APPENDIX A
Air Quality and Greenhouse Gas Emissions Technical Report

Golden Valley-Sierra Highway Mixed-Use Project

Air Quality and Greenhouse Gas Emissions Technical Report

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1.0 INTRODUCTION

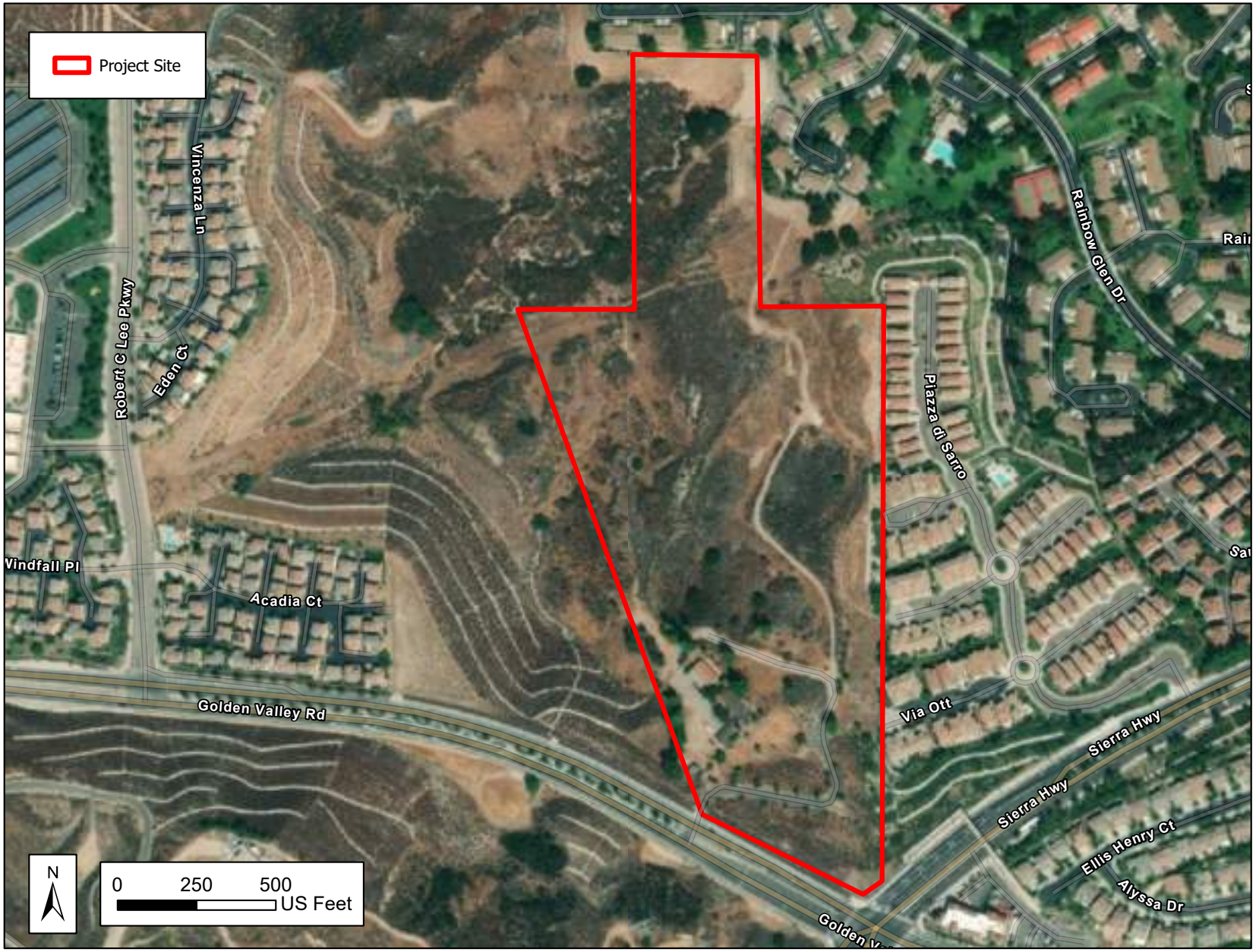
This Air Quality and Greenhouse Gas Technical Report evaluates air quality and greenhouse gas (GHG) emissions associated with the proposed Golden Valley-Sierra Highway Mixed-Use (Project) in the City of Santa Clarita (City). This report has been prepared by Impact Sciences, Inc., to support the Project's environmental documentation being prepared pursuant to the California Environmental Quality Act (CEQA) for the City. This analysis considers both the temporary air quality and GHG impacts from Project construction and long-term impacts associated with operation of the Project.

1.1 PROJECT LOCATION

The 28.13-acre Project Site is located at the northwest corner of Golden Valley Road and Sierra Highway, in the City. Currently, the majority of the site is vacant except for the single-family residence and accessory structures that are located near the southerly portion of the property near Golden Valley Road. The Project Site is designated as Mixed-Use Neighborhood Planned Development Overlay Zone (MX-N (PD)). The proposed uses are consistent with the City General Plan, Unified Development Code, and Zoning designations. Adjacent uses include residential uses to the immediate north and east, vacant land to the south, and residential uses/Golden Valley High School to the west. The surrounding uses along Golden Valley Road and Sierra Highway consist of mostly established residential uses, schools, and neighborhood commercial retail centers. See **Figure 1, Aerial Photograph of the Project Site**.

1.2 PROJECT DESCRIPTION

The Project involves the demolition of the existing single-family residence and associated debris, and development of a mixed-use project consisting of 151 senior assisted living units, 73 residential units, a 60-room hotel (with 2,544 square feet (sf) of banquet space, 3,315 sf of retail space, and 2,360 sf of restaurant space), and 5.83 acres of open space. See **Figure 2, Project Site Plan.** The Project Site would be graded with a volume totaling 360,000 cubic yards of cut and fill to be balanced on site. No soil import or export is anticipated at this time. This analysis assumes full operation by the year 2026.



SOURCE: Esri, 2022

FIGURE **1**

IMPACT SCIENCES

Aerial Photo of the Project Site

1415.001•02/22



SOURCE: Land Design Consultants Inc., 2024

FIGURE **2**

IMPACT SCIENCES

Project Site Plan

1415.001•07/24

2.0 AIR QUALITY

2.1 AIR QUALITY SETTING

South Coast Air Basin

The Project Site is located within the Los Angeles County portion of the South Coast Air Basin (Basin). The Basin includes all of Orange County and the non-desert portions of Los Angeles, San Bernardino, and Riverside Counties. The regional climate within the Basin is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime onshore breezes, and moderate humidity. The air quality within the Basin is primarily influenced by meteorological conditions and a wide range of emissions sources – such as dense population centers, heavy vehicular traffic, and industry. The South Coast Air Quality Management District (SCAQMD) divides the Basin into source receptor areas (SRAs) in which monitoring stations operate to monitor the various concentrations of air pollutants in the region. As shown in **Figure 3, Source Receptor Area Location Map**, the Project Site is located within SRA 13, which covers the Santa Clarita Valley area.

In 2004, the SCAQMD provided an expanded air quality analysis of the Santa Clarita Valley subregion. The *Santa Clarita Subregional Analysis*[1] indicated that the Santa Clarita Valley is a relatively small contributor to the total emissions of the key pollutants in both Los Angeles County and the Basin. Emissions occurring in the Santa Clarita Valley typically comprise less than 3 percent of the County and 2 percent of the Basin, based on 2002 emissions inventory data. While the Santa Clarita Valley contributes a small amount of pollutants to the region, it experiences disproportionately high concentrations of ozone and particulate matter. The subregional analysis stated that the overwhelming contribution of pollution transport to the Santa Clarita Valley comes from the San Fernando Valley and metropolitan Los Angeles. This is evidenced by meteorological monitoring data for the Santa Clarita Valley that show the primary daytime wind vectors are from the southern and upwind emission source areas. The subregional analysis also indicated that, in general, average transport, which is characterized by a moderate-to-strong sea breeze through the Newhall Pass, occurs two-thirds of all days and, that in contrast, Santa Clarita is mostly impacted from local emissions under calm winds and weak offshore flow which occurs less than 10 percent of all days. Therefore, the disproportionate impact of air pollutants in the Santa Clarita Valley is caused by the regional and local climate.

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1 SCAQMD. 2004. Santa Clarita Subregional Analysis. Available online at: http://filecenter.santa-clarita.com/Planning/VistaCanyon/DraftEIR/Volume3/Apx_4_4a_SC_Subregional_Analysis.pdf, accessed February 1, 2024.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

21865 Copley Drive, Diamond Bar, CA 91765-4182
Information: 1-800-CUT-SMOG (1-800-288-7664)
Internet: http://www.aqmd.gov

Air Quality Reporting

Since 1977, the South Coast Air Quality Management District has served as the local government agency responsible for measuring, reporting and taking steps to improve air quality.

To inform the AQMD's 15 million residents about air quality conditions, the AQMD issues an air quality forecast each day and reports current air quality conditions for each numbered Monitoring Area and General Forecast Area depicted here.

This air quality information is transmitted to the public through newspapers, television, radio and pager services, through faxes to schools, through recorded messages on the AQMD's toll-free Smog Update telephone line, 1-800-CUT-SMOG, and on the AQMD's Internet Website http://www.aqmd.gov.

Newspapers, television and radio stations typically will report air quality information using the General Forecast Areas, shown in color below, which are larger groupings of the more specific Air Monitoring Areas.

The 1-800-CUT-SMOG (1-800-288-7664) line also provides smog forecast and current smog level information by ZIP code.

The AQMD's Internet Website provides both forecasts as well as smog levels for that day and the previous day. Forecasts for the next day normally are posted by noon.

General Forecast Areas & Air Monitoring Areas

Coastal
- Northwest Los Angeles County Coastal 2
- Southwest Los Angeles County Coastal 3
- South Los Angeles County Coastal 4
- North Orange County Coastal 18
- Central Orange County Coastal 20

Metropolitan
- Central Los Angeles County 1
- Southeast Los Angeles County 5
- South Central Los Angeles County 12
- North Orange County 16

San Fernando Valley
- West San Fernando Valley 6
- East San Fernando Valley 7
- Santa Clarita Valley 13

San Gabriel Valley
- West San Gabriel Valley 8
- East San Gabriel Valley 9
- Pomona/Walnut Valley 10
- South San Gabriel Valley 11

Inland Orange County
- Central Orange County 17
- Saddleback Valley 19
- Capistrano Valley 21

Riverside Valley
- Corona/Norco Area 22
- Metropolitan Riverside 23

San Bernardino Valley
- Northwest San Bernardino Valley 32
- Southwest San Bernardino Valley 33
- Central San Bernardino Valley 34
- East San Bernardino Valley 35

Hemet/Elsinore Area
- Perris Valley 24
- Lake Elsinore 25
- Hemet/San Jacinto Valley 28

Temecula/Anza Area
- Temecula Valley 26
- Anza Area 27

San Gabriel Mountains 15

San Bernardino Mountains
- West San Bernardino Mountains 36
- Central San Bernardino Mountains 37

Big Bear Lake 38

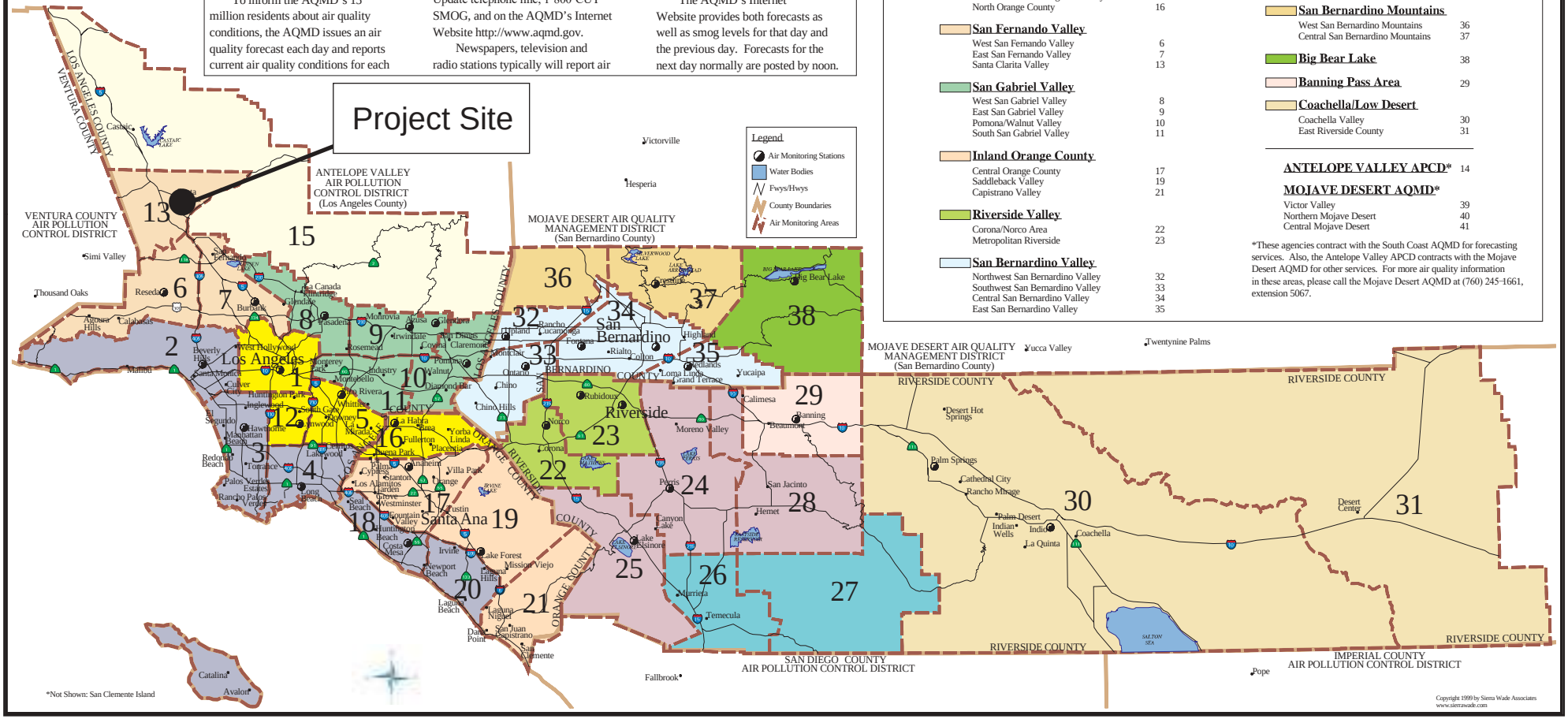
Banning Pass Area 29

Coachella/Low Desert
- Coachella Valley 30
- East Riverside County 31

ANTELOPE VALLEY APCD* 14

MOJAVE DESERT AQMD*
- Victor Valley 39
- Northern Mojave Desert 40
- Central Mojave Desert 41

*These agencies contract with the South Coast AQMD for forecasting services. Also, the Antelope Valley APCD contracts with the Mojave Desert AQMD for other services. For more air quality information in these areas, please call the Mojave Desert AQMD at (760) 245-1661, extension 5067.



SOURCE: SCQAMD, 2022

FIGURE 3

IMPACT SCIENCES

Source Receptor Area Map

1415.001•02/22

Air Pollutants of Concern

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards for outdoor concentrations. The federal and state standards have been set at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons such as children, pregnant women, and the elderly, from illness or discomfort. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter 2.5 microns or less in diameter (PM2.5), particulate matter ten microns or less in diameter (PM10), and lead (Pb). Note that reactive organic gases (ROGs), which are also known as reactive organic compounds (ROCs) or volatile organic compounds (VOCs), and nitrogen oxides (NOx) are not classified as criteria pollutants. However, ROGs and NOx are widely emitted from land development projects and participate in photochemical reactions in the atmosphere to form O_3; therefore, NOx and ROGs are relevant to the proposed Project and are of concern in the air basin. As such, they are listed below along with the criteria pollutants. Sources and health effects commonly associated with criteria pollutants are summarized in **Table 1, Criteria Pollutants Summary of Common Sources and Effects**.

Table 1
Criteria Pollutants Summary of Common Sources and Effects

Pollutant	Major Man-Made Sources	Human Health & Welfare Effects
Carbon Monoxide (CO)	An odorless, colorless gas formed when carbon in fuels is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO_2)	A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include moto vehicles, electric utilities, and other sources that burn fuel.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Contributes to global warming and nutrient overloading which deteriorates water quality. Causes brown discoloration of the atmosphere.
Ozone (O_3)	Formed by a chemical reaction between volatile organic compounds (VOC) and nitrous oxides (NOx) in the presence of sunlight. VOCs are also commonly referred to as reactive organic gases (ROGs). Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, gasoline storage and transport, solvents, paints, and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. Damages rubber, some textiles, and dyes.
Particulate Matter (PM10 & PM2.5)	Produced by power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles, and others.	Increased respiratory symptoms, such as irritation of the airways, coughing or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).

Pollutant	Major Man-Made Sources	Human Health & Welfare Effects
Sulfur Dioxide (SO_2)	A colorless, nonflammable gas formed when fuel containing sulfur is burned; when gasoline is extracted from ore. Examples are petroleum refineries, cement manufacturing, metal processing facilities, locomotives, and ships.	Respiratory irritant; aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron, and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.

Source: CAPCOA, Health Effects. Available: http://www.capcoa.org/health-effects/

2.2 AMBIENT AIR QUALITY

Criteria Air Pollutant Monitoring Data

Ambient air quality in Santa Clarita can be inferred from ambient air quality measurements conducted at nearby air quality monitoring stations. Existing levels of ambient air quality and historical trends and projections are documented by measurements made by the SCAQMD, the air pollution regulatory agency in the Basin. The SCAQMD maintains air quality monitoring stations which process ambient air quality measurements throughout the Basin.

The purpose of the monitoring station is to measure ambient concentrations of pollutants and determine whether ambient air quality meets the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS). Ozone and particulate matter (PM10 and PM2.5) are pollutants of particular concern in the Basin. The monitoring station located closest to the Project Site and most representative of air quality is the Santa Clarita-Placerita station, located at 22224 Placerita Canyon Road (SCAQMD Station No. 090). Ambient emission concentrations vary due to localized variations in emissions sources and climate and should be considered "generally" representative of ambient concentrations near the Project Site. The Santa Clarita-Placerita station monitors O_3, NO_2, CO, and PM10. Particulate matter 2.5 microns in diameter or less (PM2.5) is not measured at the Santa Clarita-Placerita station. The nearest station to the Project Site measuring PM2.5 is the Reseda station (SCAQMD Station No. 074). The air quality data monitored at the Santa Clarita-Placerita and Reseda stations are presented in **Table 2, Air Monitoring Station Ambient Pollutant Concentrations**.

Table 2
Air Monitoring Station Ambient Pollutant Concentrations

Pollutant	Standards[1]	Year		
		2020	2021	2022
OZONE (O_3)				
Maximum 1-hour concentration monitored (ppm)		0.148	0.125	0.129
Maximum 8-hour concentration monitored (ppm)		0.122	0.103	0.114
Number of days exceeding state 1-hour standard	0.09 ppm	44	30	28
Number of days exceeding federal/state 8-hour standard	0.070 ppm	73	63	68
NITROGEN DIOXIDE (NO_2)				
Maximum 1-hour concentration monitored (ppm)		0.046	0.057	0.052
Annual average concentration monitored (ppm)		0.009	0.009	0.009
Number of days exceeding state 1-hour standard	0.18 ppm	0	0	0
CARBON MONOXIDE (CO)				
Maximum 1-hour concentration monitored (ppm)		1.2	1.0	1.0
Maximum 8-hour concentration monitored (ppm)		0.8	0.7	0.6
Number of days exceeding state 1-hour standard	20 ppm	0	0	0
Number of days exceeding federal 1-hour standard	35 ppm	0	0	0
RESPIRABLE PARTICULATE MATTER (PM10)				
Maximum 24-hour concentration monitored ($\mu g/m^3$)		48.0	47	36
Annual average concentration monitored ($\mu g/m^3$)		22.5	19.9	18.5
Number of samples exceeding state standard	50 $\mu g/m^3$	0	0	0
Number of samples exceeding federal standard	150 $\mu g/m^3$	0	0	0`
FINE PARTICULATE MATTER (PM2.5)				
Maximum 24-hour concentration monitored ($\mu g/m^3$)		27.6	55.5	20.5
Annual average concentration monitored ($\mu g/m^3$)		10.1	10.0	8.8
Number of samples exceeding federal standard	35 $\mu g/m^3$	0	9	0

Source: California Air Resources Board, "Air Quality Data Statistics," http://www.arb.ca.gov/adam/. 2023.
SCAQMD. 2023. Air Quality South Coast Air Quality Management District, https://www.aqmd.gov/home/air-quality/historical-air-quality-data/historical-data-by-year, accessed February 1, 2024.,
NA = not available
[1] *Parts by volume per million of air (ppm), micrograms per cubic meter of air ($\mu g/m^3$), or annual arithmetic mean (aam).*

The attainment status for the Basin region is included in **Table 3, Attainment Status of Criteria Pollutants in the South Coast Air Basin**. Areas that meet ambient air quality standards are classified as attainment areas, while areas that do not meet these standards are classified as nonattainment areas. The Basin region is designated as a nonattainment area for federal ozone, PM2.5, and lead standards and is designated as nonattainment for state ozone, PM10, and PM2.5 standards.

Table 3
Attainment Status of the South Coast Air Basin

Pollutant	State	Federal
Ozone (O_3)	Non-Attainment	Non-Attainment
Particulate Matter (PM10)	Non-Attainment	Attainment
Particulate Matter (PM2.5)	Non-Attainment	Non-Attainment
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Attainment	Non-Attainment (Partial)[1]

Source: SCAQMD. 2016. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin. Available online at: https://ww2.arb.ca.gov/resources/documents/ambient-air-quality-standards-0, accessed February 1, 2024.[1] The Los Angeles County portion of the Basin is designated as a non-attainment area for the federal lead standard on the basis of source-specific monitoring at two locations as determined by U.S. EPA using 2007-2009 data. However, all stations in the Basin, including the near-source monitoring in Los Angeles County, have remained below the lead NAAQS for the 2012 through 2015 period. The SCAQMD will request that the U.S. EPA re-designated the Los Angeles County portion of the Basin as attainment for lead.

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes, such as petroleum refining and chrome-plating operations; commercial operations, such as gasoline stations and dry cleaners; and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage, or short-term acute affects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches.

To date, CARB has designated 244 compounds as TACs. Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to a relatively few compounds.[2]

CARB identified diesel particulate matter (DPM) as a TAC. DPM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particulates and gases produced when an engine burns diesel fuel. DPM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. DPM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of DPM vary between different engine types (heavy-duty, light-duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine. Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. DPM poses the greatest health risk among the TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely ill, and the chronically ill, especially those with cardiovascular diseases.[3]

Residential areas are considered sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Children are considered more susceptible to health effects of air pollution due to their immature immune systems and developing organs.[4] As such, schools are also considered sensitive receptors, as children are present for extended durations and engage in regular outdoor activities. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. In addition, noticeable air pollution can detract from the enjoyment of recreation. The closest

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2 California Air Resources Board. *CARB Identified Toxic Air Contaminants*. Available online at: https://ww2.arb.ca.gov/resources/documents/carb-identified-toxic-air-contaminants.

3 California Air Resources Board. *Sensitive Receptor Assessment*. Available online at: https://ww2.arb.ca.gov/capp-resource-center/community-assessment/sensitive-receptor-assessment.

4 Office of Environmental Health Hazard Assessment and The American Lung Association of California. *Air Pollution and Children's Health*. Available online at: https://oehha.ca.gov/air/air-pollution-and-childrens-health-fact-sheet-oehha-and-american-lung-association.

sensitive receptors are residences located approximately 15 feet to the north and to the east of the Project Site.

2.3 REGULATORY FRAMEWORK

Federal

Clean Air Act

The Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the U.S. Environmental Protection Agency (EPA) to establish NAAQS, with states retaining the option to adopt more stringent standards or to include other specific pollutants. On April 2, 2007, the Supreme Court found that carbon dioxide is an air pollutant covered by the CAA; however, no NAAQS have been established for carbon dioxide.

These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those "sensitive receptors" most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

The EPA has classified air basins (or portions thereof) as being in attainment, nonattainment, or unclassified for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designations. **Table 3** lists the federal attainment status of the Basin for the criteria pollutants.

National Emissions Standards for Hazardous Air Pollutants Program

Under federal law, 187 substances are currently listed as hazardous air pollutants (HAPs). Major sources of specific HAPs are subject to the requirements of the National Emissions Standards for Hazardous Air Pollutants (NESHAPS) program. The EPA is establishing regulatory schemes for specific source categories and requires implementation of the Maximum Achievable Control Technologies (MACT) for major sources of HAPs in each source category. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and is aimed at HAPs that are a problem is California. The state has formally identified 244 substances as TACs

and is adopting appropriate control measures for each. Once adopted at the state level, each air district will be required to adopt a measure that is equally or more stringent.

