DRAFT

INITIAL STUDY/MITIGATED NEGATIVE DECLARATION

APPENDICES

Norumbega Drive Residence Project

LEAD AGENCY:

City of Monrovia
Planning Division
415 South Ivy Avenue
Monrovia, California 91016
Contact: Vincent Gillespie, Planning Technician
(626) 932-5504

PREPARED BY:

SWCA Environmental Consultants
51 West Dayton Street
Pasadena, California 91105
Contact: Bobbette Biddulph
(626) 240-0587

February 2022

SWCA Project No. 67447

This document is designed for double-sided printing to conserve natural resources.

TABLE OF CONTENTS

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APPENDIX A

Design Plans

SITE / ROOF PLAN

SCALE 1"= 10'-0"

NEW RESIDENCE

NORUMBEGA RD
MONROVIA, CA 91016

VICINITY MAP **4**

TYPE OF CONSTRUCTION:	V–B
OCCUPANCY GROUP	R3/U
USE CODE:	SINGLE FAMILY
ZONE:	RF
NO. OF STORIES	2
SITE AREA	1.295 AC = 56,410 SF
PROPOSED 4 CAR GARAGE	1,348 SF
PROPOSED PORCH	72 SF
1ST FLOOR	2,619 SF
2ND FLOOR	1,139 SF
TOTAL LIVABLE	3,758 SF

LEGAL DESCRIPTION:

PARCEL #	8523–002–045
TRACT:	NORUMBEGA
LOT NO:	1

BUILDING DATA **3**

DESIGNER:
GONZALO HERRERA
245 N COUNTRY CLUB RD
GLENDORA, CA 91741
(626) 533–6120

OWNER:
GONZALEZ,
MARGARITA FIGUEROA
123 SAN ANGELO AVE
LA PUENTE, CA 91746
(626) 672–5317

BUILDING DATA **2**

SHEET INDEX **1**

GONZALO HERRERA
a+g concepts
245 N COUNTRY CLUB RD
GLENDORA, CA 91741
TEL: 626.533.6120
agconcepts@msn.com
DESIGN STUDIO

PROJECT TITLE
NEW RESIDENCE
NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE
SITE PLAN

REVISIONS

NO.	DATE	DESCRIPTION

DRAWN GH
CHK.
APP.
SCALE AS SHOWN
JOB NO.
DATE 3/8/21
SHEET NO.
T-1
OF

GEOTECHNICAL RECOMMENDATIONS:

SITE PREPARATION

PRIOR TO INITIATING GRADING OPERATIONS, ANY DEMOLISHED STRUCTURES AND ASSOCIATE FOOTINGS, UTILITY LINES, EXISTING VEGETATION, ORGANIC SOIL, TRASH, DEBRIS, OVER-SIZED MATERIALS (GREATER THAN 8 INCHES), AND OTHER DELETERIOUS MATERIALS WITHIN FILL AREAS SHOULD BE REMOVED FROM THE SITE.

EXCAVATION/SURFICIAL SOIL REMOVALS

IN AREAS TO RECEIVE FILL AND IMPROVEMENTS SUCH AS DRIVEWAY AND PLANNED CONCRETE FLATWORKS, PREVIOUSLY PLACED FILL AND COLLUVIUM SHOULD BE REMOVED TO A DEPTH OF 3 FEET BELOW THE EXISTING GRADE AS DIRECTED BY THE PROJECT GEOTECHNICAL ENGINEER AND/OR ENGINEERING GEOLOGIST. SOME RELATIVELY DEEPER REMOVALS SHOULD BE ANTICIPATED IN LOCALIZED AREAS. LOCALLY DEEPER REMOVALS MAY BE NECESSARY TO EXPOSE COMPETENT NATURAL GROUND. THE ACTUAL REMOVAL DEPTHS SHOULD BE DETERMINED IN THE FIELD AS CONDITIONS ARE EXPOSED. VISUAL INSPECTION AND/OR TESTING MAY BE USED TO DEFINE REMOVAL REQUIREMENTS.

THE PROPOSED CUT AREA WITHIN THE PROPOSED BUILDING PAD SHOULD BE CUT TO GRADE. ALL EXCAVATIONS SHOULD BE OBSERVED BY A REPRESENTATIVE OF THIS OFFICE TO VERIFY THE SUBGRADE SOIL CONDITIONS AND DETERMINE IF ADDITIONAL REMOVALS OR OTHER MITIGATIVE MEASURES ARE NEEDED.

TREATMENT OF REMOVAL BOTTOMS

SOILS EXPOSED WITHIN AREAS APPROVED FOR FILL PLACEMENT SHOULD BE SCARIFIED TO A DEPTH OF 6 INCHES, CONDITIONED TO NEAR OPTIMUM MOISTURE CONTENT, THEN COMPACTED IN-PLACE TO 90 PERCENT RELATIVE COMPACTION BASED ON LABORATORY STANDARD ASTM D-1557-12.

STRUCTURAL BACKFILL

THE ONSITE SOILS MAY BE USED AS COMPACTED FILL PROVIDED THEY ARE FREE OF ORGANIC MATERIALS AND DEBRIS. FILLS SHOULD BE PLACED IN RELATIVELY THIN LIFTS; BROUGHT TO NEAR OPTIMUM MOISTURE CONTENT, THEN COMPACTED TO OBTAIN AT LEAST 90 PERCENT RELATIVE COMPACTION BASED ON LABORATORY STANDARD ASTM D-1557-12.

NOTES:

1. RETAINING WALL PER SEPARATE PERMIT
2. CONSTRUCT DRIVEWAY APRON PER CITY STD 305, W=13', X=4'
3. INSTALL 6" PVC DRAINAGE PIPE
4. CONSTRUCT 36" WIDE PARKWAY DRAIN PER SPPWC STD 151-2
5. CONSTRUCT 24"X24" CONCRETE CATCH BASIN
6. CONSTRUCT 18" WIDE BY 12" DEEP BROW DITCH
7. CONSTRUCT 6" VCP SEWER HOUSE CONNECTION
8. INSTALL 8" PVC DRAINAGE PIPE
9. CONSTRUCT 36"X36" CONCRETE CATCH BASIN
10. REMOVE EXISTING TREE

NOTE:

ALL WORK IN THE PUBLIC RIGHT-OF-WAY REQUIRES A SEPARATE ENCROACHMENT PERMIT FROM THE PUBLIC WORKS DEPARTMENT

UNDERGROUND SERVICE ALERT

CALL: TOLL FREE 811

TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK

DESCRIPTION: TEMPORARY BENCHMARK

LOCATION: FOUND LEAD AND NAIL AT INTERSECTION OF DUARTE ROAD AND MAYFLOWER AVENUE

RECORDED:

ELEVATION: 427.32' DATUM:

GEOTECHNICAL / SOIL ENGINEER:

THE SOILS REPORT PREPARED BY CAL LAND ENGINEERING, INC

DATED 10-25-2018 JOB # 18-023-023GE

IS HEREBY MADE A PART OF THESE PLANS.

ENGINEER 10-08-2020 DATE

REGISTERED PROFESSIONAL ENGINEER JACK C. S. LEE 2153 Exp. 3-31-21 GEOTECHNICAL STATE OF CALIFORNIA

ENGINEERING TITLE BLOCK

CAL LAND ENGINEERING, INC.

576 E. LAMBERT RD., BREA CA 92821

PHONE: 714 671 1050

FAX: 714 671 1090

JACK LEE
RCE NAME

SIGNATURE 10-08-2020 DATE

REGISTERED PROFESSIONAL ENGINEER JACK C. S. LEE 40870 Exp. 3-31-21 CIVIL STATE OF CALIFORNIA

DATE	SIGNATURE	DELTA	REVISION DESCRIPTION	DATE	APPROVED

APPROVALS

INFRASTRUCTURE MAINTENANCE DIVISION — SIGNATURE — DATE

PLANNING DIVISION — SIGNATURE — DATE

BUILDING DIVISION — SIGNATURE — DATE

FIRE DEPARTMENT — SIGNATURE — DATE

CONSTRUCTION / AS-BUILT RECORD

CITY INSPECTOR — SIGNATURE — DATE

CONSTRUCTION DATE COMPLETED:

CITY OF MONROVIA
DEPARTMENT OF PUBLIC WORKS

GRADING PLAN
NORUMBEGA DR, MONROVIA, CA

ATLAS NO.

REFERENCE DRAWINGS:

APPROVED — BRAD S. MERRELL - CITY ENGINEER — DATE

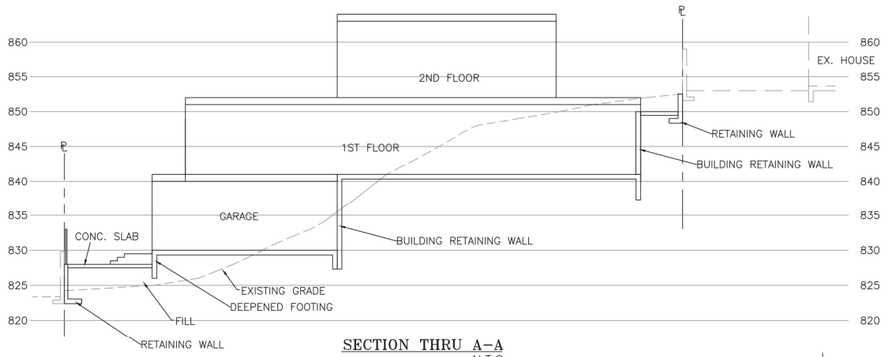
DATE: 10-08-2020

SCALE: 1" = 10'

DRAWN BY RR
DESIGNED BY JACK LEE
CHECKED BY JACK LEE
FIELD BOOK

REVISION	DATE	BY

DRAWING NUMBER G-
SHEET 2 OF 4



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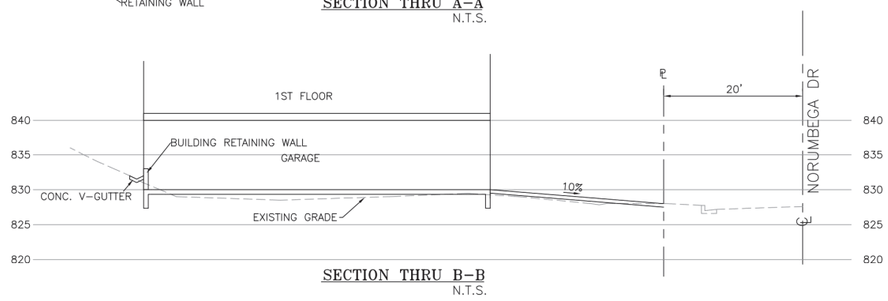

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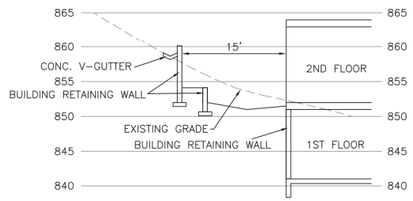

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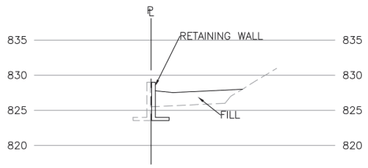

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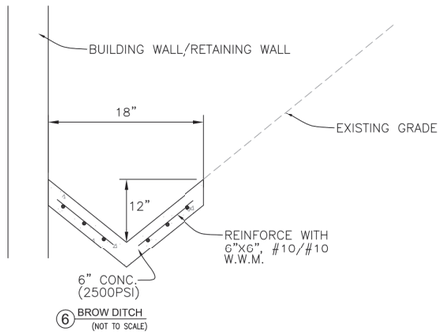

⑥ BROW DITCH
(NOT TO SCALE)

UNDERGROUND SERVICE ALERT

CALL: TOLL FREE 811

TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK

DESCRIPTION: TEMPORARY BENCHMARK

LOCATION: FOUND LEAD AND NAIL AT INTERSECTION OF DUARTE ROAD AND MAYFLOWER AVENUE

RECORDED:

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DATED 10–25–2018 JOB # 18–023–023GE

IS HEREBY MADE A PART OF THESE PLANS.

ENGINEER — DATE 10–08–2020

REGISTERED PROFESSIONAL ENGINEER — JACK C. S. LEE — 2153 — Exp. 3-31-21 — GEOTECHNICAL — STATE OF CALIFORNIA

ENGINEERING TITLE BLOCK

CAL LAND ENGINEERING, INC.

576 E. LAMBERT RD., BREA CA 92821

PHONE: 714 671 1050

FAX: 714 671 1090

JACK LEE
RCE NAME

SIGNATURE — DATE 10–08–2020

REGISTERED PROFESSIONAL ENGINEER — JACK C. S. LEE — 40870 — Exp. 3-31-21 — CIVIL — STATE OF CALIFORNIA

DATE	SIGNATURE	DELTA	REVISION DESCRIPTION	DATE	APPROVED

APPROVALS

INFRASTRUCTURE MAINTENANCE DIVISION — SIGNATURE — DATE

PLANNING DIVISION — SIGNATURE — DATE

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FIRE DEPARTMENT — SIGNATURE — DATE

CONSTRUCTION / AS-BUILT RECORD

CITY INSPECTOR — SIGNATURE — DATE

CONSTRUCTION DATE COMPLETED:

CITY OF MONROVIA
DEPARTMENT OF PUBLIC WORKS

GRADING PLAN - DETAILS
NORUMBEGA DR, MONROVIA, CA

ATI AS NO.:

REFERENCE DRAWINGS:

APPROVED — BRAD S. MERRELL - CITY ENGINEER — DATE

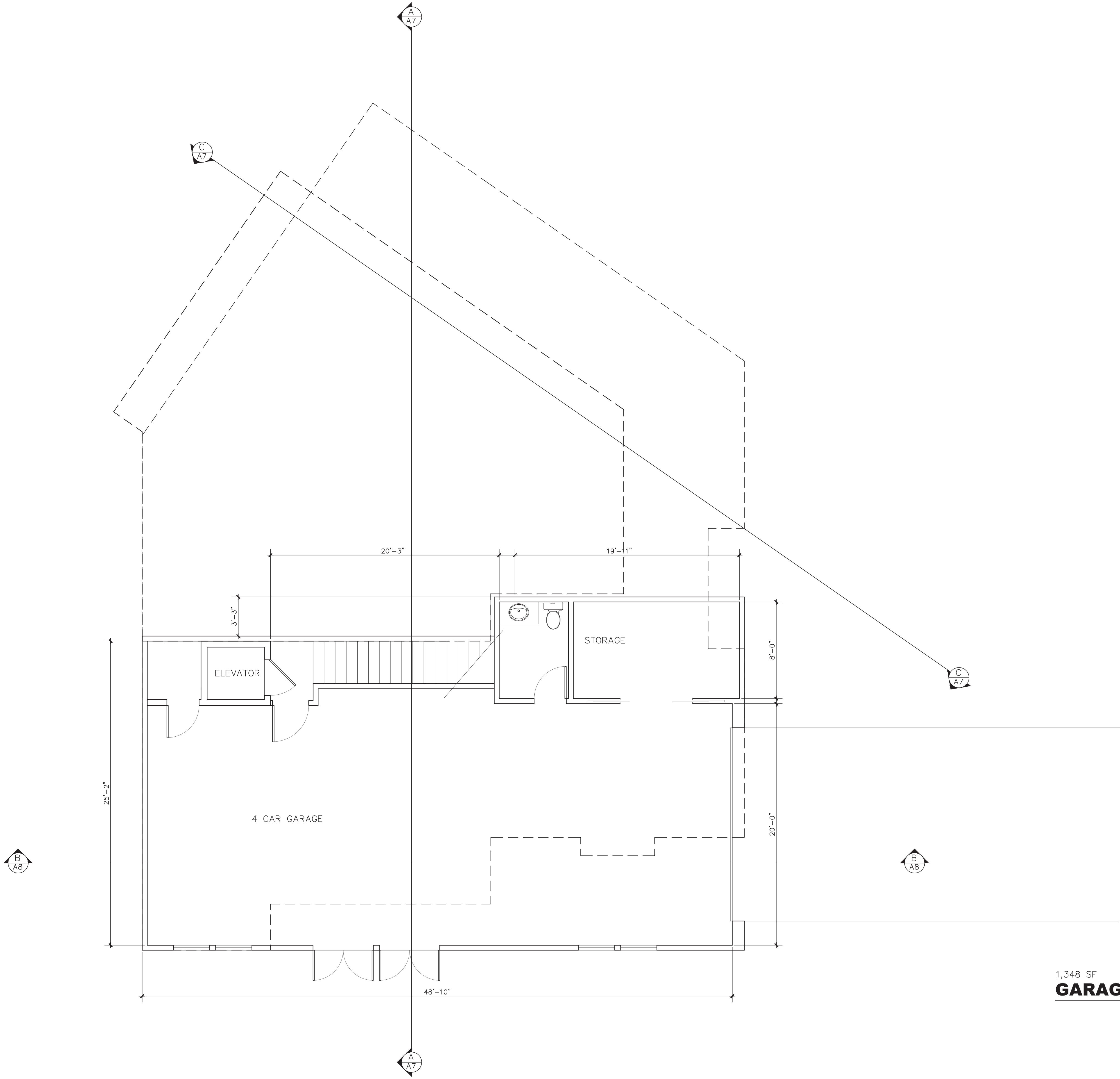
DATE: 10-08-2020

SCALE:

DRAWN BY RR
DESIGNED BY JACK LEE
CHECKED BY JACK LEE
FIELD BOOK

REVISION	DATE	BY

DRAWING NUMBER
G-
SHEET 3 OF 4



1,348 SF

GARAGE FLOOR PLAN

SCALE 1/4" = 1'-0"

GONZALO HERRERA
concepts
D E S I G N S T U D I O

PROJECT TITLE
NEW RESIDENCE
NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE
GARAGE FLOOR

REVISIONS

NO.	DATE	DESCRIPTION
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DRAWN G. H.
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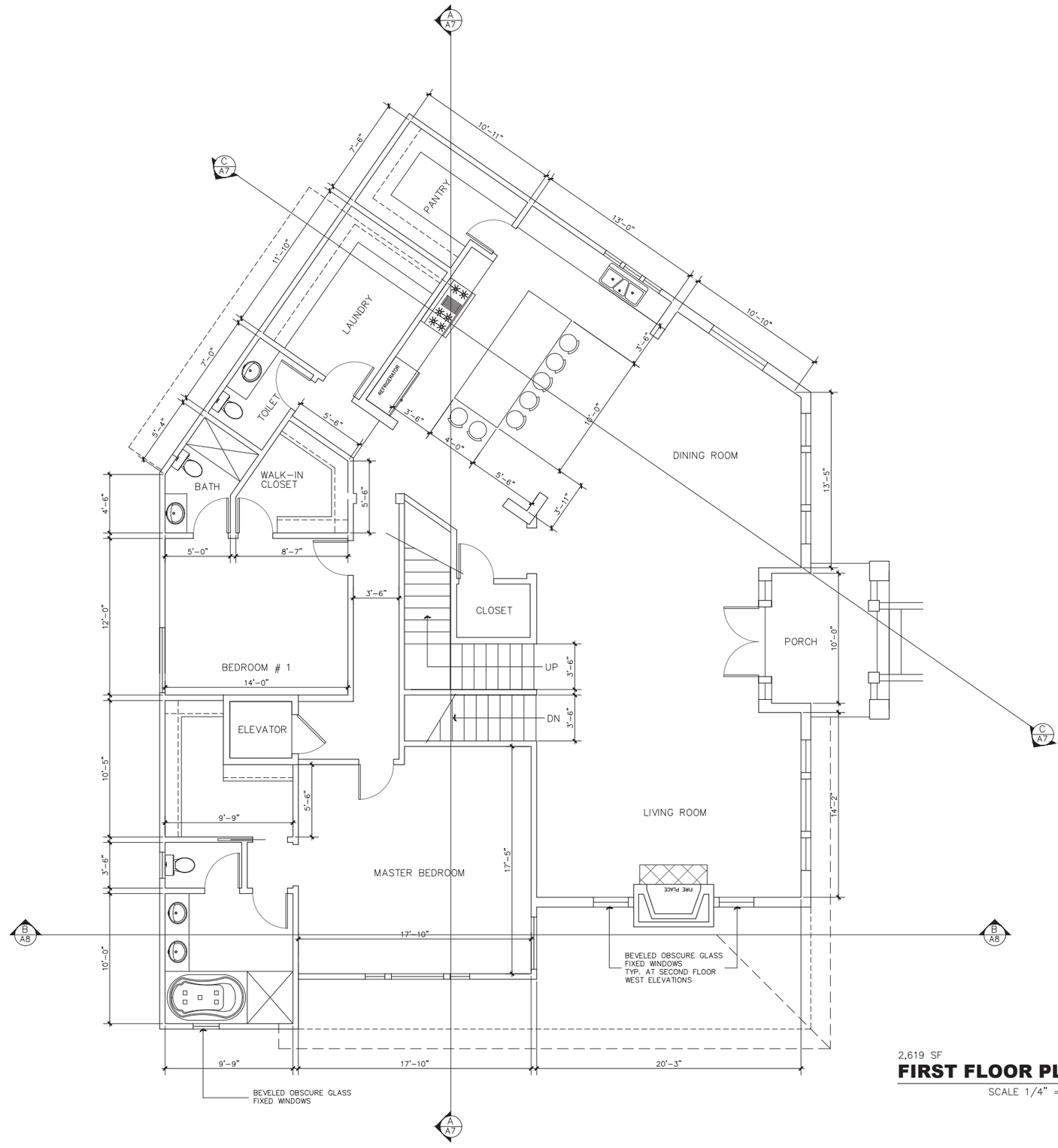

2,619 SF

FIRST FLOOR PLAN

SCALE 1/4" = 1'-0"

GONZALO HERRERA

AG CONCEPTS

TEL. 626.533.6120

DESIGN STUDIO

PROJECT TITLE

NEW RESIDENCE

NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE

FIRST FLOOR

REVISIONS

NO.	DATE	DESCRIPTION
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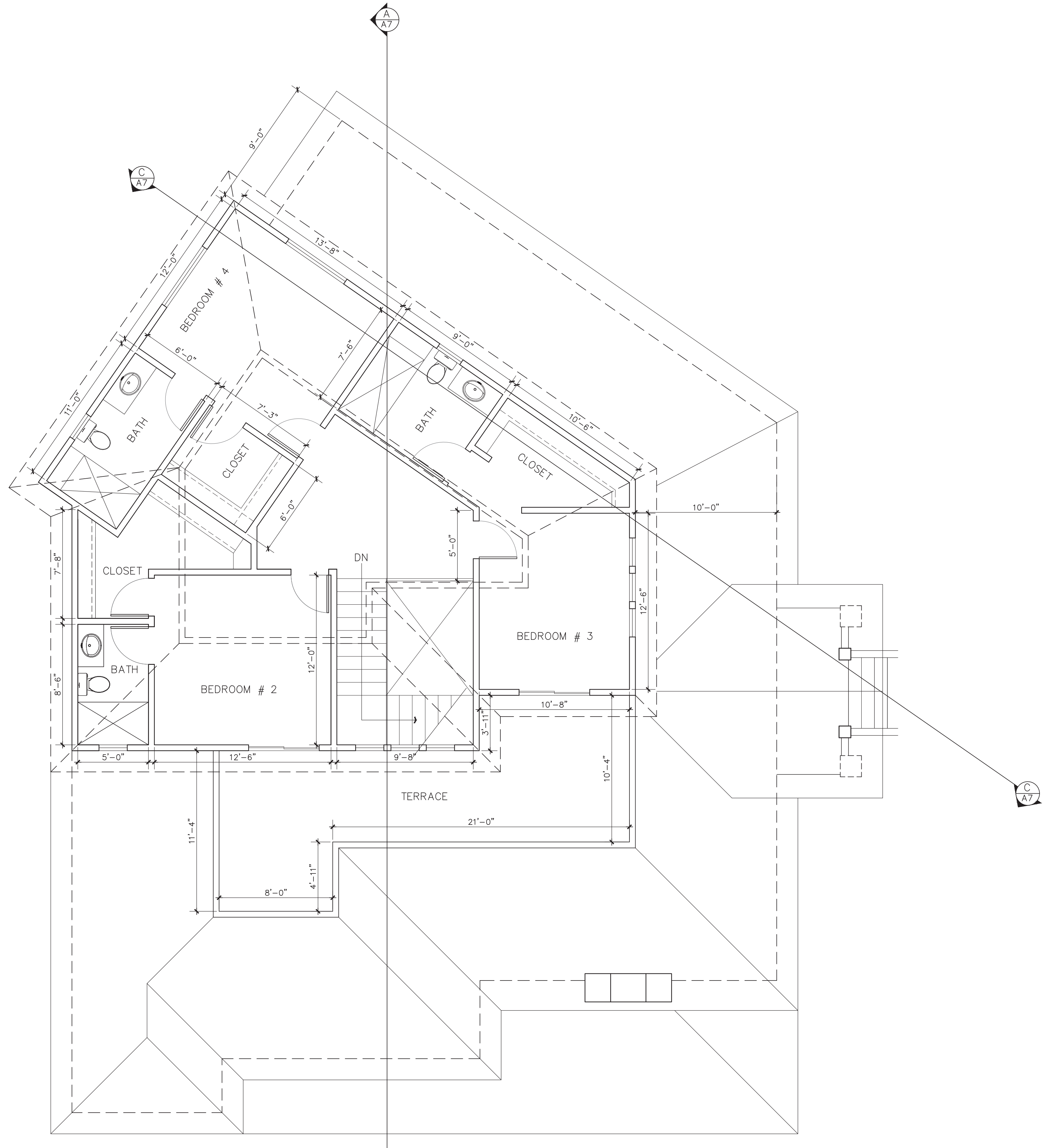

1,139 SF

SECOND FLOOR PLAN

SCALE 1/4" = 1'-0"

GONZALO HERRERA
A+g concepts
245 N COUNTRY CLUB RD
GLENDORA, CA 91741
TEL. 626.533.6120
DESIGN STUDIO

PROJECT TITLE

NEW RESIDENCE

NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE

SECOND FLOOR

REVISIONS

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SCALE AS SHOWN
JOB NO.
DATE 3/8/21
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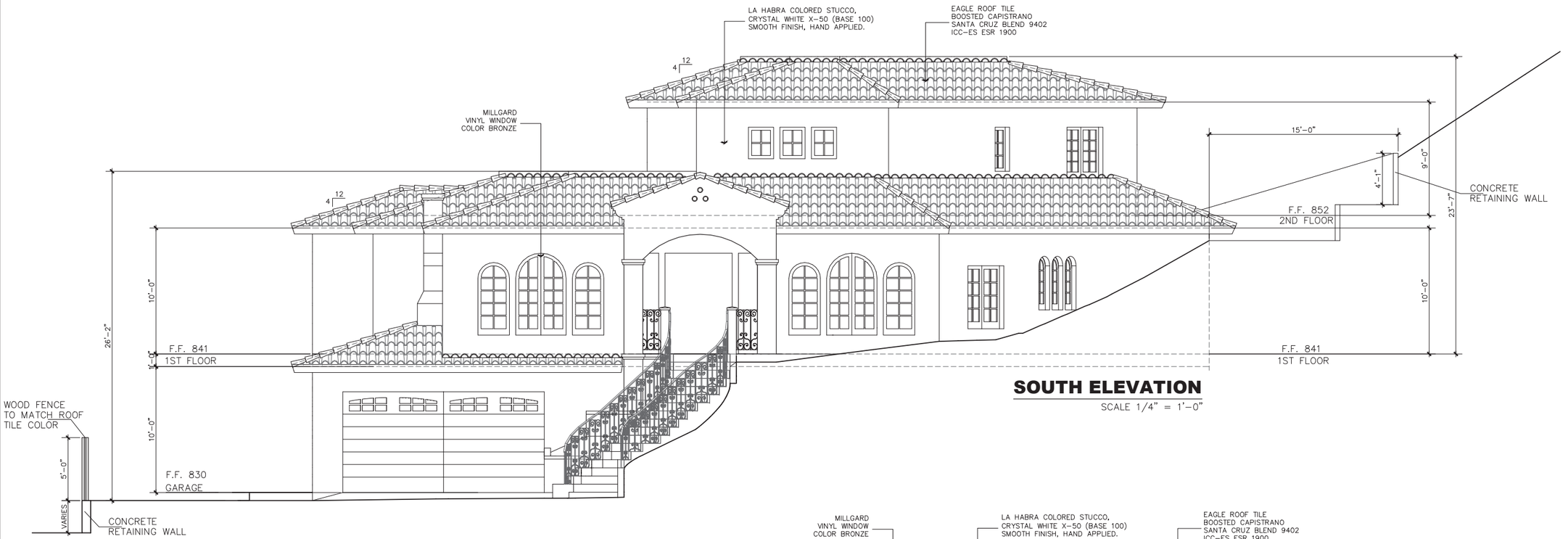
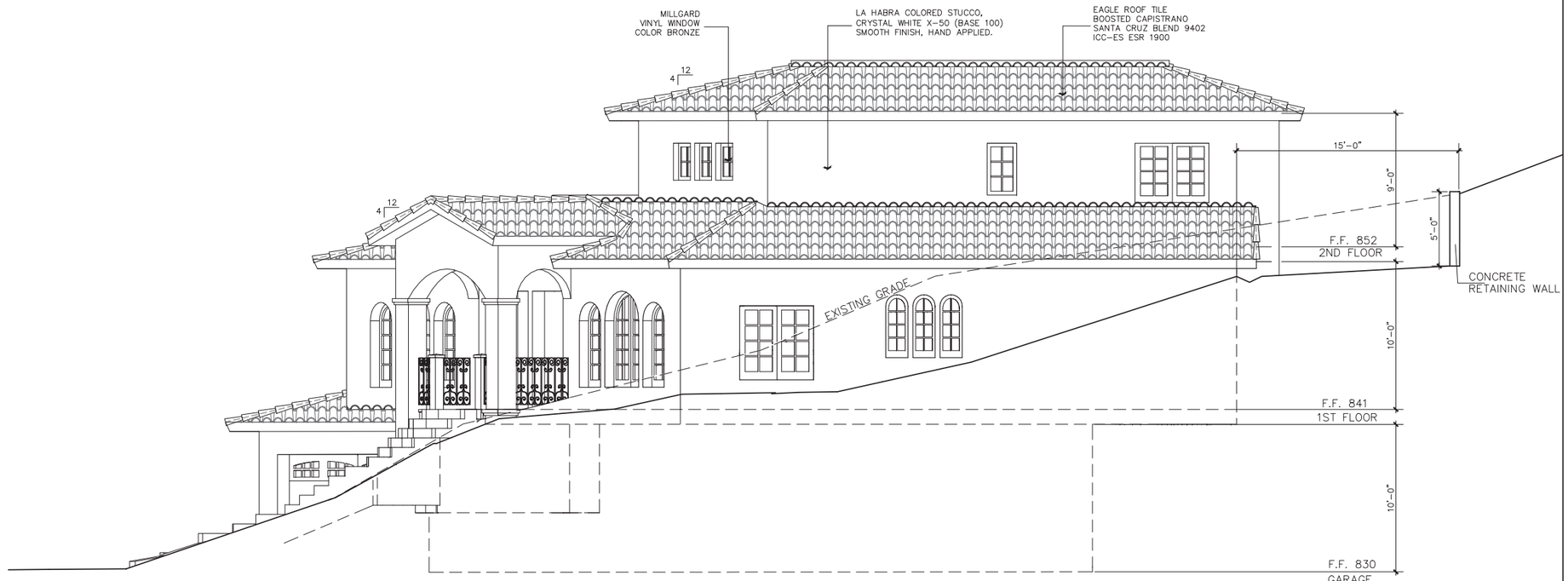


SOUTH ELEVATION

SCALE 1/4" = 1'-0"



EAST ELEVATION

SCALE 1/4" = 1'-0"

GONZALO HERRERA
AG CONCEPTS
TEL. 626.533.6120
AG CONCEPTS DESIGN STUDIO
GLENDORA, CA 91741

PROJECT TITLE
NEW RESIDENCE
NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE
S & E ELEVATIONS

REVISIONS

NO.	DATE	DESCRIPTION
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DATE 3/8/21
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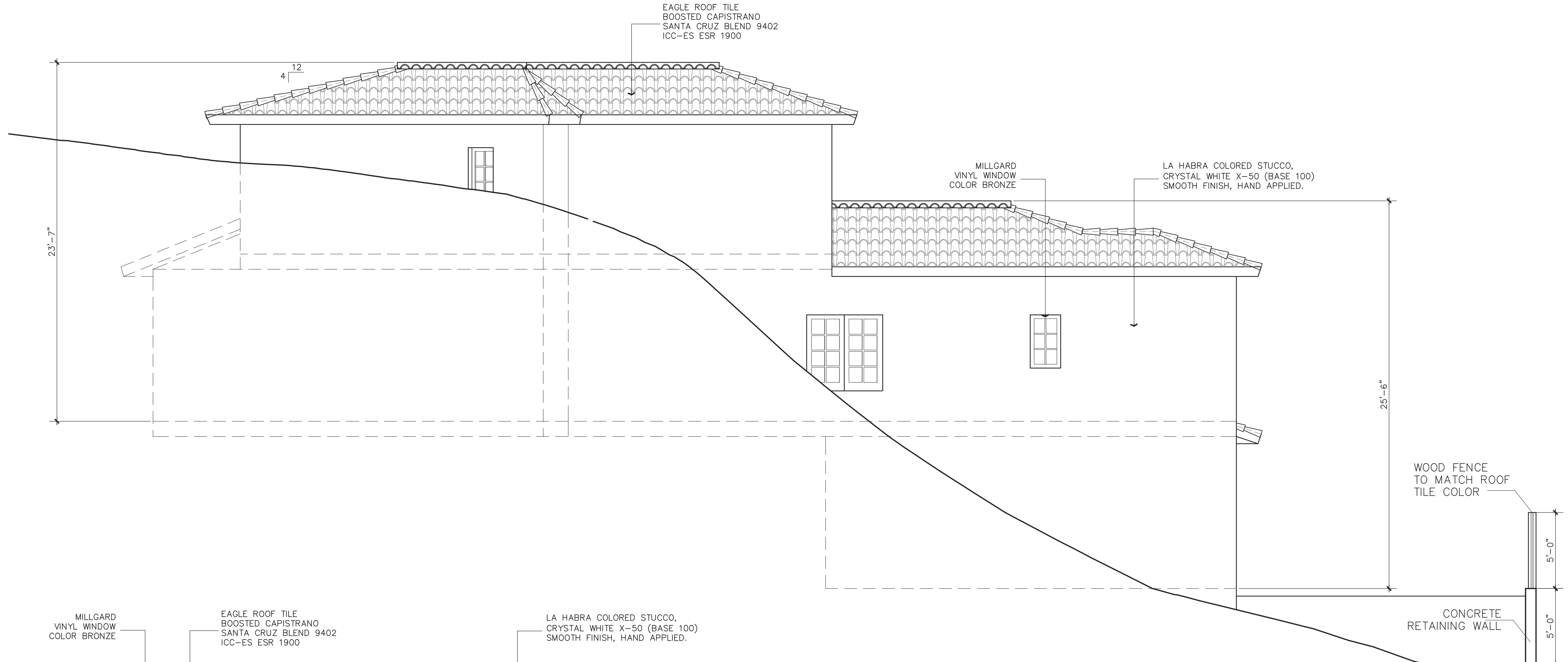

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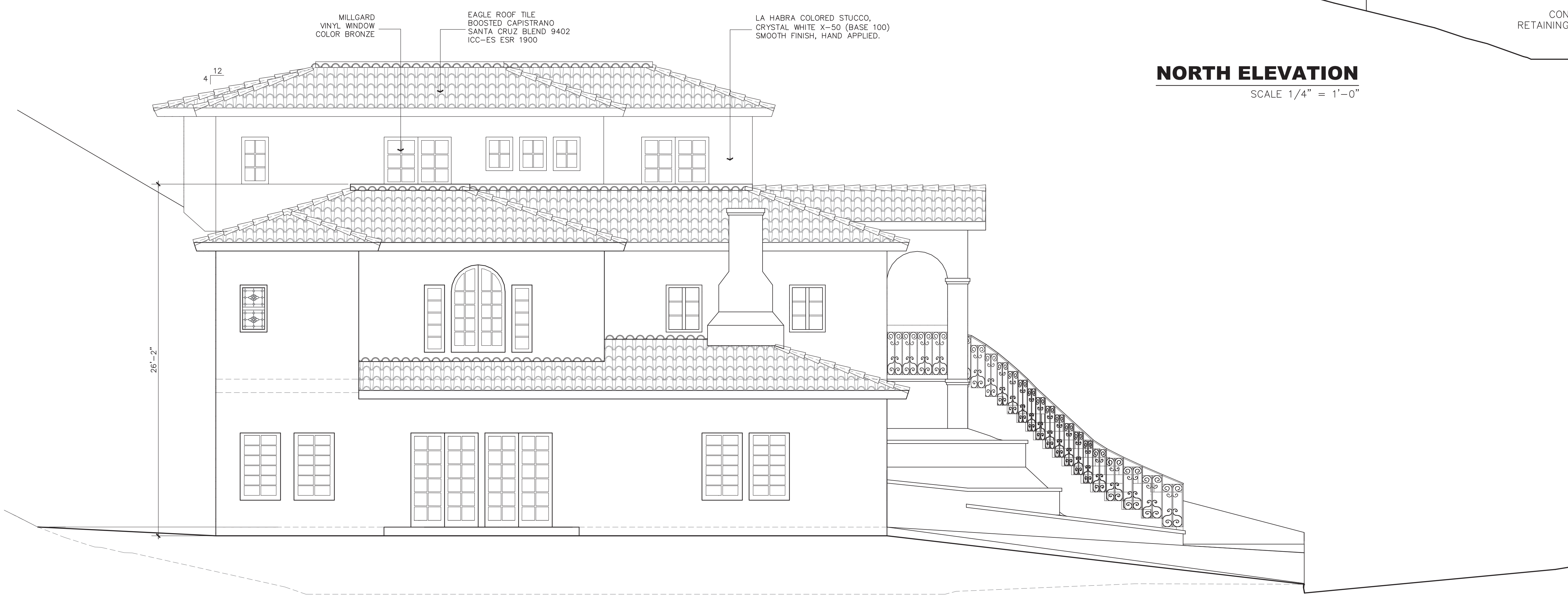

WEST ELEVATION

SCALE 1/4" = 1'-0"

GONZALO HERRERA
A+G concepts
DESIGN STUDIO

PROJECT TITLE
NEW RESIDENCE
NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE
N & W ELEVATIONS

REVISIONS

NO.	DATE	DESCRIPTION
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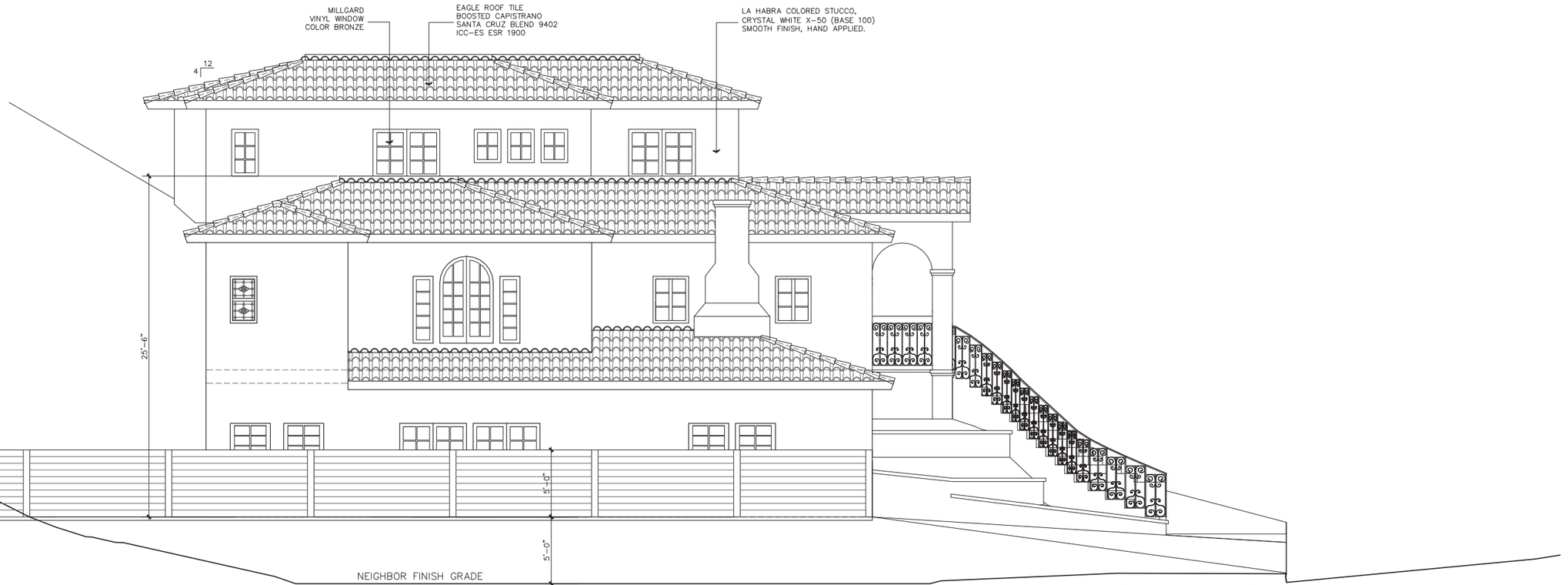

WEST ELEVATION

SCALE 1/4" = 1'-0"

GONZALO HERRERA
AG CONCEPTS
DESIGN STUDIO
TEL. 626.533.6120
AGCONCEPTS@YAHOO.COM
GLENDORA, CA 91741

PROJECT TITLE
NEW RESIDENCE

NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE
WEST ELEVATION

REVISIONS

NO.	DATE	DESCRIPTION
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APP.
SCALE AS SHOWN
JOB NO.
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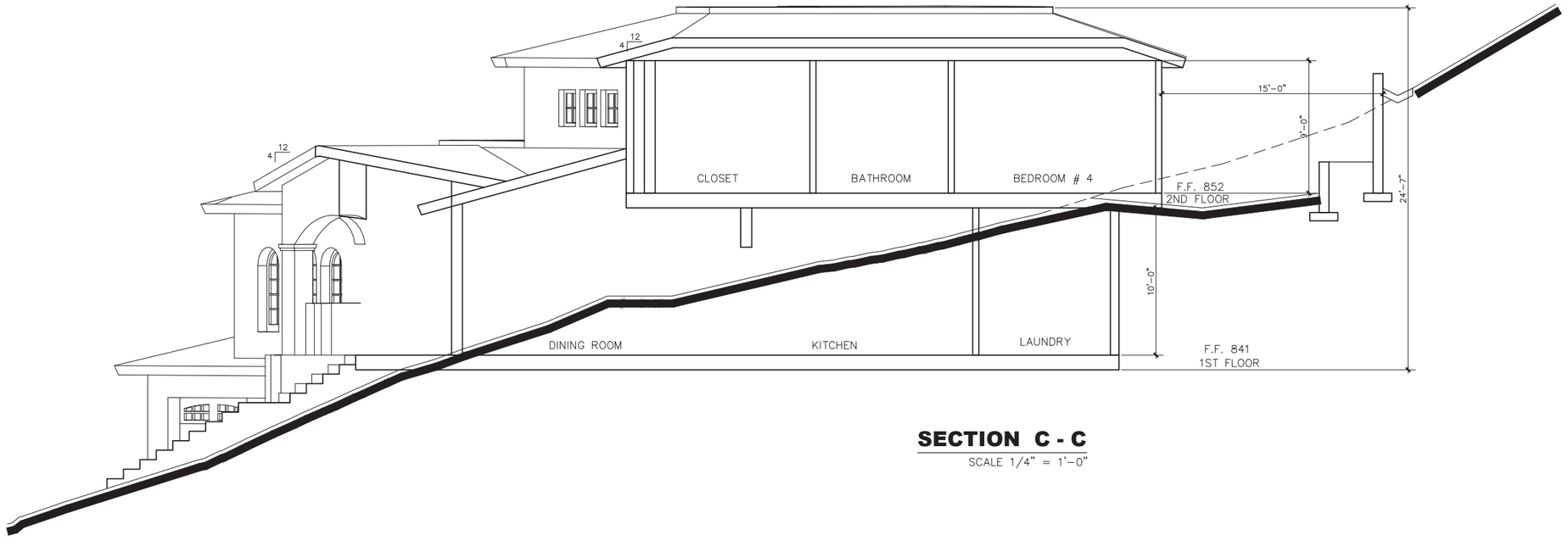

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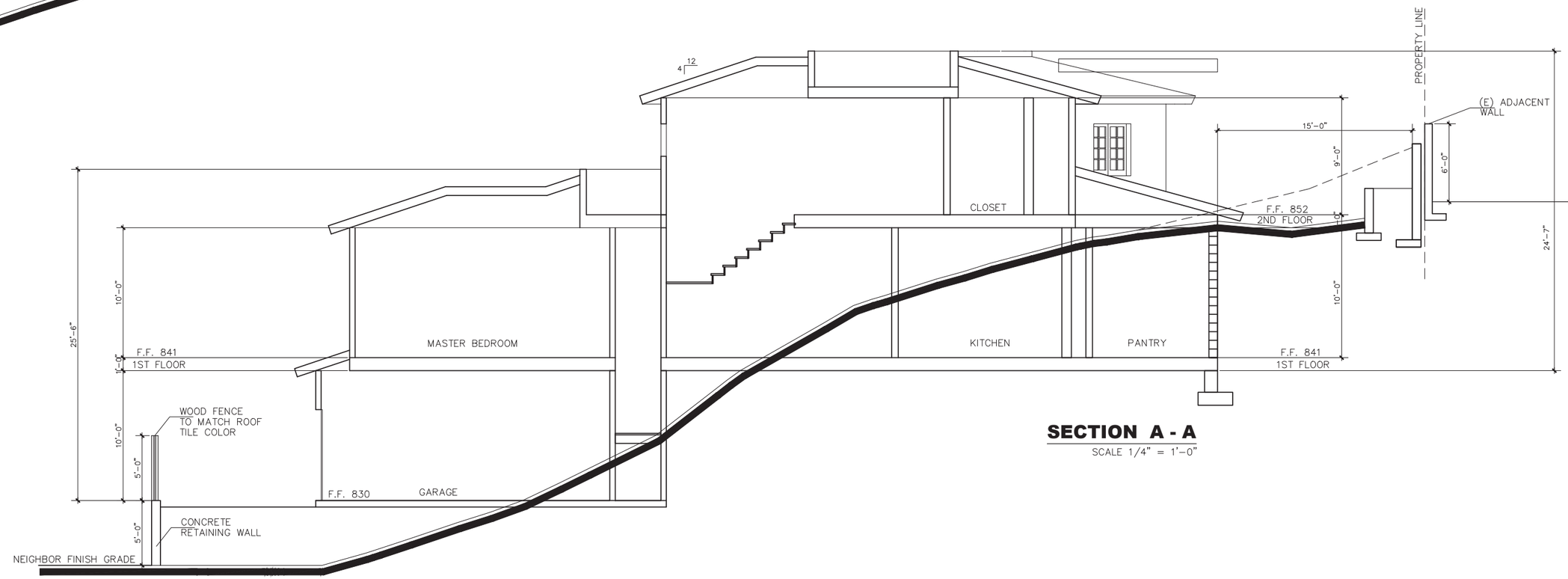

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SCALE 1/4" = 1'-0"

GONZALO HERRERA
AG CONCEPTS
TEL. 626.533.6120
AG CONCEPTS DESIGN STUDIO
GLENDORA, CA 91741

PROJECT TITLE
NEW RESIDENCE

NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE
SECTIONS

REVISIONS

NO.	DATE	DESCRIPTION
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DATE 3/8/21
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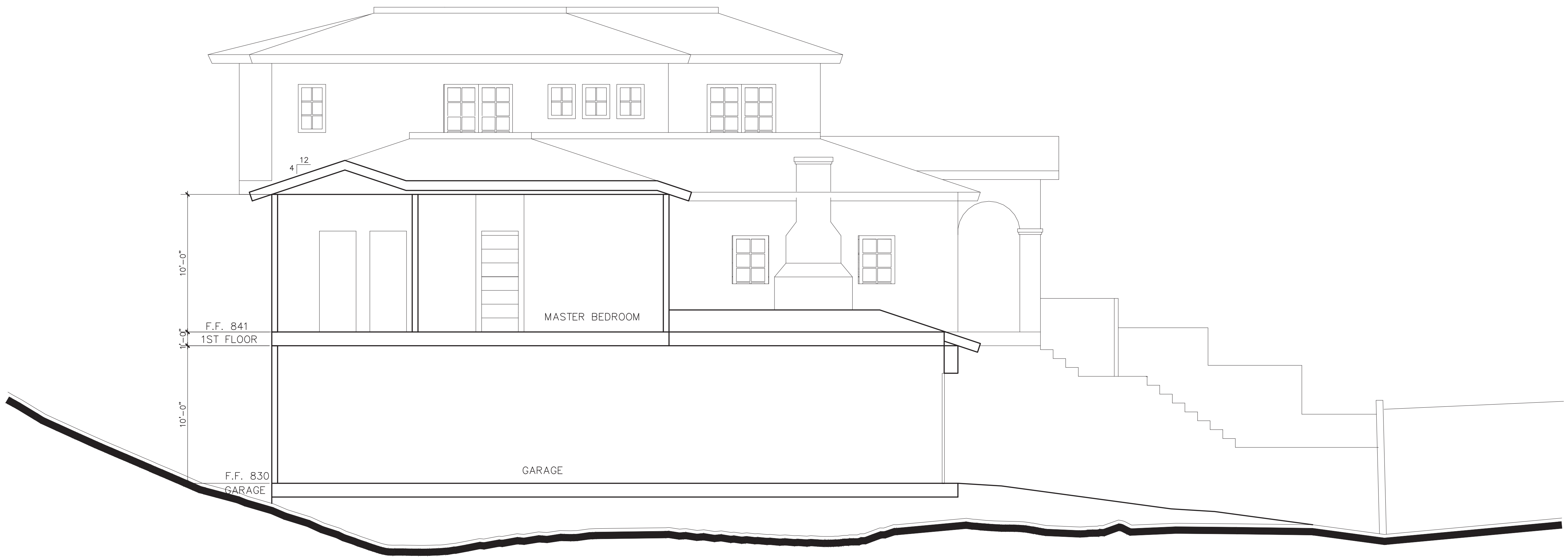

SECTION B - B

SCALE 1/4" = 1'-0"

GONZALO HERRERA

A+g concepts

245 N COUNTRY CLUB RD
GLENDORA, CA 91741

TEL. 626.533.6120

agconceptsds@gmail.com

DESIGN STUDIO

PROJECT TITLE

NEW RESIDENCE

NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE

SECTIONS

REVISIONS

NO.	DATE	DESCRIPTION
△		

DRAWN G. H.

