Field Exploration*.

- **Geotechnical Laboratory Testing**: Geotechnical laboratory tests were conducted on selected relatively undisturbed and bulk soil samples obtained from our borings. This laboratory testing program was designed to evaluate engineering characteristics of site soils. A description of test procedures and results are presented in Appendix B, *Geotechnical Laboratory Testing*.

- **Engineering and Geologic Analysis**: Data obtained from field explorations and geotechnical laboratory testing was evaluated and analyzed to develop geotechnical conclusions and provide recommendations in accordance with the California Geological Survey (CGS) Note 48 (October 2013 version). Our subsurface interpretations are provided on Figures 3a and 3b, *Geotechnical Cross Sections A-A' and B-B'*. Liquefaction calculations are presented in Appendix C, *Liquefaction Analysis*.

- **Report Preparation**: Results of our geologic hazards review and geotechnical exploration have been summarized in this report, presenting our findings, conclusions and preliminary geotechnical design recommendations.

This report does not address the potential for encountering hazardous materials in site soils nor groundwater. Important information about limitations of geotechnical reports in general, is presented in Appendix D, *GBA's Important Information About This Geotechnical-Engineering Report*.

2.0 FINDINGS

2.1 Regional Geologic Setting

This site is located within the Peninsular Ranges Geomorphic Province of California, which is characterized by northwest trending elongated mountain ranges and valleys. The Peninsular Ranges Geomorphic Province is divided into three major fault-bounded tectonic blocks, which consist of (from west to east): Santa Ana, Perris and San Jacinto Blocks. This site is situated near the north-eastern portion of the relatively stable Perris Block.

The Perris Block is approximately 20 miles by 50 miles in extent, bounded by the San Jacinto Fault Zone to the east, the poorly defined boundary of the Temecula Basin to the southeast, the Elsinore Fault Zone to the southwest, and the Cucamonga Fault Zone to the northwest. The Perris Block has had a complex tectonic history in response to movement on the Elsinore and San Jacinto Fault Zones. Thin sedimentary and volcanic materials locally mantle the crystalline bedrock. Alluvial and colluvial deposits fill the lower valley areas.

USGS (2006) regionally mapped geologic units at and around this site, including very old alluvial-fan deposits (early Pleistocene aged) with granitic outcrops 2,000 feet to the east at Lasselle Street; as depicted on Figure 4, *Regional Geology Map*. Dense reddish-brown silty and clayey sands at this site are

postulated to be residual soils associated with granitic outcrops in the area; if not older indurated alluvium.

2.2 Subsurface Soil Conditions

Based on results of our research and subsurface exploration, and as depicted on Figures 3a and 3b in cross-section view, site soils encountered to the depths explored (39 feet) consist of the following:

- **Rubble Fill (Afu)**: In January 2018, there was dumped rubble on this site including large demolished concrete slabs. These rubble piles were roughly mapped on Figure 2 as isolated areas of "Afu." Otherwise, fill soils were not specifically encountered or identified in our subsurface explorations. A photo of one of these rubble piles is shown below:

Typical rubble pile on site, January 2018.

- **Native Soils (Qvof)**: At depths greater-than (>) 2½- to 5-feet below the existing disked ground surface, older alluvial fan deposits (and possibly residual soils from granitic outcrop in-situ weathering) was encountered in all ten of our borings and all seven CPTs to the depths explored (39 feet). There was some variation in silt and clay content, with percent fines ranging from 44- to 64-percent. In-situ densities within the depth range from 5- to 24-feet ranged from 107- to 127-pounds-per-cubic-foot (pcf). Tip refusal (640 tons-per-square-foot; tsf) was reached at a depth of 39 feet in our deepest CPT and tip resistance in excess of 160 tsf (equivalent N-value ≥30) was measured at depths greater-than (>) 24-feet. A shallow bulk soil sample was found to have an **Expansion Index (EI) of 30**, which is considered as low expansion potential. Other shallow sands on site were collapsible (moisture sensitive) and compressible. Generally, throughout this site, much of the area was previously used for agriculture and currently disked for weed control. Although not specifically encountered in our borings, there is a

potential for encountering buried manure in past agricultural areas in Moreno Valley. Collapse measured in consolidations tests was as follows:

Table 2. Collapse Test Results

Boring	Sample Depth (feet)	Soil Description	Collapse (percent)*
LB-2	2½	SILTY SAND (SM)	**-4.72**
	5		-2.38
LB-3	10	SILTY SAND (SM)	-1.63
LB-4	2½	SILTY SAND (SM)	**-5.03**
	5		**-7.22**
LB-6	5	SILTY SAND (SM)	-1.18

*negative indicates collapse, while positive indicates swell

More detailed descriptions of subsurface soils encountered are presented on our boring logs in Appendix A.

2.3 Groundwater

Groundwater was locally encountered in our three deeper borings drilled on January 15, 2018 as follows:

Table 3. Encountered Depth to Groundwater

Boring	Surface Elevation* (feet)	Groundwater Depth (feet)	Groundwater Elevation (feet)
LB-1	1,564	18	1,546
LB-2	1,565	18½	1,546½
LB-3	1,566	17½	1,548½

*Based on the February 2, 2018 site topographic survey by W&W Land Design Consultants, Inc.

Significant seasonal and climatic groundwater level fluctuation is likely. However, note that there is a stormwater channel along the north (upstream) property line. Since no deep excavations are proposed for this project, groundwater is not expected to pose a constraint to the project as currently planned.

2.4 Faulting and Seismicity

Seismic hazards in Southern California could include fault rupture and strong ground shaking. There are no active or potentially active faults known to cross or project into this project site, and this site is not located within a currently-designated Alquist-Priolo Earthquake Fault Zone (Bryant and Hart, 2007) or Riverside County Fault Hazard Zone (Riverside, 2018). Therefore, potential for surface fault rupture at the site is considered very low. However, several active

and potentially active faults are mapped within close proximity to this site. Figure 5, *Regional Fault and Historical Seismicity Map*, depicts proximity of known active and potentially active faults within the region. As is the case for most of Southern California, strong ground shaking has and will occur at this site.

2.4.1 Faulting: As regionally mapped on Figure 5, closest active fault is the San Jacinto Fault to the northeast, and the San Andreas Fault, further to the northeast. Both are highly active faults with documented historic and Holocene strike-slip movement.

2.4.2 Seismicity (Ground Shaking): Principal seismic hazard that could affect the site is ground shaking resulting from an earthquake occurring along several major active or potentially active faults in southern California. Plotted on Figure 5, *Regional Fault and Historic Seismicity Map*, are epicenters of historic earthquakes (1769 through 2014) in and around Moreno Valley, color coded as a function of magnitude.

We are unaware of any earthquake damage reports specifically for this site and adjacent properties.

2.5 Secondary Seismic Hazards

In general, secondary seismic hazards for sites in the region could include soil liquefaction and earthquake-induced settlement. This site and vicinity are relatively flat, so slope instability and lateral spreading risk are **not** a site-specific concern. Potential for liquefaction and seismically-induced differential settlement are discussed below.

2.5.1 Liquefaction Potential: Liquefaction is the loss of soil strength due to a buildup of excess pore-water pressure during strong and long-duration ground shaking. Liquefaction is associated primarily with loose (low density), saturated, relatively uniform fine- to medium-grained, clean cohesionless soils. As shaking action of an earthquake progresses, soil granules are rearranged and the soil densifies within a short period. This rapid densification of soil results in a buildup of pore-water pressure. When the pore-water pressure approaches the total overburden pressure, soil shear strength reduces abruptly and temporarily behaves similar to a fluid. For liquefaction to occur there must be:

(1) loose, clean granular soils,
(2) shallow groundwater, **and**
(3) strong, long-duration ground shaking

Riverside County maps this site as having a "**Low**" liquefaction susceptibility as presented on Figure 6, *Liquefaction Map*. However, the City of Moreno Valley

General Plan Environmental Impact Report shows this site and vicinity as not being liquefiable; see:

http://www.moreno-valley.ca.us/city_hall/general-plan/06gpfinal/ieir/5_6-geo-soils.pdf

Liquefaction calculations and assumptions are presented in Appendix C and summarized as follows:

- **Groundwater**: Free groundwater was encountered on the order of 18 feet below existing grade on January 15, 2018. We conservatively modeled groundwater rising to within 10 feet of the surface during a large local earthquake.
- **Peak Horizontal Ground Acceleration (PGA_M)**: From the United States Geological Survey (USGS) web-based seismic hazard maps for California, PGA_M was 0.649g.
- **Soils Below Groundwater**: Residual soils at depths of 24-feet or more below existing grade were very dense, with Cone Penetrometer Test (CPT) tip resistance in-excess-of (≥) 160 tsf (interpreted N>30) where pushed on January 22, 2018 at this site. Potentially liquefiable silty and clayey sands exist in thin strata between depths of 10- and 24-feet.
- **Geology**: USGS Open-File Report 01-450 maps this site as Pleistocene deposits ("Qvof"). Undisturbed Pleistocene deposits are deemed non-liquefiable.

Based on this model, there remains a potential for some thin sand strata to liquefy, but this does not result in significant surface manifestations nor settlement in excess of ½-inch.

2.5.2 Seismically-Induced Settlement: Seismically induced settlement consists of dry dynamic settlement (above groundwater) and liquefaction-induced settlement (below groundwater). During a strong seismic event, seismically induced settlement can occur within loose to moderately dense sandy soil due to reduction in volume during and shortly after an earthquake event. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement. It is differential settlement that is damaging, not total settlement.

Based on site-specific geomorphology, alluvium is dense and uniform across this generally level site. Shallow soils are recommended to be recompacted. Therefore, any dynamically-induced settlement should be negligible and uniform across this site, so potentially-damaging differential settlement should be relatively small.

2.5.3 **Lateral Spreading:** Lateral spreading is highly unlikely to occur at this site due to the lack of liquefaction potential within 10-feet of the surface and lack of significant topographic changes at and around this site.

2.5.4 **Slope Instability and Landslides:** Seismically-induced landslides and other slope failures are common occurrences during or soon after earthquakes. However, as depicted on Figure 6, *Liquefaction Map*, this site and vicinity are relatively flat without slopes. Seismically-induced landslide activity can be **ruled out** for this site due to the lack of slopes.

2.5.5 **Earthquake-Induced Seiches and Tsunamis:** Seiches are large waves generated in enclosed bodies of water in response to ground shaking. Tsunamis are predominately ocean waves generated by undersea large magnitude fault displacement or major ground movement.

Based on separation of the site from any body of water, seiche impact at this site is highly unlikely. Also, due to site elevation at 1,563-feet above mean sea level and the inland location of this site relative to the Pacific Ocean (see California Geological Survey, 2009) tsunami risks at this site is **nil**.

2.5.6 **Earthquake-Induced Inundation:** This inundation hazard is flooding caused by failure of dams or other water-retaining structures as a result of earthquakes. Perris Dam is the closest dam to this site, and was just improved to mitigate liquefaction-induced failure. More importantly, this dam is downstream from this site; and if failed, would flood the valley to the southwest away from this site. The probability of this dam or any other dam inundating this site is extremely low.

2.6 Valley Subsidence

As regionally mapped on Figure 7, *Subsidence Map*, in accordance with County of Riverside Geologic Hazard Maps (Riverside, 2003), the site is located within an area susceptible to subsidence. However, this site is near the center of the valley rather than at the edge. Also, based on results of our subsurface evaluation and lack of evidence of differential subsidence and associated ground fissuring, we consider the potential for differential subsidence and ground fissuring on this site to be very low.

2.7 Storm-Induced Flood Hazard

As depicted on Figure 8, *Flood Hazard Zone Map*, this site is not located near or within a “100-year” or “500-year” flood zone as defined by the Federal Emergency Management Agency’s (FEMA’s) Flood Insurance Rate Map (FIRM).

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Findings and Conclusions Summary

This site is relatively flat, so there are **no** slope stability issues. Also, this site is **not** located within a currently designated Alquist-Priolo Earthquake Fault Zone or Riverside County Fault Hazard Zone. However, as is the case for most of Southern California, strong ground shaking has and will occur at this site. Free groundwater was encountered in three of our deeper borings at depths of 18- to 19-feet below existing grade on January 15, 2018, and encountered site soils did consist predominantly of dark-reddish-brown clayey sands to the maximum depths explored in borings (26½ feet). Granitic outcrops are located approximately 2,000-feet due east of this site, so it is hypothesized that this very dense reddish-brown clayey sand could be a residual soil, or at least older alluvium at depths greater-than 2½- to 5-feet below the existing disked surface. We also pushed seven Cone Penetrometer Tests (CPT) across the site, with the deepest hitting tip refusal (640 tons-per-square-foot) at a depth of 39 feet. These CPTs predominantly showed "very dense/stiff soils" at depths greater-than (>) 10 feet. Based on clay content and density, this residual soil at depths greater-than (>) 10 feet below the existing ground surface have low liquefaction potential.

3.2 Recommendations Summary

There were concrete and other rubble piles across this site. This rubble cannot be used in compacted fill without pulverizing and removing organic or otherwise unsuitable material. These rubble piles should either be completely disposed of off-site, or pulverized and screened for use in new engineered compacted fill. A shallow bulk soil sample was also found to have an **Expansion Index (EI) of 30**, which is low; yet still expansive. Other sands on site were collapsible (moisture sensitive) and compressible. Generally, throughout this site, much of the area was recently disked for weed control. There always is a potential for encountering buried manure in past agricultural areas in Moreno Valley. Therefore, organic soils (>2% organic content) should **not** be reused within engineered fill for structure support.

Clays and sands blended as much as possible. Overexcavation and recompaction of the upper **5-feet** of compressible and collapsible (non-organic) soils is recommended within building pads. This 5-foot overexcavation should be measured below either existing or finish grade, whichever is at a lower elevation. Conventional spread footings founded on newly compacted fill are expected to

be able to support one- to two-story structures on this site without any extraordinary geotechnical or structural remediation/mitigation.

Detailed geotechnical recommendations for this proposed skilled nursing facility are presented in the following subsections.

3.3 Earthwork

Project earthwork is expected to include complete removal of existing rubble fill piles and complete overexcavation and recompaction of undocumented fill and native soils below proposed new building footprints as described in the following subsections. We assume ground floor finish floor (FF) elevation at 1,565 feet (NAVD88). Therefore, overexcavation should extend down to or below elevation 1,560-feet at the north end and 1,558-feet at the south end. More detailed earthwork recommendations are presented in the following subsections:

3.3.1 Earthwork Observation and Testing: Leighton Consulting, Inc. should observe and test all grading and earthwork, to check that the site is properly prepared, the selected fill materials are satisfactory, and that placement and compaction of fills has been performed in accordance with our recommendations and the project specifications. Sufficient notification to us prior to earthwork is essential. A bulk sample of any imported soil or aggregate material should be submitted to the Leighton Consulting, Inc. geotechnical laboratory at least two working days in advance of earth material placement and compaction. Project plans and specifications should incorporate recommendations contained in the text of this report.

Variations in site conditions are possible and may be encountered during construction. To confirm correlation between soil data obtained during our field and laboratory testing and actual subsurface conditions encountered during construction, and to observe conformance with approved plans and specifications, it is essential that we be retained to perform continuous or intermittent review during earthwork, excavation and foundation construction phases. Therefore, conclusions and recommendations presented in this report are contingent upon us performing construction observation services.

3.3.2 Surface Drainage: Water should not be allowed to pond or accumulate anywhere except in detention basins set back at least 25 feet from structures. Pad drainage should be designed to collect and direct surface water away from structures to approved drainage facilities. Hardscape drains should be installed and drain to storm water disposal systems. Drainage patterns and drainpipes approved at the time of fine grading should be maintained throughout the life of proposed structures. Irrigation and/or infiltration should not be allowed for at least 5 feet and 25 feet, respectively, measured

horizontally around the proposed skilled nursing facility building (spread footing) perimeter.

3.3.3 **Site Preparation:** Based on encountered site conditions, we recommend that after removal of rubble and vegetation, all fill and native soils should then be excavated from proposed building footprints, down at least 2 feet below the bottoms of proposed footings or at least **5 feet** below existing grade or finish grade, whichever is deeper; or deeper if required to excavate existing fill soils from within proposed building footprints. This overexcavation bottom should extend horizontally either the thickness of fill below spread-footings or at least 5-feet horizontally beyond the outside edges of proposed perimeter footings, whichever is greater, encompassing the whole new building footprints. Any underground obstructions encountered should be removed. Efforts should be made to locate any existing utility lines. Those lines should be removed or rerouted where interfering with proposed construction. Trees to be removed should be grubbed out and the whole root ball removed.

Areas outside proposed-building footprint limits, planned for asphalt and/or concrete pavement, should be over-excavated to a minimum depth of 24-inches below existing or finish grade, or 18-inches below proposed pavement sections; whichever is deeper.

Resulting removal excavation bottom-surfaces should be observed by Leighton Consulting, Inc., prior to placement of any backfill or new construction. **It is essential that all existing fill soils be excavated from the proposed building footprints, regardless of depth.** After these over-excavations are completed, and prior to fill placement, exposed surfaces should be scarified to a minimum depth of 6 inches, moisture-conditioned to or slightly above optimum moisture content, and recompacted to a minimum 90 percent relative compaction as determined by ASTM D 1557 standard test method (modified Proctor compaction curve).

3.3.4 **Reuse of Concrete and Asphalt in Fill:** Pulverized demolition concrete free of rebar and other materials and demolished asphalt pavement can be pulverized to particles no-larger-than (≤) 3-inches, and mixed with site soils for use in compacted fill. Blended pulverized concrete and asphalt should be mixed with at least 25% soils by weight. Such materials must be free of and segregated from any hazardous materials and/or organic material of any kind.

3.3.5 **Fill Placement and Compaction:** Onsite soils **free of** organics, debris and oversized material (greater-than 3-inches in largest dimension) are suitable for use as compacted structural fill. However, any soil to be placed as fill, whether onsite or imported material, should be first viewed by Leighton Consulting, Inc., and then tested if and as necessary, prior to approval for use as compacted fill. All structural fill must be free of hazardous materials.

All fill soil should be placed in thin, loose lifts, moisture-conditioned, as necessary, to within 3 percent above optimum moisture content, and compacted to a minimum **90% relative compaction** as determined by ASTM D 1557 standard test method (modified Proctor compaction curve) within the building footprint. Aggregate base for pavement sections should be compacted to a minimum of 95% relative compaction.

3.3.6 Pipeline Backfilling: Pipeline trenches should be backfilled with compacted fill in accordance with this report, and applicable *Standard Specifications for Public Works Construction* (Greenbook), 2015 Edition standards. Backfill in and above the pipe zone should be as follows:

- **Pipe Zone**: Pipe bedding zone should be backfilled with Controlled Low Strength Material (CLSM) consisting of at least one sack of Portland cement per cubic-yard of sand, conforming to Section 201-6 of the 2015 Edition of the *Standard Specifications for Public Works Construction* (Greenbook). Imported clean/uniform sand with a Sand Equivalent (SE) greater-than-or-equal-to (≥) 30 can also be used in the pipe zone. CLSM or uniform sand bedding should be placed to 1-foot (0.3 m) over the top of the conduit, and vibrated. CLSM should **not** be jetted but sand should be flooded and jetted.

- **Over Pipe Zone**: Above the pipe zone, trenches can be backfilled with excavated on-site soils free of debris, organic and oversized material greater-than (>) 3-inches in largest dimension. As an option, the whole trench can be backfilled with one-sack CLSM same as presented above for the pipe bedding zone. Oversized rock (cobbles and/or boulders) should either be removed from any backfill, or pulverized for use in backfill only above the pipe zone. Gravel larger than ¾-inch in diameter should be mixed with at least 80-percent soil by weight passing the No. 4 sieve. Native soil backfill over the pipe-bedding zone should be placed in thin lifts, moisture conditioned, as necessary, and mechanically compacted using a minimum standard of 90% relative compaction (relative to the laboratory modified Proctor maximum **dry** density), relative to the ASTM D 1557 laboratory maximum dry density within the building footprint and hardscape areas, or 85% under landscape areas. Backfill above the pipe zone should **not** be flooded or jetted. In any case, backfill above the pipe zone (bedding) should be observed and tested by Leighton Consulting, Inc.

3.4 Infiltration Basin Design

Three small-scale infiltration tests were performed to estimate infiltration rate of onsite soils within the upper 5 feet of site alluvium. Based on our infiltration test results presented in Appendix A, for design purposes, we recommend a small-

scale infiltration rate of 0.05-inches-per-hour (very poor infiltration), based on results ranging from negligible infiltration to 0.09-inches-per-hour. We recommend that a correction factor/safety factor be applied to the infiltration rate in conformance with Riverside County guidelines, since monitoring of actual facility performance has shown that actual infiltration rates are lower than measured in small-scale tests. Infiltration basins are subject to siltation, which can result in reduced infiltration rates. This small-scale infiltration rate should be divided by a design factor of at least 2 for buried chambers and at least 3 for open basins; although the design/safety factor may be higher based on project-specific aspects. It should be noted that during periods of prolonged precipitation, underlying soils tend to become saturated to greater depths/extent. Therefore, infiltration rates tend to decrease with prolonged rainfall.

Some design considerations are presented in the following paragraphs:

- **Adjacent Structure Impact**: As infiltrating water can seep within soil strata partially-horizontally, it is important to consider impact that infiltration facilities can play on nearby subterranean structures, such as basement walls or open excavations, whether onsite or offsite, and whether existing or planned. Any such nearby features should be identified and evaluated as to whether infiltrating water can impact these facilities. Infiltration facilities should not be constructed adjacent to or under buildings. Setbacks should be discussed with Leighton Consulting, Inc. during the planning process, but a building setback of at least 25-feet horizontally is initially suggested.

- **Infiltration Basins Type and Geometry**: Further testing may be required depending on final design of infiltration facilities. Infiltration rates are anticipated to vary based on location and depth. Infiltration concepts should be discussed with Leighton Consulting, Inc. as infiltration plans are being developed. We should review all infiltration plans, including locations and depths of proposed facilities. Further testing may be required depending on infiltration facilities design details, particularly considering type, depth and location.

- **Siltation and Soil Changes**: These infiltration rates are for a clean, un-silted infiltration surface in native, sandy alluvial soil. These values may be reduced over time as silting of the basin or chamber occurs. Furthermore, if the basin or chamber bottom is allowed to be compacted by heavy equipment, this value is expected to be reduced. Infiltration of water through soil is highly dependent on such factors as grain size distribution of soil particles, gradation (uniform versus well graded), particle shape, fines content and density. Small changes in soil conditions, including density, can cause large differences in observed infiltration rates. Infiltration is not suitable in compacted fill. For

open basins and swales, vegetation within the basin bottoms and sides is expected to help reduce erosion and help maintain infiltration rates.

- **De-silting Weir/Facilities**: Periodic flow of water carrying sediments into the basin or chamber, plus deposition of fine wind-blown sediments and sediments from erosion of basin side walls, will eventually cause the basin bottom or chamber to accumulate a layer of silt, which has the potential to significantly reducing the overall infiltration rate of the basin or chamber. Therefore, we recommend that significant amounts of silt/sediment not be allowed to flow into the facility within stormwater, especially during construction of the project and prior to achieving a mature landscape onsite. We recommend that an easily maintained, robust silt/sediment removal system be installed to pretreat storm water before it enters the infiltration facility. Infiltration facilities should be constructed with spillways or other appropriate means that would prevent overfilling that could damage the facility or adjacent improvements.

- **Drainage/Infiltration Time Cycle**: In general, the rate of infiltration reduces as the head of water in the infiltration facility reduces, and it also reduces with prolonged periods of infiltration. As such, water typically infiltrates much faster near the beginning of and/or immediately after storm events than at times well after a storm when the water level in the facility has receded, since the infiltration rate is then slower due to both lower head and longer overall duration of infiltration. In open basins with compacted or silty bottoms, this could be problematic, in that even if the basin had already infiltrated significant amounts of storm water, the lower several inches or feet of water could remain in the basin for an extended period of time, creating prolonged open-water safety concern (such as potential for mosquitos and waterborne diseases, algae odor, etc.). In a buried/cover infiltration chamber, these conditions would be of less concern.

- **Design Contingencies and Optimizations**: Estimating infiltration rates, especially based on small-scale testing, is inexact and indefinite, and often involves known and unknown soil complexities, potentially resulting in a condition where actual infiltration rates of the completed facility are significantly less than the design rates. In open basins, this could create nuisance water in the basin. As such, enhancements may be needed after completion of the basin if prolonged or frequent standing water persists. A potential basin enhancement, if needed, might be to install infiltration trenches or borings in the basin bottom to capture and infiltrate low flows and to help speed infiltration during/after storms; specific recommendations, such as minimum trench/boring depth, would be developed based on conditions observed. Such a contingency should be anticipated for open basins.

- **Maintenance**: Infiltration facilities should be routinely monitored, especially before and during the rainy season, and corrective measures should be implemented if and as needed. Things to check for include removal of trash or dumping, proper infiltration, absence of accumulated silt, and that de-silting filters/features are clean and functioning. Pretreatment desilting features should be cleaned and maintained as recommended by the manufacturer or designer. Even with measures to prevent silt from flowing into the infiltration facility, accumulated silt may need to be removed.

3.5 Seismic Design Parameters

To accommodate effects of ground shaking produced by regional seismic events, seismic design can, at the discretion of the designing Structural Engineer, be performed in accordance with the 2016 Edition of the California Building Code (CBC). Table 2 (below), lists seismic design parameters based on the 2016 CBC methodology:

Table 4. 2016 CBC Site-Specific Seismic Parameters

2016 CBC Site-Specific Seismic Design Parameters	Value
Site Longitude (decimal degrees) West	-117.216
Site Latitude (decimal degrees) North	33.9184
Site Class Definition (2016 CBC 1613A.3.2 and ASCE 7-10)	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s (Figure 1613.3.1(1))	1.649
Mapped Spectral Response Acceleration at 1s Period, S_1 (Figure 1613.3.1(2))	**0.718**
Short Period Site Coefficient at 0.2s Period, F_a (Table 1613A.3.3(1))	1.0
Long Period Site Coefficient at 1s Period, F_v (Table 1613A.3.3(2))	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS} (Eq. 16A-37)	1.649
Adjusted Spectral Response Acceleration at 1s Period, S_{M1} (Eq. 16A-38)	1.076
Design Spectral Response Acceleration at 0.2s Period, S_{DS} (Eq. 16A-39)	1.100
Design Spectral Response Acceleration at 1s Period, S_{D1} (Eq. 16A-40)	0.718
Seismic Design Category (1613A.3.5, S_1>0.75, Risk Category III)	**D**
Long Period (T_L, seconds)	8

3.6 Foundations

Based on our preliminary exploration and our experience in the region, conventional shallow spread footings/mats may be used to support the proposed one- to two-story buildings. Anticipated foundation loads were not available during preparation of this report. We assumed maximum column dead loads up to (≤) 100 kips and wall loads of 3 kips-per-lineal-foot for our preliminary foundation recommendations. Overexcavation and recompaction of footing subgrade soils should be performed as detailed in Section 3.3 of this report. Specific spread footing recommendations are presented below:

3.6.1 Minimum Embedment and Width: Based on our preliminary exploration, footings for this proposed building should have a minimum embedment of 18-inches below lowest adjacent exterior grade or interior finished grade; whichever is deeper/lower. Minimum footings widths should be at least 24-inches for isolated rectangular column footings or 12-inches for continuous bearing wall (strip) footings.

3.6.2 Allowable Bearing Capacity: A net allowable bearing capacity of 2,500 pounds-per-square-foot (psf) may be used for design of continuous wall footings or 3,000 pounds-per-square-foot (psf) may be used for design of isolated rectangular column footings. These values are based on the minimum embedment depth and width recommended in Section 3.6.1, above, and are governed by properly compacted fill settlement. These allowable bearing values may be increased by 300 psf per foot increase in embedment-depth and/or width to a maximum allowable bearing pressure of 4,000 psf, and are for total dead load and sustained live loads, which can be increased by one-third when considering short-duration wind or seismic loads. Footing reinforcement should be designed by the project Structural Engineer.

3.6.3 Lateral Load Resistance: Soil resistance available to withstand lateral loads on a shallow foundation is a function of the frictional resistance along the base of the footing and the passive resistance that may develop as the face of the structure tends to move into the soil. The frictional resistance between the base of the foundation and the subgrade soil may be computed using a coefficient of friction of 0.33. The passive resistance may be computed using an equivalent fluid pressure of 300 pounds-per-cubic-foot (pcf), assuming there is constant contact between the footing and undisturbed soil. These friction and passive values have already been reduced by a factor-of-safety of 1.5, and can be increased by one-third when considering short-duration wind or seismic loads. For spread footings and slabs-on-grade bearing on properly compacted fill over undisturbed native soils, full friction and passive resistance can be combined to resist lateral loads; although some lateral displacement is required to mobilize full passive resistance.

3.6.4 Uplift Load Resistance: If required to resist seismic uplift loads, properly compacted backfill soils over spread footings can be used, modeled with both dead weight and soil shear strength resisting short term dynamic uplift forces. Properly compacted backfill soils may be assumed to have a moist unit weight of 120 pounds-per-cubic-foot (pcf). A friction angle of 30° can be used to model properly compacted backfill soil's shear strengths. A factor-of-safety has not been applied to these values.

3.6.5 Settlement Estimates: The above recommended allowable bearing capacity is generally based on a total allowable, post-construction total settlement of 1 inch, for column loads and wall loads not exceeding 200 kips and 3 kips-per-

foot, respectively, for dead plus sustained live loads. Differential settlement due to static loading is generally estimated at ½ inch over a horizontal distance of 30 feet. Once developed by the Structural Engineer, we can review total dead and sustained live loads for each column including plan location and span distance, to evaluate if differential settlements between dissimilarly loaded columns will be tolerable. Excessive differential settlement can be mitigated with the use of reduced bearing pressures, deeper footing embedment, possibly changing overexcavation schemes and using imported base material under spread footings, or possibly other methods. Assuming all existing fill soils are properly recompacted below these buildings, dynamic differential settlement in dense sands is expected to be negligible.

3.7 Concrete Slab-On-Grade

Concrete slabs-on-grade should be designed by the structural engineer in accordance with 2016 CBC requirements. More stringent requirements may be required by the structural engineer and/or architect; however, slabs-on-grade should have the following minimum recommended components:

- **Subgrade:** Slab-on-grade subgrade soil should be moisture conditioned to or within 3% over optimum moisture content, to a minimum depth of 24 inches within building footprints, and compacted to 90% of the modified Proctor (ASTM D 1557) laboratory maximum density prior to placing either a moisture barrier, steel and/or concrete.

- **Moisture Barrier:** A moisture barrier consisting of at least 15-mil-thick Stego-wrap vapor barriers (see: http://www.stegoindustries.com/products/stego_wrap_vapor_barrier.php), or equivalent, should then be placed below slabs where moisture-sensitive floor coverings or equipment will be placed.

- **Reinforced Concrete**: A conventionally reinforced concrete slab-on-grade with a thickness of at least 4-inches should be placed in pedestrian areas without heavy loads. Reinforcing steel should be designed by the structural engineer, but as a minimum should be No. 4 rebar placed at 24-inches on-center, each direction (perpendicularly), mid-depth in the slab. A modulus of subgrade reaction (k) as a linear spring constant, of 150 pounds-per-square-inch per inch deflection (pci) can be used for design of heavily loaded slabs-on-grade, assuming a linear response up to deflections on the order of ¾-inch.

- **Slab-On-Grade Control Joints**: Slab-on-grade crack control joint locations and spacing should be designed by the project Structural Engineer (SE). However, consideration should be given to potential for differential-vertical-offset at control joints, due to structure settlement. Where possible, slabs-on-grade should be allowed to "float" on the subgrade to allow for differential vertical movement. Interior full-depth joints at wall and column interfaces are

recommended to allow the slab-on-grade to "float" unrestrained by vertical structural components. However, doweling is recommended at other joints in open areas of rooms to avoid trip hazards.

Minor cracking of concrete after curing due to drying and shrinkage is normal and should be expected. However, cracking is often aggravated by a high water-to-cement ratio, high concrete temperature at the time of placement, small nominal aggregate size, and rapid moisture loss due to hot, dry, and/or windy weather conditions during placement and curing. Cracking due to temperature and moisture fluctuations can also be expected. The use of low-slump concrete or low water/cement ratios can reduce the potential for shrinkage cracking.

3.8 Sulfate Attack and Ferrous Corrosion Protection

3.8.1 Sulfate Exposure: Sulfate ions in the soil can lower the soil resistivity and can be highly aggressive to Portland cement concrete by combining chemically with certain constituents of the concrete, principally tricalcium aluminate. This reaction is accompanied by expansion and eventual disruption of the concrete matrix. A potentially high sulfate content could also cause corrosion of reinforcing steel in concrete. Section 1904A of the 2016 California Building Code (CBC) defers to the American Concrete Institute's (ACI's) ACI 318-14 for concrete durability requirements. Table 19.3.1.1 of ACI 318-14 lists "*Exposure categories and classes*," including sulfate exposure as follows:

Table 5. Sulfate Concentration and Exposure

Soluble Sulfate in Water (parts-per-million)	Water-Soluble Sulfate (SO_4) in soil (percentage by weight)	ACI 318-14 Sulfate Class
0-150	0.00 - 0.10	S0 (negligible)
150-1,500	0.10 - 0.20	S1 (moderate*)
1,500-10,000	0.20 - 2.00	S2 (severe)
>10,000	>2.00	S3 (very severe)

*or seawater

3.8.2 Ferrous Corrosivity: Many factors can modify corrosion potential of soil including soil moisture content, resistivity, permeability and pH, as well as chloride and sulfate concentration. In general, soil resistivity, which is a measure of how easily electrical current flows through soils, is the most influential factor. Based on the findings of studies presented in ASTM STP 1013 titled "*Effects of Soil Characteristics on Corrosion*" (February 1989), the approximate relationship between soil resistivity and soil corrosiveness was developed as follows:

Table 6. Soil Resistivity and Soil Corrosivity

Soil Resistivity (ohm-cm)	Classification of Soil Corrosiveness
0 to 900	Very Severely Corrosive
900 to 2,300	Severely Corrosive
2,300 to 5,000	Moderately Corrosive
5,000 to 10,000	Mildly Corrosive
10,000 to >100,000	Very Mildly Corrosive

Acidity is an important factor of soil corrosivity. The lower the pH (the more acidic the environment), the higher the soil corrosivity will be with respect to buried metallic structures and utilities. As soil pH increases above 7 (the neutral value), the soil is increasingly more alkaline and less corrosive to buried steel structures, due to protective surface films, which form on steel in high pH environments. A pH between 5 and 8.5 is generally considered relatively passive from a corrosion standpoint. Chloride and sulfate ion concentrations, and pH appear to play secondary roles in modifying corrosion potential. High chloride levels tend to reduce soil resistivity and break down otherwise protective surface deposits, which can result in corrosion of buried steel or reinforced concrete structures.

3.8.3 **Corrosivity Test Results:** To evaluate corrosion potential of soils sampled from this site, we tested a bulk soil sample for soluble sulfate content, soluble chloride content, pH and resistivity. Results of these tests are summarized below:

Table 7. Results of Corrosivity Testing

Boring Number	Sample Depth (feet)	Sulfate (mg/kg)	Chloride (mg/kg)	pH	Minimum Resistivity (ohm-cm)
LB-4	0 to 5	**125**	**20**	7.7	**2,100**
LB-6	0 to 5	**141**	**43**	7.6	3,160

Note: mg/kg = milligrams per kilogram, or parts-per-million (ppm)

These results are discussed as follows:

- **Sulfate Exposure**: Based on our previous experience and Table 19.3.1.1 of ACI 318-14, in our opinion, sulfate exposure should be considered "**negligible**" with an **Exposure Class S0** for native silty sands sampled at the site. Based on Table 19.3.2.1 of ACI 318-14, for this **Exposure Category S0**, there would be **no restrictions** on cement type ("cementitious material") nor water/cement ratio, and an f_c' (28-day compressive strength) of at least 2,500 pounds-per-square-inch (psi) is required at a minimum for structural concrete.

- **Ferrous Corrosivity**: As shown above, minimum soil resistivity of 2,100 ohm-centimeters was measured in one of our laboratory tests. In our opinion, based on resistivity correlation presented in Table 6, it appears for tested site soils that corrosion potential to buried steel may be characterized as "**severely corrosive**" at the site. Ferrous pipe buried in moist to wet site earth materials should be avoided by using high-density polyethylene (HDPE) or other non-ferrous pipe when possible. Or ferrous pipe can be protected by polyethylene bags, tap or coatings, di-electric fittings or other means to separate the pipe from on-site earth materials.

3.9 Pavement Section Design

Based on design procedures outlined in the current Caltrans *Highway Design Manual* and a design R-value of 29 for clayey sands, preliminary flexible pavement sections were calculated for the Traffic Indices (TIs) tabulated, and are listed below:

Table 8. Hot Mixed Asphalt (HMA) Pavement Sections

Assumed Traffic Index	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
4.0 (automobile parking)	3	4
5.0 (driveways and truck traffic)	3	6
6.0 (roadways and heavy truck traffic)	3½	8
7.0 (roadways and heavy truck traffic)	4	10
8.0 (roadways and heavy truck traffic)	5	11
9.0 (roadways and heavy truck traffic)	5½	13
10.0 (very heavy truck traffic)	6½	15

For fire truck (60,000-pound "apparatus") lanes, asphalt pavements designed for a TI=6.0 are recommended. However, note that undistributed apparatus outrigger loads could cause local asphalt pavement punching damage. When possible, outrigger loads should be distributed over asphalt pavements with planks and plywood. Otherwise, areas where outrigger loads are anticipated could be paved with 8-inch-thick concrete as described below.

Portland cement concrete pavement sections were calculated in accordance with procedures developed by the Portland Cement Association. Concrete paving sections for three Traffic Indices (TIs) are presented below:

Table 9. Portland Cement Concrete Pavement Sections

Assumed Traffic Index	PC Concrete (inches)	Base Course (inches)
4.0 (automobile parking)	7	4
5.0 (driveways and truck traffic)	8	
6.0 (roadways and heavy truck traffic)	9	

We have assumed that this Portland cement concrete will have a compressive strength of at least 3,000 pounds-per-square-inch (psi). Prior to placement of aggregate base, subgrade soils should be scarified to a minimum depth of 8-inches, moisture-conditioned, as necessary, and recompacted to a minimum of 90 percent relative compaction, determined in accordance with ASTM D 1557 modified Proctor laboratory maximum density. Aggregate base should be placed in thin lifts; moisture conditioned, as necessary, and compacted to a minimum of 95 percent relative compaction. Field observation and periodic testing, as needed during placement of base course materials, should be undertaken to ensure that requirements of Caltrans' *Standard Specifications* (2015) and Special Provisions are fulfilled. Consideration should be given to reinforce concrete pavements where large outrigger point loads are anticipated.

Adequate drainage (both surface and subsurface) should be provided such that the subgrade soils and aggregate base materials are not allowed to become wet. All pavement construction should be performed in accordance with the Caltrans *Standard Specifications* (2015). Recommended structural pavement materials should conform to the specified provisions in the Caltrans *Standard Specifications* (2015) including grading and quality requirements, shown below:

- **Asphalt Concrete (Hot Mixed Asphalt)** for pavement should be Type A and should conform to Section 39 of the *Standard Specifications*. Asphalt concrete specimens should be tested for surface abrasion in accordance with CT-360.
- **Portland Cement Concrete (PCC)** pavement should conform to Section 40 of the *Standard Specifications*. PCC pavement materials (pavement, structures, minor concrete) should conform to Section 90 of the *Standard Specifications*.
- **Class II Aggregate Base (AB)** should conform to Section 26 of the *Standard Specifications*.

Traffic Indices (TIs) used in our pavement design are considered reasonable values for typical parking lot areas, and should provide a pavement life of

approximately 20 years with a normal amount of flexible pavement maintenance. Irrigation adjacent to pavements, without a deep curb or other cutoff to separate landscaping from the paving, may result in premature pavement failure. Traffic parameters used for design were selected based on engineering judgment and not on information furnished to us such as an equivalent wheel-load analysis or a traffic study.

4.0 CONSTRUCTION CONSIDERATIONS

4.1 Wet Clays

During wet months, site clays can be over optimum moisture content if not saturated right after heavy rain; and therefore, can be more difficult to properly compact to specified density. Disking, blending, cement and/or lime treatment may be considered by the earthwork contractor to facilitate compaction. However, additional sulfate testing will be required prior to treating/mixing soils with lime, to avoid an adverse sulfate heave reaction. Lime and/or cement treatment also require specialized equipment to blend plastic clay thoroughly with cement or lime, to be effective. Depending on the time of year and rainfall, pavement subgrades may also need to be stabilized with crushed rock and/or geogrids, to facilitate pavement subgrade and base compaction. Choice of means and methods to mitigate wet clay compaction difficulty will be at the discretion of the contractor based on weather at the time of earthwork, available materials and equipment, among other considerations specific to the contractor. However, any proposed cement and/or lime treatment must be reviewed and approved by Leighton Consulting, Inc. and the property owner prior to implementation.

4.2 Trench Excavations

Based on our field observations, caving of cohesionless and loose fill soils will likely be encountered in unshored trench excavations. To protect workers entering excavations, excavations should be performed in accordance with OSHA and Cal-OSHA requirements, and the current edition of the California Construction Safety Orders, see:

http://www.dir.ca.gov/title8/sb4a6.html

Contractors should be advised that sand and fill soils should be considered Type C soils as defined in the California Construction Safety Orders. As indicated in Table B-1 of Article 6, Section 1541.1, Appendix B, of the California Construction Safety Orders, excavations less-than (<) 20 feet deep within Type C soils should

be sloped back no steeper than 1½:1 (horizontal:vertical), where workers are to enter the excavation. This may be impractical near adjacent existing utilities and structures; so shoring may be required depending on trench locations. Stiff undisturbed native clays will stand steeper.

During construction, soil conditions should be regularly evaluated to verify that conditions are as anticipated. The contractor is responsible for providing the "competent person" required by OSHA standards to evaluate soil conditions. Close coordination between the competent person and Leighton Consulting, Inc. should be maintained to facilitate construction while providing safe excavations.

4.3 Temporary Shoring

Temporary cantilever shoring can be designed based on the active equivalent fluid pressure of 30 pounds-per-cubic-foot (pcf) in alluvium. If excavations are braced at the top and at specific depth intervals, then braced earth pressure may be approximated by a uniform rectangular soil pressure distribution. This uniform pressure expressed in pounds-per-square-foot (psf), may be assumed to be 20 multiplied by H for design, where H is equal to the depth of the excavation being shored, in feet. These recommendations are valid only for trenches not exceeding 15 feet in depth at this site.

4.4 Geotechnical Services During Construction

Our geotechnical recommendations provided in this report are based on information available at the time the report was prepared and may change as plans are developed. Additional geotechnical exploration, testing and/or analysis may be required based on final plans. Leighton Consulting, Inc. should review site grading, foundation and shoring (if any) plans when available, to comment further on geotechnical aspects of this project and check to see general conformance of final project plans to recommendations presented in this report.

Leighton Consulting, Inc. should be retained to provide geotechnical observation and testing during excavation and all phases of earthwork. Our conclusions and recommendations should be reviewed and verified by us during construction and revised accordingly if geotechnical conditions encountered vary from our findings and interpretations. Geotechnical observation and testing should be provided:

- During all excavation,
- During compaction of all fill materials,

- After excavation of all footings and prior to placement of concrete,
- During utility trench backfilling and compaction,
- During pavement subgrade and base preparation, and/or
- If and when any unusual geotechnical conditions are encountered.

5.0 LIMITATIONS

This report was necessarily based in part upon data obtained from a limited number of observances, site visits, soil samples, tests, analyses, histories of occurrences, spaced subsurface explorations and limited information on historical events and observations. Such information is necessarily incomplete. The nature of many sites is such that differing characteristics can be experienced within small distances and under various climatic conditions. Changes in subsurface conditions can and do occur over time. This exploration was performed with the understanding that this subject site is proposed for development as described in Section 1.2 of this report. Please also refer to Appendix C, GBA's *Important Information About This Geotechnical-Engineering Report*, presenting additional information and limitations regarding geotechnical engineering studies and reports.

Until reviewed and accepted by the California Geological Survey (CGS), this report may be subject to change. Changes may be required as part of the CGS review process. Leighton Consulting, Inc. assumes no risk or liability for consequential damages that may arise due to design work progressing before this report is reviewed and accepted by CGS.

This report was prepared for T & C International Healthcare, Inc. based on their needs, directions and requirements at the time of our exploration, in accordance with generally accepted geotechnical engineering practices at this time in California for skilled nursing facilities. This report is not authorized for use by, and is not to be relied upon by, any party except T & C International Healthcare, Inc. and their design and construction management team, with whom Leighton Consulting, Inc. has contracted for this work. Use of or reliance on this report by any other party is at that party's risk. Unauthorized use of or reliance on this report constitutes an agreement to defend and indemnify Leighton Consulting, Inc. from and against any liability which may arise as a result of such use or reliance, regardless of any fault, negligence, and/or strict liability of Leighton Consulting, Inc.