National Ambient Air Quality Standards

The federal CAA required the U.S. EPA to establish NAAQS. The NAAQS set primary standards and secondary standards for specific air pollutants**.** Primary standards define limits for the intention of protecting public health, which include sensitive populations such as asthmatics, children, and the elderly. Secondary Standards define limits to protect public welfare to include protection against decreased visibility, damage to animals, crops, vegetation, and buildings. A summary of the federal ambient air quality standards is shown in **Table 4, National Ambient Air Quality Standards**.

Table 4
National Ambient Air Quality Standards

Pollutant		Primary/Secondary	Averaging Time	Level
Carbon Monoxide		Primary	8 hours	9 ppm
			1 hour	35 ppm
Lead		Primary and secondary	Rolling 3-month average	0.15 μg/m^3
Nitrogen dioxide		Primary	1 hour	100 ppb
		Primary and secondary	Annual	0.053 ppm
Ozone		Primary and secondary	8 hours	0.070 ppm
Particulate Matter	PM2.5	Primary	Annual	12 μg/m^3
		Secondary	Annual	15 μg/m^3
		Primary and secondary	24 hours	35 μg/m^3
	PM10	Primary and secondary	24 hours	150 μg/m^3
Sulfur dioxide		Primary	1 hour	75 ppb
		Secondary	3 hours	0.5 ppm

Source: California Air Resources Board. May 2016. Ambient Air Quality Standards. Available online at: https://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed February 1, 2024.

State

California Clean Air Act of 1988

The California CAA of 1988 (CCAA) allows states to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. The California Air Resources Board (CARB), a part of the California Environmental Protection Agency (Cal EPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California,

including setting the CAAQS. The CCAA, amended in 1992, requires all air quality management districts (AQMDs) in the state to achieve and maintain the CAAQS. The CAAQS are generally stricter than national standards for the same pollutants and has also established state standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles, for which there are no national standards. CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB also has primary responsibility for the development of California's State Implementation Plan (SIP), for which it works closely with the federal government and the local air districts.

California Ambient Air Quality Standards

The federal CAA permits states to adopt additional or more protective air quality standards if needed. California has set standards for certain pollutants, such as particulate matter and ozone, which are more protective of public health than respective federal standards. California has also set standards for some pollutants that are not addressed by federal standards. The state standards for ambient air quality are summarized in **Table 5, California Ambient Air Quality Standards**.

Table 5
California Ambient Air Quality Standards

Pollutant		Averaging Time	Level
Carbon monoxide		8 hours	9 ppm
		1 hour	20 ppm
Lead		30-day average	1.5 μg/m^3
Nitrogen dioxide		1 hour	0.180 ppm
		Annual	0.030 ppm
Ozone		8 hours	0.070 ppm
		1 hour	0.09 ppm
Particulate matter	PM2.5	Annual	12 μg/m^3
	PM10	24 hours	50 μg/m^3
		Annual	20 μg/m^3
Sulfur dioxide		1 hour	0.25 ppm
		24 hours	0.04 ppm
Sulfates		24 hours	25 μg/m^3
Hydrogen sulfide		1 hour	0.03 ppm
Vinyl chloride		24 hours	0.01 ppm

Source: California Air Resources Board. May 2016. Ambient Air Quality Standards. Available online at: https://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed February 1, 2024.

California State Implementation Plan

The federal CAA (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as a State Implementation Plan (SIP). The SIP is a living document that is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The EPA has the responsibility to review all SIPs to determine if they conform to the requirements of the CAA.

State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the U.S. EPA for approval and publication in the Federal Register. The 2022 Air Quality Management Plan (2022 AQMP) is the SIP for the Basin. The AQMP identifies the control measures that will be implemented to reduce major sources of pollutants. Implementation of control measures established in the previous AQMPs has substantially decreased the population's exposure to unhealthful levels of pollutants, even while population growth has occurred in the SCAB.

On December 2, 2022, the SCAQMD Governing Board approved the 2022 AQMP that lays a path for improving air quality and meeting federal air pollution standards by 2037. The AQMP aims to, among other goals, reduce almost 70 percent of smog forming emissions by 2037 beyond existing regulations, require zero-emission technologies across all sectors, and lay out specific actions needed from the federal government to reduce emissions from ships, trains, aircraft, and other sources primarily under federal regulatory authority. The 2022 AQMP also focuses on communities disproportionately impacted by air pollution with a dedicated chapter on environmental justice.[5]

The future air quality levels forecast in the 2022 AQMP are based on the most recent assumptions provided by both CARB and the Southern California Association of Governments (SCAG) for motor vehicle emissions and demographic updates and includes updated transportation conformity budgets.[6] For example, future growth projections were based on demographic growth forecasts for various socioeconomic categories (e.g., population, housing, employment by industry) developed by SCAG for their 2020 RTP/SCS.[7] The 2022 AQMP also assumes that development projects will include strategies

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5 South Coast Air Quality Management District. *South Coast AQMD Finalizes Most Ambitious Strategy to Cut Pollution*, 2022. Available online at: http://www.aqmd.gov/docs/default-source/news-archive/2022/aqmp-adopted-dec2-2022.pdf, accessed February 1, 2024.

6 *Ibid.*

7 *Ibid.*

(mitigation measures) to reduce emissions generated during construction and operation in accordance with SCAQMD and local jurisdiction regulations, which are designed to address air quality impacts and pollution control measures. The 2022 AQMP acknowledges that the most significant air quality challenge in the Basin is to reduce NOX emissions sufficiently to meet the upcoming ozone standard deadlines. The 2022 AQMP incorporates the latest scientific and technical information and planning assumptions, including SCAG's 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy (Connect SoCal) (RTP/SCS), updated emission inventory methodologies for various source categories, and SCAG's latest growth forecasts. The 2022 AQMP includes integrated strategies and measures to meet the NAAQS.

California Air Toxics "Hot Spots" Information and Assessment Act (AB 2588)

The California Air Toxics Program is supplemented by the Air Toxics "Hot Spots" program, which became law (AB 2588, Statutes of 1987) in 1987. In 1992, the AB 2588 program was amended by Senate Bill 1731 to require facilities that pose a significant health risk to the community to perform a risk reduction audit and reduce their emissions through implementation of a risk management plan. Under this program, which is required under the Air Toxics "Hot Spots" Information and Assessment Act (Section 44363 of the California Health and Safety Code), facilities are required to report their air toxics emissions, assess health risks, and notify nearby residents and workers of significant risks when present.

Typically, land development projects generate diesel emissions from construction vehicles during the construction phase, as well as some diesel emissions from small trucks during the operational phase. Diesel exhaust is mainly composed of particulate matter and gases, which contain potential cancer-causing substances. Emissions from diesel engines currently include over 40 substances that are listed by EPA as hazardous air pollutants and by CARB as TACs. On August 27, 1998, CARB identified particulate matter in diesel exhaust as a TAC, based on data linking diesel particulate emissions to increased risks of lung cancer and respiratory disease.[8]

In March 2015, the OEHHA adopted "The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments" in accordance with the Health and Safety Code, Section 44300. The Final Guidance Manual incorporates the scientific basis from three earlier developed Technical Support Documents to assess risk from exposure to facility emissions. The 2015 OEHHA Final Guidance has key changes including greater age sensitivity in particular for children, decreased exposure durations, and higher breathing rate profiles. Because cancer risk could be up to three times greater using this new guidance, it may result in greater mitigation requirements, more agency backlog, and increased difficulty

8 Diesel exhaust is included within pollutants subject to the hotspot program. Please refer to OEHHA's Air Toxics Hot Spot Program Risk Assessment Guidelines. https://oehha.ca.gov/air/crnr/notice-adoption-air-toxics-hot-spots-program-guidance-manual-preparation-health-risk-0

in getting air permits. Regardless of the change in calculation methodology, actual emissions and cancer risk within South Coast Air Basin has declined by more than 50% since 2005.

The CARB provides a computer program, the Hot Spots Analysis and Reporting Program (HARP), to assist in a coherent and consistent preparation of an HRA. HARP2, an update to HARP, was released in March 2015. HARP2 has a more refined risk characterization in HRA and CEQA documents and incorporates the 2015 OEHHA Final Guidance.

Regional

South Coast Air Quality Management District

The SCAQMD is the air pollution control district for Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The agency's primary responsibility is ensuring that the Basin region meets attainment for the federal and state standards. The SCAQMD is responsible for preparing an air quality management plan in order to meet federal attainment status. The SCAQMD is also responsible for adopting and enforcing rules and regulations concerning air pollutant sources, issuing permits for stationary sources of air pollutants, inspecting stationary sources of air pollutants, responding to citizen complaints, monitoring ambient air quality and meteorological conditions, awarding grants to reduce motor vehicle emissions, and conducting public education campaigns, as well as many other activities. All projects are subject to SCAQMD rules and regulations in effect at the time of construction.

SCAQMD Rules and Regulations

The following is a list of noteworthy SCAQMD rules that are required of construction activities associated with the proposed Project:

- **Rule 402 (Nuisance)** – This rule prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property. This rule does not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowl or animals.

- **Rule 403 (Fugitive Dust)** – This rule requires fugitive dust sources to implement best available control measures for all sources, and all forms of visible particulate matter are prohibited from crossing any property line. This rule is intended to reduce PM10 emissions from any transportation, handling,

construction, or storage activity that has the potential to generate fugitive dust. PM10 suppression techniques are summarized below.

- Portions of a construction site to remain inactive longer than a period of three months will be seeded and watered until grass cover is grown or otherwise stabilized.
- All on-site roads will be paved as soon as feasible or watered periodically or chemically stabilized.
- All material transported off-site will be either sufficiently watered or securely covered to prevent excessive amounts of dust.
- The area disturbed by clearing, grading, earthmoving, or excavation operations will be minimized at all times.
- Where vehicles leave a construction site and enter adjacent public streets, the streets will be swept daily or washed down at the end of the work day to remove soil tracked onto the paved surface.

- **Rule 1113 (Architectural Coatings)** – This rule requires manufacturers, distributors, and end-uses of architectural and industrial maintenance coatings to reduce ROG emissions from the use of these coatings, primarily by placing limits on the ROG content of various coating categories.

- **Rule 445 (Wood-Burning Devices)** – The purpose of this rule is to reduce the emission of particulate matter from wood-burning devices and establish contingency measures for applicable ozone standards for the reduction of volatile organic compounds.

  The rule requires that any new residential or commercial development that begins construction on or after March 9, 2009, only install gaseous-fueled fireplaces and stoves.[9]

- **Rule 1168 Adhesive and Sealant Applications** – This rule reduces emissions of VOCs and eliminates emissions of chloroform, ethylene dichloride, methylene chloride, perchlorethylene, and trichloroethylene from the application of adhesives, adhesive bonding primers, adhesive primers, sealants, sealant primers, or any other primers.

- **Regulation XIII New Source Review** – This regulation contains Rules 1300 through 1325, which set forth pre-construction review requirements for new, modified, or relocated facilities, to ensure that the operation of such facilities does not interfere with progress in attainment of the NAAQS, and that future growth within SCAQMD is not unnecessarily restricted. The specific air quality goal of this

9 South Coast Air Quality Management District. 2019. *Rule 445 – Wood Burning Devices Local Government, Builder, Contractor, Architect Answers to Frequently Asked Questions (FAQs).* Available online at: http://www.aqmd.gov/docs/default-source/rule-book/support-documents/rule-445/detailed-rule-445-information.pdf.

regulation is to achieve no net increases from new or modified permitted sources of nonattainment air contaminants or their precursors.

Local

City of Santa Clarita General Plan

Applicable goals and policies related to air quality from the City of Santa Clarita General Plan (General Plan) Land Use and Conservation and Open Space Element are listed below:

- Clean air to protect human health and support healthy ecosystems.
  - Reduce air pollution from mobile sources.
    - Through the mixed land use patterns and multi-modal circulation policies set forth in the Land Use and Circulation Elements, limit air pollution from transportation sources.
    - Support the use of alternative fuel vehicles.
    - Support alternative travel modes and new technologies, including infrastructure to support alternative fuel vehicles, as they become commercially available.
  - Apply guidelines to protect sensitive receptors from sources of air pollution as developed by the CARB, where appropriate.
    - Ensure adequate spacing of sensitive land use from the following sources of air pollution: high traffic freeways and roads; distribution centers; truck stops; chrome plating facilities; dry cleaners using perchloroethylene; and large gas stations, as recommended by CARB.
  - Coordinate with other agencies to plan for and implement programs for improving air quality in the South Coast Air Basin.
    - Coordinate with local, regional, state, and federal agencies to develop and implement regional air quality policies and programs.

2.4 THRESHOLDS AND METHODOLOGY

Thresholds of Significance

The impact analysis provided below is based on the application of the following *California Environmental Quality Act (CEQA) Guidelines* Appendix G, which indicates that a Project would have a significant impact on air quality if it would:

1. Conflict with or obstruct implementation of any applicable air quality plan.

2. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard.

3. Expose sensitive receptors to substantial pollutant concentrations.

4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Consistency with the Applicable AQMP

The SCAQMD has adopted criteria for consistency with regional plans and the regional AQMP in its CEQA Air Quality Handbook. Specifically, the indicators of consistency are: 1) whether the project would increase the frequency or severity of existing air quality violations or cause or contribute to new air quality violations; and 2) whether the project would exceed the assumptions utilized in preparing the AQMP.

Violation of Standards or Substantial Contribution to Air Quality Violations

As the agency principally responsible for comprehensive air pollution control in the Basin, the SCAQMD recommends that projects should be evaluated in terms of air pollution control thresholds established by the SCAQMD and published in the CEQA *Air Quality Handbook*. These thresholds were developed by the SCAQMD to provide quantifiable levels to which projects can be compared. The most current significance thresholds, shown in **Table 6, South Coast AQMD Regional Significance Thresholds**, are used in this analysis.

Table 6
South Coast AQMD Air Quality Significance Thresholds

Mass Daily Thresholds [a]		
Pollutant	**Construction [b]**	**Operation [c]**
NOx	100 lbs/day	55 lbs/day

VOC	75 lbs/day	55 lbs/day
PM10	150 lbs/day	150 lbs/day
PM2.5	55 lbs/day	55 lbs/day
SOx	150 lbs/day	150 lbs/day
CO	550 lbs/day	550 lbs/day
Lead	3 lbs/day	3 lbs/day
Toxic Air Contaminants (TACs), Odor, and GHG Thresholds		
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (Project increment)	
Odor	Project creates an odor nuisance pursuant to South Coast AQMD Rule 402	
GHG	10,000 MT/yr CO_2eq for industrial facilities	
Ambient Air Quality Standards for Criteria Pollutants [d]		
NO_2 1-hour average annual arithmetic mean	South Coast AQMD is in attainment; Project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.18 ppm (state) 0.03 ppm (state) and 0.0534 ppm (federal)	
PM10 24-hour average annual average	10.4 μg/m^3 (construction) [e] & 2.5 μg/m^3 (operation) 1.0 μg/m3	
PM2.5 24-hour average	10.4 μg/m^3 (construction) [e] & 2.5 μg/m^3 (operation)	
SO_2 1-hour average 24-hour average	0.25 ppm (state) & 0.075 ppm (federal - 99th percentile) 0.04 ppm (state)	
Sulfate 24-hour average	25 μg/m^3 (state)	
CO 1-hour average 8-hour average	South Coast AQMD is in attainment; Project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) and 35 ppm (federal) 9.0 ppm (state/federal)	
Ambient Air Quality Standards for Criteria Pollutants [d] (continued)		
Lead 30-day Average Rolling 3-month average	1.5 μg/m^3 (state) 0.15 μg/m^3 (federal)	

[a] *Source: South Coast AQMD CEQA Handbook (South Coast AQMD, 1993, updated in March 2023 to reflect the U.S. EPA's redesignation of the Coachella Valley from Severe-15 to Extreme non-attainment for the 2008 ozone NAAQS. Available online at: https://www.aqmd.gov/docs/default-source/ceqa/handbook/south-coast-aqmd-air-quality-significance-thresholds.pdf?sfvrsn=25, accessed February 1, 2024.*

[b] *Construction thresholds apply to both the South Coast Air Basin and Coachella Valley (Salton Sea and Mojave Desert Air Basins).*

[c] *For Coachella Valley, the mass daily thresholds for operation are the same as the construction thresholds.*

[d] *Ambient air quality thresholds for criteria pollutants based on South Coast AQMD Rule 1303, Table A-2 unless otherwise stated.*

[e] *Ambient air quality threshold based on South Coast AQMD Rule 403.*

Cumulatively Considerable Increase of Criteria Pollutants

The SCAQMD's *CEQA Air Quality Handbook* identifies several methods to determine the cumulative significance of land use projects (i.e., whether the contribution of a project is cumulatively considerable).

However, the SCAQMD no longer recommends the use of these methodologies. Instead, the SCAQMD recommends that any construction-related emissions and operational emissions from individual development projects that exceed the project-specific mass daily emissions thresholds identified above also be considered cumulatively considerable.[10] The SCAQMD neither recommends quantified analyses of the emissions generated by a set of cumulative development projects nor provides thresholds of significance to be used to assess the impacts associated with these emissions.

Exposure of Sensitive Receptors to Substantial Pollutant Concentrations

The SCAQMD currently recommends that impacts to sensitive receptors be considered significant when a project generates localized pollutant concentrations of NO_2, CO, PM10, or PM2.5 at sensitive receptors near a project site that exceed the localized pollutant concentration thresholds listed above or when a project's traffic causes CO concentrations at sensitive receptors located near congested intersections to exceed the national or state ambient air quality standards. The roadway CO thresholds would also apply to the contribution of emissions associated with cumulative development. Additionally, the SCAQMD recommends impacts to sensitive receptors be considered significant if a project exceeds the TAC thresholds detailed in **Table 6** above.

In addition, the SCAQMD has established localized significance criteria in the form of ambient air quality standards for criteria pollutants. To minimize the need for detailed air quality modeling to assess localized impacts, SCAQMD developed mass-based localized significance thresholds (LSTs) that are the amount of pounds of emissions per day that can be generated by a project that would cause or contribute to adverse localized air quality impacts. These localized thresholds, are found in the mass rate look-up tables in the "Final Localized Significance Threshold Methodology" document prepared by the SCAQMD.[11] LSTs represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards, and are developed based on the ambient concentrations of that pollutant for each SRA.

Exposure to Objectionable Odors

A significant impact may occur if objectionable odors occur that would adversely impact sensitive receptors. Odors are typically associated with industrial projects involving the use of chemicals, solvents,

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10 White Paper on Regulatory Options for Addressing Cumulative Impacts from Air Pollution Emissions, SCAQMD Board Meeting, September 5, 2003, Agenda No. 29, Appendix D, p. D-3.

11 SCAQMD, Final Localized Significance Threshold Methodology, June 2003, Revised July 2008. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf

petroleum products, and other strong-smelling elements used in manufacturing processes, as well as sewage treatment facilities and landfills.

Methodology

This analysis focuses on the nature and magnitude of the change in the air quality environment due to implementation of the Project. Air pollutant emissions associated with the Project would result from Project operations and from Project-related traffic volumes. Construction activities would also generate air pollutant emissions at the Project Site and on roadways resulting from construction-related traffic. The net increase in Project Site emissions generated by these activities and other secondary sources have been quantitatively estimated and compared to thresholds of significance recommended by the SCAQMD (see **Project Impacts** subheading, below).

Construction Emissions

The regional construction emissions associated with the Project were calculated using the California Emissions Estimator Model (CalEEMod) recommended by the SCAQMD. CalEEMod was developed in collaboration with the air districts of California as 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 greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects.

Construction activities associated with demolition, grading and building construction would generate pollutant emissions. Specifically, these construction activities would temporarily create emissions of dusts, fumes, equipment exhaust, and other air contaminants. These construction emissions were compared to the thresholds established by the SCAQMD.

In addition to the SCAQMD's regional significance thresholds, the SCAQMD has established localized significance criteria in the form of ambient air quality standards for criteria pollutants. For the purposes of a CEQA analysis, the SCAQMD considers a sensitive receptor to be to be a receptor such as residence, hospital, or convalescent facility where it is possible that an individual could remain for 24 hours. Thus, according to the SCAQMD, the LSTs for PM10 and PM2.5, which are based on a 24-hour averaging period, would be appropriate to evaluate the localized air quality impacts of a project on nearby sensitive receptors. Additionally, since a sensitive receptor is considered to be present onsite for 24 hours, LSTs based on shorter averaging times, such as the one-hour NO_2 or the one-hour and eight-hour CO ambient air quality standards, would also apply when evaluating localized air quality impacts on sensitive receptors. However, LSTs based on shorter averaging periods, such as the NO_2 and CO LSTs, are applied to receptors such as industrial or commercial facilities since it is reasonable to assume that workers at these sites could

be present for periods of one to eight hours.[12] Therefore, this analysis evaluates localized air quality impacts from construction activities associated with the Project on sensitive receptors for NO_2, CO, PM10, and PM2.5, and on "non-sensitive" receptors (e.g., industrial or commercial facilities) for NO_2 and CO.

Operational Emissions

Operational emissions associated with the Project were also calculated using CalEEMod and the information provided in the traffic study prepared for the Project. Operational emissions associated with the Project would be comprised of mobile source emissions, energy demand, and other area source emissions. Mobile source emissions are generated by the increase in motor vehicle trips to and from the Project Site associated with operation of the Project. Area source emissions are generated by natural gas consumption for space and water heating, landscape maintenance equipment, application of architectural coatings, and consumer products. To determine if a regional air quality impact would occur, the increase in emissions is compared with the SCAQMD's recommended regional thresholds for operational emissions.

As discussed above, the SCAQMD has developed LSTs that are based on the amount of pounds of emissions per day that can be generated by a project that would cause or contribute to adverse localized air quality impacts. However, because the LST methodology is applicable to projects where emission sources occupy a fixed location, LST methodology would typically not apply to the operational phase of the Project because emissions are primarily generated by mobile sources traveling on local roadways over potentially large distances or areas. LSTs would apply to the operational phase of a project, if the project includes stationary sources or attracts mobile sources that may spend long periods queuing and idling at the site. For example, the LST methodology applies to operational projects such as warehouse/transfer facilities.[13] As the Project would include a mix of residential and hotel uses, an operational analysis against the LST methodology is not directly applicable.

2.5 PROJECT IMPACTS

AQ Impact 1 **Would implementation of the proposed Project conflict with or obstruct implementation of any applicable air quality plan? *(Less than Significant).***

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a SIP that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution

12 Ibid.

13 SCAQMD, Sample Construction Scenarios for Projects Less than Five Acres in Size, February 2005, page 1-3.

in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the CCAA requires an air quality attainment plan to be prepared for areas designated as nonattainment with regard to the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

Drafted by the SCAQMD, the 2022 AQMP was developed in coordination with CARB, SCAG, and the U.S. EPA to establish a program of rules and regulations to reduce air pollutant emissions to achieves CAAQS and NAAQS. The AQMP's pollutant control strategies are based on SCAG's 2020-2045 Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS).

Criteria for determining consistency with the AQMP are defined in Chapter 12, Section 12.2 and Section 12.3 of the SCAQMD's *1993 CEQA Air Quality Handbook*, and include the following:

- **Consistency Criterion No. 1**: The proposed Project will not result in an increase in the frequency or severity of an existing air quality violation, or cause or contribute to new violations, or delay the timely attainment of air quality standards or the interim emissions reductions specified in the AQMP.

- **Consistency Criterion No. 2**: The proposed Project will not exceed the assumptions in the AQMP or increments based on the years of the Project build-out phase.

With respect to the first criterion, area air quality planning, including the AQMP, assumes that there will be emissions from new growth, but that such emissions may not impede the attainment and may actually contribute to the attainment of applicable air quality standards within the Basin. As discussed herein, the Project would not result in construction air quality emissions that exceed the SCAQMD thresholds of significance. Construction-related emissions would be temporary in nature, lasting only for the duration of the construction period, and would not have a long-term impact on the region's ability to meet state and federal air quality standards. Furthermore, the Project will be required to comply with applicable SCAQMD rules and regulations for new or modified sources. For example, the Project must comply with SCAQMD Rule 403 for the control of fugitive dust during construction. By meeting SCAQMD rules and regulations, project construction activities will be consistent with the goals and objectives of the AQMP to improve air quality in the Basin. Also discussed herein, the Project would not result in operational air quality emissions that exceed the SCAQMD thresholds of significance. Moreover, the thresholds of significance developed by the SCAQMD are not sensitive to property or project size, or the type of use proposed by a project. And, as discussed in more detail herein, projects, land uses, and activities that are consistent with the applicable assumptions used in the development of the AQMP would not necessarily

jeopardize attainment of the air quality levels identified in the AQMP if they exceed the SCAQMD's recommended daily emissions thresholds. Thus, the Project would be consistent with first criterion.