CHK.

APP.

SCALE AS SHOWN

JOB NO.

DATE 3/8/21

SHEET NO.

A-8

OF

GONZALO HERRERA

A+g concepts

245 N COUNTRY CLUB RD
GLENDORA, CA 91741

TEL. 626.533.6120

agconceptsds@gmail.com

D E S I G N S T U D I O

PROJECT TITLE

NEW RESIDENCE

NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE

COLOR RENDER

REVISIONS

NO.	DATE	DESCRIPTION
△		

DRAWN	G. H.
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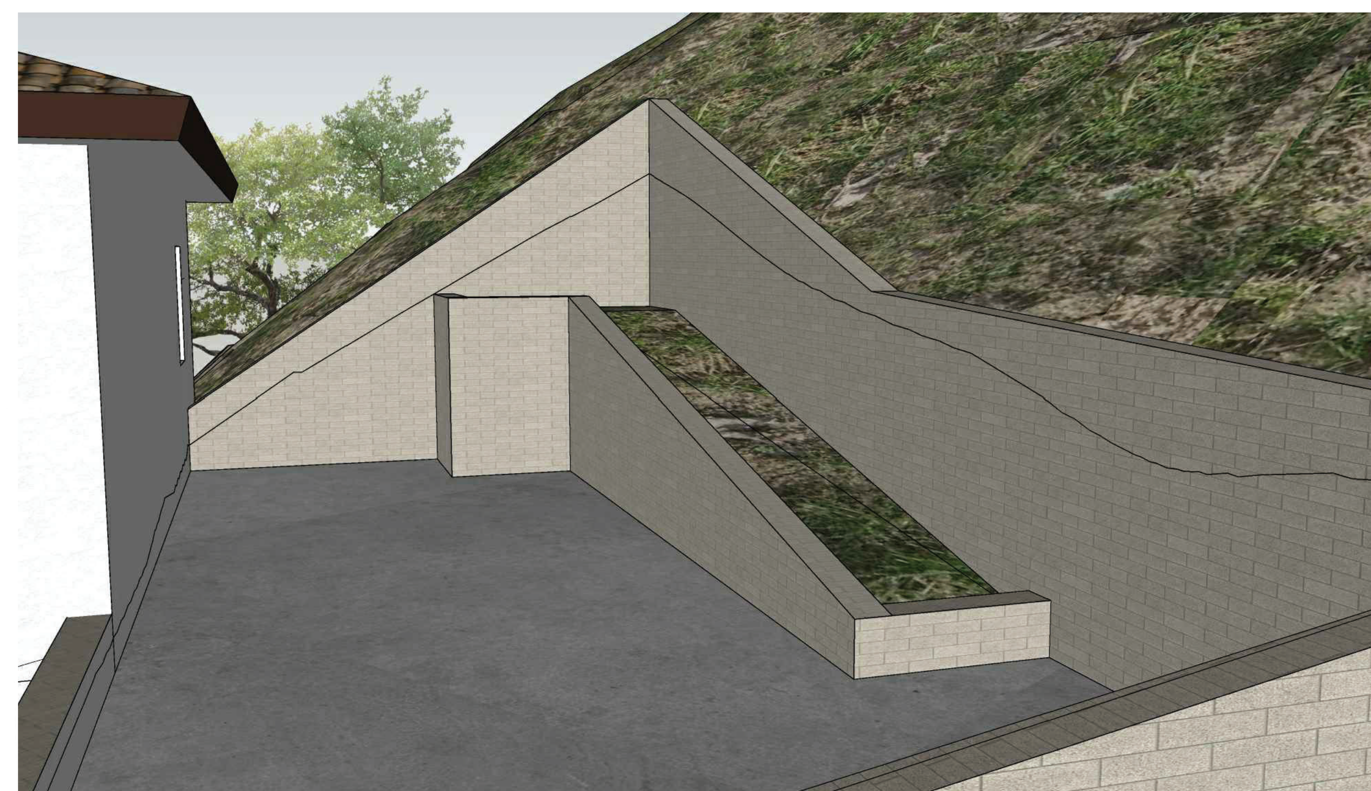

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a+g concepts
245 N COUNTRY CLUB RD
GLENDORA, CA 91741
TEL. 626.533.6120
agconceptsds@gmail.com
DESIGN STUDIO

PROJECT TITLE
NEW RESIDENCE
NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE
COLOR RENDER

REVISIONS

NO.	DATE	DESCRIPTION
△		

DRAWN G. H.
CHK.
APP.
SCALE AS SHOWN
JOB NO.
DATE 3/8/21
SHEET NO.
A-10
OF

APPENDIX B

Monrovia Fire and Rescue Department Plan Comments

MONROVIA FIRE DEPARTMENT
PLAN COMMENTS
(626) 256-8110

DATE: August 31, 2021

PROJECT: **Proposed SFD**
Norumbega Dr

The Fire Department has reviewed the submitted plan for conformance with the minimum applicable code requirements. The plans are being returned with the following notations:

1) Structure shall be fire sprinklered per CRC 313 and MMC amendments.
2) Structure is located in the Wildland Urban Interface and shall comply with CRC 337 requirements.
3) A vegetation management plan in compliance with CFC 4906 and the MMC shall be provided with architectural submittal.

APPENDIX C

Air Quality and Greenhouse Gas Technical Report

Air Quality & Greenhouse Gas Technical Report

Norumbega Drive Residence Project

Los Angeles County, California

AUGUST 2021

PREPARED FOR

Group Atom Development

PREPARED BY

SWCA Environmental Consultants

AIR QUALITY & GREENHOUSE GAS TECHNICAL REPORT NORUMBEGA DRIVE RESIDENCE PROJECT LOS ANGELES COUNTY, CALIFORNIA

Prepared for

Group Atom Development

Prepared by

SWCA Environmental Consultants

August 2021

CONTENTS

Tables

Appendices

Figures

1 INTRODUCTION

Group Atom Development (Applicant), retained SWCA Environmental Consultants (SWCA) to conduct an air quality and greenhouse gas emissions (GHGs) technical report in support of the proposed Norumbega Drive Residence Project (project) in the city of Monrovia, Los Angeles County, California (county). The purpose of this report is to explain the methodologies used to evaluate the effects of the proposed residence on ambient air quality & GHGs. This air quality technical report provides a summary of the air pollutant and GHG emissions calculation methodologies, a summary of the mitigation measures assumed and the results of the air pollutant and GHG emissions calculations. The evaluation of project impacts was conducted as recommended in the South Coast Air Quality Management District (SCAQMD) California Environmental Quality Act (CEQA) Handbook as amended and supplemented (SCAQMD 2021), which is incorporated into this technical document by reference.

2 PROJECT DESCRIPTION AND LOCATION

The proposed Project consists of the construction of one new home on Norumbega Drive near the intersection of Norumbega Drive and Norumbega Road in Monrovia, Los Angeles County, California (Assessor's Parcel Number [APN] 8523-002-045). The project would construct one new single-family residence on Norumbega Drive. The project site includes a single lot on Norumbega Drive in the hilly northwestern area of the city of Monrovia, in the San Gabriel Valley of Los Angeles County, California. The project site is at the western end of Norumbega Drive, across the street from 554 Norumbega Drive and approximately 350 feet northeast of the junction with Norumbega Road. The project site is 1.295 acres. The parcel is undeveloped. It supports disturbed chaparral and coastal sage scrub as well as oak woodlands.

The project proposes to build a 2-story residence that would be 3,758 square feet of livable space. As well, a 4-car garage on the lowest level would be an additional 1,348 square feet. The lot is 56,410 square feet (1.295 acres). The lot is a wedge-shape and the narrowest part, which fronts the street, is just over 33 feet in width.

There is an existing water line in Norumbega Drive that would serve the project**.** There is an existing sewer line in Norumbega Drive that would serve the project. Existing utilities include an overhead electrical line on the north side of Norumbega Drive and an existing natural gas line in Norumbega Drive. Natural gas and electricity access has not been defined to date. All connections would be through underground service connections. Existing infrastructure exists in the Norumbega Drive right-of-way.

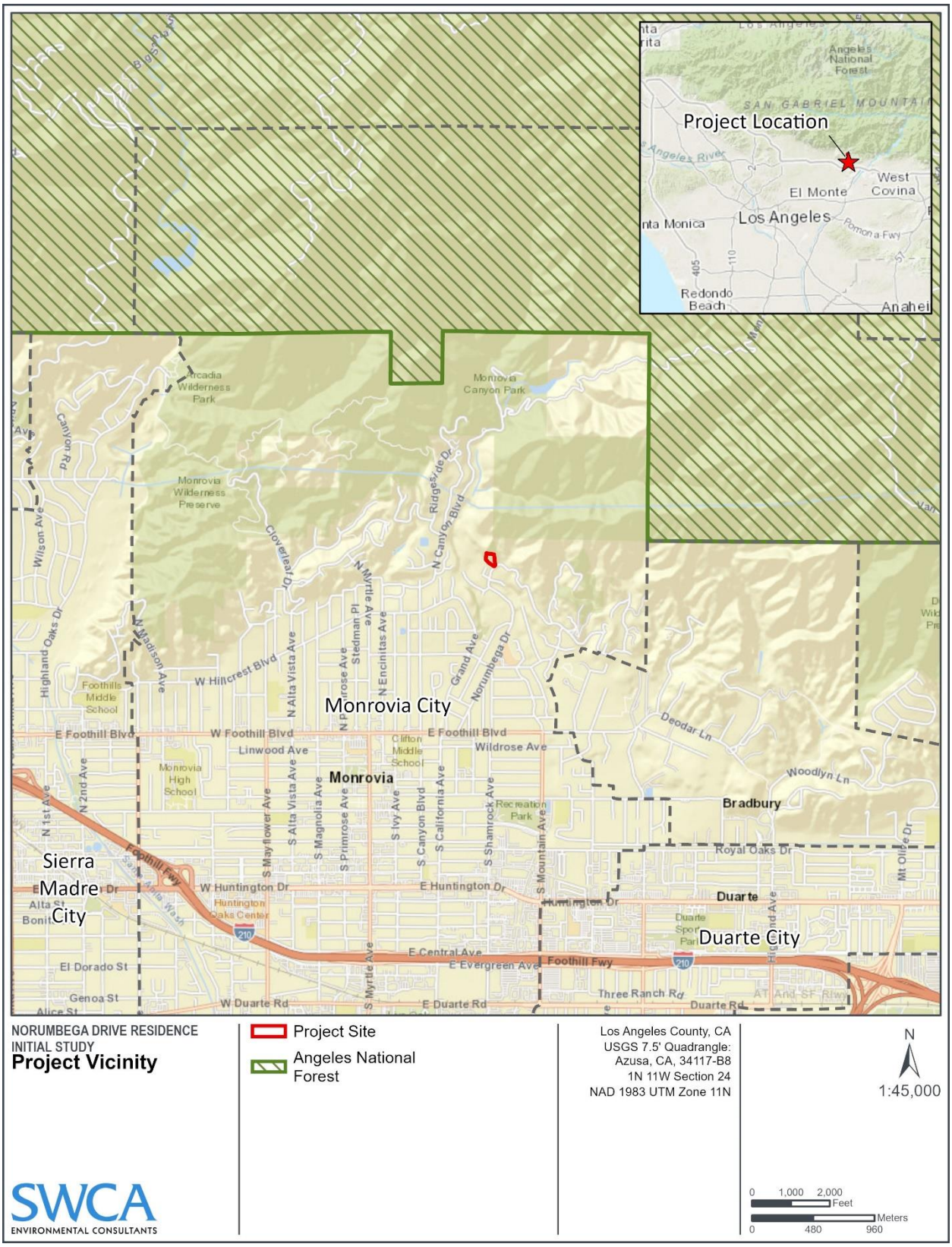

Figure 1. Vicinity map.

Figure 2. Project location.

2.1 Construction Scheduling and Phasing

It is anticipated that construction activities start in September 20, 2021 and would last approximately 16 months with the Project operation starting in 2023. Further details about the construction phasing are provided in the Methodology section of this report.

2.2 Operations

Once construction is completed the Project would be a fully constructed and functional single-family residence. There will be typical electrical consumption, water consumption, and travel to the Project consistent with a single-family residence.

2.3 Existing Environment

The Project is located in the city of Monrovia, in Los Angeles County within the South Coast Air Basin (SCAB). The SCAB consists of all of Orange County and non-desert portions of Los Angeles, San Bernadino, and Riverside Counties. The SCAQMD has jurisdiction within the SCAB. Ambient air quality is affected by the climate, topography, and the type and amount of pollutants emitted.

2.4 Climate and Topography

The SCAB is generally an arid desert region, with a significant portion located below sea level.

Los Angeles County and the broader South Coast Air Basin are defined by a semi-arid, Mediterranean climate with mild winters and warm summers. The San Gabriel, San Bernardino, and San Jacinto Mountains bound the Basin to the north and east trap ambient air and pollutants within the Los Angeles and Inland Empire valleys below. The City's climate, and that of Southern California in general, is generally controlled by the strength and position of the subtropical high-pressure cell over the Pacific Ocean. It maintains moderate temperatures and comfortable humidity, and limits precipitation to a few storms during the winter rainy season. Temperatures are normally mild, excepting the summer months, which can bring temperatures well above 100 degrees Fahrenheit (° F). The annual average temperature in the Basin is approximately 62 degrees Fahrenheit. Near the City of Monrovia, winds are driven by the dominant land/sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes while at night the wind generally slows and reverses direction traveling towards the sea. The frequency of calm winds (less than 2 miles per hour) is less than 10 percent, meaning there is little stagnation near the City, especially during busy daytime traffic hours; however, the Basin experiences temperature inversions which inhibit the dispersion of pollutants. Inversions may be either ground based or elevated. Ground-based inversions, sometimes referred to as radiation inversions, are most severe during clear, cold, early winter mornings. Under conditions of a ground-based inversion, very little mixing or turbulence occurs, and high concentrations of primary pollutants may occur local to major roadways. Elevated inversions can be generated by a variety of meteorological phenomena. Elevated inversions act as a lid or upper boundary and restrict vertical mixing. Below the elevated inversion, dispersion is not restricted.

City of Monrovia elevations range from approximately 440 feet above mean seal level (AMSL) in the southern portion of the City to approximately 1,240 feet AMSL in the northern portion of the City. Portions of the City's sphere of influence include step hillsides and rugged terrain that can reach 1,800 feet AMSL. The project site and immediate surroundings includes steep hillsides. The project site varies from approximately 824 feet above mean sea level (MSL) at Norumbega Drive to 951 feet MSL at the

northwestern corner, which is its highest point. The property slopes steeply toward Norumbega Drive, which in turn slopes toward Norumbega Road and the Sawpit Wash.

3 REGULATORY SETTING

Federal, state, and local agencies have set ambient air quality standards for certain air pollutants through statutory requirements and have established regulations and various plans and policies to maintain and improve air quality, as described below.

3.1 Criteria Pollutants

3.1.1 Federal

The federal Clean Air Act (CAA), which was passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The CAA delegates primary responsibility for clean air to the U.S. Environmental Protection Agency (EPA). The EPA develops rules and regulations to preserve and improve air quality and delegates specific responsibilities to state and local agencies. Under the act, the EPA has established the National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants that are pervasive in urban environments and for which state and national health-based ambient air quality standards have been established. Ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead (Pb), and particulate matter (PM_{10} – respirable particles less than 10 microns in diameter, and $PM_{2.5}$ – fine particles less than 2.5 microns in diameter) are the six criteria air pollutants. Ozone is a secondary pollutant, Nitrogen oxides (NO_X) and volatile organic compounds (VOCs) are of particular interest as they are precursors to ozone formation. The NAAQS are divided into primary and secondary standards; the primary standards are set to protect human health within an adequate margin of safety, and the secondary standards are set to protect environmental values, such as plant and animal life. The standards for all criteria pollutants are presented in Table 1.

The CAA requires EPA to designate areas as attainment, nonattainment, or maintenance (previously nonattainment and currently attainment) for each criteria pollutant based on whether the NAAQS have been achieved. The act also mandates that the state submit and implement a State Implementation Plan (SIP) for areas not meeting the NAAQS. These plans must include pollution control measures that demonstrate how the standards will be met.

3.1.2 State

The State of California began to set its ambient air quality standards (i.e., CAAQS) in 1969 under the mandate of the Mulford-Carrell Act. The California Clean Air Act (CCAA) was adopted by the California Air Resources Board (ARB) in 1988. The CCAA requires all air district of the state to achieve and maintain the CAAQS by the earliest practical date. Table 1 shows the CAAQS currently in effect for each of the criteria pollutants, as well as the other pollutants recognized by the state. As shown in Table 1, the CAAQS are generally more stringent than the corresponding federal standards and incorporate additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles

Table 1: State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards	
			Primary	Secondary
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m³)	--	Same as Primary
	8 Hour	0.070 ppm (137 µg/m³)	0.070 ppm (137 µg/m³)	
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m³	150 µg/m³	Same as Primary
	Annual Mean	20 µg/m³	--	
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	--	35 µg/m³	Same as Primary
	Annual Mean	12 µg/m³	12.0 µg/m³	15 µg/m³
Carbon Monoxide (CO)	1 Hour	20 ppm (23 µg/m³)	35 ppm (40 mg/m³)	--
	8 Hour	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	--
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (339 µg/m³)	100 ppb (188 µg/m³)	--
	Annual Mean	0.030 ppm (57 µg/m³)	0.053 ppm (100 µg/m³)	Same as Primary
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 µg/m³)	75 ppb (196 µg/m³)	--
	3 Hour	--	--	0.5 ppm (1300 µg/m³)
	24 Hour	0.04 ppm (105 µg/m³)	0.14 ppm	--
	Annual Mean	--	0.030 ppm	--
Lead (Pb)	30 Day Average	1.5 µg/m³	--	--
	Calendar Quarter	--	1.5 µg/m³	Same as Primary
	Rolling 3-Month Average	--	0.15 µg/m³	Same as Primary
Visibility reducing particles	8 Hour	10-mile visibility standard, extinction of 0.23 per kilometer	No National Standards	
Sulfates	24 Hour	25 µg/m³		
Hydrogen sulfide (H_2S)	1 Hour	0.03 ppm (42 µg/m³)		
Vinyl chloride	24 Hour	0.01 ppm (265 µg/m³)		

Notes:
ppm = parts per million; ppb = parts per billion; µg/m³ = micrograms per cubic meter; "--" = no standard.
Source: CARB 2016.

The ARB and local air districts are responsible for achieving CAAQS, which are to be achieved through district-level air quality management plans (AQMPs) that would be incorporated into the SIP. In California, the EPA has delegated authority to prepare SIPs to ARB, which in turn, has delegated that authority to individual air districts. Each district plan is required to either (1) achieve a 5 percent annual reduction, averaged over consecutive 3-year periods, in district-wide emissions of each non-attainment pollutant or its precursors, or (2) to provide for implementation of all feasible measures to reduce emissions. Any planning effort for air quality attainment would thus need to consider both state and federal planning requirements.

Other ARB duties include monitoring air quality (in conjunction with air monitoring networks maintained by air districts) and setting emissions standards for new motor vehicles and for other emission sources, such as consumer products and certain off-road equipment.

The CCAA substantially adds to the authority and responsibilities of air districts. CCAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures (TCMs). The CCAA also emphasizes the control of indirect and area-wide sources of air pollutant emissions and gives local air pollution control districts explicit authority to regulate indirect sources of air pollution.

3.1.3 Attainment Status

Depending on whether or not the applicable ambient air quality standards (AAQS) are met or exceeded, the air basin is classified as being in "attainment" or "nonattainment." The USEPA and California Air Resources Board (CARB) determine the air quality attainment status of designated areas by comparing ambient air quality measurements from state or local ambient air monitoring stations with the NAAQS and CAAQS. These designations are determined on a pollutant-by-pollutant basis. Consistent with federal requirements, an unclassifiable/ unclassified designation is treated as an attainment designation.

Table 2 presents the federal and state attainment status for the project area. As shown in the Table 2, the Los Angeles County – South Coast Air Basin is currently designated as nonattainment for O_3, PM_{10} and $PM_{2.5}$ under state standards. Under federal standards, the County is in nonattainment for O_3, and nonattainment for $PM_{2.5}$. The area is currently in attainment or unclassified status for all other ambient air quality standards.

Table 2: Federal and State Attainment Status

Pollutant	Federal Designation	State Designation
Ozone (O3) 1-hr	Nonattainment	Nonattainment
O3 8-hr	Nonattainment	Nonattainment
Particulate Matter (PM10) 24-hour & Annual	Attainment	Nonattainment
Particulate Matter (PM2.5)	Nonattainment	-
PM2.5 Annual	Nonattainment	Nonattainment
Carbon Monoxide (CO)	Attainment (Maintenance)	Attainment
Nitrogen Dioxide (NO2) 1 hour	Attainment	Attainment
NO2 Annual	Attainment (Maintenance)	Attainment
Sulfur Dioxide (SO2)	Attainment	Attainment
Lead (Pb)	Partial Nonattainment	Attainment
Hydrogen Sulfide (H2S)	-	Attainment
Sulfates	-	Attainment
Visibility Reducing Particles	-	Unclassified

Notes:
(-) = Not Identified/ No Status.
Source: CARB2017

Toxic Air Contaminants Regulation

California regulates toxic air containments (TACs) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588 – Connelly). In the early 1980s, the ARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Toxic Air Contaminant Identification and Control Act of 1983 (AB 1807) created California's program to reduce exposure to air toxics. The Air Toxics "Hot Spots" Information and Assessment Act (AB 2588) supplements the AB 1807 program by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

In August 1998, ARB identified DPM emissions from diesel-fueled engines as a TAC. In September 2000, ARB approved a comprehensive diesel risk reduction plan to reduce emissions from both new and existing diesel fueled engines and vehicles (ARB 2000). The goal of the plan is to reduce diesel PM_{10} (inhalable particulate matter) emissions and the associated health risk by 75% in 2010 and by 85% by 2020. The plan identified 14 measures that target new and existing on-road vehicles (e.g., heavy- duty trucks and buses, etc.), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps, etc.), and stationary engines (e.g., stand-by power generators, etc.). During the control measure phase, specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles will be evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions. The proposed Project would be required to comply with applicable diesel control measures.

Odorous Compounds

Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

3.1.4 Local

The SCAQMD is the agency responsible for monitoring air quality, as well as planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in the district.

The SCAQMD adopted its CEQA Air Quality Handbook in 1993. SCAQMD is currently in the process of developing an "Air Quality Analysis Guidance Handbook" to replace the CEQA Air Quality Handbook approved by the South Coast AQMD Governing Board in 1993. Supplemental information, as well as a description of now obsolete sections of the handbook are available through SCAQMD to provide guidance on how to determine the significance of impacts, including air pollutant emissions, related to the development of residential, commercial, and industrial projects. Where impacts are determined to be significant, the SCAQMD provides guidance to mitigate adverse impacts to air quality from development projects. The SCAQMD is the agency principally responsible for comprehensive air pollution control in the region.

The SCAQMD has developed rules and regulations that regulate stationary sources, area sources, and certain mobile source emissions, and is responsible for establishing stationary source permitting requirements and for ensuring that new, modified, or relocated stationary sources do not create net emission increases.

The following SCAQMD rules are applicable to the Project:

Rule 401 – (Visible Emissions) prohibits discharge into the atmosphere from any single source of emission for any contaminant for a period or periods aggregating more than three minutes in any one hour that is as dark or darker in shade than that designated as No. 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.

Rule 402 – (Nuisance) prohibits discharges of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property

Rule 403 – (Fugitive Dust) prohibits emissions of fugitive dust from any grading activity, storage pile, or other disturbed surface area if it crosses the project property line or if emissions caused by vehicle movement cause substantial impairment of visibility (defined as exceeding 20 percent capacity in the air). Rule 403 requires the implementation of Best Available Control Measures and includes additional provisions for projects disturbing more than five acres and those disturbing more than fifty acres.

Rule 431.2 – (Sulfur Content of Liquid Fuels) The purpose of this rule is to limit the sulfur content in diesel and other liquid fuels for the purpose of reducing the formation of SOx and particulates during combustion and of enabling the use of add-on control devices for diesel-fueled internal combustion engines. The rule applies to all refiners, importers, and other fuel suppliers such as distributors, marketers, and retailers, as well as to users of diesel, low-sulfur diesel, and other liquid fuels for stationary-source applications in the SCAQMD. The rule also affects diesel fuel supplied for mobile sources

Rule 445 – (Wood Burning Devices) prohibits installation of woodburning devices such as fireplaces and wood-burning stoves in new development unless the development is located at an elevation above 3,000 feet or if existing infrastructure for natural gas service is not available within 150-feet of the development. All fireplaces installed at the proposed Project will be natural gas fueled fireplaces.

Rule 481 – (Spray Coating Operations) imposes equipment and operational restrictions during construction for all spray painting and spray coating operations.

Rule 1110.2 – (Emissions from Gaseous- and Liquid-Fueled Engines) This rule applies to stationary and portable engines rated at greater than 50 horsepower. The purpose of Rule 1110.2 is to reduce NOx, VOCs, and CO emissions from engines. Emergency engines, including those powering standby generators, are generally exempt from the emissions and monitoring requirements of this rule because they have permit conditions that limit operation to 200 hours or less per year as determined by an elapsed operating time meter.

Rule 1113 – (Architectural Coatings) establishes maximum concentrations of VOCs in paints and other applications and establishes the thresholds for low-VOC coatings.

Rule 1143 – (Consumer Paint Thinners and Multi-Purpose Solvents) prohibits the supply, sale, manufacture, blend, package or repackage of any consumer paint thinner or multi-purpose solvent for use in the SCAQMD unless consumer paint thinners or other multi-purpose solvents comply with applicable VOC content limits

The City of Monrovia's existing General Plan does not establish specific goals, policies, or standards related to air quality; however, the City's Monrovia General Plan Proposed Land Use and Circulation Elements EIR (City of Monrovia 2008) included the following mitigation measures related to air quality:

AIR-A: The City shall require applicants to analyze the air quality impacts of construction for each project

AIR-B: If project-level analysis demonstrates that NOx emissions would be significant, the project shall provide a plan, for approval by the City, demonstrating that the heavy-duty (> 50 horsepower) off-road vehicles to be used in the construction project, including owned, leased and subcontractor vehicles, shall utilize all feasible measures to reduce the emissions to a less than significant level. Acceptable options for reducing emissions may include use of late model low-emission diesel engines, alternative fuels, engine retrofit technology, and/or other options as they become available. The SCAQMD web site provides specific information on mitigation options for off-road and on-road construction equipment.

AIR-C: The following measure shall be incorporated into all project specifications to reduce diesel engine emissions of O_3 precursors including ROG and NO_X, PM_{10}, $PM_{2.5}$, and diesel PM: Idling Restrictions. Idling of diesel-powered vehicles and equipment shall not be permitted during periods of non-active vehicle use. Diesel-powered engines shall not be allowed to idle for more than 5 consecutive minutes in a 60-minute period when the equipment is not in use, occupied by an operator, or otherwise in motion, except as follows:

- When it is necessary to operate auxiliary systems installed on the equipment, only when such system operation is necessary to accomplish the intended use of the equipment;
- When equipment is forced to remain motionless because of traffic conditions or mechanical difficulties over which the operator has no control;
- To bring the equipment to the manufacturer's recommended operating temperature;
- When the ambient temperature is below 40 degrees F or above 85 degrees F; or
- When equipment is being repaired.

AIR–D: The City shall require that all new residential fireplaces to be fueled by natural gas. Wood stoves and wood burning fireplaces shall be prohibited.

AIR-E: The City shall require applicants to analyze the potential for creating a local CO hotspot due to traffic congestion that could result from implementation of projects anticipated in the proposed General Plan amendments to the Land Use and Circulation Element

3.2 Climate Change and Greenhouse Gases

Construction climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to GHGs, particularly those generated from the production and use of fossil fuels. While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), tetrafluoromethane, hexafluoroethane, HFC-23 (fluoroform), HFC-134a (1,1,1,2-tetrafluoroethane), and HFC-152a (difluoroethane).

GHGs refer to atmospheric gases that absorb solar radiation and subsequently emit radiation in the thermal infrared region of the energy spectrum, trapping heat in the Earth's atmosphere. These gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor, among others. A growing body of research attributes long-term changes in temperature, precipitation, and other elements of Earth's climate to large increases in GHG emissions since the mid-nineteenth century, particularly from human activity related to fossil fuel combustion. Anthropogenic GHG emissions of particular interest include CO_2, CH_4, N_2O, and fluorinated gases.

GHGs differ in how much heat each can trap in the atmosphere (global warming potential, or GWP). The GWP is based on several factors, including the relative effectiveness of a gas to absorb infrared radiation and length of time that the gas remains in the atmosphere ("atmospheric lifetime"). The GWP of each gas is measured relative to CO_2, the most abundant GHG. The definition of GWP for a particular GHG is expressed relative to CO_2 over a specified time period. GHG emissions are typically measured in terms of pounds or tons of carbon dioxide equivalent (CO_2e). For example, the 2007 International Panel on Climate Change Fourth Assessment Report calculates the GWP of CH_4 as 25 and the GWP of N_2O as 298, over a 100-year time horizon (IPCC 2007). Generally, estimates of all GHGs are summed to obtain total emissions for a project or given time period, usually expressed in metric tons ($MTCO_2e$), or million metric tons ($MMTCO_2e$).

3.2.1 Federal

At the federal level there is currently no overarching law related to climate change or the reduction of GHGs. The EPA is developing regulations under the CAA to be adopted in the near future, pursuant to the EPA's authority under the CAA. Foremost amongst recent developments have been the settlement agreements between the EPA, several states, and nongovernmental organizations (NGOs) to address GHG emissions from electric generating units and refineries; the U.S. Supreme Court's decision in Massachusetts v. EPA; and EPA's "Endangerment Finding," "Cause or Contribute Finding," and "Mandatory Reporting Rule." On Sept. 20, 2013, the EPA issued a proposal to limit carbon pollution from new power plants. The EPA is proposing to set separate standards for natural gas-fired turbines and coal-fired units. Although periodically debated in Congress, no federal legislation concerning GHG limitations is has yet been adopted. In Coalition for Responsible Regulation, Inc., et al. v. EPA, the United States Court of Appeals upheld the EPA's authority to regulate GHG emissions under CAA. Furthermore, Under the authority of the CAA, the EPA is beginning to regulate GHG emissions starting with large stationary sources. In 2010, the EPA set GHG thresholds to define when permits under the New Source Review Prevention of Significant Deterioration (PSD) standard and Title V Operating Permit programs are required for new and existing industrial facilities.

3.2.2 State

California has been innovative and proactive in addressing GHG emissions through passage of legislation including Senate and Assembly bills and executive orders, some of which are listed below.

Executive Order (EO) S-3-05. In 2005, the governor issued EO S-3-05, establishing statewide GHG emissions reduction targets. The goal of this EO is to reduce California's GHG emissions to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The EO further directed the secretary of the California EPA to oversee the efforts made to reach these targets, and to prepare biannual reports on the progress made toward meeting the targets and on the impacts to California related to global warming. The first such Climate Action Team Assessment Report was produced in March 2006 and has been updated every 2 years thereafter. This goal was further reinforced with the passage of Assembly Bill 32 (AB 32) in 2006 and Senate Bill 32 (SB 32) in 2016.

Assembly Bill 32 (AB 32 California Global Warming Solution Act). In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.), which codified the 2020 GHG emissions reduction goals as outlined in EO S-3- 05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost- effective reductions of greenhouse gases." The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. The Scoping Plan was prepared and approved on December 11, 2008 and was later updated in May 2014. The update highlights California's progress toward meeting the "near- term" 2020 GHG emission reduction goals (to the level of 427 million MT of CO_2e) defined in the original Scoping Plan. It also evaluates how to align the State's longer-term GHG reduction strategies with other State policy priorities, such as for water, waste, natural resources, clean energy and transportation, and land use. 2005, the governor issued EO S-3-05, establishing statewide GHG emissions reduction.

Senate Bill 97 (SB 97). Chapter 185, 2007, Greenhouse Gas Emissions: This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Executive Order (EO) S-01-07 (January 18, 2007). This order, signed by Governor Schwarzenegger, sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

Senate Bill 375 (SB 375). Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

Executive Order B-30-15. On April 20, 2015, Governor Brown signed EO B-30-15 to establish a 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 such as the 28-nation European Union which adopted the same target in October 2014. California is on track to meet or exceed its legislated target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32, summarized above). California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2°C, the warming threshold at which there will likely be major climate disruptions such as severe droughts and rising of sea levels. The targets stated in EO B-30-15 have not been adopted by the state legislature.

Senate Bill 32 (SB 32) September 2016. Chapter 249 of the bill codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030. SB 32 provides another intermediate target between the 2020 and 2050 targets set in EO S-3-05.

Renewable Energy Portfolio. The Renewable Portfolio Standard (RPS) promotes diversification of the state's electricity supply and decreased reliance on fossil fuel energy sources. Originally adopted in 2002

with the initial requirement that 20% of electricity retail sales must be served by renewable resources by 2017 (referred to as the "initial RPS"). The goals have been accelerated and increased by EOs S-14-08 and S-21-09 to a goal of 33 percent by 2020.

The program was accelerated in 2015 with SB 350 which mandated a 50% RPS by 2030. SB 350 includes interim annual RPS targets with three-year compliance periods and requires 65% of RPS procurement to be derived from long-term contracts of 10 or more years. In 2018, SB 100 was signed into law, which again increases the RPS to 60% by 2030 and requires all the state's electricity to come from carbon-free resources by 2045.

In April 2011, the Governor signed SB 2 (1X) codifying California's 33 percent RPS goal; Section 399.19 requires the California Public Utilities Commission, in consultation with the California Energy Commission, to report to the Legislature on the progress and status of RPS procurement and other benchmarks. The purpose of the RPS upon full implementation was to provide 33 percent of the state's electricity needs through renewable energy sources. Renewable energy includes (but is not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas.

The program was further accelerated in 2015 with SB 350 which mandated a 50% RPS by 2030. SB 350 includes interim annual RPS targets with three-year compliance periods and requires 65% of RPS procurement to be derived from long-term contracts of 10 or more years. Most recently, on September 10, 2018, Governor Brown signed the SB 100 which aims at eliminating fossil fuel from electricity generation in California. The Bill sets a target of 100 percent carbon-free electricity by 2045.

The RPS is included in ARB's Scoping Plan list of GHG reduction measures to reduce energy sector emissions. It is designed to accelerate the transformation of the electricity sector through such means as investment in the energy transmission infrastructure and systems to allow integration of large quantities of intermittent wind and solar generation. Increased use of renewables would decrease California's reliance on fossil fuels, thus reducing emissions of GHGs from the electricity sector. In 2008, as part of the Scoping Plan original estimates, ARB estimated that full achievement of the RPS would decrease statewide GHG emissions by 21.3 million MT CO_2e. In 2010, ARB revised this number upwards to 24.0 million MT CO_2e.

3.2.3 Local

City of Monrovia Climate Change Regulations

The City of Monrovia, along with Southern California Edison and Intergy Corporation, has implemented an Energy Action Plan that contains goals and specific actions to ensure that sufficient, dependable, and reasonably-priced electrical power and energy supplies are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for the city's consumers and taxpayers. The Energy Action Plan looks at self-generation and demand reduction strategies that can further offset the energy, water, and transportation needs for the city of Monrovia, including the use of renewable energy sources. Appendix A to the Energy Action Plan includes the City's environmental accords or actions; however, none of these actions are directly applicable to individual development projects. Rather, Appendix A to the Energy Action Plan primarily lists actions that apply to City equipment, electricity consumption, and GHG emissions sources, or which would be implemented on a City-wide basis.

3.2.4 Air Pollutants

3.2.4.1 CRITERIA AIR POLLUTANTS

The federal and state governments have established ambient air quality standards for six criteria pollutants: carbon monoxide (CO), ozone (O_3), particulate matter (PM), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). Ozone and particulate matter are generally considered as regional pollutants because they or their precursors affect air quality across a region. Pollutants such as CO, NO_2, SO_2, and Pb are local pollutants in that they tend to accumulate in the air locally. In addition to being a regional pollutant, particulate matter is also considered a local pollutant. In the area of the proposed project site, ozone and particulate matters are of particular concern because of their attainment status at the regional level.

3.2.4.2 TOXIC AIR CONTAMINANTS

The federal TACs are air pollutants that may cause or contribute to an increase in mortality or serious illness, or which may pose a hazard to human health. Although there are no ambient standards established for TACs. Many pollutants are identified as TACs because of their potential to increase the risk of developing cancer or other acute (short-term) or chronic (long-term) health problems. For TACs that are known or suspected carcinogens, the ARB has consistently found that there are no levels or thresholds below which exposure is risk free. Individual TACs vary greatly in the risks they present; at a given level of exposure, one TAC may pose a hazard that is many times greater than another. For certain TACs, a unit risk factor can be developed to evaluate cancer risk. For acute and chronic health effects, a similar factor, called a Hazard Index, is used to evaluate risk. TACs are identified and their toxicity is studied by the California Office of Environmental Health Hazard Assessment (OEHHA). Examples of TAC sources include industrial processes, dry cleaners, gasoline stations, paint and solvent operations, and fossil fuel combustion sources. The TACs that are relevant to the implementation include DPM and airborne asbestos.

DPM was identified as a TAC by the ARB in August 1998 (CARB,1998). DPM is emitted from both mobile and stationary sources. In California, on-road diesel-fueled vehicles contribute approximately 40% of the statewide total, with an additional 57 percent attributed to other mobile sources such as construction and mining equipment, agricultural equipment, and transport refrigeration units. Stationary sources, contributing about 3 percent of emissions, include shipyards, warehouses, heavy equipment repair yards, and oil and gas production operations. Emissions from these sources are from diesel-fueled internal combustion engines. Stationary sources that report DPM emissions also include heavy construction, manufacturers of asphalt paving materials and blocks, and diesel-fueled electrical generation facilities a metal found naturally in the environment as well as in manufactured products.

Exposure to DPM can have immediate health effects. DPM can have a range of health effects including irritation of eyes, throat, and lungs, causing headaches, lightheadedness, and nausea. Exposure to DPM also causes inflammation in the lungs, which may aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma attacks. Children, the elderly and people with emphysema, asthma, and chronic heart and lung disease are especially sensitive to fine-particle pollution. In California, DPM has been identified as a carcinogen.