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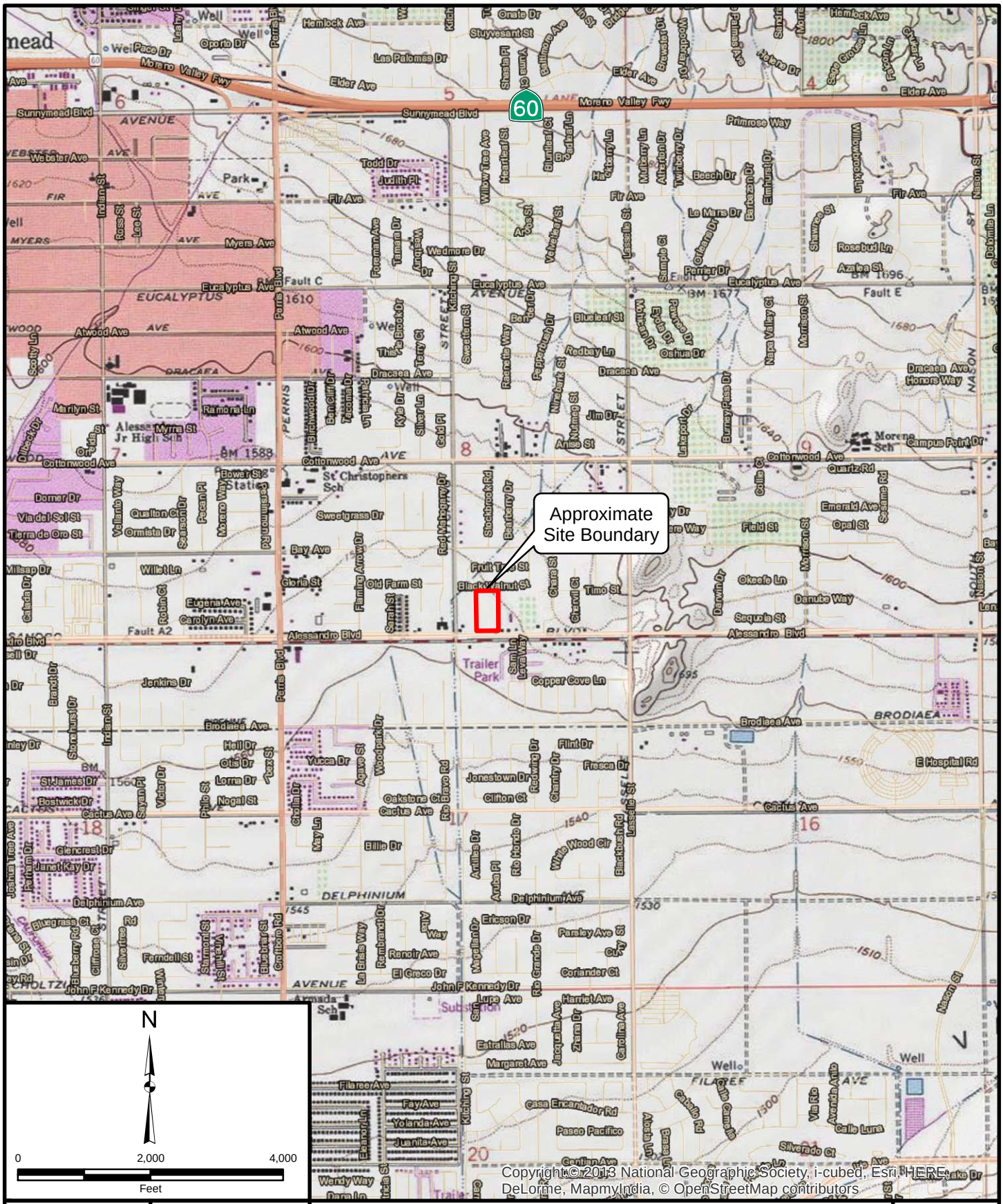

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Scale:1 " = 2,000 '	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton
Author: Leighton Geomatics (btran)

VICINITY MAP

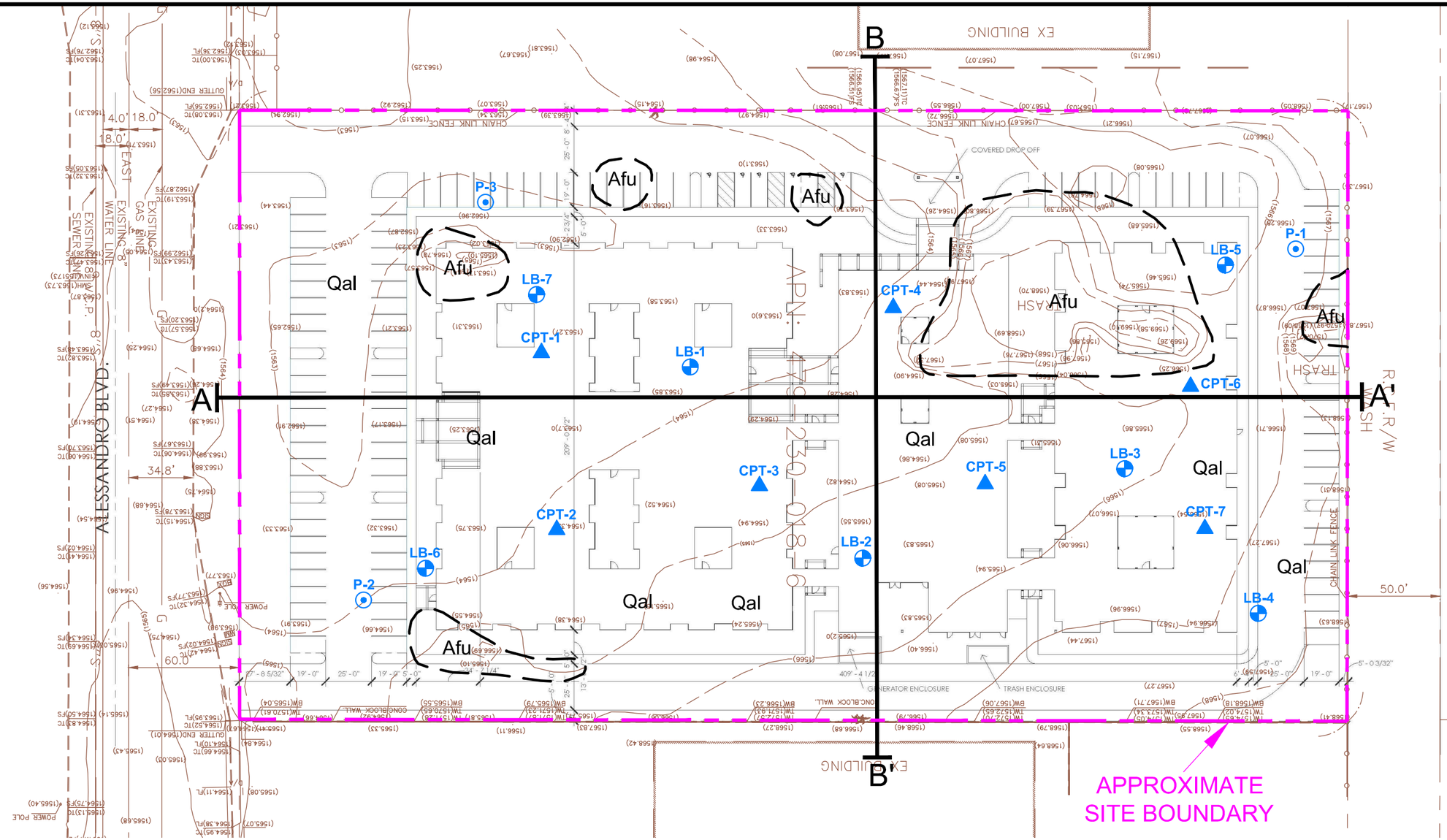
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 1

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F01_VM_2018-02-06.mxd on 2/5/2018 3:59:08 PM

Attachment: Preliminary Water Quality Management Plan (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING



LEGEND

LB-7 — Approximate Boring Location (LCI, 1/15/2018)	Afu — Artificial Fill Undocumented
CPT-7 — Approximate CPT Location (LCI, 1/22/2018)	Qal — Quaternary Alluvium
P-3 — Approximate Location of Percolation/Infiltration Test (LCI, 1/16/2018)	Approximate Geologic Contact
	B — B' Approximate Cross Section Location (See Figures 3a and 3b)

N

0 60 120

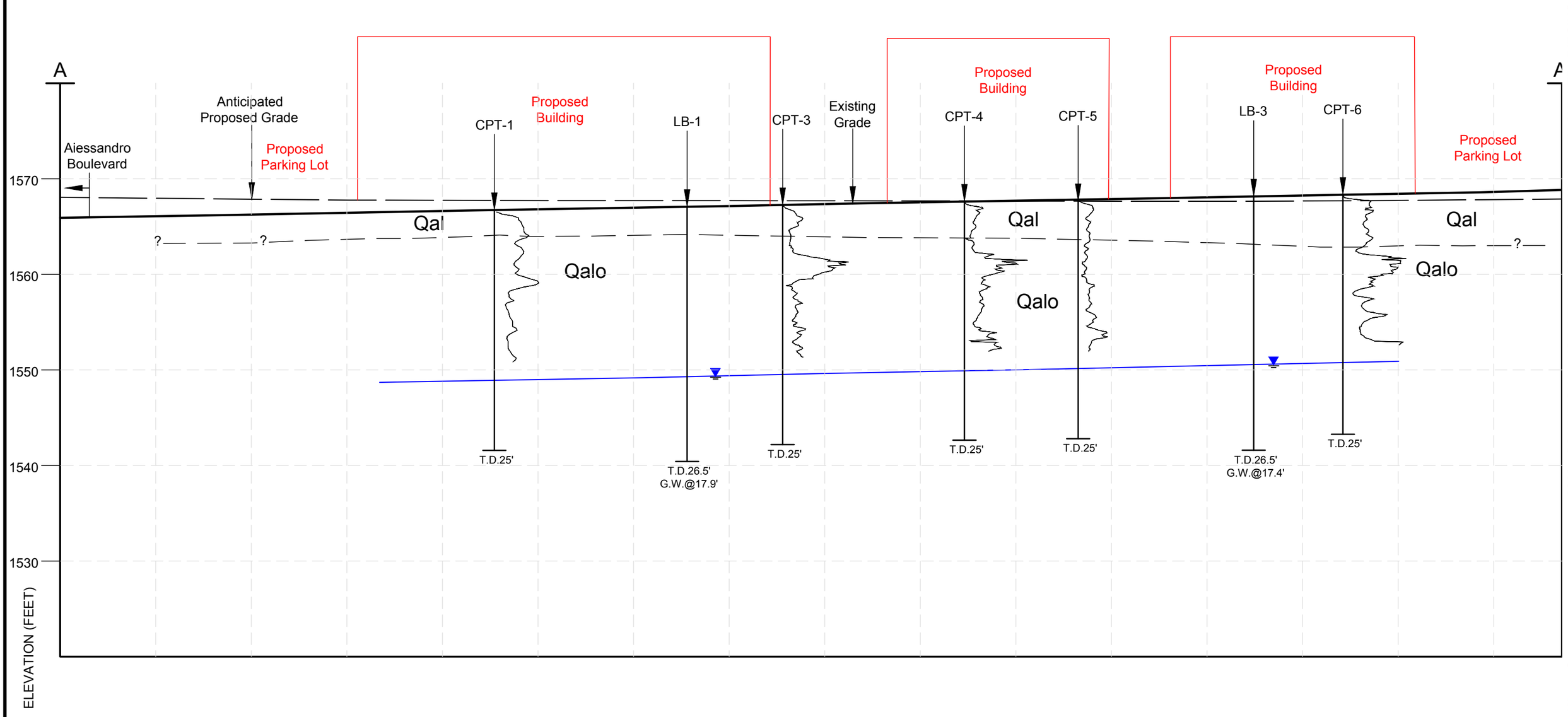
SCALE FEET

Proj: 11888.001	Eng/Geol: SIS/RFR
Scale: 1"=60'	Date: February 2018
Reference:	

EXPLORATION LOCATION MAP

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 2



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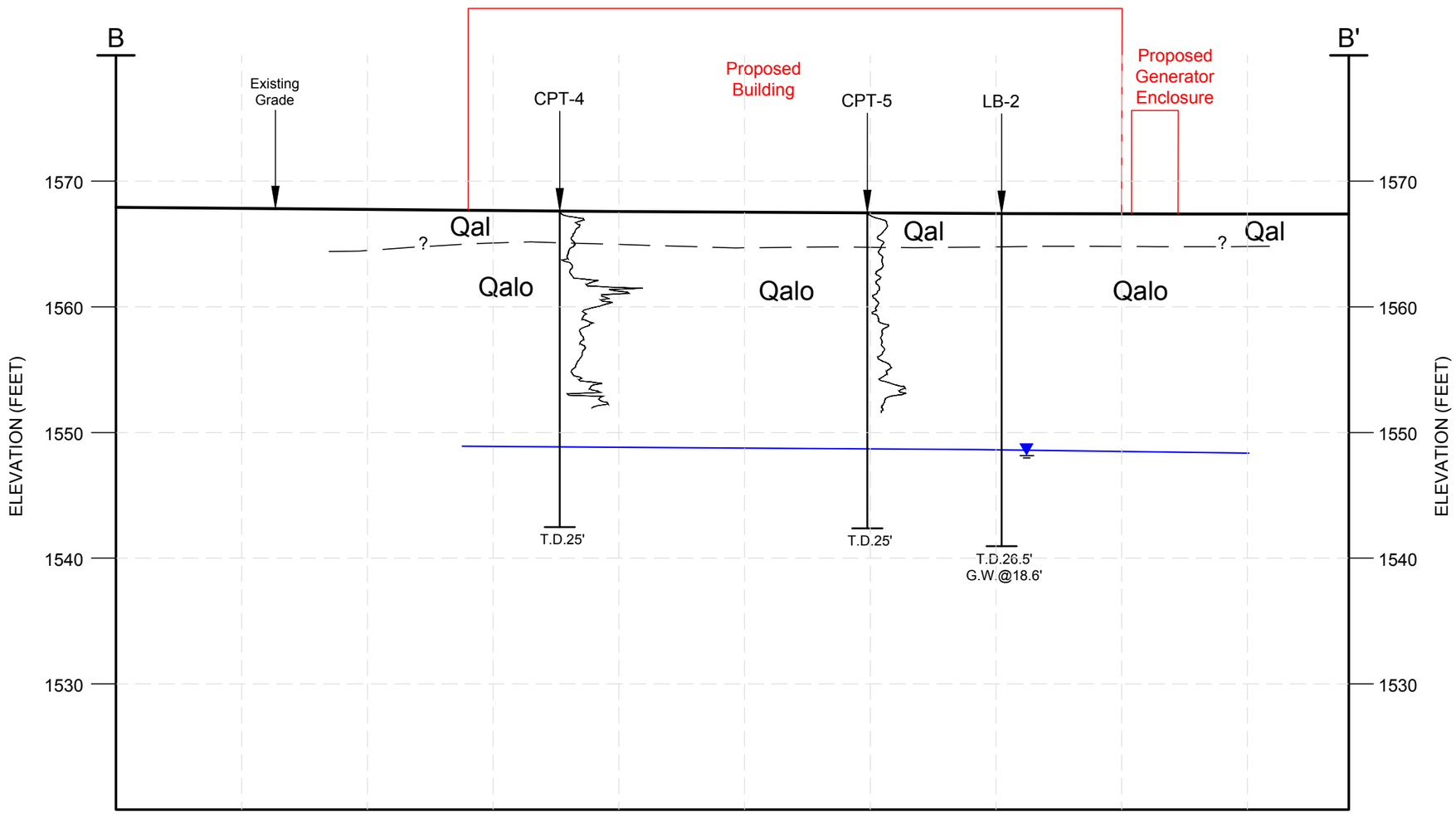
GEOTECHNICAL CROSS SECTION A-A'

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 3



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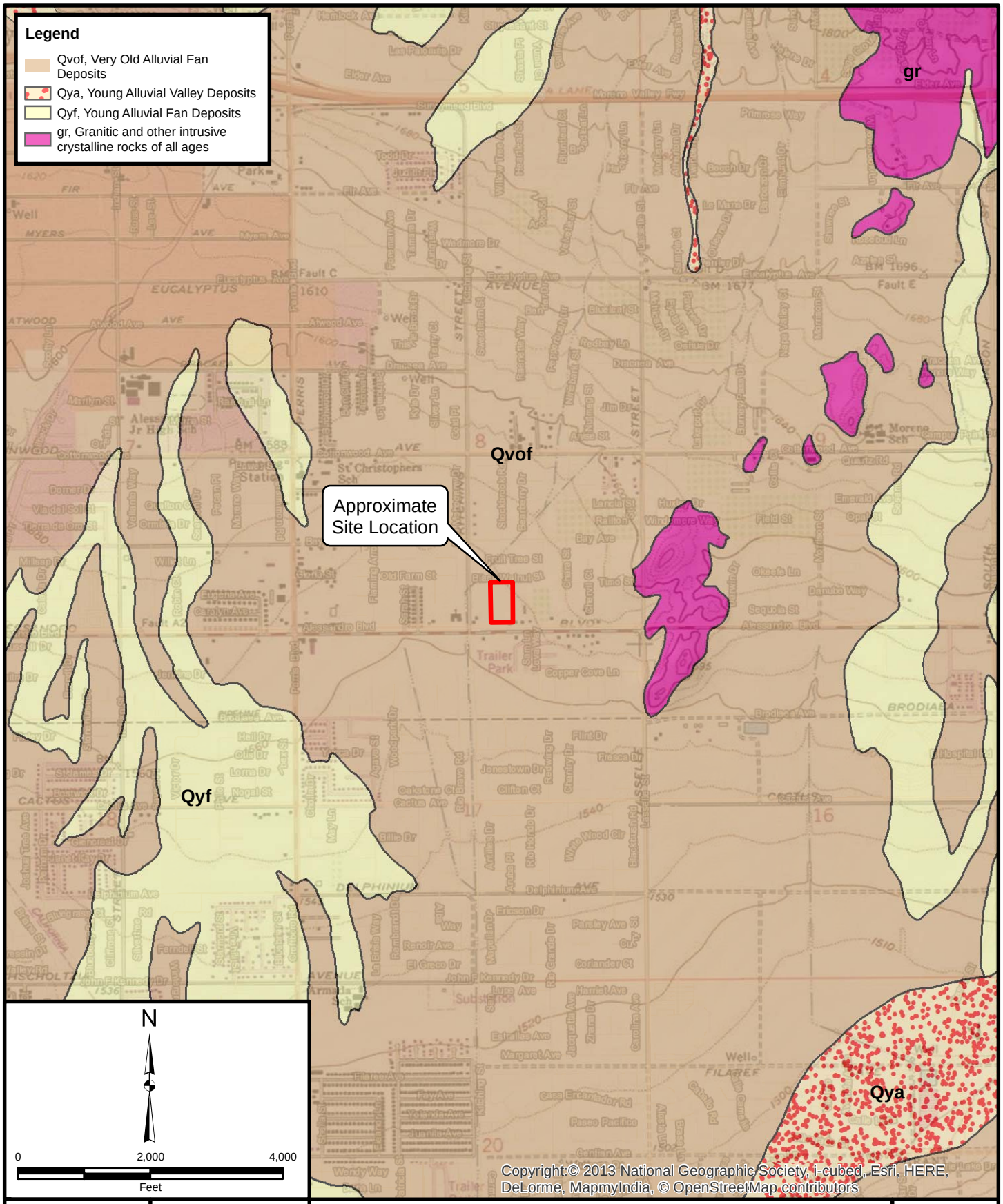
Reference:	

GEOTECHNICAL CROSS SECTION B-B'

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 3



Project: 11888.001 | Eng/Geol: SIS/RFR

Scale:1 " = 2,000 ' | Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, USGS
Author: Leighton Geomatics (btran)

REGIONAL GEOLOGY MAP

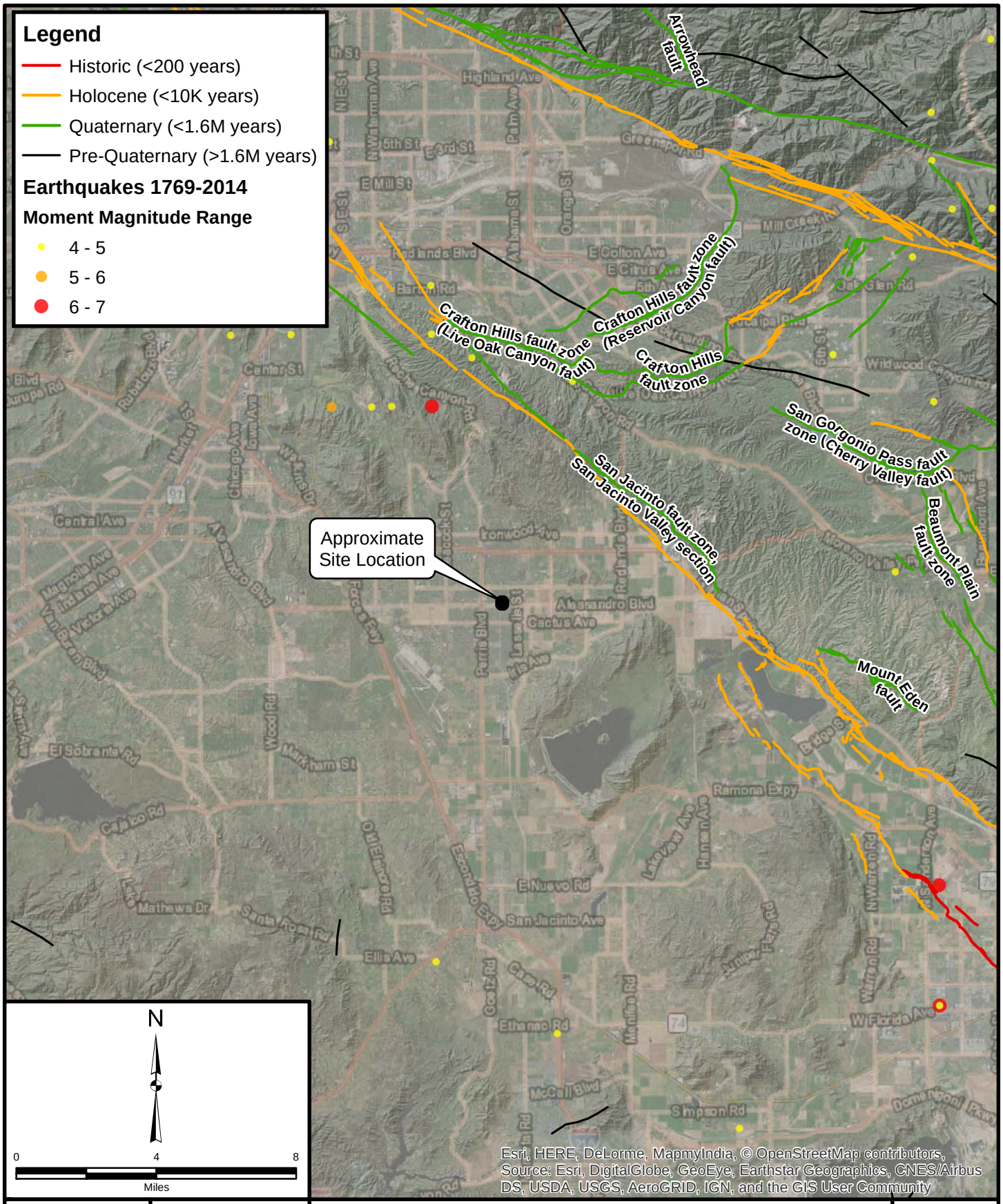
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 4

Leighton

Attachment: Preliminary Water Quality Management Plan (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F04_RGM_2018-02-06.mxd on 2/5/2018 4:00:06 PM



Project: 1188.001	Eng/Geol: SIS/RFR
Scale:1 " = 4 miles	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, CGS, Bryant 2010
Author: Leighton Geomatics (btran)

REGIONAL FAULT AND HISTORIC SEISMICITY MAP

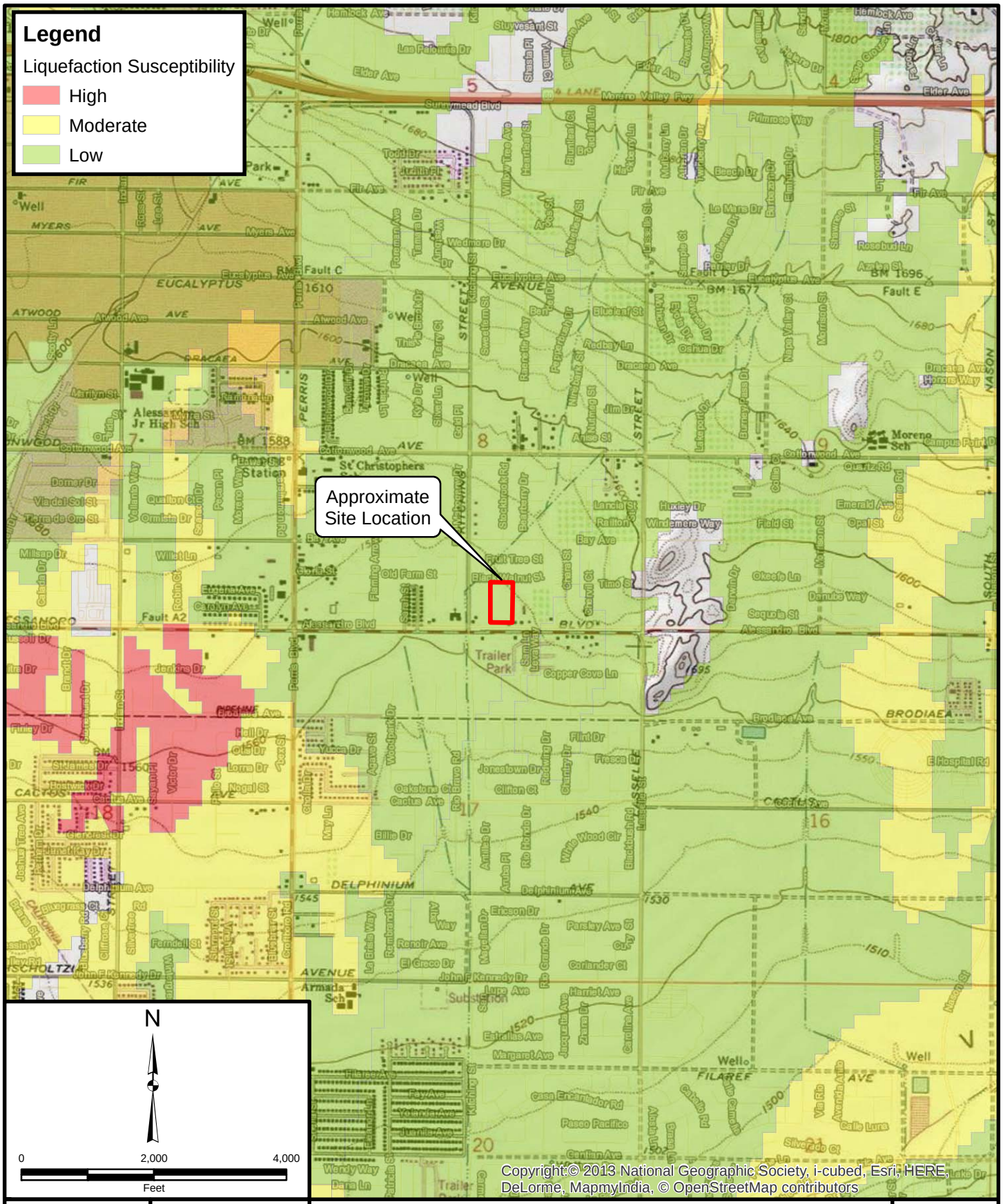
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 5

Leighton

Attachment: Preliminary Water Quality Management Plan (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F05_RF&HSM_2018-02-06.mxd on 2/5/2018 4:04:29 PM



Project: 11888.001	Eng/Geol: SIS/RFR
Scale:1 " = 2,000 '	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, CGS
Author: Leighton Geomatics (btran)

LIQUEFACTION MAP

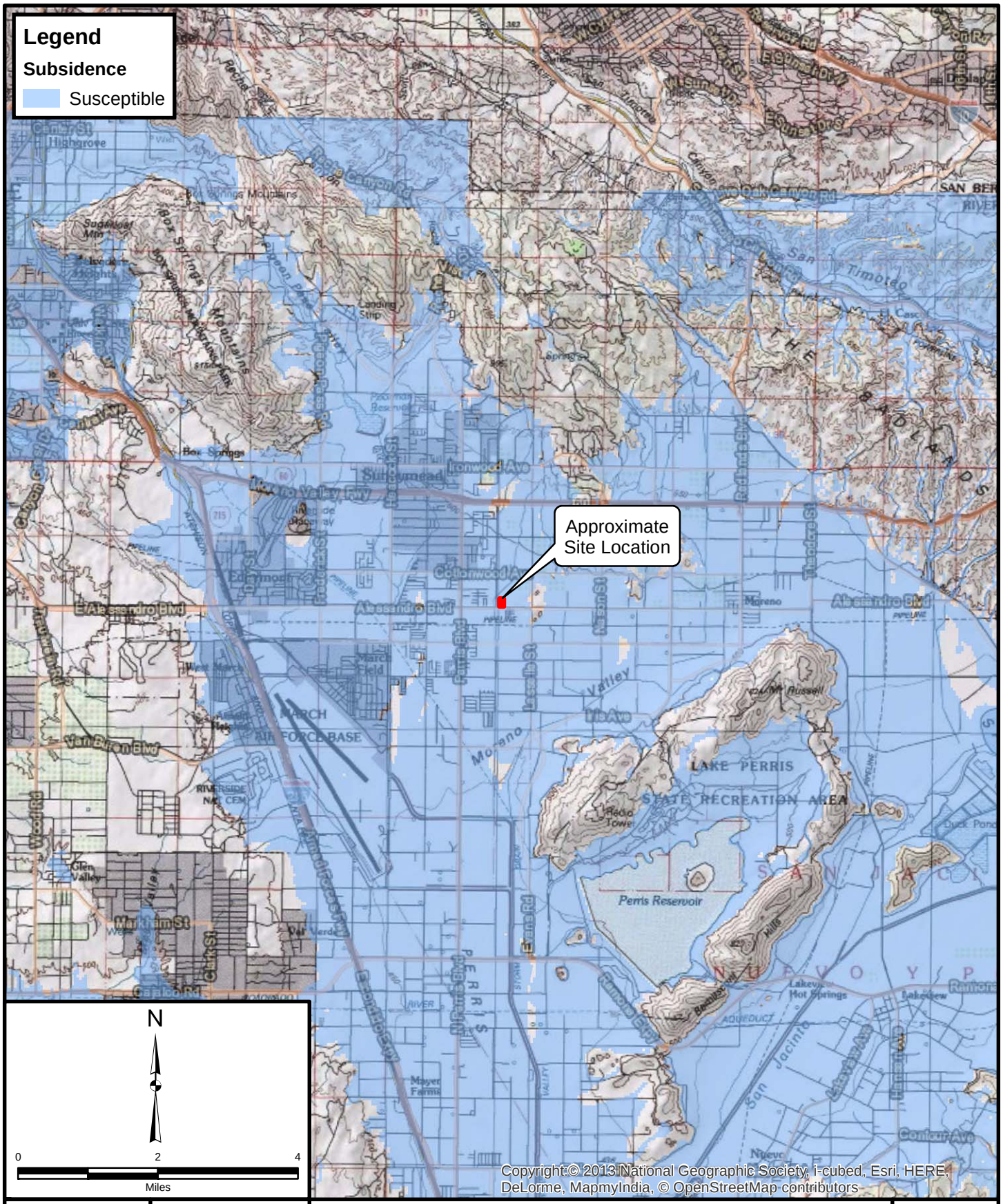
T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 6

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F06_LM_2018-02-06.mxd on 2/6/2018 3:08:29 PM

Attachment: Preliminary Water Quality Management Plan (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING



Project: 11888.001	Eng/Geol: SIS/RFR
Scale:1 " = 2 miles	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, County of Riverside
Author: Leighton Geomatics (btran)

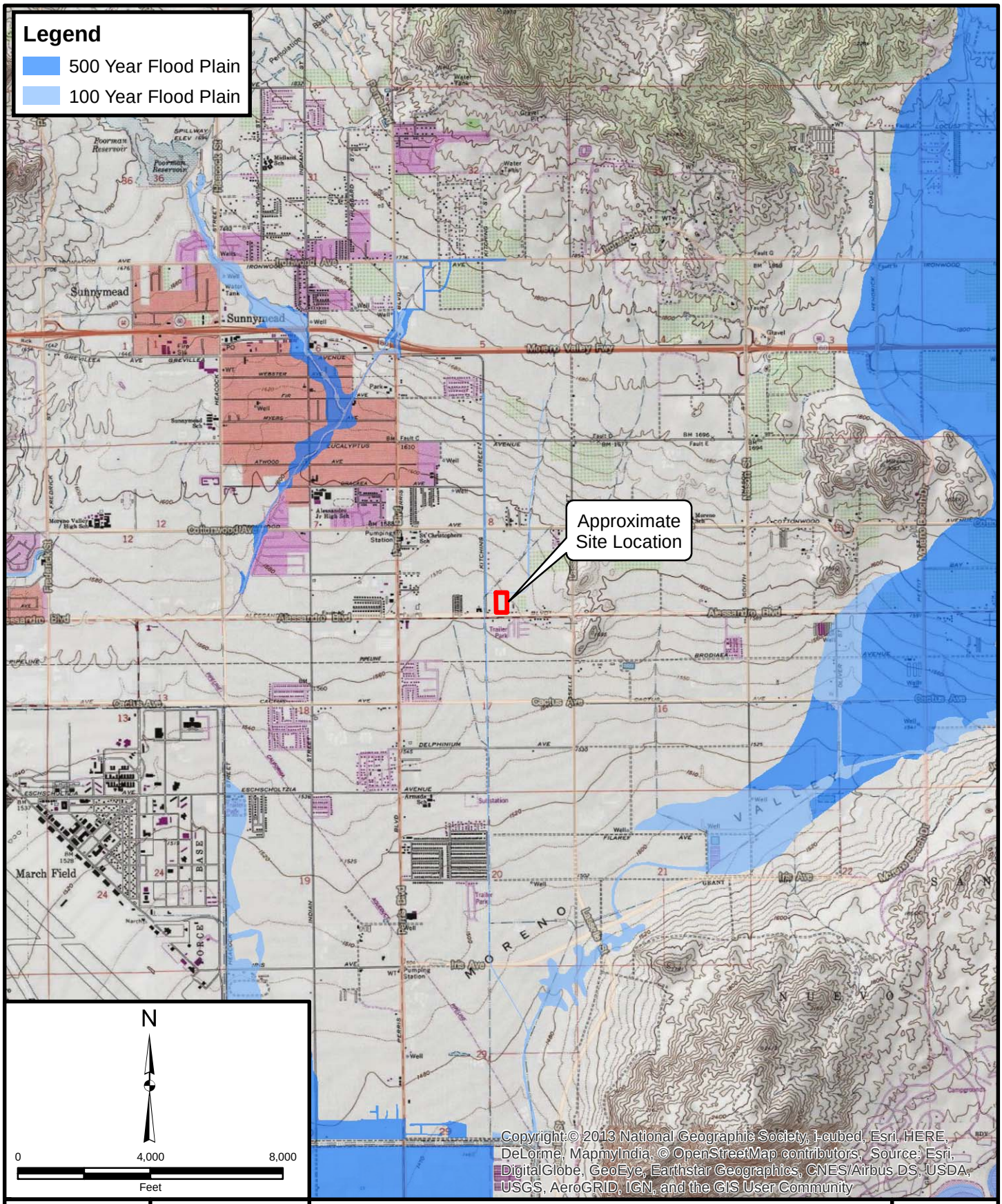
SUBSIDENCE MAP

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 7

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F07_SM_2018-02-06.mxd on 2/6/2018 3:10:36 PM



Project: 11888.001	Eng/Geol: SIS/RFR
Scale:1 " = 4,000 '	Date: February 2018

Base Map: ESRI ArcGIS Online 2018
Thematic Information: Leighton, CA DWR, FEMA
Author: Leighton Geomatics (btran)

FLOOD HAZARD ZONE MAP

T&C Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California

Figure 8

Leighton

Map Saved as V:\Drafting\11888\001\Maps\11888-001_F08_FHM_2018-02-06.mxd on 2/5/2018 4:08:54 PM

Attachment: Preliminary Water Quality Management Plan (3322 : CONDITIONAL USE PERMIT FOR MORENO VALLEY SKILLED NURSING

APPENDIX A

FIELD EXPLORATION

Our field exploration consisted of a surface reconnaissance and a subsurface exploration program consisting of ten hollow-stem-auger borings, seven Cone Penetrometer Tests and three in-situ infiltration tests. These subsurface exploration locations are plotted on Figure 2, *Exploration Location Map*, and describe in more detail below:

Firm	Date	Exploration Type	Quantity
Leighton Consulting, Inc.	January 15, 2018	Hollow-stem borings	10
	January 22, 2018	CPTs	7

Hollow-Stem Borings: On January 15, 2018 a total of ten hollow-stem-auger borings were drilled, logged and sampled to depths ranging from approximately 5 feet to 26½ feet. Encountered soils were continuously logged in the field by our representative and described in accordance with the Unified Soil Classification System (ASTM D 2488). Relatively undisturbed California ring-lined soil samples were obtained at selected intervals within the hollow-stem borings. Standard Penetration Tests (SPTs) were also driven at selected intervals within the hollow-stem auger borings. Both drive samplers were driven with a 140-pound hammer falling 30-inches. Near surface bulk soil samples were collected from these borings. Boring logs are included as part of this appendix. Our borings were backfilled immediately after drilling, logging and sampling the same day, except for Borings P-1, P-2 and P-3, where infiltration tests were performed. Boring logs and infiltration test results are included in this appendix.

Cone Penetrometer Test (CPT): On January 22, 2018, seven Cone Penetrometer Tests (CPTs) were pushed 25- to 39-feet deep (refusal) at this site in general accordance with ASTM D 3441 Standard Test Method, using a truck-mounted electric cone penetrometer operated by GREGG Drilling & Testing, Inc.. Unlike soil borings, in which drive samples are typically driven at discrete depth intervals (e.g. 5-feet), CPTs provide a continuous analog record of soil properties with depth. CPT results are presented in this appendix.

Subsurface Variations and Limitations: These attached subsurface exploration logs and related information depict subsurface conditions only at the approximate locations indicated and at the particular date designated on the logs. Subsurface conditions at other locations may differ from conditions occurring at these locations. Passage of time may result in altered subsurface conditions due to possible environmental changes. In addition, any stratification lines depicted on these logs represent an approximate boundary between soil types, but these transitions can be gradual.

GEOTECHNICAL BORING LOG LB-1

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1564'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				ML	**Quaternary Alluvium (Qal)**; SANDY SILT, brown, moist, fine to medium grained sand, MD = 131.5 @ 9.0%, EI = 30	MD, EI, SA
1560				R-1	20 35 50/5"	116	7	SM	**Older Alluvium (Qalo)**; SILTY SAND, dense, dark brown and dark reddish brown, moist, fine to coarse grained sand, few pinhole voids	
	5			R-2	15 20 30				SILTY SAND, dense, dark yellowish brown, moist, fine to medium grained sand, few pinhole voids	
1555				R-3	24 24 34			SC-SM	SILTY, CLAYEY SAND, dense, dark brown to dark reddish brown, moist, fine to medium grained sand	
	10			R-4	24 50	123	11	SM	SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1550										
	15			R-5	20 30 50				SILTY SAND, dense, dark reddish brown, moist, fine to coarse grained sand	
1545										
	20			R-6	10 20 24			SC	CLAYEY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand	
1540										
	25			R-7	20 27 45				CLAYEY SAND, dense, dark reddish brown, moist, fine to coarse grained sand	
1535									Drilled to 26.5' Sampled to 26.5' Groundwater at 18' Backfilled with Cuttings, Groundwater measured at 17.92' on 01/16/18	
	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-2

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1565'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
1565	0			B-1				SM	**Quaternary Alluvium (Qal)**; SILTY SAND, brown, moist, fine to coarse grained sand	
				R-1	12 17 17	121	5	SM	**Older Alluvium (Qalo)**; SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, few pinhole voids, CO = -4.72%	CO
1560	5			R-2	10 20 30	123	9		SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, CO = -2.38%	CO
1555	10			R-3	22 25 25			SC-SM	SILTY, CLAYEY SAND, dense, dark reddish brown, moist, fine to coarse grained sand	
1550	15			R-4	20 50/5"			SM	SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining	
1545	20			R-5	13 50				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining	
1540	25			R-6	12 20 28			SC	CLAYEY SAND, medium dense, dark reddish brown, moist to wet, fine to coarse grained sand	
1535	30								Drilled to 26.5' Sampled to 26.5' Groundwater at 19.3' Backfilled with cuttings, Groundwater measured at 18.58' on 01/16/18	

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:

B	BULK SAMPLE
C	CORE SAMPLE
G	GRAB SAMPLE
R	RING SAMPLE
S	SPLIT SPOON SAMPLE
T	TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-3

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1566'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
1565	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND, brown, moist, fine to coarse grained sand	
									SILTY SAND, reddish brown, moist, fine to medium grained sand	
1560	5			R-1 B-1	12 18 27	122	7	SM	**Older Alluvium (Qalo)**; SILTY SAND, medium dense, dark yellowish brown, moist, fine to medium grained sand, MD = 133.6 @ 8.4%	MD
				R-2	14 17 20	113	8		SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining	
1555	10			R-3	14 14 14	115	9		SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, CO = -1.63%	CO
1550	15			R-4	7 7 7	110	12	SC	CLAYEY SAND, loose, dark reddish brown, moist, fine to coarse grained sand	
1545	20			R-5	24 27 40			SM	SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining	
1540	25			R-6	50/3"				no recovery	
	30								Drilled to 25.25' Sampled to 25.25' Groundwater at 18.2' Backfilled with cuttings, Groundwater measured at 17.42' on 01/16/18	

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-4

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1567'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sandtrace gravel to 1"	CR
1565				R-1	10 9 7	107	8	SM	**Older Alluvium (Qalo)**; SILTY SAND, medim dense, dark reddish brown, moist, fine to medium grained sand, Manganese Oxide staining, CO = -5.03%	CO
	5			R-2	8 10 15	117	8		SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, CO = -7.22%	CO
1560										
	10			R-3	8 16 20			SW-SM	Well-graded SAND with SILT, medium dense, dark reddish brown, moist, fine to coarse grained sand	
1555										
	15			R-4	30 50	120	9	SM	SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1550									Drilled to 16' Sampled to 16' Groundwater not encountered Backfilled with cuttings	
	20									
1545										
	25									
1540										
	30									

SAMPLE TYPES:

B	BULK SAMPLE
C	CORE SAMPLE
G	GRAB SAMPLE
R	RING SAMPLE
S	SPLIT SPOON SAMPLE
T	TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-5

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1566'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
1565	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND, brown, moist, fine to coarse grained sand	
				R-1	18 26 28	123	5	SM	**Older Alluvium (Qalo)**; SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1560	5			R-2	22 32 34				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1555	10			R-3	50/6"				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Iron Oxide and Manganese Oxide staining	
1550	15			R-4	14 38 50	120	14		SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand, Iron Oxide and Manganese Oxide staining	
									Drilled to 16.5' Sampled to 16.5' Groundwater not encountered Backfilled with cuttings	
1545	20									
1540	25									
	30									

SAMPLE TYPES:

B	BULK SAMPLE
C	CORE SAMPLE
G	GRAB SAMPLE
R	RING SAMPLE
S	SPLIT SPOON SAMPLE
T	TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-6

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1564'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0			B-1				SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel, few concrete debris, 44% -200	-200, CR
				R-1	6 8 12	116	9	SM	**Older Alluvium (Qalo)**; SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, CO = -1.18%	
1560	5			R-2	10 14 16	123	9		SILTY SAND, medium dense, dark brown, moist, fine to medium grained sand	CO
1555	10			R-3	18 36 36	127	12		SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1550	15			R-4	20 50				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
									Drilled to 16' Sampled to 16' Groundwater not encountered Backfilled with cuttings	
1545	20									
1540	25									
1535	30									

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG LB-7

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1563'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel	
1560				R-1	20 25 33	115	6	SM	**Older Alluvium (Qalo)**; SILTY SAND, dense, dark brown, moist, fine to medium grained sand, few pinhole voids	
	5			R-2	15 22 23	113	8		SILTY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand, few pinhole voids	
1555										
	10			R-3	43 50/5"				SILTY SAND, dense, dark reddish brown, moist, fine to medium grained sand	
1550										
	15			R-4	8 12 24	125	10	SC-SM	SILTY, CLAYEY SAND, medium dense, dark reddish brown, moist, fine to medium grained sand	
1545									Drilled to 16.5' Sampled to 16.5' Groundwater not encountered Backfilled with cuttings	
	20									
1540										
	25									
1535										
	30									

The Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:
- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG P-1

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1566'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N / S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
									This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.	
1565	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel	
				S-1	6 12 13			ML	**Older Alluvium (Qalo)**; SANDY SILT, hard, dark reddish brown, mosit, fine to medium grained sand	SA
1560	5								Drilled to 5' Sampled to 5' Groundwater not encountered Backfilled with cuttings	
1555	10									
1550	15									
1545	20									
1540	25									
	30									

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

- -200 % FINES PASSING
- AL ATTERBERG LIMITS
- CN CONSOLIDATION
- CO COLLAPSE
- CR CORROSION
- CU UNDRAINED TRIAXIAL
- DS DIRECT SHEAR
- EI EXPANSION INDEX
- H HYDROMETER
- MD MAXIMUM DENSITY
- PP POCKET PENETROMETER
- RV R VALUE
- SA SIEVE ANALYSIS
- SE SAND EQUIVALENT
- SG SPECIFIC GRAVITY
- UC UNCONFINED COMPRESSIVE STRENGTH

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG P-2

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1564'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel	
1560	5			S-1	10 13 9			SM	**Older Alluvium (Qalo)**; SILTY SAND, medium dense, dark brown, moist, fine to medium grained sand	
									Drilled to 5' Sampled to 5' Groundwater not encountered Backfilled with cuttings	
1555	10									
1550	15									
1545	20									
1540	25									
1535	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:
- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GEOTECHNICAL BORING LOG P-3

Project No.	11888.001	**Date Drilled**	1-15-18
Project	T&C Skilled Nursing Facility	**Logged By**	JTD
Drilling Co.	2-R Drilling	**Hole Diameter**	8"
Drilling Method	Hollow Stem Auger - 140lb - Autohammer - 30" Drop	**Ground Elevation**	1563'
Location	See Boring Location Map	**Sampled By**	JTD

Elevation Feet	Depth Feet	Graphic Log (N S)	Attitudes	Sample No.	Blows Per 6 Inches	Dry Density pcf	Moisture Content, %	Soil Class. (U.S.C.S.)	SOIL DESCRIPTION	Type of Tests
	0							SM	**Quaternary Alluvium (Qal)**; SILTY SAND with GRAVEL, brown, moist, fine to coarse grained sand with fine gravel	
1560				S-1	4 4 4			CL	**Older Alluvium (Qalo)**; SANDY Lean CLAY, stiff, dark reddish brown, very fine to fine grained sand	
	5								Drilled to 5' Sampled to 5' Groundwater not encountered Backfilled with cuttings	
1555	10									
1550	15									
1545	20									
1540	25									
1535	30									

This Soil Description applies only to a location of the exploration at the time of sampling. Subsurface conditions may differ at other locations and may change with time. The description is a simplification of the actual conditions encountered. Transitions between soil types may be gradual.