With respect to the second criterion, the AQMP was prepared to achieve national and state air pollution standards within the region. A project that is considered to be consistent with the AQMP would not interfere with attainment of AQMP goals because the growth from the Project is included in the regional projections used to formulate the AQMP. Therefore, projects, land uses, and activities that are consistent with the applicable assumptions used in the development of the AQMP (i.e., the RTP/SCS) would not jeopardize attainment of the air quality levels identified in the AQMP, even if they exceed the SCAQMD's project-level daily emissions thresholds. The Project Site is designated as Mixed-Use Neighborhood Planned Development Overlay Zone (MX-N (PD)), and thus, the proposed uses are consistent with the City General Plan, Unified Development Code, and Zoning designations. Therefore, although the Project would increase housing, population and employment, such increases would be consistent with the planned growth assumptions utilized in preparing the AQMP. As such, the Project would not have the potential to conflict with regional growth projections identified in SCAG's RTP/SCS and the AQMP. Thus, the Project is also consistent with the second criterion. As the Project is consistent with Criterion Nos. 1 and 2, the Project would not conflict with or obstruct implementation of any applicable air quality plan, and this impact is less than significant.

AQ Impact 2 **Would implementation of the proposed Project result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard? *(Less than Significant).***

A project may have a significant impact if project-related emissions would result in a cumulatively considerable net increase for a criteria pollutant for which the region is in nonattainment under applicable federal or state ambient air quality standards. The cumulative analysis of air quality impacts follows the SCAQMD's guidance such that construction or operational project emissions will be considered cumulatively considerable if project-specific emissions exceed an applicable SCAQMD recommended daily threshold.

Regional Construction Significance Analysis

For purposes of this analysis, it is estimated that the Project would be constructed in approximately 18 months with construction beginning in 2025 and project operations commencing by 2026. While construction may begin at a later date and/or take place over a longer period, these assumptions represent the earliest and fastest build-out potential resulting in a worst-case daily impact scenario for purposes of

this analysis. As emission factors improve each year into the future, construction and operation occurring in years beyond those assumed herein would result in reduced air quality emissions. This analysis assumes construction would be undertaken with the following primary construction phases: (1) Demolition/Debris Removal, (2) Grading; and (3) Structural Building, Finishing and Paving. Each primary construction phase has been further detailed below.

Demolition and removal of existing debris would occur for approximately one month. This phase would include the demolition of the single-family residence and accessory structures (approximately 8,770 sf) that are located near the southerly portion of the property near Golden Valley Road. Grading activities would occur for approximately 5 months and would involve the cut and fill of land to ensure the proper base and slope for the entire site, including building pads and foundations. This analysis assumes approximately 360,00 cubic yards (cy) of cut and fill to be balanced on site. No soil import or export is anticipated at this time. In total, structural building, finishing, and paving activities are expected to occur for approximately 12 months. Upon completion of the building shells, finishing (coatings) and paving of parking areas and driveways would follow.

The analysis of regional daily construction emissions has been prepared utilizing the CalEEMod computer model recommended by the SCAQMD. Predicted maximum daily construction-generated emissions for the Project are summarized in **Table 7, Construction-Related Criteria Pollutant and Precursor Emissions – Maximum Pounds per Day.** These calculations assume that appropriate dust control measures would be implemented as part of the Project during each phase of development, as specified by SCAQMD Rule 403 (Fugitive Dust). Rule 403 control requirements include, but are not limited to: applying water in sufficient quantities to prevent the generation of visible dust plumes; applying soil binders to uncovered areas; reestablishing ground cover as quickly as possible; utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the Project Site; and maintaining effective cover over exposed areas. In addition, these calculations assume construction activities would be consistent with SCAQMD Rule 1113 (Architectural Coatings), which regulates the amount of VOC per liter of coating. As shown in Table 7, the peak daily emissions generated during the construction of the Project would not exceed any of the regional emission thresholds recommended by the SCAQMD. Therefore, Project construction would not result in a cumulatively considerable net increase of any criteria air pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard.

Table 7
Construction-Related Criteria Pollutant and Precursor Emissions – Maximum Pounds per Day

Construction Year	ROG	NOx	CO	SO2	PM10	PM2.5
2025	3.28	29.8	29.7	0.06	3.89	2.15
2026	45.3	20.0	37.4	0.05	4.05	1.46
Regional Threshold	**75**	**100**	**550**	**150**	**150**	**55**
Exceed?	*No*	*No*	*No*	*No*	*No*	*No*

Source: Impact Sciences, CalEEMod modeling, 2024. See Appendix A to this report.
Note: Project emissions account for the reductions from SCAQMD Rule 403 (Fugitive Dust).

Regional Operational Significance Analysis

Project-generated emissions would be associated with motor vehicle use, energy use, and area sources, such as the use of natural-gas-fired appliances, landscape maintenance equipment, consumer cleaning products, and architectural coatings associated with the operation of the Project. The operational emissions from the Project were calculated within CalEEMod and the operational emissions were compared against SCAQMD regional thresholds to determine Project significance. Long-term operational emissions attributable to the Project are summarized in **Table 8, Long-Term Operational Emissions – Maximum Pounds per Day**. As shown, the operational emissions generated by the Project would not exceed the regional thresholds of significance set by the SCAQMD.

Table 8
Long-Term Operational Emissions – Maximum Pounds per Day

Source	ROG	NOx	CO	SO2	PM10	PM2.5
Area Source	8.77	0.14	14.8	0.01	0.01	0.01
Energy Use	0.07	1.24	0.68	0.01	0.10	0.10
Mobile Source	0.99	2.74	32.2	0.09	8.77	2.27
Total	9.83	4.12	47.68	0.11	8.88	2.38
Regional Threshold	**55**	**55**	**550**	**150**	**150**	**55**
Exceed?	*No*	*No*	*No*	*No*	*No*	*No*

Source: Impact Sciences, CalEEMod modeling, 2024. See Appendix A to this report.

As shown in **Table 7** and **Table 8**, the Project's construction and operational emissions would not exceed the SCAQMD's thresholds for any criteria air pollutants. Therefore, regional construction and operation operational emissions would not result in a significant regional air quality impact. Thus, the proposed

Project would also not result in a cumulatively considerable net increase of any criteria air pollutant for which the Project region is nonattainment under an applicable federal or state ambient air quality standard. These impacts are less than significant.

Air Quality Health Impacts

On December 24, 2018, the California Supreme Court published its opinion on the *Sierra Club et al. v. County of Fresno et. Al.* (Case No. S219783) which determined that an environmental review must adequately analyze a project's potential impacts and inform the public how its bare numbers translate to potential adverse health impacts or explain how existing scientific constraints cannot translate the emissions numbers to the potential health impacts.

Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health. The national and state ambient air quality standards have been set at levels to protect human health with a determined margin of safety.[14] As discussed previously, the Basin is in state non-attainment for PM2.5, PM10, and Ozone (O_3) and federal non-attainment for PM2.5 and O_3. Therefore, an increase in emissions of particulate matter or ozone precursors (ROG and NOx) has the potential to push the region further from reaching attainment status and, as a result, are the pollutants of greatest concern in the region. As noted in **Table 7** and **Table 8** above, the Project will emit criteria air pollutants during construction and operation**.** However, the Project will not exceed SCAQMD thresholds for ozone precursors (ROG and NOx), PM2.5, PM10, or any other criteria air pollutants, and will not result in a cumulatively significant impact for which the region is in non-attainment. Thus, with respect to the Project's increase in criteria pollutant emissions, the Project would not have the potential cause significant air quality health impacts. With respect to the Project's potential TAC and DPM impacts upon sensitive receptors, please refer to the discussion under **AQ Impact 3**.

AQ Impact 3 **Would implementation of the proposed Project expose sensitive receptors to substantial air pollutant concentrations? (*Less than Significant).***

Localized Construction Significance Analysis

As detailed in the methodology section of this report, the SCAQMD has developed localized significance thresholds (LST) for construction areas that are one, two, and five acres in size to simplify the evaluation of localized emissions. LSTs represent the maximum emissions from a project that are not expected to cause

14 SCAQMD, Guidance Document for Addressing Air Quality Issues in General Plans and Local Planning, May 6, 2005.

or contribute to an exceedance of the applicable federal or State ambient air quality standard. LSTs are provided for each source receptor area (SRA) and various distances from the source of emissions. As described previously, the nearest air quality sensitive receptors to the Project Site include residences approximately 15 feet to the north and to the east.

In the case of this analysis, the Project Site is located within SRA 13 – Santa Clarita Valley with receptors located within 25 meters.[15] The closest receptor distance in the SCAQMD's mass rate look-up tables is 25 meters. Projects that are located closer than 25 meters to the nearest receptor are directed to use the LSTs for receptors located within 25 meters. The CalEEMod User's Guide states the applicable LST should be based on the equipment list for each construction phase and calculated according to the anticipated maximum number of acres a given piece of equipment can pass over in an 8-hour workday.

Based on the Project's construction assumptions outlined previously and further disclosed in Appendix A to this report, approximately 1.0 acres per day would be disturbed during demolition and 4.0 acres per day would be disturbed during the grading phase.[16] The LSTs for a 4.0-acre site in SRA 13 with sensitive receptors located within 25 meters were calculated per SCAQMD Linear Regression Methodology and utilized for the grading phase. With respect to building construction, architectural coatings, and paving activities, the 5.0-acre LST in SRA 13 with sensitive receptors located within 25 meters has been utilized to address the potential localized NOx, CO, PM10, and PM2.5 impacts. The application of a 5.0-acre threshold for building construction activities on a 28-acre site would be conservative as physical building construction emissions would likely be spread out more evenly on the 28-acre site compared to the condensed 5-acre threshold applied in this analysis. See **Appendix A** to this report for more details. As shown in **Table 9, Localized Significance of Construction Emissions – Maximum Pounds per Day**, the Project would not exceed any of the identified localized thresholds of significance during construction. Therefore, the Project's construction would not expose sensitive receptors to substantial air pollutant concentrations and these impacts would be less than significant.

15 As discussed previously under 'Methodology,' LSTs based on shorter averaging periods, such as the NO_2 and CO LSTs, are applied to receptors such as industrial or commercial facilities since it is reasonable to assume that workers at these sites could be present for periods of one to eight hours. Therefore, this analysis evaluates localized air quality impacts from construction activities associated with the Project on sensitive receptors for NO_2, CO, PM10, and PM2.5, and on "non-sensitive" receptors (e.g., industrial or commercial facilities) for NO_2 and CO.

16 Per CalEEMod, tractors, graders and dozers would pass over 0.5 acres per day each, and scrapers would pass over 1.0 acre per day each. As the Project would include two dozers during demolition, a 1.0-acre LST is appropriate for demolition. And, as the Project would include two scrapers, two tractors/loaders/backhoes, one grader, and one dozer during grading, a 4.0-acre LST is appropriate for grading.

Table 9
Localized Significance of Construction Emissions – Maximum Pounds per Day

Construction Phase	NOx	CO	PM10	PM2.5
Demolition	**22.2**	**19.9**	**1.17**	**0.88**
SCAQMD Localized Thresholds	*114.00*	*590.00*	*4.00*	*3.00*
Grading	**29.7**	**28.3**	**3.62**	**2.09**
SCAQMD Localized Thresholds	*216.69*	*1,385.92*	*10.00*	*5.31*
Building Construction	**17.83**	**24.07**	**0.72**	**0.66**
SCAQMD Localized Thresholds	*246.00*	*1,644.00*	*12.00*	*6.00*
Exceed?	***No***	***No***	***No***	***No***

Source: Impact Sciences, CalEEMod modeling, 2024. See Appendix A.
Notes: Calculations assume compliance with SCAQMD Rule 403 – Fugitive Dust. Based on the Project's construction assumptions outlined previously, the applicable LST for demolition is 1.0 acre, grading is 4.0 acres, and building construction is 5.0 acres. The localized thresholds for each phase are based on a receptor distance of 25 meters (82 feet) in SCAQMD's SRA 13. Where necessary, LST calculated per SCAQMD Linear Regression Methodology. The building construction emission total includes architectural coating and paving emissions.

Localized Operational Significance Analysis

As discussed previously, because the LST methodology is applicable to projects where emission sources occupy a fixed location, LST methodology would typically not apply to the operational phase of a mixed-use project because emissions for these projects are primarily generated by mobile sources traveling on local roadways over generally large distances or areas. LSTs would apply to the operational phase of a project if the project includes stationary sources or attracts mobile sources that may spend long periods queuing and idling at the site. For example, the LST methodology applies to operational projects such as warehouse/transfer facilities.[17] As the Project would not include warehouse or transfer facilities, an operational analysis against the LST methodology is not directly applicable to the Project. Nevertheless, **Table 10, Localized Significance of On-Site Operational Emissions – Maximum Pounds per Day**, has been included to illustrate the potential on-site emissions during Project operation. As shown in **Table 11**, the Project would not exceed any of the identified localized thresholds of significance. Therefore, the Project's operation would not expose sensitive receptors to substantial air pollutant concentrations and these impacts would be less than significant.

17 SCAQMD, Sample Construction Scenarios for Projects Less than Five Acres in Size, February 2005, page 1-3.

Table 10
Localized Significance of On-Site Operational Emissions – Maximum Pounds per Day

Emissions Source	NOx	CO	PM10	PM2.5
Area Sources	0.14	14.8	0.01	0.01
Energy Demand	1.24	0.68	0.10	0.10
Total On-Site Emissions	**1.38**	**15.48**	**0.11**	**0.11**
SCAQMD Localized Thresholds	*246.00*	*1,644.00*	*3.00*	*2.00*
Exceed?	***No***	***No***	***No***	***No***

Source: Impact Science, CalEEMod modeling, 2024. See Appendix A.
Notes: Although the Project Site is approximately 28.13 acres, this analysis conservatively applies the operational LST for a 5-acre site in SRA 13.

The Project would not result in potentially significant CO "hot spots" and a Project-specific CO hotspots analysis is not required to reach this conclusion. It has long been recognized that CO exceedances ("hot spots") are caused by vehicular emissions, primarily when idling at intersections. Vehicle emissions standards have become increasingly more stringent in the last twenty years. With the turnover of older vehicles, introduction of cleaner fuels and implementation of control technology on industrial facilities, CO concentrations for the Project vicinity have historically met state and federal attainment status for the air quality standards. As noted previously in **Table 2**, in SRA 13 (Santa Clarita Valley) the maximum 8-hour CO concentration over the past three years was 1.5 ppm in 2020, and the 1-hour CO concentration was 1.2 ppm in 2020. Based on these measured concentrations, CO concentrations in SRA 13 are substantially below the California one-hour or eight-hour CO standards of 20 or 9.0 ppm, respectively. Accordingly, with the steadily decreasing CO emissions from vehicles, even very busy intersections do not result in exceedances of the CO standard. Therefore, the Project would not have the potential to cause or contribute to an exceedance of the California one-hour or eight-hour CO standards of 20 or 9.0 ppm, respectively. Impacts with respect to localized CO concentrations would be less than significant.

Diesel Particulate Matter

Construction would result in the generation of DPM emissions from the use of off-road diesel equipment required for demolition, grading and excavation, building construction, paving, and other construction activities. The amount to which the receptors are exposed (a function of concentration and duration of exposure) is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer.

In March 2015, the Office of Environmental Health Hazard Assessment (OEHHA) adopted revised guidelines that update previous guidance by incorporating advances in risk assessment with consideration of infants and children using Age Sensitivity Factors (ASF). The intent of the OEHHA 2015 guidance is to provide HRA procedures for use in the Air Toxics Hot Spots Program or for the permitting of existing, new, or modified stationary sources. As the Project is not part of the Air Toxics Hot Spots Program and is considered an urban infill mixed-use development consisting primarily of mobile and area sources (i.e., non-stationary sources), the OEHHA 2015 guidance is not directly applicable. OEHHA 2015 offers limited information on conducting a short-term HRA, but the guidance acknowledges the many inherent uncertainties that may occur, and it does not identify the types of short-term projects or non-stationary projects subject thereto. Further, the SCAQMD has not opined on the application of OEHHA 2015 guidance to development projects such as the Project. Nevertheless, in an effort to characterize the Project's scope of DPM emissions upon nearby sensitive receptors, a quantified construction HRA was conducted for the Project (see Appendix A to this report for more information). As demonstrated therein, under worst-case assumptions, the maximum impact at the nearest sensitive receptor (i.e., residences to the north and to the east of the Project Site) would be 9.3 per 1 million, or less than the risk threshold of 10.0 in 1 million. Impacts at locations farther than this receptor would be further reduced, and thus impacts would be less than significant.

Potential noncarcinogenic effects of chronic DPM exposures were evaluated using the Hazard Index approach as described in the OEHHA Guidance. A hazard index equal to or greater than 1.0 represents a significant chronic health hazard. As shown in greater detail in Appendix A to this report, non-carcinogenic effects at the nearest sensitive receptor (i.e., residences located north and east of the Project Site) would be 0.02, which is less than the 1.0 health hazard threshold. Impacts at locations farther than this receptor would be further reduced, and thus non-cancer effects would be less than significant.

AQ Impact 4 **Would the proposed Project include sources that could create other emissions (such as those leading to odors) adversely affecting a substantial number of people? (*Less than Significant).***

The SCAQMD *CEQA Air Quality Handbook* (1993) identifies certain land uses as sources of odors. These land uses include agriculture (farming and livestock), wastewater treatment plants, food processing plants, chemical plants, composting facilities, refineries, landfills, dairies, and fiberglass molding. The Project would not include any of the land uses that have been identified by the SCAQMD as odor sources.

Construction activities associated with the Project may generate detectable odors from heavy-duty equipment exhaust and architectural coatings. However, construction-related odors would be short-term in nature and cease upon Project completion. In addition, the Project would be required to comply with the

California Code of Regulations, Title 13, sections 2449(d)(3) and 2485, which minimizes the idling time of construction equipment either by shutting it off when not in use or by reducing the time of idling to no more than five minutes. This would reduce the detectable odors from heavy-duty equipment exhaust. The Project would also be required to comply with the SCAQMD Rule 1113 – Architectural Coating, which would minimize odor impacts from ROG emissions during architectural coating. Any odor impacts to existing adjacent land uses would be short-term and not substantial. As such, the Project would not result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impacts would be less than significant.

3.0 GREENHOUSE GAS

3.1 GREENHOUSE GAS SETTING

Global climate change refers to any significant change in climate measurements, such as temperature, precipitation, or wind, lasting for an extended period (i.e., decades or longer).[18] Climate change may result from:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- Natural processes within the climate system (e.g., changes in ocean circulation, reduction in sunlight from the addition of GHG and other gases to the atmosphere from volcanic eruptions); and
- Human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification).

In recent decades, changes in climate have caused impacts on natural and human systems on all continents and across the oceans. Impacts are due to observed climate change, irrespective of its cause, indicating the sensitivity of natural and human systems to changing climate.[19] Continuing changes to the global climate system and ecosystems, and to California, are projected to include:

- Rapidly diminishing sea ice and mountain snowpack levels, thereby increasing sea levels and sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[20]
- Rising average global sea levels primarily due to thermal expansion and the melting of glaciers, ice caps, and ice sheets;
- Changing weather patterns, including changes to precipitation, ocean salinity, and wind patterns, and more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;

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18 US EPA. 2013. Overview of Greenhouse Gases. Available online at: https://www.epa.gov/ghgemissions/overview-greenhouse-gases. Accessed on February 1, 2024.

19 Intergovernmental Panel on Climate Change. 2013. "Climate Change 2013: The Physical Science Basis." Available online at: https://www.ipcc.ch/report/ar5/wg1/, accessed February 1, 2024.

20 *Ibid.*

- Changing levels in snowpack, river flow and sea levels indicating that climate change is already affecting California's water resources;[21]
- Dry seasons that start earlier and end later, evoking more frequent and intense wildland fires;[22] and
- Increasing demand for electricity due to rising temperatures.[23]

The natural process through which heat is retained in the troposphere[24] is called the "greenhouse effect." Various gases in the Earth's atmosphere, classified as atmospheric greenhouse gases, play a critical role in determining the Earth's surface temperature. Solar radiation enters Earth's atmosphere as short-wave radiation. It travels through the atmosphere without warming it and is absorbed by the Earth's surface. When the Earth re-emits this radiation back toward space, the radiation changes to long wave radiation. GHGs are transparent to incoming short wave solar radiation but absorb outgoing long wave radiation. As a result, radiation that otherwise would escape back into space is now retained, warming the atmosphere. This phenomenon is known as the greenhouse effect.

Greenhouse Gas Compounds

Global warming potential (GWP) was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time, relative to the emissions of 1 ton of carbon dioxide (CO_2). CO_2, by definition, has a GWP of 1 regardless of the time period used, because it is the gas being used as the reference. CO_2 remains in the climate system for a very long time: CO_2 emissions cause increases in atmospheric concentrations of CO_2 that will last thousands of years. Methane (CH_4) is estimated to have a GWP of 28–36 over 100 years. CH_4 emitted today lasts about a decade on average, which is much less time than CO_2. But CH_4 also absorbs much more energy than CO_2. The net effect of the shorter lifetime and higher energy absorption is reflected in the GWP. Nitrous Oxide (N_2O) has a GWP 265–298 times that of CO_2 for a 100-year timescale. N_2O emitted today remains in the atmosphere for more than 100 years, on average. Chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) are sometimes called high-GWP gases because, for

21 California Environmental Protection Agency (Cal EPA). 2010. Climate Action Team Report to Governor Schwarzenegger and the Legislature.

22 Ibid.

23 California Environmental Protection Agency (Cal EPA). 2010. Climate Action Team Report to Governor Schwarzenegger and the Legislature.

24 The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface from 6 to 7 miles.

a given amount of mass, they trap substantially more heat than CO_2. (The GWPs for these gases can be in the thousands or tens of thousands.)[25]

California State law defines GHGs to include the following six compounds:

- **Carbon Dioxide** (CO_2) is released to the atmosphere when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned. CO_2 emissions from motor vehicles occur during operation of vehicles and operation of air conditioning systems.

- **Methane** (CH_4) is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic waste in solid waste landfills, raising livestock, natural gas and petroleum systems, stationary and mobile combustion, and wastewater treatment.

- **Nitrous Oxide** (N_2O) is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels. N_2O is also emitted from motor vehicles generally occurring from operation of vehicles.

- **Hydrofluorocarbons** (HFCs) are one of several GWP gases that are not naturally occurring and are generated from industrial processes. HFC (refrigerant) emissions from vehicle air conditioning systems occur due to leakage, losses during recharging, or release from scrapping vehicles at end of their useful life.

- **Perfluorocarbons** (PFCs) are another high GWP gas that are not naturally occurring and are generated in a variety of industrial processes. Emissions of PFCs are generally negligible from motor vehicles.

- **Sulfur Hexafluoride** (SF_6) is another high GWP gas that is not naturally occurring and is generated in a variety of industrial processes. Emissions of SF_6 are generally negligible from motor vehicles.

3.2 EXISTING SETTING

The 28.13-acre Project Site is located at the northwest corner of Golden Valley Road and Sierra Highway, in the City. Currently, the majority of the site is vacant except for the single-family residence and accessory structures that are located near the southerly portion of the property near Golden Valley Road. Thus, the existing Project Site generates a very small volume of GHG emissions. The Project Site is designated as Mixed-Use Neighborhood Planned Development Overlay Zone (MX-N (PD)). Adjacent uses include residential uses to the immediate north and east, vacant land to the south, and residential uses/Golden

[25] U.S. Environmental Protection Agency. Understanding Global Warming Potentials. Available online at: https://www.epa.gov/ghgemissions/understanding-global-warming-potentials

Valley High School to the west. The surrounding uses along Golden Valley Road and Sierra Highway consist of mostly established residential uses, schools, and neighborhood commercial retail centers.

3.3 REGULATORY FRAMEWORK

Federal

Paris Climate Agreement

The Paris Climate Agreement is an international treaty on climate change adopted on December 12, 2015. The goal of the agreement is to limit global warming to 1.5 degrees Celsius as compared to pre-industrial levels. Countries will aim to reach global peaking of GHG emissions as soon as possible to achieve a climate neutral world by mid-century. In order to achieve these reductions, the Paris Climate Agreement works on a 5-year cycle of increasingly ambitious climate action carried out by countries. Therefore, by 2020, countries were required to submit their plans for climate action, known as nationally determined contributions. Additionally, the Agreement provides a framework for financial, technical and capacity building support to those countries who need it. Developed counties will take a lead in providing financial assistance to other countries since large scale investments are required for GHG mitigation and climate adaptation.[26]

The United States joined 190 other countries in the Paris Climate Agreement under the Obama administration in September 2016.[27] Under the Trump administration, the former President announced his intention to withdraw from the Agreement in June 2017 and formally notified the United Nations in November 2019. However, the Agreement requires a year-long waiting period before a formal withdrawal will be recognized. As a result, the United States officially withdrew the Agreement in November 2020.[28] However, on January 20, 2021, President Biden accepted and rejoined the Paris Climate Agreement.[29]

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26 United Nations. *The Paris Agreement*. Available online at https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement.