Airborne Asbestos. Asbestos occurs naturally in ultramafic rock (which includes serpentine). When this material is disturbed in connection with construction, grading, quarrying, or surface mining operations, asbestos-containing dust can be generated. Asbestos is a known carcinogen. Exposure to asbestos can result in adverse health effects such as lung cancer, mesothelioma (cancer of the linings of the lungs and abdomen), and asbestosis (scarring of lung tissues that results in constricted breathing).

3.2.4.3 GREENHOUSE GASES

Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans in recent decades. There is a general scientific consensus that global climate change is occurring, caused in whole or in part by increased emissions of GHGs that keep the Earth's surface warm by trapping heat in the Earth's atmosphere, in much the same way as glass traps heat in a greenhouse. The Earth's climate is changing because human activities, primarily the combustion of fossil fuels, are altering the chemical composition of the atmosphere through the buildup of GHGs. GHGs are released by the combustion of fossil fuels, land clearing, agriculture, and other activities, and lead to an increase in the greenhouse effect.

Carbon Dioxide (CO_2)

In the atmosphere, carbon generally exists in its oxidized form, as CO_2. Natural sources of CO_2 include the respiration (breathing) of humans, animals and plants, volcanic outgassing, decomposition of organic matter and evaporation from the oceans. Anthropogenic sources of CO_2 include the combustion of fossil fuels and wood, waste incineration, mineral production and deforestation. Anthropogenic sources of CO_2 amount to over 30 billion tons per year, globally. Natural sources release substantially larger amounts of CO_2. Nevertheless, natural removal processes, such as photosynthesis by land and ocean-dwelling plant species, cannot keep pace with this extra input of man-made CO_2, and, consequently, the gas is building up in the atmosphere.

Methane (CH_4)

Methane is produced when organic matter decomposes in environments lacking sufficient oxygen. Natural sources include wetlands, termites, and oceans. Decomposition occurring in landfills accounts for the majority of human-generated CH_4 emissions in California and in the United States as a whole. Agricultural processes such as intestinal fermentation, manure management, and rice cultivation are also significant sources of CH_4 in California.

Nitrous Oxide (N_2O)

Nitrous oxide is produced naturally by a wide variety of biological sources, particularly microbial action in soils and water. Tropical soils and oceans account for the majority of natural source emissions. Nitrous oxide is a product of the reaction that occurs between nitrogen and oxygen during fuel combustion. Both mobile and stationary combustion produce N_2O, and the quantity emitted varies according to the type of fuel, technology, and pollution control device used, as well as maintenance and operating practices. Agricultural soil management and fossil fuel combustion are the primary sources of human-generated N_2O emissions in California.

Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulfur Hexafluoride (SF_6)

HFCs are primarily used as substitutes for ozone depleting substances regulated under the Montreal Protocol (1987), an international treaty that was approved on January 1, 1989 and was designated to protect the ozone layer by phasing out the production of several groups of halogenated hydrocarbons believed to be responsible for ozone depletion. PFCs and SF_6 are emitted from various industrial processes, including aluminum smelting, semiconductor manufacturing, electric power transmission and distribution, and magnesium casting. There is no primary aluminum or magnesium production in California; however, the rapid growth in the semiconductor industry leads to greater use of PFCs.

The magnitude of the impact on global warming differs among the GHGs. The effect each GHG has on climate change is measured as a combination of the volume of its emissions, and its global warming

potential (GWP), expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG emissions are typically measured in terms of pounds or tons of CO_2 equivalents (CO_2e). HFCs, PFCs, and SF_6 have a greater "global warming potential" than CO_2. In other words, these other GHGs have a greater contribution to global warming than CO_2 on a per-mass basis. However, CO_2 has the greatest impact on global warming because of the relatively large quantities of CO_2 emitted into the atmosphere.

3.2.4.4 SENSITIVE RECEPTORS

Some population groups, such as children, the elderly, and acutely and chronically ill persons are considered more sensitive to air pollution than others. Sensitive receptor locations typically include residential areas, hospitals, elder-care facilities, rehabilitation centers, daycare centers, and parks. The Project site is in a residential urban area. In the vicinity of the project site, the southwest, south and east sides of the parcel are developed with one- and two-story single-family homes. The Project itself is a residence located within one mile of other residences.

3.2.4.5 EXISTING AMBIENT LOCAL AIR QUALITY

Existing levels of ambient air concentrations and historical trends and projections in the project area are best documented by measurements made by the SCAQMD and CARB. The closest most representative air monitoring station to the project site is the project site is the Azusa Monitoring Station on 803 N. Loren Avenue. The Azusa Monitoring Station monitors ozone, $PM_{2.5}$, and PM_{10}. This was determined to be appropriate since the project area is only nonattainment for ozone, PM_{10} and $PM_{2.5}$. The most recent published data for the monitoring stations is presented in Table 3, which encompasses the years of 2015 through 2019.

Table 3: Existing Local Ambient Air Quality from 2015 – 2019

Pollutant	Averaging Time	Standard	2015	2016	2017	2018	2019
Ozone (O3)	1-Hour	Maximum Concentration (ppm)	0.122	0.146	0.152	0.139	0.123
		Days > CAAQS (0.09 ppm)	21	30	38	24	34
	8-Hour	Maximum Concentration (ppm)[a]	0.096	0.106	0.114	0.099	0.094
		Days > NAAQS (0.07 ppm)	27	39	62	42	39
Particulate Matter (PM10)	24-Hour	Maximum Concentration (μ g/m^3) - National	101.0	74.0	83.9	78.3	82.0
		Maximum Concentration (μ g/m^3) - State	99.0	74.6	83.9	78.3	80.3
		Days > NAAQS (150 μ g/m^3)	0	0	0	0	0
		Days > CAAQS (50 μ g/m^3)	75.6	*	*	59	24
Particulate Matter [c] (PM2.5)	24-Hour	Maximum Concentration (μ g/m^3)	70.3	32.1	24.9	41.8	70.3
		Days > NAAQS (35 μ g/m^3)	6.1	0	0	3	3
		National Std. 98th Percentile [b]	30.0	29.0	21.2	35.3	28.3

AAM – Annual Arithmetic Mean; CAAQS – California ambient air quality standards; µg/m^3 – micrograms per cubic meter; NAAQS – National ambient air quality standards; ppm – parts per million; n/a – sufficient data not available to determine the value

*The estimated number of measured concentrations above national standards are shown in **bold**.*

Note: Ambient data for CO, NO2, SO2 and airborne lead are not included in this table since the entire Los Angeles County is currently in compliance with state and federal standards for these pollutants.

[a] The 8-hour ozone standard is attained when the fourth highest concentration in a year, averaged over 3 years, is lessthan or equal to the new national standard of 0.07 ppm. (Values listed in table represent midnight-to-midnight 24-hour averaged and exclude exceptional events.)

[b] Attainment condition for PM2.5 is that the 3-year average of the 98th percentile of 24-hour concentrations at each monitor within an area must not exceed the standard.

[c] O3, PM2.5 and PM10 data are from Azusa Monitoring Station located at 803 N. Loren Ave., approximately 4.3 miles from the project site.

Source: CARB,2019, EPA 2019

4 IMPACTS AND MITIGATION MEASURES

4.1 Thresholds of Significance

The Project is Based upon criteria presented in CEQA Appendix G, a project would have a significant air quality impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan (SCAQMD 2016 AQMP);
- Result in cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under applicable federal or state ambient air quality standards;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The SCAQMD has also established significance thresholds based on the state CEQA significance criteria. adopted guidelines for implementation of CEQA in its CEQA Air Quality Handbook (SCAQMD 2021). The SCAQMD recommended thresholds of significance are discussed below.

4.1.1 Construction

For construction-related emissions, SCAQMD indicates the thresholds presented in Table 4. In any case, regardless of the size of the project, the standard mitigation measures for construction equipment and fugitive PM_{10} must be implemented at all construction sites. The list of mitigation measures that would be implemented for the proposed Project (derived from City's General Plan requirements) is provided in Section 3.1.4.

Table 4: SCAQMD-Recommended Construction Thresholds of Significance

Pollutant	Threshold (lbs/day)
ROG	75
NOx	100
CO	550
PM10	150
PM2.5	55
SOx	150
Lead	3

Source: SCAQMD 2021

4.1.2 Operations

The operational phase of a proposed project has the potential of creating lasting or long-term impacts on air quality, it is important that a proposed development evaluate the potential impacts carefully. Therefore, air quality analyses should compare all operational emissions of a project, including motor vehicle, area source, and stationary or point sources to the thresholds in Table 5 provides general guidelines for determining the significance of impacts and the recommended type of environmental analysis required based on the total emissions that are expected from the operational phase of a project.

Table 5: SCAQMD-Recommended Operations Thresholds of Significance

Pollutant	Threshold (lbs/day)
ROG	55
NOx	55
CO	550
PM10	150
PM2.5	55
SOx	150
Lead	3

Source: SCAQMD 2021

SCAQMD has adopted interim threshold of significance for projects' GHG emissions. The SCAQMD's Interim GHG Thresholds are as follows:

- Industrial projects: 10,000 metric ton (MT) per year emissions of carbon monoxide equivalent (CO_2e)
- Residential, commercial and mixed-use projects: 3,000 MT CO_2e per year

The proposed Project is considered a residential development; as such, this analysis, compares the direct and indirect emissions from the project with the 3,000 MT threshold level.

4.1.3 Displaced Grid Electricity Emissions

Indirect sources of emissions can be of different forms. The proposed Project is a residence with electricity demands, water use etc. The GHG emissions from the Project's proposed electrical use, natural gas use, water use, waste disposal, and landscaping have been determined in the Project's CalEEMod operational calculations. As required by the adopted 2019 Green Building Code, a solar system is required for the residence.[1] Therefore the Project would provide a renewable energy resource that would displace a portion of the GHG emitted. However, due to the minimal GHG emissions from the project, these displaced emissions have not been quantified as part of this assessment.

5 METHODOLOGY

5.1 CalEEMod

The proposed Project would result in both short-term and long-term emissions of air pollutants associated with construction and operations of the proposed Project. Construction emissions would include exhaust from the operation of conventional construction equipment, on-road emissions from employee vehicle trips and haul truck trips, and fugitive dust as a result of grading and vehicle travel. Operational emissions would include daily trips to the residence as well as the emissions from the residence itself.

Construction and operational emissions were estimated using California Emissions Estimator Model (CalEEMod), version 2020.4.0. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operation of a variety of land use projects. The model utilizes widely accepted federal and state models for emission estimates and default data from sources such as USEPA AP-42 emission factors, CARB vehicle emission models, and studies from California agencies such as the California Energy Commission (CEC). The model quantifies direct emissions from construction and operations, as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use.

The model was developed in collaboration with the air districts in California. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California air districts to account for local requirements and conditions.

[1] California Building Standards Commission. 2019. *2019 California Green Building Standards Code. Cal Green.* California Code of Regulations. Title 24. Part 11. Available at: https://codes.iccsafe.org/content/CAGBSC2019/cover. Accessed August 15, 2021.

5.2 Construction Emissions

Construction emissions associated with the proposed Project, including emissions associated with the operation of off-road equipment, haul-truck trips, on-road worker vehicle trips, vehicle travel on paved and unpaved surfaces, and fugitive dust from material handling activities were calculated using CalEEMod version 2020.4.0. Emissions modeling included emissions generated during the following phases: site preparation, grading, building construction, paving, and architectural coating.

Construction-worker estimates and vendor truck trips by construction phase were provided by the Applicant. Haul truck trips during the grading phase were based on project applicant-provided earthwork quantities. Grading will occur up to a depth of 11 feet which is currently estimated to involve approximately 576 cubic yards of cut and 266 cubic yards of fill. Approximately 252 cubic yards of soil would be exported from the site, and would require approximately 26 haul truck round trips during the grading phase.

Modeling input data was based on anticipated construction schedule and phasing. Construction equipment and usage required for each phase were obtained using information provided by the Applicant, or derived from similar projects, and default parameters contained in the model for the Project area (Los Angeles County). The construction duration is assumed to be approximately 16 months. Project construction would consist of different activities which would be undertaken in phases, through to the operation of the Project. It has been conservatively assumed that some of these phases would occur simultaneously. Table 6 shows the Project's anticipated construction schedule and the phases that overlap to make the "worst-case" construction time period. This occurs in the last week of Month 14 (year 2023) when building construction and paving may occur simultaneously. Table 7 includes the anticipated equipment used in each phase for the Project.

Table 6: Construction Phasing

	Month 1				Month 2				Month 3-13				Month 14-15				Month 16				Month 17
Construction Phase	Week #																				
Site Preparation	x																				
Grading		x	x	x	x																
Building Construction						x	x	x	x	x	x	x	x	x							
Paving													x	x	x	x	x	x	x		
Architectural Coating																				x	
Operations Phase																					
Single Family Residence																					x

Table 7: Construction Anticipated Equipment

Phase (Duration)	Equipment Used		
	Type	Number	Hrs/day
1. Site Preparation (1 week)	Rubber Tired Dozers	1	8
	Grader	2	8
	Tractors/Loaders/Backhoes	1	8
2. Grading (4 weeks)	Graders	2	8
	Rubber Tired Dozers	1	8
	Tractors/Loaders/Backhoes	1	8
3. Building Construction (52 weeks)	Cranes	1	8
	Forklifts	1	8
	Welders	1	8
4. Paving (13 weeks)	Cement and Mortar Mixer	1	8
	Tractor/Loader/Backhoe	1	8
	Pavers	1	8
5. Architectural Coating (1 week)	Air compressor	1	8

Notes: For the parameters that are not provided in the table (e.g., equipment horsepower and load factor) CalEEMod defaults were used.

A maximum of 16 one-way daily worker trips (LD_Mix) and 4 one-way daily vendor/delivery trips (HDT_Mix) was utilized for the entirety of the 16 month construction period. During the grading phase 52 one-way haul truck trips are assumed. The CalEEMod defaults for the on-road vehicles trip lengths were utilized. All roads traveled to the Project are assumed to be paved, per CalEEMod defaults.

5.3 Operational Emissions

The Project will be a single-family residence when in "operation". For estimation of operational emissions, the CalEEMod defaults for a 5,106 square foot single family residence (3,758 square feet of livable space and a 1,348 square feet 4-car garage) located on a 1.3 acre lot were conservatively assumed. Operation of the Project would generate emissions from mobile sources, including vehicle trips from future residents; area sources, including the use of consumer products, architectural coatings for repainting, and landscape maintenance equipment; and energy sources, including combustion of fuels used for space and water heating and cooking appliances.

CalEEMod was used to estimate operational emissions from area sources, including emissions from consumer product use, architectural coatings, and landscape maintenance equipment. Emissions associated with natural gas usage in space heating, water heating, and stoves are calculated in the building energy use module of CalEEMod. The project would not include woodstoves or fireplaces (wood). As such, area source emissions associated with these sources were not included. Consumer products are chemically formulated products used by household and institutional consumers, including detergents; cleaning compounds; polishes; floor finishes; cosmetics; personal care products; home, lawn, and garden products; disinfectants; sanitizers; aerosol paints; and automotive specialty products. Consumer product VOC emissions are estimated in CalEEMod based on the floor area of residential buildings and on the default factor of pounds of VOC per building square foot per day. CalEEMod calculates the VOC evaporative emissions from application of residential surface coatings based on the VOC emission factor, the building square footage, the assumed fraction of surface area, and the reapplication rate. The VOC emission factor is based on the VOC content of the surface coatings, and SCAQMD's Rule 1113 (Architectural Coatings) governs the VOC content for interior and exterior coatings. The model default reapplication rate of 10% of area per year is assumed. Consistent with CalEEMod defaults, it is assumed

that the residential surface area for painting equals 2.7 times the floor square footage, with 75% assumed for interior coating and 25% assumed for exterior surface coating. Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chain saws, and hedge trimmers. The emissions associated from landscape equipment use are estimated based on CalEEMod default values for emission factors (grams per residential dwelling unit per day and grams per square foot of nonresidential building space per day) and number of summer days (when landscape maintenance would generally be performed) and winter days. For Los Angeles County, the average annual "summer" days are estimated to 365 days; however, it is assumed that landscaping equipment would likely only operate during the week (not weekends), so operational days were assumed to be 250 days per year in CalEEMod. By design, the project would not include turf, and the proposed landscaped area would be minimal. Nonetheless, emissions associated with potential landscape maintenance equipment were included to conservatively capture potential project operational emission sources. As represented in CalEEMod, energy sources include emissions associated with building electricity and natural gas usage. CalEEMod default values for energy consumption were applied.

Mobile sources for the project operations would primarily be the resident's vehicles traveling to and from the residence. Motor vehicles may be fueled with gasoline, diesel, or alternative fuels. CalEEMod default data, including temperature, trip characteristics, emissions factors, and trip distances, were conservatively used for the model inputs to estimate daily emissions from proposed vehicular sources.

Operational emissions associated with the proposed project were quantified using CalEEMod version 2020.4.0.

6 IMPACT ANALYSIS

Impact AQ-1 Would the project conflict with or obstruct implementation of the applicable air quality plan?

Less Than Significant Impact. A project is conforming with applicable adopted plans if it complies with the applicable SCAQMD rules and regulations and emission control strategies in the applicable air quality attainment plans. The project would comply with the applicable rules and regulations, including the use of standard mitigation measures for construction equipment and fugitive dust.

Consistency with air quality plans is typically conducted based on a comparison of project-generated growth in employment, population, and vehicle miles traveled (VMT) within the region, which is used for development of the emissions inventories contained in the air quality plans. While the Project would contribute to energy supply, which is one factor of population growth, the proposed Project is a residence and would not significantly increase employment or growth within the region. Moreover, development of the proposed Project would increase the amount of renewable energy and help California meet its Renewable Portfolio Standard (RPS).

Furthermore, the thresholds of significance, adopted by the air district (SCAQMD), determine compliance with the goals of attainment plans in the region. As such, emissions below the SCAQMD regional mass daily emissions thresholds presented in Table 4 and Table 5 would not conflict with or obstruct implementation of the applicable air quality plans. As **Error! Reference source not found.** and Table 9 show, the emissions from proposed Project construction (unmitigated) and operation (unmitigated) are below the thresholds of significance; therefore, the proposed Project does not conflict with implementation of the SCAQMD applicable air quality plans.

Impact AQ-2 Would the project 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?

Less Than Significant Impact. The Project implementation would generate emissions of criteria air pollutants during construction and operation. The estimated emissions from construction and operations of the Project are summarized in Table 8 and Table 9. The detailed assumptions and calculations, as well as CalEEMod outputs are provided in Appendix A of this report.

Table 8: Unmitigated Construction Emissions Summary

Construction Phase	Pollutant Emission (pounds per day)					
	ROG	**NOx**	**CO**	**PM10**	**PM2.5**	**SO2**
Site Preparation	2.21	25.00	10.54	8.84	4.48	0.03
Grading	2.42	27.33	12.90	9.44	4.65	0.03
Building Construction	0.92	7.83	5.58	0.56	0.39	0.01
Paving	0.50	4.39	6.08	0.41	0.25	0.01
Architectural Coating	5.64	1.94	3.01	0.30	0.15	0.01
Peak Daily Emission	*5.64*	*27.30*	*12.96*	*9.43*	*4.65*	*0.03*
SCAQMD Significance Thresholds	*75*	*100*	*550*	*150*	*55*	*150*
Threshold Exceeded?	*No*	*No*	*No*	*No*	*No*	*No*

NA = Not applicable, no threshold

SCAQMD significance thresholds are based on maximum daily emissions.

Emission were quantified using CalEEMod, version 2020.4.0 using "single-family residence" land use category and modifying default values, where applicable.

Summer model results are presented above.

The phases that overlap to make the "worst-case" construction time period occur in Month 14 (year 2023) when building construction and paving may occur simultaneously.

Model results (Summer, Winter & Annual) and assumptions are provided in Appendix A.

As Table 8 shows, estimated unmitigated construction emissions for all pollutants are below SCAQMD significance thresholds. The Project's operation consists of typical single-family residence "operational" emissions, conservatively estimated using CalEEMod defaults. Operational emissions are summarized in Table 9. As shown, the Project emissions during "operations" of the residence would be well below the SCAQMD significance thresholds.

Table 9: Unmitigated Operational Emissions Summary

Activity	Pollutant Emission (pounds per day)				
	ROG	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Area	0.79	0.12	6.21	1.00	1.00
Energy	0.0008	0.0064	0.0027	0.0005	0.0005
Mobile	0.03	0.03	0.31	0.07	0.02
Peak Daily Emission (Total Operational)	0.82	0.15	6.53	1.07	1.02
SCAQMD Significance Thresholds	*55*	*55*	*550*	*150*	*55*
Threshold Exceeded?	*No*	*No*	*No*	*No*	*No*

SCAQMD significance thresholds are based on maximum daily emissions.

Emission were quantified using CalEEMod, version 2020.4.0 using "user defined industrial" category and modifying default valuesusing project-specific data/assumptions, where available.

Model results and assumptions are provided in Appendix A.

As presented above, the proposed Project would not violate any air quality standards or contribute substantially to an existing or projected air quality violation. The impact is less than significant, and no mitigation required; however, per requirements of SCAQMD, any standard mitigation measures would be implemented during construction and operation of the Project.

Impact AQ-3 Would the project expose sensitive receptors to substantial pollutant concentrations?

Less Than Significant Impact. Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, daycare centers, and places of worship. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

Sensitive receptors near the project include existing one- and two-story single-family homes on the southwest, south and east sides of the parcel. In order to identify impacts to sensitive receptors, the SCAQMD recommends addressing localized significance thresholds (LSTs) for construction and operation impacts (stationary sources only). The CO hotspot analysis following the LST analysis addresses localized mobile source impacts.

Localized Significance Thresholds

LSTs were developed in response to SCAQMD Governing Boards' Environmental Justice Enhancement Initiative (I-4). The SCAQMD provided the Final Localized Significance Threshold Methodology, dated June 2003 (revised 2008), for guidance. The LST methodology assists lead agencies in analyzing localized impacts associated with project-specific level projects. The SCAQMD provides the LST lookup tables for one, two, and five acre projects emitting CO, NO_X, $PM_{2.5}$, or PM_{10} for 41 different Source Receptor Areas (SRA) throughout the Basin. The project site is located within SRA 9, East San Gabriel Valley.

Construction

Based on the SCAQMD guidance on applying CalEEMod to LSTs, the project would disturb approximately two acres of land per day. Therefore, the LST screening thresholds for two acres were utilized for the construction LST analysis. To be conservative, the LST value for 25 meters was utilized. Table 10,

Localized Short-Term Construction Emissions, shows the localized mitigated construction-related emissions. It is noted that the localized emissions presented in Table 10 include only on-site emissions (i.e., from construction equipment and fugitive dust), and do not include off-site emissions (i.e., from hauling activities). As seen in Table 10, on-site emissions would not exceed the LST screening thresholds for SRA 9. Impacts would be less than significant in this regard.

Table 10: Localized Short-Term Construction Emissions

Emissions Source[1]	**Pollutant (pounds/day)**			
	NO_X	**CO**	**PM_{10}**	**$PM_{2.5}$**
Site Preparation	24.72	9.83	4.45	2.51
Grading	26.61	12.09	4.76	2.63
Building Construction	7.54	4.87	0.35	0.33
Paving	4.14	5.43	0.20	0.19
Architectural Coating	1.74	2.41	0.09	0.09
SCAQMD LST Screening Thresholds[2]	***128***	***786***	***7***	***5***
Threshold Exceeded?	***No***	***No***	***No***	***No***

Notes:
1. Emissions were calculated using CalEEMod (CalEEMod version 2020.4.0).
2. The Localized Significance Thresholds (LSTs) were determined using Appendix C of the SCAQMD's *Final Localized Significant Threshold Methodology*, revised July 2008, for pollutants NO_X, CO, PM_{10}, and $PM_{2.5}$. The Localized Significance Threshold was based on the anticipated daily acreage disturbance for construction (two acres; therefore the 2-acre threshold was used) and Source Receptor Area 9.

As detailed in Table 10, construction emissions would not exceed the SCAQMD LST screening thresholds for any construction phase. Therefore, the project would result in a less than significant impact related to sensitive receptors, due to localized construction emissions.

Diesel Particulate Matter

Emissions of diesel particulate matter (DPM) associated with heavy-duty construction equipment are a toxic air contaminant (TAC). DPM is mainly composed of particulate matter (i.e., $PM_{2.5}$) and gases, which contain potential cancer-causing substances. The majority of heavy-duty equipment construction activity would occur during the grading and site preparation phases. As shown in Table 10, emissions from mitigated construction activities are well below the SCAQMD significance threshold. As construction activities would be short term, operation of heavy-duty construction equipment is not expected to expose sensitive receptors to substantial DPM concentrations. As such, impacts would be less than significant in this regard.

Operations

As shown in Table 11, Localized Significance of Operational Emissions, the project's operational emissions would not exceed the LST screening thresholds for the potential sensitive receptors within 25 meters of the Project. It should be noted the localized operational CalEEMod results do not include off-site mobile emissions per SCAQMD guidance. As detailed in Table 11, daily operational emissions would not exceed the SCAQMD LST screening thresholds. Thus, impacts would be less than significant in this regard.

Table 11: Localized Significance of Operational Emissions

Emissions Source[1]	Pollutant (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Area Source	0.115	6.22	1.00	1.00
Energy Consumption	0.0064	0.0027	0.0005	0.0005
Total Project Operational Emissions	***0.121***	***6.223***	***1.001***	***1.001***
SCAQMD LST Screening Thresholds	**128**	**953**	**2**	**2**
Threshold Exceeded?	***No***	***No***	***No***	***No***

Notes:
1. Emissions were calculated using CalEEMod (CalEEMod version 2020.4.0).
2. The Localized Significance Thresholds (LSTs) were determined. The Localized Significance Threshold was based on the anticipated daily acreage disturbance for construction (two acres; therefore the 2-acre threshold was used) and Source Receptor Area 9.

Carbon Monoxide Hotspots

Projects involving traffic impacts may result in the formation of locally high concentrations of CO, known as CO "hot spots." It is not anticipated that the project would have a significant impact on traffic in the area as it is a single-family residence and will have the typical traffic associated. Based on the BAAQMD CO hotspot screening-level analysis, a project would not cause a CO hotspot if the net increase in intersection traffic volumes is less than 44,000 vehicles per hour. The Project's traffic will be significantly below 44,000 vehicles per hour. Therefore, project-generated traffic would not exceed the BAAQMD significance threshold. Thus, CO hotspot impacts at sensitive receptors would be less than significant.

Air Quality Health Impacts

As evaluated above, the project's localized emissions would not exceed the SCAQMD's LST screening thresholds. Therefore, the project would not exceed the most stringent applicable Federal or State ambient air quality standards for emissions of CO, NO_X, PM_{10}, or $PM_{2.5}$, which were developed to represent levels at which the most susceptible persons (children and the elderly) are protected from health effects. In other words, the ambient air quality standards are purposefully set in a stringent manner to protect sensitive populations with respiratory problems (e.g., children, the elderly, etc.). Thus, the project's localized emissions would not create an air quality health impact, and a less than significant impact would occur in this regard.

Impact AQ-4 Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

No Impact. According to the SCAQMD's CEQA Air Quality Handbook, land uses associated with odor complaints typically include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The project does not include any of these uses or odor sources. However, certain odors may emanate from construction operations if diesel-powered construction equipment during the construction period for the project. These odors would be limited to the construction period and would disperse quickly; therefore, these odors would not be considered a significant impact.

The project is a residential development that would not include land uses with sources that have the potential to generate substantial odors and impacts associated with odors during operation would be less than significant.

Impact AQ-5 Would the project generate GHG emissions, either directly or indirectly, that may have an adverse effect on the environment?

Beneficial Impact. The Project-related direct and indirect emissions of GHGs were estimated using the similar methods for quantification of criteria air pollutants. The estimated emissions are summarized in Table 12. Detailed assumptions and calculations, as well as CalEEMod outputs are provided in Appendix A of this report. Total GHG emissions from all phases of construction activities were amortized over the estimated 30-year life of the project and added to the annual operational emissions of GHGs.

Table 12: Greenhouse Gas Emissions Summary

Emissions Source	GHG Emissions (Metric Tons CO2e/year)
Construction Equipment & Vehicle Emissions	248.72
Operations Emissions	15.52
Construction Emissions – Amortized [1]	8.3
Operational Emissions – Facility site [2]	15.52
Total	23.8
Significance Threshold [3]	3,000
Threshold Exceeded?	No

1. Total construction emissions amortized over project life of 30 years.
2. Includes direct and indirect emissions of project site operations.
3. The SCAQMD interim threshold for GHG emissions, 3,000 MT/year for commercial projects, is used. Calculations, assumptions and model outputs are provided in Appendix A

As Table 12 shows, the proposed Project's annual indirect GHG emissions from the displacement of fossil fuel fired electricity generation is significantly higher than the Project's annualized direct and indirect emissions sources, as such, the overall effect of the proposed Project is to reduce GHG emissions. Therefore, the proposed project would have a beneficial GHG emissions impact.

Impact AQ-6 Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

Less Than Significant Impact. Currently, there are no federal, State, or local climate change or GHG emissions regulations that address the GHG emissions Project construction. The project operation will, there are a number of federal, State, and local plans and policies, and GHG emissions reduction strategies that are potentially applicable to the proposed project, either directly or indirectly. The project operation is consistent with the following:

- The Project is consistent with the AB 32 scoping plan strategies to increase the total amount of renewable energy sources consistent with the goal of the State's Renewable Portfolio Standard (RPS).
- The Project is consistent with the CARB's emission reduction strategy presented in the Scoping Plans. The 2008 Scoping Plan specifically addresses critical measures directed at emission sources that are included in the cap-and-trade program that are designed to achieve cost- effective emissions reductions while accelerating the necessary transition to the low-carbon economy.
- The proposed Project implementation will help California meet its Renewable Portfolio Standard (RPS) requirements.

The Project would help promote California's GHG policies by creating renewable energy resources and would not exceed applicable GHG screening levels. Therefore, the proposed Project would not conflict with an applicable plan, policy, or regulation adopted to reduce GHG emissions. Moreover, Projects that are consistent with applicable plan, policy, or regulation adopted to reduce GHG emissions are considered less than significant during construction and operation.

6.1 Mitigation Measures

The proposed Project would not generate short- or long-term emissions of regulated air pollutants, TACs, or GHG in amounts that exceed SCAQMD-recommended thresholds of significance. No mitigation is required for the proposed Project; however, the proposed Project would implement best management practices to reduce diesel engine idling and fugitive dust. These practices are consistent with the City's General Plan requirements and are described in Section 3.1.4.

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APPENDIX A

CalEEMod Results

Air Pollutant & GHG Emission Calculations

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Norumbega Drive Residence Project

Los Angeles-South Coast County, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	1.00	Dwelling Unit	1.30	5,106.00	6

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The 2-story residence would be 3,758 square feet of livable space. As well, a 4-car garage on the lowest level would be an additional 1,348 square feet. The lot is 56,410 square feet (1.295 acres).

Construction Phase - Demolion - None
Site Prep - 1 week
Grading - 4 weeks
Building Construc.- 52 weeks
Paving - 13 weeks
Arch. Coating - 1 week

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Grading - Grading phase assumes approx. 35 total passes over the 1.3 acre lot
576 cubic yards of cut and 266 cubic yards of fill. Approximately 252 cubic yards of soil would be exported from the site

Trips and VMT - 16 one way worker trips per day maximum
4 one way vendor trips per day maximum
52 one way haul truck trips per grading phase

Land Use Change -

Woodstoves - No woodstoves or fireplaces

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	6.00
tblConstructionPhase	NumDays	200.00	314.00
tblConstructionPhase	NumDays	4.00	24.00
tblConstructionPhase	NumDays	10.00	80.00
tblConstructionPhase	NumDays	2.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	8/29/2022	1/20/2023
tblConstructionPhase	PhaseEndDate	8/1/2022	10/25/2022
tblConstructionPhase	PhaseEndDate	10/25/2021	10/24/2021
tblConstructionPhase	PhaseEndDate	8/15/2022	1/12/2023
tblConstructionPhase	PhaseEndDate	10/19/2021	9/26/2021
tblConstructionPhase	PhaseStartDate	8/16/2022	1/13/2023
tblConstructionPhase	PhaseStartDate	10/26/2021	10/25/2021
tblConstructionPhase	PhaseStartDate	10/20/2021	9/27/2021
tblConstructionPhase	PhaseStartDate	8/2/2022	10/12/2022
tblConstructionPhase	PhaseStartDate	10/16/2021	9/20/2021

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	0.05	0.00
tblGrading	AcresOfGrading	36.00	46.00
tblGrading	MaterialExported	0.00	252.00
tblLandUse	LandUseSquareFeet	1,800.00	5,106.00
tblLandUse	LotAcreage	0.32	1.30
tblLandUse	Population	3.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	32.00	52.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	10.00	16.00
tblTripsAndVMT	WorkerTripNumber	13.00	16.00

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00

2.0 Emissions Summary

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					
2021	2.4123	27.3029	12.9551	0.0319	8.2983	1.1409	9.4392	3.5951	1.0499	4.6450	0.0000	3,121.2388	3,121.2388	0.8932	0.0409	3,155.7443
2022	1.3201	11.3175	11.5660	0.0232	0.4089	0.5177	0.9266	0.1096	0.4827	0.5923	0.0000	2,220.4228	2,220.4228	0.5180	0.0323	2,242.9888
2023	5.6366	3.9759	6.0605	0.0109	0.2045	0.1805	0.3850	0.0548	0.1673	0.2221	0.0000	1,047.4352	1,047.4352	0.2567	0.0152	1,058.3861
Maximum	**5.6366**	**27.3029**	**12.9551**	**0.0319**	**8.2983**	**1.1409**	**9.4392**	**3.5951**	**1.0499**	**4.6450**	**0.0000**	**3,121.2388**	**3,121.2388**	**0.8932**	**0.0409**	**3,155.7443**

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					
2021	2.4123	27.3029	12.9551	0.0319	3.8675	1.1409	5.0084	1.6537	1.0499	2.7036	0.0000	3,121.2388	3,121.2388	0.8932	0.0409	3,155.7443
2022	1.3201	11.3175	11.5660	0.0232	0.4089	0.5177	0.9266	0.1096	0.4827	0.5923	0.0000	2,220.4228	2,220.4228	0.5180	0.0323	2,242.9888
2023	5.6366	3.9759	6.0605	0.0109	0.2045	0.1805	0.3850	0.0548	0.1673	0.2221	0.0000	1,047.4352	1,047.4352	0.2567	0.0152	1,058.3861
Maximum	**5.6366**	**27.3029**	**12.9551**	**0.0319**	**3.8675**	**1.1409**	**5.0084**	**1.6537**	**1.0499**	**2.7036**	**0.0000**	**3,121.2388**	**3,121.2388**	**0.8932**	**0.0409**	**3,155.7443**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	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	49.72	0.00	41.21	51.64	0.00	35.56	0.00	0.00	0.00	0.00	0.00	0.00

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.7887	0.1150	6.2161	0.0201		1.0012	1.0012		1.0012	1.0012	147.5410	18.1486	165.6895	0.6902	3.3000e-004	183.0432
Energy	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
Mobile	0.0296	0.0308	0.3075	6.7000e-004	0.0686	4.8000e-004	0.0691	0.0183	4.5000e-004	0.0187		68.7367	68.7367	4.4600e-003	2.7700e-003	69.6726
Total	**0.8191**	**0.1523**	**6.5263**	**0.0208**	**0.0686**	**1.0022**	**1.0708**	**0.0183**	**1.0022**	**1.0205**	**147.5410**	**95.1019**	**242.6429**	**0.6948**	**3.2500e-003**	**260.9812**

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	0.7887	0.1150	6.2161	0.0201		1.0012	1.0012		1.0012	1.0012	147.5410	18.1486	165.6895	0.6902	3.3000e-004	183.0432
Energy	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
Mobile	0.0296	0.0308	0.3075	6.7000e-004	0.0686	4.8000e-004	0.0691	0.0183	4.5000e-004	0.0187		68.7367	68.7367	4.4600e-003	2.7700e-003	69.6726
Total	**0.8191**	**0.1523**	**6.5263**	**0.0208**	**0.0686**	**1.0022**	**1.0708**	**0.0183**	**1.0022**	**1.0205**	**147.5410**	**95.1019**	**242.6429**	**0.6948**	**3.2500e-003**	**260.9812**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	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	9/20/2021	9/26/2021	6	6	
2	Grading	Grading	9/27/2021	10/24/2021	6	24	
3	Building Construction	Building Construction	10/25/2021	10/25/2022	6	314	
4	Paving	Paving	10/12/2022	1/12/2023	6	80	
5	Architectural Coating	Architectural Coating	1/13/2023	1/20/2023	6	6	

Acres of Grading (Site Preparation Phase): 9

Acres of Grading (Grading Phase): 46

Acres of Paving: 0

Residential Indoor: 10,340; Residential Outdoor: 3,447; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Grading	Graders	2	8.00	187	0.41

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Site Preparation	Graders	2	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	0	8.00	132	0.36
Paving	Rollers	0	7.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	4	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	16.00	4.00	52.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2021

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					7.6128	0.0000	7.6128	3.4820	0.0000	3.4820			0.0000			0.0000
Off-Road	2.1396	24.7162	9.8324	0.0249		1.0196	1.0196		0.9381	0.9381		2,411.6205	2,411.6205	0.7800		2,431.1197
Total	**2.1396**	**24.7162**	**9.8324**	**0.0249**	**7.6128**	**1.0196**	**8.6325**	**3.4820**	**0.9381**	**4.4200**		**2,411.6205**	**2,411.6205**	**0.7800**		**2,431.1197**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0111	0.2310	0.0772	8.1000e-004	0.0256	3.4600e-003	0.0291	7.3800e-003	3.3100e-003	0.0107		86.4964	86.4964	2.9400e-003	0.0125	90.2847
Worker	0.0601	0.0460	0.6898	1.6900e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		170.6951	170.6951	5.0400e-003	4.3600e-003	172.1216
Total	**0.0712**	**0.2770**	**0.7670**	**2.5000e-003**	**0.2045**	**4.6900e-003**	**0.2092**	**0.0548**	**4.4400e-003**	**0.0592**		**257.1916**	**257.1916**	**7.9800e-003**	**0.0168**	**262.4063**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.4258	0.0000	3.4258	1.5669	0.0000	1.5669			0.0000			0.0000
Off-Road	2.1396	24.7162	9.8324	0.0249		1.0196	1.0196		0.9381	0.9381	0.0000	2,411.6205	2,411.6205	0.7800		2,431.1197
Total	**2.1396**	**24.7162**	**9.8324**	**0.0249**	**3.4258**	**1.0196**	**4.4454**	**1.5669**	**0.9381**	**2.5050**	**0.0000**	**2,411.6205**	**2,411.6205**	**0.7800**		**2,431.1197**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0111	0.2310	0.0772	8.1000e-004	0.0256	3.4600e-003	0.0291	7.3800e-003	3.3100e-003	0.0107		86.4964	86.4964	2.9400e-003	0.0125	90.2847
Worker	0.0601	0.0460	0.6898	1.6900e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		170.6951	170.6951	5.0400e-003	4.3600e-003	172.1216
Total	**0.0712**	**0.2770**	**0.7670**	**2.5000e-003**	**0.2045**	**4.6900e-003**	**0.2092**	**0.0548**	**4.4400e-003**	**0.0592**		**257.1916**	**257.1916**	**7.9800e-003**	**0.0168**	**262.4063**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.0559	0.0000	8.0559	3.5299	0.0000	3.5299			0.0000			0.0000
Off-Road	2.3269	26.6121	12.0926	0.0280		1.1314	1.1314		1.0409	1.0409		2,712.5206	2,712.5206	0.8773		2,734.4527
Total	**2.3269**	**26.6121**	**12.0926**	**0.0280**	**8.0559**	**1.1314**	**9.1873**	**3.5299**	**1.0409**	**4.5708**		**2,712.5206**	**2,712.5206**	**0.8773**		**2,734.4527**

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	0.0143	0.4139	0.0955	1.3900e-003	0.0379	4.8000e-003	0.0427	0.0104	4.5900e-003	0.0150		151.5267	151.5267	7.9300e-003	0.0240	158.8854
Vendor	0.0111	0.2310	0.0772	8.1000e-004	0.0256	3.4600e-003	0.0291	7.3800e-003	3.3100e-003	0.0107		86.4964	86.4964	2.9400e-003	0.0125	90.2847
Worker	0.0601	0.0460	0.6898	1.6900e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		170.6951	170.6951	5.0400e-003	4.3600e-003	172.1216
Total	**0.0855**	**0.6909**	**0.8625**	**3.8900e-003**	**0.2424**	**9.4900e-003**	**0.2519**	**0.0652**	**9.0300e-003**	**0.0742**		**408.7182**	**408.7182**	**0.0159**	**0.0409**	**421.2916**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6252	0.0000	3.6252	1.5885	0.0000	1.5885			0.0000			0.0000
Off-Road	2.3269	26.6121	12.0926	0.0280		1.1314	1.1314		1.0409	1.0409	0.0000	2,712.5206	2,712.5206	0.8773		2,734.4527
Total	**2.3269**	**26.6121**	**12.0926**	**0.0280**	**3.6252**	**1.1314**	**4.7565**	**1.5885**	**1.0409**	**2.6293**	**0.0000**	**2,712.5206**	**2,712.5206**	**0.8773**		**2,734.4527**