SAMPLE TYPES:

- B BULK SAMPLE
- C CORE SAMPLE
- G GRAB SAMPLE
- R RING SAMPLE
- S SPLIT SPOON SAMPLE
- T TUBE SAMPLE

TYPE OF TESTS:

-200	% FINES PASSING	DS	DIRECT SHEAR	SA	SIEVE ANALYSIS
AL	ATTERBERG LIMITS	EI	EXPANSION INDEX	SE	SAND EQUIVALENT
CN	CONSOLIDATION	H	HYDROMETER	SG	SPECIFIC GRAVITY
CO	COLLAPSE	MD	MAXIMUM DENSITY	UC	UNCONFINED COMPRESSIVE STRENGTH
CR	CORROSION	PP	POCKET PENETROMETER		
CU	UNDRAINED TRIAXIAL	RV	R VALUE		

*** This log is a part of a report by Leighton and should not be used as a stand-alone document. ***

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

1/22/18

Leighton Consulting
Attn: Jeffrey T. DeLand

Subject: CPT Site Investigation
T&C Skilled Nursing Facility
Moreno Valley, California
GREGG Project Number: 18-509SH

Dear Mr. DeLand:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☒
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	UVOST Laser Induced Fluorescence	(UVOST)	☐
5	Groundwater Sampling	(GWS)	☐
6	Soil Sampling	(SS)	☐
7	Vapor Sampling	(VS)	☐
8	Pressuremeter Testing	(PMT)	☐
9	Vane Shear Testing	(VST)	☐
10	Dilatometer Testing	(DMT)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (562) 427-6899.

Sincerely,
GREGG Drilling & Testing, Inc.

Frank Stolfi
HRSC Division Manager, Gregg Drilling & Testing, Inc.

GREGG DRILLING & TESTING, INC.
GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (feet)	Depth of Groundwater Samples (feet)	Depth of Soil Samples (feet)	Depth of Pore Pressure Dissipation Tests (feet)
CPT-1	1/22/18	25	-	-	-
CPT-2	1/22/18	25	-	-	-
CPT-3	1/22/18	25	-	-	-
CPT-4	1/22/18	25	-	-	-
CPT-5	1/22/18	25	-	-	-
CPT-6	1/22/18	25	-	-	-
CPT-7	1/22/18	39	-	-	39.0

2726 Walnut Ave. • Signal Hill, California 90755 • (562) 427-6899 • FAX (562) 427-3314
www.greggdrilling.com

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GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

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Zemo, D.A., T.A. Delfino, J.D. Gallinatti, V.A. Baker and L.R. Hilpert, "Field Comparison of Analytical Results from Discrete-Depth Groundwater Samplers" BAT EnviroProbe and QED HydroPunch, Sixth national Outdoor Action Conference, Las Vegas, Nevada Proceedings, 1992, pp 299-312.

Copies of ASTM Standards are available through www.astm.org

Cone Penetration Testing Procedure (CPT)

Gregg Drilling carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT*.

The cone takes measurements of tip resistance (q_c), sleeve resistance (f_s), and penetration pore water pressure (u_2). Measurements are taken at either 2.5 or 5 cm intervals during penetration to provide a nearly continuous profile. CPT data reduction and basic interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are stored electronically for further analysis and reference. All CPT soundings are performed in accordance with revised ASTM standards (D 5778-12).

The 5mm thick porous plastic filter element is located directly behind the cone tip in the u_2 location. A new saturated filter element is used on each sounding to measure both penetration pore pressures as well as measurements during a dissipation test (*PPDT*). Prior to each test, the filter element is fully saturated with oil under vacuum pressure to improve accuracy.

When the sounding is completed, the test hole is backfilled according to client specifications. If grouting is used, the procedure generally consists of pushing a hollow tremie pipe with a "knock out" plug to the termination depth of the CPT hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.

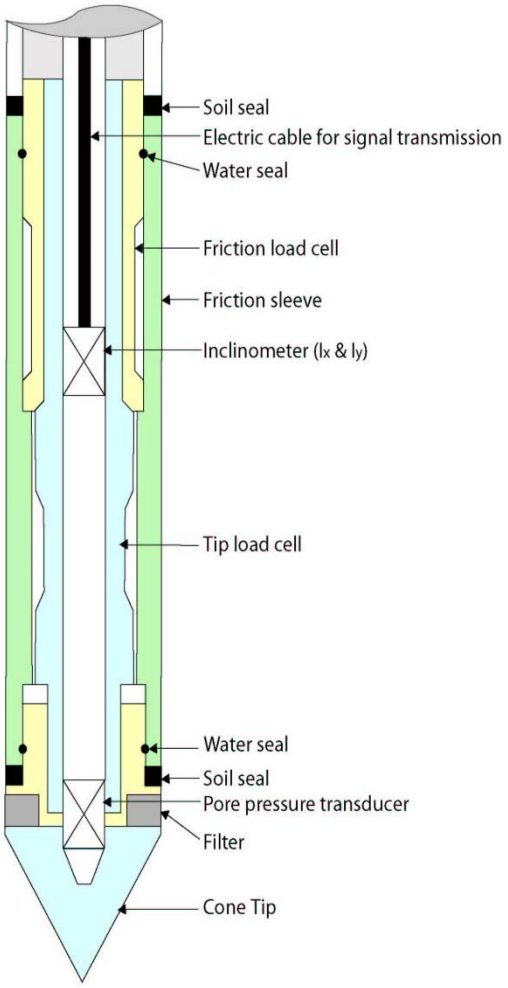


Figure CPT

Gregg 15cm^2 Standard Cone Specifications

Dimensions	
Cone base area	15 cm^2
Sleeve surface area	225 cm^2
Cone net area ratio	0.80
Specifications	
Cone load cell	
Full scale range	180 kN (20 tons)
Overload capacity	150%
Full scale tip stress	120 MPa (1,200 tsf)
Repeatability	120 kPa (1.2 tsf)
Sleeve load cell	
Full scale range	31 kN (3.5 tons)
Overload capacity	150%
Full scale sleeve stress	1,400 kPa (15 tsf)
Repeatability	1.4 kPa (0.015 tsf)
Pore pressure transducer	
Full scale range	7,000 kPa (1,000 psi)
Overload capacity	150%
Repeatability	7 kPa (1 psi)

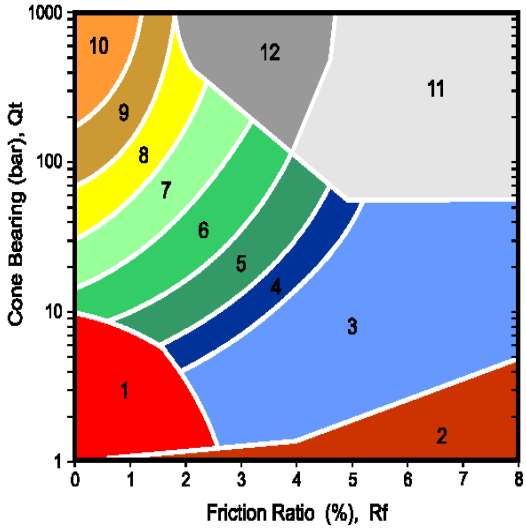
Note: The repeatability during field use will depend somewhat on ground conditions, abrasion, maintenance and zero load stability.

Cone Penetration Test Data & Interpretation

The Cone Penetration Test (CPT) data collected are presented in graphical and electronic form in the report. The plots include interpreted Soil Behavior Type (SBT) based on the charts described by Robertson (1990). Typical plots display SBT based on the non-normalized charts of Robertson et al (1986). For CPT soundings deeper than 30m, we recommend the use of the normalized charts of Robertson (1990) which can be displayed as SBTn, upon request. The report also includes spreadsheet output of computer calculations of basic interpretation in terms of SBT and SBTn and various geotechnical parameters using current published correlations based on the comprehensive review by Lunne, Robertson and Powell (1997), as well as recent updates by Professor Robertson (Guide to Cone Penetration Testing, 2015). The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg Drilling & Testing Inc. does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and does not assume any liability for use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software. Some interpretation methods require input of the groundwater level to calculate vertical effective stress. An estimate of the in-situ groundwater level has been made based on field observations and/or CPT results, but should be verified by the user.

A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Note that it is not always possible to clearly identify a soil type based solely on q_t, f_s, and u_2. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the correct soil behavior type.



ZONE		SBT
1		Sensitive, fine grained
2		Organic materials
3		Clay
4		Silty clay to clay
5		Clayey silt to silty clay
6		Sandy silt to clayey silt
7		Silty sand to sandy silt
8		Sand to silty sand
9		Sand
10		Gravely sand to sand
11		Very stiff fine grained*
12		Sand to clayey sand*

*over consolidated or cemented

Figure SBT (After Robertson et al., 1986) – Note: Colors may vary slightly compared to plots

Cone Penetration Test (CPT) Interpretation

Gregg uses a proprietary CPT interpretation and plotting software. The software takes the CPT data and performs basic interpretation in terms of soil behavior type (SBT) and various geotechnical parameters using current published empirical correlations based on the comprehensive review by Lunne, Robertson and Powell (1997). The interpretation is presented in tabular format using MS Excel. The interpretations are presented only as a guide for geotechnical use and should be carefully reviewed. Gregg does not warranty the correctness or the applicability of any of the geotechnical parameters interpreted by the software and does not assume any liability for any use of the results in any design or review. The user should be fully aware of the techniques and limitations of any method used in the software.

The following provides a summary of the methods used for the interpretation. Many of the empirical correlations to estimate geotechnical parameters have constants that have a range of values depending on soil type, geologic origin and other factors. The software uses 'default' values that have been selected to provide, in general, conservatively low estimates of the various geotechnical parameters.

Input:

1 Units for display (Imperial or metric) (atm. pressure, p_a = 0.96 tsf or 0.1 MPa)
2 Depth interval to average results (ft or m). Data are collected at either 0.02 or 0.05m and can be averaged every 1, 3 or 5 intervals.
3 Elevation of ground surface (ft or m)
4 Depth to water table, z_w (ft or m) – input required
5 Net area ratio for cone, a (default to 0.80)
6 Relative Density constant, C_{Dr} (default to 350)
7 Young's modulus number for sands, α (default to 5)
8 Small strain shear modulus number
  a. for sands, S_G (default to 180 for SBT_n 5, 6, 7)
  b. for clays, C_G (default to 50 for SBT_n 1, 2, 3 & 4)
9 Undrained shear strength cone factor for clays, N_{kt} (default to 15)
10 Over Consolidation ratio number, k_{ocr} (default to 0.3)
11 Unit weight of water, (default to γ_w = 62.4 lb/ft^3 or 9.81 kN/m^3)

Column

1 Depth, z, (m) – CPT data is collected in meters
2 Depth (ft)
3 Cone resistance, q_c (tsf or MPa)
4 Sleeve resistance, f_s (tsf or MPa)
5 Penetration pore pressure, u (psi or MPa), measured behind the cone (i.e. u_2)
6 Other – any additional data
7 Total cone resistance, q_t (tsf or MPa) $q_t = q_c + u(1-a)$

8	Friction Ratio, R_f (%)	$R_f = (f_s/q_t) \times 100\%$
9	Soil Behavior Type (non-normalized), SBT	see note
10	Unit weight, γ (pcf or kN/m^3)	based on SBT, see note
11	Total overburden stress, σ_v (tsf)	$\sigma_{vo} = \sigma z$
12	In-situ pore pressure, u_o (tsf)	$u_o = \gamma_w (z - z_w)$
13	Effective overburden stress, σ'_{vo} (tsf)	$\sigma'_{vo} = \sigma_{vo} - u_o$
14	Normalized cone resistance, Q_{t1}	$Q_{t1} = (q_t - \sigma_{vo}) / \sigma'_{vo}$
15	Normalized friction ratio, F_r (%)	$F_r = f_s / (q_t - \sigma_{vo}) \times 100\%$
16	Normalized Pore Pressure ratio, B_q	$B_q = u - u_o / (q_t - \sigma_{vo})$
17	Soil Behavior Type (normalized), SBT_n	see note
18	SBT_n Index, I_c	see note
19	Normalized Cone resistance, Q_{tn} (n varies with I_c)	see note
20	Estimated permeability, k_{SBT} (cm/sec or ft/sec)	see note
21	Equivalent SPT N_{60}, blows/ft	see note
22	Equivalent SPT $(N_1)_{60}$ blows/ft	see note
23	Estimated Relative Density, D_r, (%)	see note
24	Estimated Friction Angle, ϕ', (degrees)	see note
25	Estimated Young's modulus, E_s (tsf)	see note
26	Estimated small strain Shear modulus, Go (tsf)	see note
27	Estimated Undrained shear strength, s_u (tsf)	see note
28	Estimated Undrained strength ratio	s_u/σ_v'
29	Estimated Over Consolidation ratio, OCR	see note

Notes:

1 Soil Behavior Type (non-normalized), SBT (Lunne et al., 1997 and table below)

2 Unit weight, γ either constant at 119 pcf or based on Non-normalized SBT (Lunne et al., 1997 and table below)

3 Soil Behavior Type (Normalized), SBT_n Lunne et al. (1997)

4 SBT_n Index, I_c $I_c = ((3.47 - \log Q_{t1})^2 + (\log F_r + 1.22)^2)^{0.5}$

5 Normalized Cone resistance, Q_{tn} (n varies with Ic)

$Q_{tn} = ((q_t - \sigma_{vo})/pa)\ (pa/(\sigma'_{vo})^n$ and recalculate I_c, then iterate:

When $I_c < 1.64$, n = 0.5 (clean sand)
When $I_c > 3.30$, n = 1.0 (clays)
When $1.64 < I_c < 3.30$, $n = (I_c - 1.64)0.3 + 0.5$
Iterate until the change in n, $\Delta n < 0.01$

6 Estimated permeability, k_{SBT} based on Normalized SBT_n (Lunne et al., 1997 and table below)

7 Equivalent SPT N_{60}, blows/ft Lunne et al. (1997)

$$\frac{(q_t/p_a)}{N_{60}} = 8.5\left(1 - \frac{I_c}{4.6}\right)$$

8 Equivalent SPT $(N_1)_{60}$ blows/ft $(N_1)_{60} = N_{60}\, C_N$,
where $C_N = (pa/\sigma'_{vo})^{0.5}$

9 Relative Density, D_r, (%) $D_r^2 = Q_{tn} / C_{Dr}$
Only SBT_n 5, 6, 7 & 8 *Show 'N/A' in zones 1, 2, 3, 4 & 9*

10 Friction Angle, ϕ', (degrees) $\tan\phi' = \frac{1}{2.68}\left[\log\left(\frac{q_c}{\sigma'_{vo}}\right) + 0.29\right]$
Only SBT_n 5, 6, 7 & 8 *Show'N/A' in zones 1, 2, 3, 4 & 9*

11 Young's modulus, E_s $E_s = \alpha\, q_t$
Only SBT_n 5, 6, 7 & 8 *Show 'N/A' in zones 1, 2, 3, 4 & 9*

12 Small strain shear modulus, Go

a. $G_o = S_G\,(q_t\ \sigma'_{vo}\ pa)^{1/3}$ *For SBT_n 5, 6, 7*

b. $G_o = C_G\, q_t$ *For SBT_n 1, 2, 3& 4*

Show 'N/A' in zones 8 & 9

13 Undrained shear strength, s_u $s_u = (q_t - \sigma_{vo}) / N_{kt}$
Only SBT_n 1, 2, 3, 4 & 9 *Show 'N/A' in zones 5, 6, 7 & 8*

14 Over Consolidation ratio, OCR OCR = $k_{ocr}\, Q_{t1}$
Only SBT_n 1, 2, 3, 4 & 9 *Show 'N/A' in zones 5, 6, 7 & 8*

The following updated and simplified SBT descriptions have been used in the software:

SBT Zones		**SBT_n Zones**	
1	sensitive fine grained	1	sensitive fine grained
2	organic soil	2	organic soil
3	clay	3	clay
4	clay & silty clay	4	clay & silty clay
5	clay & silty clay		
6	sandy silt & clayey silt		

7	silty sand & sandy silt	5	silty sand & sandy silt
8	sand & silty sand	6	sand & silty sand
9	sand		
10	sand	7	sand
11	very dense/stiff soil*	8	very dense/stiff soil*
12	very dense/stiff soil*	9	very dense/stiff soil*

*heavily overconsolidated and/or cemented

Track when soils fall with zones of same description and print that description (i.e. if soils fall only within SBT zones 4 & 5, print 'clays & silty clays')

Estimated Permeability (see Lunne et al., 1997)

SBT_n	Permeability (ft/sec)	(m/sec)
1	$3x\ 10^{-8}$	$1x\ 10^{-8}$
2	$3x\ 10^{-7}$	$1x\ 10^{-7}$
3	$1x\ 10^{-9}$	$3x\ 10^{-10}$
4	$3x\ 10^{-8}$	$1x\ 10^{-8}$
5	$3x\ 10^{-6}$	$1x\ 10^{-6}$
6	$3x\ 10^{-4}$	$1x\ 10^{-4}$
7	$3x\ 10^{-2}$	$1x\ 10^{-2}$
8	$3x\ 10^{-6}$	$1x\ 10^{-6}$
9	$1x\ 10^{-8}$	$3x\ 10^{-9}$

Estimated Unit Weight (see Lunne et al., 1997)

SBT	Approximate Unit Weight (lb/ft^3)	(kN/m^3)
1	111.4	17.5
2	79.6	12.5
3	111.4	17.5
4	114.6	18.0
5	114.6	18.0
6	114.6	18.0
7	117.8	18.5
8	120.9	19.0
9	124.1	19.5
10	127.3	20.0
11	130.5	20.5
12	120.9	19.0

Pore Pressure Dissipation Tests (PPDT)

Pore Pressure Dissipation Tests (PPDT's) conducted at various intervals can be used to measure equilibrium water pressure (at the time of the CPT). If conditions are hydrostatic, the equilibrium water pressure can be used to determine the approximate depth of the ground water table. A PPDT is conducted when penetration is halted at specific intervals determined by the field representative. The variation of the penetration pore pressure (*u)* with time is measured behind the tip of the cone and recorded.

Pore pressure dissipation data can be interpreted to provide estimates of:

- Equilibrium piezometric pressure
- Phreatic Surface
- In situ horizontal coefficient of consolidation (c_h)
- In situ horizontal coefficient of permeability (k_h)

In order to correctly interpret the equilibrium piezometric pressure and/or the phreatic surface, the pore pressure must be monitored until it reaches equilibrium, *Figure PPDT*. This time is commonly referred to as t_{100}, the point at which 100% of the excess pore pressure has dissipated.

A complete reference on pore pressure dissipation tests is presented by Robertson et al. 1992 and Lunne et al. 1997.

A summary of the pore pressure dissipation tests are summarized in Table 1.

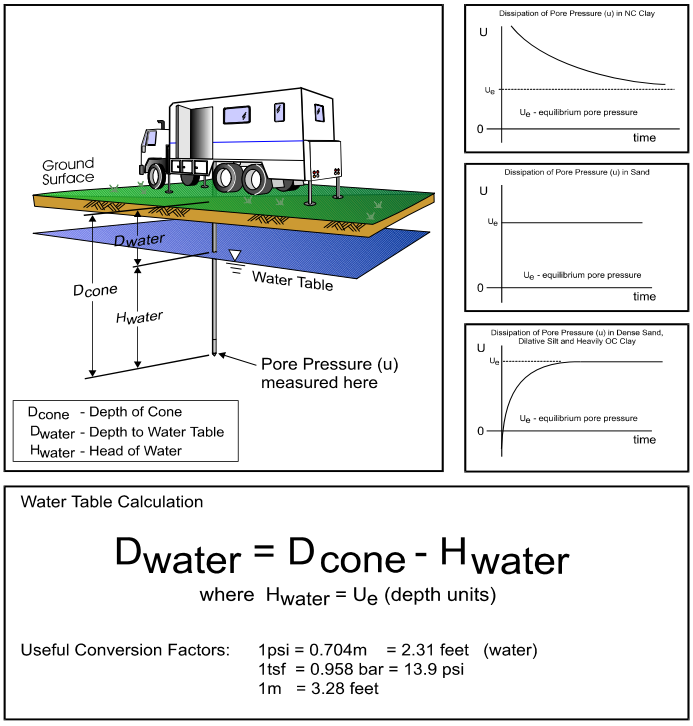


Figure PPDT

Seismic Cone Penetration Testing (SCPT)

Seismic Cone Penetration Testing (SCPT) can be conducted at various intervals during the Cone Penetration Test. Shear wave velocity (Vs) can then be calculated over a specified interval with depth. A small interval for seismic testing, such as 1-1.5m (3-5ft) allows for a detailed look at the shear wave profile with depth. Conversely, a larger interval such as 3-6m (10-20ft) allows for a more average shear wave velocity to be calculated. Gregg's cones have a horizontally active geophone located 0.2m (0.66ft) behind the tip.

To conduct the seismic shear wave test, the penetration of the cone is stopped and the rods are decoupled from the rig. An automatic hammer is triggered to send a shear wave into the soil. The distance from the source to the cone is calculated knowing the total depth of the cone and the horizontal offset distance between the source and the cone. To calculate an interval velocity, a minimum of two tests must be performed at two different depths. The arrival times between the two wave traces are compared to obtain the difference in time (Δt). The difference in depth is calculated (Δd) and velocity can be determined using the simple equation: v = Δd/Δt

Multiple wave traces can be recorded at the same depth to improve quality of the data.

A complete reference on seismic cone penetration tests is presented by Robertson et al. 1986 and Lunne et al. 1997.

A summary the shear wave velocities, arrival times and wave traces are provided with the report.

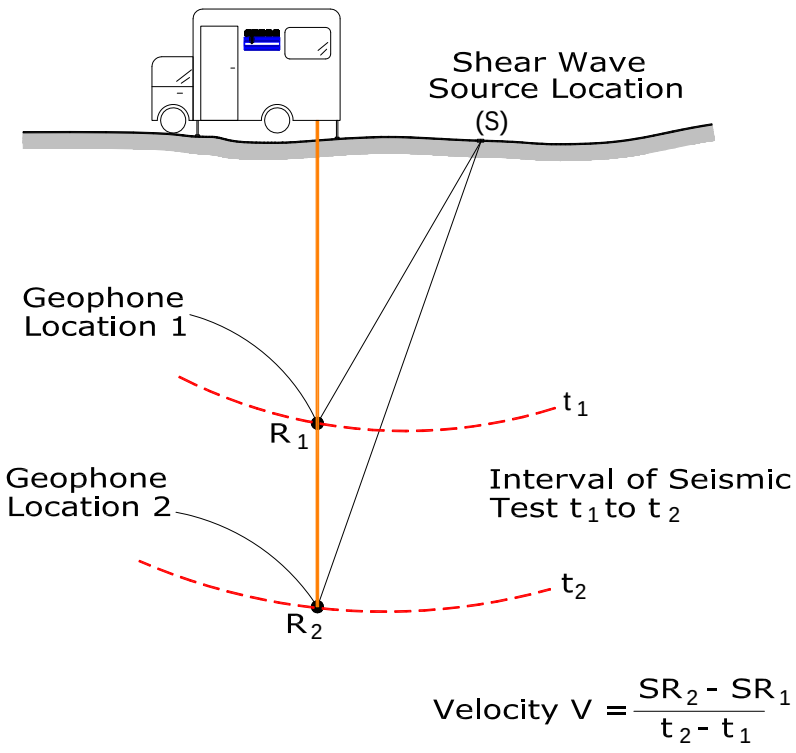


Figure SCPT

Groundwater Sampling

Gregg Drilling & Testing, Inc. conducts groundwater sampling using a sampler as shown in *Figure GWS*. The groundwater sampler has a retrievable stainless steel or disposable PVC screen with steel drop off tip. This allows for samples to be taken at multiple depth intervals within the same sounding location. In areas of slower water recharge, provisions may be made to set temporary PVC well screens during sampling to allow the pushing equipment to advance to the next sample location while the groundwater is allowed to infiltrate.

The groundwater sampler operates by advancing 44.5mm (1¾ inch) hollow push rods with the filter tip in a closed configuration to the base of the desired sampling interval. Once at the desired sample depth, the push rods are retracted; exposing the encased filter screen and allowing groundwater to infiltrate hydrostatically from the formation into the inlet screen. A small diameter bailer (approximately ½ or ¾ inch) is lowered through the push rods into the screen section for sample collection. The number of downhole trips with the bailer and time necessary to complete the sample collection at each depth interval is a function of sampling protocols, volume requirements, and the yield characteristics and storage capacity of the formation. Upon completion of sample collection, the push rods and sampler, with the exception of the PVC screen and steel drop off tip are retrieved to the ground surface, decontaminated and prepared for the next sampling event.

For a detailed reference on direct push groundwater sampling, refer to Zemo et. al., 1992.

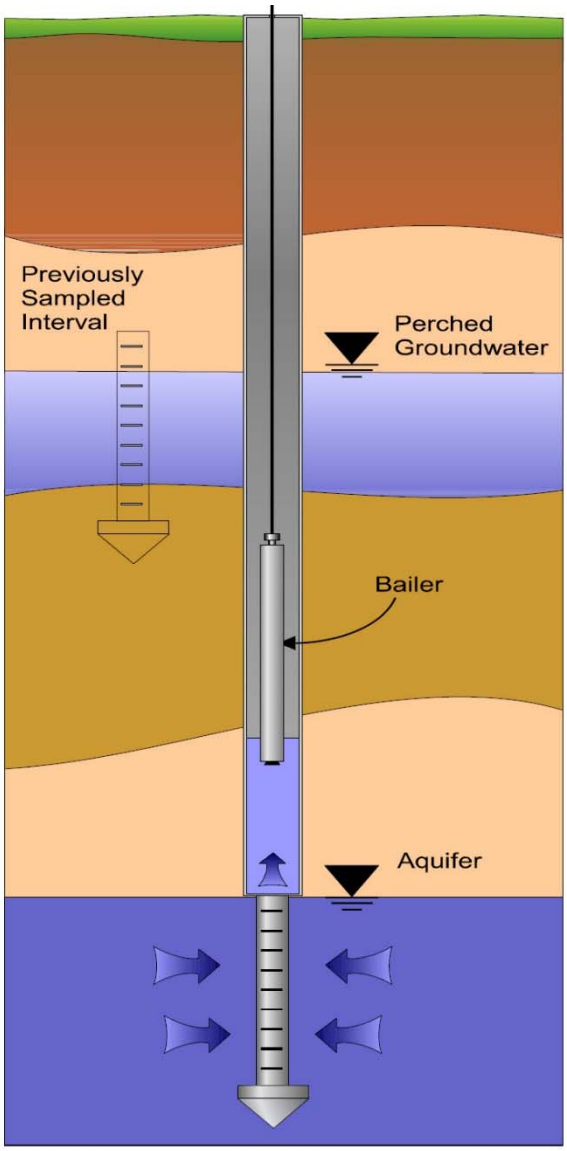


Figure GWS

Soil Sampling

Gregg Drilling & Testing, Inc. uses a piston-type push-in sampler to obtain small soil samples without generating any soil cuttings, *Figure SS*. Two different types of samplers (12 and 18 inch) are used depending on the soil type and density. The soil sampler is initially pushed in a "closed" position to the desired sampling interval using the CPT pushing equipment. Keeping the sampler closed minimizes the potential of cross contamination. The inner tip of the sampler is then retracted leaving a hollow soil sampler with inner 1¼" diameter sample tubes. The hollow sampler is then pushed in a locked "open" position to collect a soil sample. The filled sampler and push rods are then retrieved to the ground surface. Because the soil enters the sampler at a constant rate, the opportunity for 100% recovery is increased. For environmental analysis, the soil sample tube ends are sealed with Teflon and plastic caps. Often, a longer "split tube" can be used for geotechnical sampling.

For a detailed reference on direct push soil sampling, refer to Robertson et al, 1998.

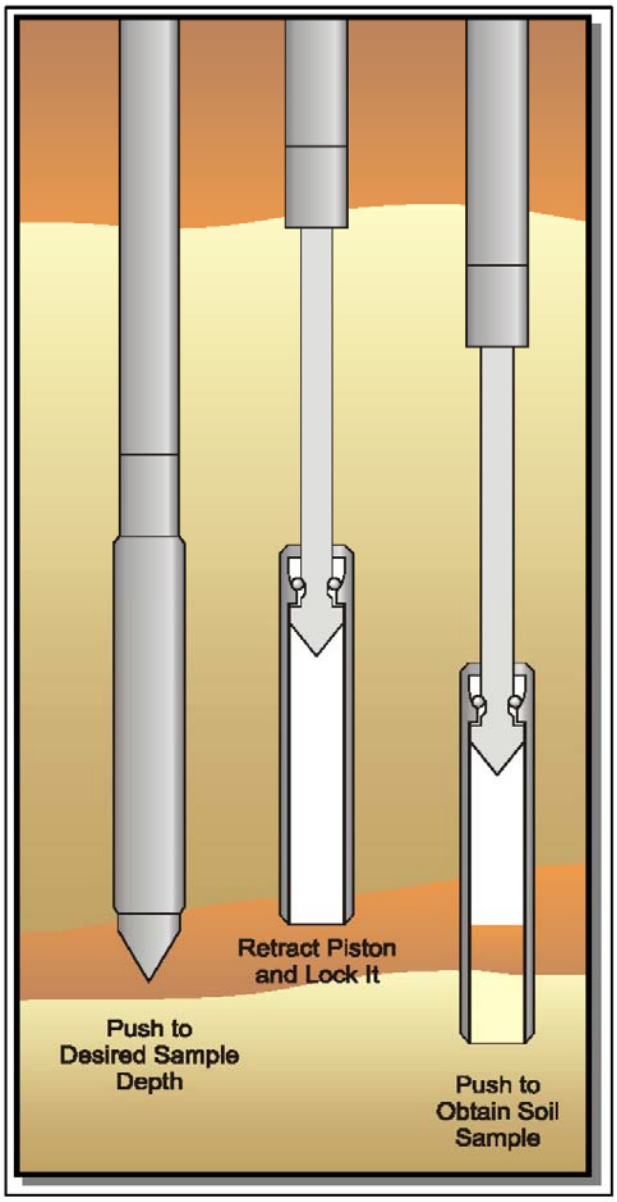


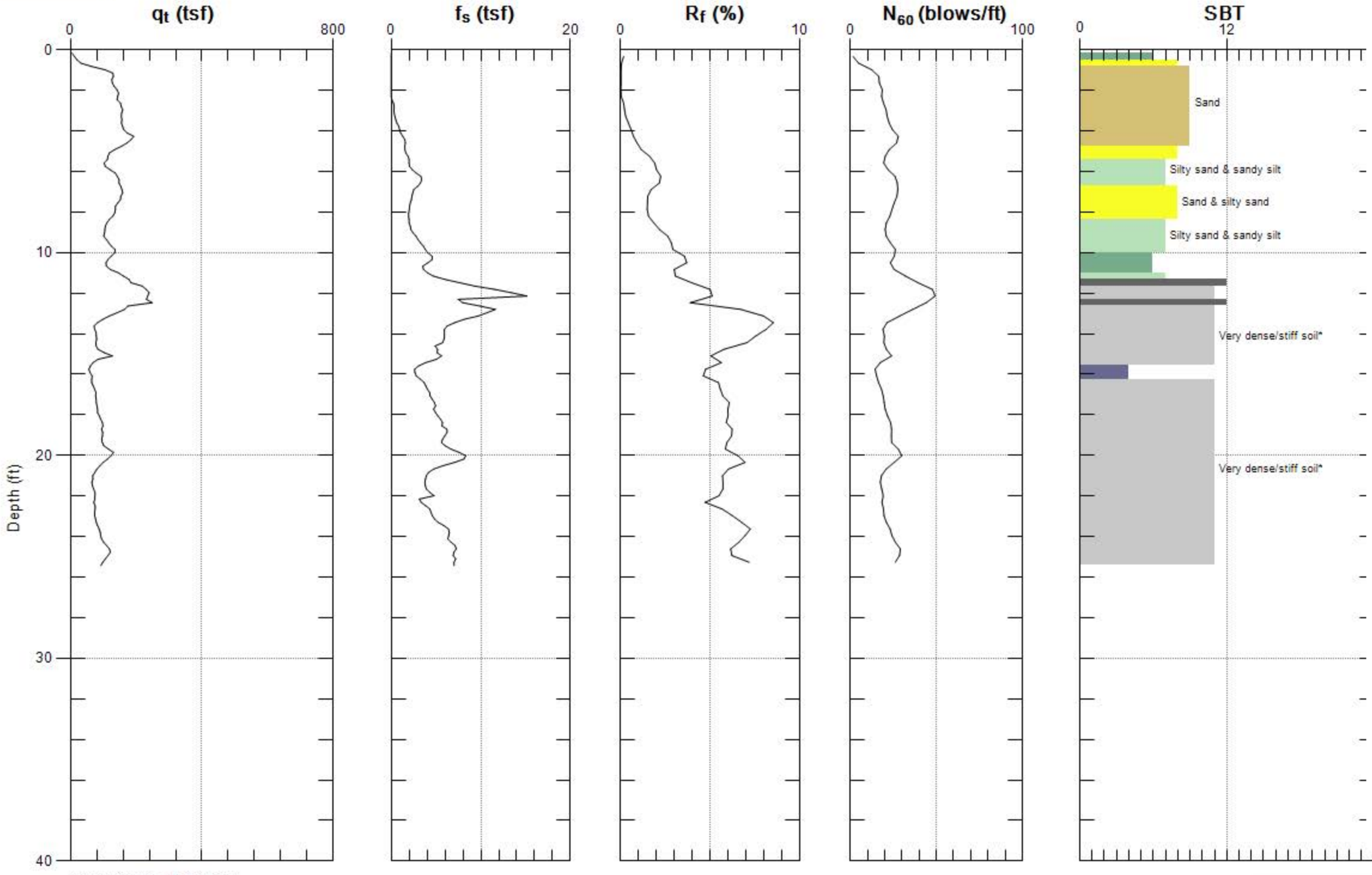
Figure SS

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-1 Date: 1/22/2018 07:51



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

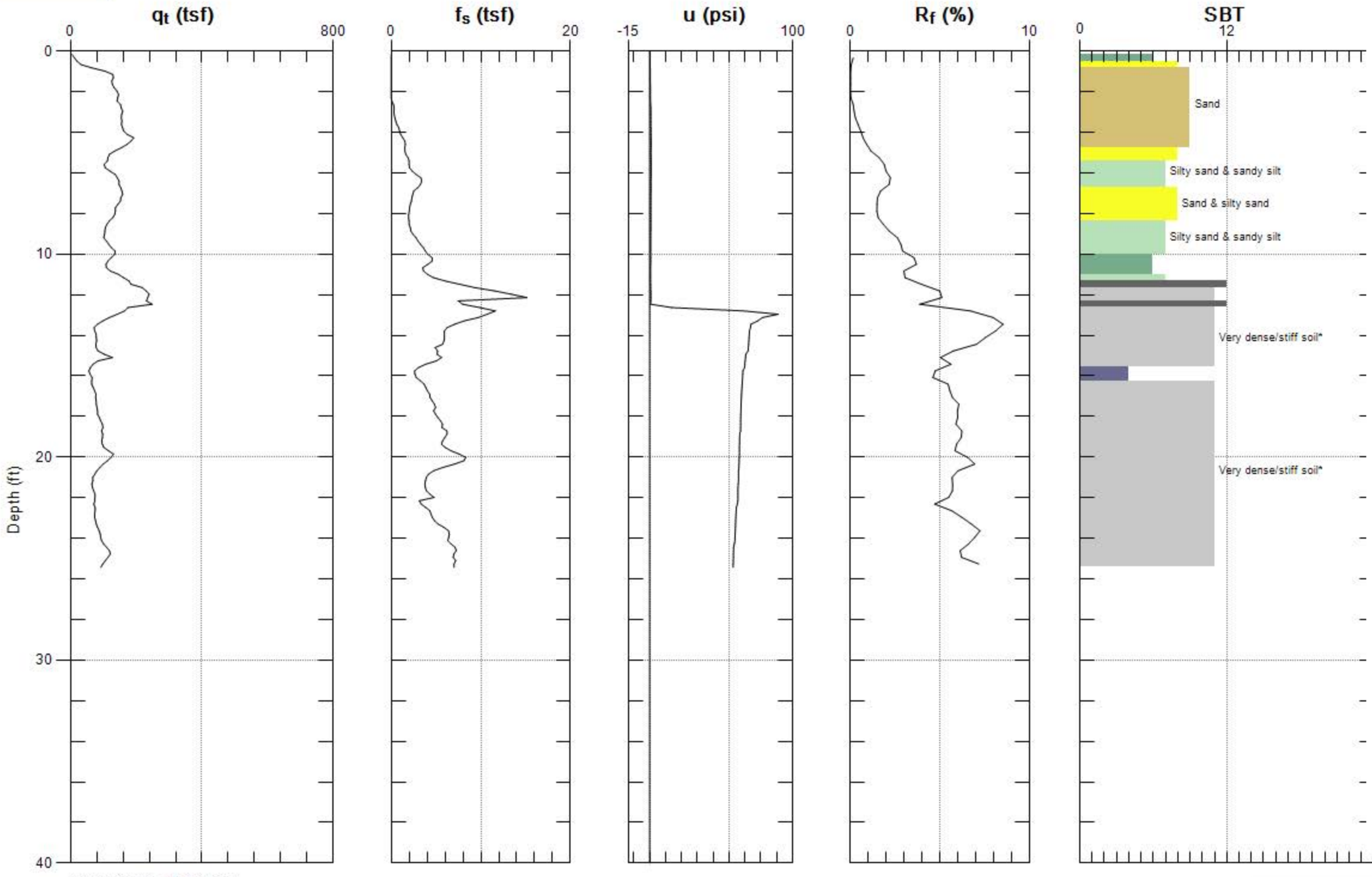
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-1 Date: 1/22/2018 07:51



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

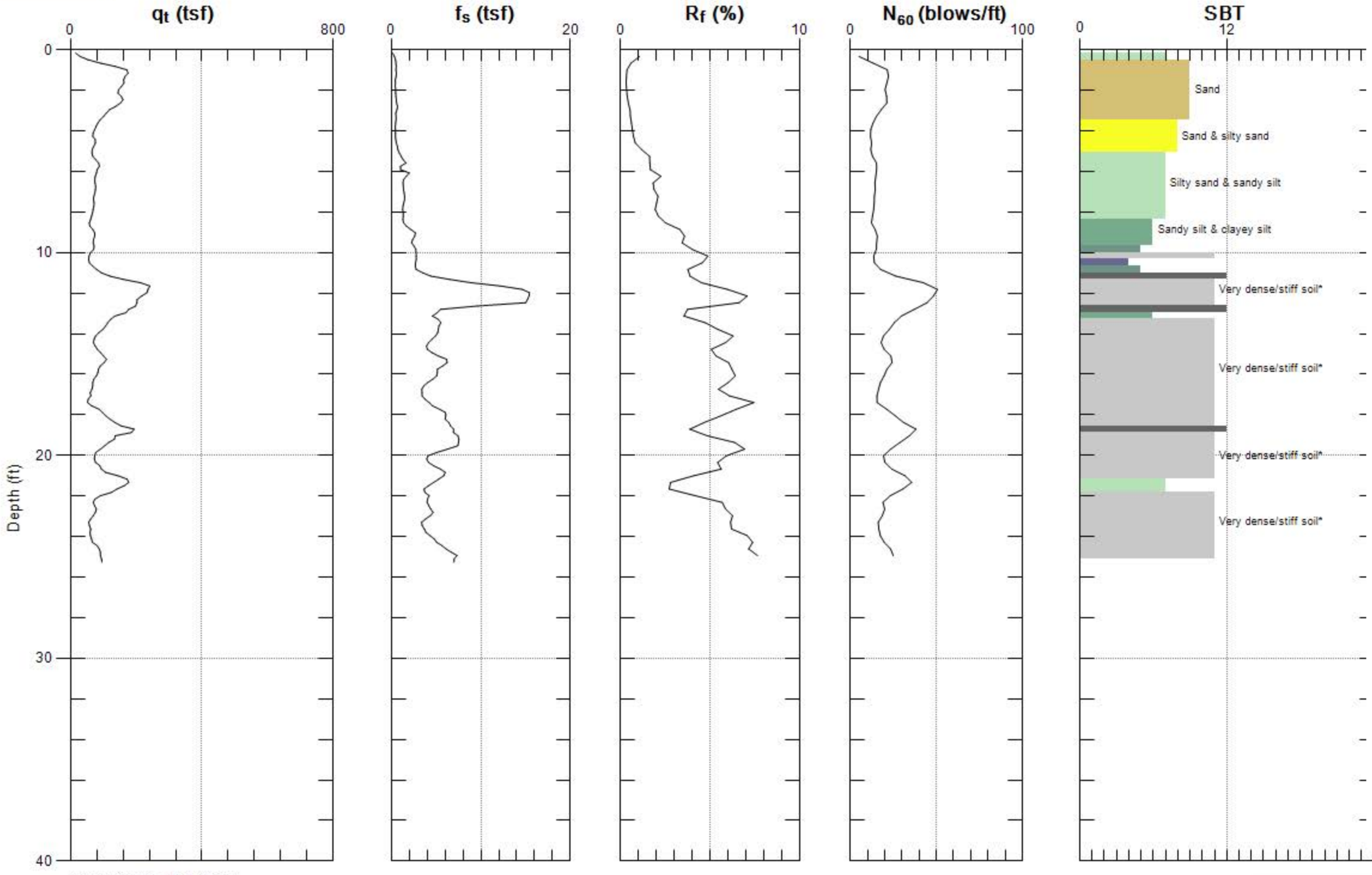
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-2 Date: 1/22/2018 07:22



Max. Depth: 25.262 (ft)
Avg. Interval: 0.328 (ft)

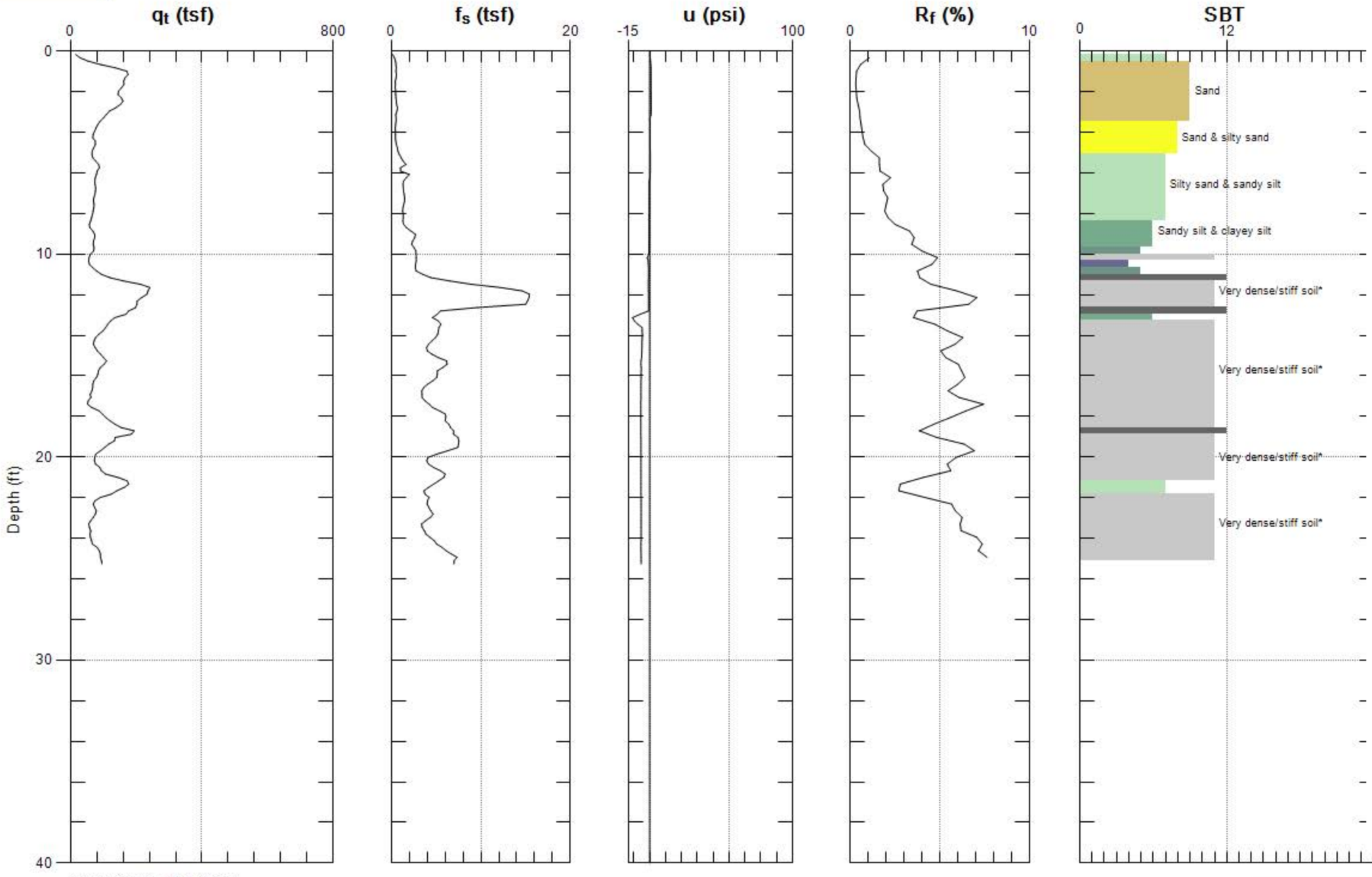
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-2 Date: 1/22/2018 07:22