27 The White House. *President Obama: The United States Formally Entered the Paris Agreement*. Available online at: https://obamawhitehouse.archives.gov/blog/2016/09/03/president-obama-united-states-formally-enters-paris-agreement.

28 NPR. *U.S. Officially Leaving Paris Climate Agreement*. Available online at: https://www.npr.org/2020/11/03/930312701/u-s-officially-leaving-paris-climate-agreement

29 The White House. 2021. *Paris Climate Agreement*. Available online at: https://www.npr.org/2020/11/03/930312701/u-s-officially-leaving-paris-climate-agreement.

State

The state of California has implemented a series of greenhouse gas plans and policies aimed at reducing state greenhouse gas emissions. Measures applicable to the Project are summarized below:

Executive Order (EO) S-03-05

On June 1, 2005, EO S-03-05 was issued by Governor Schwarzenegger in order to set statewide emissions reduction standards. The order required the state to reduce GHG emissions to 1990 levels by 2020 and reduce GHG emissions to 80% below 1990 levels by 2050. EO S-3-05 also calls for the Secretary of California Environmental Protection Agency (Cal/EPA) to be responsible for coordination of state agencies and progress reporting.

Assembly Bill (AB) 32

AB 32 (California Global Warming Solutions Act of 2006) was codified into law in 2006 and codified into law the 2020 GHG emissions targets set by EO S-03-05. AB 32 represents the first enforceable statewide program to limit GHG emissions from all major sectors with penalties for noncompliance.

Senate Bill (SB) 32

SB 32 was signed into law in 2015 and sets into law the mandated reduction targets set in EO B-30-15, which required a reduction in GHG emissions to 40% below the 1990 levels by 2030.

Assembly Bill (AB) 1279

On September 16, 2022, California signed into law AB 1279 (The California Climate Crisis Act) which establishes the policy of the state to achieve carbon neutrality as soon as possible, but no later than 2045; to maintain net negative GHG emissions thereafter; and to ensure that by 2045 statewide anthropogenic GHG emissions are reduced at least 85% below 1990 levels. The bill requires CARB to ensure that Scoping Plan updates (see below) identify and recommend measures to achieve carbon neutrality, and to identify and implement policies and strategies that enable CO2 removal solutions and carbon capture, utilization, and storage (CCUS) technologies.

2022 Scoping Plan Update

The Scoping Plan is a GHG reduction roadmap developed and updated by CARB at least once every five years, as initially required by AB 32. It lays out the transformations needed across various sectors to reduce GHG emissions and reach the State's climate targets. CARB adopted the Final 2022 Scoping Plan for

Achieving Carbon Neutrality (2022 Scoping Plan Update) in December 2022 as the third update to the initial plan that was adopted in 2008. The initial 2008 Scoping Plan laid out a path to achieve the AB 32 target of returning to 1990 levels of GHG emissions by 2020, a reduction of approximately 15% below business-as-usual activities.[30] The 2008 Scoping Plan included a mix of incentives, regulations, and carbon pricing, laying out the portfolio approach to addressing climate change and clearly making the case for using multiple tools to meet California's GHG targets. The 2013 Scoping Plan Update (adopted in 2014) assessed progress toward achieving the 2020 target and made the case for addressing short-lived climate pollutants (SLCPs).[31] The 2017 Scoping Plan Update,[32] shifted focus to the newer SB 32 goal of a 40% reduction below 1990 levels by 2030 by laying out a detailed cost-effective and technologically feasible path to this target, and also assessed progress towards achieving the AB 32 goal of returning to 1990 GHG levels by 2020. The 2020 goal was ultimately reached in 2016, four years ahead of the schedule called for under AB 32.

The 2022 Scoping Plan Update is the most comprehensive and far-reaching Scoping Plan developed to date. It identifies a technologically feasible, cost-effective, and equity-focused path to achieve new targets for carbon neutrality by 2045 and to reduce anthropogenic GHG emissions to at least 85% below 1990 levels, while also assessing the progress California is making toward reducing its GHG emissions by at least 40% below 1990 levels by 2030, as called for in SB 32 and laid out in the 2017 Scoping Plan.[33] The 2030 target is an interim but important stepping stone along the critical path to the broader goal of deep decarbonization by 2045. The relatively longer path assessed in the 2022 Scoping Plan Update incorporates, coordinates, and leverages many existing and ongoing efforts to reduce GHGs and air pollution, while identifying new clean technologies and energy. Given the focus on carbon neutrality, the 2022 Scoping Plan Update also includes discussion for the first time of the natural and working lands sectors as sources for both sequestration and carbon storage, and as sources of emissions as a result of wildfires.

Regional

SCAQMD Draft Guidance Regarding Interim CEQA GHG Significance Thresholds

SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds. In its October 2008 document, the SCAQMD proposed a 30% emission reduction target to determine significance for commercial/residential projects that emit greater than 3,000 metric tons per year. On December 5, 2008, the

30 CARB, 2008, *Climate Change Scoping Plan*.

31 CARB, 2014, *First Update to the Climate Change Scoping Plan*.

32 CARB, 2017, *California's 2017 Climate Change Scoping Plan*. Available online at: https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf. accessed February 1, 2024.

33 Ibid.

SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for stationary source/industrial projects where the SCAQMD is lead agency. However, SCAQMD has yet to adopt a GHG significance threshold for land use development projects (e.g., residential/commercial projects) and has formed a GHG Significance Threshold Working Group to further evaluate potential GHG significance thresholds.

SCAG 2020 Connect SoCal Plan RTP/SCS

On September 3, 2020, the Southern California Association of Governments (SCAG) Regional Council unanimously voted to approve and fully adopt Connect SoCal (2020-2045 Regional Transportation Plan/Sustainable Communities Strategy [RTP/SCS]).

Connect SoCal is a long-range visioning plan that builds upon and expands land use and transportation strategies established over several planning cycles to increase mobility options and achieve a more sustainable growth pattern. It charts a path toward a more mobile, sustainable and prosperous region by making connections between transportation networks, between planning strategies and between the people whole collaboration can improve the quality of life for Southern Californians. In addition, Connect SoCal is supported by a combination of transportation and land use strategies that outline how the region can achieve California's greenhouse gas emission reduction goals and federal CAA requirements. The plan also strives to achieve broader regional objectives, such as the preservation of natural lands, improvement of public health, increased roadway safety, support for the region's vital goods movement industries and more efficient use of resources.

Local

City of Santa Clarita General Plan

The City's Conservation and Open Space Element of the 2011 Santa Clarita General Plan (General Plan) has identified the following goals, objectives, and policies aimed at greenhouse gas reduction in private development projects in the City. Applicable goals and policies from the General Plan's Conservation and Open Space Elements are listed below:

- **Goal CO 8:** Development designed to improve energy efficiency, reduce energy and natural resource consumption, and reduce emissions of greenhouse gases.
  - **Objective CO 8.1:** Comply with the requirements of State law, including AB 32, SB 375 and implementing regulations, to reach targeted reductions of greenhouse gas (GHG) emissions.

- **Objective CO 8.3:** Encourage the following green building and sustainable development practices on private development projects, to the extent reasonable and feasible.

  - **Policy CO 8.3.2:** Promote construction of energy efficient buildings through requirements for LEED certification or through comparable alternative requirements as adopted by local ordinance.

  - **Policy CO 8.3.7:** Encourage the use of trees and landscaping to reduce heating and cooling energy loads, through shading of buildings and parking lots.

  - **Policy CO 8.3.8:** Encourage energy-conserving heating and cooling systems and appliances, and energy-efficiency in windows and insulation, in all new construction.

City of Santa Clarita Climate Action Plan

The State of California requires all cities that create a new general plan or update their general plan document to consider its impacts on GHG emissions. In order to do so, cities must complete a CAP. The CAP must achieve the emission reduction goals outlined by the Global Warming Solutions Act of 2006 (AB 32). AB 32 requires that statewide GHG emissions must be reduced to 1990 levels by 2020. Measures identified in the City's CAP will not only meet but exceed the state's AB 32 GHG emission reduction mandate.[34]

In June 2011, the City Council adopted a new General Plan (referred to as One Valley One Vision), which is intended to guide growth and development within all portions of the Santa Clarita Valley. As noted above, Policy CO 8.1.1 of the City's General Plan states the City shall create and adopt a CAP within 18 months of the adoption of the City's General Plan Update that meets state requirements. Consistent with this policy, in January 2011, the City began the process of developing a CAP, with the Final CAP published in August 2012. The CAP, part of the General Plan, serves as a component of the general plan document for the City to address GHG emissions. Using the goals, objectives, and policies of the General Plan as a starting point, the CAP identifies mitigation measures that can be quantified and translated into significant reductions in the GHG emissions by the year 2020. The development of a CAP begins with a premise that establishing a complete GHG emissions inventory within the City's boundary is the critical foundation for the remainder of the project.

The CAP also defines a local threshold of significance for GHG emissions for project level submittals that trigger review by the CEQA. Because goals, objectives, and policies approved under the General Plan are

[34] City of Santa Clarita. 2012. Climate Action Plan. Available online at: https://greensantaclarita.com/files/2012/10/APPROVED-CAP-AUGUST-2012.pdf

forecast to meet the GHG emission reduction targets mandated by AB 32, development projects that are able to demonstrate consistency with the General Plan and zoning ordinance will by association demonstrate consistency with the CAP. However, the CAP is only certified through 2020.

Santa Clarita Building Standards Code

Section 25.01.010 in the Santa Clarita Municipal Code adopts by reference that certain code known and designated as the California Code of Regulations, Title 24, Part 11, further described as the 2022 California Green Building Standards Code, also referred to as the 2022 CalGreen Code, published by the California Building Standards Commission. Such code shall be and become the City of Santa Clarita Green Building Standards Code, regulating the planning, design, operation, construction, use and occupancy of every new building or structure to ensure buildings have a more positive environmental impact and encourage sustainable construction practices as specifically provided for therein.

3.4 THRESHOLDS AND METHODOLOGY

Thresholds of Significance

The impact analysis provided below is based on the application of the following *CEQA Guidelines* Appendix G, which indicates that a proposed Project would have a significant impact on GHG emissions if it would:

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

2) Conflict with an applicable plan, policy or regulations adopted for the purpose of reducing the emissions of greenhouse gas emissions.

SCAQMD Draft Thresholds of Significance

As stated previously, the SCAQMD released draft guidance regarding interim CEQA GHG significance thresholds. In December 2008, the SCAQMD adopted an interim 10,000 metric tons CO_2e ($MTCO_2e$) per year screening level threshold for stationary source/industrial projects for which the SCAQMD is the lead agency. The SCAQMD continues to consider adoption of significance thresholds for non-industrial development projects. The most recent proposal issued in September 2010 uses the following tiered approach to evaluate potential GHG impacts from various uses:

- **Tier 1:** Determine if CEQA categorical exemptions are applicable. If not, move to Tier 2.

- **Tier 2:** Consider whether or not the proposed project is consistent with a locally adopted GHG reduction plan (i.e., a Climate Action Plan) that has gone through public hearings and CEQA review, that has an approved inventory, includes monitoring, etc. If not, move to Tier 3.

- **Tier 3:** Consider whether the project generates GHG emissions in excess of screening thresholds for individual land uses. The 10,000 $MTCO_2e$/year threshold for industrial uses would be recommended for use by all lead agencies. Under option 1, separate screening thresholds are proposed for residential projects (3,500 $MTCO_2e$/year), commercial projects (1,400 $MTCO_2e$/year), and mixed-use projects (3,000 $MTCO_2e$/year). Under option 2 a single numerical screening threshold of 3,000 $MTCO_2e$/year would be used for all non-industrial projects. If the project generates emissions in excess of the applicable screening threshold, move to Tier 4.

- **Tier 4:** Consider whether the project generates GHG emissions in excess of applicable performance standards for the project service population (population plus employment). The efficiency targets were established based on the goal of AB 32 to reduce statewide GHG emissions to 1990 levels by 2020. The 2020 efficiency targets are 4.8 $MTCO_2e$ per service population for project level analyses and 6.6 $MTCO_2e$ per service population for plan level analyses. If the project generates emissions in excess of the applicable efficiency targets, move to Tier 5.

- **Tier 5:** Consider the implementation of CEQA mitigation (including the purchase of GHG offsets) to reduce the project efficiency target to Tier 4 levels.

The thresholds identified above are not adopted by the SCAQMD or distributed for widespread public review and comment, and the working group tasked with developing the thresholds has not met since September 2010. The future schedule and likelihood of threshold adoption is uncertain.

Methodology

GHG emissions and climate change were evaluated in accordance with Appendix G of the *CEQA Guidelines*. *CEQA Guidelines* Section 15064.4 states that, when making a determination with respect to the significance of a Project's GHG emissions, a lead agency shall have discretion to determine whether to: (1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use; and/or (2) Rely on a qualitative analysis or performance-based standards. Section 15064.4 also states that a lead agency should consider the following factors when assessing the significance of the impact of GHG emissions on the environment: (1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting; (2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies

to the project; and (3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

GHG emissions were calculated in the same CalEEMod model used to determine the Project's criteria air pollutant emissions. Consistent with SCAQMD recommendations, construction emissions were amortized over a thirty-year period and added to the annual operational emissions to determine the proposed Project's annual GHG emissions. Consistent with *CEQA Guidelines* Section 15064(h)(3), Project significance was determined based on the proposed Project's consistency with an approved plan or mitigation program that provides specific requirements that will avoid or substantially lessen the cumulative problem within the geographic area of the Project. The relevant adopted regulatory plans include CARB's 2022 Scoping Plan Update, CALGreen, California Energy Code, SCAG's 2020 Connect SoCal Plan, and the City's General Plan. Although the City's CAP is only a qualified plan through the year 2020, the following consistency analysis with the City's CAP is included for informational purposes.

3.5 PROJECT IMPACTS

GHG Impact 1 **Would implementation of the proposed Project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? *(Less than Significant).***

Construction Emissions

For purposes of this analysis, it is estimated that the Project would be constructed in approximately 18 months with construction beginning in 2025 and project operations commencing by 2026. This analysis assumes construction would be undertaken with the following primary construction phases: (1) Demolition/Debris Removal, (2) Grading; and (3) Structural Building, Finishing and Paving. Each primary construction phase has been further detailed below.

Demolition and removal of existing debris would occur for approximately one month. This phase would include the demolition of the single-family residence and accessory structures (approximately 8,770 sf) that are located near the southerly portion of the property near Golden Valley Road. Grading activities would occur for approximately 5 months and would involve the cut and fill of land to ensure the proper base and slope for the entire site, including building pads and foundations. This analysis assumes approximately 360,00 cubic yards (cy) of cut and fill to be balanced on site. No soil import or export is anticipated at this time. In total, structural building, finishing, and paving activities are expected to occur for approximately 12 months. Upon completion of the building shells, finishing (coatings) and paving of parking areas and driveways would follow.

With the use of CalEEMod, GHG emissions throughout Project construction were calculated from off-road equipment usage, hauling vehicles, delivery, and worker trips to and from the site. The total GHG construction emissions during 2025 and 2026 would be 1,097 metric tons of carbon dioxide equivalent (MT CO_2e). As GHG emissions impact from construction activities would occur over a relatively short time span, it would contribute a relatively small portion of the lifetime GHG emission impact of the Project. The total construction GHG emissions were divided by 30 years to determine an annual construction emission rate to be amortized over the Project's first 30 years of operations, consistent with SCAQMD recommendations. Amortized over a 30-year period, the Project is anticipated to emit approximately 36.6 metric tons of carbon dioxide per year (MT CO2e/year).

Operational Emissions

The Project would incorporate several design features to reduce GHG emissions and be consistent with local and regional regulations and polices that would reduce GHG emissions during operation of the Project.[35] The Project's primary GHG reduction measures and design features include, but are not limited to, the following:

- **Low-Flow Water Fixtures:** The Project will include low-flow and/or high efficiency water fixtures such as low-flow toilets, urinals, faucets, and high-efficiency dishwashers;
- **Vegetation & Landscape Irrigation Systems**: The Project will include drought-tolerant landscaping and will implement efficient landscape irrigation techniques, such as "smart" irrigation technology, to reduce water use and its associated GHG emissions. "Smart" irrigation systems rely on weather, climate and soil moisture information to adjust watering frequency, hence maintaining the vegetation is adequately moist while conserving water;
- **Energy Reduction:** The Project will include energy efficient appliances, high-efficiency lighting, and solar panels. The Project will be built to meet and exceed the State's Green Building Standards (CALGreen Code);
- **Alternative Fuel Vehicles:** The Project would provide on-site electric vehicle (EV) parking spaces, supporting and promoting the use of electric vehicles.

The operations of the Project would generate GHG emissions from the usage of on-road motor vehicles, electricity, natural gas, water, and generation of solid waste and wastewater. Emissions of operational

35 The estimation of Project GHG emissions included herein are considered to be worst-case as the analysis discloses CalEEMod results without the incorporation of any special GHG reduction measures beyond those assumed in CalEEMod.

GHGs are shown in **Table 11, Project Greenhouse Gas Emissions**. As shown, the GHG emissions generated by the Project would be approximately 2,338.14 CO_2e MTY.

This quantified illustration of the Project's scope of GHG emissions is provided for informational purposes, and significance under CEQA is based on the Project's consistency with statewide and regional policies and plans to meet the state reduction goals set in AB 32, SB 32, and AB 1279 including CARB's 2022 Scoping Plan Update, SCAG's 2020 Connect SoCal RTP/SCS, and the City's General Plan. See **GHG Impact 2**.

Table 11
Project Greenhouse Gas Emissions

Emissions Source	Metric Tons of Carbon Dioxide Equivalent (per year)
Amortized Construction	36.6
Area Sources	4.84
Energy Sources	652
Mobile Sources	1,532
Waste Sources	65.7
Water Sources	34.2
Refrigerant Sources	12.8
Total GHG Emissions	**2,338.14**

Source: Impact Sciences, 2024. See Appendix A to this report.

GHG Impact 2 **Would implementation of the proposed Project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? *(Less than Significant).***

A proposed Project would have a significant impact with respect to GHG emissions and global climate change if it would substantially conflict with the provisions of Section 15064.4(b) of the *State CEQA Guidelines*.

Pursuant to Appendix G of the *CEQA Guidelines*, a significant GHG impact is identified if a project could conflict with applicable GHG reduction plans, policies, or regulations. The relevant adopted regulatory plans include CARB's 2022 Scoping Plan Update, CALGreen, California Energy Code, SCAG's 2020 Connect SoCal Plan, and the City's General Plan. As previously discussed, the City has an adopted CAP; however, it is only a qualified plan through the year 2020. Nevertheless, the following analysis evaluates the Project for consistency with the City's CAP for informational purposes.

Consistency with AB 32, SB 32, & AB 1279

The Project would be consistent with applicable statewide regulatory programs designed to reduce GHG emissions consistent with AB 32, SB 32, and AB 1279. During construction, the Project will utilize equipment in compliance with CARB. Mobile sources during construction and operation would be subject to the requirements of California Assembly Bill 1493 (Pavley Standards), the Advanced Clean Cars Program, and the Low Carbon Fuel Standard Regulation. Additionally, the Project would be designed, constructed, and operated consistent with California Title 24 and CALGreen (2022). These regulations require projects to comply with specific standards related to building energy efficiency and green building.

Consistency with the 2022 Scoping Plan Update

The Project would be consistent with CARB's 2022 Scoping Plan Update. In response to the passage of AB 1279 and the identification of the 2045 GHG reduction target, CARB published the 2022 Scoping Plan Update for Achieving Carbon Neutrality on November 16, 2022 and it was approved on December 15, 2022.[36] The 2022 Scoping Plan Update lays out the sector-by-sector roadmap for California, the world's fifth largest economy, to achieve carbon neutrality by 2045 or earlier, outlining a technologically feasible, cost-effective, and equity-focused path to achieve the state's climate target. The 2022 Scoping Plan Update includes policies to achieve a significant reduction in fossil fuel combustion, further reductions in short-lived climate pollutants, support for sustainable development, increased action on natural and working lands (NWL) to reduce emissions and sequester carbon, and the capture and storage of carbon.

The 2022 Scoping Plan Update discusses the role of local governments in meeting the State's GHG reductions goals because local governments have jurisdiction and land use authority related to: community-scale planning and permitting processes, local codes and actions, outreach and education programs, and municipal operations. Furthermore, local governments may have the ability to incentivize renewable energy, energy efficiency, and water efficiency measures. As discussed in detail in Appendix D (Local Actions) of the 2022 Scoping Plan Update, local jurisdictions can do much to enable statewide priorities, such as taking local action to help the state develop the housing, transport systems, and other tools we all need. Indeed, state tools—such as the Cap-and-Trade Program or zero-emission vehicle programs—do not substitute for these local efforts. Multiple legal tools are open to local jurisdictions to support this approach, including development of a climate action plan (CAP), sustainability plan, or

[36] California Air Resources Board, 2022 Scoping Plan Documents, *Notice of Decision*, https://ww2.arb.ca.gov/sites/default/files/2022-12/2022-sp-appendix-b-notice-of-decision.pdf; accessed February 1, 2024.

inclusion of a plan for reduction of GHG emissions and climate actions within a jurisdiction's general plan. Any of these can help to align zoning, permitting, and other local tools with climate action.

The Scoping Plan encourages local governments to adopt a CEQA-qualified CAP addressing three priority areas (transportation electrification, VMT reduction, and building decarbonization). However, the State recognizes that almost 50 percent of jurisdictions do not have an adopted CAP, among other reasons because they are costly, requiring technical expertise, staffing, funding. Additionally, CAPs need to be monitored and updated as State targets change and new data is available. Jurisdictions that wish to take meaningful climate action (such as preparing a non-CEQA-qualified CAP or as individual measures) aligned with the State's climate goals in the absence of a CEQA-qualified CAP are advised to look to the three priority areas when developing local climate plans, measures, policies, and actions: (transportation electrification, VMT reduction, and building decarbonization). "By prioritizing climate action in these three priority areas, local governments can address the largest sources of GHGs within their jurisdiction." (Page 9 of Appendix D.) The Project would generate less-than-significant VMT impacts,[37] the Project will provide on-site EV parking spaces, and the Project will be built to meet CalGreen Code standards. Thus, the Project is generally consistent with the three priority areas identified in the Scoping Plan. In addition, the Project would comply with all regulations adopted in furtherance of the Scoping Plan to the extent required by law and to the extent that they are applicable to the Project. Lastly, as demonstrated herein, the Project would be consistent with the City's CAP and Conservation and Open Space Element of the 2011 Santa Clarita General Plan (General Plan) which identify goals, objectives, and policies aimed at greenhouse gas reduction in private development projects in the City. As such, the Project is consistent with Appendix D (Local Actions) of the 2022 Scoping Plan Update.

Consistency with SCAG's Connect SoCal Plan

At the regional level, SCAG's Connect SoCal Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) represent the region's Climate Action Plan that defines strategies for reducing GHGs. In order to assess the Project's potential to conflict with the RTP/SCS, this section analyzes the Project's land use profile for consistency with those in the RTP/SCS. Generally, projects are considered consistent with the provisions and general policies of applicable City and regional land use plans and regulations, such as SCAG's RTP/SCS, if they are compatible with the general intent of the plans and would not preclude the attainment of their primary goals.

As shown in **Table 12**, **Project Consistency with SCAG's RTP/SCS,** the Project would be consistent with the applicable strategies set forth in the RTP/SCS's "A Path to Greater Access, Mobility, & Sustainability"

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37 TJW Engineering, Inc., Golden Valley Road Mixed-Use Vehicle Miles Traveled (VMT) Analysis, November 14, 2023.

chapter. Therefore, the Project would be consistent with the applicable GHG reduction related actions and strategies contained in Connect SoCal.