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	0.0143	0.4139	0.0955	1.3900e-003	0.0379	4.8000e-003	0.0427	0.0104	4.5900e-003	0.0150		151.5267	151.5267	7.9300e-003	0.0240	158.8854
Vendor	0.0111	0.2310	0.0772	8.1000e-004	0.0256	3.4600e-003	0.0291	7.3800e-003	3.3100e-003	0.0107		86.4964	86.4964	2.9400e-003	0.0125	90.2847
Worker	0.0601	0.0460	0.6898	1.6900e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		170.6951	170.6951	5.0400e-003	4.3600e-003	172.1216
Total	**0.0855**	**0.6909**	**0.8625**	**3.8900e-003**	**0.2424**	**9.4900e-003**	**0.2519**	**0.0652**	**9.0300e-003**	**0.0742**		**408.7182**	**408.7182**	**0.0159**	**0.0409**	**421.2916**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8449	7.5374	4.8695	9.8500e-003		0.3547	0.3547		0.3323	0.3323		914.2473	914.2473	0.2556		920.6373
Total	**0.8449**	**7.5374**	**4.8695**	**9.8500e-003**		**0.3547**	**0.3547**		**0.3323**	**0.3323**		**914.2473**	**914.2473**	**0.2556**		**920.6373**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0111	0.2310	0.0772	8.1000e-004	0.0256	3.4600e-003	0.0291	7.3800e-003	3.3100e-003	0.0107		86.4964	86.4964	2.9400e-003	0.0125	90.2847
Worker	0.0601	0.0460	0.6898	1.6900e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		170.6951	170.6951	5.0400e-003	4.3600e-003	172.1216
Total	**0.0712**	**0.2770**	**0.7670**	**2.5000e-003**	**0.2045**	**4.6900e-003**	**0.2092**	**0.0548**	**4.4400e-003**	**0.0592**		**257.1916**	**257.1916**	**7.9800e-003**	**0.0168**	**262.4063**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8449	7.5374	4.8695	9.8500e-003		0.3547	0.3547		0.3323	0.3323	0.0000	914.2473	914.2473	0.2556		920.6373
Total	**0.8449**	**7.5374**	**4.8695**	**9.8500e-003**		**0.3547**	**0.3547**		**0.3323**	**0.3323**	**0.0000**	**914.2473**	**914.2473**	**0.2556**		**920.6373**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0111	0.2310	0.0772	8.1000e-004	0.0256	3.4600e-003	0.0291	7.3800e-003	3.3100e-003	0.0107		86.4964	86.4964	2.9400e-003	0.0125	90.2847
Worker	0.0601	0.0460	0.6898	1.6900e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		170.6951	170.6951	5.0400e-003	4.3600e-003	172.1216
Total	**0.0712**	**0.2770**	**0.7670**	**2.5000e-003**	**0.2045**	**4.6900e-003**	**0.2092**	**0.0548**	**4.4400e-003**	**0.0592**		**257.1916**	**257.1916**	**7.9800e-003**	**0.0168**	**262.4063**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7633	6.7021	4.7419	9.8500e-003		0.3075	0.3075		0.2880	0.2880		914.3389	914.3389	0.2534		920.6749
Total	**0.7633**	**6.7021**	**4.7419**	**9.8500e-003**		**0.3075**	**0.3075**		**0.2880**	**0.2880**		**914.3389**	**914.3389**	**0.2534**		**920.6749**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.8700e-003	0.1959	0.0672	7.8000e-004	0.0256	1.8700e-003	0.0275	7.3800e-003	1.7900e-003	9.1600e-003		84.1846	84.1846	2.8100e-003	0.0121	87.8701
Worker	0.0554	0.0404	0.6297	1.6400e-003	0.1788	1.1400e-003	0.1800	0.0474	1.0500e-003	0.0485		165.3507	165.3507	4.5000e-003	4.0000e-003	166.6564
Total	**0.0632**	**0.2364**	**0.6969**	**2.4200e-003**	**0.2045**	**3.0100e-003**	**0.2075**	**0.0548**	**2.8400e-003**	**0.0576**		**249.5354**	**249.5354**	**7.3100e-003**	**0.0161**	**254.5265**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7633	6.7021	4.7419	9.8500e-003		0.3075	0.3075		0.2880	0.2880	0.0000	914.3389	914.3389	0.2534		920.6749
Total	**0.7633**	**6.7021**	**4.7419**	**9.8500e-003**		**0.3075**	**0.3075**		**0.2880**	**0.2880**	**0.0000**	**914.3389**	**914.3389**	**0.2534**		**920.6749**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.8700e-003	0.1959	0.0672	7.8000e-004	0.0256	1.8700e-003	0.0275	7.3800e-003	1.7900e-003	9.1600e-003		84.1846	84.1846	2.8100e-003	0.0121	87.8701
Worker	0.0554	0.0404	0.6297	1.6400e-003	0.1788	1.1400e-003	0.1800	0.0474	1.0500e-003	0.0485		165.3507	165.3507	4.5000e-003	4.0000e-003	166.6564
Total	**0.0632**	**0.2364**	**0.6969**	**2.4200e-003**	**0.2045**	**3.0100e-003**	**0.2075**	**0.0548**	**2.8400e-003**	**0.0576**		**249.5354**	**249.5354**	**7.3100e-003**	**0.0161**	**254.5265**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4304	4.1427	5.4303	8.5300e-003		0.2042	0.2042		0.1890	0.1890		807.0132	807.0132	0.2499		813.2610
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4304**	**4.1427**	**5.4303**	**8.5300e-003**		**0.2042**	**0.2042**		**0.1890**	**0.1890**		**807.0132**	**807.0132**	**0.2499**		**813.2610**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.8700e-003	0.1959	0.0672	7.8000e-004	0.0256	1.8700e-003	0.0275	7.3800e-003	1.7900e-003	9.1600e-003		84.1846	84.1846	2.8100e-003	0.0121	87.8701
Worker	0.0554	0.0404	0.6297	1.6400e-003	0.1788	1.1400e-003	0.1800	0.0474	1.0500e-003	0.0485		165.3507	165.3507	4.5000e-003	4.0000e-003	166.6564
Total	**0.0632**	**0.2364**	**0.6969**	**2.4200e-003**	**0.2045**	**3.0100e-003**	**0.2075**	**0.0548**	**2.8400e-003**	**0.0576**		**249.5354**	**249.5354**	**7.3100e-003**	**0.0161**	**254.5265**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4304	4.1427	5.4303	8.5300e-003		0.2042	0.2042		0.1890	0.1890	0.0000	807.0132	807.0132	0.2499		813.2610
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4304**	**4.1427**	**5.4303**	**8.5300e-003**		**0.2042**	**0.2042**		**0.1890**	**0.1890**	**0.0000**	**807.0132**	**807.0132**	**0.2499**		**813.2610**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.8700e-003	0.1959	0.0672	7.8000e-004	0.0256	1.8700e-003	0.0275	7.3800e-003	1.7900e-003	9.1600e-003		84.1846	84.1846	2.8100e-003	0.0121	87.8701
Worker	0.0554	0.0404	0.6297	1.6400e-003	0.1788	1.1400e-003	0.1800	0.0474	1.0500e-003	0.0485		165.3507	165.3507	4.5000e-003	4.0000e-003	166.6564
Total	**0.0632**	**0.2364**	**0.6969**	**2.4200e-003**	**0.2045**	**3.0100e-003**	**0.2075**	**0.0548**	**2.8400e-003**	**0.0576**		**249.5354**	**249.5354**	**7.3100e-003**	**0.0161**	**254.5265**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4021	3.7867	5.4228	8.5300e-003		0.1787	0.1787		0.1655	0.1655		807.3102	807.3102	0.2500		813.5603
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4021**	**3.7867**	**5.4228**	**8.5300e-003**		**0.1787**	**0.1787**		**0.1655**	**0.1655**		**807.3102**	**807.3102**	**0.2500**		**813.5603**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6100e-003	0.1535	0.0595	7.4000e-004	0.0256	7.7000e-004	0.0264	7.3800e-003	7.4000e-004	8.1200e-003		80.1130	80.1130	2.6800e-003	0.0115	83.6124
Worker	0.0512	0.0357	0.5782	1.5800e-003	0.1788	1.0800e-003	0.1799	0.0474	9.9000e-004	0.0484		160.0121	160.0121	4.0300e-003	3.6900e-003	161.2134
Total	**0.0558**	**0.1892**	**0.6377**	**2.3200e-003**	**0.2045**	**1.8500e-003**	**0.2063**	**0.0548**	**1.7300e-003**	**0.0565**		**240.1251**	**240.1251**	**6.7100e-003**	**0.0152**	**244.8258**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4021	3.7867	5.4228	8.5300e-003		0.1787	0.1787		0.1655	0.1655	0.0000	807.3102	807.3102	0.2500		813.5603
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4021**	**3.7867**	**5.4228**	**8.5300e-003**		**0.1787**	**0.1787**		**0.1655**	**0.1655**	**0.0000**	**807.3102**	**807.3102**	**0.2500**		**813.5603**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6100e-003	0.1535	0.0595	7.4000e-004	0.0256	7.7000e-004	0.0264	7.3800e-003	7.4000e-004	8.1200e-003		80.1130	80.1130	2.6800e-003	0.0115	83.6124
Worker	0.0512	0.0357	0.5782	1.5800e-003	0.1788	1.0800e-003	0.1799	0.0474	9.9000e-004	0.0484		160.0121	160.0121	4.0300e-003	3.6900e-003	161.2134
Total	**0.0558**	**0.1892**	**0.6377**	**2.3200e-003**	**0.2045**	**1.8500e-003**	**0.2063**	**0.0548**	**1.7300e-003**	**0.0565**		**240.1251**	**240.1251**	**6.7100e-003**	**0.0152**	**244.8258**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Architectural Coating - 2023

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	5.3252					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2556	1.7373	2.4148	3.9600e-003		0.0944	0.0944		0.0944	0.0944		375.2641	375.2641	0.0225		375.8253
Total	**5.5808**	**1.7373**	**2.4148**	**3.9600e-003**		**0.0944**	**0.0944**		**0.0944**	**0.0944**		**375.2641**	**375.2641**	**0.0225**		**375.8253**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6100e-003	0.1535	0.0595	7.4000e-004	0.0256	7.7000e-004	0.0264	7.3800e-003	7.4000e-004	8.1200e-003		80.1130	80.1130	2.6800e-003	0.0115	83.6124
Worker	0.0512	0.0357	0.5782	1.5800e-003	0.1788	1.0800e-003	0.1799	0.0474	9.9000e-004	0.0484		160.0121	160.0121	4.0300e-003	3.6900e-003	161.2134
Total	**0.0558**	**0.1892**	**0.6377**	**2.3200e-003**	**0.2045**	**1.8500e-003**	**0.2063**	**0.0548**	**1.7300e-003**	**0.0565**		**240.1251**	**240.1251**	**6.7100e-003**	**0.0152**	**244.8258**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Architectural Coating - 2023

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	5.3252					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2556	1.7373	2.4148	3.9600e-003		0.0944	0.0944		0.0944	0.0944	0.0000	375.2641	375.2641	0.0225		375.8253
Total	**5.5808**	**1.7373**	**2.4148**	**3.9600e-003**		**0.0944**	**0.0944**		**0.0944**	**0.0944**	**0.0000**	**375.2641**	**375.2641**	**0.0225**		**375.8253**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.6100e-003	0.1535	0.0595	7.4000e-004	0.0256	7.7000e-004	0.0264	7.3800e-003	7.4000e-004	8.1200e-003		80.1130	80.1130	2.6800e-003	0.0115	83.6124
Worker	0.0512	0.0357	0.5782	1.5800e-003	0.1788	1.0800e-003	0.1799	0.0474	9.9000e-004	0.0484		160.0121	160.0121	4.0300e-003	3.6900e-003	161.2134
Total	**0.0558**	**0.1892**	**0.6377**	**2.3200e-003**	**0.2045**	**1.8500e-003**	**0.2063**	**0.0548**	**1.7300e-003**	**0.0565**		**240.1251**	**240.1251**	**6.7100e-003**	**0.0152**	**244.8258**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.0296	0.0308	0.3075	6.7000e-004	0.0686	4.8000e-004	0.0691	0.0183	4.5000e-004	0.0187		68.7367	68.7367	4.4600e-003	2.7700e-003	69.6726
Unmitigated	0.0296	0.0308	0.3075	6.7000e-004	0.0686	4.8000e-004	0.0691	0.0183	4.5000e-004	0.0187		68.7367	68.7367	4.4600e-003	2.7700e-003	69.6726

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	9.44	9.54	8.55	31,872	31,872
Total	9.44	9.54	8.55	31,872	31,872

4.3 Trip Type Information

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

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.544785	0.062844	0.187478	0.127235	0.023089	0.006083	0.010475	0.008012	0.000925	0.000611	0.024394	0.000698	0.003374

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
NaturalGas Unmitigated	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	69.8413	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
Total		**7.5000e-004**	**6.4400e-003**	**2.7400e-003**	**4.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**		**8.2166**	**8.2166**	**1.6000e-004**	**1.5000e-004**	**8.2655**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0.0698413	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
Total		**7.5000e-004**	**6.4400e-003**	**2.7400e-003**	**4.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**		**8.2166**	**8.2166**	**1.6000e-004**	**1.5000e-004**	**8.2655**

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	0.7887	0.1150	6.2161	0.0201		1.0012	1.0012		1.0012	1.0012	147.5410	18.1486	165.6895	0.6902	3.3000e-004	183.0432
Unmitigated	0.7887	0.1150	6.2161	0.0201		1.0012	1.0012		1.0012	1.0012	147.5410	18.1486	165.6895	0.6902	3.3000e-004	183.0432

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	8.7500e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1011					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.6764	0.1141	6.1336	0.0201		1.0007	1.0007		1.0007	1.0007	147.5410	18.0000	165.5410	0.6901	3.3000e-004	182.8910
Landscaping	2.4900e-003	9.5000e-004	0.0825	0.0000		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004		0.1486	0.1486	1.4000e-004		0.1521
Total	**0.7887**	**0.1150**	**6.2161**	**0.0201**		**1.0012**	**1.0012**		**1.0012**	**1.0012**	**147.5410**	**18.1486**	**165.6895**	**0.6902**	**3.3000e-004**	**183.0431**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	8.7500e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1011					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.6764	0.1141	6.1336	0.0201		1.0007	1.0007		1.0007	1.0007	147.5410	18.0000	165.5410	0.6901	3.3000e-004	182.8910
Landscaping	2.4900e-003	9.5000e-004	0.0825	0.0000		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004		0.1486	0.1486	1.4000e-004		0.1521
Total	**0.7887**	**0.1150**	**6.2161**	**0.0201**		**1.0012**	**1.0012**		**1.0012**	**1.0012**	**147.5410**	**18.1486**	**165.6895**	**0.6902**	**3.3000e-004**	**183.0431**

7.0 Water Detail

7.1 Mitigation Measures Water

Norumbega Drive Residence Project - Los Angeles-South Coast County, Summer

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Norumbega Drive Residence Project

Los Angeles-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	1.00	Dwelling Unit	1.30	5,106.00	6

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The 2-story residence would be 3,758 square feet of livable space. As well, a 4-car garage on the lowest level would be an additional 1,348 square feet. The lot is 56,410 square feet (1.295 acres).

Construction Phase - Demolion - None
Site Prep - 1 week
Grading - 4 weeks
Building Construc.- 52 weeks
Paving - 13 weeks
Arch. Coating - 1 week

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Grading - Grading phase assumes approx. 35 total passes over the 1.3 acre lot
576 cubic yards of cut and 266 cubic yards of fill. Approximately 252 cubic yards of soil would be exported from the site

Trips and VMT - 16 one way worker trips per day maximum
4 one way vendor trips per day maximum
52 one way haul truck trips per grading phase

Land Use Change -

Woodstoves - No woodstoves or fireplaces

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	6.00
tblConstructionPhase	NumDays	200.00	314.00
tblConstructionPhase	NumDays	4.00	24.00
tblConstructionPhase	NumDays	10.00	80.00
tblConstructionPhase	NumDays	2.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	8/29/2022	1/20/2023
tblConstructionPhase	PhaseEndDate	8/1/2022	10/25/2022
tblConstructionPhase	PhaseEndDate	10/25/2021	10/24/2021
tblConstructionPhase	PhaseEndDate	8/15/2022	1/12/2023
tblConstructionPhase	PhaseEndDate	10/19/2021	9/26/2021
tblConstructionPhase	PhaseStartDate	8/16/2022	1/13/2023
tblConstructionPhase	PhaseStartDate	10/26/2021	10/25/2021
tblConstructionPhase	PhaseStartDate	10/20/2021	9/27/2021
tblConstructionPhase	PhaseStartDate	8/2/2022	10/12/2022
tblConstructionPhase	PhaseStartDate	10/16/2021	9/20/2021

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	0.05	0.00
tblGrading	AcresOfGrading	36.00	46.00
tblGrading	MaterialExported	0.00	252.00
tblLandUse	LandUseSquareFeet	1,800.00	5,106.00
tblLandUse	LotAcreage	0.32	1.30
tblLandUse	Population	3.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	32.00	52.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	10.00	16.00
tblTripsAndVMT	WorkerTripNumber	13.00	16.00

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00

2.0 Emissions Summary

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					
2021	2.4160	27.3333	12.9020	0.0318	8.2983	1.1409	9.4392	3.5951	1.0499	4.6450	0.0000	3,112.2049	3,112.2049	0.8932	0.0412	3,146.8057
2022	1.3278	11.3421	11.4676	0.0230	0.4089	0.5177	0.9266	0.1096	0.4827	0.5923	0.0000	2,203.0017	2,203.0017	0.5181	0.0329	2,225.7428
2023	5.6402	3.9868	6.0157	0.0108	0.2045	0.1805	0.3850	0.0548	0.1673	0.2221	0.0000	1,039.1349	1,039.1349	0.2568	0.0155	1,050.1710
Maximum	**5.6402**	**27.3333**	**12.9020**	**0.0318**	**8.2983**	**1.1409**	**9.4392**	**3.5951**	**1.0499**	**4.6450**	**0.0000**	**3,112.2049**	**3,112.2049**	**0.8932**	**0.0412**	**3,146.8057**

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					
2021	2.4160	27.3333	12.9020	0.0318	3.8675	1.1409	5.0084	1.6537	1.0499	2.7036	0.0000	3,112.2049	3,112.2049	0.8932	0.0412	3,146.8057
2022	1.3278	11.3421	11.4676	0.0230	0.4089	0.5177	0.9266	0.1096	0.4827	0.5923	0.0000	2,203.0017	2,203.0017	0.5181	0.0329	2,225.7428
2023	5.6402	3.9868	6.0157	0.0108	0.2045	0.1805	0.3850	0.0548	0.1673	0.2221	0.0000	1,039.1349	1,039.1349	0.2568	0.0155	1,050.1710
Maximum	**5.6402**	**27.3333**	**12.9020**	**0.0318**	**3.8675**	**1.1409**	**5.0084**	**1.6537**	**1.0499**	**2.7036**	**0.0000**	**3,112.2049**	**3,112.2049**	**0.8932**	**0.0412**	**3,146.8057**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	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	49.72	0.00	41.21	51.64	0.00	35.56	0.00	0.00	0.00	0.00	0.00	0.00

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.7887	0.1150	6.2161	0.0201		1.0012	1.0012		1.0012	1.0012	147.5410	18.1486	165.6895	0.6902	3.3000e-004	183.0432
Energy	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
Mobile	0.0291	0.0333	0.2999	6.5000e-004	0.0686	4.8000e-004	0.0691	0.0183	4.5000e-004	0.0187		65.8043	65.8043	4.5900e-003	2.8900e-003	66.7804
Total	**0.8186**	**0.1548**	**6.5187**	**0.0208**	**0.0686**	**1.0022**	**1.0708**	**0.0183**	**1.0022**	**1.0205**	**147.5410**	**92.1694**	**239.7104**	**0.6950**	**3.3700e-003**	**258.0890**

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	0.7887	0.1150	6.2161	0.0201		1.0012	1.0012		1.0012	1.0012	147.5410	18.1486	165.6895	0.6902	3.3000e-004	183.0432
Energy	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
Mobile	0.0291	0.0333	0.2999	6.5000e-004	0.0686	4.8000e-004	0.0691	0.0183	4.5000e-004	0.0187		65.8043	65.8043	4.5900e-003	2.8900e-003	66.7804
Total	**0.8186**	**0.1548**	**6.5187**	**0.0208**	**0.0686**	**1.0022**	**1.0708**	**0.0183**	**1.0022**	**1.0205**	**147.5410**	**92.1694**	**239.7104**	**0.6950**	**3.3700e-003**	**258.0890**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	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	9/20/2021	9/26/2021	6	6	
2	Grading	Grading	9/27/2021	10/24/2021	6	24	
3	Building Construction	Building Construction	10/25/2021	10/25/2022	6	314	
4	Paving	Paving	10/12/2022	1/12/2023	6	80	
5	Architectural Coating	Architectural Coating	1/13/2023	1/20/2023	6	6	

Acres of Grading (Site Preparation Phase): 9

Acres of Grading (Grading Phase): 46

Acres of Paving: 0

Residential Indoor: 10,340; Residential Outdoor: 3,447; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Grading	Graders	2	8.00	187	0.41

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Site Preparation	Graders	2	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	0	8.00	132	0.36
Paving	Rollers	0	7.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	4	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	16.00	4.00	52.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2021

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					7.6128	0.0000	7.6128	3.4820	0.0000	3.4820			0.0000			0.0000
Off-Road	2.1396	24.7162	9.8324	0.0249		1.0196	1.0196		0.9381	0.9381		2,411.6205	2,411.6205	0.7800		2,431.1197
Total	**2.1396**	**24.7162**	**9.8324**	**0.0249**	**7.6128**	**1.0196**	**8.6325**	**3.4820**	**0.9381**	**4.4200**		**2,411.6205**	**2,411.6205**	**0.7800**		**2,431.1197**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0110	0.2401	0.0797	8.1000e-004	0.0256	3.4700e-003	0.0291	7.3800e-003	3.3200e-003	0.0107		86.4987	86.4987	2.9300e-003	0.0125	90.2905
Worker	0.0641	0.0508	0.6326	1.6000e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		161.6421	161.6421	5.0900e-003	4.6600e-003	163.1595
Total	**0.0751**	**0.2910**	**0.7122**	**2.4100e-003**	**0.2045**	**4.7000e-003**	**0.2092**	**0.0548**	**4.4500e-003**	**0.0593**		**248.1408**	**248.1408**	**8.0200e-003**	**0.0171**	**253.4500**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.4258	0.0000	3.4258	1.5669	0.0000	1.5669			0.0000			0.0000
Off-Road	2.1396	24.7162	9.8324	0.0249		1.0196	1.0196		0.9381	0.9381	0.0000	2,411.6205	2,411.6205	0.7800		2,431.1197
Total	**2.1396**	**24.7162**	**9.8324**	**0.0249**	**3.4258**	**1.0196**	**4.4454**	**1.5669**	**0.9381**	**2.5050**	**0.0000**	**2,411.6205**	**2,411.6205**	**0.7800**		**2,431.1197**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0110	0.2401	0.0797	8.1000e-004	0.0256	3.4700e-003	0.0291	7.3800e-003	3.3200e-003	0.0107		86.4987	86.4987	2.9300e-003	0.0125	90.2905
Worker	0.0641	0.0508	0.6326	1.6000e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		161.6421	161.6421	5.0900e-003	4.6600e-003	163.1595
Total	**0.0751**	**0.2910**	**0.7122**	**2.4100e-003**	**0.2045**	**4.7000e-003**	**0.2092**	**0.0548**	**4.4500e-003**	**0.0593**		**248.1408**	**248.1408**	**8.0200e-003**	**0.0171**	**253.4500**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.0559	0.0000	8.0559	3.5299	0.0000	3.5299			0.0000			0.0000
Off-Road	2.3269	26.6121	12.0926	0.0280		1.1314	1.1314		1.0409	1.0409		2,712.5206	2,712.5206	0.8773		2,734.4527
Total	**2.3269**	**26.6121**	**12.0926**	**0.0280**	**8.0559**	**1.1314**	**9.1873**	**3.5299**	**1.0409**	**4.5708**		**2,712.5206**	**2,712.5206**	**0.8773**		**2,734.4527**

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	0.0141	0.4303	0.0971	1.3900e-003	0.0379	4.8100e-003	0.0427	0.0104	4.6000e-003	0.0150		151.5436	151.5436	7.9200e-003	0.0240	158.9030
Vendor	0.0110	0.2401	0.0797	8.1000e-004	0.0256	3.4700e-003	0.0291	7.3800e-003	3.3200e-003	0.0107		86.4987	86.4987	2.9300e-003	0.0125	90.2905
Worker	0.0641	0.0508	0.6326	1.6000e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		161.6421	161.6421	5.0900e-003	4.6600e-003	163.1595
Total	**0.0892**	**0.7213**	**0.8093**	**3.8000e-003**	**0.2424**	**9.5100e-003**	**0.2519**	**0.0652**	**9.0500e-003**	**0.0743**		**399.6844**	**399.6844**	**0.0159**	**0.0412**	**412.3530**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.6252	0.0000	3.6252	1.5885	0.0000	1.5885			0.0000			0.0000
Off-Road	2.3269	26.6121	12.0926	0.0280		1.1314	1.1314		1.0409	1.0409	0.0000	2,712.5206	2,712.5206	0.8773		2,734.4527
Total	**2.3269**	**26.6121**	**12.0926**	**0.0280**	**3.6252**	**1.1314**	**4.7565**	**1.5885**	**1.0409**	**2.6293**	**0.0000**	**2,712.5206**	**2,712.5206**	**0.8773**		**2,734.4527**

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	0.0141	0.4303	0.0971	1.3900e-003	0.0379	4.8100e-003	0.0427	0.0104	4.6000e-003	0.0150		151.5436	151.5436	7.9200e-003	0.0240	158.9030
Vendor	0.0110	0.2401	0.0797	8.1000e-004	0.0256	3.4700e-003	0.0291	7.3800e-003	3.3200e-003	0.0107		86.4987	86.4987	2.9300e-003	0.0125	90.2905
Worker	0.0641	0.0508	0.6326	1.6000e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		161.6421	161.6421	5.0900e-003	4.6600e-003	163.1595
Total	**0.0892**	**0.7213**	**0.8093**	**3.8000e-003**	**0.2424**	**9.5100e-003**	**0.2519**	**0.0652**	**9.0500e-003**	**0.0743**		**399.6844**	**399.6844**	**0.0159**	**0.0412**	**412.3530**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8449	7.5374	4.8695	9.8500e-003		0.3547	0.3547		0.3323	0.3323		914.2473	914.2473	0.2556		920.6373
Total	**0.8449**	**7.5374**	**4.8695**	**9.8500e-003**		**0.3547**	**0.3547**		**0.3323**	**0.3323**		**914.2473**	**914.2473**	**0.2556**		**920.6373**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0110	0.2401	0.0797	8.1000e-004	0.0256	3.4700e-003	0.0291	7.3800e-003	3.3200e-003	0.0107		86.4987	86.4987	2.9300e-003	0.0125	90.2905
Worker	0.0641	0.0508	0.6326	1.6000e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		161.6421	161.6421	5.0900e-003	4.6600e-003	163.1595
Total	**0.0751**	**0.2910**	**0.7122**	**2.4100e-003**	**0.2045**	**4.7000e-003**	**0.2092**	**0.0548**	**4.4500e-003**	**0.0593**		**248.1408**	**248.1408**	**8.0200e-003**	**0.0171**	**253.4500**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.8449	7.5374	4.8695	9.8500e-003		0.3547	0.3547		0.3323	0.3323	0.0000	914.2473	914.2473	0.2556		920.6373
Total	**0.8449**	**7.5374**	**4.8695**	**9.8500e-003**		**0.3547**	**0.3547**		**0.3323**	**0.3323**	**0.0000**	**914.2473**	**914.2473**	**0.2556**		**920.6373**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0110	0.2401	0.0797	8.1000e-004	0.0256	3.4700e-003	0.0291	7.3800e-003	3.3200e-003	0.0107		86.4987	86.4987	2.9300e-003	0.0125	90.2905
Worker	0.0641	0.0508	0.6326	1.6000e-003	0.1788	1.2300e-003	0.1801	0.0474	1.1300e-003	0.0486		161.6421	161.6421	5.0900e-003	4.6600e-003	163.1595
Total	**0.0751**	**0.2910**	**0.7122**	**2.4100e-003**	**0.2045**	**4.7000e-003**	**0.2092**	**0.0548**	**4.4500e-003**	**0.0593**		**248.1408**	**248.1408**	**8.0200e-003**	**0.0171**	**253.4500**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7633	6.7021	4.7419	9.8500e-003		0.3075	0.3075		0.2880	0.2880		914.3389	914.3389	0.2534		920.6749
Total	**0.7633**	**6.7021**	**4.7419**	**9.8500e-003**		**0.3075**	**0.3075**		**0.2880**	**0.2880**		**914.3389**	**914.3389**	**0.2534**		**920.6749**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.7800e-003	0.2040	0.0695	7.8000e-004	0.0256	1.8700e-003	0.0275	7.3800e-003	1.7900e-003	9.1700e-003		84.2163	84.2163	2.8000e-003	0.0122	87.9061
Worker	0.0593	0.0447	0.5782	1.5500e-003	0.1788	1.1400e-003	0.1800	0.0474	1.0500e-003	0.0485		156.6085	156.6085	4.5600e-003	4.2800e-003	157.9974
Total	**0.0670**	**0.2487**	**0.6477**	**2.3300e-003**	**0.2045**	**3.0100e-003**	**0.2075**	**0.0548**	**2.8400e-003**	**0.0577**		**240.8248**	**240.8248**	**7.3600e-003**	**0.0164**	**245.9035**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7633	6.7021	4.7419	9.8500e-003		0.3075	0.3075		0.2880	0.2880	0.0000	914.3389	914.3389	0.2534		920.6749
Total	**0.7633**	**6.7021**	**4.7419**	**9.8500e-003**		**0.3075**	**0.3075**		**0.2880**	**0.2880**	**0.0000**	**914.3389**	**914.3389**	**0.2534**		**920.6749**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.7800e-003	0.2040	0.0695	7.8000e-004	0.0256	1.8700e-003	0.0275	7.3800e-003	1.7900e-003	9.1700e-003		84.2163	84.2163	2.8000e-003	0.0122	87.9061
Worker	0.0593	0.0447	0.5782	1.5500e-003	0.1788	1.1400e-003	0.1800	0.0474	1.0500e-003	0.0485		156.6085	156.6085	4.5600e-003	4.2800e-003	157.9974
Total	**0.0670**	**0.2487**	**0.6477**	**2.3300e-003**	**0.2045**	**3.0100e-003**	**0.2075**	**0.0548**	**2.8400e-003**	**0.0577**		**240.8248**	**240.8248**	**7.3600e-003**	**0.0164**	**245.9035**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4304	4.1427	5.4303	8.5300e-003		0.2042	0.2042		0.1890	0.1890		807.0132	807.0132	0.2499		813.2610
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4304**	**4.1427**	**5.4303**	**8.5300e-003**		**0.2042**	**0.2042**		**0.1890**	**0.1890**		**807.0132**	**807.0132**	**0.2499**		**813.2610**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.7800e-003	0.2040	0.0695	7.8000e-004	0.0256	1.8700e-003	0.0275	7.3800e-003	1.7900e-003	9.1700e-003		84.2163	84.2163	2.8000e-003	0.0122	87.9061
Worker	0.0593	0.0447	0.5782	1.5500e-003	0.1788	1.1400e-003	0.1800	0.0474	1.0500e-003	0.0485		156.6085	156.6085	4.5600e-003	4.2800e-003	157.9974
Total	**0.0670**	**0.2487**	**0.6477**	**2.3300e-003**	**0.2045**	**3.0100e-003**	**0.2075**	**0.0548**	**2.8400e-003**	**0.0577**		**240.8248**	**240.8248**	**7.3600e-003**	**0.0164**	**245.9035**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2022

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4304	4.1427	5.4303	8.5300e-003		0.2042	0.2042		0.1890	0.1890	0.0000	807.0132	807.0132	0.2499		813.2610
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4304**	**4.1427**	**5.4303**	**8.5300e-003**		**0.2042**	**0.2042**		**0.1890**	**0.1890**	**0.0000**	**807.0132**	**807.0132**	**0.2499**		**813.2610**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	7.7800e-003	0.2040	0.0695	7.8000e-004	0.0256	1.8700e-003	0.0275	7.3800e-003	1.7900e-003	9.1700e-003		84.2163	84.2163	2.8000e-003	0.0122	87.9061
Worker	0.0593	0.0447	0.5782	1.5500e-003	0.1788	1.1400e-003	0.1800	0.0474	1.0500e-003	0.0485		156.6085	156.6085	4.5600e-003	4.2800e-003	157.9974
Total	**0.0670**	**0.2487**	**0.6477**	**2.3300e-003**	**0.2045**	**3.0100e-003**	**0.2075**	**0.0548**	**2.8400e-003**	**0.0577**		**240.8248**	**240.8248**	**7.3600e-003**	**0.0164**	**245.9035**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4021	3.7867	5.4228	8.5300e-003		0.1787	0.1787		0.1655	0.1655		807.3102	807.3102	0.2500		813.5603
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4021**	**3.7867**	**5.4228**	**8.5300e-003**		**0.1787**	**0.1787**		**0.1655**	**0.1655**		**807.3102**	**807.3102**	**0.2500**		**813.5603**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.4500e-003	0.1608	0.0614	7.5000e-004	0.0256	7.8000e-004	0.0264	7.3800e-003	7.4000e-004	8.1200e-003		80.2481	80.2481	2.6700e-003	0.0116	83.7564
Worker	0.0550	0.0394	0.5315	1.5000e-003	0.1788	1.0800e-003	0.1799	0.0474	9.9000e-004	0.0484		151.5766	151.5766	4.0900e-003	3.9400e-003	152.8542
Total	**0.0595**	**0.2002**	**0.5929**	**2.2500e-003**	**0.2045**	**1.8600e-003**	**0.2063**	**0.0548**	**1.7300e-003**	**0.0565**		**231.8247**	**231.8247**	**6.7600e-003**	**0.0155**	**236.6107**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2023

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.4021	3.7867	5.4228	8.5300e-003		0.1787	0.1787		0.1655	0.1655	0.0000	807.3102	807.3102	0.2500		813.5603
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**0.4021**	**3.7867**	**5.4228**	**8.5300e-003**		**0.1787**	**0.1787**		**0.1655**	**0.1655**	**0.0000**	**807.3102**	**807.3102**	**0.2500**		**813.5603**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.4500e-003	0.1608	0.0614	7.5000e-004	0.0256	7.8000e-004	0.0264	7.3800e-003	7.4000e-004	8.1200e-003		80.2481	80.2481	2.6700e-003	0.0116	83.7564
Worker	0.0550	0.0394	0.5315	1.5000e-003	0.1788	1.0800e-003	0.1799	0.0474	9.9000e-004	0.0484		151.5766	151.5766	4.0900e-003	3.9400e-003	152.8542
Total	**0.0595**	**0.2002**	**0.5929**	**2.2500e-003**	**0.2045**	**1.8600e-003**	**0.2063**	**0.0548**	**1.7300e-003**	**0.0565**		**231.8247**	**231.8247**	**6.7600e-003**	**0.0155**	**236.6107**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Architectural Coating - 2023

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	5.3252					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2556	1.7373	2.4148	3.9600e-003		0.0944	0.0944		0.0944	0.0944		375.2641	375.2641	0.0225		375.8253
Total	**5.5808**	**1.7373**	**2.4148**	**3.9600e-003**		**0.0944**	**0.0944**		**0.0944**	**0.0944**		**375.2641**	**375.2641**	**0.0225**		**375.8253**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.4500e-003	0.1608	0.0614	7.5000e-004	0.0256	7.8000e-004	0.0264	7.3800e-003	7.4000e-004	8.1200e-003		80.2481	80.2481	2.6700e-003	0.0116	83.7564
Worker	0.0550	0.0394	0.5315	1.5000e-003	0.1788	1.0800e-003	0.1799	0.0474	9.9000e-004	0.0484		151.5766	151.5766	4.0900e-003	3.9400e-003	152.8542
Total	**0.0595**	**0.2002**	**0.5929**	**2.2500e-003**	**0.2045**	**1.8600e-003**	**0.2063**	**0.0548**	**1.7300e-003**	**0.0565**		**231.8247**	**231.8247**	**6.7600e-003**	**0.0155**	**236.6107**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Architectural Coating - 2023

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	5.3252					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2556	1.7373	2.4148	3.9600e-003		0.0944	0.0944		0.0944	0.0944	0.0000	375.2641	375.2641	0.0225		375.8253
Total	**5.5808**	**1.7373**	**2.4148**	**3.9600e-003**		**0.0944**	**0.0944**		**0.0944**	**0.0944**	**0.0000**	**375.2641**	**375.2641**	**0.0225**		**375.8253**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	4.4500e-003	0.1608	0.0614	7.5000e-004	0.0256	7.8000e-004	0.0264	7.3800e-003	7.4000e-004	8.1200e-003		80.2481	80.2481	2.6700e-003	0.0116	83.7564
Worker	0.0550	0.0394	0.5315	1.5000e-003	0.1788	1.0800e-003	0.1799	0.0474	9.9000e-004	0.0484		151.5766	151.5766	4.0900e-003	3.9400e-003	152.8542
Total	**0.0595**	**0.2002**	**0.5929**	**2.2500e-003**	**0.2045**	**1.8600e-003**	**0.2063**	**0.0548**	**1.7300e-003**	**0.0565**		**231.8247**	**231.8247**	**6.7600e-003**	**0.0155**	**236.6107**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.0291	0.0333	0.2999	6.5000e-004	0.0686	4.8000e-004	0.0691	0.0183	4.5000e-004	0.0187		65.8043	65.8043	4.5900e-003	2.8900e-003	66.7804
Unmitigated	0.0291	0.0333	0.2999	6.5000e-004	0.0686	4.8000e-004	0.0691	0.0183	4.5000e-004	0.0187		65.8043	65.8043	4.5900e-003	2.8900e-003	66.7804

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	9.44	9.54	8.55	31,872	31,872
Total	9.44	9.54	8.55	31,872	31,872

4.3 Trip Type Information

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

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.544785	0.062844	0.187478	0.127235	0.023089	0.006083	0.010475	0.008012	0.000925	0.000611	0.024394	0.000698	0.003374

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
NaturalGas Unmitigated	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	69.8413	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
Total		**7.5000e-004**	**6.4400e-003**	**2.7400e-003**	**4.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**		**8.2166**	**8.2166**	**1.6000e-004**	**1.5000e-004**	**8.2655**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Single Family Housing	0.0698413	7.5000e-004	6.4400e-003	2.7400e-003	4.0000e-005		5.2000e-004	5.2000e-004		5.2000e-004	5.2000e-004		8.2166	8.2166	1.6000e-004	1.5000e-004	8.2655
Total		**7.5000e-004**	**6.4400e-003**	**2.7400e-003**	**4.0000e-005**		**5.2000e-004**	**5.2000e-004**		**5.2000e-004**	**5.2000e-004**		**8.2166**	**8.2166**	**1.6000e-004**	**1.5000e-004**	**8.2655**

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	0.7887	0.1150	6.2161	0.0201		1.0012	1.0012		1.0012	1.0012	147.5410	18.1486	165.6895	0.6902	3.3000e-004	183.0432
Unmitigated	0.7887	0.1150	6.2161	0.0201		1.0012	1.0012		1.0012	1.0012	147.5410	18.1486	165.6895	0.6902	3.3000e-004	183.0432

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	8.7500e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1011					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.6764	0.1141	6.1336	0.0201		1.0007	1.0007		1.0007	1.0007	147.5410	18.0000	165.5410	0.6901	3.3000e-004	182.8910
Landscaping	2.4900e-003	9.5000e-004	0.0825	0.0000		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004		0.1486	0.1486	1.4000e-004		0.1521
Total	**0.7887**	**0.1150**	**6.2161**	**0.0201**		**1.0012**	**1.0012**		**1.0012**	**1.0012**	**147.5410**	**18.1486**	**165.6895**	**0.6902**	**3.3000e-004**	**183.0431**

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	8.7500e-003					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.1011					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.6764	0.1141	6.1336	0.0201		1.0007	1.0007		1.0007	1.0007	147.5410	18.0000	165.5410	0.6901	3.3000e-004	182.8910
Landscaping	2.4900e-003	9.5000e-004	0.0825	0.0000		4.6000e-004	4.6000e-004		4.6000e-004	4.6000e-004		0.1486	0.1486	1.4000e-004		0.1521
Total	**0.7887**	**0.1150**	**6.2161**	**0.0201**		**1.0012**	**1.0012**		**1.0012**	**1.0012**	**147.5410**	**18.1486**	**165.6895**	**0.6902**	**3.3000e-004**	**183.0431**

7.0 Water Detail

7.1 Mitigation Measures Water

Norumbega Drive Residence Project - Los Angeles-South Coast County, Winter

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Norumbega Drive Residence Project

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1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Single Family Housing	1.00	Dwelling Unit	1.30	5,106.00	6

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	33
Climate Zone	9			**Operational Year**	2023
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	390.98	**CH4 Intensity (lb/MWhr)**	0.033	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - The 2-story residence would be 3,758 square feet of livable space. As well, a 4-car garage on the lowest level would be an additional 1,348 square feet. The lot is 56,410 square feet (1.295 acres).