Max. Depth: 25.262 (ft)
Avg. Interval: 0.328 (ft)

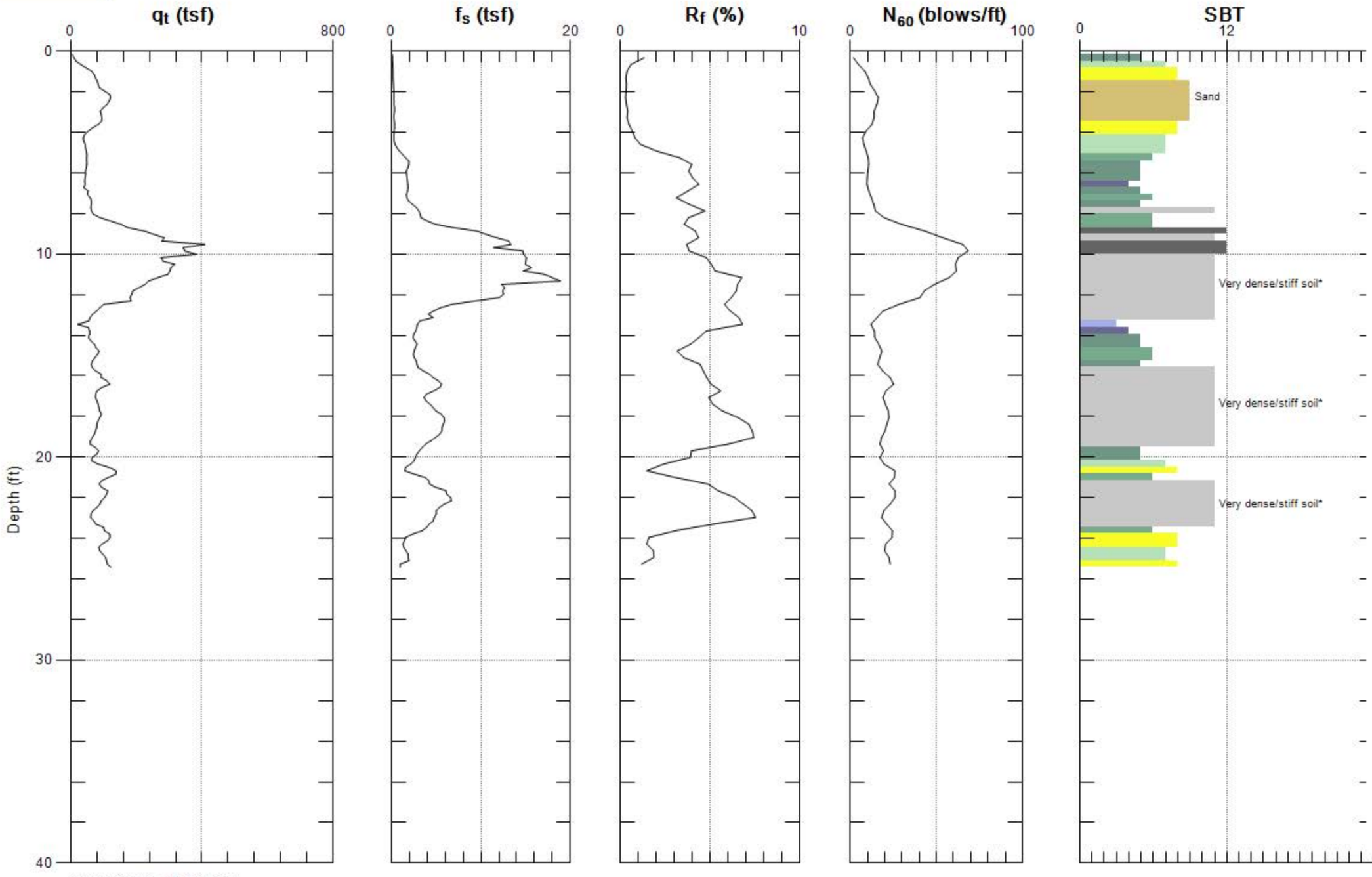
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-3 Date: 1/22/2018 08:20



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

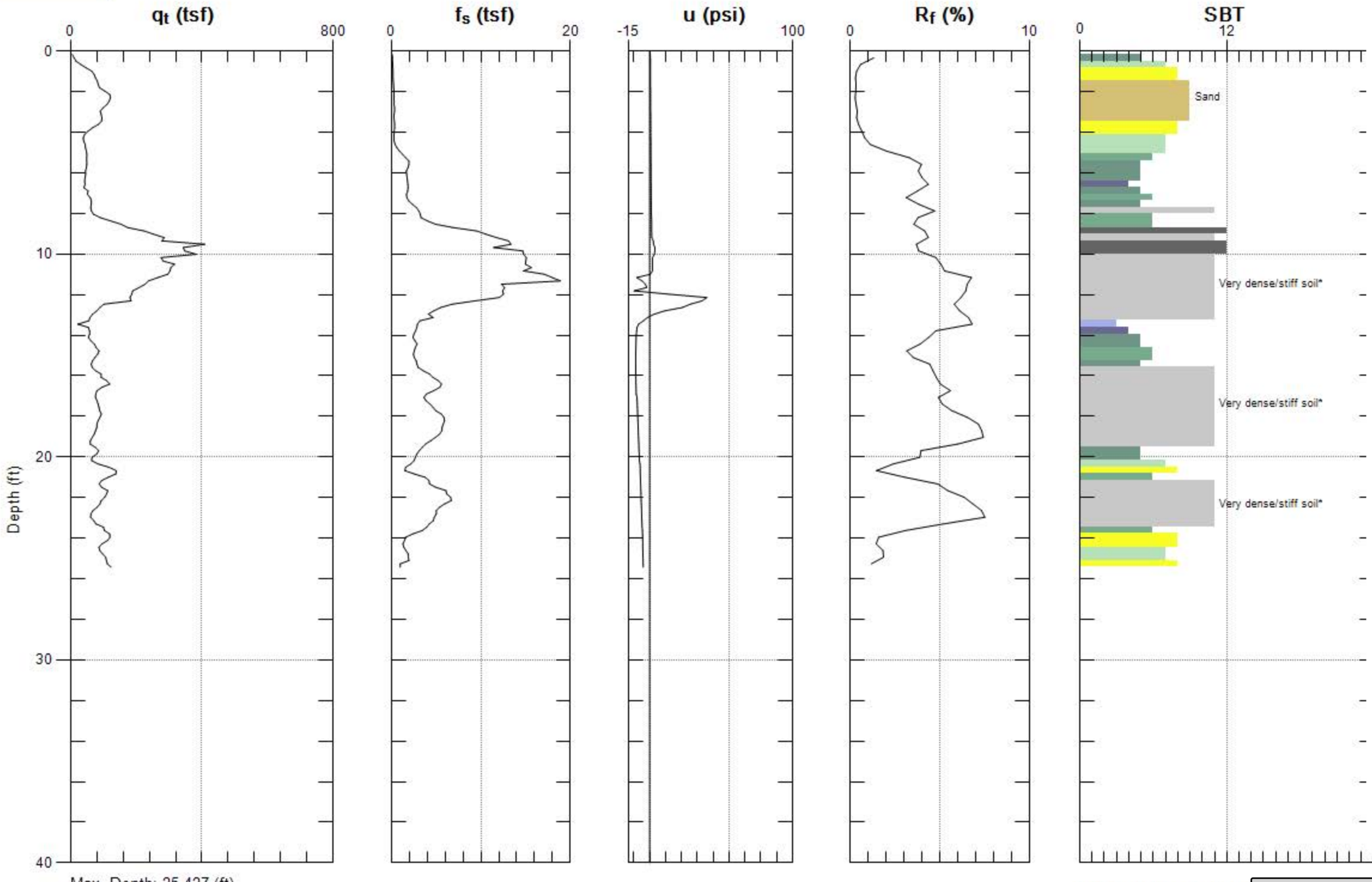
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-3 Date: 1/22/2018 08:20



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

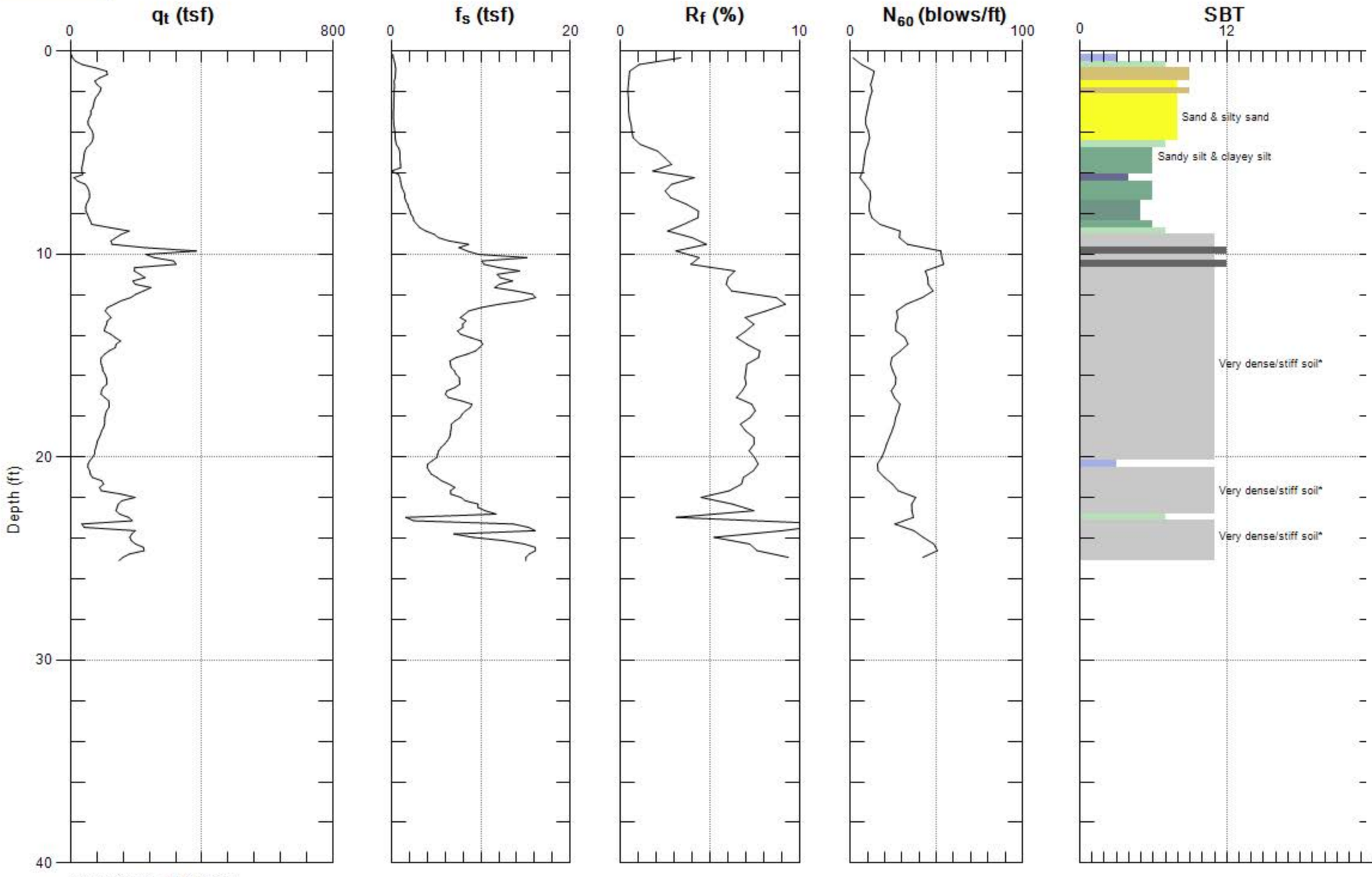
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-4 Date: 1/22/2018 08:52



Max. Depth: 25.098 (ft)
Avg. Interval: 0.328 (ft)

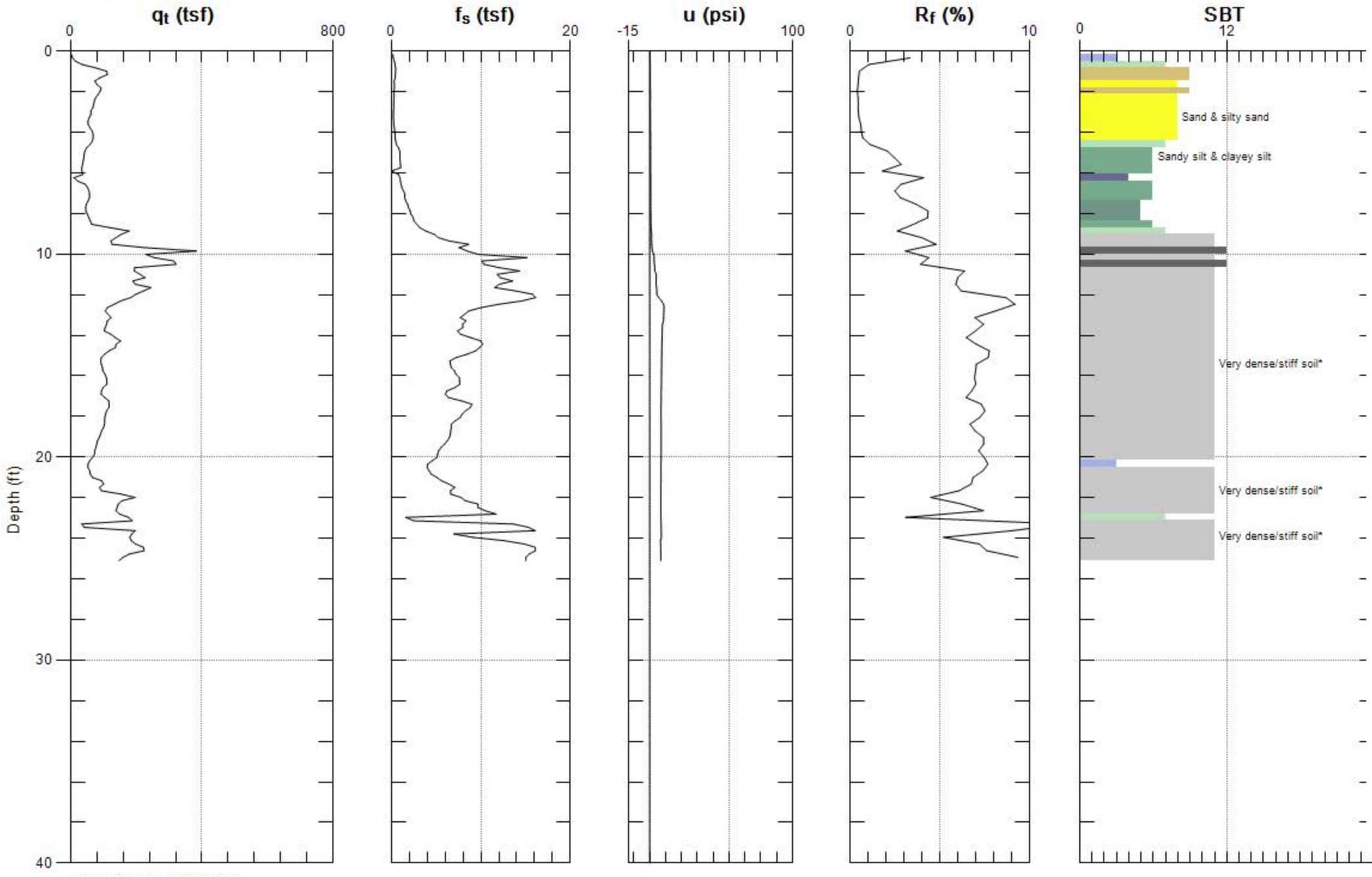
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-4 Date: 1/22/2018 08:52



Max. Depth: 25.098 (ft)
Avg. Interval: 0.328 (ft)

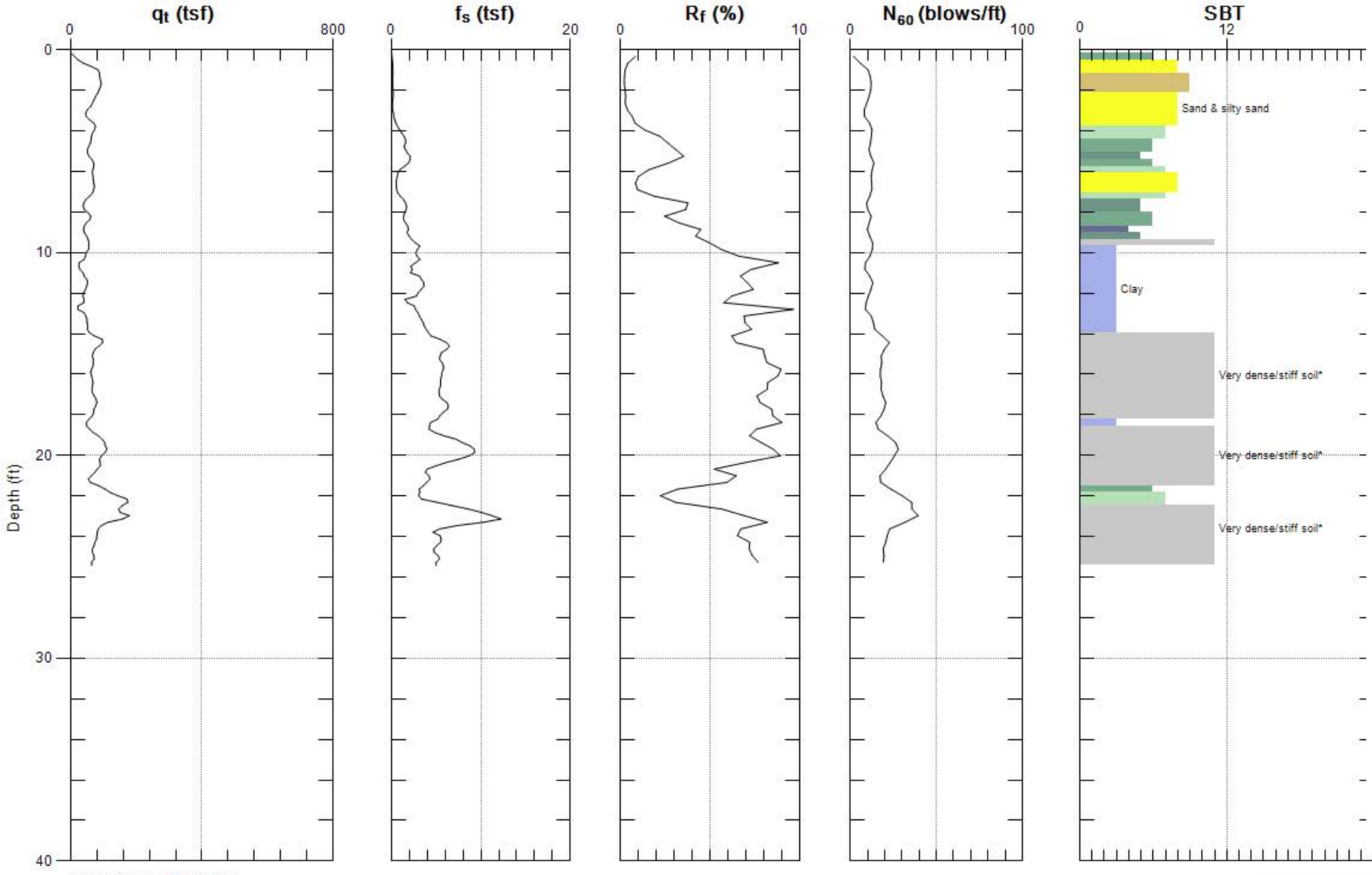
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-5 Date: 1/22/2018 09:16



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

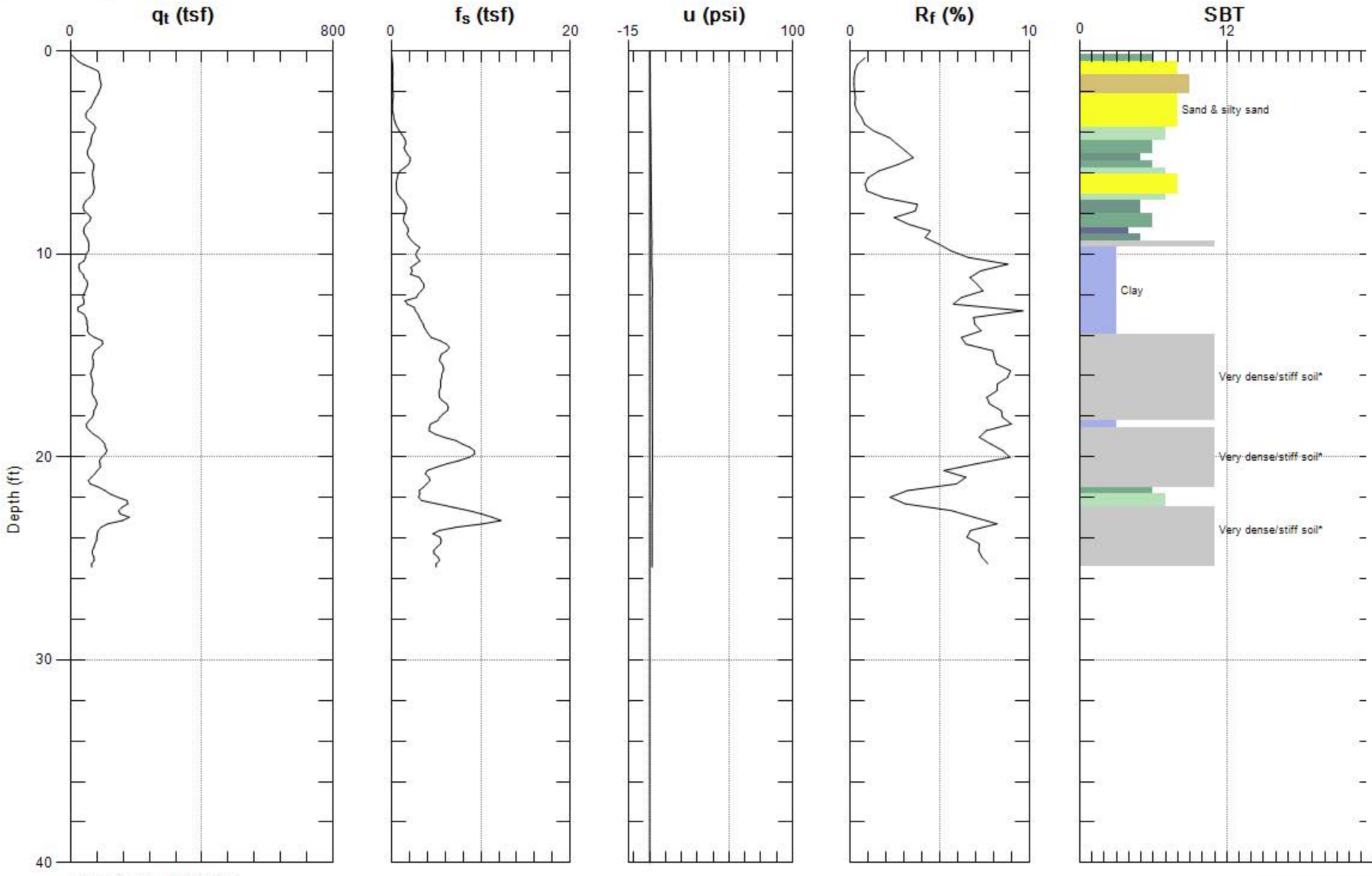
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-5 Date: 1/22/2018 09:16



Max. Depth: 25.427 (ft)
Avg. Interval: 0.328 (ft)

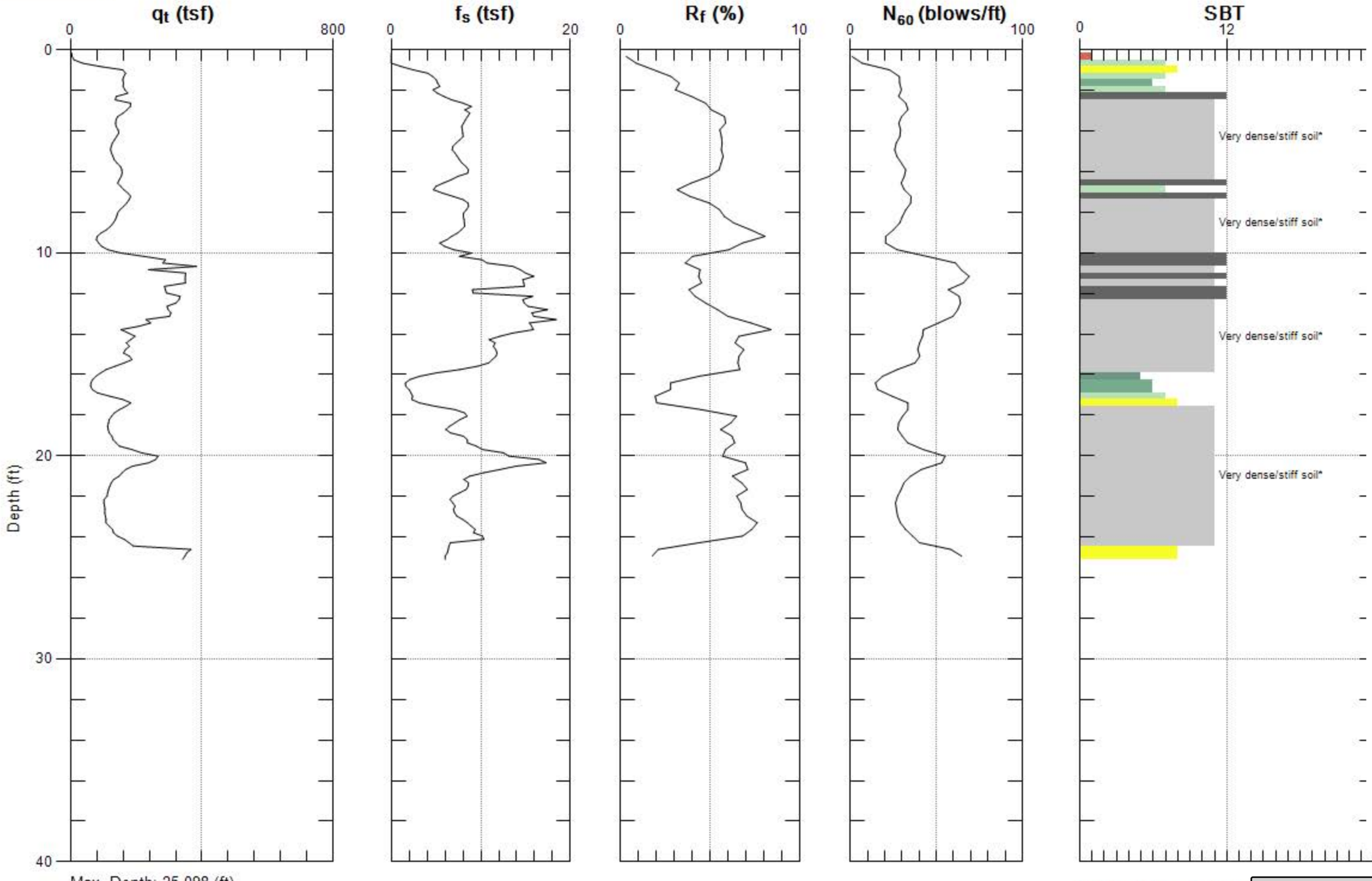
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-6 Date: 1/22/2018 09:33



Max. Depth: 25.098 (ft)
Avg. Interval: 0.328 (ft)

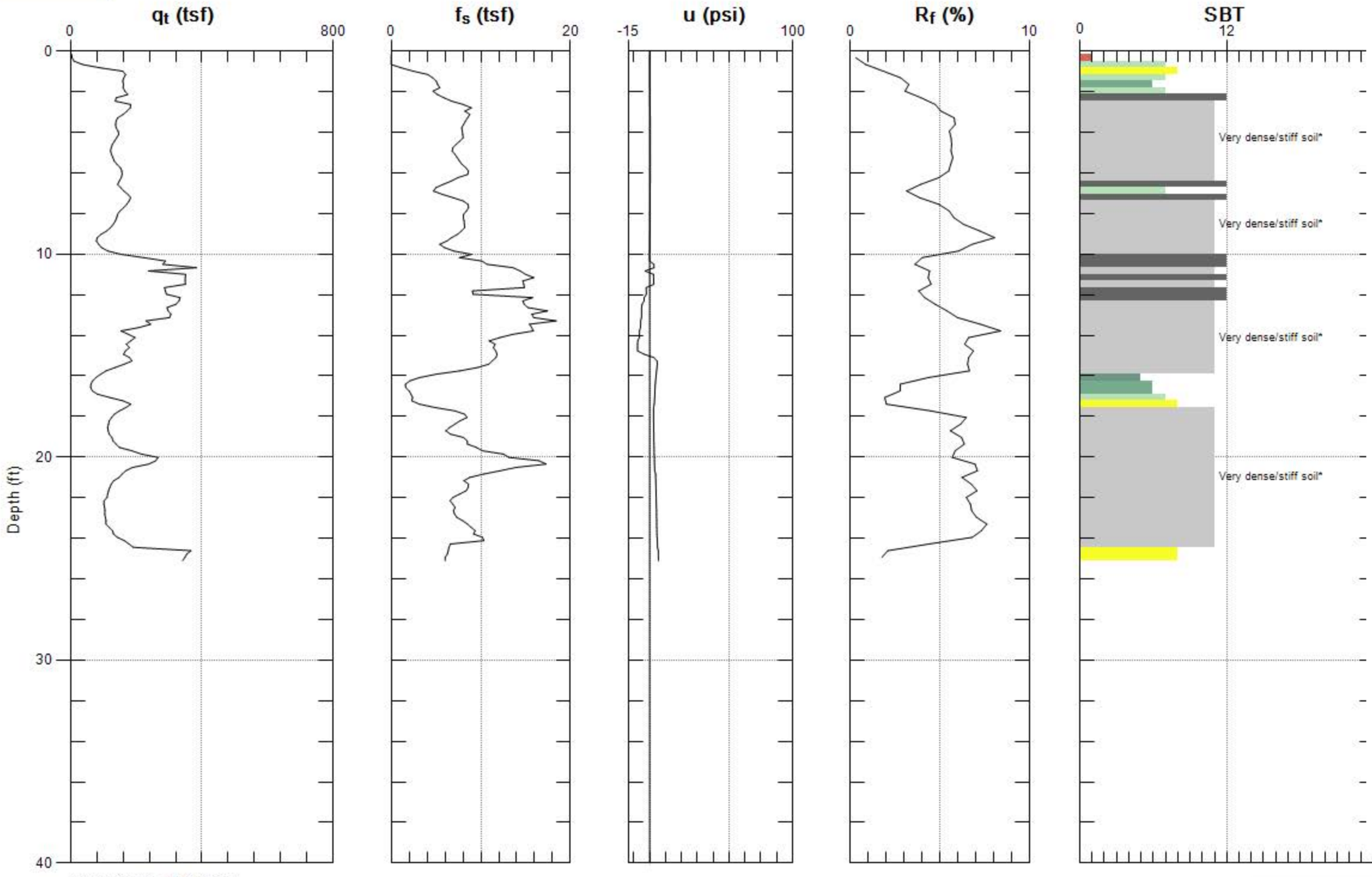
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-6 Date: 1/22/2018 09:33



Max. Depth: 25.098 (ft)
Avg. Interval: 0.328 (ft)

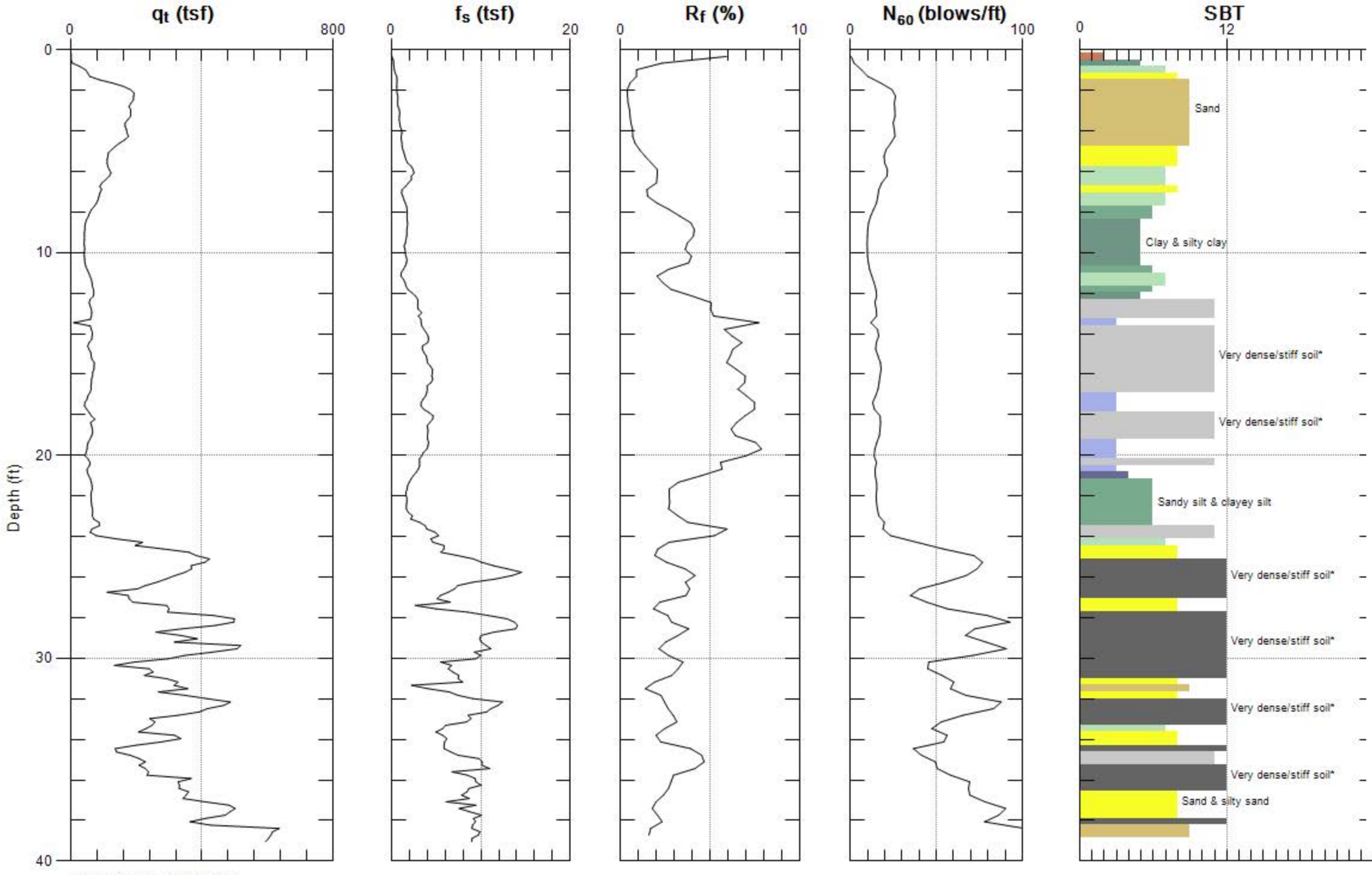
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-7 Date: 1/22/2018 10:19



Max. Depth: 39.042 (ft)
Avg. Interval: 0.328 (ft)

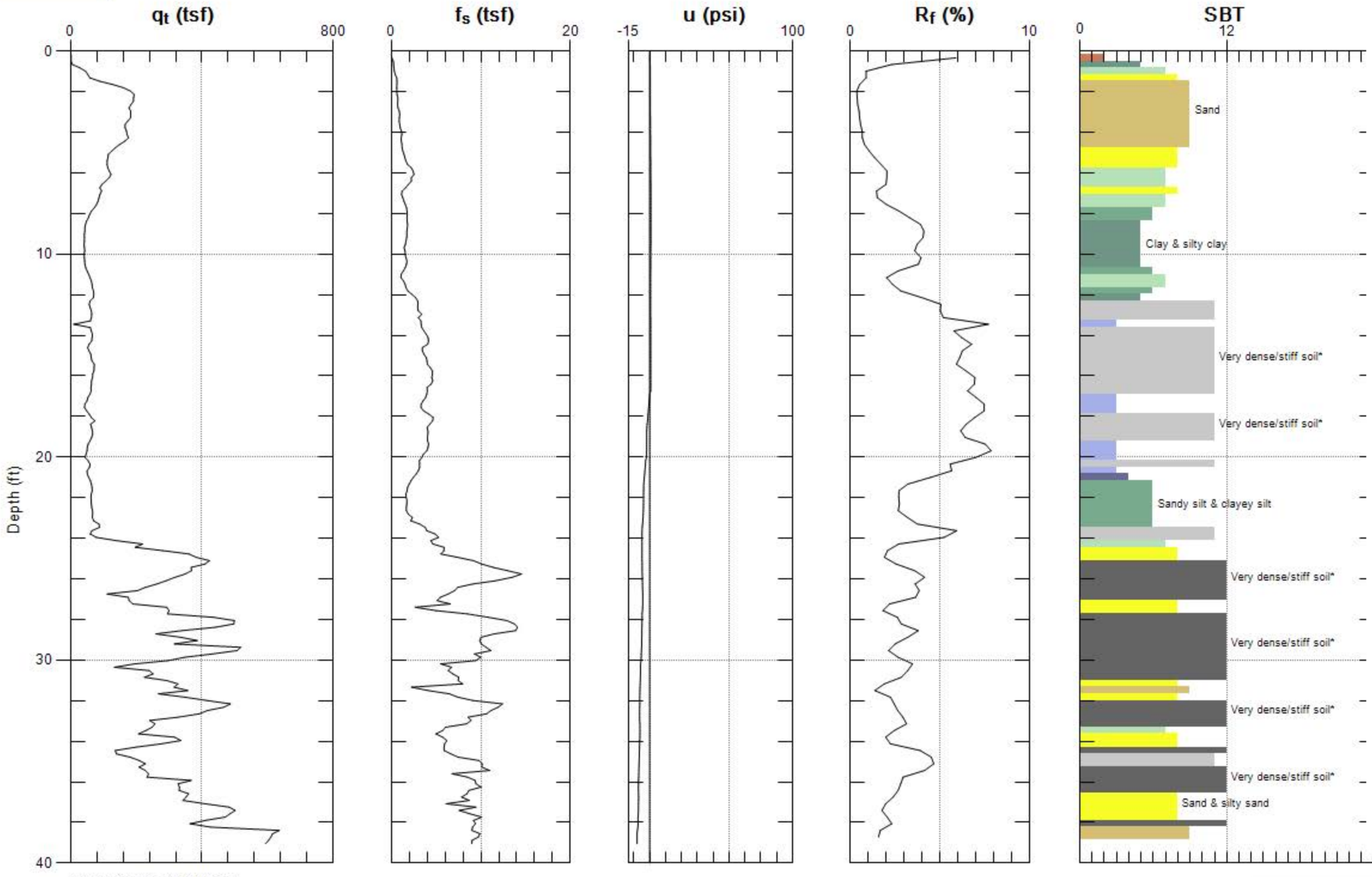
SBT: Soil Behavior Type

GREGG

LEIGHTON

Site: T&C SKILLED NURSING Engineer: JEFF D.

Sounding: CPT-7 Date: 1/22/2018 10:19



Max. Depth: 39.042 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type

APPENDIX B
GEOTECHNICAL LABORATORY TESTING

Our geotechnical laboratory testing program was directed toward a quantitative and qualitative evaluation of physical and mechanical properties of soils underlying proposed improvements, and to aid in verifying soil classification.

In-Situ Moisture and Density: As-sampled soil moisture content was measured (ASTM D 2216) on selected samples recovered from our borings. In addition, in place dry density was measured (ASTM D 2937) on selected relatively undisturbed soil samples. Results of these tests are shown on our logs at the appropriate sample depths in Appendix A.

Percent Passing No. 200 Sieve: Percent fines (silt and clay) passing the No. 200 U.S. Standard Sieve was determined for soil samples in accordance with ASTM D 1140 Standard Test Method. Samples were dried and passed through a No. 4 sieve, then a No. 200 sieve. Result of this grain size analysis, as percent by dry weight passing the No. 200 U.S. Standard Sieve, is tabulated in this appendix and entered on our boring logs.

Particle Size (Sieve) Analysis: Particle size analysis of bulk soil samples by passing sieves was evaluated using the ASTM D 6913 Standard Test Method. Results of these analysis are presented on the *Particle-Size Distribution ASTM D 6913* sheets in this appendix.

Expansion Index (EI): An Expansion Index (EI) test was performed in accordance with the ASTM D 4829 Standard Test Method, for a shallow bulk soil sample from this site. EI results are included in this appendix on the "*Expansion Index of Soils*" sheet.

Consolidation: Consolidation tests run on relatively undisturbed drive soil samples from our borings were performed in accordance with ASTM D 2435. Results are included in this appendix on the *One-Dimensional Consolidation Properties of Soils* sheets.

R-value (CTM 301): For use in pavement design, two shallow subgrade bulk-soil samples were tested in accordance with CTM Test 301, to determine the R-value. Results are included in this appendix on the *R-value Test Results* sheets.

Corrosivity Tests: To evaluate corrosion potential of subsurface soils at the site, we tested two bulk soil samples collected during our subsurface exploration for pH, electrical resistivity (CTM 532/643), soluble sulfate content (CTM 417 Part II) and soluble chloride content (CTM 422) testing. Results of these tests are enclosed at the end of this appendix.

Boring No.	LB-6							
Sample No.	B-1							
Depth (ft.)	0 - 5.0							
Sample Type	BULK							
Visual Soil Classification	SM							
Moisture Correction								
Wet Weight of Soil + Container (gm.)	1039.8							
Dry Weight of Soil + Container (gm.)	1023.1							
Weight of Container (gm)	699.7							
Moisture Content (%)	5.2							
Container No.:	123							
Sample Dry Weight Determination								
Weight of Sample + Container (gm.)	1039.8							
Weight of Container (gm.)	699.7							
Weight of Dry Sample (gm.)	323.4							
Container No.:	123							
After Wash								
Dry Weight of Sample + Container (gm)	880.8							
Weight of Container (gm)	699.7							
Dry Weight of Sample (gm)	181.1							
% Passing No. 200 Sieve	**44**							
% Retained No. 200 Sieve	56							

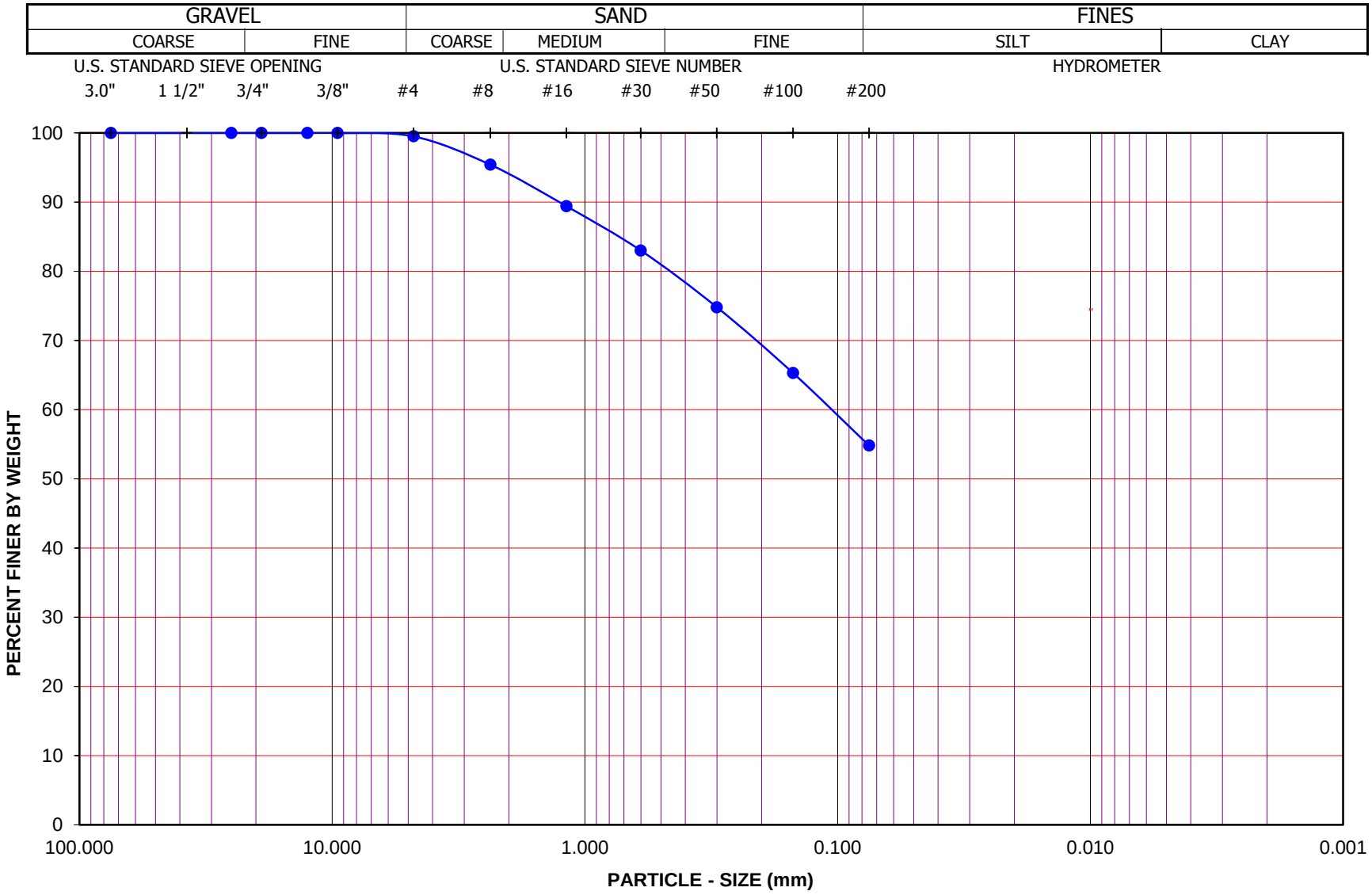
PERCENT PASSING No. 200 SIEVE
ASTM D 1140

Leighton

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Client Name: T&C International Healthcare, Inc.
Tested By: F. Mina Date: 1/25/18

Rev. 08-04

200 Wash; L



Project Name: T&C Skilled Nursing Facility

Project No.: 11888.001

Boring No.: LB-1 Sample No.: B-1

Depth (feet): 0 - 5.0 Soil Type : s(ML)

Soil Identification: Sandy Silt s(ML), Dark Reddish Brown.