Table 12
Project Consistency with SCAG's RTP/SCS

Actions and Strategies	Consistency Analysis
Focus Growth Near Destinations & Mobility Options	
Emphasize land use patterns that facilitate multimodal access to work, educational and other destinations	No Conflict: The proposed project involves the demolition of the existing single-family residence and associated debris, and development of a mixed-use project consisting of 151 senior assisted living units, 73 residential units, a 60-room hotel (with 2,544 square feet (sf) of banquet space, 3,315 sf of retail space, and 2,360 sf of restaurant space), and 5.83 acres of open space. The majority of the site is currently vacant except for the single-family residence and accessory structures. The Project Site is designated as Mixed-Use Neighborhood Planned Development Overlay Zone (MX-N (PD)). The proposed uses are consistent with the City General Plan, Unified Development Code, and Zoning designations. Therefore, the project would emphasize a land use pattern that would not conflict with the Mixed-Use Neighborhood Planned Development Overlay Zone providing a mix of uses.
Focus on job/housing balance to reduce commute times and distances and expand job opportunities near transit and along center-focused main streets	No Conflict: The proposed project involves the development of a mixed-use project consisting of 151 senior assisted living units, 73 residential units, a 60-room hotel (with 2,544 square feet (sf) of banquet space, 3,315 sf of retail space, and 2,360 sf of restaurant space), and 5.83 acres of open space. The project would be located at the intersection of Golden Valley Road and Sierra Highway, which provide access to existing residential uses, schools, and neighborhood commercial retail centers. The project would add job opportunities along main streets in the City and would not conflict with this strategy.
Plan for growth near transit investments and support implementation of first/last mile strategies	Consistent: The proposed project would implement the designated Mixed-Use Neighborhood Planned Development Overlay Zone (MX-N (PD)). The Project Site would be located near the intersection of Golden Valley Road and Sierra Highway, which provide access to existing residential uses, schools, and neighborhood commercial retail centers. Existing bus stops located at the intersection of Golden Valley Road and Sierra Highway would also provide nearby residents, customers, and employees with access to public transit.
Promote the redevelopment of underperforming retail developments and other outmoded nonresidential uses	Not Applicable: The Project does not include the redevelopment of underperforming retail or other outmoded nonresidential uses.
Prioritize infill and redevelopment of underutilized land to accommodate new growth, increase amenities and connectivity in existing neighborhoods	No Conflict: The majority of the site is currently vacant except for the single-family residence and accessory structures. The proposed project involves the development of a mixed-use project consisting of 151 senior assisted living units, 73 residential units, a 60-room hotel (with 2,544 square feet (sf) of banquet space, 3,315 sf of retail space, and 2,360 sf of restaurant space), and 5.83 acres of open space. The project would be located at near the intersection of Golden Valley Road and Sierra Highway, which provide access to existing residential uses, schools, and neighborhood commercial retail centers. While the Project is not considered infill, the Project would add

Actions and Strategies	Consistency Analysis
	new growth and increased amenities to underutilized land in the City and would not conflict with this strategy.
Encourage design and transportation options that reduce the reliance on and number of solo car trips (this could include mixed uses or locating and orienting close to existing destinations)	Consistent: The Project Site is designated as Mixed-Use Neighborhood Planned Development Overlay Zone (MX-N (PD)). The proposed project involves the development of a mixed-use project consisting of 151 senior assisted living units, 73 residential units, a 60-room hotel (with 2,544 square feet (sf) of banquet space, 3,315 sf of retail space, and 2,360 sf of restaurant space), and 5.83 acres of open space. The proposed project would also connect to existing uses such as access to schools and neighborhood commercial retail centers along Golden Valley Road and Sierra Highway.
Promote Diverse Housing	
Preserve and rehabilitate affordable housing and prevent displacement	Not Applicable: The proposed project would provide 151 senior assisted living facilities as well as 73 residential units. The proposed project would not conflict with such policymaking.
Identify opportunities for new workforce and affordable housing development	Not Applicable: The proposed project would provide 151 senior assisted living facilities (i.e., not workforce housing) as well as 73 residential units. The proposed project would not conflict with such policymaking.
Leverage Technology Innovations	
Promote low emission technologies such as neighborhood electric vehicles, shared rides hailing, car sharing, bike sharing and scooters by providing supportive and safe infrastructure such as dedications lanes, charging and parking/drop-off space	Not Applicable: This strategy calls on local government to promote low emission technologies. That said, the proposed project would provide on-site electric vehicle (EV) parking spaces, supporting and promoting the use of electric vehicles. The proposed Project would not conflict with such policymaking.
Identify ways to incorporate "micro-power grids" in communities, for example solar energy, hydrogen fuel cell power storage and power generation	Not Applicable: This strategy is aimed at local government to identify ways to incorporate “micro-power grids.” The proposed Project would not conflict with such policymaking.
Support Implementation of Sustainability Policies	
Pursue funding opportunities to support local sustainable development implementation projects that reduce GHG emissions	Not Applicable: While this strategy calls on local governments to adopt policies for sustainable infrastructure and development projects, the proposed project would not conflict with such policymaking.
Support statewide legislation that reduces barriers to new construction and that incentivizes development near transit corridors and stations	Not Applicable: While this strategy calls on the state to adopt policies to new construction near transit corridors and stations, the proposed project would not conflict with such policymaking.
Support cities in the establishment of Enhanced Infrastructure Financing Districts (EIFDs), Community Revitalization and Investment Authorities (CRIAs), or other tax increment or value capture tools to finance sustainable infrastructure and development projects	Not Applicable: While this strategy calls on cities to establish tax incentive or other value capture tools to finance sustainable infrastructure, the proposed project would not conflict with such policymaking.
Work with local jurisdictions/communities to identify opportunities and assess barriers to implement sustainability strategies	Not Applicable: While this strategy calls on SCAG to work with local jurisdictions to identify ways to implement sustainable strategies, the proposed project would not conflict with such policymaking.
Enhance partnerships with other planning organizations to promote resources and best practices in the SCAG region	Not Applicable: While this strategy calls on planning organizations to promote resources and best practices in SCAG, the proposed project would not conflict with such policymaking.

Actions and Strategies	Consistency Analysis
Continue to support long range planning efforts by local jurisdictions	Not Applicable: While this strategy calls on local jurisdictions to support long range planning, the proposed project would not conflict with such policymaking.
Provide educational opportunities to local decisions makers and staff on new tools, best practices and policies related to implementing the Sustainable Communities Strategy	Not Applicable: While this strategy calls on local jurisdictions to provide educational opportunities on new tools and practices to promote the Sustainable Communities Strategy, the proposed project would not conflict with such policymaking.
Promote a Green Region	
Support development of local climate adaptation and hazard mitigation plans, as well as Project implementation that improves community resiliency to climate change and natural hazards.	Not Applicable: This strategy calls on local governments to support the development
Support local policies for renewable energy production, reduction of urban heat islands and carbon sequestration.	Not Applicable: While this strategy calls on local governments to adopt policies for renewable energy production, the proposed project would not conflict with such policymaking.
Integrate local food production into the regional landscape	Not Applicable: While this strategy calls on local governments to integrate local food into the regional landscape, the proposed project would not conflict with such policymaking.
Promote more resource efficient development focused on conservation, recycling and reclamation	Consistent. The proposed project will be required to adhere to the latest CALGreen Building Codes and Title 24.
Preserve, enhance and restore regional wildlife connectivity	Consistent: The proposed project would not interfere with any known wildlife corridors.
Reduce consumption of resource areas, including agricultural land	Consistent. The proposed project will not consume any resource areas or agricultural land.
Identify ways to improve access to public park space	Not Applicable. This strategy calls on local governments to improve access to public park space. The proposed project would not conflict with this goal. It should be noted the Project would have on-site park space, which would potentially alleviate the demand on existing off-site public parks in the City.

Source: Impact Sciences, 2022.
SCAG. 2019. Connect SoCal – The 2020-2045 Regional Transportation Plan/Sustainable Communities Strategy, Chapter 3: A Path to Greater Access, Mobility, & Sustainability. Available online at: https://scag.ca.gov/connect-socal, accessed February 1, 2024.

Consistency with Santa Clarita General Plan & CAP

Because goals, objectives and policies approved under the General Plan are forecast to meet the GHG emission reduction targets mandated by AB 32 and SB 32, development projects that are able to demonstrate consistency with the General Plan and zoning ordinance will by association demonstrate consistency with the CAP.

The Project Site is designated as Mixed-Use Neighborhood Planned Development Overlay Zone (MX-N (PD)). The proposed mix of uses are consistent with the City General Plan, Unified Development Code,

and Zoning designations, and thus the Project would also be consistent with the CAP. Furthermore, the Project is consistent with the following goals, objectives, and policies of the City's General Plan.

Goal CO 8: Development designed to improve energy efficiency, reduce energy and natural resource consumption, and reduce emissions of greenhouse gases.

> **Objective CO 8.1:** Comply with the requirements of State law, including AB 32, SB 375 and implementing regulations, to reach targeted reductions of greenhouse gas (GHG) emissions.
>
> > **Policy CO 8.1.1:** Create and adopt a Climate Action Plan within 18 months of the OVOV adoption date of the City's General Plan Update that meets State requirements and includes the following components:
> >
> > a. Plans and programs to reduce GHG emissions to State-mandated targets, including enforceable reduction measures;
> >
> > i. The CAP may establish goals beyond 2020, which are consistent with the applicable laws and regulations referenced in this paragraph and based on current science;
> >
> > ii. The CAP shall include specific and general tools and strategies to reduce the City's current and projected 2020 inventory and to meet the CAPs target for GHG reductions by 2020;
> >
> > iii. The CAP shall consider, among other GHG reduction strategies, the feasibility of development fees; incentive and rebate programs; and, voluntary and mandatory reduction strategies in areas of energy efficiency, renewable energy, water conservation and efficiency, solid waste, land use and transportation.
> >
> > b. Mechanisms to ensure regular review of progress towards the emission reduction targets established by the Climate Action Plan;
> >
> > c. Procedures for reporting on progress to officials and the public;
> >
> > d. Procedures for revising the plan as needed to meet GHG emissions reduction targets; and,
> >
> > e. Allocation of funding and staffing for Plan implementation;

Policy CO 8.1.2: Participate in the preparation of a regional Sustainable Communities Strategy (SCS) Plan to meet regional targets for greenhouse gas emission reductions, as required by SB 375.

Policy CO 8.1.3: Revise codes and ordinances as needed to address energy conservation, including but not limited to the following:

a. Strengthen building codes for new construction and renovation to achieve a higher level of energy efficiency, with a goal of exceeding energy efficiency beyond that required by Title 24;

b. Adopt a Green Building Program to encourage green building practices and materials, along with appropriate ordinances and incentives;

c. Require orientation of buildings to maximize passive solar heating during cool seasons, avoid solar heat gain during hot periods, enhance natural ventilation, promote effective use of daylight, and optimize opportunities for on-site solar generation;

d. Encourage mitigation of the "heat island" effect through use of cool roofs, light-colored paving, and shading to reduce energy consumption for air conditioning.

Policy CO 8.1.4: Provide information and education to the public about energy conservation and local strategies to address climate change.

Policy CO 8.1.5: Coordinate various activities within the community and appropriate agencies related to GHG emissions reduction activities.

Objective CO 8.3: Encourage the following green building and sustainable development practices on private development projects, to the extent reasonable and feasible.

Policy CO 8.3.1: Evaluate site plans proposed for new development based on energy efficiency pursuant to LEED (Leadership in Energy and Environmental Design) standards for New Construction and Neighborhood Development, including the following: a) location efficiency; b) environmental preservation; c) compact, complete, and connected neighborhoods; and d) resource efficiency, including use of recycled materials and water.

Policy CO 8.3.2: Promote construction of energy efficient buildings through requirements for LEED certification or through comparable alternative requirements as adopted by local ordinance.

Policy CO 8.3.5: Encourage on-site solar generation of electricity in new retail and office commercial buildings and associated parking lots, carports, and garages, in concert with other significant energy conservation efforts.

Policy CO 8.3.6: Require new development to use passive solar heating and cooling techniques in building design and construction, which may include but are not limited to building orientation, clerestory windows, skylights, placement and type of windows, overhangs to shade doors and windows, and use of light colored roofs, shade trees, and paving materials.

Policy CO 8.3.7: Encourage the use of trees and landscaping to reduce heating and cooling energy loads, through shading of buildings and parking lots.

Policy CO 8.3.8: Encourage energy-conserving heating and cooling systems and appliances, and energy-efficiency in windows and insulation, in all new construction.

Policy CO 8.3.9: Limit excessive lighting levels and encourage a reduction of lighting when businesses are closed to a level required for security.

Policy CO 8.3.10: Provide incentives and technical assistance for installation of energy-efficient improvements in existing and new buildings.

Policy CO 8.3.12: Reduce extensive heat gain from paved surfaces through development standards wherever feasible.

Conclusion

Given the Project's consistency with all relevant adopted regulatory plans, the Project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. Moreover, the Project would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases and these impacts would be less than significant.

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APPENDIX A

Air Quality Data

Golden Valley-Sierra Hwy July 2024 Custom Report

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1.1. Basic Project Information

Data Field	Value
Project Name	Golden Valley-Sierra Hwy July 2024
Construction Start Date	7/1/2025
Operational Year	2026
Lead Agency	Santa Clarita
Land Use Scale	Project/site
Analysis Level for Defaults	County
Windspeed (m/s)	2.50
Precipitation (days)	19.6
Location	34.39966904249752, -118.48644360718563
County	Los Angeles-South Coast
City	Santa Clarita
Air District	South Coast AQMD
Air Basin	South Coast
TAZ	3618
EDFZ	7
Electric Utility	Southern California Edison
Gas Utility	Southern California Gas
App Version	2022.1.1.26

1.2. Land Use Types

Land Use Subtype	Size	Unit	Lot Acreage	Building Area (sq ft)	Landscape Area (sq ft)	Special Landscape Area (sq ft)	Population	Description
Parking Lot	223	Space	2.00	0.00	0.00	—	—	—

City Park	5.83	Acre	5.83	0.00	100,000	100,000	—	—
Hotel	60.0	Room	3.76	47,828	5,000	—	—	—
Condo/Townhouse	73.0	Dwelling Unit	13.1	162,129	10,000	—	157	—
Congregate Care (Assisted Living)	151	Dwelling Unit	5.43	101,166	7,500	—	151	—

1.3. User-Selected Emission Reduction Measures by Emissions Sector

No measures selected

2. Emissions Summary

2.1. Construction Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	3.90	3.28	29.8	29.7	0.06	1.23	2.65	3.89	1.14	1.01	2.15	—	6,875	6,875	0.28	0.25	11.0	6,902
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	45.8	45.3	29.8	37.4	0.06	1.23	3.31	4.05	1.14	1.01	2.15	—	8,021	8,021	0.34	0.28	0.35	8,115
Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	6.57	6.31	10.3	18.0	0.02	0.43	1.92	2.22	0.39	0.46	0.73	—	4,251	4,251	0.18	0.18	3.47	4,313
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.20	1.15	1.89	3.29	< 0.005	0.08	0.35	0.40	0.07	0.08	0.13	—	704	704	0.03	0.03	0.58	714

2.2. Construction Emissions by Year, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Year	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily - Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.90	3.28	29.8	29.7	0.06	1.23	2.65	3.89	1.14	1.01	2.15	—	6,875	6,875	0.28	0.08	1.50	6,902
2026	2.11	1.77	11.7	25.2	0.03	0.39	2.64	3.04	0.36	0.63	0.99	—	5,845	5,845	0.24	0.25	11.0	5,936
Daily - Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	3.90	3.28	29.8	29.5	0.06	1.23	2.65	3.89	1.14	1.01	2.15	—	6,861	6,861	0.28	0.06	0.03	6,887
2026	45.8	45.3	20.0	37.4	0.05	0.74	3.31	4.05	0.67	0.79	1.46	—	8,021	8,021	0.34	0.28	0.35	8,115
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	1.35	1.14	10.3	10.2	0.02	0.43	0.83	1.26	0.39	0.31	0.70	—	2,306	2,306	0.09	0.02	0.17	2,316
2026	6.57	6.31	8.95	18.0	0.02	0.30	1.92	2.22	0.27	0.46	0.73	—	4,251	4,251	0.18	0.18	3.47	4,313
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2025	0.25	0.21	1.89	1.86	< 0.005	0.08	0.15	0.23	0.07	0.06	0.13	—	382	382	0.02	< 0.005	0.03	383
2026	1.20	1.15	1.63	3.29	< 0.005	0.05	0.35	0.40	0.05	0.08	0.13	—	704	704	0.03	0.03	0.58	714

2.4. Operations Emissions Compared Against Thresholds

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Un/Mit.	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	10.4	9.83	3.87	47.6	0.10	0.16	8.72	8.88	0.16	2.21	2.37	132	13,531	13,663	13.8	0.35	110	14,224
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	8.80	8.35	3.98	28.1	0.10	0.15	8.72	8.87	0.15	2.21	2.36	132	13,081	13,213	13.8	0.37	78.1	13,746

Average Daily (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	9.87	9.36	4.13	39.5	0.10	0.16	8.61	8.77	0.15	2.19	2.34	132	13,219	13,352	13.8	0.37	91.3	13,899
Annual (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Unmit.	1.80	1.71	0.75	7.21	0.02	0.03	1.57	1.60	0.03	0.40	0.43	21.9	2,189	2,211	2.29	0.06	15.1	2,301

2.5. Operations Emissions by Sector, Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Sector	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.36	0.99	2.49	32.2	0.09	0.05	8.72	8.77	0.05	2.21	2.27	—	9,439	9,439	0.27	0.29	32.7	9,563
Area	8.86	8.77	0.14	14.8	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	42.5	42.5	< 0.005	< 0.005	—	42.7
Energy	0.14	0.07	1.24	0.68	0.01	0.10	—	0.10	0.10	—	0.10	—	3,924	3,924	0.28	0.02	—	3,938
Water	—	—	—	—	—	—	—	—	—	—	—	18.9	125	144	1.95	0.05	—	207
Waste	—	—	—	—	—	—	—	—	—	—	—	113	0.00	113	11.3	0.00	—	397
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	77.2	77.2
Total	10.4	9.83	3.87	47.6	0.10	0.16	8.72	8.88	0.16	2.21	2.37	132	13,531	13,663	13.8	0.35	110	14,224
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.35	0.98	2.74	27.5	0.09	0.05	8.72	8.77	0.05	2.21	2.27	—	9,031	9,031	0.27	0.30	0.85	9,128
Area	7.30	7.30	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
Energy	0.14	0.07	1.24	0.68	0.01	0.10	—	0.10	0.10	—	0.10	—	3,924	3,924	0.28	0.02	—	3,938
Water	—	—	—	—	—	—	—	—	—	—	—	18.9	125	144	1.95	0.05	—	207
Waste	—	—	—	—	—	—	—	—	—	—	—	113	0.00	113	11.3	0.00	—	397
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	77.2	77.2
Total	8.80	8.35	3.98	28.1	0.10	0.15	8.72	8.87	0.15	2.21	2.36	132	13,081	13,213	13.8	0.37	78.1	13,746

Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	1.35	0.98	2.79	28.7	0.09	0.05	8.61	8.66	0.05	2.19	2.24	—	9,141	9,141	0.27	0.30	14.1	9,252
Area	8.37	8.31	0.10	10.1	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	29.1	29.1	< 0.005	< 0.005	—	29.2
Energy	0.14	0.07	1.24	0.68	0.01	0.10	—	0.10	0.10	—	0.10	—	3,924	3,924	0.28	0.02	—	3,938
Water	—	—	—	—	—	—	—	—	—	—	—	18.9	125	144	1.95	0.05	—	207
Waste	—	—	—	—	—	—	—	—	—	—	—	113	0.00	113	11.3	0.00	—	397
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	77.2	77.2
Total	9.87	9.36	4.13	39.5	0.10	0.16	8.61	8.77	0.15	2.19	2.34	132	13,219	13,352	13.8	0.37	91.3	13,899
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mobile	0.25	0.18	0.51	5.24	0.02	0.01	1.57	1.58	0.01	0.40	0.41	—	1,513	1,513	0.04	0.05	2.33	1,532
Area	1.53	1.52	0.02	1.85	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	4.82	4.82	< 0.005	< 0.005	—	4.84
Energy	0.03	0.01	0.23	0.12	< 0.005	0.02	—	0.02	0.02	—	0.02	—	650	650	0.05	< 0.005	—	652
Water	—	—	—	—	—	—	—	—	—	—	—	3.13	20.7	23.8	0.32	0.01	—	34.2
Waste	—	—	—	—	—	—	—	—	—	—	—	18.8	0.00	18.8	1.88	0.00	—	65.7
Refrig.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.8	12.8
Total	1.80	1.71	0.75	7.21	0.02	0.03	1.57	1.60	0.03	0.40	0.43	21.9	2,189	2,211	2.29	0.06	15.1	2,301

3. Construction Emissions Details

3.1. Demolition (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipment	2.86	2.40	22.2	19.9	0.03	0.92	—	0.92	0.84	—	0.84	—	3,425	3,425	0.14	0.03	—	3,437
Demolition	—	—	—	—	—	—	0.25	0.25	—	0.04	0.04	—	—	—	—	—	—	—
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.34	1.20	< 0.005	0.06	—	0.06	0.05	—	0.05	—	206	206	0.01	< 0.005	—	207
Demolition	—	—	—	—	—	—	0.02	0.02	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.03	0.03	0.24	0.22	< 0.005	0.01	—	0.01	0.01	—	0.01	—	34.2	34.2	< 0.005	< 0.005	—	34.3
Demolition	—	—	—	—	—	—	< 0.005	< 0.005	—	< 0.005	< 0.005	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.07	0.06	0.06	1.04	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	207	207	0.01	0.01	0.76	210
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Hauling	0.02	< 0.005	0.39	0.15	< 0.005	< 0.005	0.09	0.09	< 0.005	0.02	0.03	—	318	318	0.02	0.05	0.74	334
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.06	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	12.0	12.0	< 0.005	< 0.005	0.02	12.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	0.02	0.01	< 0.005	< 0.005	0.01	0.01	< 0.005	< 0.005	< 0.005	—	19.2	19.2	< 0.005	< 0.005	0.02	20.1
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.99	1.99	< 0.005	< 0.005	< 0.005	2.02
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	—	3.17	3.17	< 0.005	< 0.005	< 0.005	3.33

3.3. Grading (2025) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	2.39	2.39	—	0.95	0.95	—	—	—	—	—	—	—
Onsite truck	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	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	3.80	3.20	29.7	28.3	0.06	1.23	—	1.23	1.14	—	1.14	—	6,599	6,599	0.27	0.05	—	6,622
Dust From Material Movement	—	—	—	—	—	—	2.39	2.39	—	0.95	0.95	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.15	0.96	8.94	8.53	0.02	0.37	—	0.37	0.34	—	0.34	—	1,989	1,989	0.08	0.02	—	1,996
Dust From Material Movement	—	—	—	—	—	—	0.72	0.72	—	0.29	0.29	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.21	0.18	1.63	1.56	< 0.005	0.07	—	0.07	0.06	—	0.06	—	329	329	0.01	< 0.005	—	330
Dust From Material Movement	—	—	—	—	—	—	0.13	0.13	—	0.05	0.05	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.09	1.39	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	277	277	0.01	0.01	1.01	281
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.09	0.08	0.10	1.18	0.00	0.00	0.26	0.26	0.00	0.06	0.06	—	262	262	0.01	0.01	0.03	265
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.03	0.03	0.03	0.37	0.00	0.00	0.08	0.08	0.00	0.02	0.02	—	80.2	80.2	< 0.005	< 0.005	0.13	81.2
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.01	< 0.005	0.01	0.07	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	13.3	13.3	< 0.005	< 0.005	0.02	13.5
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.5. Building Construction (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Off-Road Equipm	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	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	0.00
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	1.28	1.07	9.85	13.0	0.02	0.38	—	0.38	0.35	—	0.35	—	2,397	2,397	0.10	0.02	—	2,405
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.76	6.99	9.20	0.02	0.27	—	0.27	0.25	—	0.25	—	1,701	1,701	0.07	0.01	—	1,707
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.17	0.14	1.28	1.68	< 0.005	0.05	—	0.05	0.05	—	0.05	—	282	282	0.01	< 0.005	—	283
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.75	0.67	0.70	11.7	0.00	0.00	2.37	2.37	0.00	0.56	0.56	—	2,457	2,457	0.10	0.09	8.31	2,494
Vendor	0.07	0.03	1.09	0.53	0.01	0.01	0.27	0.29	0.01	0.08	0.08	—	991	991	0.04	0.14	2.68	1,037
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.75	0.66	0.79	10.00	0.00	0.00	2.37	2.37	0.00	0.56	0.56	—	2,330	2,330	0.11	0.09	0.22	2,358
Vendor	0.07	0.03	1.14	0.54	0.01	0.01	0.27	0.29	0.01	0.08	0.08	—	991	991	0.04	0.14	0.07	1,035
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.53	0.47	0.61	7.42	0.00	0.00	1.66	1.66	0.00	0.39	0.39	—	1,677	1,677	0.08	0.06	2.55	1,700
Vendor	0.05	0.02	0.82	0.38	0.01	0.01	0.19	0.20	0.01	0.05	0.06	—	703	703	0.03	0.10	0.82	735
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.10	0.09	0.11	1.35	0.00	0.00	0.30	0.30	0.00	0.07	0.07	—	278	278	0.01	0.01	0.42	281
Vendor	0.01	< 0.005	0.15	0.07	< 0.005	< 0.005	0.03	0.04	< 0.005	0.01	0.01	—	116	116	< 0.005	0.02	0.14	122
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.7. Paving (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.91	0.76	7.12	9.94	0.01	0.32	—	0.32	0.29	—	0.29	—	1,511	1,511	0.06	0.01	—	1,516
Paving	0.25	0.25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.05	0.04	0.41	0.57	< 0.005	0.02	—	0.02	0.02	—	0.02	—	86.9	86.9	< 0.005	< 0.005	—	87.2
Paving	0.01	0.01	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.01	0.01	0.07	0.10	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	14.4	14.4	< 0.005	< 0.005	—	14.4
Paving	< 0.005	< 0.005	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.06	0.05	0.07	0.83	0.00	0.00	0.20	0.20	0.00	0.05	0.05	—	193	193	0.01	0.01	0.02	195
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.05	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	11.2	11.2	< 0.005	< 0.005	0.02	11.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.01	0.00	0.00	< 0.005	< 0.005	0.00	< 0.005	< 0.005	—	1.86	1.86	< 0.005	< 0.005	< 0.005	1.89
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

3.9. Architectural Coating (2026) - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Location	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Onsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.15	0.12	0.86	1.13	< 0.005	0.02	—	0.02	0.02	—	0.02	—	134	134	0.01	< 0.005	—	134
Architectural Coatings	42.2	42.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	0.02	0.01	0.10	0.13	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	15.7	15.7	< 0.005	< 0.005	—	15.8
Architectural Coatings	4.97	4.97	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Onsite truck	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	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Off-Road Equipment	< 0.005	< 0.005	0.02	0.02	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	2.60	2.60	< 0.005	< 0.005	—	2.61
Architectural Coatings	0.91	0.91	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Onsite truck	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	0.00
Offsite	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.15	0.13	0.16	2.00	0.00	0.00	0.47	0.47	0.00	0.11	0.11	—	466	466	0.02	0.02	0.04	472
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Average Daily	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	0.02	0.02	0.02	0.25	0.00	0.00	0.06	0.06	0.00	0.01	0.01	—	55.7	55.7	< 0.005	< 0.005	0.08	56.4
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Worker	< 0.005	< 0.005	< 0.005	0.04	0.00	0.00	0.01	0.01	0.00	< 0.005	< 0.005	—	9.22	9.22	< 0.005	< 0.005	0.01	9.35
Vendor	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00
Hauling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	—	0.00	0.00	0.00	0.00	0.00	0.00

4. Operations Emissions Details

4.1. Mobile Emissions by Land Use

4.1.1. Unmitigated

Mobile source emissions results are presented in Sections 2.6. No further detailed breakdown of emissions is available.