Construction Phase - Demolion - None
Site Prep - 1 week
Grading - 4 weeks
Building Construc.- 52 weeks
Paving - 13 weeks
Arch. Coating - 1 week

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

Off-road Equipment - Equipment defaults modified to reflect Project

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

Grading - Grading phase assumes approx. 35 total passes over the 1.3 acre lot
576 cubic yards of cut and 266 cubic yards of fill. Approximately 252 cubic yards of soil would be exported from the site

Trips and VMT - 16 one way worker trips per day maximum
4 one way vendor trips per day maximum
52 one way haul truck trips per grading phase

Land Use Change -

Woodstoves - No woodstoves or fireplaces

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	10.00	6.00
tblConstructionPhase	NumDays	200.00	314.00
tblConstructionPhase	NumDays	4.00	24.00
tblConstructionPhase	NumDays	10.00	80.00
tblConstructionPhase	NumDays	2.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	PhaseEndDate	8/29/2022	1/20/2023
tblConstructionPhase	PhaseEndDate	8/1/2022	10/25/2022
tblConstructionPhase	PhaseEndDate	10/25/2021	10/24/2021
tblConstructionPhase	PhaseEndDate	8/15/2022	1/12/2023
tblConstructionPhase	PhaseEndDate	10/19/2021	9/26/2021
tblConstructionPhase	PhaseStartDate	8/16/2022	1/13/2023
tblConstructionPhase	PhaseStartDate	10/26/2021	10/25/2021
tblConstructionPhase	PhaseStartDate	10/20/2021	9/27/2021
tblConstructionPhase	PhaseStartDate	8/2/2022	10/12/2022
tblConstructionPhase	PhaseStartDate	10/16/2021	9/20/2021

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblFireplaces	FireplaceWoodMass	1,019.20	0.00
tblFireplaces	NumberWood	0.05	0.00
tblGrading	AcresOfGrading	36.00	46.00
tblGrading	MaterialExported	0.00	252.00
tblLandUse	LandUseSquareFeet	1,800.00	5,106.00
tblLandUse	LotAcreage	0.32	1.30
tblLandUse	Population	3.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	32.00	52.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	10.00	16.00
tblTripsAndVMT	WorkerTripNumber	13.00	16.00

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblTripsAndVMT	WorkerTripNumber	8.00	16.00
tblTripsAndVMT	WorkerTripNumber	0.00	16.00
tblWoodstoves	WoodstoveDayYear	25.00	0.00

2.0 Emissions Summary

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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					
2021	0.0626	0.6342	0.3518	8.3000e-004	0.1289	0.0274	0.1563	0.0553	0.0254	0.0807	0.0000	72.3244	72.3244	0.0189	9.6000e-004	73.0826
2022	0.1226	1.0404	0.9021	1.9400e-003	0.0326	0.0468	0.0794	8.7500e-003	0.0438	0.0526	0.0000	167.2264	167.2264	0.0383	2.4300e-003	168.9092
2023	0.0220	0.0267	0.0407	8.0000e-005	1.7000e-003	1.2400e-003	2.9400e-003	4.6000e-004	1.1700e-003	1.6300e-003	0.0000	6.6579	6.6579	1.2600e-003	1.2000e-004	6.7250
Maximum	**0.1226**	**1.0404**	**0.9021**	**1.9400e-003**	**0.1289**	**0.0468**	**0.1563**	**0.0553**	**0.0438**	**0.0807**	**0.0000**	**167.2264**	**167.2264**	**0.0383**	**2.4300e-003**	**168.9092**

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					
2021	0.0626	0.6342	0.3518	8.3000e-004	0.0632	0.0274	0.0905	0.0263	0.0254	0.0516	0.0000	72.3243	72.3243	0.0189	9.6000e-004	73.0825
2022	0.1226	1.0404	0.9021	1.9400e-003	0.0326	0.0468	0.0794	8.7500e-003	0.0438	0.0526	0.0000	167.2262	167.2262	0.0383	2.4300e-003	168.9090
2023	0.0220	0.0267	0.0407	8.0000e-005	1.7000e-003	1.2400e-003	2.9400e-003	4.6000e-004	1.1700e-003	1.6300e-003	0.0000	6.6579	6.6579	1.2600e-003	1.2000e-004	6.7250
Maximum	**0.1226**	**1.0404**	**0.9021**	**1.9400e-003**	**0.0632**	**0.0468**	**0.0905**	**0.0263**	**0.0438**	**0.0526**	**0.0000**	**167.2262**	**167.2262**	**0.0383**	**2.4300e-003**	**168.9090**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	ROG	NOx	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**	**40.28**	**0.00**	**27.55**	**45.00**	**0.00**	**21.53**	**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	**9-20-2021**	**12-19-2021**	0.6485	0.6485
2	**12-20-2021**	**3-19-2022**	0.3051	0.3051
3	**3-20-2022**	**6-19-2022**	0.3062	0.3062
4	**6-20-2022**	**9-19-2022**	0.3062	0.3062
5	**9-20-2022**	**12-19-2022**	0.2645	0.2645
6	**12-20-2022**	**3-19-2023**	0.0740	0.0740
		Highest	0.6485	0.6485

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.0207	3.5000e-004	0.0135	1.0000e-005		5.7000e-004	5.7000e-004		5.7000e-004	5.7000e-004	0.0669	0.2210	0.2879	3.3000e-004	0.0000	0.2973
Energy	1.4000e-004	1.1700e-003	5.0000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	2.7539	2.7539	1.4000e-004	4.0000e-005	2.7692
Mobile	5.1000e-003	6.0200e-003	0.0539	1.2000e-004	0.0120	9.0000e-005	0.0121	3.1900e-003	8.0000e-005	3.2700e-003	0.0000	10.7364	10.7364	7.4000e-004	4.7000e-004	10.8948
Waste						0.0000	0.0000		0.0000	0.0000	0.4994	0.0000	0.4994	0.0295	0.0000	1.2371
Water						0.0000	0.0000		0.0000	0.0000	0.0207	0.2314	0.2521	2.1400e-003	5.0000e-005	0.3213
Total	**0.0260**	**7.5400e-003**	**0.0678**	**1.4000e-004**	**0.0120**	**7.5000e-004**	**0.0127**	**3.1900e-003**	**7.4000e-004**	**3.9300e-003**	**0.5870**	**13.9427**	**14.5297**	**0.0329**	**5.6000e-004**	**15.5197**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	0.0207	3.5000e-004	0.0135	1.0000e-005		5.7000e-004	5.7000e-004		5.7000e-004	5.7000e-004	0.0669	0.2210	0.2879	3.3000e-004	0.0000	0.2973
Energy	1.4000e-004	1.1700e-003	5.0000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	2.7539	2.7539	1.4000e-004	4.0000e-005	2.7692
Mobile	5.1000e-003	6.0200e-003	0.0539	1.2000e-004	0.0120	9.0000e-005	0.0121	3.1900e-003	8.0000e-005	3.2700e-003	0.0000	10.7364	10.7364	7.4000e-004	4.7000e-004	10.8948
Waste						0.0000	0.0000		0.0000	0.0000	0.4994	0.0000	0.4994	0.0295	0.0000	1.2371
Water						0.0000	0.0000		0.0000	0.0000	0.0207	0.2314	0.2521	2.1400e-003	5.0000e-005	0.3213
Total	**0.0260**	**7.5400e-003**	**0.0678**	**1.4000e-004**	**0.0120**	**7.5000e-004**	**0.0127**	**3.1900e-003**	**7.4000e-004**	**3.9300e-003**	**0.5870**	**13.9427**	**14.5297**	**0.0329**	**5.6000e-004**	**15.5197**

	ROG	NOx	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	9/20/2021	9/26/2021	6	6	
2	Grading	Grading	9/27/2021	10/24/2021	6	24	
3	Building Construction	Building Construction	10/25/2021	10/25/2022	6	314	

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4	Paving	Paving	10/12/2022	1/12/2023	6	80	
5	Architectural Coating	Architectural Coating	1/13/2023	1/20/2023	6	6	

Acres of Grading (Site Preparation Phase): 9

Acres of Grading (Grading Phase): 46

Acres of Paving: 0

Residential Indoor: 10,340; Residential Outdoor: 3,447; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	8.00	78	0.48
Paving	Cement and Mortar Mixers	1	8.00	9	0.56
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	1	8.00	89	0.20
Building Construction	Generator Sets	0	8.00	84	0.74
Grading	Graders	2	8.00	187	0.41
Site Preparation	Graders	2	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	0	8.00	132	0.36
Paving	Rollers	0	7.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45

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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	4	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	5	16.00	4.00	52.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	3	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	3	16.00	4.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	16.00	4.00	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 - 2021

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					0.0228	0.0000	0.0228	0.0105	0.0000	0.0105	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4200e-003	0.0742	0.0295	7.0000e-005		3.0600e-003	3.0600e-003		2.8100e-003	2.8100e-003	0.0000	6.5634	6.5634	2.1200e-003	0.0000	6.6164
Total	**6.4200e-003**	**0.0742**	**0.0295**	**7.0000e-005**	**0.0228**	**3.0600e-003**	**0.0259**	**0.0105**	**2.8100e-003**	**0.0133**	**0.0000**	**6.5634**	**6.5634**	**2.1200e-003**	**0.0000**	**6.6164**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	7.3000e-004	2.3000e-004	0.0000	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.2354	0.2354	1.0000e-005	3.0000e-005	0.2457
Worker	1.8000e-004	1.6000e-004	1.9500e-003	0.0000	5.3000e-004	0.0000	5.3000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4465	0.4465	1.0000e-005	1.0000e-005	0.4507
Total	**2.1000e-004**	**8.9000e-004**	**2.1800e-003**	**0.0000**	**6.1000e-004**	**1.0000e-005**	**6.2000e-004**	**1.6000e-004**	**1.0000e-005**	**1.7000e-004**	**0.0000**	**0.6819**	**0.6819**	**2.0000e-005**	**4.0000e-005**	**0.6964**

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					0.0103	0.0000	0.0103	4.7000e-003	0.0000	4.7000e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.4200e-003	0.0742	0.0295	7.0000e-005		3.0600e-003	3.0600e-003		2.8100e-003	2.8100e-003	0.0000	6.5634	6.5634	2.1200e-003	0.0000	6.6164
Total	**6.4200e-003**	**0.0742**	**0.0295**	**7.0000e-005**	**0.0103**	**3.0600e-003**	**0.0133**	**4.7000e-003**	**2.8100e-003**	**7.5100e-003**	**0.0000**	**6.5634**	**6.5634**	**2.1200e-003**	**0.0000**	**6.6164**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.0000e-005	7.3000e-004	2.3000e-004	0.0000	8.0000e-005	1.0000e-005	9.0000e-005	2.0000e-005	1.0000e-005	3.0000e-005	0.0000	0.2354	0.2354	1.0000e-005	3.0000e-005	0.2457
Worker	1.8000e-004	1.6000e-004	1.9500e-003	0.0000	5.3000e-004	0.0000	5.3000e-004	1.4000e-004	0.0000	1.4000e-004	0.0000	0.4465	0.4465	1.0000e-005	1.0000e-005	0.4507
Total	**2.1000e-004**	**8.9000e-004**	**2.1800e-003**	**0.0000**	**6.1000e-004**	**1.0000e-005**	**6.2000e-004**	**1.6000e-004**	**1.0000e-005**	**1.7000e-004**	**0.0000**	**0.6819**	**0.6819**	**2.0000e-005**	**4.0000e-005**	**0.6964**

3.3 Grading - 2021

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					0.0967	0.0000	0.0967	0.0424	0.0000	0.0424	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.3193	0.1451	3.4000e-004		0.0136	0.0136		0.0125	0.0125	0.0000	29.5291	29.5291	9.5500e-003	0.0000	29.7678
Total	**0.0279**	**0.3193**	**0.1451**	**3.4000e-004**	**0.0967**	**0.0136**	**0.1103**	**0.0424**	**0.0125**	**0.0549**	**0.0000**	**29.5291**	**29.5291**	**9.5500e-003**	**0.0000**	**29.7678**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2021

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	1.7000e-004	5.2300e-003	1.1500e-003	2.0000e-005	4.5000e-004	6.0000e-005	5.0000e-004	1.2000e-004	6.0000e-005	1.8000e-004	0.0000	1.6496	1.6496	9.0000e-005	2.6000e-004	1.7297
Vendor	1.3000e-004	2.9100e-003	9.4000e-004	1.0000e-005	3.0000e-004	4.0000e-005	3.4000e-004	9.0000e-005	4.0000e-005	1.3000e-004	0.0000	0.9416	0.9416	3.0000e-005	1.4000e-004	0.9829
Worker	7.1000e-004	6.2000e-004	7.7900e-003	2.0000e-005	2.1000e-003	1.0000e-005	2.1200e-003	5.6000e-004	1.0000e-005	5.7000e-004	0.0000	1.7861	1.7861	6.0000e-005	5.0000e-005	1.8029
Total	**1.0100e-003**	**8.7600e-003**	**9.8800e-003**	**5.0000e-005**	**2.8500e-003**	**1.1000e-004**	**2.9600e-003**	**7.7000e-004**	**1.1000e-004**	**8.8000e-004**	**0.0000**	**4.3774**	**4.3774**	**1.8000e-004**	**4.5000e-004**	**4.5155**

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					0.0435	0.0000	0.0435	0.0191	0.0000	0.0191	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0279	0.3193	0.1451	3.4000e-004		0.0136	0.0136		0.0125	0.0125	0.0000	29.5291	29.5291	9.5500e-003	0.0000	29.7678
Total	**0.0279**	**0.3193**	**0.1451**	**3.4000e-004**	**0.0435**	**0.0136**	**0.0571**	**0.0191**	**0.0125**	**0.0316**	**0.0000**	**29.5291**	**29.5291**	**9.5500e-003**	**0.0000**	**29.7678**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.3 Grading - 2021

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	1.7000e-004	5.2300e-003	1.1500e-003	2.0000e-005	4.5000e-004	6.0000e-005	5.0000e-004	1.2000e-004	6.0000e-005	1.8000e-004	0.0000	1.6496	1.6496	9.0000e-005	2.6000e-004	1.7297
Vendor	1.3000e-004	2.9100e-003	9.4000e-004	1.0000e-005	3.0000e-004	4.0000e-005	3.4000e-004	9.0000e-005	4.0000e-005	1.3000e-004	0.0000	0.9416	0.9416	3.0000e-005	1.4000e-004	0.9829
Worker	7.1000e-004	6.2000e-004	7.7900e-003	2.0000e-005	2.1000e-003	1.0000e-005	2.1200e-003	5.6000e-004	1.0000e-005	5.7000e-004	0.0000	1.7861	1.7861	6.0000e-005	5.0000e-005	1.8029
Total	**1.0100e-003**	**8.7600e-003**	**9.8800e-003**	**5.0000e-005**	**2.8500e-003**	**1.1000e-004**	**2.9600e-003**	**7.7000e-004**	**1.1000e-004**	**8.8000e-004**	**0.0000**	**4.3774**	**4.3774**	**1.8000e-004**	**4.5000e-004**	**4.5155**

3.4 Building Construction - 2021

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	0.0249	0.2224	0.1437	2.9000e-004		0.0105	0.0105		9.8000e-003	9.8000e-003	0.0000	24.4670	24.4670	6.8400e-003	0.0000	24.6381
Total	**0.0249**	**0.2224**	**0.1437**	**2.9000e-004**		**0.0105**	**0.0105**		**9.8000e-003**	**9.8000e-003**	**0.0000**	**24.4670**	**24.4670**	**6.8400e-003**	**0.0000**	**24.6381**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.3000e-004	7.1600e-003	2.3100e-003	2.0000e-005	7.4000e-004	1.0000e-004	8.5000e-004	2.1000e-004	1.0000e-004	3.1000e-004	0.0000	2.3148	2.3148	8.0000e-005	3.3000e-004	2.4163
Worker	1.7500e-003	1.5300e-003	0.0192	5.0000e-005	5.1700e-003	4.0000e-005	5.2100e-003	1.3700e-003	3.0000e-005	1.4100e-003	0.0000	4.3908	4.3908	1.4000e-004	1.3000e-004	4.4320
Total	**2.0800e-003**	**8.6900e-003**	**0.0215**	**7.0000e-005**	**5.9100e-003**	**1.4000e-004**	**6.0600e-003**	**1.5800e-003**	**1.3000e-004**	**1.7200e-003**	**0.0000**	**6.7056**	**6.7056**	**2.2000e-004**	**4.6000e-004**	**6.8483**

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	0.0249	0.2224	0.1437	2.9000e-004		0.0105	0.0105		9.8000e-003	9.8000e-003	0.0000	24.4670	24.4670	6.8400e-003	0.0000	24.6380
Total	**0.0249**	**0.2224**	**0.1437**	**2.9000e-004**		**0.0105**	**0.0105**		**9.8000e-003**	**9.8000e-003**	**0.0000**	**24.4670**	**24.4670**	**6.8400e-003**	**0.0000**	**24.6380**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	3.3000e-004	7.1600e-003	2.3100e-003	2.0000e-005	7.4000e-004	1.0000e-004	8.5000e-004	2.1000e-004	1.0000e-004	3.1000e-004	0.0000	2.3148	2.3148	8.0000e-005	3.3000e-004	2.4163
Worker	1.7500e-003	1.5300e-003	0.0192	5.0000e-005	5.1700e-003	4.0000e-005	5.2100e-003	1.3700e-003	3.0000e-005	1.4100e-003	0.0000	4.3908	4.3908	1.4000e-004	1.3000e-004	4.4320
Total	**2.0800e-003**	**8.6900e-003**	**0.0215**	**7.0000e-005**	**5.9100e-003**	**1.4000e-004**	**6.0600e-003**	**1.5800e-003**	**1.3000e-004**	**1.7200e-003**	**0.0000**	**6.7056**	**6.7056**	**2.2000e-004**	**4.6000e-004**	**6.8483**

3.4 Building Construction - 2022

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	0.0973	0.8545	0.6046	1.2600e-003		0.0392	0.0392		0.0367	0.0367	0.0000	105.7580	105.7580	0.0293	0.0000	106.4908
Total	**0.0973**	**0.8545**	**0.6046**	**1.2600e-003**		**0.0392**	**0.0392**		**0.0367**	**0.0367**	**0.0000**	**105.7580**	**105.7580**	**0.0293**	**0.0000**	**106.4908**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2022

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-003	0.0262	8.7000e-003	1.0000e-004	3.2100e-003	2.4000e-004	3.4500e-003	9.3000e-004	2.3000e-004	1.1600e-003	0.0000	9.7389	9.7389	3.3000e-004	1.4000e-003	10.1656
Worker	6.9900e-003	5.8200e-003	0.0756	2.0000e-004	0.0224	1.5000e-004	0.0225	5.9400e-003	1.3000e-004	6.0700e-003	0.0000	18.3853	18.3853	5.3000e-004	5.0000e-004	18.5483
Total	**7.9900e-003**	**0.0321**	**0.0843**	**3.0000e-004**	**0.0256**	**3.9000e-004**	**0.0260**	**6.8700e-003**	**3.6000e-004**	**7.2300e-003**	**0.0000**	**28.1242**	**28.1242**	**8.6000e-004**	**1.9000e-003**	**28.7139**

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	0.0973	0.8545	0.6046	1.2600e-003		0.0392	0.0392		0.0367	0.0367	0.0000	105.7579	105.7579	0.0293	0.0000	106.4907
Total	**0.0973**	**0.8545**	**0.6046**	**1.2600e-003**		**0.0392**	**0.0392**		**0.0367**	**0.0367**	**0.0000**	**105.7579**	**105.7579**	**0.0293**	**0.0000**	**106.4907**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.4 Building Construction - 2022

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.0000e-003	0.0262	8.7000e-003	1.0000e-004	3.2100e-003	2.4000e-004	3.4500e-003	9.3000e-004	2.3000e-004	1.1600e-003	0.0000	9.7389	9.7389	3.3000e-004	1.4000e-003	10.1656
Worker	6.9900e-003	5.8200e-003	0.0756	2.0000e-004	0.0224	1.5000e-004	0.0225	5.9400e-003	1.3000e-004	6.0700e-003	0.0000	18.3853	18.3853	5.3000e-004	5.0000e-004	18.5483
Total	**7.9900e-003**	**0.0321**	**0.0843**	**3.0000e-004**	**0.0256**	**3.9000e-004**	**0.0260**	**6.8700e-003**	**3.6000e-004**	**7.2300e-003**	**0.0000**	**28.1242**	**28.1242**	**8.6000e-004**	**1.9000e-003**	**28.7139**

3.5 Paving - 2022

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	0.0151	0.1450	0.1901	3.0000e-004		7.1500e-003	7.1500e-003		6.6100e-003	6.6100e-003	0.0000	25.6239	25.6239	7.9400e-003	0.0000	25.8222
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0151**	**0.1450**	**0.1901**	**3.0000e-004**		**7.1500e-003**	**7.1500e-003**		**6.6100e-003**	**6.6100e-003**	**0.0000**	**25.6239**	**25.6239**	**7.9400e-003**	**0.0000**	**25.8222**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2022

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	2.7000e-004	7.2000e-003	2.3900e-003	3.0000e-005	8.8000e-004	7.0000e-005	9.5000e-004	2.5000e-004	6.0000e-005	3.2000e-004	0.0000	2.6734	2.6734	9.0000e-005	3.9000e-004	2.7906
Worker	1.9200e-003	1.6000e-003	0.0208	6.0000e-005	6.1400e-003	4.0000e-005	6.1800e-003	1.6300e-003	4.0000e-005	1.6700e-003	0.0000	5.0470	5.0470	1.4000e-004	1.4000e-004	5.0917
Total	**2.1900e-003**	**8.8000e-003**	**0.0232**	**9.0000e-005**	**7.0200e-003**	**1.1000e-004**	**7.1300e-003**	**1.8800e-003**	**1.0000e-004**	**1.9900e-003**	**0.0000**	**7.7204**	**7.7204**	**2.3000e-004**	**5.3000e-004**	**7.8822**

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	0.0151	0.1450	0.1901	3.0000e-004		7.1500e-003	7.1500e-003		6.6100e-003	6.6100e-003	0.0000	25.6238	25.6238	7.9400e-003	0.0000	25.8222
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0151**	**0.1450**	**0.1901**	**3.0000e-004**		**7.1500e-003**	**7.1500e-003**		**6.6100e-003**	**6.6100e-003**	**0.0000**	**25.6238**	**25.6238**	**7.9400e-003**	**0.0000**	**25.8222**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2022

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	2.7000e-004	7.2000e-003	2.3900e-003	3.0000e-005	8.8000e-004	7.0000e-005	9.5000e-004	2.5000e-004	6.0000e-005	3.2000e-004	0.0000	2.6734	2.6734	9.0000e-005	3.9000e-004	2.7906
Worker	1.9200e-003	1.6000e-003	0.0208	6.0000e-005	6.1400e-003	4.0000e-005	6.1800e-003	1.6300e-003	4.0000e-005	1.6700e-003	0.0000	5.0470	5.0470	1.4000e-004	1.4000e-004	5.0917
Total	**2.1900e-003**	**8.8000e-003**	**0.0232**	**9.0000e-005**	**7.0200e-003**	**1.1000e-004**	**7.1300e-003**	**1.8800e-003**	**1.0000e-004**	**1.9900e-003**	**0.0000**	**7.7204**	**7.7204**	**2.3000e-004**	**5.3000e-004**	**7.8822**

3.5 Paving - 2023

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	2.0100e-003	0.0189	0.0271	4.0000e-005		8.9000e-004	8.9000e-004		8.3000e-004	8.3000e-004	0.0000	3.6619	3.6619	1.1300e-003	0.0000	3.6903
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.0100e-003**	**0.0189**	**0.0271**	**4.0000e-005**		**8.9000e-004**	**8.9000e-004**		**8.3000e-004**	**8.3000e-004**	**0.0000**	**3.6619**	**3.6619**	**1.1300e-003**	**0.0000**	**3.6903**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.5 Paving - 2023

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	2.0000e-005	8.1000e-004	3.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.3636	0.3636	1.0000e-005	5.0000e-005	0.3795
Worker	2.5000e-004	2.0000e-004	2.7300e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	0.0000	2.4000e-004	0.0000	0.6978	0.6978	2.0000e-005	2.0000e-005	0.7037
Total	**2.7000e-004**	**1.0100e-003**	**3.0300e-003**	**1.0000e-005**	**1.0100e-003**	**1.0000e-005**	**1.0100e-003**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**0.0000**	**1.0614**	**1.0614**	**3.0000e-005**	**7.0000e-005**	**1.0832**

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	2.0100e-003	0.0189	0.0271	4.0000e-005		8.9000e-004	8.9000e-004		8.3000e-004	8.3000e-004	0.0000	3.6619	3.6619	1.1300e-003	0.0000	3.6902
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.0100e-003**	**0.0189**	**0.0271**	**4.0000e-005**		**8.9000e-004**	**8.9000e-004**		**8.3000e-004**	**8.3000e-004**	**0.0000**	**3.6619**	**3.6619**	**1.1300e-003**	**0.0000**	**3.6902**

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3.5 Paving - 2023

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	2.0000e-005	8.1000e-004	3.0000e-004	0.0000	1.3000e-004	0.0000	1.3000e-004	4.0000e-005	0.0000	4.0000e-005	0.0000	0.3636	0.3636	1.0000e-005	5.0000e-005	0.3795
Worker	2.5000e-004	2.0000e-004	2.7300e-003	1.0000e-005	8.8000e-004	1.0000e-005	8.8000e-004	2.3000e-004	0.0000	2.4000e-004	0.0000	0.6978	0.6978	2.0000e-005	2.0000e-005	0.7037
Total	**2.7000e-004**	**1.0100e-003**	**3.0300e-003**	**1.0000e-005**	**1.0100e-003**	**1.0000e-005**	**1.0100e-003**	**2.7000e-004**	**0.0000**	**2.8000e-004**	**0.0000**	**1.0614**	**1.0614**	**3.0000e-005**	**7.0000e-005**	**1.0832**

3.6 Architectural Coating - 2023

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	0.0186					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9000e-004	6.0800e-003	8.4500e-003	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	1.1915	1.1915	7.0000e-005	0.0000	1.1933
Total	**0.0195**	**6.0800e-003**	**8.4500e-003**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**	**0.0000**	**1.1915**	**1.1915**	**7.0000e-005**	**0.0000**	**1.1933**

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3.6 Architectural Coating - 2023

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	2.0000e-005	5.6000e-004	2.1000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	3.0000e-005	0.0000	3.0000e-005	0.0000	0.2546	0.2546	1.0000e-005	4.0000e-005	0.2657
Worker	1.8000e-004	1.4000e-004	1.9100e-003	1.0000e-005	6.1000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.4885	0.4885	1.0000e-005	1.0000e-005	0.4926
Total	**2.0000e-004**	**7.0000e-004**	**2.1200e-003**	**1.0000e-005**	**7.0000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.7430**	**0.7430**	**2.0000e-005**	**5.0000e-005**	**0.7583**

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	0.0186					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	8.9000e-004	6.0800e-003	8.4500e-003	1.0000e-005		3.3000e-004	3.3000e-004		3.3000e-004	3.3000e-004	0.0000	1.1915	1.1915	7.0000e-005	0.0000	1.1933
Total	**0.0195**	**6.0800e-003**	**8.4500e-003**	**1.0000e-005**		**3.3000e-004**	**3.3000e-004**		**3.3000e-004**	**3.3000e-004**	**0.0000**	**1.1915**	**1.1915**	**7.0000e-005**	**0.0000**	**1.1933**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

3.6 Architectural Coating - 2023

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	2.0000e-005	5.6000e-004	2.1000e-004	0.0000	9.0000e-005	0.0000	9.0000e-005	3.0000e-005	0.0000	3.0000e-005	0.0000	0.2546	0.2546	1.0000e-005	4.0000e-005	0.2657
Worker	1.8000e-004	1.4000e-004	1.9100e-003	1.0000e-005	6.1000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.4885	0.4885	1.0000e-005	1.0000e-005	0.4926
Total	**2.0000e-004**	**7.0000e-004**	**2.1200e-003**	**1.0000e-005**	**7.0000e-004**	**0.0000**	**7.1000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.7430**	**0.7430**	**2.0000e-005**	**5.0000e-005**	**0.7583**

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EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	5.1000e-003	6.0200e-003	0.0539	1.2000e-004	0.0120	9.0000e-005	0.0121	3.1900e-003	8.0000e-005	3.2700e-003	0.0000	10.7364	10.7364	7.4000e-004	4.7000e-004	10.8948
Unmitigated	5.1000e-003	6.0200e-003	0.0539	1.2000e-004	0.0120	9.0000e-005	0.0121	3.1900e-003	8.0000e-005	3.2700e-003	0.0000	10.7364	10.7364	7.4000e-004	4.7000e-004	10.8948

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Single Family Housing	9.44	9.54	8.55	31,872	31,872
Total	9.44	9.54	8.55	31,872	31,872

4.3 Trip Type Information

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

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Single Family Housing	0.544785	0.062844	0.187478	0.127235	0.023089	0.006083	0.010475	0.008012	0.000925	0.000611	0.024394	0.000698	0.003374

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	1.3936	1.3936	1.2000e-004	1.0000e-005	1.4008
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	1.3936	1.3936	1.2000e-004	1.0000e-005	1.4008
NaturalGas Mitigated	1.4000e-004	1.1700e-003	5.0000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.3604	1.3604	3.0000e-005	2.0000e-005	1.3684
NaturalGas Unmitigated	1.4000e-004	1.1700e-003	5.0000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.3604	1.3604	3.0000e-005	2.0000e-005	1.3684

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	25492.1	1.4000e-004	1.1700e-003	5.0000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.3604	1.3604	3.0000e-005	2.0000e-005	1.3684
Total		**1.4000e-004**	**1.1700e-003**	**5.0000e-004**	**1.0000e-005**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**1.3604**	**1.3604**	**3.0000e-005**	**2.0000e-005**	**1.3684**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Single Family Housing	25492.1	1.4000e-004	1.1700e-003	5.0000e-004	1.0000e-005		9.0000e-005	9.0000e-005		9.0000e-005	9.0000e-005	0.0000	1.3604	1.3604	3.0000e-005	2.0000e-005	1.3684
Total		**1.4000e-004**	**1.1700e-003**	**5.0000e-004**	**1.0000e-005**		**9.0000e-005**	**9.0000e-005**		**9.0000e-005**	**9.0000e-005**	**0.0000**	**1.3604**	**1.3604**	**3.0000e-005**	**2.0000e-005**	**1.3684**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	7857.94	1.3936	1.2000e-004	1.0000e-005	1.4008
Total		**1.3936**	**1.2000e-004**	**1.0000e-005**	**1.4008**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Single Family Housing	7857.94	1.3936	1.2000e-004	1.0000e-005	1.4008
Total		**1.3936**	**1.2000e-004**	**1.0000e-005**	**1.4008**

6.0 Area Detail

6.1 Mitigation Measures Area

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	ROG	NOx	CO	SO2	Fugitive 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	0.0207	3.5000e-004	0.0135	1.0000e-005		5.7000e-004	5.7000e-004		5.7000e-004	5.7000e-004	0.0669	0.2210	0.2879	3.3000e-004	0.0000	0.2973
Unmitigated	0.0207	3.5000e-004	0.0135	1.0000e-005		5.7000e-004	5.7000e-004		5.7000e-004	5.7000e-004	0.0669	0.2210	0.2879	3.3000e-004	0.0000	0.2973

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	1.6000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0185					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.6000e-004	2.3000e-004	3.1400e-003	1.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0669	0.2041	0.2710	3.2000e-004	0.0000	0.2801
Landscaping	3.1000e-004	1.2000e-004	0.0103	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0169	0.0169	2.0000e-005	0.0000	0.0173
Total	**0.0207**	**3.5000e-004**	**0.0135**	**1.0000e-005**		**5.7000e-004**	**5.7000e-004**		**5.7000e-004**	**5.7000e-004**	**0.0669**	**0.2210**	**0.2879**	**3.4000e-004**	**0.0000**	**0.2973**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

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	1.6000e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0185					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	3.6000e-004	2.3000e-004	3.1400e-003	1.0000e-005		5.1000e-004	5.1000e-004		5.1000e-004	5.1000e-004	0.0669	0.2041	0.2710	3.2000e-004	0.0000	0.2801
Landscaping	3.1000e-004	1.2000e-004	0.0103	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.0169	0.0169	2.0000e-005	0.0000	0.0173
Total	**0.0207**	**3.5000e-004**	**0.0135**	**1.0000e-005**		**5.7000e-004**	**5.7000e-004**		**5.7000e-004**	**5.7000e-004**	**0.0669**	**0.2210**	**0.2879**	**3.4000e-004**	**0.0000**	**0.2973**

7.0 Water Detail

7.1 Mitigation Measures Water

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.2521	2.1400e-003	5.0000e-005	0.3213
Unmitigated	0.2521	2.1400e-003	5.0000e-005	0.3213

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.065154 / 0.0410754	0.2521	2.1400e-003	5.0000e-005	0.3213
Total		**0.2521**	**2.1400e-003**	**5.0000e-005**	**0.3213**

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Single Family Housing	0.065154 / 0.0410754	0.2521	2.1400e-003	5.0000e-005	0.3213
Total		**0.2521**	**2.1400e-003**	**5.0000e-005**	**0.3213**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.4994	0.0295	0.0000	1.2371
Unmitigated	0.4994	0.0295	0.0000	1.2371

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	2.46	0.4994	0.0295	0.0000	1.2371
Total		**0.4994**	**0.0295**	**0.0000**	**1.2371**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Single Family Housing	2.46	0.4994	0.0295	0.0000	1.2371
Total		**0.4994**	**0.0295**	**0.0000**	**1.2371**

9.0 Operational Offroad

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

EMFAC Off-Model Adjustment Factors for Gasoline Light Duty Vehicle to Account for the SAFE Vehicle Rule Not Applied

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

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

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX D

Revised Biological Assessment

HAMILTON BIOLOGICAL

September 9, 2020

Mr. Miguel Uribe
ATOM Development Group
802 South Ditman Avenue
Los Angeles, CA 90023

SUBJECT: REVISED BIOLOGICAL ASSESSMENT
APN 8523-002-045, NORUMBEGA DRIVE
CITY OF MONROVIA, LOS ANGELES COUNTY, CALIFORNIA

Dear Mr. Uribe,

At your request, I have conducted a Biological Assessment required by the City of Monrovia (City) for a proposed single-family residential development project at APN 8523-002-045, located across the street from 558 Norumbega Drive; see Figures 1 and 2. The property covers approximately 1.3 acre, and is located in an existing residential neighborhood adjacent to the San Gabriel Mountains.

The goals of the biological assessment were: (1) to characterize the site's vegetation; (2) to identify the plant and wildlife species present, or potentially occurring, on the site, including listed and otherwise sensitive species; and (3) to evaluate the proposed actions (construction of a single-family residence) in the context of the applicable local, state, and federal planning regulations and policies. This letter report describes the study's methods, reports my observations, and specifies my recommendations and conclusions. This report has been revised to reflect information from the land owner concerning ongoing bi-monthly vegetation control on the property, an existing land use that lowers the potential for rare plant species to occur on the site.

METHODS

On January 30, 2020, I accessed Calflora (www.calflora.org) and the California Native Plant Society's Online Inventory (www.rareplants.cnps.org) and searched for sensitive plant species known from the San Gabriel Mountain foothills.

On January 30, 2020, I reviewed the California Natural Diversity Data Base (2019, 2020a, 2020b) to develop a list of a list of sensitive species recorded in the U.S. Geologic Survey's Pasadena 7.5' topographic quadrangle.

316 Monrovia Avenue — Long Beach, CA 90803 — 562-477-2181 — robb@hamiltonbiological.com

Figure 1. The property is located in Monrovia, in an existing residential neighborhood adjacent to the San Gabriel Mountains. Aerial Source: Google Earth Pro.

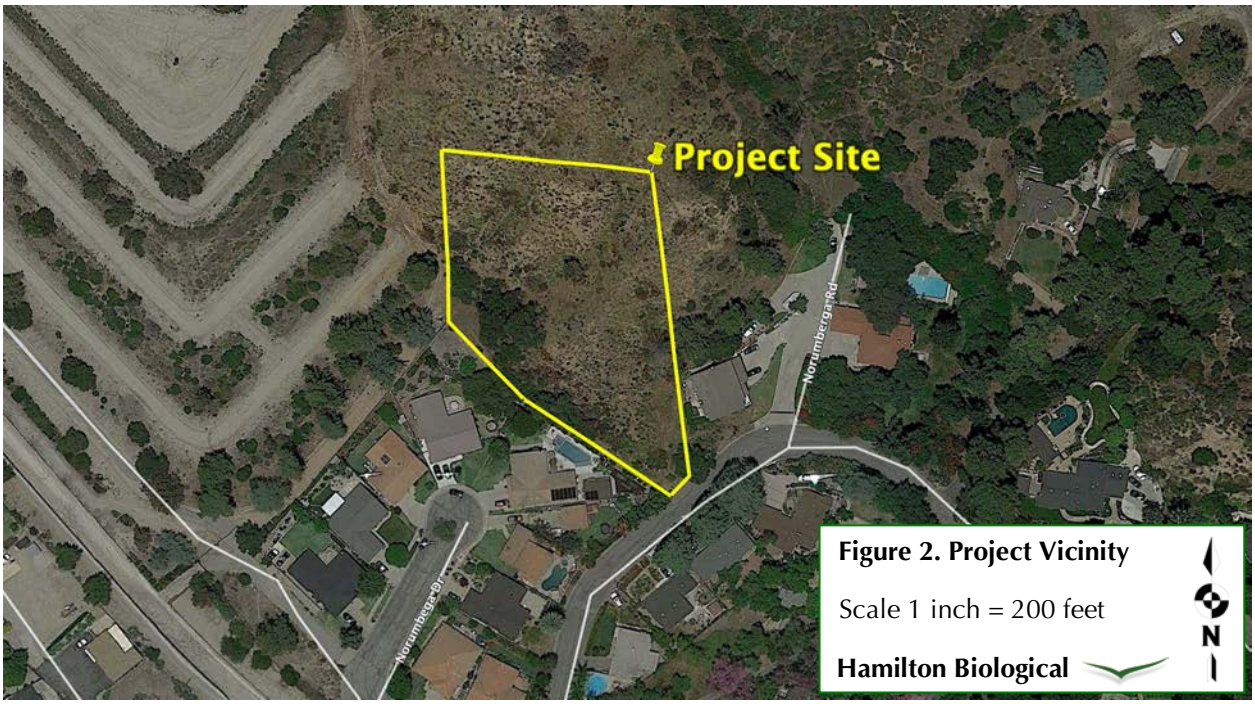


Figure 2. The property is located across the street from 554 Norumbega Drive. Existing homes lie to the south of the property and natural open space lies to the north. Aerial Source: Google Earth Pro.

On January 31, 2020, I conducted a field visit from 10:05 a.m. to 12:05 p.m. The temperature was 66–75° F, skies were clear, and winds were 1–3 miles per hour. I walked the entire project site and recorded all plant species observed there. I also recorded all wildlife species present on and directly adjacent to the site, including examination of the site for tracks, scat, and other sign. I mapped the plant communities present, and evaluated the potential for wildlife to move through the site.

RESULTS

Please refer to the attached species lists for the scientific names of all species recorded during the surveys. In the following discussions, scientific names are provided only for plant species, and for and wildlife species not recorded during the surveys.

Topography and Surrounding Land Uses

The property occupies a steep, southeast-facing slope in an existing hillside residential neighborhood. Elevation ranges from approximately 829 feet on the southern property boundary, at Norumbega Drive, to 978 feet at the northern property boundary. No streambeds or seasonal drainage courses occur on the project site.

Soils

Soils on the project site consist of the following:

- Trigo family, granitic substratum, 60 to 90 percent slopes.
- Urban land-Soboba complex, 0 to 5 percent slopes.

The **Trigo family** consists of very shallow or shallow, somewhat excessively drained soils that formed in material weathered from granitic, metamorphic, or sedimentary rocks. The soils are on mountainsides and ridges at elevations of 800 to 6,400 feet. Slopes range from 5 to 100 percent. Annual precipitation is 10 to 30 inches. Taxonomic Class: These soils are loamy, mixed, nonacid, thermic shallow Typic Xerorthents. Texture: Gravelly loam, sandy loam, fine sandy loam, gravelly sandy loam, or sandy clay loam.

The **Urban land-Soboba complex** consists of a disturbed soil profile derived from the Soboba series (urban land series soils are typically disturbed and do not resemble any mapped soil unit due to anthropogenic modification of the profile). The **Soboba** series consists of very deep, excessively drained soils that formed in alluvium from granitic sources. In their undisturbed state, these soils are on alluvial fans and flood plains, on shallow slopes (0 to 15 percent).

Plant Communities

The property supports oak woodland and disturbed chaparral/coastal sage scrub; see Figure 3, below.

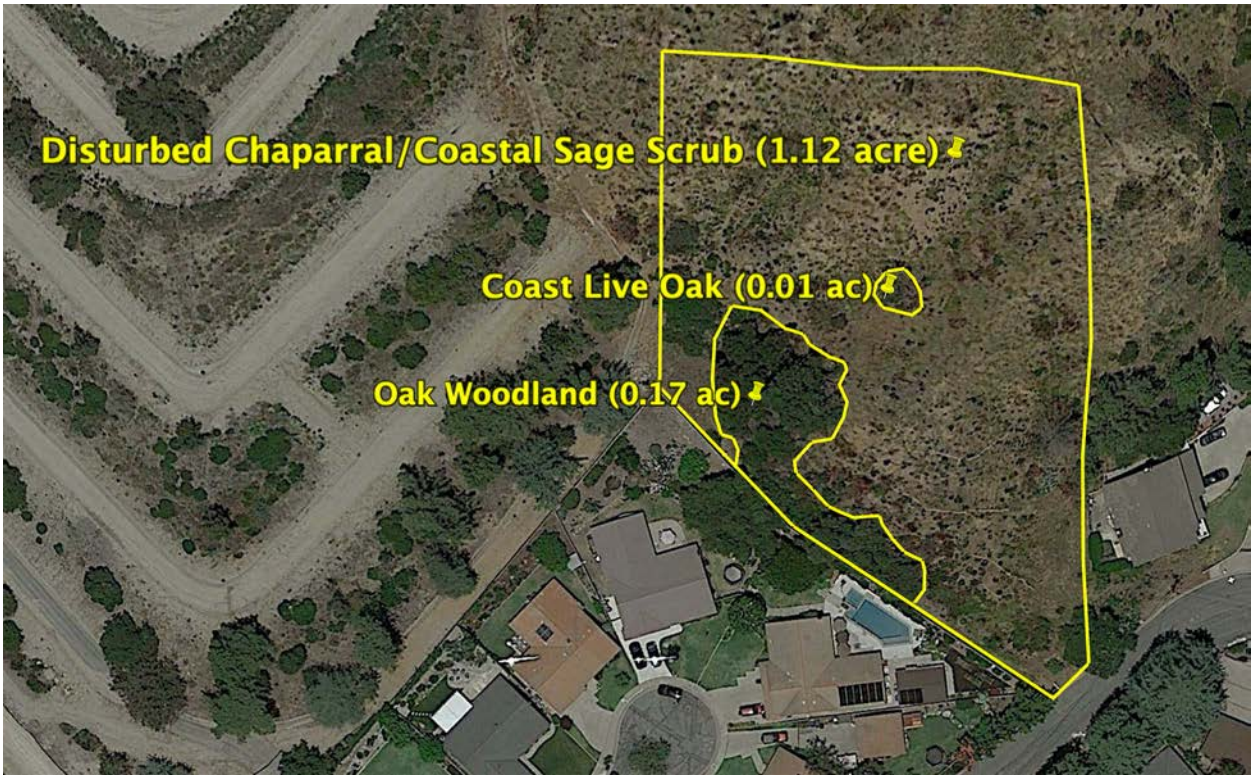


Figure 3. Plant Communities.

Disturbed Chaparral/Coastal Sage Scrub

Approximately 1.12 acre of the property is dominated by Fountain Grass (*Pennisetum setaceum*) with scattered Castor Bean (*Ricinus communis*); these are non-native, invasive plants found in areas with a history of disturbance. The land owner reports that the site has been subject to repeated spraying for weeds, every two months, as required by the City. Many non-native annual grasses and forbs were sprouting, especially in the flatter southeastern part near Norumbega Drive; these include Shortpod Mustard (*Hirschfeldia incana*), Petty Spurge (*Euphorbia peplus*), Henbit (*Lamium amplexicaule*), Bur Chervil (*Anthriscus caucalis*). Many plants were not yet developed enough to be identifiable to species. Scattered among the non-native plants are native species characteristic of chaparral and coastal sage scrub in the local foothills. Native shrubs observed include Laurel Sumac (*Malosma laurina*), Redberry (*Rhamnus crocea*), Chamise (*Adenostoma fasciculatum*), Wishbone Bush (*Mirabilis californica*), Sweetbush (*Bebbia juncea*), and White Sage (*Salvia apiana*). Native forbs and vines observed include Wild Cucumber (*Marah macrocarpa*), Deerweed (*Acmispon glaber*), Mustard Evening-Primrose (*Eulobus californicus*), Showy Penstemon (*Penstemon spectabilis*), Common Sunflower (*Helianthus annuus*), and Redgland Spurge (*Euphorbia melanadenia*).

Oak Woodland

The southwestern part of the site supports approximately 0.17 acre of oak woodland, dominated by the native Coast Live Oak (*Quercus agrifolia*). An isolated Coast Live Oak also occurs in the middle of the property. The understory of the oak woodland includes such native species as Coffeeberry (*Frangula californica*), Two-color Rabbit-Tobacco (*Pseudognaphalium biolettii*), Douglas's Nightshade (*Solanum douglasii*), and Canyon Sunflower (*Venegasia carpesioides*); non-native species observed include Hairy Beggarticks (*Bidens pilosa*), Garden Nasturtium (*Tropaeolum majus*), and Smilo Grass (*Stipa miliacea*).

Site Photos

The following representative photos of the property were taken during the site visit.

Photo 1. View from Norumbega Drive facing northwest, showing the lower part of the property. January 31, 2010.

Robert A. Hamilton

Photo 2. Showing non-native Fountain Grass and Castor Bean in the foreground, and native Coast Live Oak and Lauren Sumac in the background. January 31, 2010.

Robert A. Hamilton

Photo 3. View facing north from the southern half of the property, showing extensive Fountain Grass and a solitary Coast Live Oak in the right foreground. The oak at the top of the hill is off the property.

January 31, 2010.

Robert A. Hamilton

Photo 4. Showing the predominance of non-native Fountain Grass and Castor Bean, indicating past and ongoing disturbance of the site.
January 31, 2010.

Robert A. Hamilton

Photo 5. View facing east from the middle of the property. The dense carpet of non-native Fountain Grass indicates a past and ongoing disturbance on the site.

January 31, 2010.

Robert A Hamilton

Wildlife

Two lizard species, the Side-blotched Lizard and Western Fence Lizard, were observed on the site. A total of 19 bird species were observed, including the Red-tailed Hawk, Mourning Dove, Anna's Hummingbird, Allen's Hummingbird, Bewick's Wren, House Finch, Lesser Goldfinch, and Rufous-crowned Sparrow. One species of mammal was observed, the California Ground Squirrel, as well as the holes of Botta's Pocket Gopher.

Sensitive Biological Resources

Sensitive species are listed as threatened or endangered by state or federal governments, or are of current local, regional or state concern (see California Natural Diversity Database 2019, 2020a, 2020b; Allen et al. 2009). Legal protection for sensitive species varies widely, from the relatively comprehensive protection extended to listed threatened/endangered species to no legal status at present.

No listed or otherwise sensitive plant or wildlife species were observed on the site during the field visit. The following Table A includes plant and wildlife species known from chaparral, coastal sage scrub, and oak woodland habitats in the general area of the project site, as determined through review of the literature. Due to repeated spraying of the site for weed control and fuel modification, the potential for low-growing rare plant species to occur on the site is considered to be very low.

Table A uses the following abbreviations:

- **E Endangered** (listed by State or Federal governments). "Take" of the species or disturbance of occupied habitat are prohibited unless specifically authorized.
- **FP Fully Protected** by the State of California. These species may not be taken or possessed at any time, although take may be authorized for necessary scientific research.
- **T Threatened** (listed by State or Federal governments). "Take" of the species or disturbance of occupied habitat are prohibited unless specifically authorized.
- **SSC Species of Special Concern**. The California Department of Fish and Wildlife has designated certain vertebrate species as Species of Special Concern because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as Species of Special Concern is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long term viability. Not all Species of Special Concern have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing as a Threatened or Endangered species under the State and/or Federal Endangered Species Acts.

- **CNPS California Native Plant Society.** Table A includes plant species assigned the following ranks by CNPS:
    - **1A**, referring to species CNPS presumes to be extinct.
    - **1B.1**, referring to species CNPS considers to be rare, threatened, or endangered in California and elsewhere; seriously threatened in California (over 80% of occurrences threatened / high degree and immediacy of threat).
    - **1B.2**, referring to species CNPS considers to be rare, threatened, or endangered in California and elsewhere; moderately threatened in California (20-80% of occurrences threatened / moderate degree and immediacy of threat).
    - **1B.3**, referring to species CNPS considers to be rare, threatened, or endangered in California and elsewhere; not very threatened in California (less than 20% of occurrences threatened / moderate degree and immediacy of threat).
    - **2B.2**, referring to species CNPS considers to be rare, threatened, or endangered in California, but more common elsewhere; moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat).
    - **4.1**, referring to species of limited distribution or infrequent throughout a broader area in California, whose status should be monitored regularly; moderately threatened in California (>80% occurrences threatened / moderate degree and immediacy of threat).
    - **4.2**, referring to species of limited distribution or infrequent throughout a broader area in California, whose status should be monitored regularly; moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat).
    - **4.3**, referring to species of limited distribution or infrequent throughout a broader area in California, whose status should be monitored regularly; not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known).

- **NatureServe Element Rankings.** In some cases, species have not been granted special status by state or federal agencies, but they may be recognized as ecologically sensitive by the California Natural Diversity Database, which uses a ranking methodology maintained by NatureServe. Species are given a Global rank (G-rank) that applies to the taxon's entire distribution, and a State rank (S-rank) that applies to the taxon's state distribution. Taxa with rankings of G1, G2, G3, S1, S2, or S3 may be considered "sensitive" and potentially worthy of special consideration in resource planning. NatureServe Element Rankings are identified in Table A only for taxa that have no other federal or state/CNPS special status. If no rank provided, either the taxon's rank is above G3/S3 (and is thus considered "apparently secure" or "secure" at global and state levels) or the taxon is not yet ranked.

  NatureServe Ranks:

    - **G1, Critically Imperiled,** referring to taxa at very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
    - **G2, Imperiled,** referring to taxa at high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

- **G3, Vulnerable,** referring to taxa at moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.
- **S1, Critically Imperiled,** referring to taxa critically imperiled in the state because of extreme rarity (often 5 or fewer populations) or because of factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
- **S2, Imperiled,** referring to taxa imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.
- **S3, Vulnerable,** referring to taxa vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation from the state.