GR:SA:FI : (%) 1 : 44 : 55

Leighton

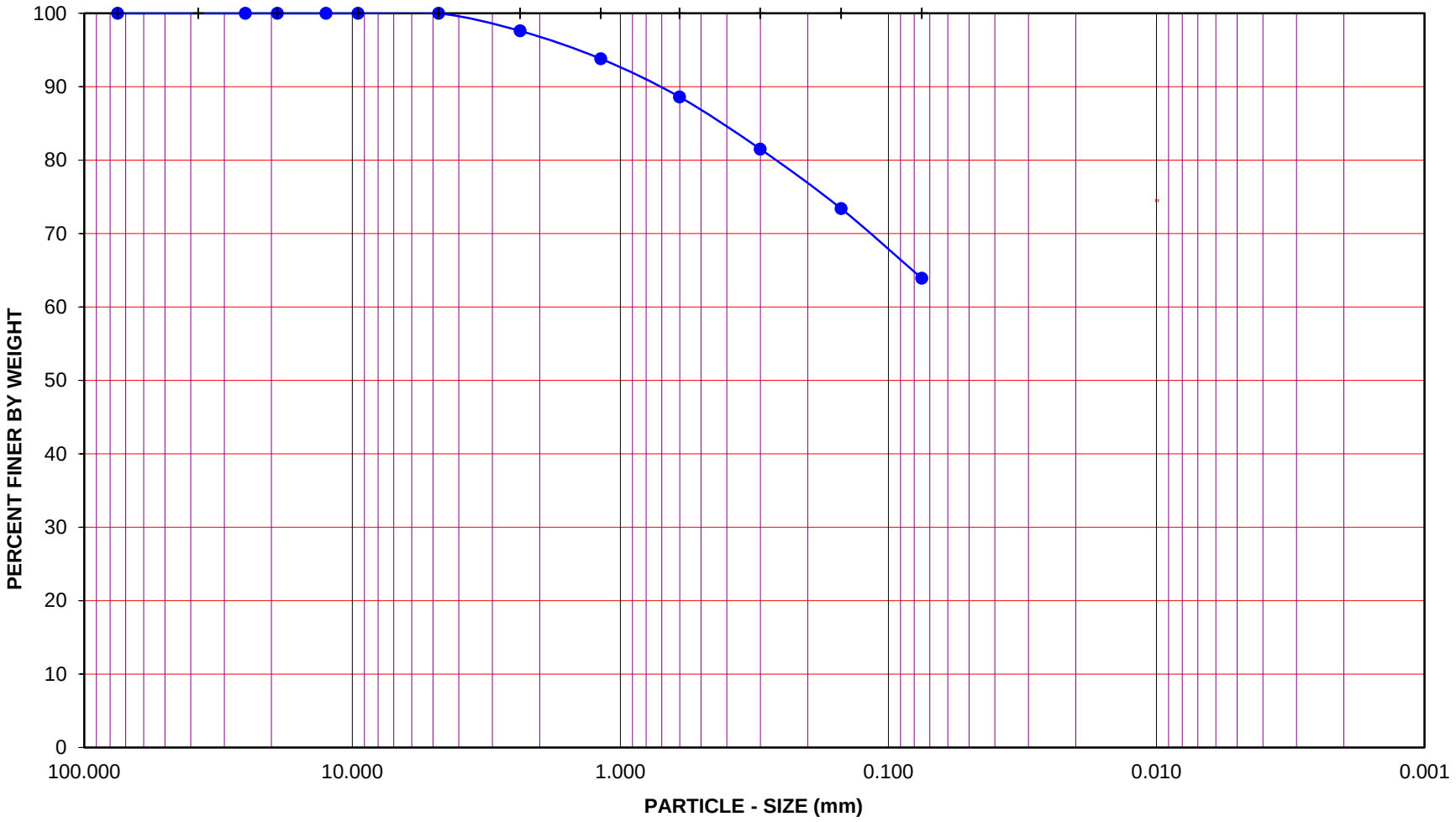
PARTICLE - SIZE DISTRIBUTION ASTM D 6913

Feb-18

Sieve; L

GRAVEL		SAND			FINES	
COARSE	FINE	COARSE	MEDIUM	FINE	SILT	CLAY

U.S. STANDARD SIEVE OPENING: 3.0" 1 1/2" 3/4" 3/8"
U.S. STANDARD SIEVE NUMBER: #4 #8 #16 #30 #50 #100 #200
HYDROMETER



Project Name: T&C Skilled Nursing Facility

Project No.: 11888.001

Boring No.: P-1 Sample No.: S-1

Depth (feet): 3.5 Soil Type : s(ML)

Soil Identification: Sandy Silt s(ML), Reddish Brown.

GR:SA:FI : (%) 0 : 36 : 64

Leighton

PARTICLE - SIZE DISTRIBUTION ASTM D 6913

Feb-18

Leighton

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	T&C Skilled Nursing Facility	Tested By:	F. Mina	Date:	01/29/18
Project No.:	11888.001	Input By:	M. Vinet	Date:	02/02/18
Boring No.:	LB-1	Depth (ft.):	0 - 5.0		
Sample No.:	B-1				
Soil Identification:	Sandy Silt s(ML), Dark Reddish Brown.				

Preparation Method: [X] Moist [ ] Dry — [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03340 *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5663	5720	5660			
Weight of Mold (g)	3542	3542	3542			
Net Weight of Soil (g)	2121	2178	2118			
Wet Weight of Soil + Cont. (g)	2268.8	2333.5	2271.1			
Dry Weight of Soil + Cont. (g)	2120.2	2145.8	2050.9			
Weight of Container (g)	158.0	159.2	163.1			
Moisture Content (%)	7.6	9.4	11.7			
Wet Density (pcf)	140.0	143.8	139.8			
Dry Density (pcf)	130.1	131.3	125.2			

Maximum Dry Density (pcf) 131.5 **Optimum Moisture Content (%)** 9.0

PROCEDURE USED

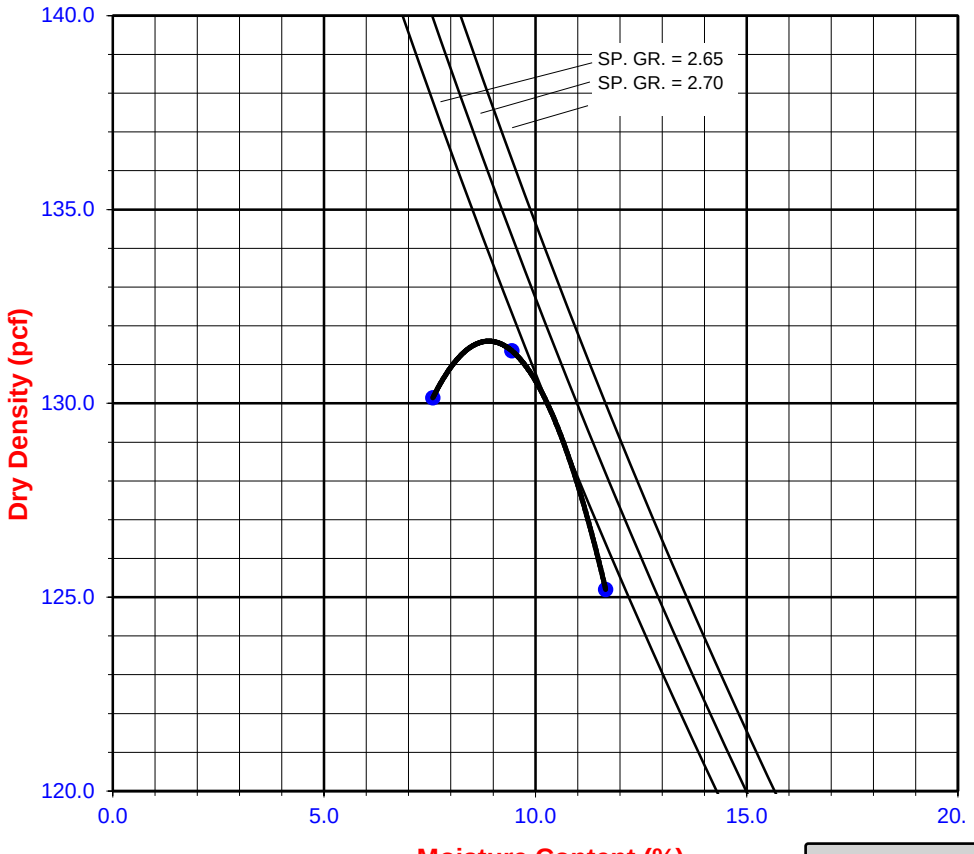
[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
1:44:55
GR:SA:FI

Atterberg Limits:
LL,PL,PI



Leighton

MODIFIED PROCTOR COMPACTION TEST

ASTM D 1557

Project Name:	T&C Skilled Nursing Facility	Tested By:	F. Mina	Date:	01/29/18
Project No.:	11888.001	Input By:	M. Vinet	Date:	02/02/18
Boring No.:	LB-3	Depth (ft.):	5.0 - 1.0		
Sample No.:	B-1				
Soil Identification:	Silty Sand (SM), Dark Reddish Brown.				

Preparation Method: [X] Moist [ ] Dry — [X] Mechanical Ram [ ] Manual Ram

Mold Volume (ft³) 0.03340 *Ram Weight = 10 lb.; Drop = 18 in.*

TEST NO.	1	2	3	4	5	6
Wt. Compacted Soil + Mold (g)	5574	5730	5711			
Weight of Mold (g)	3542	3542	3542			
Net Weight of Soil (g)	2032	2188	2169			
Wet Weight of Soil + Cont. (g)	2173.2	2345.2	2307.1			
Dry Weight of Soil + Cont. (g)	2055.0	2180.1	2110.3			
Weight of Container (g)	144.3	171.1	152.0			
Moisture Content (%)	6.2	8.2	10.0			
Wet Density (pcf)	134.1	144.4	143.2			
Dry Density (pcf)	126.3	133.5	130.1			

Maximum Dry Density (pcf) 133.6 **Optimum Moisture Content (%)** 8.4

PROCEDURE USED

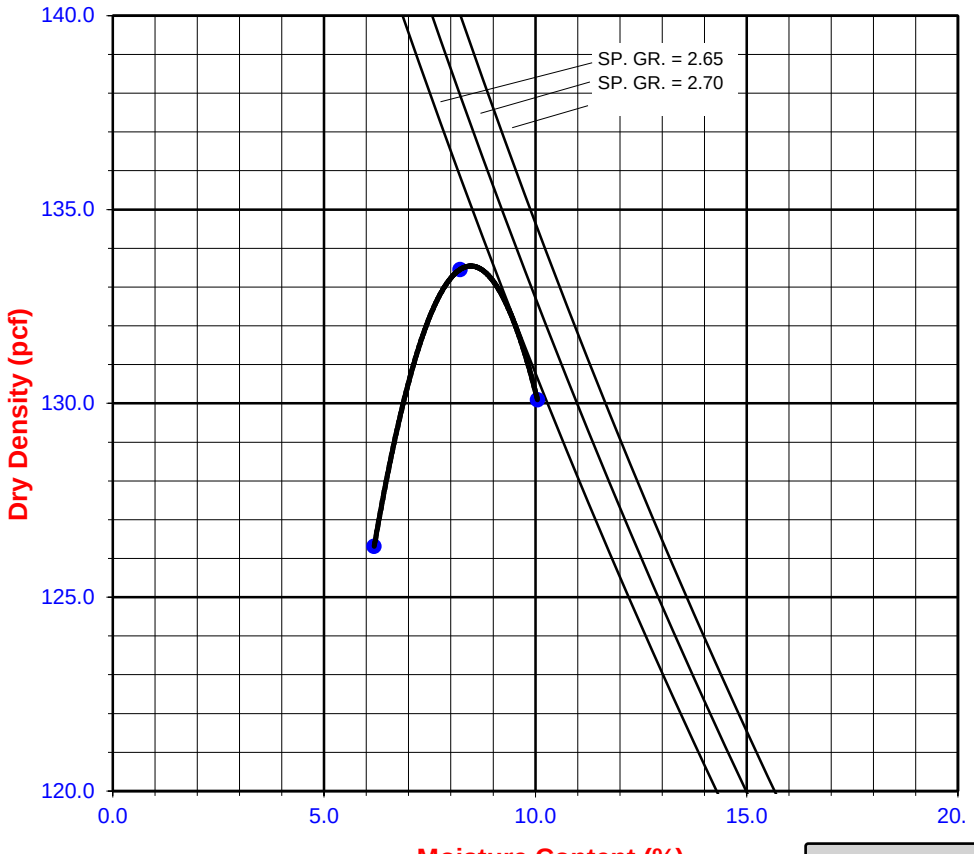
[X] **Procedure A**
Soil Passing No. 4 (4.75 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
May be used if +#4 is 20% or less

[ ] **Procedure B**
Soil Passing 3/8 in. (9.5 mm) Sieve
Mold : 4 in. (101.6 mm) diameter
Layers : 5 (Five)
Blows per layer : 25 (twenty-five)
Use if +#4 is >20% and +3/8 in. is 20% or less

[ ] **Procedure C**
Soil Passing 3/4 in. (19.0 mm) Sieve
Mold : 6 in. (152.4 mm) diameter
Layers : 5 (Five)
Blows per layer : 56 (fifty-six)
Use if +3/8 in. is >20% and +¾ in. is <30%

Particle-Size Distribution:
GR:SA:FI

Atterberg Limits:
LL,PL,PI



Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-2**
Sample No.: **R-1**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 2.5

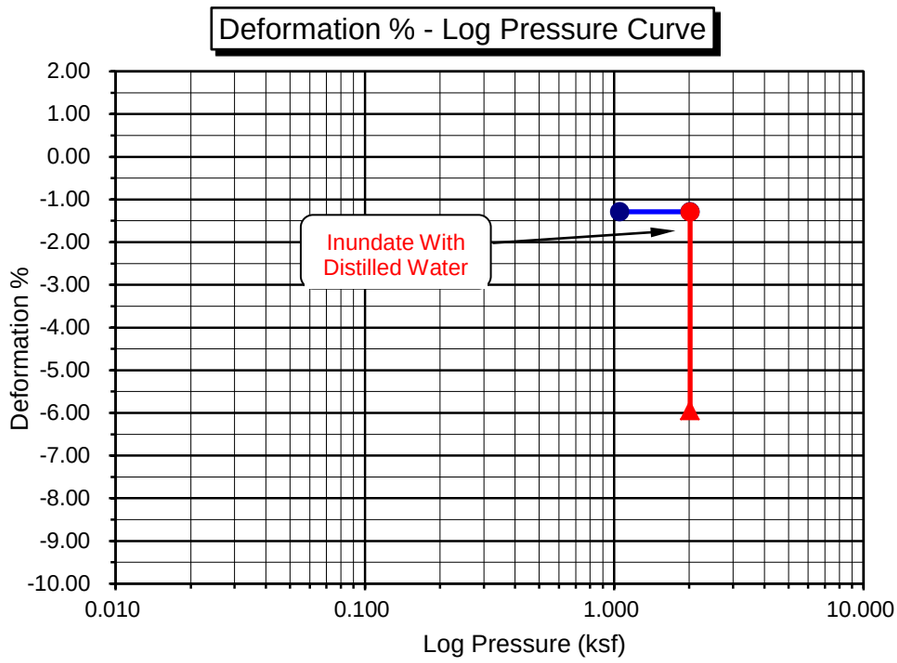
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	110.8
Initial Moisture (%):	6.2
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	117.8
Final Moisture (%) :	14.0
Initial Void ratio:	0.5217
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	31.8

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0129	0.9871	0.00	-1.29	0.5021	-1.29
2.013	0.0129	0.9871	0.00	-1.29	0.5021	-1.29
H2O	0.0595	0.9405	0.00	-5.95	0.4311	-5.95

Percent Swell / Settlement After Inundation = -4.72



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-2**
Sample No.: **R-2**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 5.0

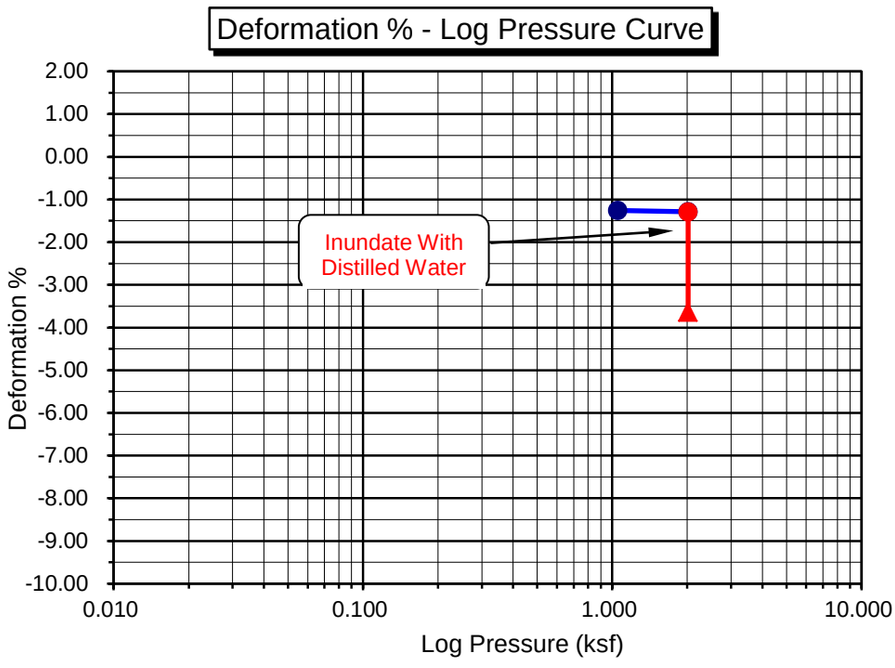
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	114.7
Initial Moisture (%):	10.4
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	119.0
Final Moisture (%) :	14.6
Initial Void ratio:	0.4699
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	59.5

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0126	0.9874	0.00	-1.26	0.4513	-1.26
2.013	0.0129	0.9871	0.00	-1.29	0.4509	-1.29
H2O	0.0364	0.9636	0.00	-3.64	0.4164	-3.64

Percent Swell / Settlement After Inundation = -2.38



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-3**
Sample No.: **R-3**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 10.0

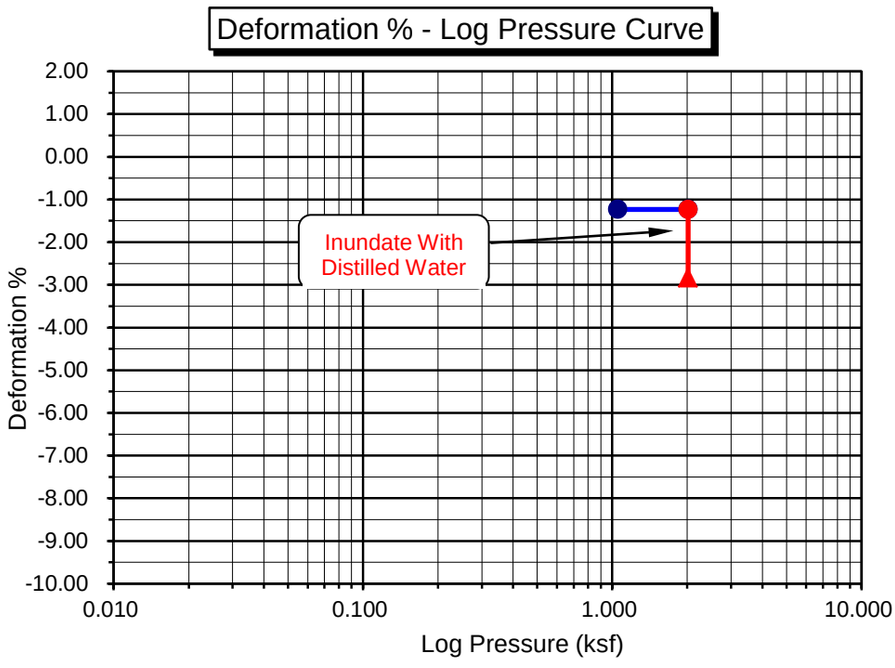
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	111.3
Initial Moisture (%):	11.7
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	114.5
Final Moisture (%) :	17.0
Initial Void ratio:	0.5149
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	61.5

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0123	0.9877	0.00	-1.23	0.4962	-1.23
2.013	0.0123	0.9877	0.00	-1.23	0.4962	-1.23
H2O	0.0284	0.9716	0.00	-2.84	0.4718	-2.84

Percent Swell / Settlement After Inundation = -1.63



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-4**
Sample No.: **R-1**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 2.5

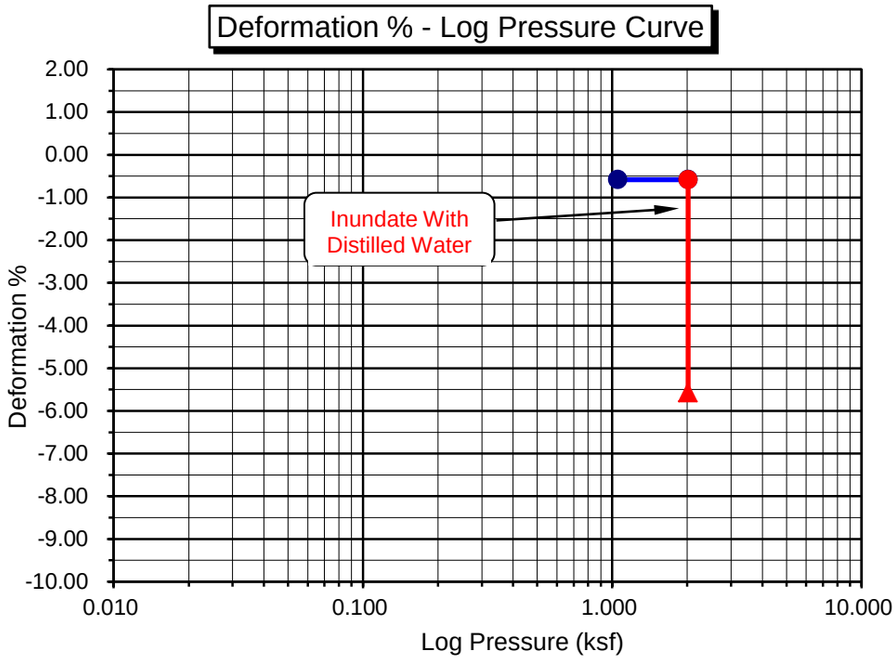
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	103.0
Initial Moisture (%):	8.9
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	109.0
Final Moisture (%) :	18.5
Initial Void ratio:	0.6371
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	37.6

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0058	0.9942	0.00	-0.58	0.6276	-0.58
2.013	0.0058	0.9942	0.00	-0.58	0.6276	-0.58
H2O	0.0558	0.9442	0.00	-5.58	0.5458	-5.58

Percent Swell / Settlement After Inundation = -5.03



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-4**
Sample No.: **R-2**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/26/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 5.0

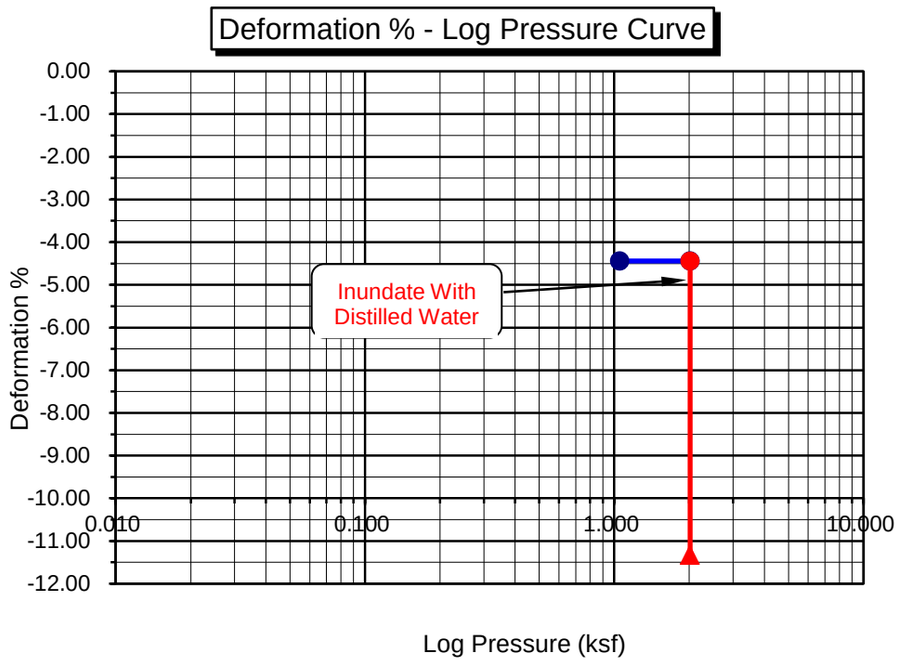
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	101.7
Initial Moisture (%):	7.1
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	114.7
Final Moisture (%) :	15.3
Initial Void ratio:	0.6572
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	29.2

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0444	0.9556	0.00	-4.44	0.5836	-4.44
2.013	0.0444	0.9556	0.00	-4.44	0.5836	-4.44
H2O	0.1134	0.8866	0.00	-11.34	0.4693	-11.34

Percent Swell / Settlement After Inundation = -7.22



Rev. 01-10

Leighton

One-Dimensional Swell or Settlement Potential of Cohesive Soils

(ASTM D 4546) -- Method 'B'

Project Name: T&C Skilled Nursing Facility
Project No.: 11888.001
Boring No.: **LB-6**
Sample No.: **R-2**
Sample Description: Silty Sand (SM), Reddish Brown.

Tested By: M. Vinet Date: 1/30/18
Checked By: M. Vinet Date: 2/2/18
Sample Type: IN SITU
Depth (ft.) 5.0

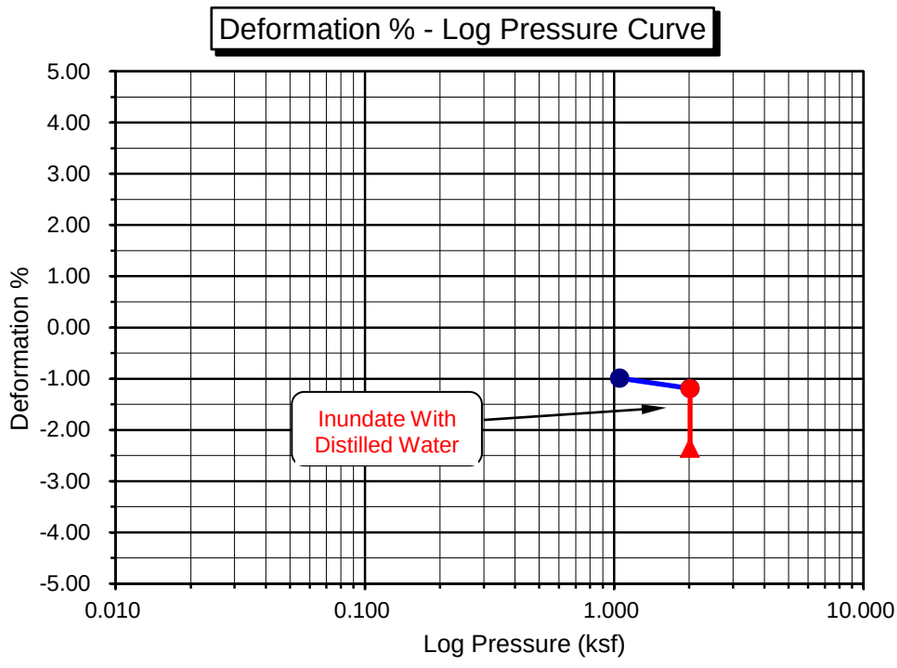
Source and Type of Water Used for Inundation: Arrowhead (Distilled)
** Note: Loading After Wetting (Inundation) not Performed Using this Test Method.

Initial Dry Density (pcf):	113.8
Initial Moisture (%):	10.4
Initial Height (in.):	1.0000
Initial Dial Reading (in):	0.0000
Inside Diameter of Ring (in):	2.416

Final Dry Density (pcf):	116.5
Final Moisture (%) :	14.1
Initial Void ratio:	0.4817
Specific Gravity (assumed):	2.70
Initial Degree of Saturation (%):	58.1

Pressure (p) (ksf)	Final Reading (in)	Apparent Thickness (in)	Load Compliance (%)	Swell (+) Settlement (-) % of Sample Thickness	Void Ratio	Corrected Deformation (%)
1.050	0.0099	0.9901	0.00	-0.99	0.4670	-0.99
2.013	0.0119	0.9881	0.00	-1.19	0.4640	-1.19
H2O	0.0236	0.9764	0.00	-2.36	0.4467	-2.36

Percent Swell / Settlement After Inundation = -1.18



Rev. 01-10

Leighton

EXPANSION INDEX of SOILS

ASTM D 4829

Project Name:	T&C Skilled Nursing Facility	Tested By:	F. Mina	Date:	1/22/18
Project No. :	11888.001	Checked By:	M. Vinet	Date:	2/2/18
Boring No.:	LB-1	Depth:	0 - 5.0		
Sample No. :	B-1	Location:	N/A		
Sample Description:	Sandy Silt s(ML), Dark Reddish Brown.				

Dry Wt. of Soil + Cont. (gm.)	1988.7
Wt. of Container No. (gm.)	0.0
Dry Wt. of Soil (gm.)	1988.7
Weight Soil Retained on #4 Sieve	7.1
Percent Passing # 4	99.6

MOLDED SPECIMEN	Before Test	After Test
Specimen Diameter (in.)	4.01	4.01
Specimen Height (in.)	1.0000	1.0304
Wt. Comp. Soil + Mold (gm.)	629.5	656.4
Wt. of Mold (gm.)	209.1	209.1
Specific Gravity (Assumed)	2.70	2.70
Container No.	7	7
Wet Wt. of Soil + Cont. (gm.)	444.3	656.4
Dry Wt. of Soil + Cont. (gm.)	421.3	388.2
Wt. of Container (gm.)	144.3	209.1
Moisture Content (%)	8.3	15.2
Wet Density (pcf)	126.8	130.9
Dry Density (pcf)	117.1	113.6
Void Ratio	0.440	0.484
Total Porosity	0.305	0.326
Pore Volume (cc)	63.2	69.5
Degree of Saturation (%) [S meas]	**51.0**	**85.0**

SPECIMEN INUNDATION in distilled water for the period of 24 h or expansion rate < 0.0002 in./h.

Date	Time	Pressure (psi)	Elapsed Time (min.)	Dial Readings (in.)
1/22/18	11:00	1.0	0	0.5000
1/22/18	11:10	1.0	10	0.5000
	Add Distilled Water to the Specimen			
1/23/18	8:00	1.0	1250	0.5304
1/23/18	9:00	1.0	1310	0.5304

Expansion Index (EI meas) = ((Final Rdg - Initial Rdg) / Initial Thick.) x 1000	30.4
Expansion Index (Report) = Nearest Whole Number or Zero (0) if Initial Height is > than Final Heigh	**30**

Rev. 03-08

• ANALYSIS
• DESIGN

LaBelle • Marvin
PROFESSIONAL PAVEMENT ENGINEERING
A CALIFORNIA CORPORATION

• SOILS, ASPHALT
TECHNOLOGY

January 31, 2018

Mr. George Ruiz
Leighton Consulting, Inc.
17781 Cowan
Irvine, CA 92614

Project No. 43225

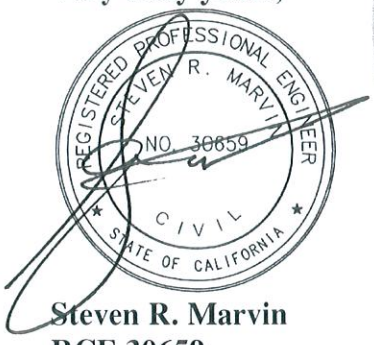
Dear Mr. Ruiz:

Laboratory testing of the bulk soil samples delivered to our laboratory on 1/30/2018 has been completed.

Reference:	P.N. 11888.001
Project:	T&C Skilled Nursing Facility GE
Samples:	LB-1 / B-1 @ 0'-5'
	LB-6 / B-1 @ 0'-5'

A tabulation of test data is transmitted herewith for your use and information. Any untested portion of the sample will be retained for a period of 60 days prior to disposal. The opportunity to be of services is appreciated and should you have any questions, kindly call.

Very truly yours,



Steven R. Marvin
RCE 30659

SRM:tw
Enclosures

LaBelle Marvin

R - VALUE DATA SHEET

PROJECT No. 43225

DATE: 1/31/2018

BORING NO. LB-1/B-1 @ 0'-5'

T&C Skilled Nursing Facility GE

P.N. 11888.001

SAMPLE DESCRIPTION: Brown Silt

R-VALUE TESTING DATA | CA TEST 301

	SPECIMEN ID		
	a	b	c
Mold ID Number	13	14	15
Water added, grams	94	58	68
Initial Test Water, %	14.2	10.6	11.6
Compact Gage Pressure,psi	40	110	70
Exudation Pressure, psi	128	799	231
Height Sample, Inches	2.53	2.35	2.42
Gross Weight Mold, grams	3084	3018	3029
Tare Weight Mold, grams	1969	1940	1944
Sample Wet Weight, grams	1115	1078	1085
Expansion, Inches x 10exp-4	2	40	27
Stability 2,000 lbs (160psi)	51 / 125	28 / 59	33 / 80
Turns Displacement	4.98	4.12	4.93
R-Value Uncorrected	12	51	34
R-Value Corrected	12	47	32
Dry Density, pcf	116.9	125.7	121.7

DESIGN CALCULATION DATA

Traffic Index	Assumed:	4.0	4.0	4.0
G.E. by Stability		0.90	0.54	0.70
G. E. by Expansion		0.07	1.33	0.90

Equilibrium R-Value	**29** by EXPANSION	Examined & Checked: 1 /31/ 18
REMARKS:	Gf = 1.25 0.0% Retained on the 3/4" Sieve.	Steven R. Marvin, RCE 30659

REGISTERED PROFESSIONAL ENGINEER STEVEN R. MARVIN C 30659 CIVIL STATE OF CALIFORNIA

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

R-VALUE GRAPHICAL PRESENTATION

LaBelle Marvin

PROJECT NO. 43225

DATE: 1 /31/ 18

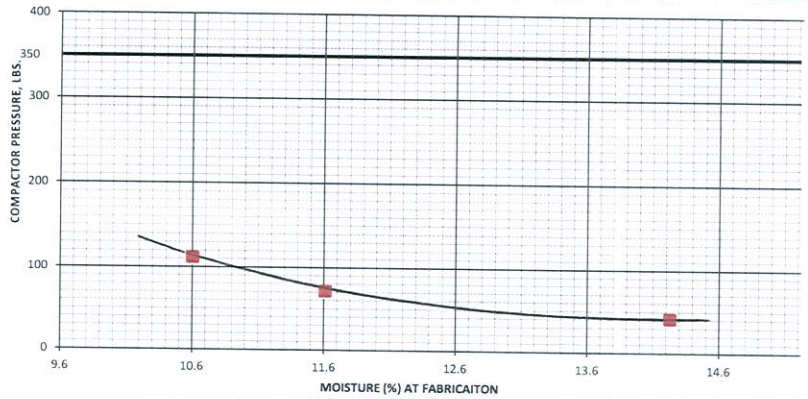
REMARKS:

BORING NO. LB-1/B-1 @ 0'-5'

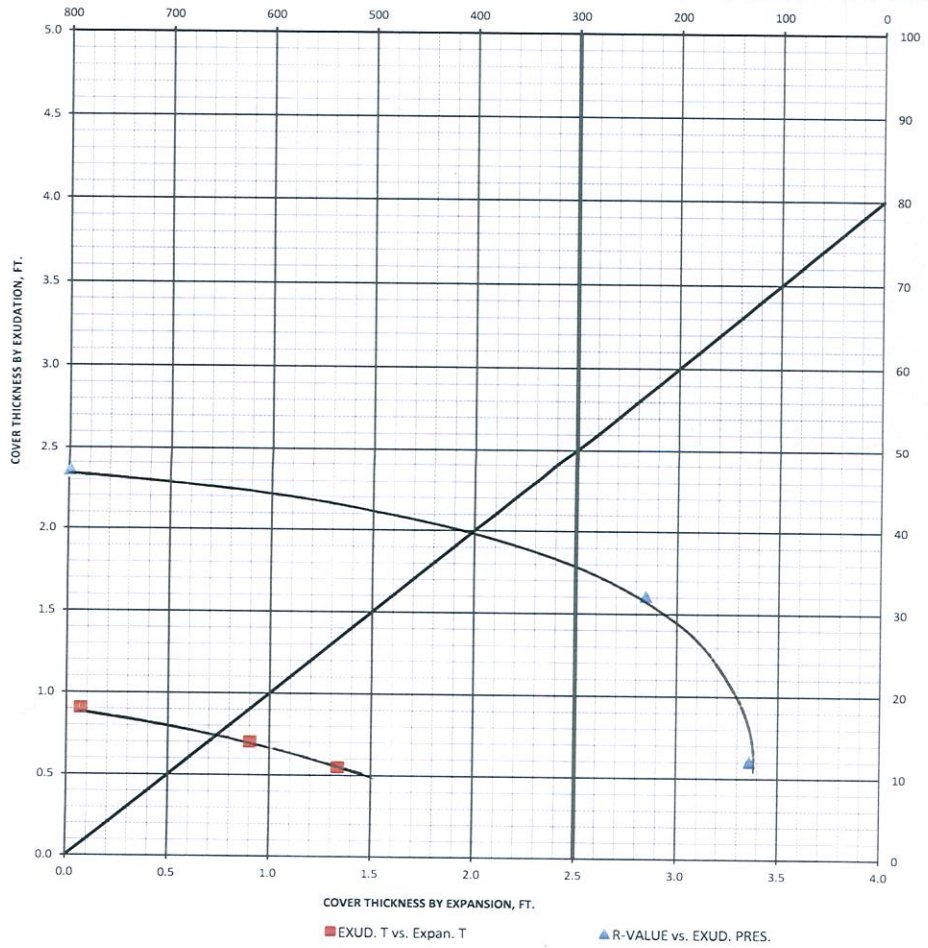
T&C Skilled Nursing Facility GE

P.N. 11888.001

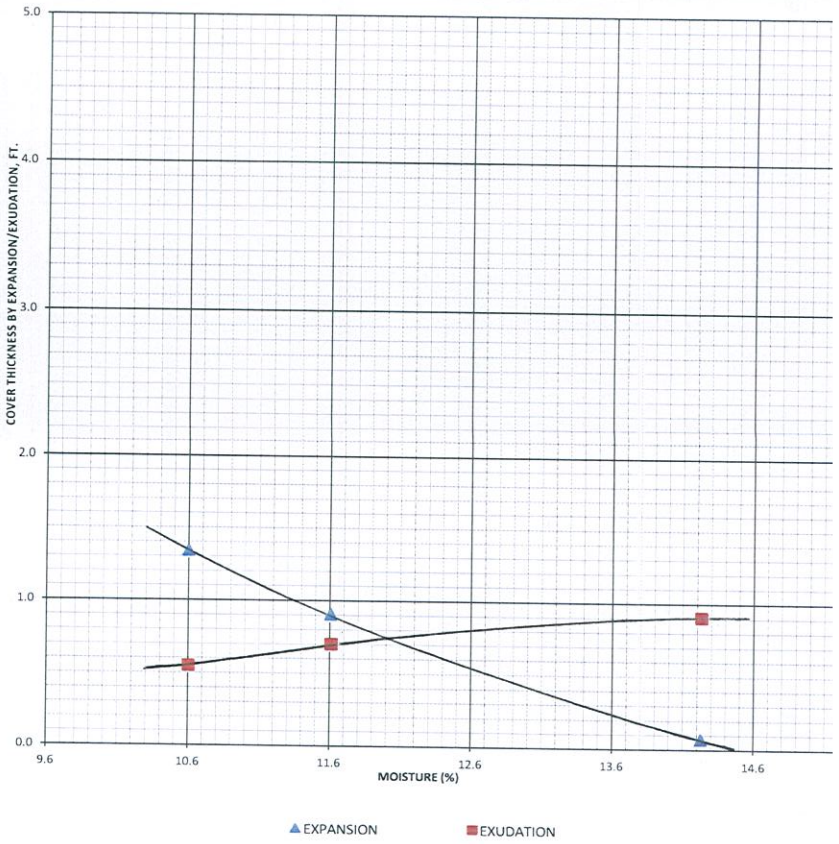
COMPACTOR PRESSURE vs MOISTURE %



COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



COVER THICKNESS vs MOISTURE %



LaBelle Marvin

R - VALUE DATA SHEET

PROJECT No. 43225

DATE: 1/31/2018

BORING NO. LB-6/B-1 @ 0'-5'

T&C Skilled Nursing Facility GE

P.N. 11888.001

SAMPLE DESCRIPTION: Brown Silt

R-VALUE TESTING DATA | CA TEST 301

	SPECIMEN ID		
	a	b	c
Mold ID Number	16	17	18
Water added, grams	68	39	30
Initial Test Water, %	13.1	10.2	9.4
Compact Gage Pressure,psi	40	70	100
Exudation Pressure, psi	144	301	425
Height Sample, Inches	2.52	2.41	2.36
Gross Weight Mold, grams	3077	3050	3049
Tare Weight Mold, grams	1948	1942	1956
Sample Wet Weight, grams	1129	1108	1093
Expansion, Inches x 10exp-4	0	25	45
Stability 2,000 lbs (160psi)	56 / 131	29 / 62	22 / 48
Turns Displacement	4.58	4.53	4.43
R-Value Uncorrected	11	47	57
R-Value Corrected	11	45	53
Dry Density, pcf	120.0	126.4	128.3

DESIGN CALCULATION DATA

Traffic Index	Assumed:	4.0	4.0	4.0
G.E. by Stability		0.91	0.56	0.48
G. E. by Expansion		0.00	0.83	1.50

Equilibrium R-Value	**40** by EXPANSION	Examined & Checked: 1 /31/ 18
REMARKS:	Gf = 1.25 0.0% Retained on the 3/4" Sieve.	Steven R. Marvin, RCE 30659

The data above is based upon processing and testing samples as received from the field. Test procedures in accordance with latest revisions to Department of Transportation, State of California, Materials & Research Test Method No. 301.