4.2. Energy

4.2.1. Electricity Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	111	111	0.01	< 0.005	—	112
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	975	975	0.06	0.01	—	979
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	489	489	0.03	< 0.005	—	490
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	—	807	807	0.05	0.01	—	810
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,382	2,382	0.15	0.02	—	2,391
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	111	111	0.01	< 0.005	—	112
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	975	975	0.06	0.01	—	979
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	489	489	0.03	< 0.005	—	490
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	—	807	807	0.05	0.01	—	810
Total	—	—	—	—	—	—	—	—	—	—	—	—	2,382	2,382	0.15	0.02	—	2,391
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	—	18.4	18.4	< 0.005	< 0.005	—	18.5
City Park	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	—	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	162	162	0.01	< 0.005	—	162
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	80.9	80.9	0.01	< 0.005	—	81.2
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	—	134	134	0.01	< 0.005	—	134
Total	—	—	—	—	—	—	—	—	—	—	—	—	394	394	0.02	< 0.005	—	396

4.2.3. Natural Gas Emissions By Land Use - Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	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
City Park	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
Hotel	0.04	0.02	0.37	0.31	< 0.005	0.03	—	0.03	0.03	—	0.03	—	443	443	0.04	< 0.005	—	444
Condo/Townhouse	0.05	0.03	0.44	0.19	< 0.005	0.04	—	0.04	0.04	—	0.04	—	562	562	0.05	< 0.005	—	564
Congregate Care (Assisted Living)	0.05	0.02	0.42	0.18	< 0.005	0.03	—	0.03	0.03	—	0.03	—	537	537	0.05	< 0.005	—	539
Total	0.14	0.07	1.24	0.68	0.01	0.10	—	0.10	0.10	—	0.10	—	1,542	1,542	0.14	< 0.005	—	1,547
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	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
City Park	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
Hotel	0.04	0.02	0.37	0.31	< 0.005	0.03	—	0.03	0.03	—	0.03	—	443	443	0.04	< 0.005	—	444
Condo/Townhouse	0.05	0.03	0.44	0.19	< 0.005	0.04	—	0.04	0.04	—	0.04	—	562	562	0.05	< 0.005	—	564
Congregate Care (Assisted Living)	0.05	0.02	0.42	0.18	< 0.005	0.03	—	0.03	0.03	—	0.03	—	537	537	0.05	< 0.005	—	539
Total	0.14	0.07	1.24	0.68	0.01	0.10	—	0.10	0.10	—	0.10	—	1,542	1,542	0.14	< 0.005	—	1,547
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Parking Lot	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
City Park	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
Hotel	0.01	< 0.005	0.07	0.06	< 0.005	0.01	—	0.01	0.01	—	0.01	—	73.3	73.3	0.01	< 0.005	—	73.5
Condo/Townhouse	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	93.1	93.1	0.01	< 0.005	—	93.3
Congregate Care (Assisted Living)	0.01	< 0.005	0.08	0.03	< 0.005	0.01	—	0.01	0.01	—	0.01	—	89.0	89.0	0.01	< 0.005	—	89.2
Total	0.03	0.01	0.23	0.12	< 0.005	0.02	—	0.02	0.02	—	0.02	—	255	255	0.02	< 0.005	—	256

4.3. Area Emissions by Source

4.3.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Source	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	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
Consumer Products	6.72	6.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.58	0.58	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Landscape Equipment	1.56	1.47	0.14	14.8	< 0.005	0.01	—	0.01	0.01	—	0.01	—	42.5	42.5	< 0.005	< 0.005	—	42.7
Total	8.86	8.77	0.14	14.8	< 0.005	0.01	—	0.01	0.01	—	0.01	0.00	42.5	42.5	< 0.005	< 0.005	—	42.7
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	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
Consumer Products	6.72	6.72	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.58	0.58	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	7.30	7.30	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
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Hearths	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
Consumer Products	1.23	1.23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Architectural Coatings	0.11	0.11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Landscape Equipment	0.19	0.18	0.02	1.85	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	—	4.82	4.82	< 0.005	< 0.005	—	4.84
Total	1.53	1.52	0.02	1.85	< 0.005	< 0.005	—	< 0.005	< 0.005	—	< 0.005	0.00	4.82	4.82	< 0.005	< 0.005	—	4.84

4.4. Water Emissions by Land Use

4.4.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	24.1	24.1	< 0.005	< 0.005	—	24.2
Hotel	—	—	—	—	—	—	—	—	—	—	—	2.92	15.6	18.6	0.30	0.01	—	28.2
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	5.21	28.3	33.5	0.54	0.01	—	50.8
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	10.8	56.8	67.6	1.11	0.03	—	103
Total	—	—	—	—	—	—	—	—	—	—	—	18.9	125	144	1.95	0.05	—	207
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	24.1	24.1	< 0.005	< 0.005	—	24.2
Hotel	—	—	—	—	—	—	—	—	—	—	—	2.92	15.6	18.6	0.30	0.01	—	28.2
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	5.21	28.3	33.5	0.54	0.01	—	50.8

Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	10.8	56.8	67.6	1.11	0.03	—	103
Total	—	—	—	—	—	—	—	—	—	—	—	18.9	125	144	1.95	0.05	—	207
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.00	3.99	3.99	< 0.005	< 0.005	—	4.01
Hotel	—	—	—	—	—	—	—	—	—	—	—	0.48	2.59	3.07	0.05	< 0.005	—	4.67
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	0.86	4.69	5.55	0.09	< 0.005	—	8.41
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	1.79	9.41	11.2	0.18	< 0.005	—	17.1
Total	—	—	—	—	—	—	—	—	—	—	—	3.13	20.7	23.8	0.32	0.01	—	34.2

4.5. Waste Emissions by Land Use

4.5.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.27	0.00	0.27	0.03	0.00	—	0.95

Hotel	—	—	—	—	—	—	—	—	—	—	—	17.7	0.00	17.7	1.77	0.00	—	61.9
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	21.1	0.00	21.1	2.11	0.00	—	74.0
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	74.3	0.00	74.3	7.43	0.00	—	260
Total	—	—	—	—	—	—	—	—	—	—	—	113	0.00	113	11.3	0.00	—	397
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.27	0.00	0.27	0.03	0.00	—	0.95
Hotel	—	—	—	—	—	—	—	—	—	—	—	17.7	0.00	17.7	1.77	0.00	—	61.9
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	21.1	0.00	21.1	2.11	0.00	—	74.0
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	74.3	0.00	74.3	7.43	0.00	—	260
Total	—	—	—	—	—	—	—	—	—	—	—	113	0.00	113	11.3	0.00	—	397
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Parking Lot	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00	0.00	0.00	0.00	—	0.00
City Park	—	—	—	—	—	—	—	—	—	—	—	0.04	0.00	0.04	< 0.005	0.00	—	0.16
Hotel	—	—	—	—	—	—	—	—	—	—	—	2.93	0.00	2.93	0.29	0.00	—	10.3
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	3.50	0.00	3.50	0.35	0.00	—	12.2

Congreg Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	12.3	0.00	12.3	1.23	0.00	—	43.0
Total	—	—	—	—	—	—	—	—	—	—	—	18.8	0.00	18.8	1.88	0.00	—	65.7

4.6. Refrigerant Emissions by Land Use

4.6.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Land Use	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	74.8	74.8
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.16	1.16
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.28	1.28
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	77.2	77.2
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	74.8	74.8

Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.16	1.16
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1.28	1.28
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	77.2	77.2
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
City Park	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.00	0.00
Hotel	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.4	12.4
Condo/Townhouse	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.19	0.19
Congregate Care (Assisted Living)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.21	0.21
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12.8	12.8

4.7. Offroad Emissions By Equipment Type

4.7.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.8. Stationary Emissions By Equipment Type

4.8.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e
Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

4.9. User Defined Emissions By Equipment Type

4.9.1. Unmitigated

Criteria Pollutants (lb/day for daily, ton/yr for annual) and GHGs (lb/day for daily, MT/yr for annual)

Equipment Type	TOG	ROG	NOx	CO	SO2	PM10E	PM10D	PM10T	PM2.5E	PM2.5D	PM2.5T	BCO2	NBCO2	CO2T	CH4	N2O	R	CO2e

Daily, Summer (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Daily, Winter (Max)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

5. Activity Data

5.1. Construction Schedule

Phase Name	Phase Type	Start Date	End Date	Days Per Week	Work Days per Phase	Phase Description
Demolition	Demolition	7/1/2025	7/30/2025	5.00	22.0	—
Grading	Grading	7/31/2025	12/31/2025	5.00	110	—
Building Construction	Building Construction	1/2/2026	12/30/2026	5.00	259	—
Paving	Paving	12/2/2026	12/30/2026	5.00	21.0	—
Architectural Coating	Architectural Coating	11/2/2026	12/30/2026	5.00	43.0	—

5.2. Off-Road Equipment

5.2.1. Unmitigated

Phase Name	Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor
Demolition	Rubber Tired Dozers	Diesel	Average	2.00	8.00	367	0.40
Demolition	Excavators	Diesel	Average	3.00	8.00	36.0	0.38
Demolition	Concrete/Industrial Saws	Diesel	Average	1.00	8.00	33.0	0.73
Grading	Graders	Diesel	Average	1.00	8.00	148	0.41

Grading	Excavators	Diesel	Average	2.00	8.00	36.0	0.38
Grading	Tractors/Loaders/Backhoes	Diesel	Average	2.00	8.00	84.0	0.37
Grading	Scrapers	Diesel	Average	2.00	8.00	423	0.48
Grading	Rubber Tired Dozers	Diesel	Average	1.00	8.00	367	0.40
Building Construction	Forklifts	Diesel	Average	3.00	8.00	82.0	0.20
Building Construction	Generator Sets	Diesel	Average	1.00	8.00	14.0	0.74
Building Construction	Cranes	Diesel	Average	1.00	7.00	367	0.29
Building Construction	Welders	Diesel	Average	1.00	8.00	46.0	0.45
Building Construction	Tractors/Loaders/Backhoes	Diesel	Average	3.00	7.00	84.0	0.37
Paving	Pavers	Diesel	Average	2.00	8.00	81.0	0.42
Paving	Paving Equipment	Diesel	Average	2.00	8.00	89.0	0.36
Paving	Rollers	Diesel	Average	2.00	8.00	36.0	0.38
Architectural Coating	Air Compressors	Diesel	Average	1.00	6.00	37.0	0.48

5.3. Construction Vehicles

5.3.1. Unmitigated

Phase Name	Trip Type	One-Way Trips per Day	Miles per Trip	Vehicle Mix
Demolition	—	—	—	—
Demolition	Worker	15.0	18.5	LDA,LDT1,LDT2
Demolition	Vendor	—	10.2	HHDT,MHDT
Demolition	Hauling	4.59	20.0	HHDT
Demolition	Onsite truck	—	—	HHDT
Grading	—	—	—	—
Grading	Worker	20.0	18.5	LDA,LDT1,LDT2
Grading	Vendor	—	10.2	HHDT,MHDT
Grading	Hauling	0.00	20.0	HHDT

Grading	Onsite truck	—	—	HHDT
Building Construction	—	—	—	—
Building Construction	Worker	181	18.5	LDA,LDT1,LDT2
Building Construction	Vendor	31.8	10.2	HHDT,MHDT
Building Construction	Hauling	0.00	20.0	HHDT
Building Construction	Onsite truck	—	—	HHDT
Paving	—	—	—	—
Paving	Worker	15.0	18.5	LDA,LDT1,LDT2
Paving	Vendor	—	10.2	HHDT,MHDT
Paving	Hauling	0.00	20.0	HHDT
Paving	Onsite truck	—	—	HHDT
Architectural Coating	—	—	—	—
Architectural Coating	Worker	36.3	18.5	LDA,LDT1,LDT2
Architectural Coating	Vendor	—	10.2	HHDT,MHDT
Architectural Coating	Hauling	0.00	20.0	HHDT
Architectural Coating	Onsite truck	—	—	HHDT

5.4. Vehicles

5.4.1. Construction Vehicle Control Strategies

Non-applicable. No control strategies activated by user.

5.5. Architectural Coatings

Phase Name	Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
Architectural Coating	453,600	151,200	130,680	43,560	1,934

5.6. Dust Mitigation

5.6.1. Construction Earthmoving Activities

Phase Name	Material Imported (cy)	Material Exported (cy)	Acres Graded (acres)	Material Demolished (Building Square Footage)	Acres Paved (acres)
Demolition	0.00	0.00	0.00	8,770	—
Grading	—	—	330	0.00	—
Paving	0.00	0.00	0.00	0.00	2.00

5.6.2. Construction Earthmoving Control Strategies

Control Strategies Applied	Frequency (per day)	PM10 Reduction	PM2.5 Reduction
Water Exposed Area	3	74%	74%
Water Demolished Area	2	36%	36%

5.7. Construction Paving

Land Use	Area Paved (acres)	% Asphalt
Parking Lot	2.00	100%
City Park	0.00	0%
Hotel	0.00	0%
Condo/Townhouse	—	0%
Congregate Care (Assisted Living)	—	0%

5.8. Construction Electricity Consumption and Emissions Factors

kWh per Year and Emission Factor (lb/MWh)

Year	kWh per Year	CO2	CH4	N2O
2025	0.00	532	0.03	< 0.005
2026	0.00	532	0.03	< 0.005

5.9. Operational Mobile Sources

5.9.1. Unmitigated

Land Use Type	Trips/Weekday	Trips/Saturday	Trips/Sunday	Trips/Year	VMT/Weekday	VMT/Saturday	VMT/Sunday	VMT/Year
Total all Land Uses	0.00	0.00	0.00	0.00	12,297	12,297	12,297	4,488,405

5.10. Operational Area Sources

5.10.1. Hearths

5.10.1.1. Unmitigated

Hearth Type	Unmitigated (number)
Condo/Townhouse	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	0
Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0
Congregate Care (Assisted Living)	—
Wood Fireplaces	0
Gas Fireplaces	0
Propane Fireplaces	0
Electric Fireplaces	0
No Fireplaces	0

Conventional Wood Stoves	0
Catalytic Wood Stoves	0
Non-Catalytic Wood Stoves	0
Pellet Wood Stoves	0

5.10.2. Architectural Coatings

Residential Interior Area Coated (sq ft)	Residential Exterior Area Coated (sq ft)	Non-Residential Interior Area Coated (sq ft)	Non-Residential Exterior Area Coated (sq ft)	Parking Area Coated (sq ft)
533172.375	177,724	71,742	23,914	5,227

5.10.3. Landscape Equipment

Season	Unit	Value
Snow Days	day/yr	0.00
Summer Days	day/yr	250

5.11. Operational Energy Consumption

5.11.1. Unmitigated

Electricity (kWh/yr) and CO2 and CH4 and N2O and Natural Gas (kBTU/yr)

Land Use	Electricity (kWh/yr)	CO2	CH4	N2O	Natural Gas (kBTU/yr)
Parking Lot	76,317	532	0.0330	0.0040	0.00
City Park	0.00	532	0.0330	0.0040	0.00
Hotel	669,291	532	0.0330	0.0040	1,380,876
Condo/Townhouse	335,228	532	0.0330	0.0040	1,754,216
Congregate Care (Assisted Living)	553,541	532	0.0330	0.0040	1,677,133

5.12. Operational Water and Wastewater Consumption

5.12.1. Unmitigated

Land Use	Indoor Water (gal/year)	Outdoor Water (gal/year)
Parking Lot	0.00	0.00
City Park	0.00	3,116,574
Hotel	1,522,006	70,123
Condo/Townhouse	2,720,987	171,412
Congregate Care (Assisted Living)	5,628,344	128,559

5.13. Operational Waste Generation

5.13.1. Unmitigated

Land Use	Waste (ton/year)	Cogeneration (kWh/year)
Parking Lot	0.00	—
City Park	0.50	—
Hotel	32.9	—
Condo/Townhouse	39.2	—
Congregate Care (Assisted Living)	138	—

5.14. Operational Refrigeration and Air Conditioning Equipment

5.14.1. Unmitigated

Land Use Type	Equipment Type	Refrigerant	GWP	Quantity (kg)	Operations Leak Rate	Service Leak Rate	Times Serviced
City Park	Other commercial A/C and heat pumps	R-410A	2,088	< 0.005	4.00	4.00	18.0
City Park	Stand-alone retail refrigerators and freezers	R-134a	1,430	0.04	1.00	0.00	1.00

Hotel	Household refrigerators and/or freezers	R-134a	1,430	0.00	0.60	0.00	1.00
Hotel	Other commercial A/C and heat pumps	R-410A	2,088	1.80	4.00	4.00	18.0
Hotel	Walk-in refrigerators and freezers	R-404A	3,922	< 0.005	7.50	7.50	20.0
Condo/Townhouse	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Condo/Townhouse	Household refrigerators and/or freezers	R-134a	1,430	0.12	0.60	0.00	1.00
Congregate Care (Assisted Living)	Average room A/C & Other residential A/C and heat pumps	R-410A	2,088	< 0.005	2.50	2.50	10.0
Congregate Care (Assisted Living)	Household refrigerators and/or freezers	R-134a	1,430	0.22	0.60	0.00	1.00

5.15. Operational Off-Road Equipment

5.15.1. Unmitigated

Equipment Type	Fuel Type	Engine Tier	Number per Day	Hours Per Day	Horsepower	Load Factor

5.16. Stationary Sources

5.16.1. Emergency Generators and Fire Pumps

Equipment Type	Fuel Type	Number per Day	Hours per Day	Hours per Year	Horsepower	Load Factor

5.16.2. Process Boilers

Equipment Type	Fuel Type	Number	Boiler Rating (MMBtu/hr)	Daily Heat Input (MMBtu/day)	Annual Heat Input (MMBtu/yr)

5.17. User Defined

Equipment Type	Fuel Type

8. User Changes to Default Data

Screen	Justification
Land Use	Project Site totals 28.13 acres; acreage breakdown by land use estimated by applicant. It is noted the acre total assumed here is slightly overestimated to ensure the parking-related paving emissions are accounted for. Hotel use includes 2,544 sf banquet space 3,315 sf of retail, and 2,360 sf restaurant space. City park use reflects Project's open space lot plus riding/hiking trail. Population estimates reflect the total population of 308 identified in Project's Traffic VMT analysis.
Construction: Construction Phases	construction schedule per applicant
Construction: Architectural Coatings	Low VOC per SCAQMD
Operations: Hearths	Assumes no wood/gas/propane fireplaces or wood stoves.

SRA 13 **Localized Significance Thresholds***
Construction At 25 Meters

CO	
x-value Area of Site (acerage)	**y-value LST (mass/day)**
1	590.00
2	877.00
5	1644.00
4.00	**1385.92**

NOx	
x-value Area of Site (acerage)	**y-value LST (mass/day)**
1	114.00
2	163.00
5	246.00
4.00	**216.69**

PM_{10}	
x-value Area of Site (acerage)	**y-value LST (mass/day)**
1	4
2	6
5	12
4.00	**10.00**

$PM_{2.5}$	
x-value Area of Site (acerage)	**y-value LST (mass/day)**
1	3
2	4
5	6
4.00	**5.31**

**based on SCAQMD localized signifcance thresholds (LST)*

Construction Health Risk Assessment

Golden Valley-Sierra Highway Mixed-Use Project

March 2022

Toxic Air Contaminants (TACs) Background

TACs refer to a diverse group of air pollutants that include both organic and inorganic chemical substances that may be emitted from a variety of common sources including gasoline stations, motor vehicles, dry cleaners, industrial operations, painting operations, and research and teaching facilities. TACs are typically found in low concentrations in ambient air, especially in urban areas. TACs are different than "criteria" pollutants in that ambient air quality standards have not been established for them, largely because there are hundreds of air toxics and their effects on health tend to be felt on a local scale rather than on a regional basis. TACs are regulated at the regional, state, and federal level, however, because chronic exposure can result in adverse health effects. TACs are known to cause or contribute to cancer or non-cancer health effects such as birth defects, genetic damage, and other adverse health effects. Effects from TACs may be both chronic (i.e., of long duration) and acute (i.e., severe but of short duration) on human health. Acute health effects are attributable to sudden exposure to high quantities of air toxics. These effects include nausea, skin irritation, respiratory illness, and, in some cases, death. Chronic health effects result from low-dose, long-term exposure from routine releases of air toxics. Diesel exhaust, or Diesel Particulate matter (DPM), is the predominant TAC in urban air and is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). According to the California Air Resources Board (CARB), diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, including benzene, formaldehyde, acrolein, butadiene, and acetaldehyde have been previously identified as TACs by the CARB, and are listed as carcinogens either under the state's Proposition 65 or under the federal Hazardous Air Pollutants programs.

Methodology

The greatest potential for TAC emissions during Project construction would be related to diesel particulate matter emissions associated with heavy-duty equipment. Construction activities associated with the Project would be short term in nature (i.e., 18 months). Although construction would be temporary, construction impacts associated with TACs have been estimated herein. In March 2015, the Office of Environmental Health Hazard Assessment (OEHHA) adopted revised guidelines that update previous guidance by incorporating advances in risk assessment with consideration of infants and children using Age Sensitivity Factors (ASF). The construction HRA was performed in accordance with the revised OEHHA Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments (OEHHA 2015). The analysis utilizes dispersion modeling using the United States Environmental Protection Agency (USEPA) AERMOD model with meteorological data from the closest South Coast Air Quality Management District (SCAQMD) monitoring station located at the Santa Clarita station.

See attachments herein for additional information related to the assumptions of the construction HRA.

Based on the Project's construction assumptions and California Emissions Estimator Model (CalEEMod) the worst-case daily DPM emissions were utilized to assess potential health risks to the nearest off-site sensitive receptors. Note, this assessment focuses on the project construction and the maximum impact to the nearest sensitive receptors.

The American Meteorological Society (AMS)/USEPA Regulatory Model (AERMOD) was utilized to quantify the concentrations of DPM at the nearest sensitive receptors, and a worst-case receptor location was analyzed. AERMOD is steady-state plume modeling system specially designed to support the USEPA's regulatory modeling programs. AERMOD allows the user to conduct site-specific modeling with the use of various inputs including source types, receptor locations, terrain data, meteorological conditions, and much more. Discrete receptors were placed at the sensitive receptor locations to represent ground-level receptors (worst-case). The terrain data for the Project area was applied from the USGS online database.