Table A. Sensitive Species

Latin name	Common name	Fed	State	CNPS	Local and/or Regional Status	Discussion
Plants						
Asplenium vespertinum	Western Spleenwort	—	—	4.2	Found in rocky areas in chaparral, coastal sage scrub, oak woodland. Scattered records in the local area.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.
Astragalus brauntonii	Braunton's Milkvetch	E	—	1B.1	Found in openings on calcareous soils. Several records from hills above Monrovia.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Calochortus catalinae	Catalina Mariposa Lily	—	—	4.2	Widespread in region, including in project vicinity.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Calochortus clavatus var. *clavatus*	Slender Mariposa Lily	—	—	4.3	Widespread in region. Historical records from project vicinity.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Calochortus clavatus var. *gracilis*	Slender Mariposa Lily	—	—	1B.2	Widespread in region. Historical records from project vicinity.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Calochortus plummerae	Plummer's Mariposa Lily	—	—	4.2	Widespread in region. Several records from project vicinity.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Calochortus weedii var. *intermedius*	Intermediate Mariposa Lily	—	—	4.2	Widespread in region. Several records from project vicinity.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Dudleya cymosa ssp. *crebrifolia*	San Gabriel River Dudleya	—	—	1B.2	Known only from rocky habitats along the San Gabriel River.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.

Latin name	Common name	Fed	State	CNPS	Local and/or Regional Status	Discussion
Dudleya densiflora	San Gabriel Mountains Dudleya	—	—	1B.1	Known only from rocky habitats in the San Gabriel Mountains east of the project site.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.
Dudleya multicaulis	Many-stemmed Dudleya	—	—	1B.2	Known from rocky habitats at lower elevations, mainly south and east of the project site.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Galium angustifolium ssp. *gabrielense*	San Antonio Canyon Bedstraw	—	—	4.3	Known from chaparral and woodlands in the San Gabriel Mountains, including in the project vicinity.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Galium grande	San Gabriel Bedstraw	—	—	1B.2	Known from chaparral and woodlands in the San Gabriel Mountains, including in the project vicinity.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Heuchera caespitosa	Urn-flowered Alumroot	—	—	4.3	Known from oak woodlands in the San Gabriel Mountains, mostly at higher elevation.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Horkelia cuneata ssp. *puberula*	Mesa Horkelia	—	—	1B.1	Sandy openings in native communities. Scattered records across the region.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.
Imperata brevifolia	California Satintail	—	—	2B.1	Found in chaparral, coastal sage scrub, oak woodland. Historical records from Project vicinity.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.
Juglans californica	Southern California Black Walnut	—	—	4.2	Widespread in region.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.
Lepechinia fragrans	Fragrant Pitcher Sage	—	—	4.2	Known from chaparral and woodlands in the San Gabriel Mountains, including in the project vicinity.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.
Pseudognaphalium leucocephalum	White Rabbit-tobacco	—	—	2B.2	Occurs in openings in natural communities, including in the project vicinity.	Very low potential for occurrence due to repeated and ongoing site disturbance.
Quercus durata var. gabrielensis	San Gabriel Mtn. Leather Oak	—	—	4.2	Known from chaparral and woodlands in the San Gabriel Mountains, including in the project vicinity.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.

Latin name	Common name	Fed	State	CNPS	Local and/or Regional Status	Discussion
Quercus engelmannii	Engelmann Oak	—	—	4.2	Known from chaparral and woodlands in the San Gabriel Mountains, including in the project vicinity.	Very low potential for occurrence. Would have been visible during the field survey but was not observed.
Invertebrates						
Bombas crotchii	Crotch's Bumblebee	—	S1S2	—	Historical and recent records scattered around southern California.	Low potential for occurrence due to repeated and ongoing site disturbance.
Helminthoglypta tudiculata	Southern California Shoulderband Snail	—	S1S2	—	Numerous records from coastal slope of southern California.	Moderate potential on property to occur in oak woodland on site.
Reptiles						
Phrynosoma blainvillii	Coast Horned Lizard	—	SSC	—	Found in expansive natural areas with sandy openings and native harvester ants.	Moderate potential on property to occur due to site disturbance.
Aspidoscelis tigris stejnegeri	Coastal Whiptail	—	SSC	—	Widespread in the region, in various habitats.	High potential on property; tolerant of disturbance.
Anniella stebbinsi	So. California Legless Lizard	—	SSC	—	Local in a variety of habitats with sandy soil or deep leaf-litter.	Moderate potential on property in oak woodland.
Arizona elegans occidentalis	California Glossy Snake	—	SSC	—	Widespread, but uncommon, in habitats with soil loose enough for easy burrowing.	Moderate potential on property to occur due to site disturbance.
Salvadora hexalepis virgultea	Coast Patch-nosed Snake	—	SSC	—	Widespread in the region, in brushy and rocky habitats.	Moderate potential on property to occur due to site disturbance.
Birds						
Geococcyx californianus	Greater Roadrunner	—	G5	—	Widespread in expansive natural areas with shrub cover. Sensitive species in Los Angeles County (Allen et al. 2009).	High potential on property to occur due to lack of intact natural communities.
Circus hudsonius	Northern Harrier	—	SSC	—	Nests on the ground in expansive open space areas; more widespread during migration and winter.	Expected to occur occasionally during migration and possibly winter.
Buteo regalis	Ferruginous Hawk	—	G4/ S3S4	—	Winters in expansive rangelands and agricultural areas in the region. Sensitive species in Los Angeles County (Allen et al. 2009).	Expected to occur occasionally during migration and possibly winter.
Lanius ludovicianus	Loggerhead Shrike	—	SSC	—	Winters in expansive rangelands and agricultural areas in the region.	Potentially occurs occasionally during migration and possibly winter.

Latin name	Common name	Fed	State	CNPS	Local and/or Regional Status	Discussion
Sialia currucoides	Mountain Bluebird	—	—	—	Winters in expansive open areas. Sensitive species in Los Angeles County (Allen et al. 2009).	Potentially occurs occasionally during migration and possibly winter.
Pooecetes gramineus affinis	Oregon Vesper Sparrow	—	SSC	—	Winters in expansive open areas. Sensitive species in Los Angeles County (Allen et al. 2009).	Potentially occurs occasionally during migration and possibly winter.
Mammals						
Antrozous pallidus	Pallid Bat	—	SSC	—	Widespread in chaparral and similar habitats, foraging on the ground and in vegetation. Roosts in rock crevices and under tree bark. Maternal roosts active between March and August.	Low potential to forage on site.
Eumops perotis californicus	Western Mastiff Bat	—	SSC	—	Roosts in cliff crevices and in buildings.	Species may fly over the site occasionally while foraging, but suitable cliff roosting habitat absent.
Chaetodipus fallax fallax	NW San Diego Pocket Mouse	—	SSC	—	Scrub habitats with sandy or gravelly soils.	Low potential to occur due to site disturbance.
Taxidea taxus	American Badger	—	SSC		Occurs in various habitats, usually in expansive open space areas.	Low potential to occur. Suitable habitat is limited on the property.

The project site supports several Coast Live Oaks (*Quercus agrifolia*), a species of native tree that is not biologically "sensitive" but that does generally provide habitat for a variety of wildlife species. Native oaks are afforded protection under the City of Monrovia's Oak Tree Preservation Plan (Section 17.20.040 of the Monrovia Municipal Code) when any of the following conditions are met:

- Any trees in the oak family that measure ten inches in diameter or more at two feet above the level ground.
- Oak trees located in the front yard or street facing side yard of single-family properties.
- All oak trees located in the multiple-family, commercial or industrial zones (exception are single-family developed properties where no additional development is proposed are subject to same conditions as single-family zoned properties).
- All oak trees on vacant lots.
- All oak trees indicated on an oak tree preservation plan.

The oak trees on the project site occupy a vacant lot, and thus an oak tree preservation permit will be required from the City of Monrovia.

Wildlife Movement

The project site is very steep, and lies on the edge of the urban/wildland interface. Based on its topography and position relative to existing development in the City of Monrovia, the site does not appear to play a substantial role in facilitating the movement of any terrestrial wildlife species through the local area or wider region.

Regulations Protecting Nesting Birds

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) of 1918 implemented the 1916 Convention between the U.S. and Great Britain (for Canada) for the protection of migratory birds. Later amendments implemented treaties between the U.S. and Mexico, the U.S. and Japan, and the U.S. and the Soviet Union (now Russia). At the heart of the MBTA is this language:

> Establishment of a Federal prohibition, unless permitted by regulations, to "pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird, included in the terms of this Convention . . . for the protection of migratory birds . . . or any part, nest, or egg of any such bird." (16 U.S.C. 703)

For many years, this language was subject to broad interpretation, which in some cases led to prosecution for violations of the MBTA that were incidental to otherwise lawful activities, such as tree trimming. On December 22, 2017, the federal government issued revised guidance on the MBTA that reached the following conclusion:

> The text, history, and purpose of the MBTA demonstrate that it is a law limited in relevant part to affirmative and purposeful actions, such as hunting and poaching, that reduce migratory birds and their nests and eggs, by killing or capturing, to human control. Even assuming that the text could be subject to multiple interpretations, com1s and agencies are to avoid interpreting ambiguous laws in ways that raise grave Constitutional doubts if alternative interpretations are available. Interpreting the MBTA to criminalize incidental takings raises serious due process concerns and is contrary to the fundamental principle that ambiguity in criminal statutes must be resolved in favor of defendants. Based upon the text, history, and purpose of the MBTA, and consistent with decisions in the Courts of Appeals for the Fifth, Eighth, and Ninth circuits, there is an alternative interpretation that avoids these concerns. Thus, based on the foregoing, we conclude that the MBTA's prohibition on pursuing, hunting, taking, capturing, killing, or attempting to do the same applies only to direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests, by killing or capturing, to human control.

Thus, at this time, the MBTA is not considered relevant to this project.

California Fish and Game Code

Section 3503 of the California Fish and Game Code states, "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Thus, in California, it remains a po-

tential State offense to knowingly disrupt an active nest of virtually any native bird species. The term "active nest" is not clearly defined in the Fish and Game Code, and in some circumstances may be left to the discretion of the biologist in the field. At present, wardens for the California Department of Fish & Wildlife (CDFW) typically define an active nest as one that is completed and holding at least one egg.

EVALUATION OF POTENTIAL PROJECT EFFECTS

Project Effects Considered Not Potentially Significant

The 1.3-acre project site consists mainly of highly disturbed chaparral/coastal sage scrub (1.17 acre) plus 0.13 acre of somewhat disturbed oak woodland. No wetlands, riparian habitat, or sensitive natural communities are present. The site does not represent a component of any habitat linkage/wildlife movement corridor.

The site supports several native Coast Live Oaks (*Quercus agrifolia*) that are afforded protection under Section 17.20.040 of the Monrovia Municipal Code, and thus an oak tree preservation permit will be required from the City of Monrovia.

The site's apparent history of disturbance — as evidenced by the strong dominance of non-native Fountain Grass throughout most of the site — greatly limits the potential for most sensitive species to occur there. The property owner reports spraying the site with herbicide every two months to control weeds and to protect against fire, which greatly reduces the potential for several sensitive plant species are judged to have at least some potential to occur on the site. Therefore, while the initial biological survey on January 31, 2020, was too early in the season for many annual species to be identifiable, it is my opinion that the potential for rare plants to occur on the site is very low. For this reason, a supplemental spring survey during the main spring flowering period would be very unlikely to produce any observations of rare plants that were not visible during the January survey.

The property does not occur within a Significant Ecological Area, Natural Communities Conservation Plan (NCCP) area, or other local or regional conservation planning area, and implementation of the proposed project would not have a significant adverse effect on local or regional planning efforts.

Disruption of the nesting of any native bird species would represent a violation of Sections 3503 and 3513 of the California Fish and Game Code.

For the reasons discussed above, the biological effects of constructing a house on this parcel would be less than significant, with the following conditions:

- An oak tree preservation permit is obtained from the City of Monrovia in accordance with Section 17.20.040 of the Monrovia Municipal Code.
- Impacts to actively nesting birds are avoided.

RECOMMENDED MITIGATION/AVOIDANCE MEASURES

The landowner should work with a qualified arborist to obtain an oak tree preservation permit compliance with Section 17.20.040 of the Monrovia Municipal Code, should be obtained a certified arborist.

In order to avoid potential impacts to nesting birds, it is recommended that any necessary pruning or removal of trees be conducted outside of the typical nesting season for native birds in the region. This period is variable, but generally extends from February 1 to August 31. If pruning or removal of any trees or large shrubs must be conducted during the nesting bird season, a qualified biologist should first conduct a survey to determine whether any native birds are nesting in the area. If any active nests are found (i.e., complete nests with at least one egg), they should be avoided until after all young have fledged from the nest.

FINDINGS OF SIGNIFICANCE

With implementation of the recommended mitigation/avoidance measures, project implementation would not result in any significant impacts to biological resources.

CONCLUSION

Thank you for the opportunity to work on this interesting project. Please call me at 562-477-2181 if you have questions or wish to further discuss any matters; you may send e-mail to robb@hamiltonbiological.com.

Sincerely,

Robert A. Hamilton
President, Hamilton Biological, Inc.

LITERATURE CITED

Allen, L. W., and Los Angeles County Sensitive Bird Species Working Group. 2009. Los Angeles County's Sensitive Bird Species. Western Tanager 75(3):E1–E11. http://planning.lacounty.gov/site/sea/wp-content/uploads/2018/08/LA-Countys-Sensitive-Bird-Species.pdf

California Natural Diversity Database. 2019. Special Animals List. Current list of wildlife taxa considered to be rare, threatened, endangered, or otherwise "sensitive" by the State of California. List dated August 2019.

California Natural Diversity Database. 2020a. Special Vascular Plants, Bryophytes, and Lichens List. Current list of vegetative taxa considered to be rare, threatened, endangered, or otherwise "sensitive" by the State of California. List dated January 2020.

California Natural Diversity Data Base. 2020b. Rarefind data accessed online on January 30, for the U.S. Geologic Survey's Pasadena 7.5' topographic quadrangle.

LIST OF VASCULAR PLANTS AND VERTEBRATE WILDLIFE DETECTED

The following list identifies plant and wildlife species detected during the current study in upland habitats within the expanded study area. Sources:

Calflora: Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of California Herbaria. 2014. Berkeley, California: The Calflora Database [a non-profit organization]. http://www.calflora.org/

* Taxon not native to the study area

VASCULAR PLANTS

SECTION: GYMNOSPERMS

Pinaceae - Pine Family

* *Pinus halepensis*, Aleppo Pine

SECTION: EUDICOTS

Anacardiaceae - Sumac Family

Malosma laurina, Laurel Sumac

Apiaceae - Carrot Family

* *Anthriscus caucalis*, Bur Chevril

Asteraceae - Sunflower Family

Artemisia dracunculus, Tarragon
Bebbia juncea, Sweetbush
Brickellia californica, California Brickellbush
Helianthus annuus, Common Sunflower
Pseudognaphalium biolettii, Two-color Rabbit-Tobacco
Venegasia carpesioides, Canyon Sunflower

Boraginaceae – Forget-me-not Family

Phacelia sp., phacelia

Brassicaceae - Mustard Family

* *Hirschfeldia incana*, Short-pod Mustard

Cactaceae – Cactus Family

* *Opuntia ficus-indica*, Indian Fig

Chenopodiaceae - Goosefoot Family

* *Atriplex semibaccata*, Australian Saltbush

Cucurbitaceae - Cucumber Family

Marah macrocarpa, Wild Cucumber

Euphorbiaceae - Spurge Family

* *Euphorbia peplus*, Petty Spurge
Euphorbia melanadenia, Red-gland Spurge
* *Ricinus communis*, Castor Bean

Fabaceae - Pea Family

Acmispon glaber, Deerweed
Lupinus hirsutissimus, Stinging Annual Lupine

Fagaceae – Oak Family

Quercus agrifolia, Coast Live Oak

Moraceae - Fig Family

* *Ficus benjamina*, Weeping Fig

Lamiaceae - Mint Family

* *Lamium amplexicaule*, Henbit
Salvia apiana, White Sage
Salvia columbariae, Chia

Nyctaginaceae – Four O'Clock Family

Mirabilis californica, Wishbone Bush

Onagraceae – Evening-Primrose Family

Eulobus californicus, Mustard Evening-Primrose

Plantaginaceae – Plantain Family

Penstemon spectabilis, Showy Penstemon

Polygonaceae – Buckwheat Family

Eriogonum fasciculatum, California Buckwheat

Rhamnaceae – Buckthorn Family

Rhamnus crocea, Redberry
Ceanothus sp., ceanothus
Frangula californica, Coffeeberry

Rosaceae – Rose Family

Adenostoma fasciculatum, Chamise

Solanaceae – Nightshade Family

Solanum douglasii, Douglas's Nightshade

Tropaeolaceae – Nasturtium Family

* *Tropaeolum majus*, Garden Nasturtium

SECTION: MONOCOTS

Asparagaceae – Asparagus Family

Hesperoyucca whipplei, Whipple's Yucca

Poaceae - Grass Family

* *Avena fatua*, Common Oat
* *Bromus diandrus*, Ripgut Brome
* *Stipa miliacea*, Smilo Grass

VERTEBRATE WILDLIFE

CLASS REPTILIA – REPTILES

Phrynosomatidae – North American Spiny Lizard Family

Uta stansburiana, Side-blotched Lizard
Sceloperus occidentalis, Western Fence Lizard

CLASS AVES – BIRDS

Columbidae – Pigeon and Dove Family

Zenaida macroura, Mourning Dove

Trochilidae - Hummingbird Family

Calypte costae, Costa's Hummingbird
Calypte anna, Anna's Hummingbird
Selasphorus sasin, Allen's Hummingbird

Accipitridae – Vultures, Hawks, and Allies

Buteo jamaicensis, Red-tailed Hawk

Picidae – Woodpecker Family

Dryobates nuttallii, Nuttall's Woodpecker

Corvidae – Jay, Magpie, Crow, and Raven Family

Aphelocoma californica, California Scrub-Jay
Corvus corax, Common Raven

Troglodytidae - Wren Family

Thryomanes bewickii, Bewick's Wren

Aegithalidae – Bushtit and Long-tailed Tit Family

Psaltriparus minimus, Bushtit

Regulidae – Kinglet Family

Regulus calendula, Ruby-crowned Kinglet

Paridae - Titmouse Family

Baeolophus inornatus, Oak Titmouse

Mimidae – Catbird, Mockingbird, and Thrasher Family

Mimus polyglottos, Northern Mockingbird
Toxostoma redivivum, California Thrasher

Fringillidae - Finch Family

Haemorhous mexicanus, House Finch
Spinus psaltria, Lesser Goldfinch

Passerellidae – New World Sparrow Family

Aimophila ruficeps, Rufous-crowned Sparrow

Melozone crissalis, California Towhee

Parulidae – New World Warbler Family

Setophaga coronata, Yellow-rumped Warbler

CLASS MAMMALIA – MAMMALS

Geomyidae - Pocket Gopher Family

Thomomys bottae, Botta's Pocket Gopher

Sciuridae - Squirrel Family

Otospermophilus beecheyi, California Ground Squirrel

APPENDIX E

Arborist Report

Arborist Report

NORUMBEGA DRIVE (APN: 8523-002-045)

Miguel Uribe for Margurita G. Figueroa
Hard Hat Construction
hardhatconstruction.ymail.com

April 13, 2020

PREPARED BY:

REBECCA LATTA CONSULTING

359 NORTH WESTRIDGE AVE

GLENDORA CALIFORNIA 91741

(626) 272-8444

ISA Certified Arborist #WE-4264A

ISA Qualified Tree Risk Assessor

Member, American Society of Consulting Arborists

Member, California Native Plant Society

TABLE OF CONTENTS

Appendices

EXECUTIVE SUMMARY

Rebecca Latta Consulting conducted a tree survey at Norumbega Drive (APN: 8523-002-045) for a proposed single-family residence. A total of eight coast live oak *(Quercus agrifolia*) trees were located, one off-property and seven on the property that are protected by the City of Monrovia Oak Tree Preservation Ordinance.

Based on the level of proposed disturbance from construction **two protected oaks are proposed for encroachments and no trees are recommended for removal to construct the residence.** Specific impacts include encroachment into the root zone and dripline from a proposed retaining wall. It is our recommendation that exploratory trenching occur under observation by our office along the limit of the retaining wall occur prior to wall construction to determine the extent of root impacts. It is the intent of the client to keep the trees for screening and privacy. While the retaining wall is located close to the trees, there is an existing drop-off in the approximate location of the retaining wall.

All trees to remain that are not inaccessible should be protected during construction with fencing as recommended in this report and/or having a qualified arborist present onsite to protect trees from impacts.

INTRODUCTION

This report includes the results of a tree survey conducted by Rebecca Latta Consulting for a proposed single-family development on a vacant lot (Assessor's Parcel Number [APN]: 8523-002-045) adjacent to the south of 547 Norumbega Drive in the City of Monrovia in Los Angeles County California. The purpose of this report is to assess impacts to oak trees on the parcel that are protected by the City of Monrovia Oak Tree Preservation Ordinance. The scope of this report includes a description of the proposed project and survey area, methods used to survey and assess the trees, a discussion of the proposed project's impacts to protected oak trees, and recommended mitigation.

Appendix 'A' contains the tree map and Appendix 'B' contains the tree photos

PROJECT DESCRIPTION

Please refer to the plans in Appendix 'A'. The proposed project includes the new construction of a 3,784 square-feet (ft^2) two-story home with a basement level 1,348 ft2 garage and a driveway that totals approximately 6,000 ft^2 of surface in the area shown in the Site Plan and Figure 1 in Appendix A. Retaining walls are proposed on the north and eastern edges of the property.

MONROVIA OAK TREE PRESERVATION ORDINANCE

According to the City of Monrovia Oak Tree Preservation Ordinance (17.20.40 of the Monrovia Municipal Code) all coast live oak (*Quercus agrifolia*) on vacant lots that are 10-inches in diameter or more when measured at 2-feet above the level ground (diameter at breast height [dbh]) are protected. An oak tree preservation permit is required from the City prior to removal, pruning of one-third of the crown or root system, or if irrigation is installed or grading takes place within the dripline of a protected oak. An oak tree location map and a report describing the condition of the protected oaks that would be impacted by construction is required to apply for an oak tree preservation permit from the City.

LIMITS TO ASSIGNMENT

The findings in this report are based solely on a visual inspection of the site and trees conducted on March 18, 2020 and April 11, 2020. The tree inspections were limited to ground level visual observations; root crown inspections and aerial inspections were not conducted.

PURPOSE AND USE

This report is prepared to inventory trees on and adjacent to the site and analyze construction impacts to protected trees. Upon submission, this report will become the property of Margurita G. Figueroa and her designees and its use will be at her discretion.

METHODS

Certified arborist Rebecca Latta conducted an oak tree survey on the southern half of the parcel on March 18, 2020 and certified arborist Matthew South conducted an oak tree survey of the northern half of the parcel on April 11, 2020. The tree survey area is the project parcel and immediate surrounding areas within 50-feet. The survey included a basic visual assessment of each tree and was limited to ground level visual observations; root crown inspections and aerial inspections were not conducted. A basic visual assessment is a 360-degree inspection of the tree conducted from the ground that includes collection of geographical position of the trunk using a Trimble GPS, and height and diameter measurements. Trees are assessed for structure, disease or insect issues, and overall health. The influence of adjacent trees and other factors affecting the growth of a subject tree, such as wires, cables, or nesting holes, were also taken into consideration when assessing tree condition. Oaks not accessible due to steep and wet conditions or that were off the property were assessed from a safe distance using binoculars, and tree conditions and measurements were estimated.

RESULTS

A total of seven (7) protected coast live oak occur on the parcel and one protected coast live oak occur on the western adjacent parcel and the dripline overhangs the project parcel. Generally, the oaks were located on steep slopes and had considerable erosion at the base of each. Oaks 1 and 2 (see Figure 1) are located at the edge of Norumbega Drive have roots that were previously graded and were in poor health as a result. Oaks 3, 4, and 5 are at the western property edge at the base of a steep slope but also showed signs of disturbance from erosion and grading at the base. Oaks 6, 7, and 8 are on the north facing slope of a steep drainage on the northern portion of the parcel that flows into a storm drain at the northwest corner. Again, these oaks showed signs of erosion at the root zone and had exposed roots. The location of the oaks is shown in Figure 1 in Appendix A and the data collected for each oak is in Appendix B. Appendix C includes a photograph exhibit of the protected oaks.

IMPACTS ANALYSIS

Table 1 summarizes the impacts to protected oaks from the proposed project. As shown in Figure 1, the proposed development would be placed within the dripline of protected coast live oaks #1 and #2 and retaining walls would be near the base of the oaks. No protected oaks are proposed for removal, and all oaks are expected to remain in place.

Table 1. Summary of Tree Survey Results and Impacts

Summary Table	On-property trees	Off-property trees	Total
Protected trees (no impacts)	5	1	6
Protected trees (impacts)	2	0	2
Protected trees (removal recommended)	0	0	0
Total	7	1	8

COAST LIVE OAK #1 - RETAIN

Estimated Impacts - 20% Root, 10% Canopy

This tree is growing co-dominantly with coast live oak tree #2 and their canopies work as one unit. The power company has pruned it on one side severely for line clearance. It should be evaluated for pruning in late summer of 2020 prior to construction to clean up stubs and substandard powerline clearance.

There are dead branches in the canopy from the pruning. The proposed retaining wall to the west is farther away from this tree than it is from #2, but roots will still be impacted.

COAST LIVE OAK #2 - RETAIN

Estimated Impacts - 40% Root, 10% Canopy Impacts Estimated

This tree has some evidence of bacterial disease in the canopy as coast live oak #1. There is dieback that can be removed from the tree. I believe that the tree can be retained but will need to be monitored for any further decline. There is a proposed retaining wall to the west within 3-5 feet of the trunk where the soil already slopes steeply to the west. Some of the footings in this location may need to be converted to pier footings to preserve roots.

RECOMMENDATIONS

Two trees (coast live oak #1 and #2) are proposed for encroachments. No protected trees either on the property or adjacent property are recommended for removal to construct the proposed project. It is recommended that the project arborist meet on site with the contractor, prior to the start of construction to verify that the protective fencing described in the protective measures is in place and to sign an acknowledgement that they have read and understand the tree protection measures for the project.

SPECIFIC PRESERVATION MEASURES FOR OAK TREES #1 AND #2

Carefully pre excavate footing locations in the protected zone is recommended using an Airspade™ to identify roots prior to construction and determine if fence post locations need to be adjusted to avoid large roots. This work is recommended to be observed by the project arborist. All spoils from digging should be placed on ¾ inch plywood or outside the protected zone of the trees.

Pruning Plan for Oak Trees #1 and #2

The dead wood should be removed and the canopy should be reduced on the outer 2/3 of area as it extends towards the street to prevent the branches from falling into the street. The tree has co-dominant structure and needs to have a central leader encouraged. This work should occur under observation by our office using a qualified tree care service provider using the most current standards as listed in the recommendations. Trees should be pruned by qualified arborist using Best Management Pruning Practices (2008) part of ANZI A300 or equivalent. Trees should be pruned as needed, not on a set schedule. More information is available at www.isa-arbor.com.

MONROVIA REQUIRED PROTECTION MEASURES

The following protection requirements from the City of Monrovia Oak Tree Preservation Ordinance must be following during construction of the proposed project:

a) Specified oak trees are to have a protective fence, approved by the Development Review Committee, surrounding the base out at least two-thirds of the total drip line during construction. Permanent decorative fencing may be required by the Development Review Committee as one of the conditions of approval for the project.
b) Grading (cutting and/or filling) within the drip line of the trees shall be approved by the Development Review Committee.
c) Trees that have been damaged by construction shall be repaired in accordance with accepted arboriculture methods by a tree specialist.
d) Oil, gas, chemical, or other construction materials shall not be stored in the drip line of any trees.
e) Drains shall be installed according to expert advice whenever soil fill is placed around trees.
f) Signs, wires, or any type of obstruction shall not be attached to trees.
g) The required landscape and irrigation plan shall be detailed per the needs of the retained tree as specified by a tree specialist. The irrigation system must be on a separate clock.

ADDITIONAL RECOMMENDED PROTECTION MEASURES FOR TREES TO BE RETAINED

These recommendations were developed to minimize any preventable construction related damage to the trees that will remain. It is important to preserve soil structure and fertility by physically protecting the soil from compaction and other maintenance activities that destroy fine roots.

1. Provide protective fencing at the edge of the canopy plus 5 feet. FENCING IS RECOMMENDED TO BE ALREADY INSTALLED AND INSPECTED BY THE PROJECT ARBORIST PRIOR TO THE BEGINNING OF WORK ON-SITE. Tree protection fencing should be a chain link fence with an access gate at least 4 feet high with 2 inch by 6-inch steel posts installed at 8 feet on center**. Post locations to be installed under observation by a qualified consulting arborist to avoid root damage.**

2. Provide a minimum 8.5 inch by 11-inch retroreflective sign spaced a maximum of every 100 feet along each fence perimeter. The signs should display the following information:

    i. “TREE PROTECTION ZONE”

    ii. Name and contact information of project owner or authorized representative.

2. Avoid mechanical injury and compaction to roots, root flares, trunks and branches under the dripline of any tree to be retained. A qualified arborist is recommended be present to observe the area with the roots exposed, prior to undertaking any root pruning or grading. Root pruning on public trees should be performed by city staff.

3. Lay steel plates across any areas near street trees or under protected trees used for access. where construction traffic must run through tree protection zones.
4. No construction staging, washoutor disposal of construction materials or byproducts should be placed within the tree protection zones. Avoid storing soil or material on unprotected natural grade. Containment to be provided for concrete, paint, stucco and other washoutactivities.

5. Equipment should not idle under the driplines of trees. Significant burn can occur to leaves and bark from exhaust and heat.

6. **The tree/root protection zone should be irrigated sufficiently with clean, potable water to keep the tree in good health and vigor before, during and after construction.** Trees should be soaked so that water reaches a depth of 2-3 feet on a monthly basis, starting as soon aspossible.

7. Apply mulch and compost around the trees once every 6 months during construction. **Mulch in the form of wood chips is recommended for application over the surface of the soil to 4 inches deep to preserve moisture and improve soil condition**.

8. INSPECTION: Trees should be inspected on a periodic basis by a qualified tree consultant. The relative age, condition and targets under the tree should determine the inspection frequency. It is the responsibility of the property owner to establish and implement an appropriate inspection schedule based on the recommendation provided by a qualified arboricultural consultant.

Disclaimer:

Arborists are tree specialists who employ their education, knowledge, training and experience to examine trees, recommend actions to improve the health and structure of trees, and suggest measures to reduce the risk of having activities under trees. Clients may decide to accept or disregard the recommendations of the arborist or seek additional advice.

Arborists cannot detect every condition that could possibly lead to structural failure of a tree or anticipate extreme weather events that could contribute to failure. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden inside trees and below ground. Arborists cannot guarantee that trees will be healthy or safe under all circumstances, or for a specific time period. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatment, pruning and removal of trees may involve considerations beyond the scope of the Arborists services (assignment) such as property ownership, property boundaries, site lines, neighbor's disputes and other issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist should be then expected to reasonably rely upon the completeness and accuracy of the information provided.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

CERTIFICATE OF PERFORMANCE

I, Rebecca Latta certify that:

- I have personally inspected the trees described in this report and have accurately stated my findings. The extent of the evaluation is stated in the attached report;
- I have no current or future interest in the vegetation or the property that is the subject of the report and no bias with respect to the parties involved;
- The analysis, opinions, evaluation, investigation and conclusions have been prepared using accepted arboricultural practices;
- I performed the work myself and prepared the report and reviewed the report, except as specifically indicated in the report;
- That my compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party nor the results if the assignment, attainment of stipulated results or the occurrence of any subsequent events.
- I further state that I am a member in good standing with American Society of Consulting Arborists and the International Society of Arboriculture. I have been involved in the practice of arboriculture and the care and study of trees for 27 years.

Signed: Rebecca Latta Date: April 13, 2020

APPENDIX 'A'

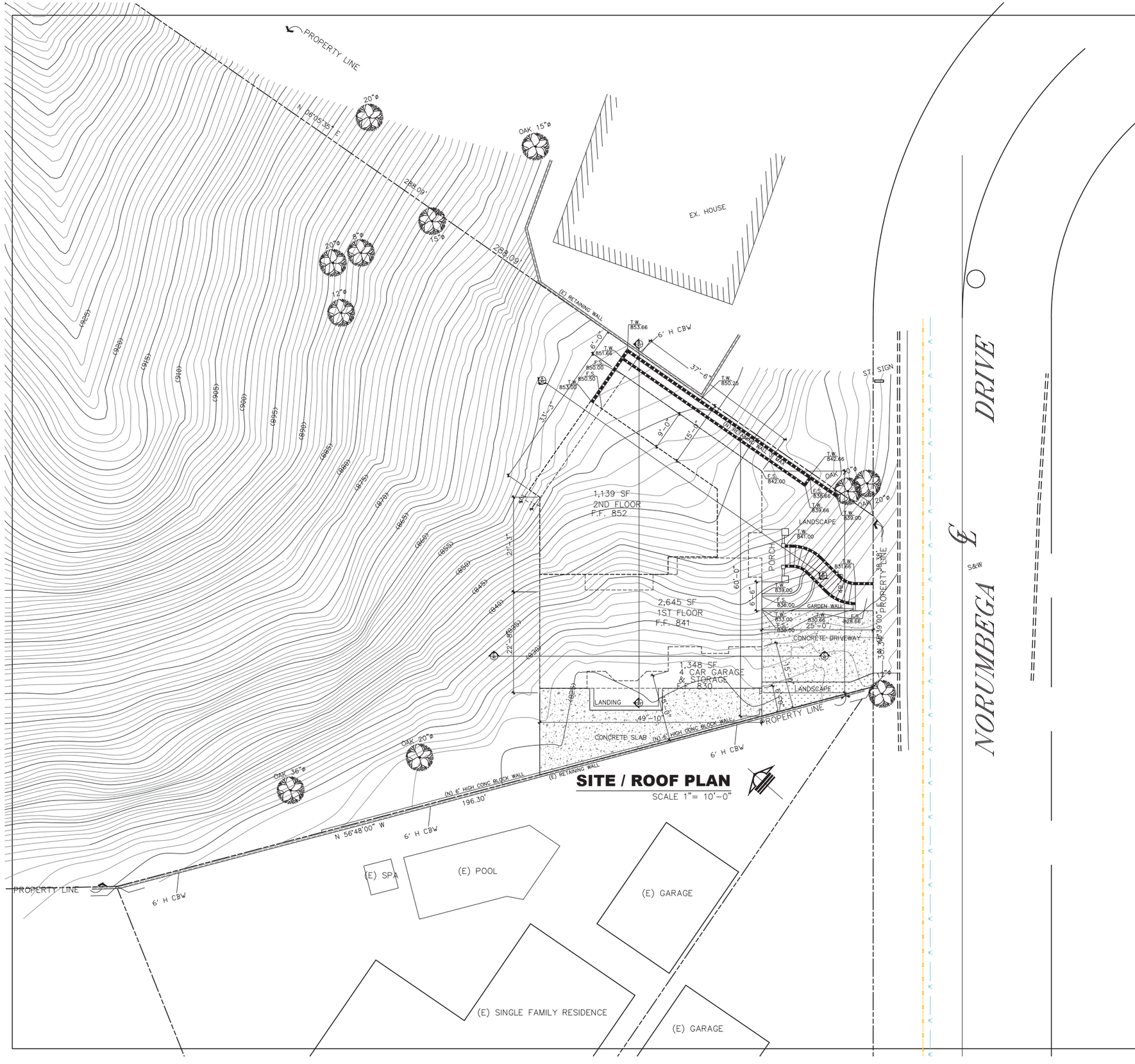
SITE PLAN AND FIGURES

Source: ESRI Aerial Basemap 2020

Norumbega Drive

Figure 1. Tree Survey and Assessment

SOUTH ENVIRONMENTAL



SITE / ROOF PLAN
SCALE 1"= 10'-0"

NEW RESIDENCE

NORUMBEGA RD
MONROVIA, CA 91016

VICINITY MAP | 4

TYPE OF CONSTRUCTION:	V–B
OCCUPANCY GROUP	R3/U
USE CODE:	SINGLE FAMILY
ZONE:	RF
NO. OF STORIES	2
SITE AREA	1.295 AC = 56,410 SF
PROPOSED 4 CAR GARAGE	1,348 SF
PROPOSED PORCH	72 SF
1ST FLOOR	2,645 SF
2ND FLOOR	1,139 SF
TOTAL LIVABLE	3,784 SF

LEGAL DESCRIPTION:

PARCEL #	8523–002–045
TRACT:	NORUMBEGA
LOT NO:	1

BUILDING DATA | 3

DESIGNER:
GONZALO HERRERA
245 N COUNTRY CLUB RD
GLENDORA, CA 91741
(626) 533–6120

OWNER:
GONZALEZ,
MARGARITA FIGUEROA
123 SAN ANGELO AVE
LA PUENTE, CA 91746
(626) 672–5317

BUILDING DATA | 2

SHEET INDEX | 1

GONZALO HERRERA
TEL. 626.533.6120
245 N COUNTRY CLUB RD
GLENDORA, CA 91741
agconcepts@mail.com
DESIGN STUDIO

PROJECT TITLE
NEW RESIDENCE
NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE
SITE PLAN

REVISIONS

NO.	DATE	DESCRIPTION

DRAWN GH
CHK.
APP.
SCALE AS SHOWN
JOB NO.
DATE 2/15/20
SHEET NO. **T-1**
OF

GONZALO HERRERA

A+g concepts

245 N COUNTRY CLUB RD
GLENDORA, CA 91741

TEL. 626.533.6120

agconceptsds@gmail.com

DESIGN STUDIO

PROJECT TITLE

NEW RESIDENCE

NORUMBEGA RD.
MONROVIA CA, 91016

SHEET TITLE

COLOR RENDER

REVISIONS

NO.	DATE	DESCRIPTION
△		

DRAWN G. H.
CHK.
APP.
SCALE AS SHOWN
JOB NO.
DATE 2/15/20
SHEET NO.

A-8

OF

APPENDIX 'B'

DATA MATRIX

APPENDIX 'C'

PHOTOGRAPH EXHIBIT

Image 1. Depicts protected oak #1 (on right) and #2 (on left). Taken from Norumbega Drive facing northeast.

Image 2. Depicts the base and trunk of protected oak #1 (in foreground) and #2 (in background).

Image 3. Depicts protected oak #3 and is taken from the southwestern edge of the parcel facing southeast toward Norumbega Drive.

Image 4. Depicts protected oak #4 and is taken from the southwestern edge of the parcel facing northwest.

Image 5. Depicts protected oak #op5 and is taken from the western edge of the parcel facing west.

Image 6. Depicts protected oak #6 in the front and #7 in the back. Taken from the west end of the drainage in the north of the parcel facing southeast.

Image 7. Depicts protected #7 and is taken from the west end of the drainage in the north of the parcel facing south.

Image 8. Depicts protected oak #8 in the back. Taken from the west end of the drainage the north of the parcel facing east.

APPENDIX F

Geotechnical Engineering Investigation Report

Cal Land Engineering, Inc.
dba Quartech Consultants
Geotechnical, Environmental and Civil Engineering

May 22, 2020

Mr. Jose Ramirez

123 San Angelo Ave,
La Puente, CA 91786

Subject: Report of Geotechnical Engineering Investigation, Proposed Residential Development, Vacant Lot (Adjacent Southwest of 547 Norumbega Drive), APN: 8523-002-045, Monrovia, California. QCI Project No.: 19-022-035GE

Reference: "Limited Geological Evaluation of Faulting and Seismic Hazards Report, Proposed Single Family Residence, APN: 8523-002-045, Vacant Lot Adjacent Southwest of 547 Norumbega Drive, City of Monrovia, California" by Cal Land Engineering, dated October 8, 2019

Dear Mr. Ramirez:

In accordance with your request, Quartech Consultants (QCI) is pleased to submit this Geotechnical Engineering Report for the subject site. The purpose of this report was to evaluate the subsurface conditions and provide recommendations for foundation designs and other relevant parameters of the proposed construction.

Based on the findings of our field exploration, laboratory testing and engineering analysis, the proposed construction of the subject site for the intended use is feasible from the geotechnical engineering viewpoints, provided that specific recommendations set forth herein are followed.

This opportunity to be of service is sincerely appreciated. If you have any questions pertaining to this report, please call the undersigned.

Respectfully submitted,

Cal Land Engineering, Inc. (CLE)
dba Quartech Consultants (QCI)

Jack C. Lee, GE 2153

REGISTERED PROFESSIONAL ENGINEER
JACK C. S. LEE
2153
Exp. 3-31-21
GEOTECHNICAL
STATE OF CALIFORNIA

Churuo Zhang
Project Engineer

Reviewed By:

Fred Aflakian, CEG 2051

PROFESSIONAL ENGINEERING GEOLOGIST
FRED AFLAKIAN
No. 2051
Certified
Engineering
Geologist
STATE OF CALIFORNIA

Abe Kazemzadeh

Dist: (4) Addressee

REPORT OF GEOTECHNICAL ENGINEERING INVESTIGATION

Proposed Residential Development

At

APN: 8523-002-045
Vacant Lot (Adjacent Southwest of 547 Norumbega Drive)
Monrovia, California

Prepared by
QUARTECH CONSULTANTS (QCI)
Project No.: 19-022-035
May 22, 2020

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 Purpose

This report presents a summary of our preliminary geotechnical engineering investigation for the proposed development at the subject site. The purposes of this investigation were to evaluate the subsurface conditions at the area of proposed construction and to provide recommendations pertinent to grading, foundation design and other relevant parameters of the development.

1.2 Scope of Services

Our scope of services included:

- Review of available soil and geologic data of the area.
- Subsurface exploration consisting of logging and sampling of four mini excavator dug test pits. The test pits were extended to a maximum depth of 10.0 feet below the existing ground surface. Test pit logs are presented in Appendix A.
- Laboratory testing of representative samples to establish engineering characteristics of the on-site soil. The laboratory test results are presented in Appendices A and B.
- Engineering analyses of the geotechnical data obtained from our background studies, field investigation, and laboratory testing.
- Preparation of this report presenting our findings, conclusions, and recommendations for the proposed construction.

1.3 Proposed Construction

It is anticipated that the proposed construction consists of construction of a new single family dwelling and associated retaining walls and other improvements. It is anticipated that the proposed development will be one and/or two-story in height above ground level and one level of basement. The maximum depth of basement floor will be on the order of 10-11 feet below the existing grade. Column loads are anticipated to be light to medium.

1.4 Site Location

The subject site is located on north side of Norumbega Drive at a short distance north of the intersection of Norumbega Drive and Norumbega Road in the City of Monrovia, Los Angeles, California. The approximately location of the site is presented in the attached Site Location Map (Figure 1). The property is trapezoid-shape and consists of a hilly parcel of land. The property is bordered by a residential properties to the east and west, and Norumbega Drive to the south of site. Detailed configuration of the site is presented in the attached site plan (Figure 2).

2.0 SUBSURFACE EXPLORATION AND LABORATORY TESTING

2.1 Subsurface Exploration three hand dug pits

Our subsurface investigation consisted of excavation of four mini excavator dug test pits to a maximum depth of 10.0 feet at the locations shown on the attached Site Plan, Figure 2. The test pits were supervised and logged by an engineering geologist. Relatively undisturbed and bulk samples were collected during excavation for laboratory testing. Logs of borings are presented in Appendix A.

2.2 Laboratory Testing

Representative samples were tested for the following parameters: in-situ moisture content, direct shears strength, expansion, and corrosion potential. Results of our laboratory testing along with a summary of the testing procedures are presented in Appendix B. In-situ moisture and density test results are presented on the boring logs in Appendix A.

3.0 SITE GEOLOGY

3.1 Site Underlying Materials

Description of the subsurface materials from top down is provided as follows:

3.1.1 Fill

Thin layer of fill was encountered in test pit TP-4. The encountered fill depth is about 6 feet. The fill is comprised of silty sand (SM), grayish brown, slightly moist, medium dense, with rock fragments up to 6' inches in size. Fill materials ae not suitable for the structural support.

3.1.2 Colluvium (Map Symbol-Qc)

Layer of colluvium was encountered in all test pits except test pit TP-4. The encountered colluvium depth varied from 6 to 10 feet and more. The colluvium is comprised of silty sand (SM) with rock fragments, brown to reddish brown, dry to slightly moist, loose to medium dense, slightly porous. These materials are not suitable for structural support. The residential building should be supported by the foundation founded on competent bedrock as discussed below.