LaBelle Marvin

R-VALUE GRAPHICAL PRESENTATION

PROJECT NO. 43225

DATE: 1 /31/ 18

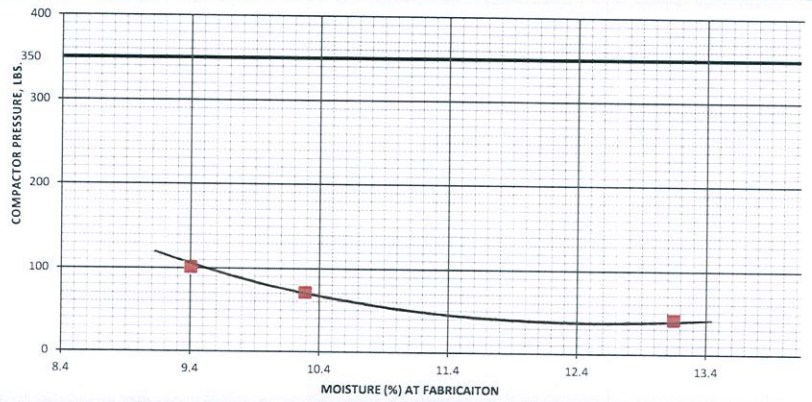
REMARKS:

BORING NO. LB-6/B-1 @ 0'-5'

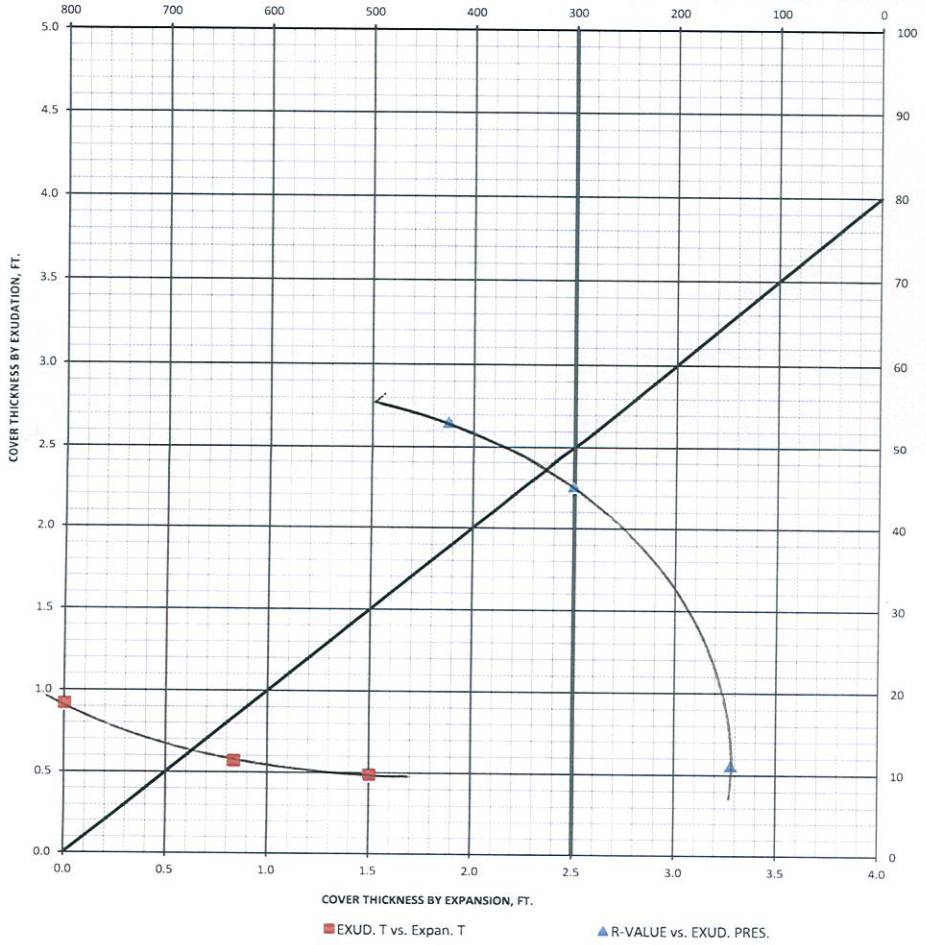
T&C Skilled Nursing Facility GE

P.N. 11888.001

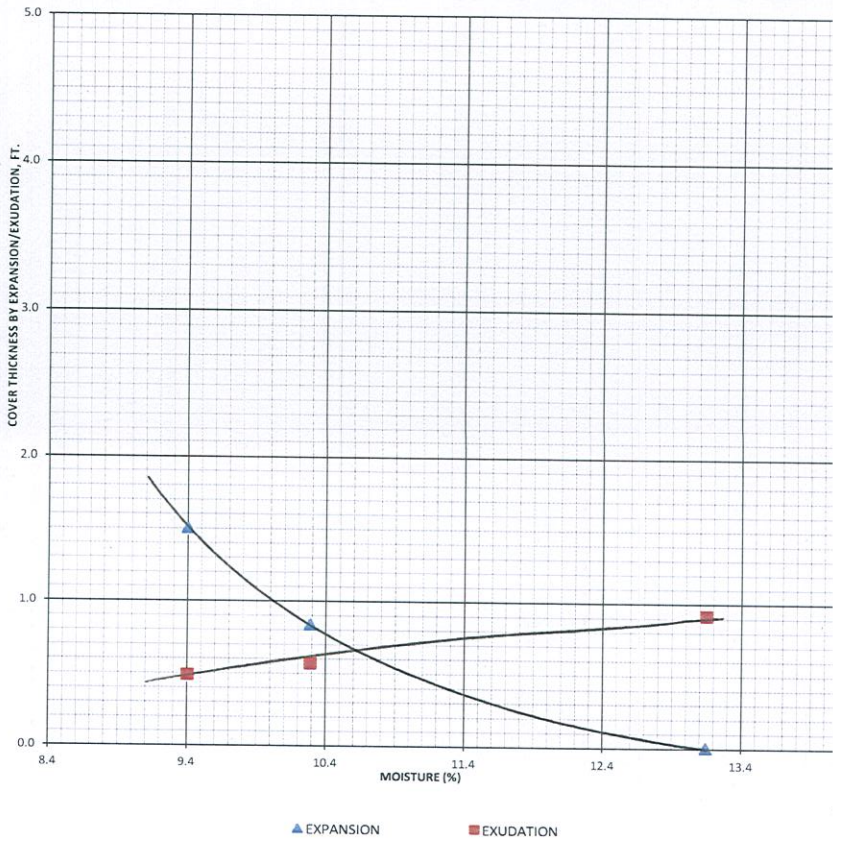
COMPACTOR PRESSURE vs MOISTURE %



COVER THICKNESS BY EXUDATION vs COVER THICKNESS BY EXPANSION



COVER THICKNESS vs MOISTURE %



Leighton

TESTS for SULFATE CONTENT CHLORIDE CONTENT and pH of SOILS

Project Name: T&C Skilled Nursing Facility Tested By : G. Berdy Date: 01/24/18

Project No. : 11888.001 Data Input By: J. Ward Date: 02/01/18

Boring No.	LB-4	LB-6		
Sample No.	B-1	B-1		
Sample Depth (ft)	0-5	0-5		
Soil Identification:	Dark brown SC	Dark brown SC-SM		
Wet Weight of Soil + Container (g)	224.05	204.76		
Dry Weight of Soil + Container (g)	222.04	194.92		
Weight of Container (g)	58.32	52.57		
Moisture Content (%)	1.23	6.91		
Weight of Soaked Soil (g)	100.21	100.36		

SULFATE CONTENT, DOT California Test 417, Part II

Beaker No.	16	151		
Crucible No.	15	23		
Furnace Temperature (°C)	860	860		
Time In / Time Out	9:00/9:45	9:00/9:45		
Duration of Combustion (min)	45	45		
Wt. of Crucible + Residue (g)	25.5544	23.3670		
Wt. of Crucible (g)	25.5514	23.3638		
Wt. of Residue (g) (A)	0.0030	0.0032		
PPM of Sulfate (A) x 41150	123.45	131.68		
PPM of Sulfate, Dry Weight Basis	**125**	**141**		

CHLORIDE CONTENT, DOT California Test 422

ml of Extract For Titration (B)	15	15		
ml of AgNO3 Soln. Used in Titration (C)	0.3	0.4		
PPM of Chloride (C -0.2) * 100 * 30 / B	20	40		
PPM of Chloride, Dry Wt. Basis	**20**	**43**		

pH TEST, DOT California Test 643

pH Value	**7.69**	**7.59**		
Temperature °C	21.7	21.6		

Leighton

SOIL RESISTIVITY TEST

DOT CA TEST 643

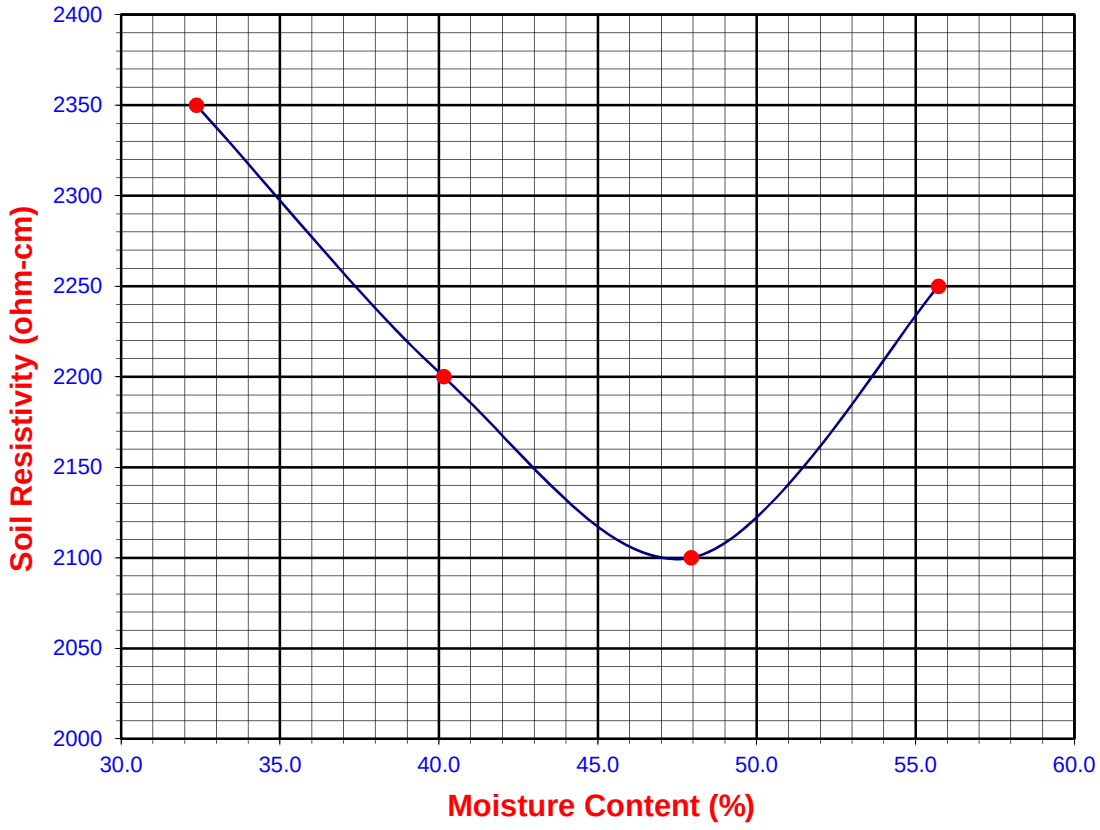
Project Name: T&C Skilled Nursing Facility
Tested By : G. Berdy Date: 01/29/18
Project No. : 11888.001
Data Input By: J. Ward Date: 02/01/18
Boring No.: LB-4
Depth (ft.) : 0-5
Sample No. : B-1
Soil Identification:* Dark brown SC

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	40	32.37	2350	2350
2	50	40.15	2200	2200
3	60	47.94	2100	2100
4	70	55.72	2250	2250
5				

Moisture Content (%) (MCi)	1.23
Wet Wt. of Soil + Cont. (g)	224.05
Dry Wt. of Soil + Cont. (g)	222.04
Wt. of Container (g)	58.32
Container No.	
Initial Soil Wt. (g) (Wt)	130.03
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
2100	**47.5**	**125**	**20**	**7.69**	**21.7**



Leighton

SOIL RESISTIVITY TEST

DOT CA TEST 643

Project Name:	T&C Skilled Nursing Facility		Tested By :	G. Berdy	Date: 01/29/18
Project No. :	11888.001		Data Input By:	J. Ward	Date: 02/01/18
Boring No.:	LB-6		Depth (ft.) :	0-5	
Sample No. :	B-1				

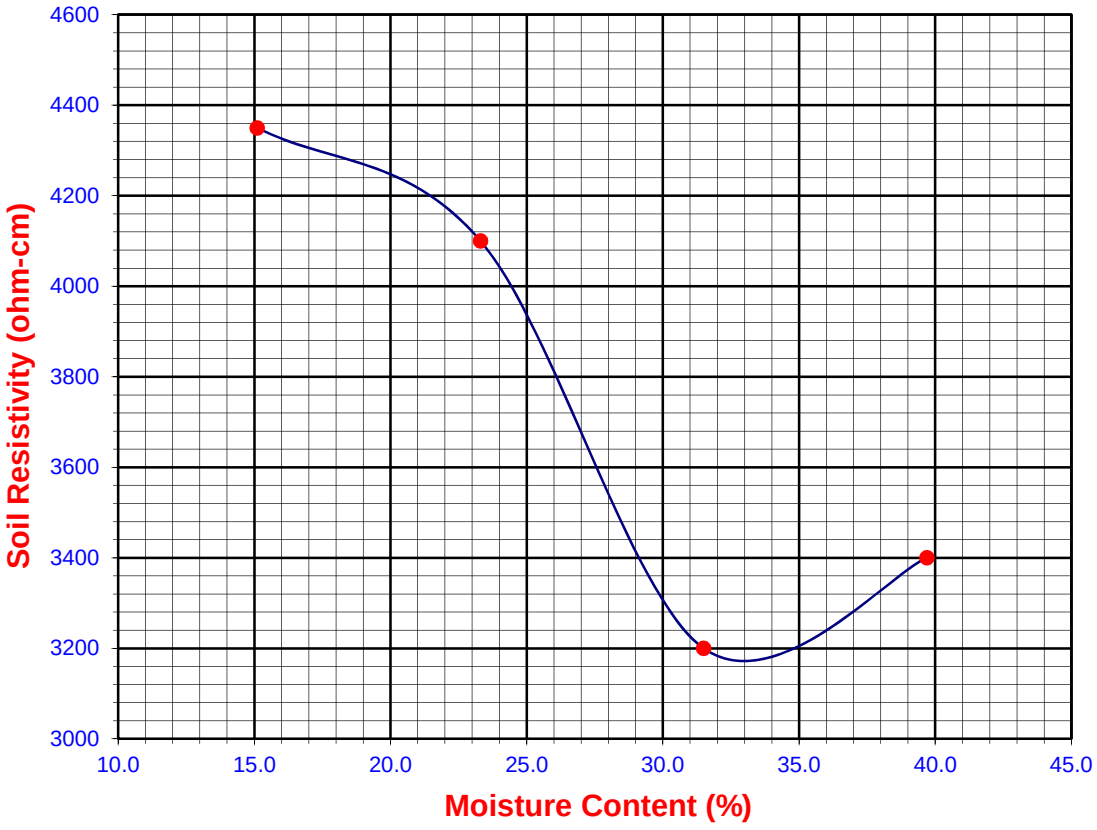
Soil Identification:* Dark brown SC-SM

*California Test 643 requires soil specimens to consist only of portions of samples passing through the No. 8 US Standard Sieve before resistivity testing. Therefore, this test method may not be representative for coarser materials.

Specimen No.	Water Added (ml) (Wa)	Adjusted Moisture Content (MC)	Resistance Reading (ohm)	Soil Resistivity (ohm-cm)
1	10	15.11	4350	4350
2	20	23.30	4100	4100
3	30	31.50	3200	3200
4	40	39.70	3400	3400
5				

Moisture Content (%) (MCi)	6.91
Wet Wt. of Soil + Cont. (g)	204.76
Dry Wt. of Soil + Cont. (g)	194.92
Wt. of Container (g)	52.57
Container No.	
Initial Soil Wt. (g) (Wt)	130.45
Box Constant	1.000
MC =(((1+Mci/100)x(Wa/Wt+1))-1)x100	

Min. Resistivity (ohm-cm)	Moisture Content (%)	Sulfate Content (ppm)	Chloride Content (ppm)	Soil pH	
				pH	Temp. (°C)
DOT CA Test 643		DOT CA Test 417 Part II	DOT CA Test 422	DOT CA Test 643	
3160	**33.0**	**141**	**43**	**7.59**	**21.6**



APPENDIX C

LIQUEFACTION ANALYSIS

1.t

USGS Design Maps Summary Report

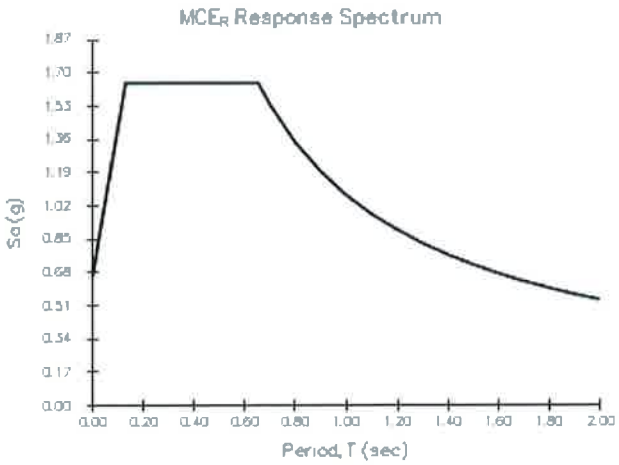
User–Specified Input

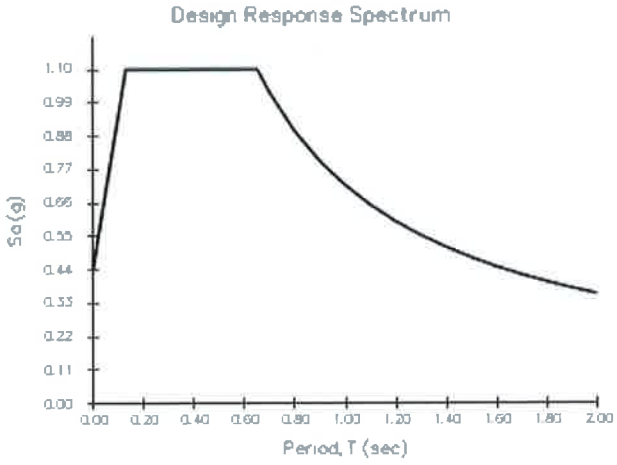
Report Title	T & C Skilled Nursing Facility Fri January 12, 2018 21:47:28 UTC
Building Code Reference Document	ASCE 7-10 Standard (which utilizes USGS hazard data available in 2008)
Site Coordinates	33.9184°N, 117.216°W
Site Soil Classification	Site Class D – "Stiff Soil"
Risk Category	IV (e.g. essential facilities)

USGS–Provided Output

S_S =	1.649 g	S_{MS} =	1.649 g	S_{DS} =	1.100 g
S_1 =	0.718 g	S_{M1} =	1.076 g	S_{D1} =	0.718 g

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.





For PGA_M, T_L, C_{RS}, and C_{R1} values, please view the detailed report.

USGS Design Maps Detailed Report

ASCE 7-10 Standard (33.9184°N, 117.216°W)

Site Class D – "Stiff Soil", Risk Category IV (e.g. essential facilities)

Section 11.4.1 — Mapped Acceleration Parameters

Note: Ground motion values provided below are for the direction of maximum horizontal spectral response acceleration. They have been converted from corresponding geometric mean ground motions computed by the USGS by applying factors of 1.1 (to obtain S_s) and 1.3 (to obtain S_1). Maps in the 2010 ASCE-7 Standard are provided for Site Class B. Adjustments for other Site Classes are made, as needed, in Section 11.4.3.

From Figure 22-1 [1] $S_s = 1.649$ g

From Figure 22-2 [2] $S_1 = 0.718$ g

Section 11.4.2 — Site Class

The authority having jurisdiction (not the USGS), site-specific geotechnical data, and/or the default has classified the site as Site Class D, based on the site soil properties in accordance with Chapter 20.

Table 20.3-1 Site Classification

Site Class	$\bar{v}_s$	$\bar{N}$ or $\bar{N}_{ch}$	$\bar{s}_u$
A. Hard Rock	>5,000 ft/s	N/A	N/A
B. Rock	2,500 to 5,000 ft/s	N/A	N/A
C. Very dense soil and soft rock	1,200 to 2,500 ft/s	>50	>2,000 psf
D. Stiff Soil	600 to 1,200 ft/s	15 to 50	1,000 to 2,000 psf
E. Soft clay soil	<600 ft/s	<15	<1,000 psf
	Any profile with more than 10 ft of soil having the characteristics: • Plasticity index PI > 20, • Moisture content $w \geq 40\%$, and • Undrained shear strength $\bar{s}_u$ < 500 psf		
F. Soils requiring site response analysis in accordance with Section 21.1	See Section 20.3.1		

For SI: 1ft/s = 0.3048 m/s 1lb/ft² = 0.0479 kN/m²

Section 11.4.3 — Site Coefficients and Risk-Targeted Maximum Considered Earthquake (MCE_R) Spectral Response Acceleration Parameters

Table 11.4-1: Site Coefficient F_a

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at Short Period				
	$S_S \leq 0.25$	$S_S = 0.50$	$S_S = 0.75$	$S_S = 1.00$	$S_S \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_S

For Site Class = D and S_s = 1.649 g, F_a = 1.000

Table 11.4-2: Site Coefficient F_v

Site Class	Mapped MCE_R Spectral Response Acceleration Parameter at 1-s Period				
	$S_1 \leq 0.10$	$S_1 = 0.20$	$S_1 = 0.30$	$S_1 = 0.40$	$S_1 \geq 0.50$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.7	1.6	1.5	1.4	1.3
D	2.4	2.0	1.8	1.6	1.5
E	3.5	3.2	2.8	2.4	2.4
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of S_1

For Site Class = D and S_1 = 0.718 g, F_v = 1.500

Equation (11.4–1): $S_{MS} = F_a S_S = 1.000 \times 1.649 = 1.649$ g

Equation (11.4–2): $S_{M1} = F_v S_1 = 1.500 \times 0.718 = 1.076$ g

Section 11.4.4 — Design Spectral Acceleration Parameters

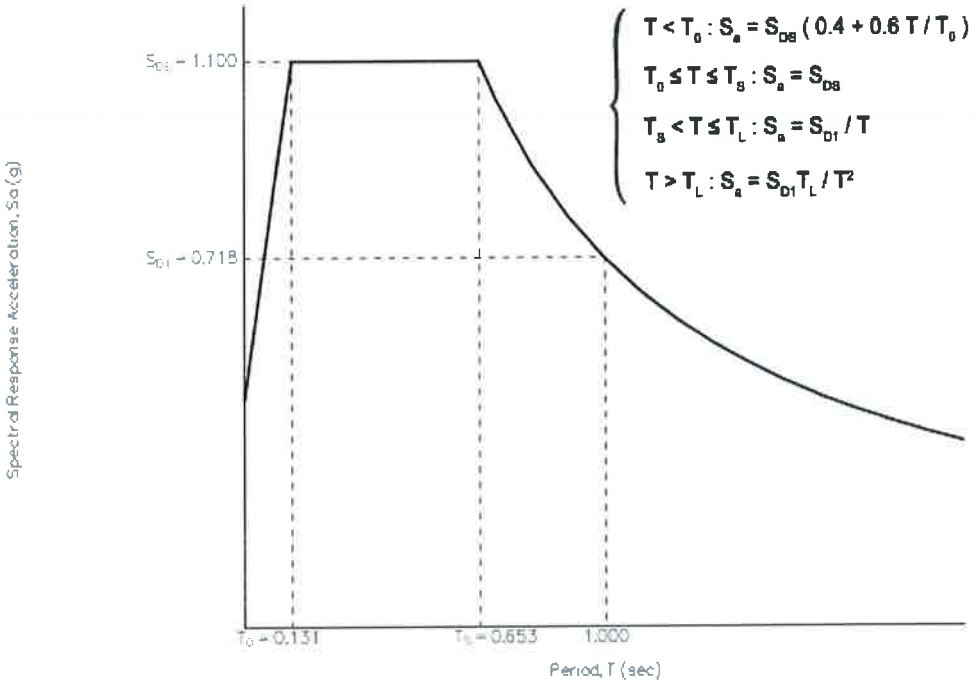
Equation (11.4–3): $S_{DS} = \frac{2}{3} S_{MS} = \frac{2}{3} \times 1.649 = 1.100$ g

Equation (11.4–4): $S_{D1} = \frac{2}{3} S_{M1} = \frac{2}{3} \times 1.076 = 0.718$ g

Section 11.4.5 — Design Response Spectrum

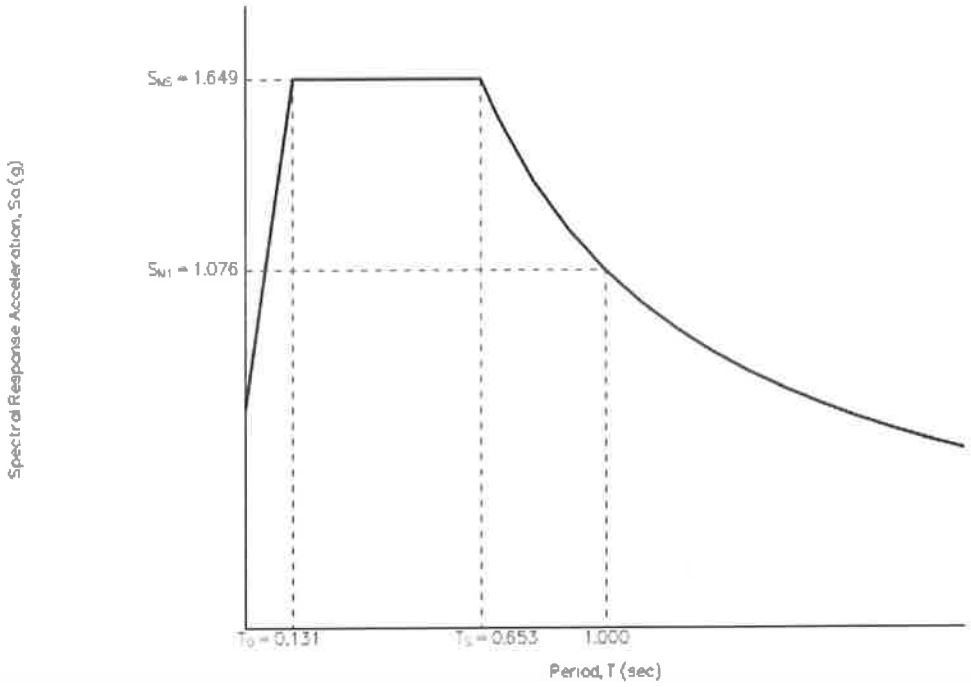
From Figure 22-12 [3] $T_L = 8$ seconds

Figure 11.4–1: Design Response Spectrum



Section 11.4.6 — Risk-Targeted Maximum Considered Earthquake (MCE_R) Response Spectrum

The MCE_R Response Spectrum is determined by multiplying the design response spectrum above by 1.5.



1.t

Section 11.8.3 — Additional Geotechnical Investigation Report Requirements for Seismic Design Categories D through F

From Figure 22-7 [4] PGA = 0.649

Equation (11.8-1): $PGA_M = F_{PGA}PGA = 1.000 \times 0.649 = 0.649$ g

Table 11.8-1: Site Coefficient F_{PGA}

Site Class	Mapped MCE Geometric Mean Peak Ground Acceleration, PGA				
	PGA ≤ 0.10	PGA = 0.20	PGA = 0.30	PGA = 0.40	PGA ≥ 0.50
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9
F	See Section 11.4.7 of ASCE 7				

Note: Use straight-line interpolation for intermediate values of PGA

For Site Class = D and PGA = 0.649 g, F_{PGA} = 1.000

Section 21.2.1.1 — Method 1 (from Chapter 21 – Site-Specific Ground Motion Procedures for Seismic Design)

From Figure 22-17 [5] C_{RS} = 1.021

From Figure 22-18 [6] C_{R1} = 0.989

Section 11.6 — Seismic Design Category

Table 11.6-1 Seismic Design Category Based on Short Period Response Acceleration Parameter

VALUE OF S_{DS}	RISK CATEGORY		
	I or II	III	IV
$S_{DS} < 0.167g$	A	A	A
$0.167g \le S_{DS} < 0.33g$	B	B	C
$0.33g \le S_{DS} < 0.50g$	C	C	D
$0.50g \le S_{DS}$	D	D	D

For Risk Category = IV and S_{DS} = 1.100 g, Seismic Design Category = D

Table 11.6-2 Seismic Design Category Based on 1-S Period Response Acceleration Parameter

VALUE OF S_{D1}	RISK CATEGORY		
	I or II	III	IV
$S_{D1} < 0.067g$	A	A	A
$0.067g \le S_{D1} < 0.133g$	B	B	C
$0.133g \le S_{D1} < 0.20g$	C	C	D
$0.20g \le S_{D1}$	D	D	D

For Risk Category = IV and S_{D1} = 0.718 g, Seismic Design Category = D

Note: When S_1 is greater than or equal to 0.75g, the Seismic Design Category is **E** for buildings in Risk Categories I, II, and III, and **F** for those in Risk Category IV, irrespective of the above.

Seismic Design Category ≡ "the more severe design category in accordance with Table 11.6-1 or 11.6-2" = D

Note: See Section 11.6 for alternative approaches to calculating Seismic Design Category.

References

1. *Figure 22-1*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-1.pdf
2. *Figure 22-2*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-2.pdf
3. *Figure 22-12*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-12.pdf
4. *Figure 22-7*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-7.pdf
5. *Figure 22-17*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-17.pdf
6. *Figure 22-18*: https://earthquake.usgs.gov/hazards/designmaps/downloads/pdfs/2010_ASCE-7_Figure_22-18.pdf

APPENDIX D

GBA'S *IMPORTANT INFORMATION ABOUT THIS GEOTECHNICAL-ENGINEERING REPORT*

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, clients can benefit from a lowered exposure to the subsurface problems that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed below, contact your GBA-member geotechnical engineer. Active involvement in the Geoprofessional Business Association exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Geotechnical-Engineering Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client. *Those who rely on a geotechnical-engineering report prepared for a different client can be seriously misled*. No one except authorized client representatives should rely on this geotechnical-engineering report without first conferring with the geotechnical engineer who prepared it. *And no one – not even you – should apply this report for any purpose or project except the one originally contemplated.*

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read it *in its entirety*. Do not rely on an executive summary. Do not read selected elements only. *Read this report in full.*

You Need to Inform Your Geotechnical Engineer about Change

Your geotechnical engineer considered unique, project-specific factors when designing the study behind this report and developing the confirmation-dependent recommendations the report conveys. A few typical factors include:

- the client's goals, objectives, budget, schedule, and risk-management preferences;
- the general nature of the structure involved, its size, configuration, and performance criteria;
- the structure's location and orientation on the site; and
- other planned or existing site improvements, such as retaining walls, access roads, parking lots, and underground utilities.

Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light-industrial plant to a refrigerated warehouse;
- the elevation, configuration, location, orientation, or weight of the proposed structure;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.*

This Report May Not Be Reliable

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, that it could be unwise to rely on a geotechnical-engineering report whose reliability may have been affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If your geotechnical engineer has not indicated an "apply-by" date on the report, ask what it should be*, and, in general, *if you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying it. A minor amount of additional testing or analysis – if any is required at all – could prevent major problems.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface through various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing were performed*. The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgment to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team from project start to project finish, so the individual can provide informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, *they are not final*, because the geotechnical engineer who developed them relied heavily on judgment and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* revealed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a full-time member of the design team, to:

- confer with other design-team members,
- help develop specifications,
- review pertinent elements of other design professionals' plans and specifications, and
- be on hand quickly whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction observation.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for informational purposes only*. To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report, but they may rely on the factual data relative to the specific times, locations, and depths/elevations referenced. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely*. Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually relate any environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures*. If you have not yet obtained your own environmental information, ask your geotechnical consultant for risk-management guidance. As a general rule, *do not rely on an environmental report prepared for a different client, site, or project, or that is more than six months old.*

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, none of the engineer's services were designed, conducted, or intended to prevent uncontrolled migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration.*** Confront the risk of moisture infiltration by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

Thursday, June 21, 2018

Project No. 11888.001

T & C International Healthcare, Inc.
1961 Scenic Ridge Drive
Chino Hills, CA 91709-1004

Attention: Mr. Zanwei Chen
President

Subject: Response to City's Comment Regarding Infiltration Testing
Proposed Skilled Nursing Facility
25622 Alessandro Boulevard
Moreno Valley, Riverside County, California
APN 479-230-018-6

In accordance with our December 28, 2017 proposal authorized on January 3, 2018, Leighton Consulting, Inc. prepared the April 5, 2018 revised *Final-Design Geotechnical Exploration* report for a proposed skilled nursing facility to be constructed at this undeveloped rectangular parcel located north of Alessandro Boulevard easterly of Kitching Street in Moreno Valley, Riverside County, California. That report completely replaced our February 14, 2018 report for this project based on review of the conceptual grading plan. Our report was submitted by others to the City of Moreno Valley for review. We were provided a PDF scan of a red-pencil review comment written at the bottom of page 12 of our April 5, 2018 report, quoted as follows:

> *"Include infiltration test results and provide a description of test procedures. Refer to the Riverside County Design handbook for LID BMP, Appendix A for infiltration testing criteria and Table-1 for requirements in regards to number of tests required."*

Infiltration test spreadsheets are attached. On January 16, 2016, three infiltration tests were performed within 60-inch-deep, 8-inch-diameter drilled holes, across this site, at the P-1 through P-3 locations depicted on Figure 2, *Exploration Location Map*, included in our April 5, 2018 revised *Final-Design Geotechnical Exploration* report. These three infiltration tests were performed in accordance with procedures of Section 2.3 of the Riverside County Flood Control and Water Conservation District (RCFC&WCD) *Design Handbook* (RCFC&WCD, 2011). Results presented below are the most conservative

reading in minutes per inch drop. No factor-of-safety has been applied to these rates. Infiltration rates were estimated using the Porchet Method:

Table 1. Summary of Infiltration Test Results

Location*	Test Hole	Ground Surface Elevation (feet)	Depth (feet)	Percolation Rate (minutes/inch)	Infiltration Rate (inches/hour)	Soil Description
northwest	P-1	1566½	5	60	0.09	Alluvium: CLAYEY SAND (SC)
southeast	P-2	1564	5	60	0.09	
west	P-3	1563	5	>300	negligible**	

*See April 5, 2018 report Figure 2, *Exploration Location Map*.
**No drop detected.

We appreciate the opportunity to be of additional service to T & C. If you have any questions or if we can be of further service, then please contact us at your convenience at (951) 296-0530 or ***866-LEIGHTON***; specifically at the phone extensions and/or e-mail addresses listed below.

Respectfully submitted,

LEIGHTON CONSULTING, INC.

Robert F. Riha, CEG 1921
Senior Principal Geologist
Extension 8914, rriha@leightongroup.com

Thomas C. Benson, Jr, GE 2091
President and CEO
Extension 8771, tbenson@leightonconsulting.com

RFR/TCB:tcb

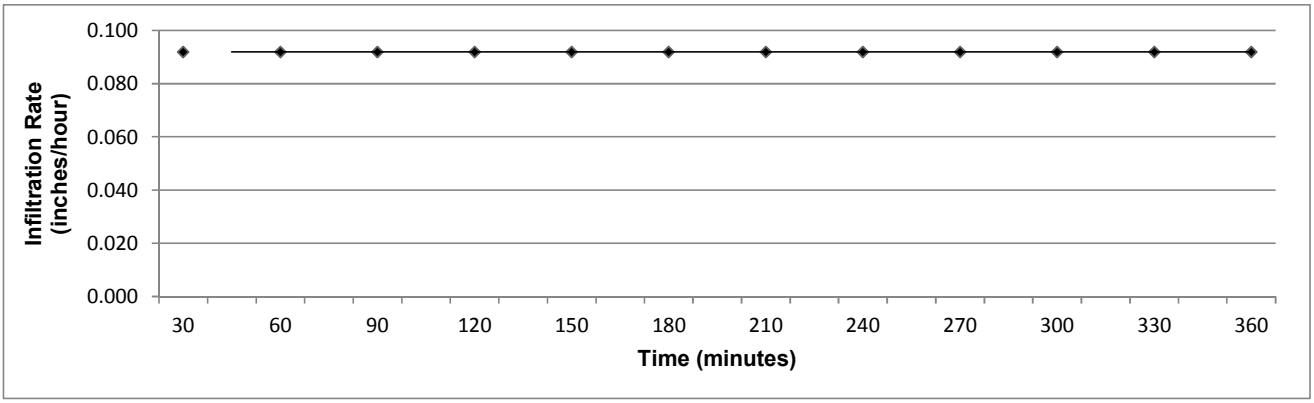
Distribution: (1) addressee (via e-mail PDF)

Enclosure: Infiltration Test Spreadsheets (3 pages)

Test Hole Number:	**P-1**	**Project:**	T&C Skilled Nursing Facility
Date Excavated:	1/15/2018	**Project Number:**	11888.001
Tested by:	JTD	**Date Tested:**	1/16/2018
Soil Unit:	Older Alluvium (Qalo)	**Test Hole Depth (inches):**	60
USCS Soil Type:	SILTY SAND (SM), reddish brown	**Test Hole Diameter (inches):**	8

Sunny ~70 °

Time	Δt (minutes)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					inches/hour*	minute/inch
8:33:00	30.00	40.00	40.50	0.50	0.092	60.000
9:03:00						
9:03:00	30.00	40.00	40.50	0.50	0.092	60.000
9:33:00						
9:33:00	30.00	40.00	40.50	0.50	0.092	60.000
10:03:00						
10:03:00	30.00	40.00	40.50	0.50	0.092	60.000
10:33:00						
10:33:00	30.00	40.00	40.50	0.50	0.092	60.000
11:03:00						
11:03:00	30.00	40.00	40.50	0.50	0.092	60.000
11:33:00						
11:33:00	30.00	40.00	40.50	0.50	0.092	60.000
12:03:00						
12:03:00	30.00	40.00	40.50	0.50	0.092	60.000
12:33:00						
12:33:00	30.00	40.00	40.50	0.50	0.092	60.000
1:03:00						
1:03:00	30.00	40.00	40.50	0.50	0.092	60.000
1:33:00						
1:33:00	30.00	40.00	40.50	0.50	0.092	60.000
2:03:00						
2:03:00	30.00	40.00	40.50	0.50	0.092	60.000
2:33:00						



*Based on Porchet Method: http://rcflood.org/downloads/NPDES/Documents/LIDManual/Appendix%20A_Infiltration_Testing.pdf

PERCOLATION TEST

P-1

Project Name: T&C Skilled Nursing Facility
Moreno Valley, California

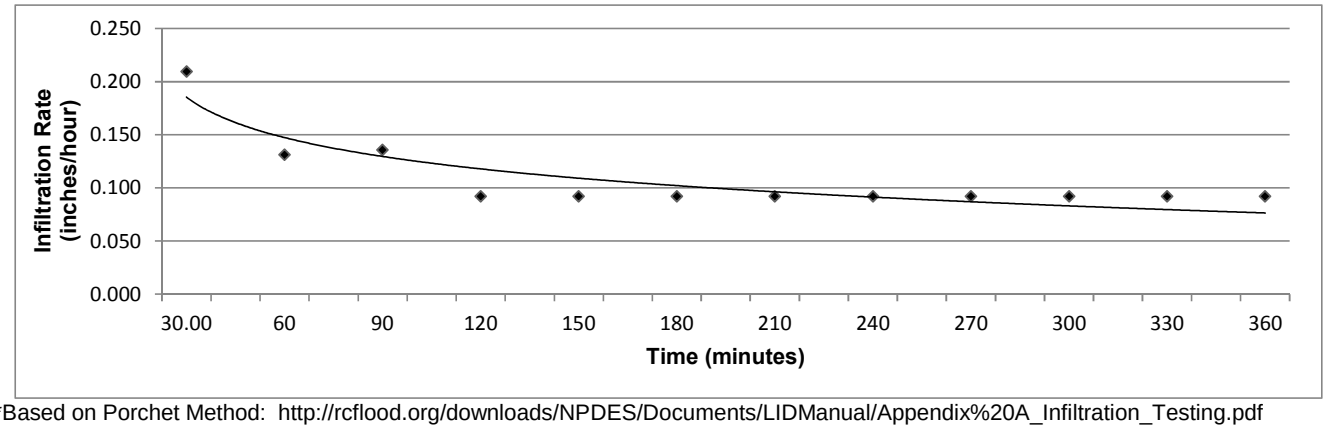
Project No.: 11188.001

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Test Hole Number:	**P-2**	**Project:**	T&C Skilled Nursing Facility
Date Excavated:	1/15/2018	**Project Number:**	11888.001
Tested by:	JTD	**Date Tested:**	1/16/2018
Soil Unit:	Older Alluvium (Qalo)	**Test Hole Depth (inches):**	60
USCS Soil Type:	SILTY SAND (SM), reddish brown	**Test Hole Diameter (inches):**	8

Sunny ~70 °

Time	Δt (minutes)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					inches/hour*	minute/inch
8:36:00 – 9:06:00	30.00	37.50	38.75	1.25	0.209	24.000
9:06:00 – 9:36:00	30.00	38.75	39.50	0.75	0.131	40.000
9:36:00 – 10:06:00	30.00	39.50	40.25	0.75	0.136	40.000
10:06:00 – 10:36:00	30.00	40.00	40.50	0.50	0.092	60.000
10:36:00 – 11:06:00	30.00	40.00	40.50	0.50	0.092	60.000
11:06:00 – 11:36:00	30.00	40.00	40.50	0.50	0.092	60.000
11:36:00 – 12:06:00	30.00	40.00	40.50	0.50	0.092	60.000
12:06:00 – 12:36:00	30.00	40.00	40.50	0.50	0.092	60.000
12:36:00 – 1:06:00	30.00	40.00	40.50	0.50	0.092	60.000
1:06:00 – 1:36:00	30.00	40.00	40.50	0.50	0.092	60.000
1:36:00 – 2:06:00	30.00	40.00	40.50	0.50	0.092	60.000
2:06:00 – 2:36:00	30.00	40.00	40.50	0.50	0.092	60.000



*Based on Porchet Method: http://rcflood.org/downloads/NPDES/Documents/LIDManual/Appendix%20A_Infiltration_Testing.pdf

PERCOLATION TEST

P-2

Project Name: T&C Skilled Nursing Facility
Moreno Valley, California

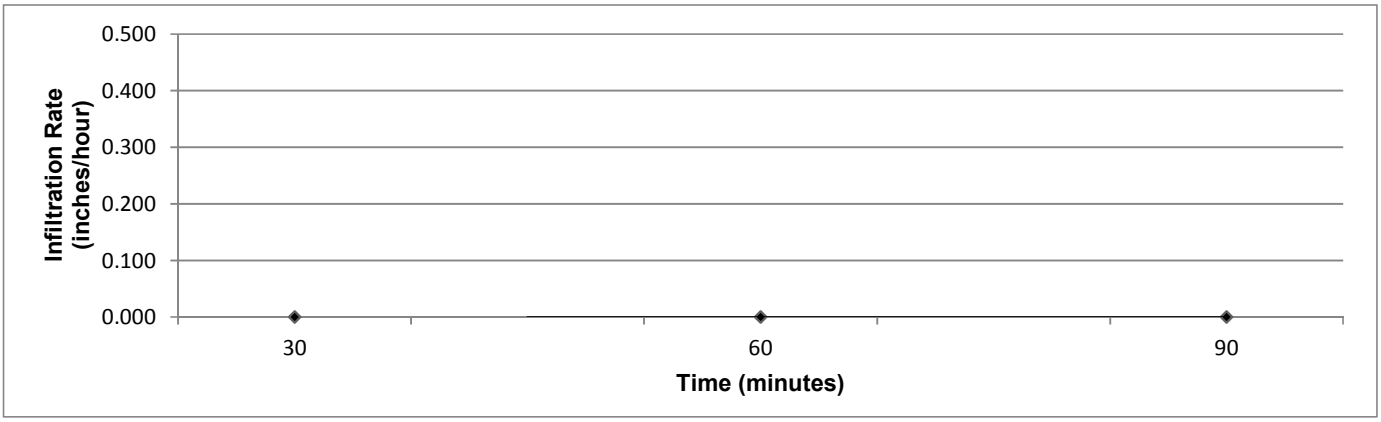
Project No.: 11188.001

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Test Hole Number:	**P-3**	**Project:**	T&C Skilled Nursing Facility
Date Excavated:	1/15/2018	**Project Number:**	11888.001
Tested By:	JTD	**Date Tested:**	1/16/2018
Soil Unit:	Older Alluvium (Qalo)	**Test Hole Depth (inches):**	60
USCS Soil Type:	CLAY (CL), sandy, reddish-brown	**Test Hole Diameter (inches):**	8

Sunny ~70 °

Time	Δt (minutes)	Initial Water Depth (inches)	Final Water Depth (inches)	Change In Water Level (inches)	Infiltration/Percolation Rate	
					inches/hour*	minute/inch
8:38:00	30	32.00	32.00	0.00	0.000	-negligible -
9:08:00						
9:08:00	30	32.00	32.00	0.00	0.000	
9:38:00						
9:38:00	30	32.00	32.00	0.00	0.000	
10:08:00						
				-END OF TEST-		



*Based on Porchet Method: http://rcflood.org/downloads/NPDES/Documents/LIDManual/Appendix%20A_Infiltration_Testing.pdf

PERCOLATION TEST

P-3

Project Name: T&C Skilled Nursing Facility
Moreno Valley, California

Project No.: 11188.001

Leighton Consulting, Inc.
A LEIGHTON GROUP COMPANY

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

(not applicable)

Appendix 5: LID Infeasibility

LID Technical Infeasibility Analysis

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	W&W Land Design Consultant, LLC.	Date	10/4/2018
Designed by	Henry Lu	Case No	LWQ18-0016
Company Project Number/Name	APN: 479-230-018-6, Moreno Valley		

BMP Identification

BMP NAME / ID: Bioretention #1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85} = 0.65 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D1	*25,265*	*Concrete or Asphalt*	*1*	*0.89*	*22536.4*			
D2	*46,174*	*Concrete or Asphalt*	*1*	*0.89*	*41187.2*			
D3	*29,148*	*Concrete or Asphalt*	*1*	*0.89*	*26000*			
D4	*40,075*	*Concrete or Asphalt*	*1*	*0.89*	*35746.9*			
P1	*9,222*	*Concrete or Asphalt*	*1*	*0.89*	*8226*			
	149884	*Total*			133696.5	0.65	*7241.9*	*7832*

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: W&W Land Design Consultant, LLC. Date: 4/18/2018
Designed by: Henry Lu Case No: PAxx-xxxx
Company Project Number/Name: APN: 479-230-018-6, Moreno Valley

BMP Identification

BMP NAME / ID: Bioretention #2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E D_{85}= 0.65 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D5	*41,179*	*Concrete or Asphalt*	*1*	*0.89*	*36731.7*			
D6	*13,827*	*Concrete or Asphalt*	*1*	*0.89*	*12333.7*			
	55006	***Total***			**49065.4**	**0.65**	***2657.7***	***2660***

Notes:

Bioretention Facility - Design Procedure	BMP ID: Bioretention #1	Legend:	Required Entries / Calculated Cells

Company Name:	W&W Land Design Consultant	Date:	7/12/2018
Designed by:	Henry Lu	County/City Case No.:	LWQ18-0016

Design Volume

Enter the area tributary to this feature	A_T=	3.44	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	7,250	ft^3

Type of Bioretention Facility Design

- ○ Side slopes required (parallel to parking spaces or adjacent to walkways)
- ◉ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	3.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	19.0	ft
Total Effective Depth, d_E			
$d_E = [(0.3) \times d_S + (0.4) \times 1] + 0.5$	d_E =	1.80	ft
Minimum Surface Area, A_m			
$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	4,028	ft^2
Proposed Surface Area	A=	4,425	ft^2
Minimum Required Length of Bioretention Facility, L	L =	212.0	ft

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =		:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0.5	%
6" Check Dam Spacing		0	feet
Describe Vegetation:	Natural Grasses		

Notes:

Bioretention Facility - Design Procedure	BMP ID: Bioretention #2	Legend:	Required Entries / Calculated Cells

Company Name:	W&W Land Design Consultant	Date:	5/18/2018
Designed by:	Henry Lu	County/City Case No.:	PAxx-xxxx

Design Volume

Enter the area tributary to this feature	A_T=	1.27	acres
Enter V_{BMP} determined from Section 2.1 of this Handbook	V_{BMP}=	2,660	ft^3

Type of Bioretention Facility Design

- ○ Side slopes required (parallel to parking spaces or adjacent to walkways)
- ◉ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer	d_S =	3.0	ft
Top Width of Bioretention Facility, excluding curb	w_T =	6.0	ft
Total Effective Depth, d_E			
$d_E = [(0.3) \times d_S + (0.4) \times 1] + 0.5$	d_E =	1.80	ft
Minimum Surface Area, A_m			
$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$	A_M =	1,478	ft^2
Proposed Surface Area	A=	1,480	ft^2
Minimum Required Length of Bioretention Facility, L	L =	246.3	ft