Based on OEHHA (2015) methodology for residential receptors, the cancer risk for a particular chemical of interest is based on the following:

RISK inh-res = DOSEair × CPF × ASF × ED/AT × FAH

Where:

RISK inh-res = Residential inhalation cancer risk

DOSEair = Daily inhalation dose (mg/kg-day)

CPF = Inhalation cancer potency factor ($mg/kg\text{-}day^{-1}$)

ASF = Age sensitivity factor for a specified age group

ED = Exposure duration (in years) for a specified age group

AT = Averaging time for lifetime cancer risk (years)

FAH = Fraction of time spent at home

The attached carcinogenic calculation sheets illustrate the assumptions and calculations utilized in this HRA.

Noncancer chronic inhalation impacts are calculated by dividing the annual average concentration by the Reference Exposure Level (REL or REF) for that substance. The REL is defined as the concentration at which no adverse noncancer health effects are anticipated.

For a single substance, this result is called the Hazard Quotient (HQ). The following equation is used to calculate the HQ:

$HQ = C_i/REL_i$

Where:

C_i = Concentration in the air of substance i

REL_i = Chronic noncancer Reference Exposure Level for substance i

For multiple substances, the Hazard Index (HI) is calculated. The HI is calculated by summing the HQs from all substances that affect the same organ system.

Carcinogenic and Chronic Noncarcinogenic Risk Results

The construction activities associated with the project would result in the generation of TACs, including diesel particulate matter. Potential health risks associated with construction of the Project were performed based on the OEHHA guidance and incorporation of the results from the AERMOD dispersion model. It should be noted that the calculated cancer risk is conservative as it is estimated for outdoor exposure over the entire construction period (i.e., 18 months), which assumes that sensitive receptors (residential uses) would not have any mitigation such as mechanical filtration and that residential uses would have continuously open windows and the receptor would be home and outside for all hours. This HRA also assumes that all construction equipment would operate at full-time use (i.e., load factor). The max day for $PM_{2.5}$ (diesel exhaust) emissions was assumed to occur each day for all 18 months of construction days; this is conservative to assume the peak day would occur all day and every day during construction. The most harmful DPM is classified as ultrafine particulates as a subset of $PM_{2.5}$ (the most harmful DPM is classified as 0.1 microns in diameter). This report assumes all $PM_{2.5}$ exhaust would be considered the most harmful class of ultrafine diesel particulate, thereby resulting in likely overstated effects of DPM exhaust. Under these worst-case assumptions, the maximum impact at the nearest sensitive receptor (i.e., residences to the north and to the east of the Project Site) would be 9.3 per 1 million, or less than the risk threshold of 10.0 in 1 million. Impacts at locations farther than this receptor would be further reduced, and thus impacts would be less than significant.

Potential noncarcinogenic effects of chronic (i.e., long term – DPM does not have an acute REL) DPM exposures were evaluated using the Hazard Index approach as described in the OEHHA Guidance. A hazard index equal to or greater than 1.0 represents a significant chronic health hazard. As shown in greater detail the following attachments, non-carcinogenic effects at the nearest sensitive receptor (i.e., residences located north and east of the Project Site) would be 0.02, which is less than the 1.0 health hazard threshold. Impacts at locations farther than this receptor would be further reduced, and thus non-cancer effects would be less than significant.

REFERENCES

AMS/USEPA Regulatory Model (AERMOD)

California Air Pollution Control Officers Association (CAPCOA)

Health Risk Assessments for Proposed Land Use Project, Guidance Document, July 2009

California Air Resources Board (CARB)

Air Quality and Land Use Handbook, April 2005

California Office of Environmental Health Hazard Assessment (OEHHA)
Air Toxics Hot Spots Program Guidance Manual for the Preparation of Risk, 2015
Hot Spots Unit Risk and Cancer Potency Values
(http://www.oehha.ca.gov/air/hot_spots/2009/AppendixA.pdf)
Chronic REL Summary (http://www.oehha.ca.gov/air/allrels.html)
Google Earth, 2022
South Coast Air Quality Management District (SCAQMD)
Air Quality Significance Thresholds
California Emissions Estimator Model (CalEEMod) and User Guide
CEQA Air Quality Handbook, 1993
Meteorological Data for AERMOD
Modeling Guidance for AERMOD
District Staff

ATTACHMENTS

1. Cancer and Health Calculations
2. Emissions Summary
3. AERMOD Output File

Carcinogenic Risks - 3rd Trimester to Birth

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk		
	(ug/m3)	(mg/m3)			URF[a] (ug/m3)	CPF[a] (mg/kg/day)	RISK (per million)
Construction	1.00E-01	1.00E-04	1.00E+00	DPM	3.00E-04	1.10E+00	6.24E-01
						Totals	6.24E-01

[a] http://www.oehha.ca.gov/air/hot_spots/2009/AppendixA.pdf (updated 2011)

Assumptions (per OEHHA Guidance Manual for Preparation of HRAs, Appendix I, February 2015)

Daily Breathing Rate	273 L/kg-day (80th percentile)
Inhalation Absorbtion	1
Exposure Frequency	250 construction days/yr
Age Sensitivity Factor	10
Fraction At Home	0.85
Exposure Duration	0.25 years (1st 3 months of construction)
Averaging Time	70 years (25,550 days)

Carcinogenic Risks - 0<2

Source	Concentration		Weight Fraction	Contaminant	Carcinogenic Risk		
	(ug/m3)	(mg/m3)			URF[a] (ug/m3)	CPF[a] (mg/kg/day)	RISK (per million)
Construction	1.00E-01	1.00E-04	1.00E+00	DPM	3.00E-04	1.10E+00	8.67E+00
						Totals	8.67E+00

[a] http://www.oehha.ca.gov/air/hot_spots/2009/AppendixA.pdf (updated 2011)

Assumptions (per OEHHA Guidance Manual for Preparation of HRAs, Appendix I, February 2015)

Daily Breathing Rate	758 L/kg-day (80th percentile)
Inhalation Absorbtion	1
Exposure Frequency	250 construction days/year
Age Sensitivity Factor	10
Fraction At Home	0.85
Exposure Duration	1.25 construction years (last 15 months of construction)
Averaging Time	70 years (25,550 days)

Chronic Noncarcinogenic Hazards

Source	Concentration		Weight Fraction	Contaminant	Chronic Noncarcinogenic Hazards/Toxicological Endpoints								
	(ug/m3)	(mg/m3)			REL[a] (ug/m3)	RESP	CNS/PNS	CV/BL	IMMUN	KIDN	GI/LV	REPRO	EYES
Construction	1.00E-01	1.00E-04	1.00E+00	DPM	5.00E+00	2.00E-02							
					Totals	2.00E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[a] http://www.oehha.ca.gov/air/allrels.html

Toxicological Endpoints

RESP	Respiratory System
CNS/PNS	Central/Peripheral Nervous System
CV/BL	Cardiovascular/Blood System
IMMUN	Immune System
KIDN	Kidney
GI/LV	Gastrointestinal System/Liver
REPRO	Reproductive System
EYES	Eye irritation

Emission Rate Summary

Maximum Daily DPM (see max exhaust from attached CalEEMod Sheets)

Construction Phase	Demo (1 mo 18)	Grading (5 mos of 18)	Bldg (12 mos of 18)
Total (pounds/day)	1.15	1.5	0.66