3.1.3 Bedrock of Quartz Diorite (qd):

Underlying the fill and colluvium is bedrock of Quartz Diorite. Bedrock is coarse grained, dark gray, slightly moist, weathered, moderate hard, massive

3.2 Groundwater

Groundwater was not encountered during our field exploration. In our opinion, groundwater will not be a problem during construction.

3.3 Site Geological Setting

The subject property is situated at the base of the San Gabriel Mountains within the Transverse Ranges Geomorphic Province. The Transverse Ranges which are an east-west trending series of steep mountain ranges and valleys resulting from north-south tectonic compression extends from the San Bernardino Mountains in the east to the offshore Channel Islands to the west.

Based on USGS Professional Paper 1339, the materials underlying the site consist of Holocene soils and plutonic rocks. The report describes the bedrock as light to dark gray medium to coarse grained Wilson Diorite and Quartz Monzonite. Detailed configuration are shown in Figure 3.

The closest known potentially active faults to site are the Raymond Fault and the Sierra Madre Fault Zone where they merge together. The closest mapped fault trace trends in an east-west direction, south of the site.

3.4 Faulting and Seismic Condition

The project site is located in the highly seismic Southern California region within the influence of several fault systems that are considered to be active or potentially active. An active fault is defined by the State of California as a “sufficiently active and well defined fault” that has exhibited surface displacement within the Holocene time (about the last 11,000 years). A potentially active fault is defined by the State as a fault with a history of movement within Pleistocene time (between 11,000 and 1.6 million years ago). These active and potentially active faults are capable of producing potentially damaging seismic shaking and ground rupture.

The project site is situated within a designated Alquist-Priolo fault zone. Site seismicity and faulting was addressed under a separate cover (Calland 2019). Based on the referenced report, it is our conclusion that the construction of the proposed development is feasible from an engineering geologic view point, and the postulated active fault is situated at least 80 (Sierra Madre Fault Zone) to 290 (Raymond Fault) feet from the nearest property corner.

4.0 SEISMICITY

4.1 Faulting

Based on our study, there are no known active faults crossing the property. The nearest known active regional fault is the Raymond zones located approximate 0.04 miles from the site.

4.2 Seismicity

The subject site is located in southern California, which is a tectonically active area. The type and magnitude of seismic hazards affecting the site depend on the distance to causative faults, the intensity, and the magnitude of the seismic event. Table 1 indicates the distance of the fault zones and the associated maximum magnitude earthquake that can be produced by nearby seismic events. As indicated in Table 1, the Raymond fault zones are considered to have the most significant effect to the site from a design standpoint.

TABLE 1

Characteristics and Estimated Earthquakes for Regional Faults

Fault Name	Approximate Distance to Site (mile)	Maximum Magnitude Earthquake (Mmax)
Raymond	0.04	6.8
Sierra Madre Connected	0.1	7.3
Clamshell-Sawpit	1.1	6.7
Elysian Park (Upper)	9.1	6.7
Verdugo	9.7	6.9
San Jose	10.7	6.7
Elsinore;W+GI+T+J+CM	12.1	7.8
Hollywood	14.1	6.7
Cucamonga	15.2	6.7
Puente Hills (LA)	15.5	7.0
Puente Hills (Santa Fe Springs)	16.1	6.7
Chino, alt 2	16.6	6.8
Chino, alt 1	16.7	6.7
Santa Monica Connected alt 2	17.3	7.4
Puente Hills (Coyote Hills)	18.9	6.9
Sierra Madre (San Fernando)	19.2	6.7
San Gabriel	19.8	7.3

Reference: 2008 National Seismic Hazard Maps-Source Parameters

4.3 Estimated Earthquake Ground Motions

In order to estimate the seismic ground motions at the subject site, QCI has utilized the seismic hazard map published by California Geological Survey. According to this report, the peak ground

alluvium acceleration at the subject site for a 10% probability of exceedance in 50 years is about 0.607g (2008 USGS Interactive Deaggregation). Site Modified Peak ground acceleration (PGA_M), corresponding to USGS Design Map Summary Report, ASCE 7-16 Standard is 0.978g.

5.0 SLOPE STABILITY

5.1 Slope Stability

Based on our review of the regional topographic map, the existing slope shows approximate ratio of 1½ to 1 (horizontal to vertical) to 2 to 1 (horizontal to vertical). It is estimated that this slope reaches a maximum height of approximate 95 feet.

Our slope stability analysis indicated that the factor of safety of the existing slope is greater than the minimum code requirements for both gross and surficial slope stability. It is our opinion that the existing slope should be stable under the design conditions provided they are properly maintained.

5.2 Surficial Slope Stability and Landscaping

All slopes will be subject to surficial erosion. Therefore, slopes should be protected from surface runoff by means of top-of-slope compacted earth berms or concrete interceptor drains. All slopes should be landscaped with a suitable plant material requiring minimal cultivation and irrigation water in order to thrive. An irrigation system should be installed. Overwatering and subsequent saturation of slope surfaces should be avoided.

At all times avoid saturation or desiccation of the slope materials since these conditions tend to deteriorate the slope. Irrigation facilities should be turned off during the rainy season. Maintenance includes correction of defective drainage terraces on slope, elimination of burrowing rodents, corrections of defective irrigation facilities, and controlled slope vegetation growth. Irrigation programs for all landscaped slopes should be well controlled and minimized. Seasonal adjustments should be made to prevent excess moisture in the slope soils. Overwatering, especially prior to winter storms, may generate surficial slope distress.

6.0 CONCLUSIONS

Based on the results of our subsurface investigation and engineering analyses, it is our opinion that the proposed construction is feasible from a geotechnical standpoint, provided the recommendations contained herein are incorporated in the design and construction.

6.1 Seismicity and Seismic Induced Hazard

The project site is located in the highly seismic Southern California region within the influence of several fault systems that are considered to be active or potentially active. An active fault is defined by the State of California as a "sufficiently active and well defined fault" that has exhibited surface displacement within the Holocene time (about the last 11,000 years). A potentially active fault is defined by the State as a fault with a history of movement within Pleistocene time (between 11,000 and 1.6 million years ago). Based on our research and evaluation, it is concluded that the construction of the proposed development is feasible from an engineering geologic view point, and the postulated active fault is situated at least 80 (Sierra Madre Fault Zone) to 290 (Raymond Fault) feet from the nearest property corner. Details are presented in the Limited Fault Report by Cal Land Engineering, Inc. dated October 8, 2019.

6.2 Excavatability

Based on our subsurface investigation, excavation of the subsurface materials should be able to be accomplished with conventional earthwork equipment.

6.3 Surficial Soil Removal

Based on our field investigation and laboratory testing program, it is concluded that the existing near surface materials are disturbed/ weathered and is varied in density within the job site. These soils are not suitable for support of fills and structures and will require remedial grading as discussed herein.

6.4 Residential Foundation

The site is underlain by the previously placed fill, colluvium and bedrock. In order to provide a uniform support for the proposed residence. It is recommended that the residential structures be supported by the shallow and caissons and grade beam foundation system. All foundation should be founded on the competent bedrock. Foundation design and construction recommendations are presented in the following sections.

6.4 Groundwater

Groundwater was not encountered during our field exploration. In our opinion, groundwater will not be a problem during construction.

7.0 RECOMMENDATIONS

Based on the subsurface conditions exposed during field investigation and laboratory testing program, it is recommended that the following recommendations be incorporated in the design and construction phases of the project.

7.1 Grading

7.1.1 Site Preparation

Prior to initiating grading operations, any demolished structures and associate footings, utility lines, existing vegetation, organic soil, trash, debris, over-sized materials (greater than 8 inches), and other deleterious materials within fill areas should be removed from the site.

7.1.2 Excavation/Surficial Soil Removals

In areas to receive fill and improvements such as driveway and planned concrete flatworks, previously placed fill and colluvium should be removed to a depth of 3 feet below the existing grade as directed by the project geotechnical engineer and/or engineering geologist. Some relatively deeper removals should be anticipated in localized areas. Locally deeper removals may be necessary to expose competent natural ground. The actual removal depths should be determined in the field as conditions are exposed. Visual inspection and/or testing may be used to define removal requirements.

The proposed cut area within the proposed building pad should be cut to grade. All excavations should be observed by a representative of this office to verify the subgrade soil conditions and determine if additional removals or other mitigative measures are needed.

7.1.3 Treatment of Removal Bottoms

Soils exposed within areas approved for fill placement should be scarified to a depth of 6 inches, conditioned to near optimum moisture content, then compacted in-place to 90 percent relative compaction based on laboratory standard ASTM D-1557-12.

7.1.4 Structural Backfill

The onsite soils may be used as compacted fill provided they are free of organic materials and debris. Fills should be placed in relatively thin lifts; brought to near optimum moisture content, then compacted to obtain at least 90 percent relative compaction based on laboratory standard ASTM D-1557-12.

7.2 Temporary Excavation

The required excavation for the proposed basement will extend to a maximum of approximately 10-11 feet below the existing ground surface. The criteria for sloped excavations and/or shoring method for the alignments required vertical cuts, depends on many factors, which include depth of excavation, soil conditions, types of shoring, distance to the existing structures or public improvement, consequences of potential ground movement, and construction procedures.

7.2.1 Sloping Excavation

Should the space be available at the site, the required excavation may be made with sloping banks. Based on materials encountered in the test borings, it is our opinion that sloped excavations may be made no steeper than 3/4 to 1 (horizontal to vertical) for the underlying native soils. Flatter slope cuts may be required if loose soils are encountered during excavation. No heavy construction vehicles, equipment, nor surcharge loading should be permitted at the top of the slope. A representative of this office should inspect the temporary excavation to make any necessary modifications or recommendations.

7.2.2 Shoring

Shoring will be required for temporary excavation made vertically or near vertically of more than 5 feet. An active earth pressure of 20 pound per cubic foot may be used for the temporary cantilever shoring system. Any surcharge loads resulting from adjacent buildings or traffic should be considered as an added load to the design. Soldier piles or beams should be spaced at the specification by the project structural/shoring engineer. Lagging may be required to span between soldier piles to support the lateral earth pressure. The shoring and bracing should be designed and constructed in accordance with current requirements of CAL/OSHA and all other public agencies having jurisdiction. Careful examination of the soil excavation and inspection of on-site installation of the shoring system by a representative of this office is recommended to verify the conditions or to make recommendations as are pertinent if different conditions are disclosed during excavation.

7.2.3 Slot Cut

Should the slot cut method be used for the onsite vertical excavation of more than 5 feet in height, the following presents the slot cut recommendations. The slot cut stability analysis is presented in the attached plate.

1. Excavate to the design elevation at the side slopes no steeper than 1:1, horizontal to vertical.

2. Excavate in alternative slots with each slot no wider than the design width (i.e. 8 feet)

3. Excavate the footings at each slot, pour the footings and construct the walls per project standard. The depth of vertical cut should be limited to no more than 10 feet.

4. After completion of the slope construction, excavate the adjacent slots and repeated the above procedures to complete the adjacent slope.

5. All excavations should be made under the inspection and testing of the project geotechnical consultant.

6. Care should be taken to prevent surcharge loads above un-shored slots within a horizontal distance from the top of cut equal to depth of excavation.

7. Provisions for drainage should be implemented to prevent saturation of un-shored excavations.

7.3 Foundation Design

7.3.1 Shallow Foundation Design

Conventional continuous footings may be used for the residential foundation support on the rear cut portion of the building pad and should be a minimum of 18 inches into competent bedrock. An allowable bearing value of 3000 pounds per square foot (psf) may be used for design of continuous footings with a minimum of 12 inches in width. This value may be increased by one third (1/3) when considering short duration seismic or wind loads.

7.3.2 Caisson Foundation

Caissons may be used in combination with conventional footings to support the portions of the residential building where the area is underlain by the fill and/or colluvium. Caissons should be a minimum of 5 feet into the competent rock. All caissons should be at least 24 inches in diameter to facilitate cleanout. Caissons may be designed for an allowable end bearing pressure of 4000 pounds per square feet. The excavations of the caisson should be cleaned of all loose and/or disturbed soils. Caissons may be assumed fixed at 2 feet into rock.

7.3.3 Building Setback

Residential building should be setback from the adjacent slope face per current City's building code.

7.3.4 Settlement

Settlement of the footings placed as recommended and subject to no more than allowable loads is not expected to exceed 3/4 inch. Differential settlement between adjacent columns is not anticipated to exceed 1/2 inch.

7.3.5 Lateral Pressure

The active earth pressure to be utilized for cantilever retaining wall designs may be computed as an equivalent fluid having a density of 30 pounds per cubic foot when the slope of the backfill behind the wall is level. Restrained retaining wall may be design with an equivalent fluid pressure of 60 pcf. These values assume free-draining condition.

Passive earth pressure for the residential foundation design may be computed as an equivalent fluid pressure of 300 pounds per cubic foot, with a maximum earth pressure of 3500 pounds per square foot. An allowable coefficient of friction between soil and concrete of 0.30 may be used with the dead load forces. When combining passive pressure and frictional resistance, the passive pressure component should be reduced by one-third.

7.3.6 Wall Seismic Loading

Earthquake earth pressure distribution on retaining walls retaining more than 6 feet of soils when the slope of the backfill behind the wall is level may be computed as an inverted right triangle with 30H psf at the base. Resultant seismic earth force may be applied at approximately 0.6xH from the top of the footing. H should be measured from top of footing to the top of wall. The earthquake-induced pressure should be added to the static earth pressure. Design of walls less than 6 feet in height may neglect the additional seismic pressure.

7.3.7 Retaining Wall Backfill and Wall Drainage

Walls may be backfilled with onsite soils. A free-drainage, selected backfill (SE of 30 or greater), should be used against the retaining wall to the top of the wall. The upper 18 inches of backfill should consist of native soils. All backfill should be compacted to at least 90 percent of the laboratory maximum dry density (ASTM D-1557-12).

Any proposed retaining walls at the site should be provided with backdrains to reduce the potential for the buildup of hydrostatic pressure. Backdrains should consist of 4-inch (minimum) diameter perforated PVC pipe surrounded by a minimum of 1 cubic foot per lineal foot of clean coarse gravel wrapped in filter fabric (Mirafi 140 or the equivalent) placed at the base of the wall.

The drain should be covered by no less than 18 inches (vertical) of compacted wall backfill soils. The backdrain should outlet through non-perforated PVC pipe or weepholes. Alternatively, commercially available drainage fabric (i.e., J-drain) could be used. The fabric manufacturer's recommendations should be followed in the installation of the drainage fabric backdrain.

If there is not enough room for placing the above mentioned drainage systems, an alternative system such as pre-fabricated drainage system AQUADRAIN 100 BD with a 3-inch drain pipe set in gravel behind the wall, to prevent the buildup of hydrostatic pressure. This drainpipe may be connected to a 3-inch drain collector pipe connected to a sump pump.

7.4 Foundation Construction

7.4.1 Conventional Foundation

It is anticipated that the entire structure will be underlain by onsite soils of very low expansion potential. All conventional footings should be a minimum of 18 inches deep and founded at least 18 inches into competent bedrock materials. All continuous footings should have at least two No. 4 reinforcing bar placed both at the top and two No. 4 reinforcing bar placed at the bottom of the footings.

7.4.2 Caissons and Grade Beam Foundation

It is anticipated that the portion of the structure will be supported by caissons and grade foundation system. The reinforcement of the caissons and grade beam should be designed by the project structural engineer. All caissons should be at least 24 inches in diameter to facilitate cleanout. The excavations of the caisson should be cleaned of all loose and/or disturbed soils. All caisson excavations should be inspected by the project geotechnical consultant prior to the placing the reinforcement steel. The base of all caissons excavations should be cleaned of all loose materials.

7.5 Concrete Slabs

Floor slabs should be designed as raised wood floors or structural slabs deriving support from the foundation system. Should the raised floors be used, adequate ventilation should be provided for crawl spaces below flooring to release accumulated moisture.

If the structural slab-on-grade be used for the residential slabs, the 2019 CalGreen Section 4.505.2.1 should be complied for the moisture sensitive concrete slabs. It is recommended that a

minimum of 4-inch thick base of ½ inches or larger clean aggregate be provided with a vapor barrier in direct contact with concrete. A 10-mil Polyethylene vapor retarder, with joints lapped not less than 6 inches, should be placed above the aggregate and in direct contact with the concrete slabs. As an alternate method, 2 inch of sand then 10-mil polyethylene membrane and another 2 inches of sand over the membrane and under the concrete may be used, provided this request for an alternative method is approved by County Building Officials.

7.6 Temporary Excavation and Backfill

All trench excavations should conform to CAL-OSHA and local safety codes. All utilities trench backfill should be brought to near optimum moisture content and then compacted to obtain a minimum relative compaction of 90 percent of ASTM D-1557-12. All temporary excavations should be observed by a field engineer of this office so as to evaluate the suitability of the excavation to the exposed soil conditions.

8.0 INSPECTION

As a necessary requisite to the use of this report, the following inspection is recommended:

- Temporary excavations.
- Removal of surficial and unsuitable soils.
- Backfill placement and compaction.
- Utility trench backfill.

The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

9.0 CORROSION POTENTIAL

Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. The testing results are presented in Appendix B .According to 2019 CBC and ACI 318-14, a "negligible" exposure to sulfate can be expected for concrete placed in contact with the onsite soils. Therefore, Type II cement or its equivalent may be used for this project. Based on the resistivity test results, it is estimated that the subsurface soils are moderately corrosive to buried metal pipe. It is recommended that any underground steel utilities be blasted and given protective coating. Should additional protective measures be warranted, a corrosion specialist should be consulted.

10.0 SEISMIC DESIGN

Based on our studies on seismicity, there are no known active faults crossing the property. However, the subject site is located in southern California, which is a tectonically active area. Based on ASCE 7-16 Standard, the following seismic related values may be used:

Seismic Parameters (Latitude:34.1634863, Longitude:-117.9903595)	Site Class "C"
Mapped 0.2 Sec Period Spectral Acceleration **S_S**	1.874g
Mapped 1.0 Sec Period Spectral Acceleration **S_1**	0.712g
Site Coefficient for Site Class "D", **F_a**	1.2
Site Coefficient for Site Class "D", **F_v**	1.4
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 0.2 Second, **S_{MS}**	2.249g
Maximum Considered Earthquake Spectral Response Acceleration Parameter at 1.0 Second, **S_{M1}**	0.996g
Design Spectral Response Acceleration Parameters for 0.2 sec, **S_{DS}**	1.5g
Design Spectral Response Acceleration Parameters for 1.0 Sec, **S_{D1}**	0.664g

The Project Structural Engineer should be aware of the information provided above to determine if any additional structural strengthening is warranted.

11.0 INSPECTION

As a necessary requisite to the use of this report, the following inspection is recommended:

- Temporary excavations.
- Removal of surficial and unsuitable soils.
- Backfill placement and compaction, and
- Utility trench backfill.

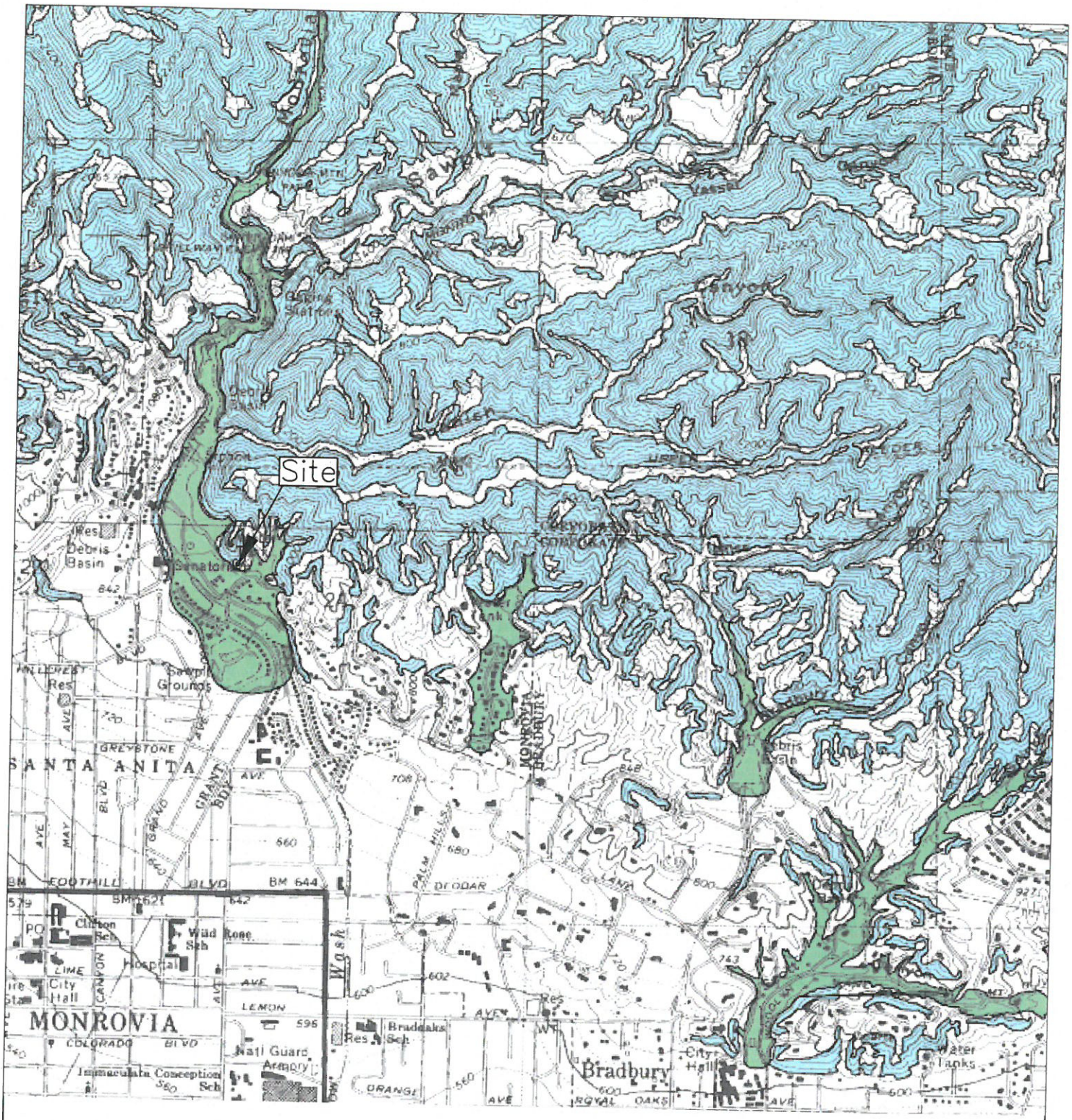
The geotechnical engineer should be notified at least 1 day in advance of the start of construction. A joint meeting between the client, the contractor, and the geotechnical engineer is recommended prior to the start of construction to discuss specific procedures and scheduling.

12.0 REMARKS

The conclusions and recommendations contained herein are based on the findings and observations at the exploratory locations. However, soil materials may vary in characteristics between locations of the exploratory locations. If conditions are encountered during construction

which appear to be different from those disclosed by the exploratory work, this office shall be notified so as to recommend the need for modifications.

This report has been prepared in accordance with generally accepted professional engineering principles and practice. No warranty is expressed or implied. This report is subject to review by controlling public agencies having jurisdiction.



N

SCALE 1" = 2000'

LEGEND

Maps modified from "Seismic Hazard Zones, Azusa Quadrangle" by CDMG

CalLand Engineering, Inc. dba Quartech Consultants Geotechnical, Environmental & Civil Engineering Services	Project Address: APN: 8523-002-045 Vacant Lot Adjacent Southwest of 547 Norumbega Dr. Monrovia, California

Site Location Map

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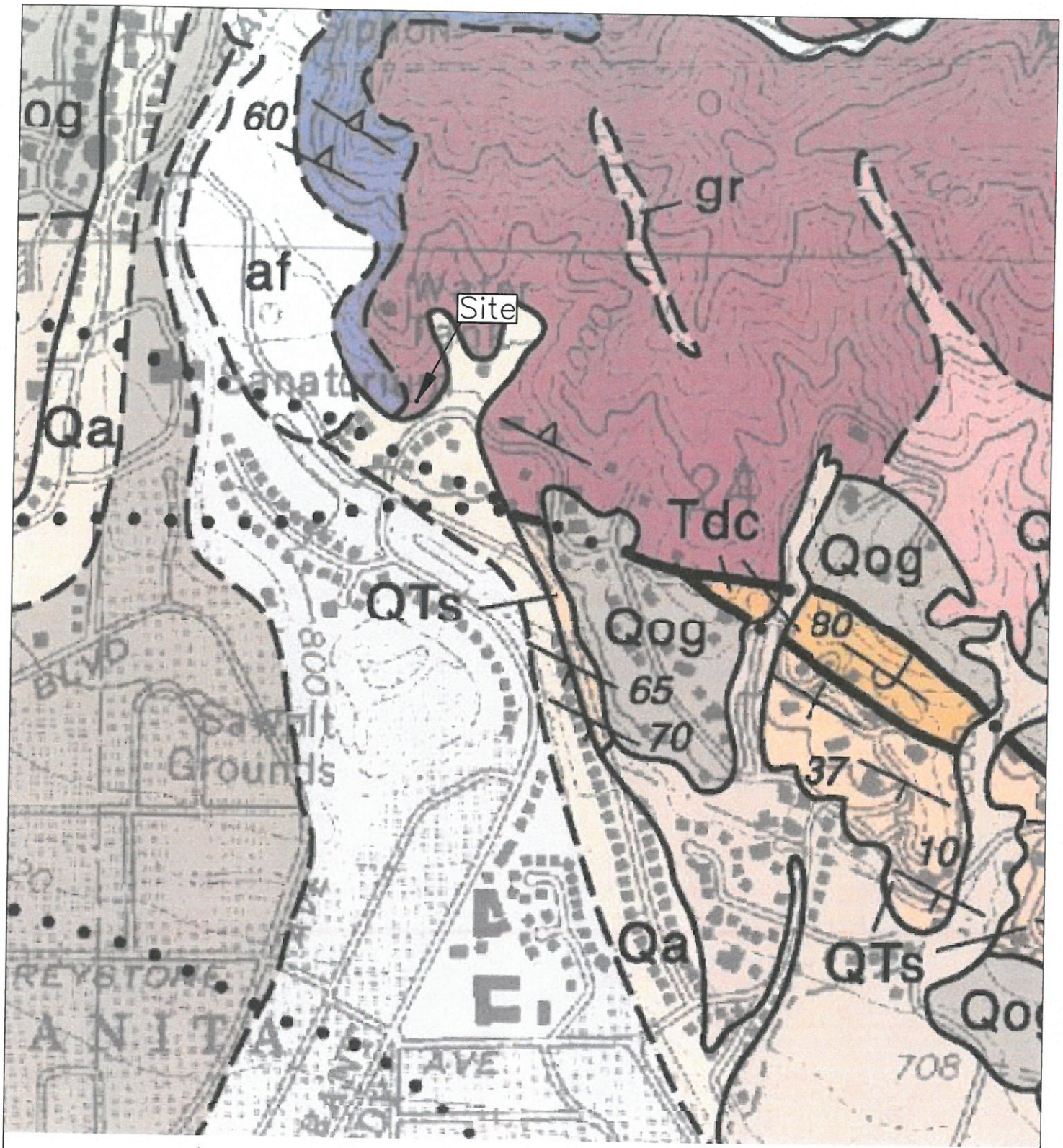
FIGURE 1



N

NOT TO SCALE

LEGEND

Maps modified from "Geological Map of the Azusa Quadrangles"
Los Angeles County, CA
by Thomas W. Dibblee, Jr., 2001

Quartz Diorite

qd – Gray quartz diorite, medium grained, somewhat incoherent where weathered, composed of plagioclase feldspar, biotite mica, potassic feldspar, quartz, and hornblende, in that order of descending abundance; rock massive to gneissoid and includes small lenses of gneiss; in many places rock complexly intruded by dikes, sills and pods of leucogranitic rocks (gr) of which larger messes are shown

CalLand Engineering, Inc.
dba Quartech Consultants

Geotechnical, Environmental & Civil Engineering Services

Project Address:
APN: 8523-002-045
Vacant Lot Adjacent
Southwest of 547
Norumbega Dr.
Monrovia, California

Regional Geologic Map

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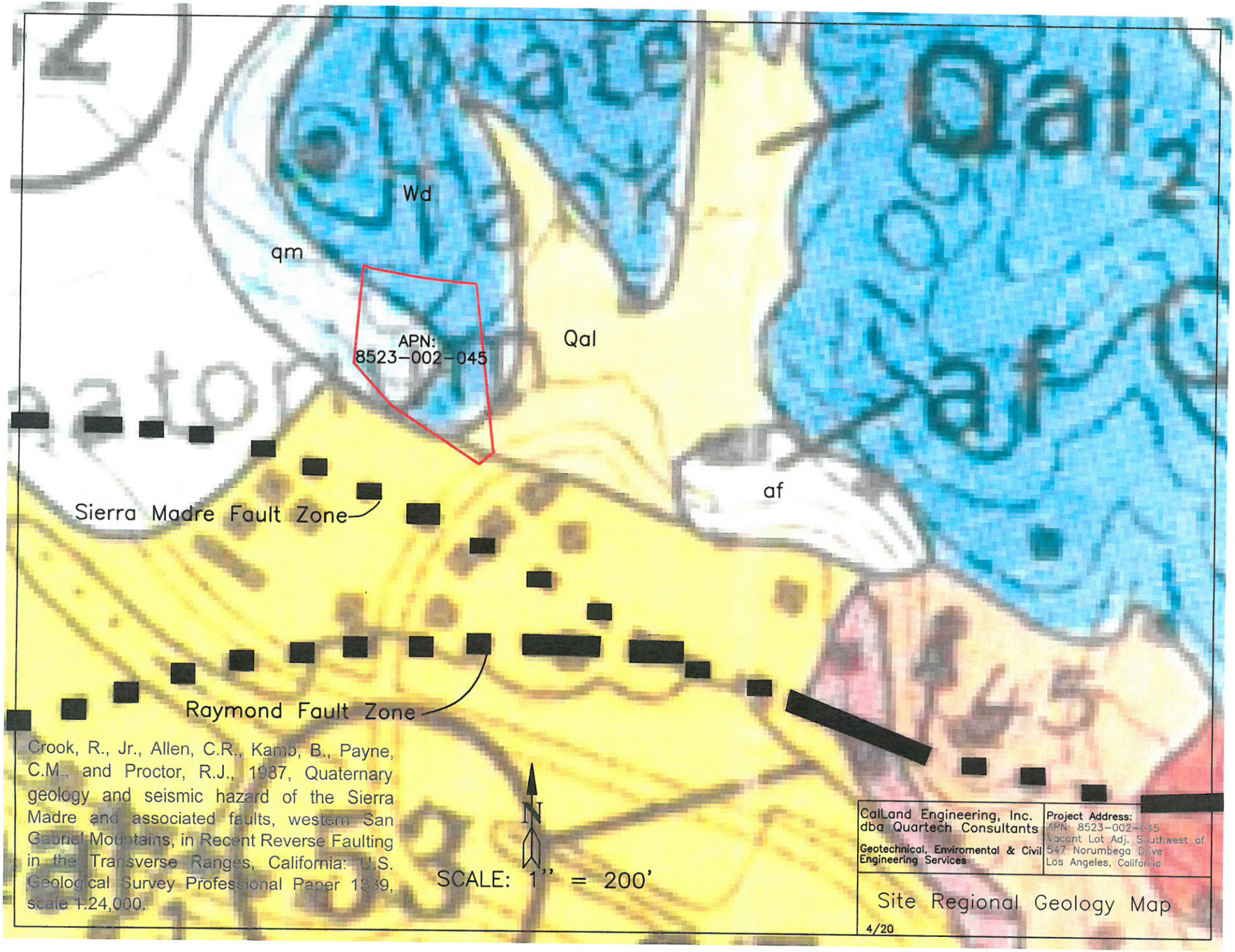
FIGURE 1a



Crook, R., Jr., Allen, C.R., Kamb, B., Payne, C.M., and Proctor, R.J., 1987, Quaternary geology and seismic hazard of the Sierra Madre and associated faults, western San Gabriel Mountains, in Recent Reverse Faulting in the Transverse Ranges, California: U.S. Geological Survey Professional Paper 1339, scale 1:24,000.

CalLand Engineering, Inc.
dba Quartech Consultants
Geotechnical, Enviromental & Civil Engineering Services

Project Address:
APN: 8523-002-045
Vacant Lot Adj. Southwest of
547 Norumbega Drive
Los Angeles, California

Site Regional Geology Map

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Scale: 1’ = 30’’

LEGEND

Af Artificial Fill
Qc Colluvium
qd Bedrock of Quartz Diorite
A A Cross Section
Approximate Location of Geologic Contact
TP–1 Approximate testpit location
70 Joint Attitude

CalLand Engineering, Inc. dba Quartech Consultants Geotechnical, Enviromental & Civil Engineering Services	Project Address: APN: 8523–002–045 Vacant Lot Adj. to 547 Norumbega Drive Monrovia, California

BORING LOCATION

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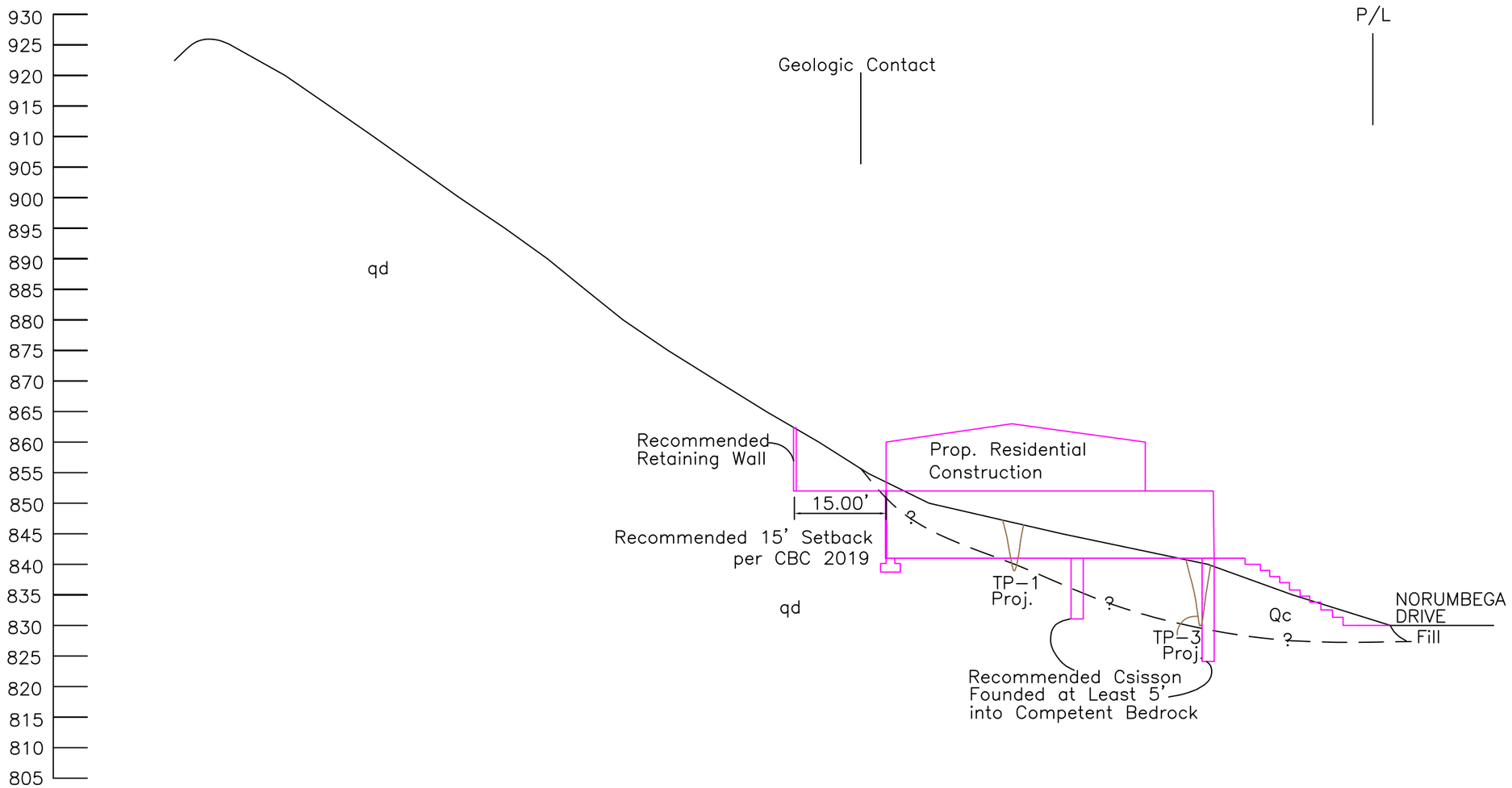
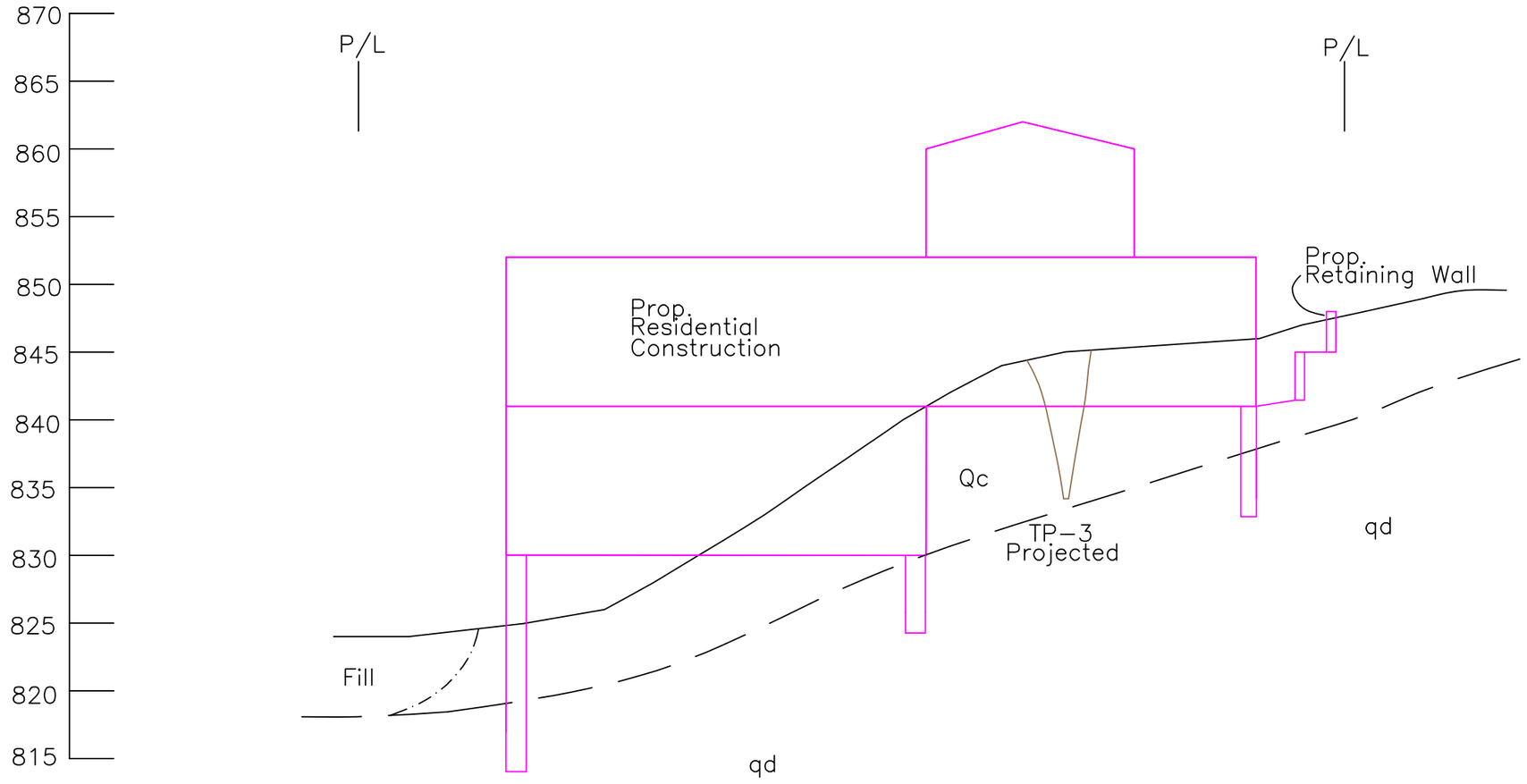


Scale: 1' = 20''

CalLand Engineering, Inc. dba Quartech Consultants Geotechnical, Enviromental & Civil Engineering Services	Project Address: APN: 8523-002-045 Vacant Lot Adjacent Southwest of 547 Norumbega Dr. Monrovia, California

CROSS SECTION A-A

4/20



Scale: 1' = 10''

CalLand Engineering, Inc. dba Quartech Consultants Geotechnical, Enviromental & Civil Engineering Services	Project Address: APN: 8523-002-045 Vacant Lot Adjacent Southwest of 547 Norumbega Dr. Monrovia, California

CROSS SECTION B-B

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APPENDIX A
FIELD INVESTIGATION

Subsurface conditions were explored by excavation of four mini excavator test pits to a maximum depth of 10.0 feet at approximate locations shown on the enclosed Site Plan, Figure 2.

The excavation of the test pits were supervised by an engineering geologist, who continuously logged the trenches and visually classified the soils in accordance with the Unified Soil Classification System. Ring samples were taken at frequent intervals. These samples were obtained by driving a ring sampler with successive blows of 32-pound hammer dropping from a height of 48 inches.

Representative undisturbed samples of the subsurface soils were retained in a series of brass rings, each having an inside diameter of 2.42 inches and a height of 1.00 inch. All ring samples were transported to our laboratory. Bulk surface soil samples were also collected for additional classification and testing.

CalLand Engineering, Inc
dba Quartech Cosultants

TEST PIT LOG TP-1

PROJECT LOCATION: Vacant Lot Adj. to 547 Norumbega Dr., Monrovia, CA
PROJECT NO.: 19-022-035

DATE DRILLED: 9/21/2019
SAMPLE METHOD: Mini Excavator
ELEVATION: N/A
LOGGED BY: FA

B: Bulk Bag
S: Standard Penatration Test
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
							Colluvium: Silty sand with rock fragments, grayish brown, dry, loose to medium dense
	B			SM		5.8	4' ~7': coarse grained, orange brown, slightly moist, dense, some rock fragments
5		R		SM	118.2	6.1	Silty sand, coarse grained, orange brown, slightly moist, dense
7							
		R			114.3	6.6	Bedrock of Quartz Diorite (qd): Bedrock of Quartz Diorite, coarse grained, dark gray, slightly moist, moderate hard, massive
10							
15							Total Depth: 8.0 feet No Groundwater Hole Backfilled
20							
25							
30							
35							

CalLand Engineering, Inc
dba Quartech Cosultants

TEST PIT LOG TP-2

PROJECT LOCATION: Vacant Lot Adj. to 547 Norumbega Dr., Monrovia, CA
PROJECT NO.: 19-022-035

DATE DRILLED: 9/21/2019
SAMPLE METHOD: Mini Excavator
ELEVATION: N/A
LOGGED BY: FA

B: Bulk Bag
S: Standard Penatration Test
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
0							Colluvium: Silty sand with abundunt rock fragments, grayish brown to brown, dry to slightly moist, medium dense, dry to slightly moist, rooted
5							
7		R			115.2	6.1	Bedrock of Quartz Diorite (qd): Light gray granitic rock, slighly moist, fractured, weathered, moderate hard
10							Total Depth: 8.0 feet No Groundwater Hole Backfilled
15							
20							
25							
30							
35							

PLATE A-2

CalLand Engineering, Inc
dba Quartech Cosultants

TEST PIT LOG TP-3

PROJECT LOCATION: Vacant Lot Adj. to 547 Norumbega Dr., Monrovia, CA
PROJECT NO.: 19-022-035

DATE DRILLED: 9/21/2019
SAMPLE METHOD: Mini Excavator
ELEVATION: N/A
LOGGED BY: FA

B: Bulk Bag
S: Standard Penatration Test
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
5		R		SM	120.1	7.0	Colluvium: Silty sand with rock fragments, brown to reddish brown, dry to slightly moist, loose to medium dense, slightly porous
10							Total Depth: 10.0 feet No Groundwater Hole Backfilled
15							
20							
25							
30							
35							

CalLand Engineering, Inc
dba Quartech Cosultants

TEST PIT LOG TP-4

PROJECT LOCATION: Vacant Lot Adj. to 547 Norumbega Dr., Monrovia, CA
PROJECT NO.: 19-022-035

DATE DRILLED: 9/21/2019
SAMPLE METHOD: Mini Excavator
ELEVATION: N/A
LOGGED BY: FA

B: Bulk Bag
S: Standard Penatration Test
R: Ring Sample

Depth (ft)	Sample: Bulk	Sample: Undisturbed	Sample: Blows/12"	USCS Symbol	Dry Unit Wt. (pcf)	Moisture (%)	Description of Material
0							Fill: Silty sand with rock fragments, grayish brown, dry to slightly moist, medium dense
							@3' to grayish silty sand, grayish brown, slightly moist, medium dense, with rock fragments up to 6" in size
5							Bedrock of Quartz Diorite (qd): Light gray granitic rock, slighly moist, fractured, weathered, moderate hard
10							Total Depth: 8.0 feet No Groundwater Hole Backfilled
15							
20							
25							
30							
35							

APPENDIX B
LABORATORY TESTING

During the subsurface exploration, QCI personnel collected relatively undisturbed ring samples and bulk samples. The following tests were performed on selected soil samples:

Moisture-Density

The moisture content and dry unit weight were determined for each relatively undisturbed soil sample obtained in the test borings in accordance with ASTM D2937 standard. The results of these tests are shown on the boring logs in Appendix A.