Bioretention Facility Properties

Side Slopes in Bioretention Facility	z =		:1
Diameter of Underdrain		6	inches
Longitudinal Slope of Site (3% maximum)		0.5	%
6" Check Dam Spacing		0	feet
Describe Vegetation:	Natural Grasses		

Notes:

Santa Ana Watershed - BMP Design Flow Rate, Q_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name	W&W Land Design Consultant, LLC.	Date	10/4/2018
Designed by	Henry Lu	Case No	LWQ18-0016
Company Project Number/Name	APN: 479-230-018-6, Moreno Valley		

BMP Identification

BMP NAME / ID: Bioretention #1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

Design Rainfall Intensity: I = 0.20 in/hr

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

	DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type (use pull-down menu)	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	Design Rainfall Intensity (in/hr)	Design Flow Rate (cfs)	Proposed Flow Rate (cfs)
DMAs	P1	9,222	Concrete or Asphalt	1	0.89	8226			
	D1	25,265	Concrete or Asphalt	1	0.892	22536.4			
	D2	46,174	Concrete or Asphalt	1	0.892	41187.2			
	D3	29,148	Concrete or Asphalt	1	0.892	26000			
	D4	40,075	Concrete or Asphalt	1	0.892	35746.9			
		149884		Total		133696.5	0.20	0.6	3.46

Notes:

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries | Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name W&W Land Design Consultant, LLC. Date 8/15/2018

Designed by Henry Lu Case No PAxx-xxxx

Company Project Number/Name APN: 479-230-018-6, Moreno Valley

BMP Identification

BMP NAME / ID Bioretention #2

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E D_{85}= 0.65 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
D5	*41,179*	*Concrete or Asphalt*	*1*	*0.89*	*36731.7*			
D6	*13,827*	*Concrete or Asphalt*	*1*	*0.89*	*12333.7*			
	55006	***Total***			**49065.4**	**0.65**	***2657.7***	***3533***

Notes:

Appendix 7: Hydromodification

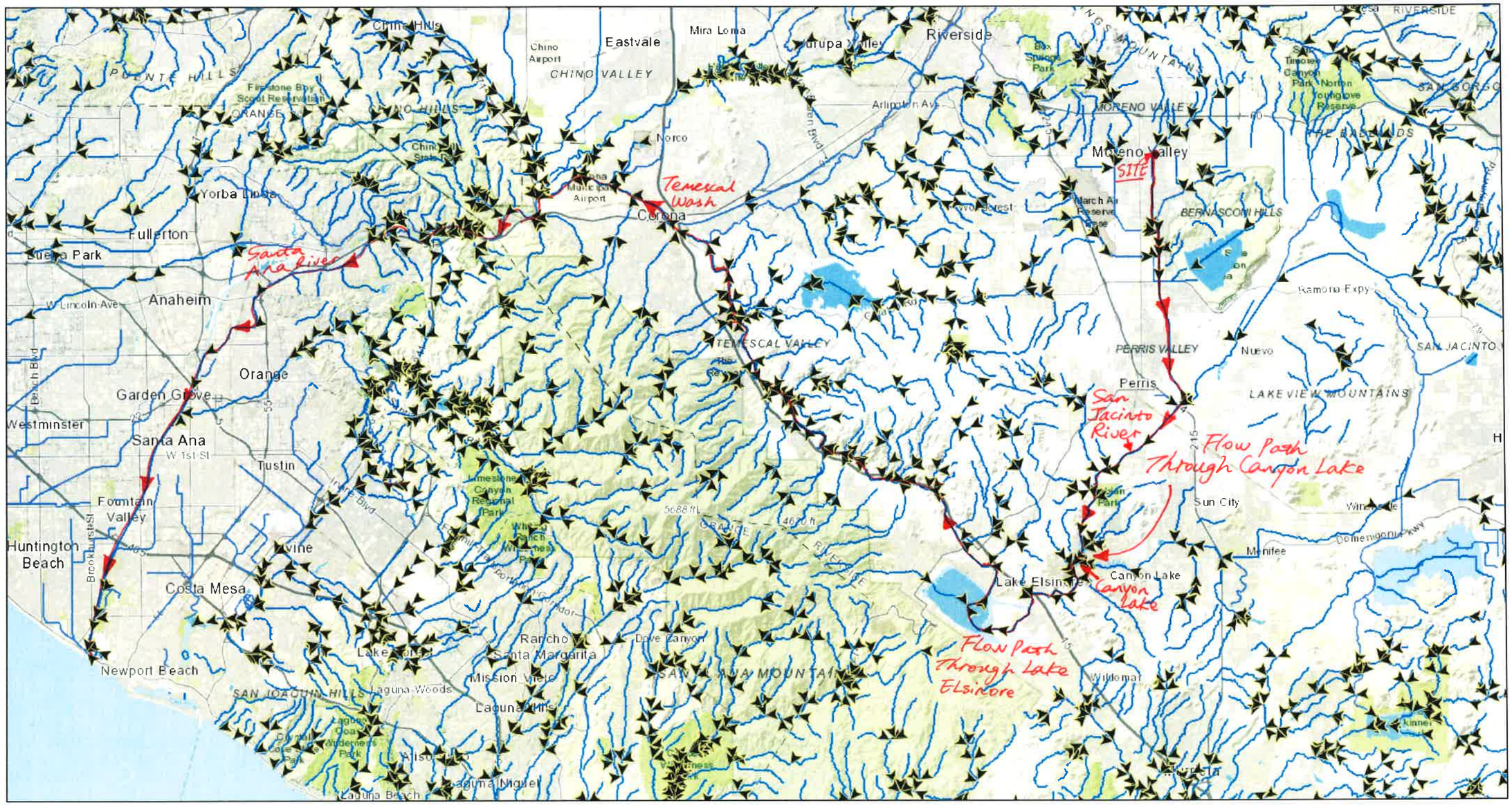
Supporting Detail Relating to Hydrologic Conditions of Concern

HCOC Applicability Map

Hydromodification Susceptibility Documentation Report and Mapping
Riverside County Flood Control and Water Conservation District

Map 2

Receiving Water Map-Skilled Nursing Facility



7/12/2018 1:26:49 PM

- Waterbodies
- Canals
- Flow Direction
- Streams

1:240,387

0 3 6 12 mi

0 4.75 9.5 19 km

US EPA, Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User

US Environment Protection Agency
County of Riverside, Bureau of Land Management, Esri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS | US EPA

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ A. **On-site storm drain inlets**	☑ **Locations of inlets.**	☑ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	☑ **Maintain and periodically repaint or replace inlet markings.** ☑ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ☑ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ☑ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
☐ B. **Interior floor drains and elevator shaft sump pumps**		☐ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	☐ **Inspect and maintain drains to preven blockages and overflow.**
☐ C. **Interior parking garages**		☐ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	☐ **Inspect and maintain drains to preven blockages and overflow.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ D1. **Need for future indoor & structural pest control**		☑ **Note building design features that discourage entry of pests.**	☑ **Provide Integrated Pest Management information to owners, lessees, and operators.**
☑ D2. **Landscape/ Outdoor Pesticide Use**	☑ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ☑ **Show self-retaining landscape areas, if any.** ☐ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ☑ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ☑ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ☑ **Consider using pest-resistant plants, especially adjacent to hardscape.** **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	☑ **Maintain landscaping using minimum or no pesticides.** ☑ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** ☑ **Provide IPM information to new owners, lessees and operators.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ E. **Pools, spas, ponds, decorative fountains, and other water features.**	☑ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	☑ **See applicable operational BMPs in** "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
☐ F. **Food service**	☐ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ☐ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	☐ **Describe the location and features of the designated cleaning area.** ☐ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	☐ **See the brochure, "**The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ **Provide this brochure to new site owners, lessees, and operators.**
☐ G. **Refuse areas**	☑ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ☑ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ☑ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	☑ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ☑ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	☑ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at** www.cabmphandbooks.com

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ H. **Industrial processes.**	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** www.cchealth.org/groups/hazmat/	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☐ J. **Vehicle and Equipment Cleaning**	☐ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	☐ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ☐ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ☐ **Car dealerships and similar may rinse cars with water only.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ K. **Vehicle/Equipment Repair and Maintenance**	❑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	❑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ❑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ❑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ❑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** Refer to "Automotive Maintenance & Ca Care Best Management Practices for Aut Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ L. **Fuel Dispensing Areas**	❑ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ❑ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		❑ **The property owner shall dry sweep the fueling area routinely.** ❑ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ M. **Loading Docks**	❑ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ❑ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ❑ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		❑ **Move loaded and unloaded items indoors as soon as possible.** ❑ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ N. **Fire Sprinkler Test Water**		☑ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	☑ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ☑ **Boiler drain lines** ☑ **Condensate drain lines** ☑ **Rooftop equipment** ☑ **Drainage sumps** ☑ **Roofing, gutters, and trim.** ☐ **Other sources**		☑ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ☑ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ☑ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ☑ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ☑ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** **Include controls for other sources as specified by local reviewer.**	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
☑ P. **Plazas, sidewalks, and parking lots.**			☑ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain**

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

Bioretention Operations and Maintenance

General Requirements

Bioretention areas require annual plant, soil, and mulch layer maintenance to ensure optimum infiltration, storage, and pollutant removal capabilities. In general, bioretention maintenance requirements are typical landscape care procedures and include:

1. Watering: Plants should be selected to be drought tolerant and not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.

2. Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix E for guidance on facility inspection and Appendix F for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems occur the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3. Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants excluded.

4. Nutrient and pesticides: The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5. Mulch: Replace mulch annually in bioretention facilities where heavy metal deposition is likely (e.g., contributing areas that include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6. Soil: Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. Replacing mulch in bioretention facilities where heavy metal

deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

Maintenance Standards

A summary of the routine and major maintenance activities recommended for bioretention areas is shown in Table 5-1. Detailed Routine and major maintenance standards are listed in Tables 5-2 and 5-3.

Table 5-1: Bioretention Routine and Major Maintenance Quick Guide

Inspection and Maintenance Activities Summary	
Routine Maintenance	• Repair small eroded areas and ruts by filling with gravel. Overseed bare areas to reestablish vegetation • Remove trash and debris and rake surface soils to mitigate ponding • Remove accumulated fine sediments, dead leaves and trash to restore surface permeability • Remove any evidence of visual contamination from floatables such as oil and grease • Eradicate weeds and prune back excess plant growth that interferes with facility operation. Remove invasive vegetation and replace with non-invasive species • Remove sediment and debris accumulation near inlet and outlet structures to alleviate clogging • Clean and reset flow spreaders (if present) as needed to restore original function • Mow routinely to maintain ideal grass height and to suppress weeds • Periodically observe function under wet weather conditions
Major Maintenance	• Repair structural damage to flow control structures including inlet, outlet and overflow structures • Clean out under-drain, if present, to alleviate ponding. Replace media if ponding or loss of infiltrative capacity persists and revegetate • Regrade and revegetate to repair damage from severe erosion/scour channelization and to restore sheet flow • Take photographs before and after major maintenance (encouraged)

Table 5-2: Routine Maintenance – Bioretention

Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed	Frequency
Erosion	Splash pads or spreader incorrectly placed; eroded or scoured areas due to flow channelization, or higher flows.	No erosion on surface of basin. No erosion or scouring evident. For ruts or bare areas less than 12 inches wide, damaged areas repaired by filling with crushed gravel. The grass will creep in over the rock in time.	Annually prior to wet season. After major storm events (>0.75 in/24 hrs) if spot checks of some basins indicate widespread damage/ maintenance needs
Standing Water	When water stands in the basin between storms and does not drain freely (with 36- 48 hours after storm event).	Water drains completely from basin as designed and surface is clear of trash and debris. Underdrains (if installed) are cleared.	
Loss of Surface Permeability	Accumulation of fine sediments, dead leaves, trash and other debris on surface	Surface permeability restored. Surface layer removed and replaced with fresh mulch.	
Visual Contaminants and Pollution	Any visual evidence of oil, gasoline, contaminants or other pollutants.	No visual contaminants or pollutants present.	Monthly (or as dictated by agreement between County and landscape contractor
Vegetation	Weeds, excessive plant growth, plants interfering with basin operation, plants diseased or dying	Basin tidy, plants healthy and pruned. Any plants that interfere with function are removed. Invasive or non-acclimated plants replaced.	
Inlet/Overflow	Inlet/outlet areas clogged with sediment and/or debris.	Material removed so that there is no clogging or blockage of the inlet or overflow area.	
Trash and Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet (one standard garbage can).	Trash and debris removed and facility looks well kept.	

Table 5-3: Major Maintenance – Bioretention

Defect or Problem	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**	**Frequency**
Standing water	When water stands in the basin between storms and does not drain freely (with 36- 48 hours after storm event).	Filter media (sand, gravel, and topsoil) and vegetation removed and replaced.	Annually prior to wet season
Erosion/ Scouring	Bare spots greater than 12 inches	No erosion on surface of basin. Large bare areas are regraded and reseeded/replanted.	As needed

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

3.5 Bioretention Facility

Type of BMP	LID – Bioretention
Treatment Mechanisms	Infiltration, Evapotranspiration, Evaporation, Biofiltration
Maximum Drainage Area	This BMP is intended to be integrated into a project's landscaped area in a distributed manner. Typically, contributing drainage areas to Bioretention Facilities range from less than 1 acre to a maximum of around 10 acres.
Other Names	Rain Garden, Bioretention Cell, Bioretention Basin, Biofiltration Basin, Landscaped Filter Basin, Porous Landscape Detention

Description

Bioretention Facilities are shallow, vegetated basins underlain by an engineered soil media. Healthy plant and biological activity in the root zone maintain and renew the macro-pore space in the soil and maximize plant uptake of pollutants and runoff. This keeps the Best Management Practice (BMP) from becoming clogged and allows more of the soil column to function as both a sponge (retaining water) and a highly effective and self-maintaining biofilter. In most cases, the bottom of a Bioretention Facility is unlined, which also provides an opportunity for infiltration to the extent the underlying onsite soil can accommodate. When the infiltration rate of the underlying soil is exceeded, fully biotreated flows are discharged via underdrains. Bioretention Facilities therefore will inherently achieve the maximum feasible level of infiltration and evapotranspiration and achieve the minimum feasible (but highly biotreated) discharge to the storm drain system.

Siting Considerations

These facilities work best when they are designed in a relatively level area. Unlike other BMPs, Bioretention Facilities can be used in smaller landscaped spaces on the site, such as:

- ✓ Parking islands
- ✓ Medians
- ✓ Site entrances

Landscaped areas on the site (such as may otherwise be required through minimum landscaping ordinances), can often be designed as Bioretention Facilities. This can be accomplished by:

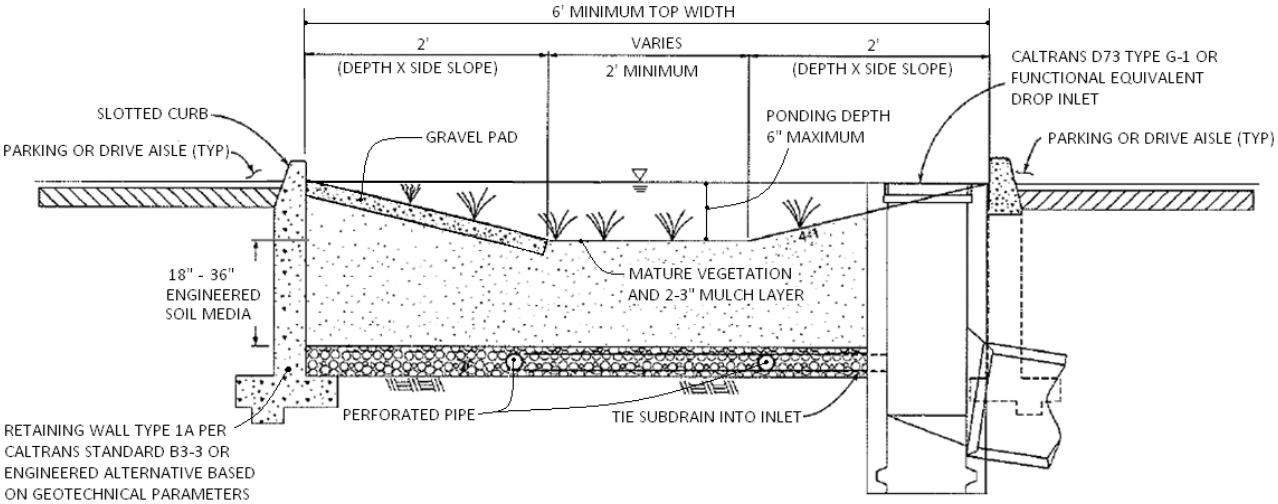
- *Depressing* landscaped areas below adjacent impervious surfaces, rather than elevating those areas
- Grading the site to direct runoff from those impervious surfaces *into* the Bioretention Facility, rather than away from the landscaping
- Sizing and designing the depressed landscaped area as a Bioretention Facility as described in this Fact Sheet

Bioretention Facilities should however not be used downstream of areas where large amounts of sediment can clog the system. Placing a Bioretention Facility at the toe of a steep slope should also be avoided due to the potential for clogging the engineered soil media with erosion from the slope, as well as the potential for damaging the vegetation.

Design and Sizing Criteria

The recommended cross section necessary for a Bioretention Facility includes:

- Vegetated area
- 18' minimum depth of engineered soil media
- 12' minimum gravel layer depth with 6' perforated pipes (added flow control features such as orifice plates may be required to mitigate for HCOC conditions)



While the 18-inch minimum engineered soil media depth can be used in some cases, it is recommended to use 24 inches or a preferred 36 inches to provide an adequate root zone for the chosen plant palate. Such a design also provides for improved removal effectiveness for nutrients. The recommended ponding depth inside of a Bioretention Facility is 6 inches; measured from the flat bottom surface to the top of the water surface as shown in Figure 1.

Because this BMP is filled with an engineered soil media, pore space in the soil and gravel layer is assumed to provide storage volume. However, several considerations must be noted:

- Surcharge storage above the soil surface (6 inches) is important to assure that design flows do not bypass the BMP when runoff exceeds the soil's absorption rate.
- In cases where the Bioretention Facility contains engineered soil media deeper than 36 inches, the pore space within the engineered soil media can only be counted to the 36-inch depth.
- A maximum of 30 percent pore space can be used for the soil media whereas a maximum of 40 percent pore space can be use for the gravel layer.

Figure 1: Standard Layout for a Bioretention Facility

Engineered Soil Media Requirements

The engineered soil media shall be comprised of 85 percent mineral component and 15 percent organic component, by volume, drum mixed prior to placement. The mineral component shall be a Class A sandy loam topsoil that meets the range specified in Table 1 below. The organic component shall be nitrogen stabilized compost[1], such that nitrogen does not leach from the media.

Table 1: Mineral Component Range Requirements

Percent Range	Component
70-80	Sand
15-20	Silt
5-10	Clay

The trip ticket, or certificate of compliance, shall be made available to the inspector to prove the engineered mix meets this specification.

Vegetation Requirements

Vegetative cover is important to minimize erosion and ensure that treatment occurs in the Bioretention Facility. The area should be designed for at least 70 percent mature coverage throughout the Bioretention Facility. To prevent the BMP from being used as walkways, Bioretention Facilities shall be planted with a combination of small trees, densely planted shrubs, and natural grasses. Grasses shall be native or ornamental; preferably ones that do not need to be mowed. The application of fertilizers and pesticides should be minimal. To maintain oxygen levels for the vegetation and promote biodegradation, it is important that vegetation not be completely submerged for any extended period of time. Therefore, a maximum of 6 inches of ponded water shall be used in the design to ensure that plants within the Bioretention Facility remain healthy.

A 2 to 3-inch layer of standard shredded aged hardwood mulch shall be placed as the top layer inside the Bioretention Facility. The 6-inch ponding depth shown in Figure 1 above shall be measured from the top surface of the 2 to 3-inch mulch layer.

Curb Cuts

To allow water to flow into the Bioretention Facility, 1-foot-wide (minimum) curb cuts should be placed approximately every 10 feet around the perimeter of the Bioretention Facility. Figure 2 shows a curb cut in a Bioretention Facility. Curb cut flow lines must be at or above the V_{BMP} water surface level.

[1] For more information on compost, visit the US Composting Council website at: http://compostingcouncil.org/

BIORETENTION FACILITY BMP FACT SHEET

Figure 2: Curb Cut located in a Bioretention Facility

To reduce erosion, a gravel pad shall be placed at each inlet point to the Bioretention Facility. The gravel should be 1- to 1.5-inch diameter in size. The gravel should overlap the curb cut opening a minimum of 6 inches. The gravel pad inside the Bioretention Facility should be flush with the finished surface at the curb cut and extend to the bottom of the slope.

In addition, place an apron of stone or concrete, a foot square or larger, inside each inlet to prevent vegetation from growing up and blocking the inlet. See Figure 3.

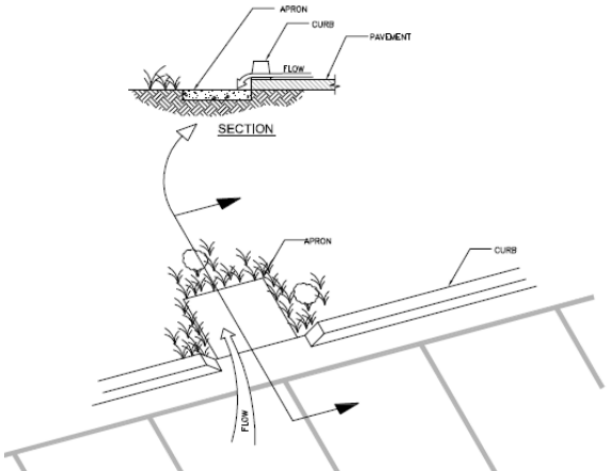


Figure 3: Apron located in a Bioretention Facility

Terracing the Landscaped Filter Basin

It is recommended that Bioretention Facilities be level. In the event the facility site slopes and lacks proper design, water would fill the lowest point of the BMP and then discharge from the basin without being treated. To ensure that the water will be held within the Bioretention Facility on sloped sites, the BMP must be terraced with nonporous check dams to provide the required storage and treatment capacity.

The terraced version of this BMP shall be used on non-flat sites with no more than a 3 percent slope. The surcharge depth cannot exceed 0.5 feet, and side slopes shall not exceed 4:1. Table 2 below shows the spacing of the check dams, and slopes shall be rounded up (i.e., 2.5 percent slope shall use 10' spacing for check dams).

Table 2: Check Dam Spacing

6" Check Dam Spacing	
Slope	**Spacing**
1%	*25'*
2%	*15'*
3%	*10'*

Roof Runoff

Roof downspouts may be directed towards Bioretention Facilities. However, the downspouts must discharge onto a concrete splash block to protect the Bioretention Facility from erosion.

Retaining Walls

It is recommended that Retaining Wall Type 1A, per Caltrans Standard B3-3 or equivalent, be constructed around the entire perimeter of the Bioretention Facility. This practice will protect the sides of the Bioretention Facility from collapsing during construction and maintenance or from high service loads adjacent to the BMP. Where such service loads would not exist adjacent to the BMP, an engineered alternative may be used if signed by a licensed civil engineer.

Side Slope Requirements

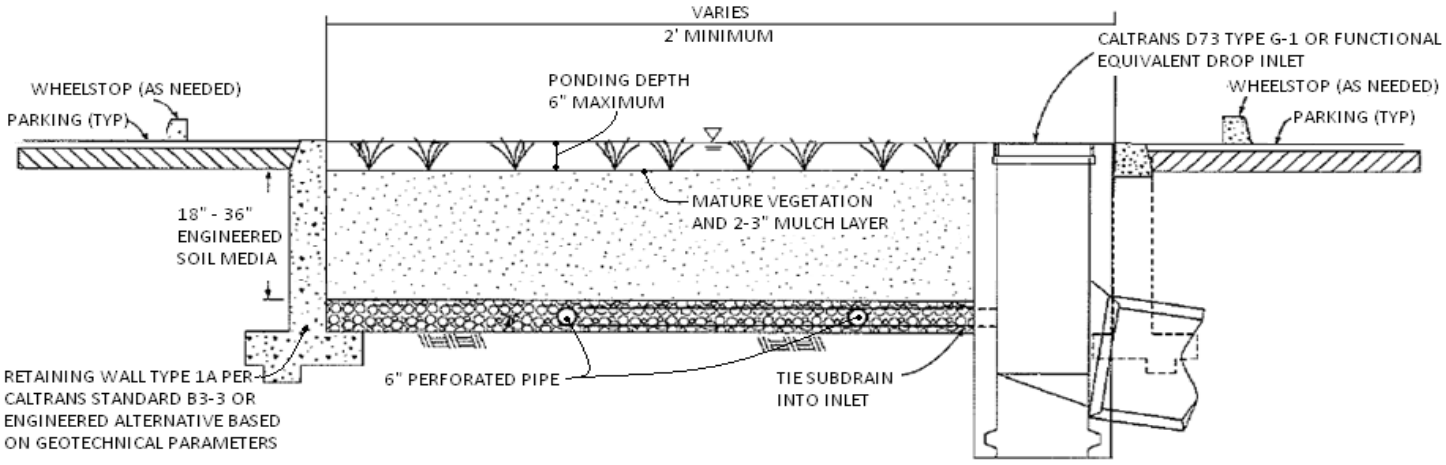
Bioretention Facilities Requiring Side Slopes

The design should assure that the Bioretention Facility does not present a tripping hazard. Bioretention Facilities proposed near pedestrian areas, such as areas parallel to parking spaces or along a walkway, must have a gentle slope to the bottom of the facility. Side slopes inside of a Bioretention Facility shall be 4:1. A typical cross section for the Bioretention Facility is shown in Figure 1.

Bioretention Facilities Not Requiring Side Slopes

Where cars park perpendicular to the Bioretention Facility, side slopes are not required. A 6-inch maximum drop may be used, and the Bioretention Facility must be planted with trees and shrubs to prevent pedestrian access. In this case, a curb is not placed around the Bioretention Facility,

but wheel stops shall be used to prevent vehicles from entering the Bioretention Facility, as shown in Figure 4.



Planter Boxes

Bioretention Facilities can also be placed above ground as planter boxes. Planter boxes must have a minimum width of 2 feet, a maximum surcharge depth of 6 inches, and no side slopes are necessary. Planter boxes must be constructed so as to ensure that the top surface of the engineered soil media will remain level. This option may be constructed of concrete, brick, stone or other stable materials that will not warp or bend. Chemically treated wood or galvanized steel, which has the ability to contaminate stormwater, should not be used. Planter boxes must be lined with an impermeable liner on all sides, including the bottom. Due to the impermeable liner, the inside bottom of the planter box shall be designed and constructed with a cross fall, directing treated flows within the subdrain layer toward the point where subdrain exits the planter box, and subdrains shall be oriented with drain holes oriented down. These provisions will help avoid excessive stagnant water within the gravel underdrain layer. Similar to the in-ground Bioretention Facility versions, this BMP benefits from healthy plants and biological activity in the root zone. Planter boxes should be planted with appropriately selected vegetation.

Figure 5: Planter Box
Source: LA Team Effort

Overflow

An overflow route is needed in the Bioretention Facility design to bypass stored runoff from storm events larger than V_{BMP} or in the event of facility or subdrain clogging. Overflow systems must connect to an acceptable discharge point, such as a downstream conveyance system as shown in Figure 1 and Figure 4. The inlet to the overflow structure shall be elevated inside the Bioretention Facility to be flush with the ponding surface for the design capture volume (V_{BMP}) as shown in Figure 4. This will allow the design capture volume to be fully treated by the Bioretention Facility, and for larger events to safely be conveyed to downstream systems. The overflow inlet shall **not** be located in the entrance of a Bioretention Facility, as shown in Figure 6.

Underdrain Gravel and Pipes

An underdrain gravel layer and pipes shall be provided in accordance with Appendix B – Underdrains.

Figure 6: Incorrect Placement of an Overflow Inlet.

Inspection and Maintenance Schedule

The Bioretention Facility area shall be inspected for erosion, dead vegetation, soggy soils, or standing water. The use of fertilizers and pesticides on the plants inside the Bioretention Facility should be minimized.

Schedule	Activity
Ongoing	• Keep adjacent landscape areas maintained. Remove clippings from landscape maintenance activities. • Remove trash and debris • Replace damaged grass and/or plants • Replace surface mulch layer as needed to maintain a 2-3 inch soil cover.
After storm events	• Inspect areas for ponding
Annually	• Inspect/clean inlets and outlets

Bioretention Facility Design Procedure

1) Enter the area tributary, A_T, to the Bioretention Facility.

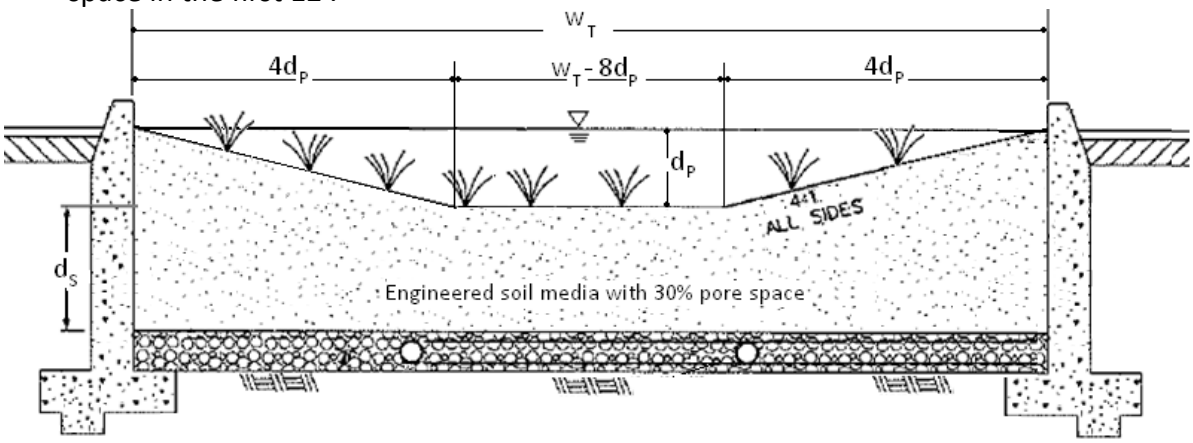
2) Enter the Design Volume, V_{BMP}, determined from Section 2.1 of this Handbook.

3) Select the type of design used. There are two types of Bioretention Facility designs: the standard design used for most project sites that include side slopes, and the modified design used when the BMP is located perpendicular to the parking spaces or with planter boxes that do not use side slopes.

4) Enter the depth of the engineered soil media, d_S. The minimum depth for the engineered soil media can be 18' in limited cases, but it is recommended to use 24' or a preferred 36' to provide an adequate root zone for the chosen plant palette. Engineered soil media deeper than 36' will only get credit for the pore space in the first 36'.

5) Enter the top width of the Bioretention Facility.

6) Calculate the total effective depth, d_E, within the Bioretention Facility. The maximum allowable pore space of the soil media is 30% while the maximum allowable pore space for the gravel layer is 40%. Gravel layer deeper than 12' will only get credit for the pore space in the first 12'.



a. For the design with side slopes the following equation shall be used to determine the total effective depth. Where, d_P is the depth of ponding within the basin.

$$d_E(\text{ft}) = \frac{0.3 \times \left[\left(w_T(\text{ft}) \times d_S(\text{ft})\right) + 4\left(d_P(\text{ft})\right)^2\right] + 0.4 \times 1(\text{ft}) + d_P(\text{ft})\left[4d_P(\text{ft}) + \left(w_T(\text{ft}) - 8d_P(\text{ft})\right)\right]}{w_T(\text{ft})}$$

This above equation can be simplified if the maximum ponding depth of 0.5' is used. The equation below is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(\text{ft}) = (0.3 \times d_S(\text{ft}) + 0.4 \text{ x } 1(\text{ft})) - \left(\frac{0.7\ (\text{ft}^2)}{w_T(\text{ft})}\right) + 0.5(\text{ft})$$

b. For the design without side slopes the following equation shall be used to determine the total effective depth:

$$d_E(ft) = d_P(ft) + [(0.3) \times d_S(ft) + (0.4) \times 1(ft)]$$

The equation below, using the maximum ponding depth of 0.5', is used on the worksheet to find the minimum area required for the Bioretention Facility:

$$d_E(ft) = 0.5\ (ft) + [(0.3) \times d_S(ft) + (0.4) \times 1(ft)]$$

7) Calculate the minimum surface area, A_M, required for the Bioretention Facility. This does not include the curb surrounding the Bioretention Facility or side slopes.

$$A_M(ft^2) = \frac{V_{BMP}(ft^3)}{d_E\ (ft)}$$

8) Enter the proposed surface area. This area shall not be less than the minimum required surface area.

9) Verify that side slopes are no steeper than 4:1 in the standard design, and are not required in the modified design.

10) Provide the diameter, minimum 6 inches, of the perforated underdrain used in the Bioretention Facility. See Appendix B for specific information regarding perforated pipes.

11) Provide the slope of the site around the Bioretention Facility, if used. The maximum slope is 3 percent for a standard design.

12) Provide the check dam spacing, if the site around the Bioretention Facility is sloped.

13) Describe the vegetation used within the Bioretention Facility.

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Bioretention Operations and Maintenance

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1. Watering: Plants should be selected to be drought tolerant and not require watering after establishment (2 to 3 years). Watering may be required during prolonged dry periods after plants are established.

2. Erosion control: Inspect flow entrances, ponding area, and surface overflow areas periodically, and replace soil, plant material, and/or mulch layer in areas if erosion has occurred (see Appendix E for guidance on facility inspection and Appendix F for a bioretention inspection and maintenance checklist). Properly designed facilities with appropriate flow velocities should not have erosion problems except perhaps in extreme events. If erosion problems occur the following should be reassessed: (1) flow velocities and gradients within the cell, and (2) flow dissipation and erosion protection strategies in the pretreatment area and flow entrance. If sediment is deposited in the bioretention area, immediately determine the source within the contributing area, stabilize, and remove excess surface deposits.

3. Plant material: Depending on aesthetic requirements, occasional pruning and removing of dead plant material may be necessary. Replace all dead plants and if specific plants have a high mortality rate, assess the cause and, if necessary, replace with more appropriate species. Periodic weeding is necessary until plants are established. The weeding schedule should become less frequent if the appropriate plant species and planting density have been used and, as a result, undesirable plants excluded.

4. Nutrient and pesticides: The soil mix and plants are selected for optimum fertility, plant establishment, and growth. Nutrient and pesticide inputs should not be required and may degrade the pollutant processing capability of the bioretention area, as well as contribute pollutant loads to receiving waters. By design, bioretention facilities are located in areas where phosphorous and nitrogen levels are often elevated and these should not be limiting nutrients. If in question, have soil analyzed for fertility.

5. Mulch: Replace mulch annually in bioretention facilities where heavy metal deposition is likely (e.g., contributing areas that include industrial and auto dealer/repair parking lots and roads). In residential lots or other areas where metal deposition is not a concern, replace or add mulch as needed to maintain a 2 to 3 inch depth at least once every two years.

6. Soil: Soil mixes for bioretention facilities are designed to maintain long-term fertility and pollutant processing capability. Estimates from metal attenuation research suggest that metal accumulation should not present an environmental concern for at least 20 years in bioretention systems. Replacing mulch in bioretention facilities where heavy metal

deposition is likely provides an additional level of protection for prolonged performance. If in question, have soil analyzed for fertility and pollutant levels.

Maintenance Standards

A summary of the routine and major maintenance activities recommended for bioretention areas is shown in Table 5-1. Detailed Routine and major maintenance standards are listed in Tables 5-2 and 5-3.

Table 5-1: Bioretention Routine and Major Maintenance Quick Guide

Inspection and Maintenance Activities Summary	
Routine Maintenance	• Repair small eroded areas and ruts by filling with gravel. Overseed bare areas to reestablish vegetation • Remove trash and debris and rake surface soils to mitigate ponding • Remove accumulated fine sediments, dead leaves and trash to restore surface permeability • Remove any evidence of visual contamination from floatables such as oil and grease • Eradicate weeds and prune back excess plant growth that interferes with facility operation. Remove invasive vegetation and replace with non-invasive species • Remove sediment and debris accumulation near inlet and outlet structures to alleviate clogging • Clean and reset flow spreaders (if present) as needed to restore original function • Mow routinely to maintain ideal grass height and to suppress weeds • Periodically observe function under wet weather conditions
Major Maintenance	• Repair structural damage to flow control structures including inlet, outlet and overflow structures • Clean out under-drain, if present, to alleviate ponding. Replace media if ponding or loss of infiltrative capacity persists and revegetate • Regrade and revegetate to repair damage from severe erosion/scour channelization and to restore sheet flow • Take photographs before and after major maintenance (encouraged)

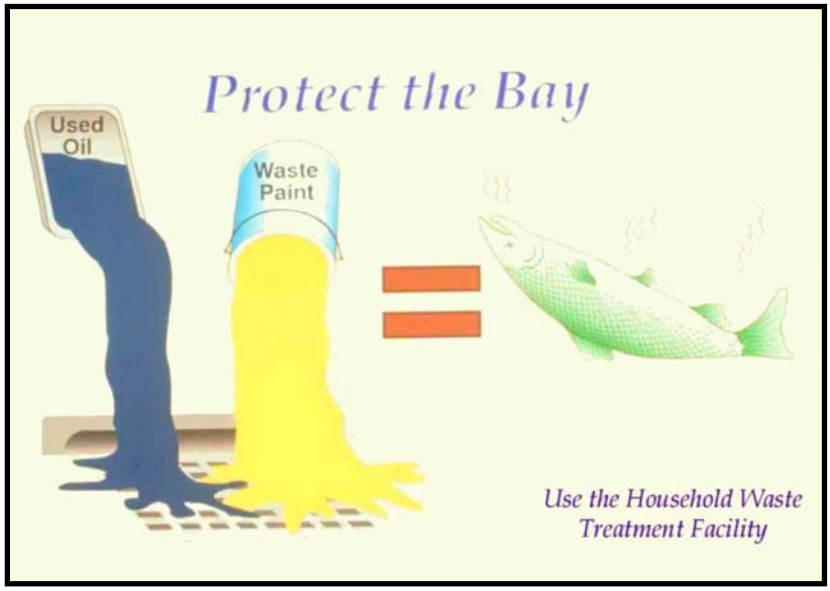
Table 5-2: Routine Maintenance – Bioretention

Defect or Problem	Condition When Maintenance is Needed	Results Expected When Maintenance Is Performed	Frequency
Erosion	Splash pads or spreader incorrectly placed; eroded or scoured areas due to flow channelization, or higher flows.	No erosion on surface of basin. No erosion or scouring evident. For ruts or bare areas less than 12 inches wide, damaged areas repaired by filling with crushed gravel. The grass will creep in over the rock in time.	Annually prior to wet season. After major storm events (>0.75 in/24 hrs) if spot checks of some basins indicate widespread damage/ maintenance needs
Standing Water	When water stands in the basin between storms and does not drain freely (with 36- 48 hours after storm event).	Water drains completely from basin as designed and surface is clear of trash and debris. Underdrains (if installed) are cleared.	
Loss of Surface Permeability	Accumulation of fine sediments, dead leaves, trash and other debris on surface	Surface permeability restored. Surface layer removed and replaced with fresh mulch.	
Visual Contaminants and Pollution	Any visual evidence of oil, gasoline, contaminants or other pollutants.	No visual contaminants or pollutants present.	Monthly (or as dictated by agreement between County and landscape contractor
Vegetation	Weeds, excessive plant growth, plants interfering with basin operation, plants diseased or dying	Basin tidy, plants healthy and pruned. Any plants that interfere with function are removed. Invasive or non-acclimated plants replaced.	
Inlet/Overflow	Inlet/outlet areas clogged with sediment and/or debris.	Material removed so that there is no clogging or blockage of the inlet or overflow area.	
Trash and Debris	Any trash and debris which exceed 5 cubic feet per 1,000 square feet (one standard garbage can).	Trash and debris removed and facility looks well kept.	

Table 5-3: Major Maintenance – Bioretention

Defect or Problem	**Condition When Maintenance is Needed**	**Results Expected When Maintenance Is Performed**	**Frequency**
Standing water	When water stands in the basin between storms and does not drain freely (with 36- 48 hours after storm event).	Filter media (sand, gravel, and topsoil) and vegetation removed and replaced.	Annually prior to wet season
Erosion/ Scouring	Bare spots greater than 12 inches	No erosion on surface of basin. Large bare areas are regraded and reseeded/replanted.	As needed

Non-Stormwater Discharges SC-10



Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Non-stormwater discharges are those flows that do not consist entirely of stormwater. Some non-stormwater discharges do not include pollutants and may be discharged to the storm drain. These include uncontaminated groundwater and natural springs. There are also some non-stormwater discharges that typically do not contain pollutants and may be discharged to the storm drain with conditions. These include car washing, air conditioner condensate, etc. However there are certain non-stormwater discharges that pose environmental concern. These discharges may originate from illegal dumping or from internal floor drains, appliances, industrial processes, sinks, and toilets that are connected to the nearby storm drainage system. These discharges (which may include: process waste waters, cooling waters, wash waters, and sanitary wastewater) can carry substances such as paint, oil, fuel and other automotive fluids, chemicals and other pollutants into storm drains. They can generally be detected through a combination of detection and elimination. The ultimate goal is to effectively eliminate non-stormwater discharges to the stormwater drainage system through implementation of measures to detect, correct, and enforce against illicit connections and illegal discharges of pollutants on streets and into the storm drain system and creeks.

Approach

Initially the industry must make an assessment of non-stormwater discharges to determine which types must be eliminated or addressed through BMPs. The focus of the following approach is in the elimination of non-stormwater discharges.

Targeted Constituents

Sediment	
Nutrients	✓
Trash	
Metals	✓
Bacteria	✓
Oil and Grease	✓
Organics	✓

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SC-10 Non-Stormwater Discharges

Pollution Prevention

- Ensure that used oil, used antifreeze, and hazardous chemical recycling programs are being implemented. Encourage litter control.

Suggested Protocols

Recommended Complaint Investigation Equipment

- Field Screening Analysis
  - pH paper or meter
  - Commercial stormwater pollutant screening kit that can detect for reactive phosphorus, nitrate nitrogen, ammonium nitrogen, specific conductance, and turbidity
  - Sample jars
  - Sample collection pole
  - A tool to remove access hole covers
- Laboratory Analysis
  - Sample cooler
  - Ice
  - Sample jars and labels
  - Chain of custody forms
- Documentation
  - Camera
  - Notebook
  - Pens
  - Notice of Violation forms
  - Educational materials

General

- Develop clear protocols and lines of communication for effectively prohibiting non-stormwater discharges, especially those that are not classified as hazardous. These are often not responded to as effectively as they need to be.
- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as “Dump No Waste Drains to Stream” stenciled or demarcated next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.

Non-Stormwater Discharges SC-10

- See SC44 Stormwater Drainage System Maintenance for additional information.

Illicit Connections

- Locate discharges from the industrial storm drainage system to the municipal storm drain system through review of "as-built" piping schematics.
- Isolate problem areas and plug illicit discharge points.
- Locate and evaluate all discharges to the industrial storm drain system.

Visual Inspection and Inventory

- Inventory and inspect each discharge point during dry weather.
- Keep in mind that drainage from a storm event can continue for a day or two following the end of a storm and groundwater may infiltrate the underground stormwater collection system. Also, non-stormwater discharges are often intermittent and may require periodic inspections.

Review Infield Piping

- A review of the "as-built" piping schematic is a way to determine if there are any connections to the stormwater collection system.
- Inspect the path of floor drains in older buildings.

Smoke Testing

- Smoke testing of wastewater and stormwater collection systems is used to detect connections between the two systems.
- During dry weather the stormwater collection system is filled with smoke and then traced to sources. The appearance of smoke at the base of a toilet indicates that there may be a connection between the sanitary and the stormwater system.

Dye Testing

- A dye test can be performed by simply releasing a dye into either your sanitary or process wastewater system and examining the discharge points from the stormwater collection system for discoloration.

TV Inspection of Drainage System

- TV Cameras can be employed to visually identify illicit connections to the industrial storm drainage system.

Illegal Dumping

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste.

SC-10 Non-Stormwater Discharges

- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Once a site has been cleaned:

- Post "No Dumping" signs with a phone number for reporting dumping and disposal.
- Landscaping and beautification efforts of hot spots may also discourage future dumping, as well as provide open space and increase property values.
- Lighting or barriers may also be needed to discourage future dumping.
- See fact sheet SC11 Spill Prevention, Control, and Cleanup.

Inspection

- Regularly inspect and clean up hot spots and other storm drainage areas where illegal dumping and disposal occurs.
- Conduct field investigations of the industrial storm drain system for potential sources of non-stormwater discharges.
- Pro-actively conduct investigations of high priority areas. Based on historical data, prioritize specific geographic areas and/or incident type for pro-active investigations.

Reporting

- A database is useful for defining and tracking the magnitude and location of the problem.
- Report prohibited non-stormwater discharges observed during the course of normal daily activities so they can be investigated, contained, and cleaned up or eliminated.
- Document that non-stormwater discharges have been eliminated by recording tests performed, methods used, dates of testing, and any on-site drainage points observed.
- Document and report annually the results of the program.
- Maintain documentation of illicit connection and illegal dumping incidents, including significant conditionally exempt discharges that are not properly managed.

Training

- Training of technical staff in identifying and documenting illegal dumping incidents is required.
- Consider posting the quick reference table near storm drains to reinforce training.
- Train employees to identify non-stormwater discharges and report discharges to the appropriate departments.

Non-Stormwater Discharges SC-10

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills. The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur. Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Determine and implement appropriate outreach efforts to reduce non-permissible non-stormwater discharges.
- Conduct spill response drills annually (if no events occurred to evaluate your plan) in cooperation with other industries.
- When a responsible party is identified, educate the party on the impacts of his or her actions.

Spill Response and Prevention

- See SC11 Spill Prevention Control and Cleanup.

Other Considerations

- Many facilities do not have accurate, up-to-date schematic drawings.

Requirements

Costs (including capital and operation & maintenance)

- The primary cost is for staff time and depends on how aggressively a program is implemented.
- Cost for containment and disposal is borne by the discharger.
- Illicit connections can be difficult to locate especially if there is groundwater infiltration.
- Indoor floor drains may require re-plumbing if cross-connections to storm drains are detected.

Maintenance (including administrative and staffing)

- Illegal dumping and illicit connection violations requires technical staff to detect and investigate them.