Shear Tests

Shear tests were performed in a direct shear machine of strain-control type in accordance with ASTM D3080 standard. The rate of deformation was 0.005 inch per minute. Selected samples were sheared under varying confining loads in order to determine the Coulomb shear strength parameters: internal friction angle and cohesion. The shear test results are presented in the attached plates.

Corrosion Potential

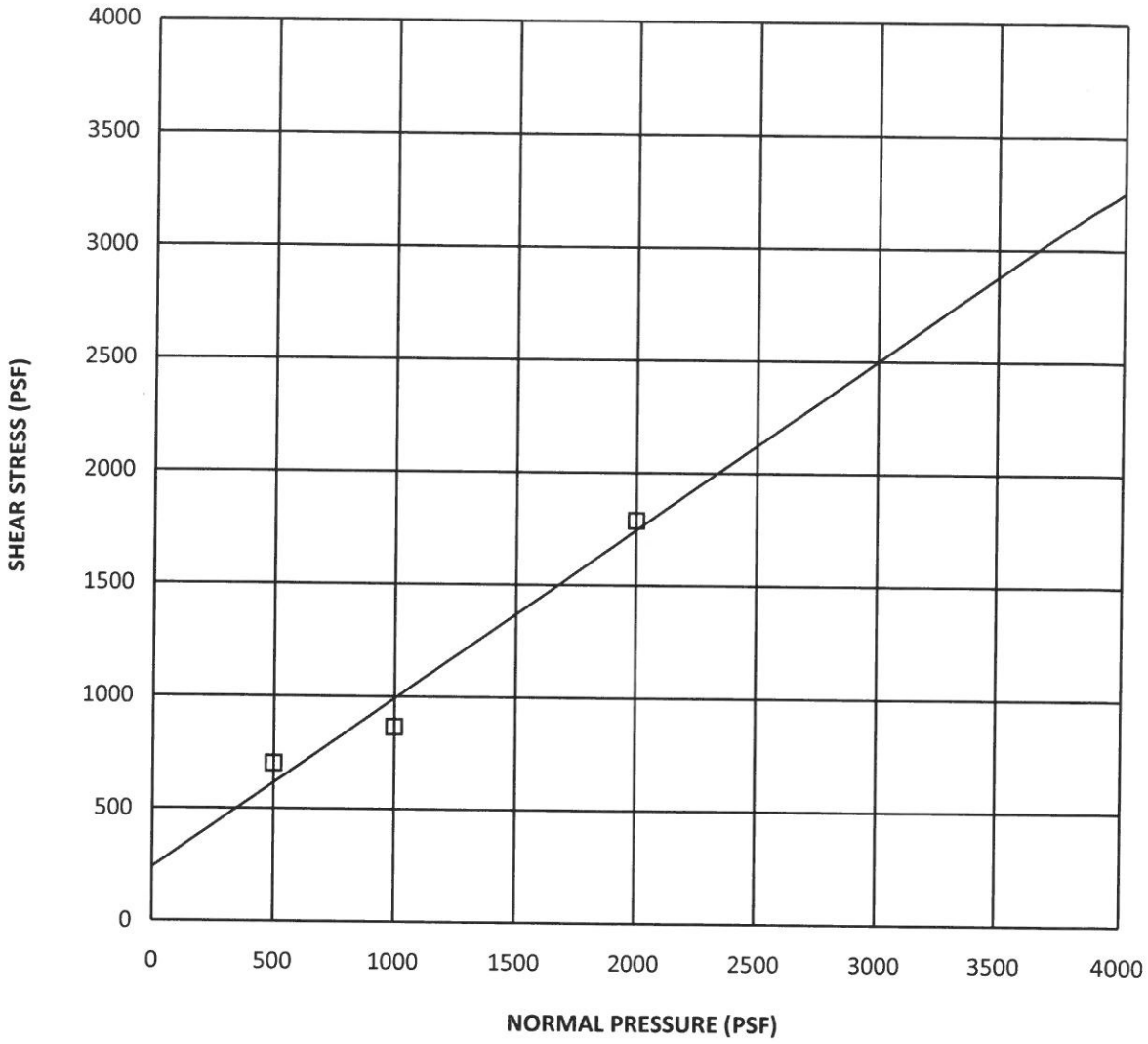
Chemical laboratory tests were conducted on the existing onsite near surface materials sampled during QCI's field investigation to aid in evaluation of soil corrosion potential and the attack on concrete by sulfate soils. These tests are performed in accordance with California Test Method 417, 422, 532, and 643. The testing results are presented below:

Sample Location	pH	Chloride (ppm)	Sulfate (% by weight)	Min. Resistivity (ohm-cm)
TP-1 @ 3.0'	8.00	180	0.0040	5,200

Expansion Index

Expansion Index test was conducted on the existing onsite near surface materials sampled during QCI's field investigation. The test is performed in accordance with ASTM D-4829. The testing results are presented below:

Sample	Expansion Index	Expansion Potential
TP1 @ 0-4'	5	Very Low



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	COHESION (PSF)	FRICTION ANGLE (DEG)
□	TP-3	N/A	4'	RING	SM	238	37

Vertical Loads (PSF)	Moisture Content Before Test (%)	Moisture Content After Test (%)
500	7.0	14.9
1000	7.0	14.6
2000	7.0	14.5

CalLand Engineering, Inc
dba Quartech Consultants
Geotechnical, Environmental & Civil Engineering Services

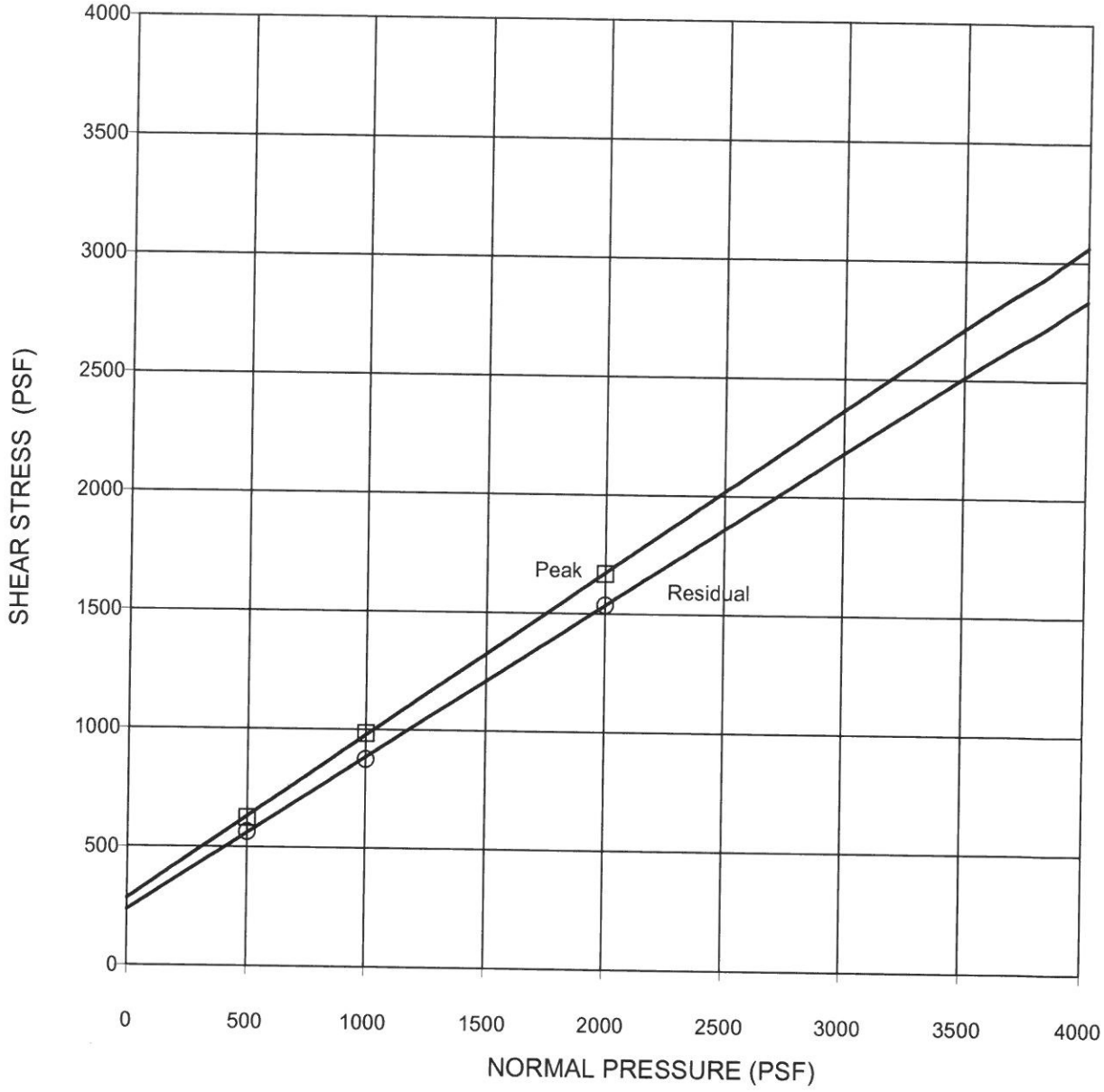
Project Address:
APN: 8523-002-045
Vacant Lot Adj. to 547 Norumbega Dr.
Monrovia, California

DIRECT SHEAR

(ASTM D3080)

4/20

FIGURE 3



SYMBOL	BOREHOLE NUMBER	SAMPLE NUMBER	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	COHESION (PSF)	FRICTION ANGLE (DEG)
□	TP-1	N/A	7.0	RING	Bedrock	280	35
○						230	33

Vertical Loads (PSF)	Moisture Content Before Test(%)	Moisture Content After test (%)
500	6.6	17.2
1000	6.6	16.8
2000	6.6	16.5

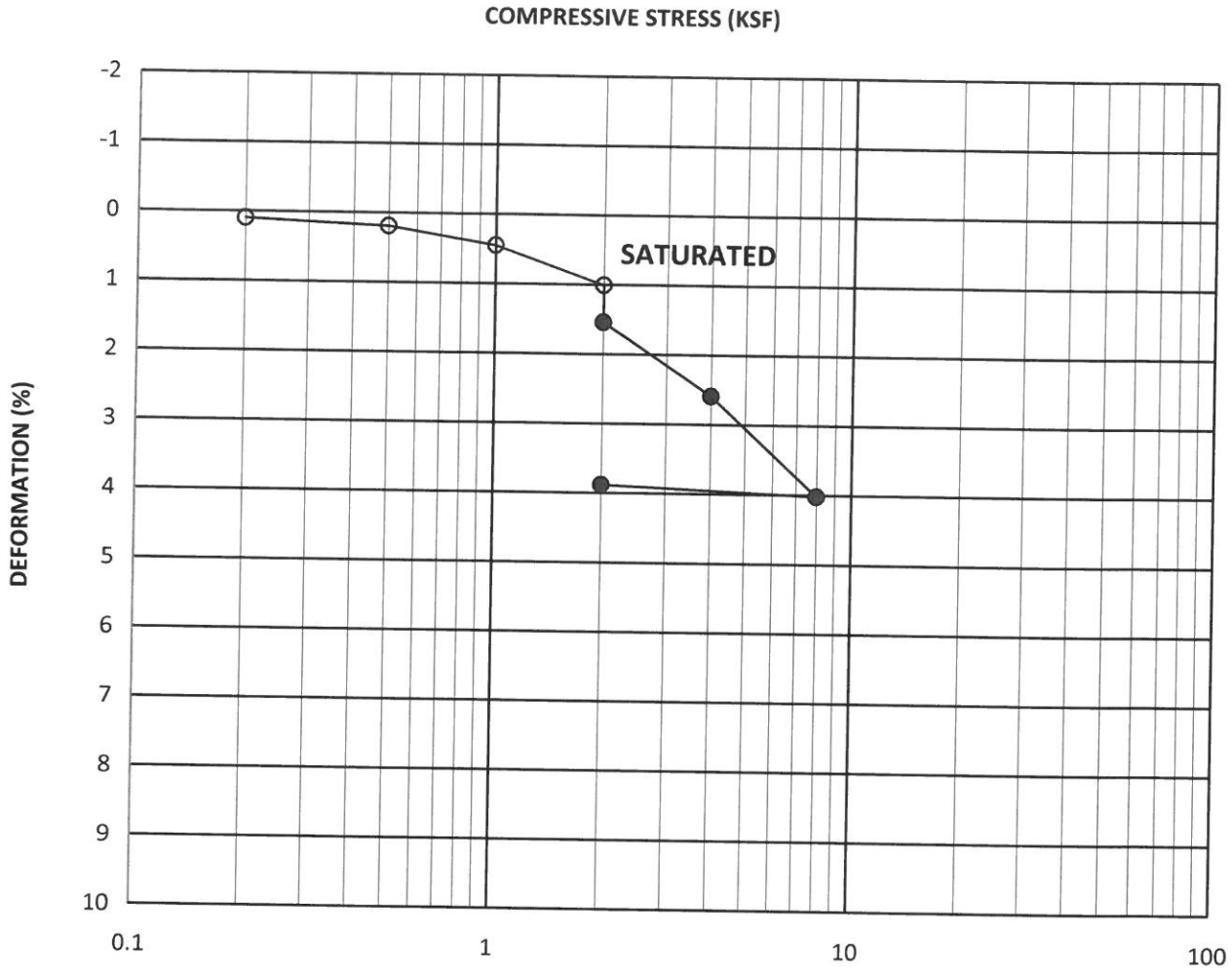
Cal Land Engineering, Inc.
dba Quartech Consultants
Geotechnical, Environmental & Civil Engineering Services

Project Address:
APN: 8523-002-045
Site W. of 547 Norumbega Dr.
Monrovia, California

DIRECT SHEAR
(ASTM D3080)

4/20

FIGURE 4



SYMBOL	BORING NO.	SAMPLE NO.	DEPTH (FT)	SOIL TYPE	INIT. MOISTURE CONTENT (%)	INIT. DRY DENSITY (PCF)	INIT. VOID RATIO
○	TP-1	N/A	5	SM	6.1	118.2	0.425

CalLand Engineering, Inc
dba Quartech Consultants
Geotechnical, Environmental & Civil Engineering Services

Project Address:
APN: 8523-002-045
Lot Adj. to 547 Norumbega Dr.
Monrovia, California

CONSOLIDATION

(ASTM D2435)

4/20

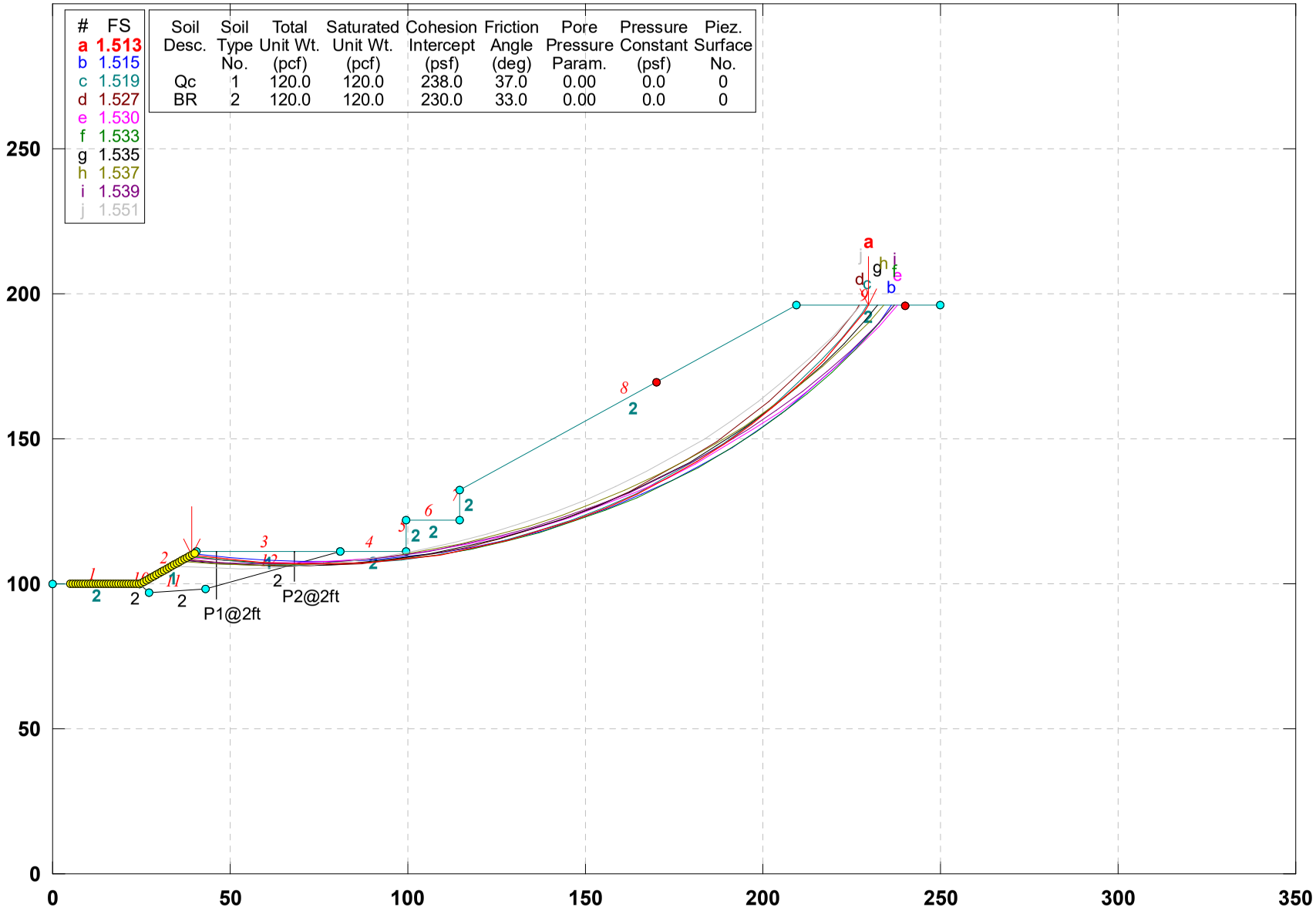
FIGURE 5

Slope Stability_547 Norumbega Drive Static

y:\soil reports\reports 19\monrovia\vacant lot adjacent to 547 norumbega dr\soil report\slope stability\slope stability.pl2 Run By: Username 6/4/2020 03:24PM

#	FS
a	1.513
b	1.515
c	1.519
d	1.527
e	1.530
f	1.533
g	1.535
h	1.537
i	1.539
j	1.551

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qc	1	120.0	120.0	238.0	37.0	0.00	0.0	0
BR	2	120.0	120.0	230.0	33.0	0.00	0.0	0



GSTABL7 v.2 FSmin=1.513

Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***
** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

****

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 6/4/2020
Time of Run: 03:24PM
Run By: Username
Input Data Filename: Y:\SOIL REPORTS\REPORTS 19\Monrovia\Vacant Lot Adjacent to 547 Norumbega Dr\Soil Report\Slope Stability\Slope Stability.in
Output Filename: Y:\SOIL REPORTS\REPORTS 19\Monrovia\Vacant Lot Adjacent to 547 Norumbega Dr\Soil Report\Slope Stability\Slope Stability.OUT
Unit System: English
Plotted Output Filename: Y:\SOIL REPORTS\REPORTS 19\Monrovia\Vacant Lot Adjacent to 547 Norumbega Dr\Soil Report\Slope Stability\Slope Stability.PLT
PROBLEM DESCRIPTION: Slope Stability_547 Norumbega Drive
Static

BOUNDARY COORDINATES
9 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	100.00	24.65	100.00	2
2	24.65	100.00	40.69	111.00	1
3	40.69	111.00	80.99	111.00	1
4	80.99	111.00	99.42	111.00	2
5	99.42	111.00	99.42	122.00	2
6	99.42	122.00	114.54	122.00	2
7	114.54	122.00	114.54	132.33	2
8	114.54	132.33	209.29	195.87	2
9	209.29	195.87	250.00	195.87	2
10	24.69	100.00	27.00	97.12	2
11	27.00	97.12	43.22	98.45	2
12	43.22	98.45	80.99	111.00	2

Default Y-Origin = 0.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	238.0	37.0	0.00	0.0	0
2	120.0	120.0	230.0	33.0	0.00	0.0	0

Specified Peak Ground Acceleration Coefficient (A) = 0.500(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.150(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
EARTHQUAKE DATA HAS BEEN SUPPRESSED

PIER/PILE LOAD(S)
2 Pier/Pile Load(s) Specified

Pier/Pile No.	X-Pos (ft)	Y-Pos (ft)	Load (lbs)	Spacing (ft)	Inclination (deg)	Length (ft)
1	46.00	111.00	2000.0	2.0	90.00	16.0
2	68.00	111.00	2000.0	2.0	90.00	10.0

NOTE - An Equivalent Line Load Is Calculated For Each Row Of Piers/Piles
Assuming A Uniform Distribution Of Load Horizontally Between
Individual Piers/Piles.
A Critical Failure Surface Searching Method, Using A Random

Technique For Generating Circular Surfaces, Has Been Specified.
1000 Trial Surfaces Have Been Generated.
20 Surface(s) Initiate(s) From Each Of 50 Points Equally Spaced
Along The Ground Surface Between X = 5.00(ft)
and X = 40.00(ft)
Each Surface Terminates Between X = 170.00(ft)
and X = 240.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 1000
Number of Trial Surfaces With Valid FS = 1000
Statistical Data On All Valid FS Values:
FS Max = 2.810 FS Min = 1.513 FS Ave = 2.019
Standard Deviation = 0.260 Coefficient of Variation = 12.89 %
Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	39.286	110.037
2	49.149	108.387
3	59.088	107.287
4	69.073	106.738
5	79.073	106.744
6	89.057	107.304
7	98.995	108.417
8	108.856	110.078
9	118.610	112.283
10	128.227	115.026
11	137.677	118.297
12	146.931	122.086
13	155.961	126.383
14	164.739	131.173
15	173.238	136.442
16	181.432	142.174
17	189.296	148.352
18	196.805	154.955
19	203.937	161.965
20	210.670	169.359
21	216.982	177.114
22	222.856	185.208
23	228.271	193.615
24	229.553	195.870

Circle Center At X = 73.983 ; Y = 286.924 ; and Radius = 180.258
Factor of Safety
*** 1.513 ***
Individual data on the 29 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	1.4	100.9	0.0	0.0	0.	0.	0.0	0.0	0.0
2	8.5	1934.0	0.0	0.0	0.	0.	0.0	0.0	0.0
3	9.9	3772.6	0.0	0.0	0.	0.	0.0	0.0	0.0
4	9.2	4381.1	0.0	0.0	0.	0.	0.0	0.0	0.0
5	0.8	396.6	0.0	0.0	0.	0.	0.0	0.0	0.0
6	10.0	5110.3	0.0	0.0	0.	0.	0.0	0.0	0.0
7	1.9	966.6	0.0	0.0	0.	0.	0.0	0.0	0.0
8	8.1	3796.6	0.0	0.0	0.	0.	0.0	0.0	0.0
9	9.9	3743.9	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.4	129.9	0.0	0.0	0.	0.	0.0	0.0	0.0
11	9.4	14399.7	0.0	0.0	0.	0.	0.0	0.0	0.0
12	5.7	7693.2	0.0	0.0	0.	0.	0.0	0.0	0.0
13	4.1	10682.0	0.0	0.0	0.	0.	0.0	0.0	0.0

14	9.6	28422.3	0.0	0.0	0.	0.	0.0	0.0	0.0
15	9.4	31769.8	0.0	0.0	0.	0.	0.0	0.0	0.0
16	9.3	34155.8	0.0	0.0	0.	0.	0.0	0.0	0.0
17	9.0	35590.6	0.0	0.0	0.	0.	0.0	0.0	0.0
18	8.8	36101.5	0.0	0.0	0.	0.	0.0	0.0	0.0
19	8.5	35732.9	0.0	0.0	0.	0.	0.0	0.0	0.0
20	8.2	34545.3	0.0	0.0	0.	0.	0.0	0.0	0.0
21	7.9	32614.8	0.0	0.0	0.	0.	0.0	0.0	0.0
22	7.5	30031.5	0.0	0.0	0.	0.	0.0	0.0	0.0
23	7.1	26898.3	0.0	0.0	0.	0.	0.0	0.0	0.0
24	5.4	18737.6	0.0	0.0	0.	0.	0.0	0.0	0.0
25	1.4	4515.3	0.0	0.0	0.	0.	0.0	0.0	0.0
26	6.3	17145.1	0.0	0.0	0.	0.	0.0	0.0	0.0
27	5.9	10366.4	0.0	0.0	0.	0.	0.0	0.0	0.0
28	5.4	4197.4	0.0	0.0	0.	0.	0.0	0.0	0.0
29	1.3	173.5	0.0	0.0	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	40.000	110.527
2	49.887	109.027
3	59.838	108.039
4	69.827	107.567
5	79.827	107.612
6	89.811	108.174
7	99.753	109.251
8	109.626	110.841
9	119.403	112.938
10	129.059	115.538
11	138.568	118.634
12	147.904	122.216
13	157.043	126.277
14	165.959	130.804
15	174.630	135.786
16	183.031	141.210
17	191.141	147.060
18	198.938	153.322
19	206.401	159.978
20	213.510	167.011
21	220.246	174.402
22	226.591	182.131
23	232.528	190.178
24	236.289	195.870

Circle Center At X = 73.974 ; Y = 300.791 ; and Radius = 193.274

Factor of Safety

*** 1.515 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	38.571	109.547
2	48.448	107.978
3	58.395	106.952
4	68.383	106.472
5	78.383	106.538
6	88.364	107.152
7	98.297	108.311
8	108.151	110.011
9	117.898	112.248
10	127.508	115.014
11	136.952	118.302
12	146.202	122.102
13	155.230	126.402
14	164.009	131.190
15	172.514	136.450
16	180.718	142.168
17	188.597	148.326
18	196.127	154.906

19	203.286	161.888
20	210.052	169.252
21	216.406	176.974
22	222.327	185.032
23	227.799	193.402
24	229.226	195.870

Circle Center At X = 72.185 ; Y = 289.011 ; and Radius = 182.585

Factor of Safety

*** 1.519 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	37.143	108.567
2	47.049	107.201
3	57.014	106.367
4	67.010	106.069
5	77.007	106.306
6	86.977	107.079
7	96.891	108.385
8	106.722	110.220
9	116.439	112.579
10	126.017	115.456
11	135.426	118.842
12	144.641	122.727
13	153.634	127.100
14	162.379	131.948
15	170.853	137.259
16	179.030	143.015
17	186.886	149.202
18	194.400	155.801
19	201.550	162.793
20	208.314	170.157
21	214.674	177.874
22	220.612	185.921
23	226.110	194.274
24	227.042	195.870

Circle Center At X = 67.596 ; Y = 292.510 ; and Radius = 186.447

Factor of Safety

*** 1.527 ***

**** END OF GSTABL7 OUTPUT ****

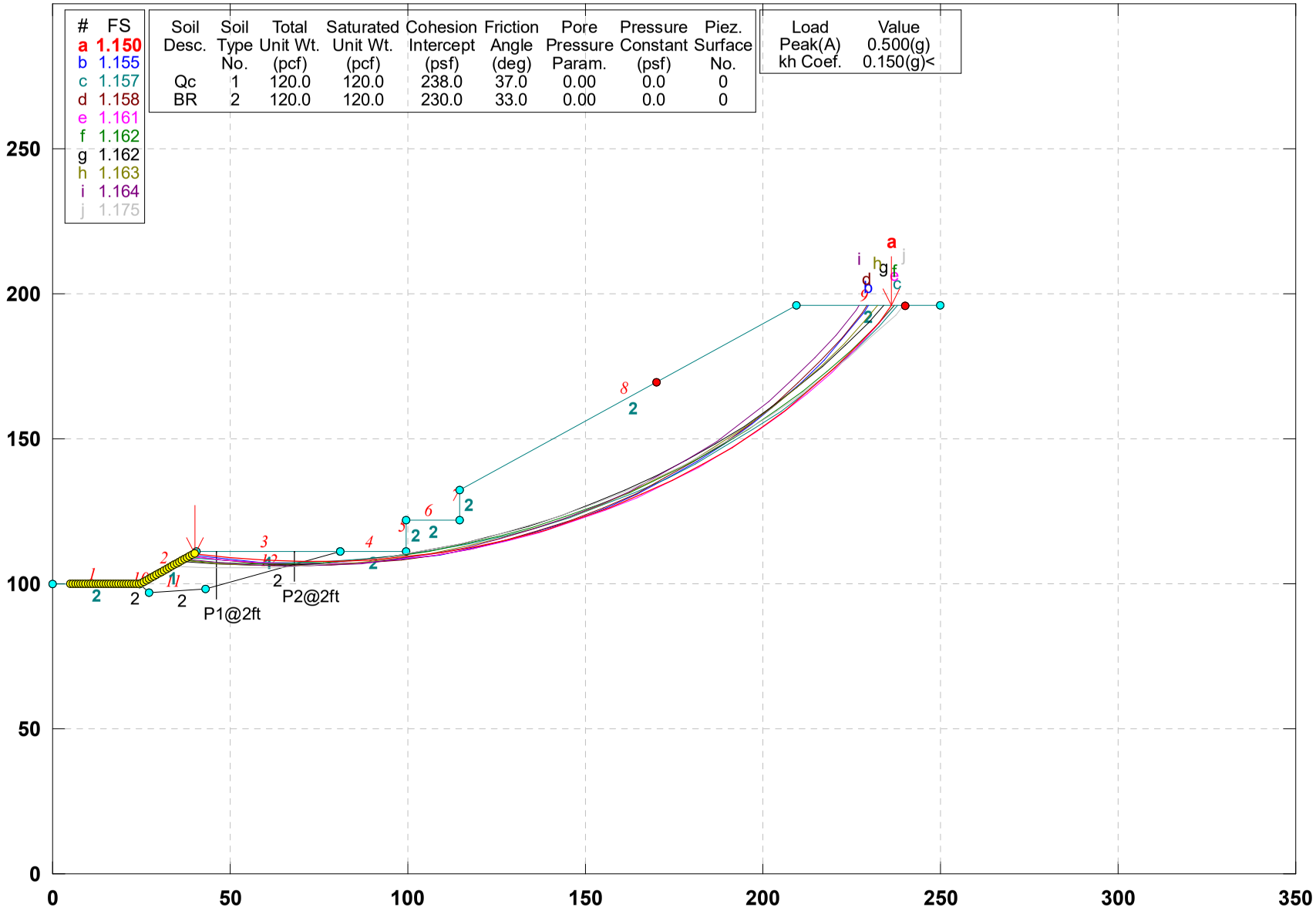
Slope Stability_547 Norumbega Drive Seismic a=0.15

y:\soil reports\reports 19\monrovia\vacant lot adjacent to 547 norumbega dr\soil report\slope stability\slope stability.pl2 Run By: Username 6/4/2020 03:26PM

#	FS
a	1.150
b	1.155
c	1.157
d	1.158
e	1.161
f	1.162
g	1.162
h	1.163
i	1.164
j	1.175

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qc	1	120.0	120.0	238.0	37.0	0.00	0.0	0
BR	2	120.0	120.0	230.0	33.0	0.00	0.0	0

Load	Value
Peak(A)	0.500(g)
kh Coef.	0.150(g)<



GSTABL7 v.2 FSmin=1.150

Safety Factors Are Calculated By The Modified Bishop Method

*** GSTABL7 ***
** GSTABL7 by Dr. Garry H. Gregory, Ph.D.,P.E.,D.GE **
** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

****

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 6/4/2020
Time of Run: 03:26PM
Run By: Username
Input Data Filename: Y:\SOIL REPORTS\REPORTS 19\Monrovia\Vacant Lot Adjacent to 547 Norumbega Dr\Soil Report\Slope Stability\Slope Stability.in
Output Filename: Y:\SOIL REPORTS\REPORTS 19\Monrovia\Vacant Lot Adjacent to 547 Norumbega Dr\Soil Report\Slope Stability\Slope Stability.OUT
Unit System: English
Plotted Output Filename: Y:\SOIL REPORTS\REPORTS 19\Monrovia\Vacant Lot Adjacent to 547 Norumbega Dr\Soil Report\Slope Stability\Slope Stability.PLT
PROBLEM DESCRIPTION: Slope Stability_547 Norumbega Drive
Seismic a=0.15

BOUNDARY COORDINATES
9 Top Boundaries
12 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	100.00	24.65	100.00	2
2	24.65	100.00	40.69	111.00	1
3	40.69	111.00	80.99	111.00	1
4	80.99	111.00	99.42	111.00	2
5	99.42	111.00	99.42	122.00	2
6	99.42	122.00	114.54	122.00	2
7	114.54	122.00	114.54	132.33	2
8	114.54	132.33	209.29	195.87	2
9	209.29	195.87	250.00	195.87	2
10	24.69	100.00	27.00	97.12	2
11	27.00	97.12	43.22	98.45	2
12	43.22	98.45	80.99	111.00	2

Default Y-Origin = 0.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS
2 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	120.0	120.0	238.0	37.0	0.00	0.0	0
2	120.0	120.0	230.0	33.0	0.00	0.0	0

Specified Peak Ground Acceleration Coefficient (A) = 0.500(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.150(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000

PIER/PILE LOAD(S)
2 Pier/Pile Load(s) Specified

Pier/Pile No.	X-Pos (ft)	Y-Pos (ft)	Load (lbs)	Spacing (ft)	Inclination (deg)	Length (ft)
1	46.00	111.00	2000.0	2.0	90.00	16.0
2	68.00	111.00	2000.0	2.0	90.00	10.0

NOTE - An Equivalent Line Load Is Calculated For Each Row Of Piers/Piles
Assuming A Uniform Distribution Of Load Horizontally Between
Individual Piers/Piles.

A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.

1000 Trial Surfaces Have Been Generated.
20 Surface(s) Initiate(s) From Each Of 50 Points Equally Spaced
Along The Ground Surface Between X = 5.00(ft)
and X = 40.00(ft)
Each Surface Terminates Between X = 170.00(ft)
and X = 240.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
10.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 1000
Number of Trial Surfaces With Valid FS = 1000
Statistical Data On All Valid FS Values:
FS Max = 2.028 FS Min = 1.150 FS Ave = 1.519
Standard Deviation = 0.195 Coefficient of Variation = 12.84 %
Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	40.000	110.527
2	49.887	109.027
3	59.838	108.039
4	69.827	107.567
5	79.827	107.612
6	89.811	108.174
7	99.753	109.251
8	109.626	110.841
9	119.403	112.938
10	129.059	115.538
11	138.568	118.634
12	147.904	122.216
13	157.043	126.277
14	165.959	130.804
15	174.630	135.786
16	183.031	141.210
17	191.141	147.060
18	198.938	153.322
19	206.401	159.978
20	213.510	167.011
21	220.246	174.402
22	226.591	182.131
23	232.528	190.178
24	236.289	195.870

Circle Center At X = 73.974 ; Y = 300.791 ; and Radius = 193.274
Factor of Safety
*** 1.150 ***
Individual data on the 29 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Surcharge Load Ver (lbs)	Surcharge Load (lbs)
1	0.7	23.9	0.0	0.0	0.	0.	3.6	0.0	0.0
2	9.2	1407.9	0.0	0.0	0.	0.	211.2	0.0	0.0
3	10.0	2946.1	0.0	0.0	0.	0.	441.9	0.0	0.0
4	10.0	3831.8	0.0	0.0	0.	0.	574.8	0.0	0.0
5	0.8	347.4	0.0	0.0	0.	0.	52.1	0.0	0.0
6	9.2	3744.6	0.0	0.0	0.	0.	561.7	0.0	0.0
7	1.2	468.3	0.0	0.0	0.	0.	70.2	0.0	0.0
8	8.8	3253.8	0.0	0.0	0.	0.	488.1	0.0	0.0
9	9.6	2658.2	0.0	0.0	0.	0.	398.7	0.0	0.0
10	0.3	509.8	0.0	0.0	0.	0.	76.5	0.0	0.0
11	9.9	14162.5	0.0	0.0	0.	0.	2124.4	0.0	0.0
12	4.9	6270.1	0.0	0.0	0.	0.	940.5	0.0	0.0
13	4.9	12572.8	0.0	0.0	0.	0.	1885.9	0.0	0.0
14	9.7	28494.3	0.0	0.0	0.	0.	4274.2	0.0	0.0

15	9.5	32142.9	0.0	0.0	0.	0.	4821.4	0.0	0.0
16	9.3	34897.4	0.0	0.0	0.	0.	5234.6	0.0	0.0
17	9.1	36760.9	0.0	0.0	0.	0.	5514.1	0.0	0.0
18	8.9	37750.9	0.0	0.0	0.	0.	5662.6	0.0	0.0
19	8.7	37898.4	0.0	0.0	0.	0.	5684.8	0.0	0.0
20	8.4	37248.2	0.0	0.0	0.	0.	5587.2	0.0	0.0
21	8.1	35858.0	0.0	0.0	0.	0.	5378.7	0.0	0.0
22	7.8	33797.3	0.0	0.0	0.	0.	5069.6	0.0	0.0
23	7.5	31147.3	0.0	0.0	0.	0.	4672.1	0.0	0.0
24	2.9	11611.3	0.0	0.0	0.	0.	1741.7	0.0	0.0
25	4.2	15671.2	0.0	0.0	0.	0.	2350.7	0.0	0.0
26	6.7	20339.7	0.0	0.0	0.	0.	3051.0	0.0	0.0
27	6.3	13402.9	0.0	0.0	0.	0.	2010.4	0.0	0.0
28	5.9	6921.5	0.0	0.0	0.	0.	1038.2	0.0	0.0
29	3.8	1284.5	0.0	0.0	0.	0.	192.7	0.0	0.0

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	39.286	110.037
2	49.149	108.387
3	59.088	107.287
4	69.073	106.738
5	79.073	106.744
6	89.057	107.304
7	98.995	108.417
8	108.856	110.078
9	118.610	112.283
10	128.227	115.026
11	137.677	118.297
12	146.931	122.086
13	155.961	126.383
14	164.739	131.173
15	173.238	136.442
16	181.432	142.174
17	189.296	148.352
18	196.805	154.955
19	203.937	161.965
20	210.670	169.359
21	216.982	177.114
22	222.856	185.208
23	228.271	193.615
24	229.553	195.870

Circle Center At X = 73.983 ; Y = 286.924 ; and Radius = 180.258

Factor of Safety

*** 1.155 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	37.857	109.057
2	47.800	107.988
3	57.782	107.388
4	67.781	107.260
5	77.775	107.603
6	87.742	108.418
7	97.659	109.701
8	107.505	111.451
9	117.257	113.663
10	126.894	116.332
11	136.395	119.453
12	145.738	123.018
13	154.902	127.020
14	163.867	131.450
15	172.614	136.297
16	181.122	141.552
17	189.373	147.202
18	197.348	153.235
19	205.030	159.637

20	212.402	166.394
21	219.447	173.491
22	226.149	180.913
23	232.494	188.642
24	237.877	195.870

Circle Center At X = 65.508 ; Y = 319.182 ; and Radius = 211.936

Factor of Safety

*** 1.157 ***

Failure Surface Specified By 24 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	38.571	109.547
2	48.448	107.978
3	58.395	106.952
4	68.383	106.472
5	78.383	106.538
6	88.364	107.152
7	98.297	108.311
8	108.151	110.011
9	117.898	112.248
10	127.508	115.014
11	136.952	118.302
12	146.202	122.102
13	155.230	126.402
14	164.009	131.190
15	172.514	136.450
16	180.718	142.168
17	188.597	148.326
18	196.127	154.906
19	203.286	161.888
20	210.052	169.252
21	216.406	176.974
22	222.327	185.032
23	227.799	193.402
24	229.226	195.870

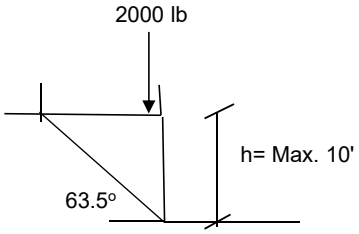
Circle Center At X = 72.185 ; Y = 289.011 ; and Radius = 182.585

Factor of Safety

*** 1.158 ***

**** END OF GSTABL7 OUTPUT ****

SLOT CUT CALCULATIONS
Proposed Residential Development
Monrovia, California



Surcharge =	2000	lb	
α (Failure Surface inclination) =	63.5	deg	
γ m =	120.0	pcf	
ϕ =	37	deg	
C =	238	psf	
Ko =	1-SIN(ϕ)	0.40	
H (Height) =	10	ft	
d (Slot Width) =	8	ft	
b=	Height/TAN(α)	5.0	ft
A (Side Area) =	1/2(H)(b)	24.9	ft^2
Δ F = Side Shear =	$A(1/2*\gamma_{m*H*}K_o*TAN(\phi)+C)$ =	10421.2	lb
W (weight of soil + surcharge) =	$A*\gamma_m$ + Surcharge =	4991.5	lb

$$F.S. = \frac{d*[W*COS^2\alpha TAN(\phi) + Cb] + 2\,\Delta f}{d*(WSIN\alpha COS\alpha)} = \mathbf{2.3}$$

LATERAL PRESSURE CALCULATIONS

r: Unit Weight of Soil C : Cohesion of Soil Φ : Friction Angle of Soil

For Colluvium: r: 120 pcf C : 238 psf Φ : 37°

For Cantilever Retaining Wall

Long Term: Say F.S. = 1.5

C' = C/1.5 = 158.7 pcf $\phi'=\tan^{-1}(\tan 37/1.5) = 26.67°$

$K_a = \tan^2(45- \phi'/2) = 0.38$ $F = rHK_a - 2C'K_a^{1/2} = 305.9$ lbs

Pa = F/H = 305.9/11 = 27.8 pcf, Say 30 pcf

Short Term: Say F.S. =1.25

C' = C/1.25 = 190.4 pcf $\phi'=\tan^{-1}(\tan 37/1.25) = 31.08°$

$K_a = \tan^2(45- \phi'/2) = 0.32$ $F = rHK_a - 2C'K_a^{1/2} = 207$ lbs

Pa = F/H = 207/11 = 18.8 pcf, Say 20 pcf

Surcharge at 11 feet: q=120 x 11 = 1320 psf

Strength at the depth of 11 feet: 238 + 120 x 11 x tan (37°) = 1233 psf

Equivalent Friction Angle: $\Phi'' = \tan^{-1}(1233/1320) = 43°$

For F.S. = 1.5, $\phi'=\tan^{-1}(\tan 43/1.5) = 31.9°$, **Say 31°**

For Restrained Retaining Wall At Rest Earth Pressure

Pa = r x Ko Ko = 1-sin(ϕ') = 0.48 Pa = 120 x 0.48 = 57.6 pcf, say 60 pcf

Seismic Lateral Pressure

$P_E = 3/4 \times r \times k_h$ $PGA_M = 0.978g$ $k_h = 1/2 \times 2/3 \times PGA_M = 0.326g$

P_E (EFP) = 29.34 pcf Use 30 pcf

Passive Earth Pressure at

Pp = r x Kp $K_p = \tan^2(45 + \phi'/2) = 3.12$

Pp = 120 x 3.12 = 374.4 > 300 pcf

Friction u = 0.67 x tan (ϕ') = 0.402 > 0.3, OK

Reference: (1) "Geotechnical Engineering Analysis and Evaluation", Roy Hunt, McGraw Hill Book Company, 1986

(2) Retaining Wall Design, City of Los Angeles Document No. P/BC 2020-083

(3) "Principles of Foundation Engineering", by B.M. Das, PWS Publishers, 1984