Supplemental Information

Further Detail of the BMP

Illegal Dumping

- Substances illegally dumped on streets and into the storm drain systems and creeks include paints, used oil and other automotive fluids, construction debris, chemicals, fresh concrete, leaves, grass clippings, and pet wastes. All of these wastes cause stormwater and receiving water quality problems as well as clog the storm drain system itself.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots

SC-10 Non-Stormwater Discharges

- Types and quantities (in some cases) of wastes
- Patterns in time of occurrence (time of day/night, month, or year)
- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

One of the keys to success of reducing or eliminating illegal dumping is increasing the number of people at the facility who are aware of the problem and who have the tools to at least identify the incident, if not correct it. Therefore, train field staff to recognize and report the incidents.

What constitutes a "non-stormwater" discharge?

- Non-stormwater discharges to the stormwater collection system may include any water used directly in the manufacturing process (process wastewater), air conditioning condensate and coolant, non-contact cooling water, cooling equipment condensate, outdoor secondary containment water, vehicle and equipment wash water, sink and drinking fountain wastewater, sanitary wastes, or other wastewaters.

Permit Requirements

- Facilities subject to stormwater permit requirements must include a certification that the stormwater collection system has been tested or evaluated for the presence of non-stormwater discharges. The State's General Industrial Stormwater Permit requires that non-stormwater discharges be eliminated prior to implementation of the facility's SWPPP.

Performance Evaluation

- Review annually internal investigation results; assess whether goals were met and what changes or improvements are necessary.
- Obtain feedback from personnel assigned to respond to, or inspect for, illicit connections and illegal dumping incidents.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Spill Prevention, Control & Cleanup SC-11

Photo Credit: Geoff Brosseau

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Description

Many activities that occur at an industrial or commercial site have the potential to cause accidental or illegal spills. Preparation for accidental or illegal spills, with proper training and reporting systems implemented, can minimize the discharge of pollutants to the environment.

Spills and leaks are one of the largest contributors of stormwater pollutants. Spill prevention and control plans are applicable to any site at which hazardous materials are stored or used. An effective plan should have spill prevention and response procedures that identify potential spill areas, specify material handling procedures, describe spill response procedures, and provide spill clean-up equipment. The plan should take steps to identify and characterize potential spills, eliminate and reduce spill potential, respond to spills when they occur in an effort to prevent pollutants from entering the stormwater drainage system, and train personnel to prevent and control future spills.

Targeted Constituents

Sediment	
Nutrients	
Trash	
Metals	☑
Bacteria	
Oil and Grease	☑
Organics	☑

Approach

Pollution Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- Develop a Spill Prevention Control and Countermeasure (SPCC) Plan. The plan should include:

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- Description of the facility, owner and address, activities and chemicals present
- Facility map
- Notification and evacuation procedures
- Cleanup instructions
- Identification of responsible departments
- Identify key spill response personnel

- Recycle, reclaim, or reuse materials whenever possible. This will reduce the amount of process materials that are brought into the facility.

Suggested Protocols (including equipment needs)

Spill Prevention

- Develop procedures to prevent/mitigate spills to storm drain systems. Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures.

- If consistent illegal dumping is observed at the facility:
  - Post "No Dumping" signs with a phone number for reporting illegal dumping and disposal. Signs should also indicate fines and penalties applicable for illegal dumping.
  - Landscaping and beautification efforts may also discourage illegal dumping.
  - Bright lighting and/or entrance barriers may also be needed to discourage illegal dumping.

- Store and contain liquid materials in such a manner that if the tank is ruptured, the contents will not discharge, flow, or be washed into the storm drainage system, surface waters, or groundwater.

- If the liquid is oil, gas, or other material that separates from and floats on water, install a spill control device (such as a tee section) in the catch basins that collects runoff from the storage tank area.

- Routine maintenance:
  - Place drip pans or absorbent materials beneath all mounted taps, and at all potential drip and spill locations during filling and unloading of tanks. Any collected liquids or soiled absorbent materials must be reused/recycled or properly disposed.
  - Store and maintain appropriate spill cleanup materials in a location known to all near the tank storage area; and ensure that employees are familiar with the site's spill control plan and/or proper spill cleanup procedures.
  - Sweep and clean the storage area monthly if it is paved, *do not hose down the area to a storm drain.*

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  - Check tanks (and any containment sumps) daily for leaks and spills. Replace tanks that are leaking, corroded, or otherwise deteriorating with tanks in good condition. Collect all spilled liquids and properly dispose of them.

- Label all containers according to their contents (e.g., solvent, gasoline).
- Label hazardous substances regarding the potential hazard (corrosive, radioactive, flammable, explosive, poisonous).
- Prominently display required labels on transported hazardous and toxic materials (per US DOT regulations).
- Identify key spill response personnel.

Spill Control and Cleanup Activities

- Follow the Spill Prevention Control and Countermeasure Plan.
- Clean up leaks and spills immediately.
- Place a stockpile of spill cleanup materials where it will be readily accessible (e.g., near storage and maintenance areas).
- On paved surfaces, clean up spills with as little water as possible. Use a rag for small spills, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to a certified laundry (rags) or disposed of as hazardous waste. Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Never hose down or bury dry material spills. Sweep up the material and dispose of properly.
- Chemical cleanups of material can be achieved with the use of adsorbents, gels, and foams. Use adsorbent materials on small spills rather than hosing down the spill. Remove the adsorbent materials promptly and dispose of properly.
- For larger spills, a private spill cleanup company or Hazmat team may be necessary.

Reporting

- Report spills that pose an immediate threat to human health or the environment to the Regional Water Quality Control Board.
- Federal regulations require that any oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) at 800-424-8802 (24 hour).
- Report spills to local agencies, such as the fire department; they can assist in cleanup.
- Establish a system for tracking incidents. The system should be designed to identify the following:

  - Types and quantities (in some cases) of wastes

  - Patterns in time of occurrence (time of day/night, month, or year)

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- Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
- Responsible parties

Training

- Educate employees about spill prevention and cleanup.
- Well-trained employees can reduce human errors that lead to accidental releases or spills:
  - The employee should have the tools and knowledge to immediately begin cleaning up a spill should one occur.
  - Employees should be familiar with the Spill Prevention Control and Countermeasure Plan.
- Employees should be educated about aboveground storage tank requirements. Employees responsible for aboveground storage tanks and liquid transfers should be thoroughly familiar with the Spill Prevention Control and Countermeasure Plan and the plan should be readily available.
- Train employees to recognize and report illegal dumping incidents.

Other Considerations (Limitations and Regulations)

- A Spill Prevention Control and Countermeasure Plan (SPCC) is required for facilities that are subject to the oil pollution regulations specified in Part 112 of Title 40 of the Code of Federal Regulations or if they have a storage capacity of 10,000 gallons or more of petroleum. (Health and Safety Code 6.67)
- State regulations also exist for storage of hazardous materials (Health & Safety Code Chapter 6.95), including the preparation of area and business plans for emergency response to the releases or threatened releases.
- Consider requiring smaller secondary containment areas (less than 200 sq. ft.) to be connected to the sanitary sewer, prohibiting any hard connections to the storm drain.

Requirements

Costs (including capital and operation & maintenance)

- Will vary depending on the size of the facility and the necessary controls.
- Prevention of leaks and spills is inexpensive. Treatment and/or disposal of contaminated soil or water can be quite expensive.

Maintenance (including administrative and staffing)

- This BMP has no major administrative or staffing requirements. However, extra time is needed to properly handle and dispose of spills, which results in increased labor costs.

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Supplemental Information

Further Detail of the BMP

Reporting

Record keeping and internal reporting represent good operating practices because they can increase the efficiency of the facility and the effectiveness of BMPs. A good record keeping system helps the facility minimize incident recurrence, correctly respond with appropriate cleanup activities, and comply with legal requirements. A record keeping and reporting system should be set up for documenting spills, leaks, and other discharges, including discharges of hazardous substances in reportable quantities. Incident records describe the quality and quantity of non-stormwater discharges to the storm sewer. These records should contain the following information:

- Date and time of the incident
- Weather conditions
- Duration of the spill/leak/discharge
- Cause of the spill/leak/discharge
- Response procedures implemented
- Persons notified
- Environmental problems associated with the spill/leak/discharge

Separate record keeping systems should be established to document housekeeping and preventive maintenance inspections, and training activities. All housekeeping and preventive maintenance inspections should be documented. Inspection documentation should contain the following information:

- The date and time the inspection was performed
- Name of the inspector
- Items inspected
- Problems noted
- Corrective action required
- Date corrective action was taken

Other means to document and record inspection results are field notes, timed and dated photographs, videotapes, and drawings and maps.

Aboveground Tank Leak and Spill Control

Accidental releases of materials from aboveground liquid storage tanks present the potential for contaminating stormwater with many different pollutants. Materials spilled, leaked, or lost from

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tanks may accumulate in soils or on impervious surfaces and be carried away by stormwater runoff.

The most common causes of unintentional releases are:

- Installation problems
- Failure of piping systems (pipes, pumps, flanges, couplings, hoses, and valves)
- External corrosion and structural failure
- Spills and overfills due to operator error
- Leaks during pumping of liquids or gases from truck or rail car to a storage tank or vice versa

Storage of reactive, ignitable, or flammable liquids should comply with the Uniform Fire Code and the National Electric Code. Practices listed below should be employed to enhance the code requirements:

- Tanks should be placed in a designated area.
- Tanks located in areas where firearms are discharged should be encapsulated in concrete or the equivalent.
- Designated areas should be impervious and paved with Portland cement concrete, free of cracks and gaps, in order to contain leaks and spills.
- Liquid materials should be stored in UL approved double walled tanks or surrounded by a curb or dike to provide the volume to contain 10 percent of the volume of all of the containers or 110 percent of the volume of the largest container, whichever is greater. The area inside the curb should slope to a drain.
- For used oil or dangerous waste, a dead-end sump should be installed in the drain.
- All other liquids should be drained to the sanitary sewer if available. The drain must have a positive control such as a lock, valve, or plug to prevent release of contaminated liquids.
- Accumulated stormwater in petroleum storage areas should be passed through an oil/water separator.

Maintenance is critical to preventing leaks and spills. Conduct routine inspections and:

- Check for external corrosion and structural failure.
- Check for spills and overfills due to operator error.
- Check for failure of piping system (pipes, pumps, flanger, coupling, hoses, and valves).
- Check for leaks or spills during pumping of liquids or gases from truck or rail car to a storage facility or vice versa.

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- Visually inspect new tank or container installation for loose fittings, poor welding, and improper or poorly fitted gaskets.
- Inspect tank foundations, connections, coatings, and tank walls and piping system. Look for corrosion, leaks, cracks, scratches, and other physical damage that may weaken the tank or container system.
- Frequently relocate accumulated stormwater during the wet season.
- Periodically conduct integrity testing by a qualified professional.

Vehicle Leak and Spill Control

Major spills on roadways and other public areas are generally handled by highly trained Hazmat teams from local fire departments or environmental health departments. The measures listed below pertain to leaks and smaller spills at vehicle maintenance shops.

In addition to implementing the spill prevention, control, and clean up practices above, use the following measures related to specific activities:

Vehicle and Equipment Maintenance

- Perform all vehicle fluid removal or changing inside or under cover to prevent the run-on of stormwater and the runoff of spills.
- Regularly inspect vehicles and equipment for leaks, and repair immediately.
- Check incoming vehicles and equipment (including delivery trucks, and employee and subcontractor vehicles) for leaking oil and fluids. Do not allow leaking vehicles or equipment onsite.
- Always use secondary containment, such as a drain pan or drop cloth, to catch spills or leaks when removing or changing fluids.
- Immediately drain all fluids from wrecked vehicles.
- Store wrecked vehicles or damaged equipment under cover.
- Place drip pans or absorbent materials under heavy equipment when not in use.
- Use adsorbent materials on small spills rather than hosing down the spill.
- Remove the adsorbent materials promptly and dispose of properly.
- Promptly transfer used fluids to the proper waste or recycling drums. Don't leave full drip pans or other open containers lying around.
- Oil filters disposed of in trashcans or dumpsters can leak oil and contaminate stormwater. Place the oil filter in a funnel over a waste oil recycling drum to drain excess oil before disposal. Oil filters can also be recycled. Ask your oil supplier or recycler about recycling oil filters.

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- Store cracked batteries in a non-leaking secondary container. Do this with all cracked batteries, even if you think all the acid has drained out. If you drop a battery, treat it as if it is cracked. Put it into the containment area until you are sure it is not leaking.

Vehicle and Equipment Fueling

- Design the fueling area to prevent the run-on of stormwater and the runoff of spills:
  - Cover fueling area if possible.
  - Use a perimeter drain or slope pavement inward with drainage to a sump.
  - Pave fueling area with concrete rather than asphalt.
- If dead-end sump is not used to collect spills, install an oil/water separator.
- Install vapor recovery nozzles to help control drips as well as air pollution.
- Discourage "topping-off' of fuel tanks.
- Use secondary containment when transferring fuel from the tank truck to the fuel tank.
- Use adsorbent materials on small spills and general cleaning rather than hosing down the area. Remove the adsorbent materials promptly.
- Carry out all Federal and State requirements regarding underground storage tanks, or install above ground tanks.
- Do not use mobile fueling of mobile industrial equipment around the facility; rather, transport the equipment to designated fueling areas.
- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Train employees in proper fueling and cleanup procedures.

Industrial Spill Prevention Response

For the purposes of developing a spill prevention and response program to meet the stormwater regulations, facility managers should use information provided in this fact sheet and the spill prevention/response portions of the fact sheets in this handbook, for specific activities. The program should:

- Integrate with existing emergency response/hazardous materials programs (e.g., Fire Department)
- Develop procedures to prevent/mitigate spills to storm drain systems
- Identify responsible departments
- Develop and standardize reporting procedures, containment, storage, and disposal activities, documentation, and follow-up procedures
- Address spills at municipal facilities, as well as public areas

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- Provide training concerning spill prevention, response and cleanup to all appropriate personnel

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Stormwater Managers Resource Center http://www.stormwatercenter.net/

Parking/Storage Area Maintenance SC-43

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize
- Product Substitution

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	✓
Bacteria	
Oil and Grease	✓
Organics	✓

Description

Parking lots and storage areas can contribute a number of substances, such as trash, suspended solids, hydrocarbons, oil and grease, and heavy metals that can enter receiving waters through stormwater runoff or non-stormwater discharges. The protocols in this fact sheet are intended to prevent or reduce the discharge of pollutants from parking/storage areas and include using good housekeeping practices, following appropriate cleaning BMPs, and training employees.

Approach

The goal of this program is to ensure stormwater pollution prevention practices are considered when conducting activities on or around parking areas and storage areas to reduce potential for pollutant discharge to receiving waters. Successful implementation depends on effective training of employees on applicable BMPs and general pollution prevention strategies and objectives.

Pollution Prevention

- Encourage alternative designs and maintenance strategies for impervious parking lots. (See New Development and Redevelopment BMP Handbook)
- Keep accurate maintenance logs to evaluate BMP implementation.

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Suggested Protocols

General

- Keep the parking and storage areas clean and orderly. Remove debris in a timely fashion.
- Allow sheet runoff to flow into biofilters (vegetated strip and swale) and/or infiltration devices.
- Utilize sand filters or oleophilic collectors for oily waste in low quantities.
- Arrange rooftop drains to prevent drainage directly onto paved surfaces.
- Design lot to include semi-permeable hardscape.
- Discharge soapy water remaining in mop or wash buckets to the sanitary sewer through a sink, toilet, clean-out, or wash area with drain.

Controlling Litter

- Post "No Littering" signs and enforce anti-litter laws.
- Provide an adequate number of litter receptacles.
- Clean out and cover litter receptacles frequently to prevent spillage.
- Provide trash receptacles in parking lots to discourage litter.
- Routinely sweep, shovel, and dispose of litter in the trash.

Surface Cleaning

- Use dry cleaning methods (e.g., sweeping, vacuuming) to prevent the discharge of pollutants into the stormwater conveyance system if possible.
- Establish frequency of public parking lot sweeping based on usage and field observations of waste accumulation.
- Sweep all parking lots at least once before the onset of the wet season.
- Follow the procedures below if water is used to clean surfaces:
  - Block the storm drain or contain runoff.
  - Collect and pump wash water to the sanitary sewer or discharge to a pervious surface. Do not allow wash water to enter storm drains.
  - Dispose of parking lot sweeping debris and dirt at a landfill.
- Follow the procedures below when cleaning heavy oily deposits:
  - Clean oily spots with absorbent materials.
  - Use a screen or filter fabric over inlet, then wash surfaces.

Parking/Storage Area Maintenance SC-43

- Do not allow discharges to the storm drain.
- Vacuum/pump discharges to a tank or discharge to sanitary sewer.
- Appropriately dispose of spilled materials and absorbents.

Surface Repair

- Preheat, transfer or load hot bituminous material away from storm drain inlets.
- Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff.
- Cover and seal nearby storm drain inlets where applicable (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal.
- Use only as much water as necessary for dust control, to avoid runoff.
- Catch drips from paving equipment that is not in use with pans or absorbent material placed under the machines. Dispose of collected material and absorbents properly.

Inspection

- Have designated personnel conduct inspections of parking facilities and stormwater conveyance systems associated with parking facilities on a regular basis.
- Inspect cleaning equipment/sweepers for leaks on a regular basis.

Training

- Provide regular training to field employees and/or contractors regarding cleaning of paved areas and proper operation of equipment.
- Train employees and contractors in proper techniques for spill containment and cleanup.

Spill Response and Prevention

- Keep your Spill Prevention Control and Countermeasure (SPCC) Plan up-to-date.
- Place a stockpile of spill cleanup materials where it will be readily accessible or at a central location.
- Clean up fluid spills immediately with absorbent rags or material.
- Dispose of spilled material and absorbents properly.

Other Considerations

Limitations related to sweeping activities at large parking facilities may include high equipment costs, the need for sweeper operator training, and the inability of current sweeper technology to remove oil and grease.

SC-43 Parking/Storage Area Maintenance

Requirements

Costs

Cleaning/sweeping costs can be quite large. Construction and maintenance of stormwater structural controls can be quite expensive as well.

Maintenance

- Sweep parking lot regularly to minimize cleaning with water.
- Clean out oil/water/sand separators regularly, especially after heavy storms.
- Clean parking facilities regularly to prevent accumulated wastes and pollutants from being discharged into conveyance systems during rainy conditions.

Supplemental Information

Further Detail of the BMP

Surface Repair

Apply concrete, asphalt, and seal coat during dry weather to prevent contamination from contacting stormwater runoff. Where applicable, cover and seal nearby storm drain inlets (with waterproof material or mesh) and manholes before applying seal coat, slurry seal, etc. Leave covers in place until job is complete and all water from emulsified oil sealants has drained or evaporated. Clean any debris from these covered manholes and drains for proper disposal. Only use only as much water as is necessary for dust control to avoid runoff.

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Pollution from Surface Cleaning Folder. 1996. Bay Area Stormwater Management Agencies Association (BASMAA). http://www.basmaa.org/

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net/

Drainage System Maintenance SC-44

Objectives

- Cover
- Contain
- Educate
- Reduce/Minimize

Description

As a consequence of its function, the stormwater conveyance system collects and transports urban runoff and stormwater that may contain certain pollutants. The protocols in this fact sheet are intended to reduce pollutants reaching receiving waters through proper conveyance system operation and maintenance.

Targeted Constituents

Sediment	✓
Nutrients	
Trash	✓
Metals	
Bacteria	✓
Oil and Grease	
Organics	

Approach

Pollution Prevention

Maintain catch basins, stormwater inlets, and other stormwater conveyance structures on a regular basis to remove pollutants, reduce high pollutant concentrations during the first flush of storms, prevent clogging of the downstream conveyance system, restore catch basins' sediment trapping capacity, and ensure the system functions properly hydraulically to avoid flooding.

Suggested Protocols

Catch Basins/Inlet Structures

- Staff should regularly inspect facilities to ensure compliance with the following:
  - Immediate repair of any deterioration threatening structural integrity.
  - Cleaning before the sump is 40% full. Catch basins should be cleaned as frequently as needed to meet this standard.
  - Stenciling of catch basins and inlets (see SC34 Waste Handling and Disposal).

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- Clean catch basins, storm drain inlets, and other conveyance structures before the wet season to remove sediments and debris accumulated during the summer.
- Conduct inspections more frequently during the wet season for problem areas where sediment or trash accumulates more often. Clean and repair as needed.
- Keep accurate logs of the number of catch basins cleaned.
- Store wastes collected from cleaning activities of the drainage system in appropriate containers or temporary storage sites in a manner that prevents discharge to the storm drain.
- Dewater the wastes if necessary with outflow into the sanitary sewer if permitted. Water should be treated with an appropriate filtering device prior to discharge to the sanitary sewer. If discharge to the sanitary sewer is not allowed, water should be pumped or vacuumed to a tank and properly disposed. Do not dewater near a storm drain or stream.

Storm Drain Conveyance System

- Locate reaches of storm drain with deposit problems and develop a flushing schedule that keeps the pipe clear of excessive buildup.
- Collect and pump flushed effluent to the sanitary sewer for treatment whenever possible.

Pump Stations

- Clean all storm drain pump stations prior to the wet season to remove silt and trash.
- Do not allow discharge to reach the storm drain system when cleaning a storm drain pump station or other facility.
- Conduct routine maintenance at each pump station.
- Inspect, clean, and repair as necessary all outlet structures prior to the wet season.

Open Channel

- Modify storm channel characteristics to improve channel hydraulics, increase pollutant removals, and enhance channel/creek aesthetic and habitat value.
- Conduct channel modification/improvement in accordance with existing laws. Any person, government agency, or public utility proposing an activity that will change the natural (emphasis added) state of any river, stream, or lake in California, must enter into a Steam or Lake Alteration Agreement with the Department of Fish and Game. The developer-applicant should also contact local governments (city, county, special districts), other state agencies (SWRCB, RWQCB, Department of Forestry, Department of Water Resources), and Federal Corps of Engineers and USFWS.

Illicit Connections and Discharges

- Look for evidence of illegal discharges or illicit connections during routine maintenance of conveyance system and drainage structures:
  - Is there evidence of spills such as paints, discoloring, etc?

Drainage System Maintenance SC-44

- Are there any odors associated with the drainage system?
- Record locations of apparent illegal discharges/illicit connections?
- Track flows back to potential dischargers and conduct aboveground inspections. This can be done through visual inspection of upgradient manholes or alternate techniques including zinc chloride smoke testing, fluorometric dye testing, physical inspection testing, or television camera inspection.
- Eliminate the discharge once the origin of flow is established.

- Stencil or demarcate storm drains, where applicable, to prevent illegal disposal of pollutants. Storm drain inlets should have messages such as "Dump No Waste Drains to Stream" stenciled next to them to warn against ignorant or intentional dumping of pollutants into the storm drainage system.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Illegal Dumping

- Inspect and clean up hot spots and other storm drainage areas regularly where illegal dumping and disposal occurs.
- Establish a system for tracking incidents. The system should be designed to identify the following:
  - Illegal dumping hot spots
  - Types and quantities (in some cases) of wastes
  - Patterns in time of occurrence (time of day/night, month, or year)
  - Mode of dumping (abandoned containers, "midnight dumping" from moving vehicles, direct dumping of materials, accidents/spills)
  - Responsible parties
- Post "No Dumping" signs in problem areas with a phone number for reporting dumping and disposal. Signs should also indicate fines and penalties for illegal dumping.
- Refer to fact sheet SC-10 Non-Stormwater Discharges.

Training

- Train crews in proper maintenance activities, including record keeping and disposal.
- Allow only properly trained individuals to handle hazardous materials/wastes.
- Have staff involved in detection and removal of illicit connections trained in the following:
  - OSHA-required Health and Safety Training (29 CFR 1910.120) plus annual refresher training (as needed).

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- OSHA Confined Space Entry training (Cal-OSHA Confined Space, Title 8 and Federal OSHA 29 CFR 1910.146).
- Procedural training (field screening, sampling, smoke/dye testing, TV inspection).

Spill Response and Prevention

- Investigate all reports of spills, leaks, and/or illegal dumping promptly.
- Clean up all spills and leaks using "dry" methods (with absorbent materials and/or rags) or dig up, remove, and properly dispose of contaminated soil.
- Refer to fact sheet SC-11 Spill Prevention, Control, and Cleanup.

Other Considerations (Limitations and Regulations)

- Clean-up activities may create a slight disturbance for local aquatic species. Access to items and material on private property may be limited. Trade-offs may exist between channel hydraulics and water quality/riparian habitat. If storm channels or basins are recognized as wetlands, many activities, including maintenance, may be subject to regulation and permitting.
- Storm drain flushing is most effective in small diameter pipes (36-inch diameter pipe or less, depending on water supply and sediment collection capacity). Other considerations associated with storm drain flushing may include the availability of a water source, finding a downstream area to collect sediments, liquid/sediment disposal, and prohibition against disposal of flushed effluent to sanitary sewer in some areas.
- Regulations may include adoption of substantial penalties for illegal dumping and disposal.
- Local municipal codes may include sections prohibiting discharge of soil, debris, refuse, hazardous wastes, and other pollutants into the storm drain system.

Requirements

Costs

- An aggressive catch basin cleaning program could require a significant capital and O&M budget.
- The elimination of illegal dumping is dependent on the availability, convenience, and cost of alternative means of disposal. The primary cost is for staff time. Cost depends on how aggressively a program is implemented. Other cost considerations for an illegal dumping program include:
  - Purchase and installation of signs.
  - Rental of vehicle(s) to haul illegally-disposed items and material to landfills.
  - Rental of heavy equipment to remove larger items (e.g., car bodies) from channels.
  - Purchase of landfill space to dispose of illegally-dumped items and material.

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- Methods used for illicit connection detection (smoke testing, dye testing, visual inspection, and flow monitoring) can be costly and time-consuming. Site-specific factors, such as the level of impervious area, the density and ages of buildings, and type of land use will determine the level of investigation necessary.

Maintenance

- Two-person teams may be required to clean catch basins with vactor trucks.
- Teams of at least two people plus administrative personnel are required to identify illicit discharges, depending on the complexity of the storm sewer system.
- Arrangements must be made for proper disposal of collected wastes.
- Technical staff are required to detect and investigate illegal dumping violations.

Supplemental Information

Further Detail of the BMP

Storm Drain Flushing

Flushing is a common maintenance activity used to improve pipe hydraulics and to remove pollutants in storm drainage systems. Flushing may be designed to hydraulically convey accumulated material to strategic locations, such as an open channel, another point where flushing will be initiated, or the sanitary sewer and the treatment facilities, thus preventing resuspension and overflow of a portion of the solids during storm events. Flushing prevents "plug flow" discharges of concentrated pollutant loadings and sediments. Deposits can hinder the designed conveyance capacity of the storm drain system and potentially cause backwater conditions in severe cases of clogging.

Storm drain flushing usually takes place along segments of pipe with grades that are too flat to maintain adequate velocity to keep particles in suspension. An upstream manhole is selected to place an inflatable device that temporarily plugs the pipe. Further upstream, water is pumped into the line to create a flushing wave. When the upstream reach of pipe is sufficiently full to cause a flushing wave, the inflated device is rapidly deflated with the assistance of a vacuum pump, thereby releasing the backed up water and resulting in the cleaning of the storm drain segment.

To further reduce impacts of stormwater pollution, a second inflatable device placed well downstream may be used to recollect the water after the force of the flushing wave has dissipated. A pump may then be used to transfer the water and accumulated material to the sanitary sewer for treatment. In some cases, an interceptor structure may be more practical or required to recollect the flushed waters.

It has been found that cleansing efficiency of periodic flush waves is dependent upon flush volume, flush discharge rate, sewer slope, sewer length, sewer flow rate, sewer diameter, and population density. As a rule of thumb, the length of line to be flushed should not exceed 700 feet. At this maximum recommended length, the percent removal efficiency ranges between 65-75% for organics and 55-65% for dry weather grit/inorganic material. The percent removal efficiency drops rapidly beyond that. Water is commonly supplied by a water truck, but fire hydrants can also supply water. To make the best use of water, it is recommended that reclaimed water be used or that fire hydrant line flushing coincide with storm sewer flushing.

SC-44 Drainage System Maintenance

References and Resources

California's Nonpoint Source Program Plan http://www.swrcb.ca.gov/nps/index.html

Clark County Storm Water Pollution Control Manual
http://www.co.clark.wa.us/pubworks/bmpman.pdf

Ferguson, B.K. 1991. Urban Stream Reclamation, p. 324-322, Journal of Soil and Water Conservation.

King County Storm Water Pollution Control Manual http://dnr.metrokc.gov/wlr/dss/spcm.htm

Oregon Association of Clean Water Agencies. Oregon Municipal Stormwater Toolbox for Maintenance Practices. June 1998.

Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp.org

The Storm Water Managers Resource Center http://www.stormwatercenter.net

United States Environmental Protection Agency (USEPA). 2002. Pollution Prevention/Good Housekeeping for Municipal Operations Storm Drain System Cleaning. On line:
http://www.epa.gov/npdes/menuofbmps/poll_16.htm

Site Design & Landscape Planning SD-10

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- ☑ Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Each project site possesses unique topographic, hydrologic, and vegetative features, some of which are more suitable for development than others. Integrating and incorporating appropriate landscape planning methodologies into the project design is the most effective action that can be done to minimize surface and groundwater contamination from stormwater.

Approach

Landscape planning should couple consideration of land suitability for urban uses with consideration of community goals and projected growth. Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Design requirements for site design and landscapes planning should conform to applicable standards and specifications of agencies with jurisdiction and be consistent with applicable General Plan and Local Area Plan policies.

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SD-10 Site Design & Landscape Planning

Designing New Installations

Begin the development of a plan for the landscape unit with attention to the following general principles:

- Formulate the plan on the basis of clearly articulated community goals. Carefully identify conflicts and choices between retaining and protecting desired resources and community growth.
- Map and assess land suitability for urban uses. Include the following landscape features in the assessment: wooded land, open unwooded land, steep slopes, erosion-prone soils, foundation suitability, soil suitability for waste disposal, aquifers, aquifer recharge areas, wetlands, floodplains, surface waters, agricultural lands, and various categories of urban land use. When appropriate, the assessment can highlight outstanding local or regional resources that the community determines should be protected (e.g., a scenic area, recreational area, threatened species habitat, farmland, fish run). Mapping and assessment should recognize not only these resources but also additional areas needed for their sustenance.

Project plan designs should conserve natural areas to the extent possible, maximize natural water storage and infiltration opportunities, and protect slopes and channels.

Conserve Natural Areas during Landscape Planning

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

- Cluster development on least-sensitive portions of a site while leaving the remaining land in a natural undisturbed condition.
- Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
- Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and/or drought tolerant plants.
- Promote natural vegetation by using parking lot islands and other landscaped areas.
- Preserve riparian areas and wetlands.

Maximize Natural Water Storage and Infiltration Opportunities Within the Landscape Unit

- Promote the conservation of forest cover. Building on land that is already deforested affects basin hydrology to a lesser extent than converting forested land. Loss of forest cover reduces interception storage, detention in the organic forest floor layer, and water losses by evapotranspiration, resulting in large peak runoff increases and either their negative effects or the expense of countering them with structural solutions.
- Maintain natural storage reservoirs and drainage corridors, including depressions, areas of permeable soils, swales, and intermittent streams. Develop and implement policies and

regulations to discourage the clearing, filling, and channelization of these features. Utilize them in drainage networks in preference to pipes, culverts, and engineered ditches.

- Evaluating infiltration opportunities by referring to the stormwater management manual for the jurisdiction and pay particular attention to the selection criteria for avoiding groundwater contamination, poor soils, and hydrogeological conditions that cause these facilities to fail. If necessary, locate developments with large amounts of impervious surfaces or a potential to produce relatively contaminated runoff away from groundwater recharge areas.

Protection of Slopes and Channels during Landscape Design

- Convey runoff safely from the tops of slopes.
- Avoid disturbing steep or unstable slopes.
- Avoid disturbing natural channels.
- Stabilize disturbed slopes as quickly as possible.
- Vegetate slopes with native or drought tolerant vegetation.
- Control and treat flows in landscaping and/or other controls prior to reaching existing natural drainage systems.
- Stabilize temporary and permanent channel crossings as quickly as possible, and ensure that increases in run-off velocity and frequency caused by the project do not erode the channel.
- Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion. Energy dissipaters shall be installed in such a way as to minimize impacts to receiving waters.
- Line on-site conveyance channels where appropriate, to reduce erosion caused by increased flow velocity due to increases in tributary impervious area. The first choice for linings should be grass or some other vegetative surface, since these materials not only reduce runoff velocities, but also provide water quality benefits from filtration and infiltration. If velocities in the channel are high enough to erode grass or other vegetative linings, riprap, concrete, soil cement, or geo-grid stabilization are other alternatives.
- Consider other design principles that are comparable and equally effective.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define “redevelopment” in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of “ redevelopment” must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under “designing new installations” above should be followed.

SD-10 Site Design & Landscape Planning

Redevelopment may present significant opportunity to add features which had not previously been implemented. Examples include incorporation of depressions, areas of permeable soils, and swales in newly redeveloped areas. While some site constraints may exist due to the status of already existing infrastructure, opportunities should not be missed to maximize infiltration, slow runoff, reduce impervious areas, disconnect directly connected impervious areas.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Stormwater Management Manual for Western Washington, Washington State Department of Ecology, August 2001.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Roof Runoff Controls SD-11

Rain Garden

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Description

Various roof runoff controls are available to address stormwater that drains off rooftops. The objective is to reduce the total volume and rate of runoff from individual lots, and retain the pollutants on site that may be picked up from roofing materials and atmospheric deposition. Roof runoff controls consist of directing the roof runoff away from paved areas and mitigating flow to the storm drain system through one of several general approaches: cisterns or rain barrels; dry wells or infiltration trenches; pop-up emitters, and foundation planting. The first three approaches require the roof runoff to be contained in a gutter and downspout system. Foundation planting provides a vegetated strip under the drip line of the roof.

Approach

Design of individual lots for single-family homes as well as lots for higher density residential and commercial structures should consider site design provisions for containing and infiltrating roof runoff or directing roof runoff to vegetative swales or buffer areas. Retained water can be reused for watering gardens, lawns, and trees. Benefits to the environment include reduced demand for potable water used for irrigation, improved stormwater quality, increased groundwater recharge, decreased runoff volume and peak flows, and decreased flooding potential.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment.

Design Considerations

Designing New Installations

Cisterns or Rain Barrels

One method of addressing roof runoff is to direct roof downspouts to cisterns or rain barrels. A cistern is an above ground storage vessel with either a manually operated valve or a permanently open outlet. Roof runoff is temporarily stored and then released for irrigation or infiltration between storms. The number of rain

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barrels needed is a function of the rooftop area. Some low impact developers recommend that every house have at least 2 rain barrels, with a minimum storage capacity of 1000 liters. Roof barrels serve several purposes including mitigating the first flush from the roof which has a high volume, amount of contaminants, and thermal load. Several types of rain barrels are commercially available. Consideration must be given to selecting rain barrels that are vector proof and childproof. In addition, some barrels are designed with a bypass valve that filters out grit and other contaminants and routes overflow to a soak-away pit or rain garden.

If the cistern has an operable valve, the valve can be closed to store stormwater for irrigation or infiltration between storms. This system requires continual monitoring by the resident or grounds crews, but provides greater flexibility in water storage and metering. If a cistern is provided with an operable valve and water is stored inside for long periods, the cistern must be covered to prevent mosquitoes from breeding.

A cistern system with a permanently open outlet can also provide for metering stormwater runoff. If the cistern outlet is significantly smaller than the size of the downspout inlet (say ¼ to ½ inch diameter), runoff will build up inside the cistern during storms, and will empty out slowly after peak intensities subside. This is a feasible way to mitigate the peak flow increases caused by rooftop impervious land coverage, especially for the frequent, small storms.

Dry wells and Infiltration Trenches

Roof downspouts can be directed to dry wells or infiltration trenches. A dry well is constructed by excavating a hole in the ground and filling it with an open graded aggregate, and allowing the water to fill the dry well and infiltrate after the storm event. An underground connection from the downspout conveys water into the dry well, allowing it to be stored in the voids. To minimize sedimentation from lateral soil movement, the sides and top of the stone storage matrix can be wrapped in a permeable filter fabric, though the bottom may remain open. A perforated observation pipe can be inserted vertically into the dry well to allow for inspection and maintenance.

In practice, dry wells receiving runoff from single roof downspouts have been successful over long periods because they contain very little sediment. They must be sized according to the amount of rooftop runoff received, but are typically 4 to 5 feet square, and 2 to 3 feet deep, with a minimum of 1-foot soil cover over the top (maximum depth of 10 feet).

To protect the foundation, dry wells must be set away from the building at least 10 feet. They must be installed in solids that accommodate infiltration. In poorly drained soils, dry wells have very limited feasibility.

Infiltration trenches function in a similar manner and would be particularly effective for larger roof areas. An infiltration trench is a long, narrow, rock-filled trench with no outlet that receives stormwater runoff. These are described under Treatment Controls.

Pop-up Drainage Emitter

Roof downspouts can be directed to an underground pipe that daylights some distance from the building foundation, releasing the roof runoff through a pop-up emitter. Similar to a pop-up irrigation head, the emitter only opens when there is flow from the roof. The emitter remains flush to the ground during dry periods, for ease of lawn or landscape maintenance.

Roof Runoff Controls SD-11

Foundation Planting

Landscape planting can be provided around the base to allow increased opportunities for stormwater infiltration and protect the soil from erosion caused by concentrated sheet flow coming off the roof. Foundation plantings can reduce the physical impact of water on the soil and provide a subsurface matrix of roots that encourage infiltration. These plantings must be sturdy enough to tolerate the heavy runoff sheet flows, and periodic soil saturation.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Supplemental Information

Examples

- City of Ottawa's Water Links Surface –Water Quality Protection Program
- City of Toronto Downspout Disconnection Program
- City of Boston, MA, Rain Barrel Demonstration Program

Other Resources

Hager, Marty Catherine, Stormwater, "Low-Impact Development", January/February 2003. www.stormh2o.com

Low Impact Urban Design Tools, Low Impact Development Design Center, Beltsville, MD. www.lid-stormwater.net

Start at the Source, Bay Area Stormwater Management Agencies Association, 1999 Edition

Efficient Irrigation SD-12

Design Objectives

- ☑ Maximize Infiltration
- ☑ Provide Retention
- ☑ Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Irrigation water provided to landscaped areas may result in excess irrigation water being conveyed into stormwater drainage systems.

Approach

Project plan designs for development and redevelopment should include application methods of irrigation water that minimize runoff of excess irrigation water into the stormwater conveyance system.

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Designing New Installations

The following methods to reduce excessive irrigation runoff should be considered, and incorporated and implemented where determined applicable and feasible by the Permittee:

- Employ rain-triggered shutoff devices to prevent irrigation after precipitation.
- Design irrigation systems to each landscape area's specific water requirements.
- Include design featuring flow reducers or shutoff valves triggered by a pressure drop to control water loss in the event of broken sprinkler heads or lines.
- Implement landscape plans consistent with County or City water conservation resolutions, which may include provision of water sensors, programmable irrigation times (for short cycles), etc.

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SD-12 Efficient Irrigation

- Design timing and application methods of irrigation water to minimize the runoff of excess irrigation water into the storm water drainage system.
- Group plants with similar water requirements in order to reduce excess irrigation runoff and promote surface filtration. Choose plants with low irrigation requirements (for example, native or drought tolerant species). Consider design features such as:
  - Using mulches (such as wood chips or bar) in planter areas without ground cover to minimize sediment in runoff
  - Installing appropriate plant materials for the location, in accordance with amount of sunlight and climate, and use native plant materials where possible and/or as recommended by the landscape architect
  - Leaving a vegetative barrier along the property boundary and interior watercourses, to act as a pollutant filter, where appropriate and feasible
  - Choosing plants that minimize or eliminate the use of fertilizer or pesticides to sustain growth
- Employ other comparable, equally effective methods to reduce irrigation water runoff.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Storm Drain Signage SD-13

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- ☑ Prohibit Dumping of Improper Materials
- Contain Pollutants
- Collect and Convey

Description

Waste materials dumped into storm drain inlets can have severe impacts on receiving and ground waters. Posting notices regarding discharge prohibitions at storm drain inlets can prevent waste dumping. Storm drain signs and stencils are highly visible source controls that are typically placed directly adjacent to storm drain inlets.

Approach

The stencil or affixed sign contains a brief statement that prohibits dumping of improper materials into the urban runoff conveyance system. Storm drain messages have become a popular method of alerting the public about the effects of and the prohibitions against waste disposal.

Suitable Applications

Stencils and signs alert the public to the destination of pollutants discharged to the storm drain. Signs are appropriate in residential, commercial, and industrial areas, as well as any other area where contributions or dumping to storm drains is likely.

Design Considerations

Storm drain message markers or placards are recommended at all storm drain inlets within the boundary of a development project. The marker should be placed in clear sight facing toward anyone approaching the inlet from either side. All storm drain inlet locations should be identified on the development site map.

Designing New Installations

The following methods should be considered for inclusion in the project design and show on project plans:

- Provide stenciling or labeling of all storm drain inlets and catch basins, constructed or modified, within the project area with prohibitive language. Examples include “NO DUMPING

CASQA
CALIFORNIA STORMWATER QUALITY ASSOCIATION

SD-13 Storm Drain Signage

– DRAINS TO OCEAN" and/or other graphical icons to discourage illegal dumping.

- Post signs with prohibitive language and/or graphical icons, which prohibit illegal dumping at public access points along channels and creeks within the project area.

Note - Some local agencies have approved specific signage and/or storm drain message placards for use. Consult local agency stormwater staff to determine specific requirements for placard types and methods of application.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. If the project meets the definition of "redevelopment", then the requirements stated under " designing new installations" above should be included in all project design plans.

Additional Information

Maintenance Considerations

- Legibility of markers and signs should be maintained. If required by the agency with jurisdiction over the project, the owner/operator or homeowner's association should enter into a maintenance agreement with the agency or record a deed restriction upon the property title to maintain the legibility of placards or signs.

Placement

- Signage on top of curbs tends to weather and fade.

- Signage on face of curbs tends to be worn by contact with vehicle tires and sweeper brooms.

Supplemental Information

Examples

- Most MS4 programs have storm drain signage programs. Some MS4 programs will provide stencils, or arrange for volunteers to stencil storm drains as part of their outreach program.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

Ventura Countywide Technical Guidance Manual for Stormwater Quality Control Measures, July 2002.

Trash Storage Areas SD-32

Description

Trash storage areas are areas where a trash receptacle (s) are located for use as a repository for solid wastes. Stormwater runoff from areas where trash is stored or disposed of can be polluted. In addition, loose trash and debris can be easily transported by water or wind into nearby storm drain inlets, channels, and/or creeks. Waste handling operations that may be sources of stormwater pollution include dumpsters, litter control, and waste piles.

Approach

This fact sheet contains details on the specific measures required to prevent or reduce pollutants in stormwater runoff associated with trash storage and handling. Preventative measures including enclosures, containment structures, and impervious pavements to mitigate spills, should be used to reduce the likelihood of contamination.

Design Objectives

- Maximize Infiltration
- Provide Retention
- Slow Runoff
- Minimize Impervious Land Coverage
- Prohibit Dumping of Improper Materials
- ☑ Contain Pollutants
- Collect and Convey

Suitable Applications

Appropriate applications include residential, commercial and industrial areas planned for development or redevelopment. (Detached residential single-family homes are typically excluded from this requirement.)

Design Considerations

Design requirements for waste handling areas are governed by Building and Fire Codes, and by current local agency ordinances and zoning requirements. The design criteria described in this fact sheet are meant to enhance and be consistent with these code and ordinance requirements. Hazardous waste should be handled in accordance with legal requirements established in Title 22, California Code of Regulation.

Wastes from commercial and industrial sites are typically hauled by either public or commercial carriers that may have design or access requirements for waste storage areas. The design criteria in this fact sheet are recommendations and are not intended to be in conflict with requirements established by the waste hauler. The waste hauler should be contacted prior to the design of your site trash collection areas. Conflicts or issues should be discussed with the local agency.

Designing New Installations

Trash storage areas should be designed to consider the following structural or treatment control BMPs:

- Design trash container areas so that drainage from adjoining roofs and pavement is diverted around the area(s) to avoid run-on. This might include berming or grading the waste handling area to prevent run-on of stormwater.
- Make sure trash container areas are screened or walled to prevent off-site transport of trash.

SD-32 Trash Storage Areas

- Use lined bins or dumpsters to reduce leaking of liquid waste.
- Provide roofs, awnings, or attached lids on all trash containers to minimize direct precipitation and prevent rainfall from entering containers.
- Pave trash storage areas with an impervious surface to mitigate spills.
- Do not locate storm drains in immediate vicinity of the trash storage area.
- Post signs on all dumpsters informing users that hazardous materials are not to be disposed of therein.

Redeveloping Existing Installations

Various jurisdictional stormwater management and mitigation plans (SUSMP, WQMP, etc.) define "redevelopment" in terms of amounts of additional impervious area, increases in gross floor area and/or exterior construction, and land disturbing activities with structural or impervious surfaces. The definition of " redevelopment" must be consulted to determine whether or not the requirements for new development apply to areas intended for redevelopment. If the definition applies, the steps outlined under "designing new installations" above should be followed.

Additional Information

Maintenance Considerations

The integrity of structural elements that are subject to damage (i.e., screens, covers, and signs) must be maintained by the owner/operator. Maintenance agreements between the local agency and the owner/operator may be required. Some agencies will require maintenance deed restrictions to be recorded of the property title. If required by the local agency, maintenance agreements or deed restrictions must be executed by the owner/operator before improvement plans are approved.

Other Resources

A Manual for the Standard Urban Stormwater Mitigation Plan (SUSMP), Los Angeles County Department of Public Works, May 2002.

Model Standard Urban Storm Water Mitigation Plan (SUSMP) for San Diego County, Port of San Diego, and Cities in San Diego County, February 14, 2002.

Model Water Quality Management Plan (WQMP) for County of Orange, Orange County Flood Control District, and the Incorporated Cities of Orange County, Draft February 2003.

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