Composite (pounds/day) **0.92**

Maximum DPM Emission Rate

Construction Phase	Avg
Total (grams/sec)	0.004800

It is noted that CalEEMod data was updated in July 2024 to reflect a more realistic buildout timeline for the Project (adjusted construction from 2024 and 2025 to construction in 2025 and 2026, assuming full operations by 2026). As the CalEEMod data indicates, DPM exhaust emissions are reduced compared to those used in this construction HRA. As such, construction related health risk impacts would be lower than those shown herein.

```
**
****************************************
**
** AERMOD Input Produced by:
** AERMOD View Ver. 10.2.1
** Lakes Environmental Software Inc.
** Date: 3/16/2022
** File: C:\Lakes\AERMOD View\Golden Valley\Golden Valley.ADI
**
****************************************
**
**
****************************************
** AERMOD Control Pathway
****************************************
**
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CO STARTING
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   MODELOPT DFAULT CONC
   AVERTIME ANNUAL
   URBANOPT 9818605
   POLLUTID DPM
   RUNORNOT RUN
   ERRORFIL "Golden Valley.err"
CO FINISHED
**
****************************************
** AERMOD Source Pathway
****************************************
**
**
SO STARTING
** Source Location **
** Source ID - Type - X Coord. - Y Coord. **
** ---------------------------------------------------------------
-------
** Line Source Represented by Adjacent Volume Sources
** LINE VOLUME Source ID = SLINE1
** DESCRSRC
** PREFIX
** Length of Side = 2.00
** Configuration = Adjacent
** Emission Rate = 0.0048
** Vertical Dimension = 2.00
** SZINIT = 0.93
** Nodes = 6
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** 363352.747, 3807494.556, 498.87, 0.00, 0.93
** 363204.826, 3807492.349, 491.50, 0.00, 0.93
** 363363.786, 3807130.273, 527.93, 0.00, 0.93
** 363445.473, 3807090.533, 516.65, 0.00, 0.93
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** 363383.656, 3807445.985, 499.60, 0.00, 0.93
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   LOCATION L0000002     VOLUME   363348.409 3807661.556 480.37
   LOCATION L0000003     VOLUME   363348.461 3807659.557 480.32
   LOCATION L0000004     VOLUME   363348.513 3807657.558 480.27
   LOCATION L0000005     VOLUME   363348.565 3807655.558 480.22
   LOCATION L0000006     VOLUME   363348.617 3807653.559 480.17
   LOCATION L0000007     VOLUME   363348.669 3807651.560 480.12
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   LOCATION L0000009     VOLUME   363348.773 3807647.561 480.02
   LOCATION L0000010     VOLUME   363348.824 3807645.562 480.04
   LOCATION L0000011     VOLUME   363348.876 3807643.562 480.13
   LOCATION L0000012     VOLUME   363348.928 3807641.563 480.21
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   LOCATION L0000014     VOLUME   363349.032 3807637.564 480.39
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   LOCATION L0000016     VOLUME   363349.136 3807633.566 480.57
   LOCATION L0000017     VOLUME   363349.188 3807631.566 480.66
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   LOCATION L0000019     VOLUME   363349.292 3807627.568 480.84
   LOCATION L0000020     VOLUME   363349.344 3807625.568 480.93
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   LOCATION L0000022     VOLUME   363349.448 3807621.570 481.12
   LOCATION L0000023     VOLUME   363349.500 3807619.570 481.22
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   LOCATION L0000025     VOLUME   363349.603 3807615.572 481.54
   LOCATION L0000026     VOLUME   363349.655 3807613.572 481.87
   LOCATION L0000027     VOLUME   363349.707 3807611.573 482.21
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   LOCATION L0000037     VOLUME   363350.227 3807591.580 485.56
   LOCATION L0000038     VOLUME   363350.278 3807589.580 485.89
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   LOCATION L0000042     VOLUME   363350.486 3807581.583 486.93
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   LOCATION L0000045     VOLUME   363350.642 3807575.585 487.57
   LOCATION L0000046     VOLUME   363350.694 3807573.586 487.79
   LOCATION L0000047     VOLUME   363350.746 3807571.587 488.00
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   LOCATION L0000049     VOLUME   363350.850 3807567.588 488.44
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   URBANSRC ALL
   SRCGROUP ALL
SO FINISHED
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** AERMOD Receptor Pathway
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**
**
RE STARTING
   INCLUDED "Golden Valley.rou"
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RE FINISHED
**
**************************************
** AERMOD Meteorology Pathway
**************************************
**
**
ME STARTING
   SURFFILE sclr8.sfc
   PROFFILE sclr8.PFL
   SURFDATA 0 2008
   UAIRDATA 3190 2008
   SITEDATA 99999 2008
   PROFBASE 1100.0 FEET
ME FINISHED
**
**************************************
** AERMOD Output Pathway
**************************************
**
**
OU STARTING
** Auto-Generated Plotfiles
   PLOTFILE ANNUAL ALL "Golden Valley.AD\AN00GALL.PLT" 31
   SUMMFILE "Golden Valley.sum"
OU FINISHED

 **********************************
 *** SETUP Finishes Successfully ***
 **********************************
```

```
 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\AERMOD View
\Golden Valley\Golden Valley.isc                 ***
03/16/22
 *** AERMET - VERSION  14134 ***   ***
***        16:20:06

PAGE   1
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                          ***     MODEL SETUP
OPTIONS SUMMARY       ***
 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

 **Model Is Setup For Calculation of Average CONCentration
Values.

   --  DEPOSITION LOGIC  --
 **NO GAS DEPOSITION Data Provided.
 **NO PARTICLE DEPOSITION Data Provided.
 **Model Uses NO DRY DEPLETION.  DRYDPLT  =  F
 **Model Uses NO WET DEPLETION.  WETDPLT  =  F

 **Model Uses URBAN Dispersion Algorithm for the SBL for   583
Source(s),
   for Total of    1 Urban Area(s):
   Urban Population =   9818605.0 ;  Urban Roughness Length =
1.000 m

 **Model Uses Regulatory DEFAULT Options:
        1. Stack-tip Downwash.
        2. Model Accounts for ELEVated Terrain Effects.
        3. Use Calms Processing Routine.
        4. Use Missing Data Processing Routine.
        5. No Exponential Decay.
        6. Urban Roughness Length of 1.0 Meter Assumed.

 **Other Options Specified:
        TEMP_Sub - Meteorological data includes TEMP
substitutions

 **Model Assumes No FLAGPOLE Receptor Heights.

 **The User Specified a Pollutant Type of:  DPM

 **Model Calculates ANNUAL Averages Only

 **This Run Includes:    583 Source(s);       1 Source Group(s);
and       5 Receptor(s)

               with:      0 POINT(s), including
                          0 POINTCAP(s) and      0 POINTHOR(s)
```



```
                          and:    583 VOLUME source(s)
                          and:      0 AREA type source(s)
                          and:      0 LINE source(s)
                          and:      0 RLINE/RLINEXT source(s)
                          and:      0 OPENPIT source(s)
                          and:      0 BUOYANT LINE source(s) with a total
of     0 line(s)


 **Model Set To Continue RUNning After the Setup Testing.

 **The AERMET Input Meteorological Data Version Date:  14134

 **Output Options Selected:
         Model Outputs Tables of ANNUAL Averages by Receptor
         Model Outputs External File(s) of High Values for
Plotting (PLOTFILE Keyword)
         Model Outputs Separate Summary File of High Ranked
Values (SUMMFILE Keyword)

 **NOTE:  The Following Flags May Appear Following CONC Values:
c for Calm Hours

m for Missing Hours

b for Both Calm and Missing Hours

 **Misc. Inputs:  Base Elev. for Pot. Temp. Profile (m MSL) =
335.28 ;  Decay Coef. =    0.000     ;  Rot. Angle =     0.0
                  Emission Units =
GRAMS/SEC                           ;  Emission Rate Unit
Factor =   0.10000E+07
                  Output Units   = MICROGRAMS/M**3

 **Approximate Storage Requirements of Model =      3.7 MB of
RAM.

 **Input Runstream File:          aermod.inp
 **Output Print File:             aermod.out

 **Detailed Error/Message File:   Golden Valley.err
 **File for Summary of Results:   Golden Valley.sum
```



```
 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\AERMOD View
\Golden Valley\Golden Valley.isc                 ***
03/16/22
 *** AERMET - VERSION  14134 ***   ***
***        16:20:06

PAGE   2
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN


                                                *** VOLUME
SOURCE DATA ***

               NUMBER EMISSION RATE                    BASE
RELEASE    INIT.    INIT.   URBAN  EMISSION RATE
   SOURCE       PART.  (GRAMS/SEC)     X        Y      ELEV.
HEIGHT      SY       SZ     SOURCE  SCALAR VARY
     ID          CATS.                (METERS) (METERS) (METERS)
(METERS) (METERS) (METERS)            BY
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- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

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0.00     0.93     0.93     YES
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 L0000008         0   0.82330E-05  363348.7 3807649.6   480.1
0.00     0.93     0.93     YES
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0.00     0.93     0.93     YES
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0.00     0.93     0.93     YES
 L0000011         0   0.82330E-05  363348.9 3807643.6   480.1
0.00     0.93     0.93     YES
 L0000012         0   0.82330E-05  363348.9 3807641.6   480.2
0.00     0.93     0.93     YES
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0.00     0.93     0.93     YES
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0.00     0.93     0.93     YES
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0.00     0.93     0.93     YES
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 L0000017         0   0.82330E-05  363349.2 3807631.6   480.7
0.00     0.93     0.93     YES
 L0000018         0   0.82330E-05  363349.2 3807629.6   480.8
0.00     0.93     0.93     YES
 L0000019         0   0.82330E-05  363349.3 3807627.6   480.8
0.00     0.93     0.93     YES
 L0000020         0   0.82330E-05  363349.3 3807625.6   480.9
0.00     0.93     0.93     YES
 L0000021         0   0.82330E-05  363349.4 3807623.6   481.0
0.00     0.93     0.93     YES
 L0000022         0   0.82330E-05  363349.4 3807621.6   481.1
0.00     0.93     0.93     YES
 L0000023         0   0.82330E-05  363349.5 3807619.6   481.2
0.00     0.93     0.93     YES
 L0000024         0   0.82330E-05  363349.6 3807617.6   481.3
0.00     0.93     0.93     YES
 L0000025         0   0.82330E-05  363349.6 3807615.6   481.5
0.00     0.93     0.93     YES
 L0000026         0   0.82330E-05  363349.7 3807613.6   481.9
0.00     0.93     0.93     YES
 L0000027         0   0.82330E-05  363349.7 3807611.6   482.2
0.00     0.93     0.93     YES
 L0000028         0   0.82330E-05  363349.8 3807609.6   482.5
0.00     0.93     0.93     YES
 L0000029         0   0.82330E-05  363349.8 3807607.6   482.9
0.00     0.93     0.93     YES
 L0000030         0   0.82330E-05  363349.9 3807605.6   483.2
0.00     0.93     0.93     YES
 L0000031         0   0.82330E-05  363349.9 3807603.6   483.6
0.00     0.93     0.93     YES
 L0000032         0   0.82330E-05  363350.0 3807601.6   483.9
0.00     0.93     0.93     YES
 L0000033         0   0.82330E-05  363350.0 3807599.6   484.2
0.00     0.93     0.93     YES
 L0000034         0   0.82330E-05  363350.1 3807597.6   484.6
0.00     0.93     0.93     YES
 L0000035         0   0.82330E-05  363350.1 3807595.6   484.9
0.00     0.93     0.93     YES
 L0000036         0   0.82330E-05  363350.2 3807593.6   485.2
0.00     0.93     0.93     YES
 L0000037         0   0.82330E-05  363350.2 3807591.6   485.6
0.00     0.93     0.93     YES
 L0000038         0   0.82330E-05  363350.3 3807589.6   485.9
0.00     0.93     0.93     YES
 L0000039         0   0.82330E-05  363350.3 3807587.6   486.2
0.00     0.93     0.93     YES
 L0000040         0   0.82330E-05  363350.4 3807585.6   486.5
0.00     0.93     0.93     YES
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*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC)	SOURCE SZ (METERS)	SOURCE SY (METERS)	INIT. SCALAR VARY BY	URBAN (METERS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)
	L0000041		0	0.82330E-05	0.00	0.93	0.93 YES	363350.4	3807583.6	486.7
	L0000042		0	0.82330E-05	0.00	0.93	0.93 YES	363350.5	3807581.6	486.9
	L0000043		0	0.82330E-05	0.00	0.93	0.93 YES	363350.5	3807579.6	487.1
	L0000044		0	0.82330E-05	0.00	0.93	0.93 YES	363350.6	3807577.6	487.4
	L0000045		0	0.82330E-05	0.00	0.93	0.93 YES	363350.6	3807575.6	487.6
	L0000046		0	0.82330E-05	0.00	0.93	0.93 YES	363350.7	3807573.6	487.8
	L0000047		0	0.82330E-05	0.00	0.93	0.93 YES	363350.7	3807571.6	488.0
	L0000048		0	0.82330E-05	0.00	0.93	0.93 YES	363350.8	3807569.6	488.2
	L0000049		0	0.82330E-05	0.00	0.93	0.93 YES	363350.8	3807567.6	488.4
	L0000050		0	0.82330E-05	0.00	0.93	0.93 YES	363350.9	3807565.6	488.7
	L0000051		0	0.82330E-05	0.00	0.93	0.93 YES	363351.0	3807563.6	488.9
	L0000052		0	0.82330E-05	0.00	0.93	0.93 YES	363351.0	3807561.6	489.1
	L0000053		0	0.82330E-05	0.00	0.93	0.93 YES	363351.1	3807559.6	489.3
	L0000054		0	0.82330E-05	0.00	0.93	0.93 YES	363351.1	3807557.6	489.5
	L0000055		0	0.82330E-05	0.00	0.93	0.93 YES	363351.2	3807555.6	489.8

	L0000056		0	0.82330E-05	0.00	0.93	0.93 YES	363351.2	3807553.6	490.2
	L0000057		0	0.82330E-05	0.00	0.93	0.93 YES	363351.3	3807551.6	490.5
	L0000058		0	0.82330E-05	0.00	0.93	0.93 YES	363351.3	3807549.6	490.9
	L0000059		0	0.82330E-05	0.00	0.93	0.93 YES	363351.4	3807547.6	491.2
	L0000060		0	0.82330E-05	0.00	0.93	0.93 YES	363351.4	3807545.6	491.5
	L0000061		0	0.82330E-05	0.00	0.93	0.93 YES	363351.5	3807543.6	491.9
	L0000062		0	0.82330E-05	0.00	0.93	0.93 YES	363351.5	3807541.6	492.2
	L0000063		0	0.82330E-05	0.00	0.93	0.93 YES	363351.6	3807539.6	492.6
	L0000064		0	0.82330E-05	0.00	0.93	0.93 YES	363351.6	3807537.6	492.9
	L0000065		0	0.82330E-05	0.00	0.93	0.93 YES	363351.7	3807535.6	493.2
	L0000066		0	0.82330E-05	0.00	0.93	0.93 YES	363351.7	3807533.6	493.6
	L0000067		0	0.82330E-05	0.00	0.93	0.93 YES	363351.8	3807531.6	493.9
	L0000068		0	0.82330E-05	0.00	0.93	0.93 YES	363351.8	3807529.6	494.2
	L0000069		0	0.82330E-05	0.00	0.93	0.93 YES	363351.9	3807527.6	494.6
	L0000070		0	0.82330E-05	0.00	0.93	0.93 YES	363351.9	3807525.6	494.9
	L0000071		0	0.82330E-05	0.00	0.93	0.93 YES	363352.0	3807523.6	495.2
	L0000072		0	0.82330E-05	0.00	0.93	0.93 YES	363352.0	3807521.6	495.5
	L0000073		0	0.82330E-05	0.00	0.93	0.93 YES	363352.1	3807519.6	495.9
	L0000074		0	0.82330E-05	0.00	0.93	0.93 YES	363352.1	3807517.6	496.2
	L0000075		0	0.82330E-05	0.00	0.93	0.93 YES	363352.2	3807515.6	496.5
	L0000076		0	0.82330E-05	0.00	0.93	0.93 YES	363352.3	3807513.6	496.8
	L0000077		0	0.82330E-05	0.00	0.93	0.93 YES	363352.3	3807511.6	497.1
	L0000078		0	0.82330E-05	0.00	0.93	0.93 YES	363352.4	3807509.6	497.4
	L0000079		0	0.82330E-05	0.00	0.93	0.93 YES	363352.4	3807507.6	497.7
	L0000080		0	0.82330E-05	0.00	0.93	0.93 YES	363352.5	3807505.6	498.0

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC)	SOURCE SZ (METERS)	SOURCE SY (METERS)	INIT. SCALAR VARY BY	URBAN (METERS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)
	L0000081		0	0.82330E-05	0.00	0.93	0.93 YES	363352.5	3807503.6	498.3
	L0000082		0	0.82330E-05	0.00	0.93	0.93 YES	363352.6	3807501.6	498.6
	L0000083		0	0.82330E-05	0.00	0.93	0.93 YES	363352.6	3807499.6	498.9
	L0000084		0	0.82330E-05	0.00	0.93	0.93 YES	363352.7	3807497.6	499.2
	L0000085		0	0.82330E-05	0.00	0.93	0.93 YES	363352.7	3807495.6	499.4
	L0000086		0	0.82330E-05	0.00	0.93	0.93 YES	363351.8	3807494.5	499.3
	L0000087		0	0.82330E-05	0.00	0.93	0.93 YES	363349.8	3807494.5	499.2
	L0000088		0	0.82330E-05	0.00	0.93	0.93 YES	363347.8	3807494.5	498.9
	L0000089		0	0.82330E-05	0.00	0.93	0.93 YES	363345.8	3807494.5	498.8
	L0000090		0	0.82330E-05	0.00	0.93	0.93 YES	363343.8	3807494.4	498.6
	L0000091		0	0.82330E-05	0.00	0.93	0.93 YES	363341.8	3807494.4	498.4
	L0000092		0	0.82330E-05	0.00	0.93	0.93 YES	363339.8	3807494.4	498.2
	L0000093		0	0.82330E-05	0.00	0.93	0.93 YES	363337.8	3807494.3	497.9
	L0000094		0	0.82330E-05	0.00	0.93	0.93 YES	363335.8	3807494.3	497.4
	L0000095		0	0.82330E-05	0.00	0.93	0.93 YES	363333.8	3807494.3	496.9

	L0000096		0	0.82330E-05	0.00	0.93	0.93 YES	363331.8	3807494.2	496.5
	L0000097		0	0.82330E-05	0.00	0.93	0.93 YES	363329.8	3807494.2	496.0
	L0000098		0	0.82330E-05	0.00	0.93	0.93 YES	363327.8	3807494.2	495.6
	L0000099		0	0.82330E-05	0.00	0.93	0.93 YES	363325.8	3807494.2	495.1
	L0000100		0	0.82330E-05	0.00	0.93	0.93 YES	363323.8	3807494.1	494.7
	L0000101		0	0.82330E-05	0.00	0.93	0.93 YES	363321.8	3807494.1	494.2
	L0000102		0	0.82330E-05	0.00	0.93	0.93 YES	363319.8	3807494.1	493.8
	L0000103		0	0.82330E-05	0.00	0.93	0.93 YES	363317.8	3807494.0	493.3
	L0000104		0	0.82330E-05	0.00	0.93	0.93 YES	363315.8	3807494.0	492.9
	L0000105		0	0.82330E-05	0.00	0.93	0.93 YES	363313.8	3807494.0	492.4
	L0000106		0	0.82330E-05	0.00	0.93	0.93 YES	363311.8	3807493.9	492.0
	L0000107		0	0.82330E-05	0.00	0.93	0.93 YES	363309.8	3807493.9	491.5
	L0000108		0	0.82330E-05	0.00	0.93	0.93 YES	363307.8	3807493.9	491.3
	L0000109		0	0.82330E-05	0.00	0.93	0.93 YES	363305.8	3807493.9	491.3
	L0000110		0	0.82330E-05	0.00	0.93	0.93 YES	363303.8	3807493.8	491.3
	L0000111		0	0.82330E-05	0.00	0.93	0.93 YES	363301.8	3807493.8	491.3
	L0000112		0	0.82330E-05	0.00	0.93	0.93 YES	363299.8	3807493.8	491.3
	L0000113		0	0.82330E-05	0.00	0.93	0.93 YES	363297.8	3807493.7	491.3
	L0000114		0	0.82330E-05	0.00	0.93	0.93 YES	363295.8	3807493.7	491.3
	L0000115		0	0.82330E-05	0.00	0.93	0.93 YES	363293.8	3807493.7	491.3
	L0000116		0	0.82330E-05	0.00	0.93	0.93 YES	363291.8	3807493.6	491.3
	L0000117		0	0.82330E-05	0.00	0.93	0.93 YES	363289.8	3807493.6	491.3
	L0000118		0	0.82330E-05	0.00	0.93	0.93 YES	363287.8	3807493.6	491.3
	L0000119		0	0.82330E-05	0.00	0.93	0.93 YES	363285.8	3807493.6	491.3
	L0000120		0	0.82330E-05	0.00	0.93	0.93 YES	363283.8	3807493.5	491.3

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. SY	INIT. SZ	NUMBER EMISSION RATE PART. CATS.	URBAN SOURCE	EMISSION RATE SCALAR VARY BY	X (METERS)	Y (METERS)	BASE ELEV. (METERS)		
L0000121	0.00	0.93	0.93	YES	0	0.82330E-05	363281.8	3807493.5	491.3		
L0000122	0.00	0.93	0.93	YES	0	0.82330E-05	363279.8	3807493.5	491.3		
L0000123	0.00	0.93	0.93	YES	0	0.82330E-05	363277.8	3807493.4	491.3		
L0000124	0.00	0.93	0.93	YES	0	0.82330E-05	363275.8	3807493.4	491.3		
L0000125	0.00	0.93	0.93	YES	0	0.82330E-05	363273.8	3807493.4	491.4		
L0000126	0.00	0.93	0.93	YES	0	0.82330E-05	363271.8	3807493.3	491.4		
L0000127	0.00	0.93	0.93	YES	0	0.82330E-05	363269.8	3807493.3	491.4		
L0000128	0.00	0.93	0.93	YES	0	0.82330E-05	363267.8	3807493.3	491.4		
L0000129	0.00	0.93	0.93	YES	0	0.82330E-05	363265.8	3807493.3	491.4		
L0000130	0.00	0.93	0.93	YES	0	0.82330E-05	363263.8	3807493.2	491.4		
L0000131	0.00	0.93	0.93	YES	0	0.82330E-05	363261.8	3807493.2	491.5		
L0000132	0.00	0.93	0.93	YES	0	0.82330E-05	363259.8	3807493.2	491.5		
L0000133	0.00	0.93	0.93	YES	0	0.82330E-05	363257.8	3807493.1	491.5		
L0000134	0.00	0.93	0.93	YES	0	0.82330E-05	363255.8	3807493.1	491.5		
L0000135	0.00	0.93	0.93	YES	0	0.82330E-05	363253.8	3807493.1	491.6		

L0000136	0.00	0.93	0.93	YES	0	0.82330E-05	363251.8	3807493.0	491.6		
L0000137	0.00	0.93	0.93	YES	0	0.82330E-05	363249.8	3807493.0	491.6		
L0000138	0.00	0.93	0.93	YES	0	0.82330E-05	363247.8	3807493.0	491.6		
L0000139	0.00	0.93	0.93	YES	0	0.82330E-05	363245.8	3807493.0	491.7		
L0000140	0.00	0.93	0.93	YES	0	0.82330E-05	363243.8	3807492.9	491.7		
L0000141	0.00	0.93	0.93	YES	0	0.82330E-05	363241.8	3807492.9	491.7		
L0000142	0.00	0.93	0.93	YES	0	0.82330E-05	363239.8	3807492.9	491.7		
L0000143	0.00	0.93	0.93	YES	0	0.82330E-05	363237.8	3807492.8	491.8		
L0000144	0.00	0.93	0.93	YES	0	0.82330E-05	363235.8	3807492.8	491.8		
L0000145	0.00	0.93	0.93	YES	0	0.82330E-05	363233.8	3807492.8	491.8		
L0000146	0.00	0.93	0.93	YES	0	0.82330E-05	363231.8	3807492.8	491.9		
L0000147	0.00	0.93	0.93	YES	0	0.82330E-05	363229.8	3807492.7	491.9		
L0000148	0.00	0.93	0.93	YES	0	0.82330E-05	363227.8	3807492.7	491.9		
L0000149	0.00	0.93	0.93	YES	0	0.82330E-05	363225.8	3807492.7	492.0		
L0000150	0.00	0.93	0.93	YES	0	0.82330E-05	363223.8	3807492.6	492.0		
L0000151	0.00	0.93	0.93	YES	0	0.82330E-05	363221.8	3807492.6	492.0		
L0000152	0.00	0.93	0.93	YES	0	0.82330E-05	363219.8	3807492.6	492.1		
L0000153	0.00	0.93	0.93	YES	0	0.82330E-05	363217.8	3807492.5	492.1		
L0000154	0.00	0.93	0.93	YES	0	0.82330E-05	363215.8	3807492.5	492.0		
L0000155	0.00	0.93	0.93	YES	0	0.82330E-05	363213.8	3807492.5	491.9		
L0000156	0.00	0.93	0.93	YES	0	0.82330E-05	363211.8	3807492.5	491.9		
L0000157	0.00	0.93	0.93	YES	0	0.82330E-05	363209.8	3807492.4	491.8		
L0000158	0.00	0.93	0.93	YES	0	0.82330E-05	363207.8	3807492.4	491.8		
L0000159	0.00	0.93	0.93	YES	0	0.82330E-05	363205.8	3807492.4	491.7		
L0000160	0.00	0.93	0.93	YES	0	0.82330E-05	363205.2	3807491.4	491.9		

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. SY	INIT. SZ	NUMBER EMISSION RATE PART. CATS.	URBAN SOURCE	EMISSION RATE SCALAR VARY BY	X (METERS)	Y (METERS)	BASE ELEV. (METERS)		
L0000161	0.00	0.93	0.93	YES	0	0.82330E-05	363206.0	3807489.6	492.4		
L0000162	0.00	0.93	0.93	YES	0	0.82330E-05	363206.8	3807487.8	493.0		
L0000163	0.00	0.93	0.93	YES	0	0.82330E-05	363207.6	3807485.9	493.5		
L0000164	0.00	0.93	0.93	YES	0	0.82330E-05	363208.4	3807484.1	494.0		
L0000165	0.00	0.93	0.93	YES	0	0.82330E-05	363209.2	3807482.3	494.5		
L0000166	0.00	0.93	0.93	YES	0	0.82330E-05	363210.1	3807480.4	495.0		
L0000167	0.00	0.93	0.93	YES	0	0.82330E-05	363210.9	3807478.6	495.6		
L0000168	0.00	0.93	0.93	YES	0	0.82330E-05	363211.7	3807476.8	496.1		
L0000169	0.00	0.93	0.93	YES	0	0.82330E-05	363212.5	3807474.9	496.6		
L0000170	0.00	0.93	0.93	YES	0	0.82330E-05	363213.3	3807473.1	497.1		
L0000171	0.00	0.93	0.93	YES	0	0.82330E-05	363214.1	3807471.3	497.6		
L0000172	0.00	0.93	0.93	YES	0	0.82330E-05	363214.9	3807469.5	498.1		
L0000173	0.00	0.93	0.93	YES	0	0.82330E-05	363215.7	3807467.6	498.6		
L0000174	0.00	0.93	0.93	YES	0	0.82330E-05	363216.5	3807465.8	499.1		
L0000175	0.00	0.93	0.93	YES	0	0.82330E-05	363217.3	3807464.0	499.5		

L0000176	0.00	0.93	0.93	YES	0	0.82330E-05	363218.1	3807462.1	499.9		
L0000177	0.00	0.93	0.93	YES	0	0.82330E-05	363218.9	3807460.3	500.2		
L0000178	0.00	0.93	0.93	YES	0	0.82330E-05	363219.7	3807458.5	500.5		
L0000179	0.00	0.93	0.93	YES	0	0.82330E-05	363220.5	3807456.6	500.8		
L0000180	0.00	0.93	0.93	YES	0	0.82330E-05	363221.3	3807454.8	501.1		
L0000181	0.00	0.93	0.93	YES	0	0.82330E-05	363222.1	3807453.0	501.3		
L0000182	0.00	0.93	0.93	YES	0	0.82330E-05	363222.9	3807451.1	501.5		
L0000183	0.00	0.93	0.93	YES	0	0.82330E-05	363223.7	3807449.3	501.8		
L0000184	0.00	0.93	0.93	YES	0	0.82330E-05	363224.5	3807447.5	502.0		
L0000185	0.00	0.93	0.93	YES	0	0.82330E-05	363225.3	3807445.6	502.2		
L0000186	0.00	0.93	0.93	YES	0	0.82330E-05	363226.1	3807443.8	502.5		
L0000187	0.00	0.93	0.93	YES	0	0.82330E-05	363226.9	3807442.0	502.7		
L0000188	0.00	0.93	0.93	YES	0	0.82330E-05	363227.7	3807440.2	502.9		
L0000189	0.00	0.93	0.93	YES	0	0.82330E-05	363228.5	3807438.3	503.1		
L0000190	0.00	0.93	0.93	YES	0	0.82330E-05	363229.3	3807436.5	503.3		
L0000191	0.00	0.93	0.93	YES	0	0.82330E-05	363230.2	3807434.7	503.4		
L0000192	0.00	0.93	0.93	YES	0	0.82330E-05	363231.0	3807432.8	503.5		
L0000193	0.00	0.93	0.93	YES	0	0.82330E-05	363231.8	3807431.0	503.6		
L0000194	0.00	0.93	0.93	YES	0	0.82330E-05	363232.6	3807429.2	503.7		
L0000195	0.00	0.93	0.93	YES	0	0.82330E-05	363233.4	3807427.3	503.8		
L0000196	0.00	0.93	0.93	YES	0	0.82330E-05	363234.2	3807425.5	503.9		
L0000197	0.00	0.93	0.93	YES	0	0.82330E-05	363235.0	3807423.7	504.0		
L0000198	0.00	0.93	0.93	YES	0	0.82330E-05	363235.8	3807421.8	504.0		
L0000199	0.00	0.93	0.93	YES	0	0.82330E-05	363236.6	3807420.0	504.0		
L0000200	0.00	0.93	0.93	YES	0	0.82330E-05	363237.4	3807418.2	504.1		

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC) SZ (METERS)	SOURCE (METERS)	INIT. SCALAR VARY BY	URBAN (METERS)	EMISSION RATE X (METERS)	Y (METERS)	BASE ELEV. (METERS)	SY
L0000201		0	0.82330E-05	363238.2	3807416.3				504.1	0.00
0.93	0.93	YES								
L0000202		0	0.82330E-05	363239.0	3807414.5				504.1	0.00
0.93	0.93	YES								
L0000203		0	0.82330E-05	363239.8	3807412.7				504.1	0.00
0.93	0.93	YES								
L0000204		0	0.82330E-05	363240.6	3807410.8				504.0	0.00
0.93	0.93	YES								
L0000205		0	0.82330E-05	363241.4	3807409.0				504.0	0.00
0.93	0.93	YES								
L0000206		0	0.82330E-05	363242.2	3807407.2				503.9	0.00
0.93	0.93	YES								
L0000207		0	0.82330E-05	363243.0	3807405.4				503.7	0.00
0.93	0.93	YES								
L0000208		0	0.82330E-05	363243.8	3807403.5				503.4	0.00
0.93	0.93	YES								
L0000209		0	0.82330E-05	363244.6	3807401.7				503.2	0.00
0.93	0.93	YES								
L0000210		0	0.82330E-05	363245.4	3807399.9				502.9	0.00
0.93	0.93	YES								
L0000211		0	0.82330E-05	363246.2	3807398.0				502.6	0.00
0.93	0.93	YES								
L0000212		0	0.82330E-05	363247.0	3807396.2				502.2	0.00
0.93	0.93	YES								
L0000213		0	0.82330E-05	363247.8	3807394.4				501.9	0.00
0.93	0.93	YES								
L0000214		0	0.82330E-05	363248.6	3807392.5				501.6	0.00
0.93	0.93	YES								
L0000215		0	0.82330E-05	363249.4	3807390.7				501.4	0.00
0.93	0.93	YES								

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC) SZ (METERS)	SOURCE (METERS)	INIT. SCALAR VARY BY	URBAN (METERS)	EMISSION RATE X (METERS)	Y (METERS)	BASE ELEV. (METERS)	SY
L0000216		0	0.82330E-05	363250.3	3807388.9				501.3	0.00
0.93	0.93	YES								
L0000217		0	0.82330E-05	363251.1	3807387.0				501.2	0.00
0.93	0.93	YES								
L0000218		0	0.82330E-05	363251.9	3807385.2				501.1	0.00
0.93	0.93	YES								
L0000219		0	0.82330E-05	363252.7	3807383.4				501.0	0.00
0.93	0.93	YES								
L0000220		0	0.82330E-05	363253.5	3807381.5				500.9	0.00
0.93	0.93	YES								
L0000221		0	0.82330E-05	363254.3	3807379.7				500.9	0.00
0.93	0.93	YES								
L0000222		0	0.82330E-05	363255.1	3807377.9				500.8	0.00
0.93	0.93	YES								
L0000223		0	0.82330E-05	363255.9	3807376.1				500.8	0.00
0.93	0.93	YES								
L0000224		0	0.82330E-05	363256.7	3807374.2				500.8	0.00
0.93	0.93	YES								
L0000225		0	0.82330E-05	363257.5	3807372.4				500.8	0.00
0.93	0.93	YES								
L0000226		0	0.82330E-05	363258.3	3807370.6				500.8	0.00
0.93	0.93	YES								
L0000227		0	0.82330E-05	363259.1	3807368.7				500.9	0.00
0.93	0.93	YES								
L0000228		0	0.82330E-05	363259.9	3807366.9				500.9	0.00
0.93	0.93	YES								
L0000229		0	0.82330E-05	363260.7	3807365.1				501.0	0.00
0.93	0.93	YES								
L0000230		0	0.82330E-05	363261.5	3807363.2				501.1	0.00
0.93	0.93	YES								
L0000231		0	0.82330E-05	363262.3	3807361.4				501.2	0.00
0.93	0.93	YES								
L0000232		0	0.82330E-05	363263.1	3807359.6				501.3	0.00
0.93	0.93	YES								
L0000233		0	0.82330E-05	363263.9	3807357.7				501.5	0.00
0.93	0.93	YES								
L0000234		0	0.82330E-05	363264.7	3807355.9				501.6	0.00
0.93	0.93	YES								
L0000235		0	0.82330E-05	363265.5	3807354.1				501.8	0.00
0.93	0.93	YES								
L0000236		0	0.82330E-05	363266.3	3807352.2				502.0	0.00
0.93	0.93	YES								
L0000237		0	0.82330E-05	363267.1	3807350.4				502.2	0.00
0.93	0.93	YES								
L0000238		0	0.82330E-05	363267.9	3807348.6				502.4	0.00
0.93	0.93	YES								
L0000239		0	0.82330E-05	363268.7	3807346.8				502.7	0.00
0.93	0.93	YES								
L0000240		0	0.82330E-05	363269.5	3807344.9				503.2	0.00
0.93	0.93	YES								

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC) SZ (METERS)	SOURCE (METERS)	INIT. SCALAR VARY BY	URBAN (METERS)	EMISSION RATE X (METERS)	Y (METERS)	BASE ELEV. (METERS)	SY
L0000241		0	0.82330E-05	363270.4	3807343.1				503.7	0.00
0.93	0.93	YES								
L0000242		0	0.82330E-05	363271.2	3807341.3				504.3	0.00
0.93	0.93	YES								
L0000243		0	0.82330E-05	363272.0	3807339.4				504.9	0.00
0.93	0.93	YES								
L0000244		0	0.82330E-05	363272.8	3807337.6				505.6	0.00
0.93	0.93	YES								
L0000245		0	0.82330E-05	363273.6	3807335.8				506.3	0.00
0.93	0.93	YES								
L0000246		0	0.82330E-05	363274.4	3807333.9				507.0	0.00
0.93	0.93	YES								
L0000247		0	0.82330E-05	363275.2	3807332.1				507.8	0.00
0.93	0.93	YES								
L0000248		0	0.82330E-05	363276.0	3807330.3				508.6	0.00
0.93	0.93	YES								
L0000249		0	0.82330E-05	363276.8	3807328.4				509.4	0.00
0.93	0.93	YES								
L0000250		0	0.82330E-05	363277.6	3807326.6				510.3	0.00
0.93	0.93	YES								
L0000251		0	0.82330E-05	363278.4	3807324.8				511.2	0.00
0.93	0.93	YES								
L0000252		0	0.82330E-05	363279.2	3807322.9				511.9	0.00
0.93	0.93	YES								
L0000253		0	0.82330E-05	363280.0	3807321.1				512.6	0.00
0.93	0.93	YES								
L0000254		0	0.82330E-05	363280.8	3807319.3				513.2	0.00
0.93	0.93	YES								
L0000255		0	0.82330E-05	363281.6	3807317.5				513.8	0.00
0.93	0.93	YES								

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC) SZ (METERS)	SOURCE (METERS)	INIT. SCALAR VARY BY	URBAN (METERS)	EMISSION RATE X (METERS)	Y (METERS)	BASE ELEV. (METERS)	SY
L0000256		0	0.82330E-05	363282.4	3807315.6				514.2	0.00
0.93	0.93	YES								
L0000257		0	0.82330E-05	363283.2	3807313.8				514.5	0.00
0.93	0.93	YES								
L0000258		0	0.82330E-05	363284.0	3807312.0				514.8	0.00
0.93	0.93	YES								
L0000259		0	0.82330E-05	363284.8	3807310.1				515.1	0.00
0.93	0.93	YES								
L0000260		0	0.82330E-05	363285.6	3807308.3				515.4	0.00
0.93	0.93	YES								
L0000261		0	0.82330E-05	363286.4	3807306.5				515.7	0.00
0.93	0.93	YES								
L0000262		0	0.82330E-05	363287.2	3807304.6				516.0	0.00
0.93	0.93	YES								
L0000263		0	0.82330E-05	363288.0	3807302.8				516.4	0.00
0.93	0.93	YES								
L0000264		0	0.82330E-05	363288.8	3807301.0				516.8	0.00
0.93	0.93	YES								
L0000265		0	0.82330E-05	363289.6	3807299.1				517.2	0.00
0.93	0.93	YES								
L0000266		0	0.82330E-05	363290.5	3807297.3				517.6	0.00
0.93	0.93	YES								
L0000267		0	0.82330E-05	363291.3	3807295.5				518.0	0.00
0.93	0.93	YES								
L0000268		0	0.82330E-05	363292.1	3807293.6				518.4	0.00
0.93	0.93	YES								
L0000269		0	0.82330E-05	363292.9	3807291.8				518.9	0.00
0.93	0.93	YES								
L0000270		0	0.82330E-05	363293.7	3807290.0				519.4	0.00
0.93	0.93	YES								
L0000271		0	0.82330E-05	363294.5	3807288.2				519.9	0.00
0.93	0.93	YES								
L0000272		0	0.82330E-05	363295.3	3807286.3				520.3	0.00
0.93	0.93	YES								
L0000273		0	0.82330E-05	363296.1	3807284.5				520.5	0.00
0.93	0.93	YES								
L0000274		0	0.82330E-05	363296.9	3807282.7				520.8	0.00
0.93	0.93	YES								
L0000275		0	0.82330E-05	363297.7	3807280.8				521.1	0.00
0.93	0.93	YES								
L0000276		0	0.82330E-05	363298.5	3807279.0				521.4	0.00
0.93	0.93	YES								
L0000277		0	0.82330E-05	363299.3	3807277.2				521.8	0.00
0.93	0.93	YES								
L0000278		0	0.82330E-05	363300.1	3807275.3				522.2	0.00
0.93	0.93	YES								
L0000279		0	0.82330E-05	363300.9	3807273.5				522.6	0.00
0.93	0.93	YES								
L0000280		0	0.82330E-05	363301.7	3807271.7				523.0	0.00
0.93	0.93	YES								

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC) SZ (METERS)	SOURCE (METERS)	INIT. SCALAR VARY BY	URBAN (METERS)	EMISSION RATE X (METERS)	Y (METERS)	BASE ELEV. (METERS)
L0000281	0.00	0.93	0	0.82330E-05	0.93	YES	363302.5	3807269.8	523.5
L0000282	0.00	0.93	0	0.82330E-05	0.93	YES	363303.3	3807268.0	524.0
L0000283	0.00	0.93	0	0.82330E-05	0.93	YES	363304.1	3807266.2	524.5
L0000284	0.00	0.93	0	0.82330E-05	0.93	YES	363304.9	3807264.3	525.1
L0000285	0.00	0.93	0	0.82330E-05	0.93	YES	363305.7	3807262.5	525.7
L0000286	0.00	0.93	0	0.82330E-05	0.93	YES	363306.5	3807260.7	526.3
L0000287	0.00	0.93	0	0.82330E-05	0.93	YES	363307.3	3807258.9	526.9
L0000288	0.00	0.93	0	0.82330E-05	0.93	YES	363308.1	3807257.0	527.6
L0000289	0.00	0.93	0	0.82330E-05	0.93	YES	363308.9	3807255.2	527.8
L0000290	0.00	0.93	0	0.82330E-05	0.93	YES	363309.7	3807253.4	527.6
L0000291	0.00	0.93	0	0.82330E-05	0.93	YES	363310.6	3807251.5	527.5
L0000292	0.00	0.93	0	0.82330E-05	0.93	YES	363311.4	3807249.7	527.4
L0000293	0.00	0.93	0	0.82330E-05	0.93	YES	363312.2	3807247.9	527.3
L0000294	0.00	0.93	0	0.82330E-05	0.93	YES	363313.0	3807246.0	527.2
L0000295	0.00	0.93	0	0.82330E-05	0.93	YES	363313.8	3807244.2	527.2

L0000296	0.00	0.93	0	0.82330E-05	0.93	YES	363314.6	3807242.4	527.3
L0000297	0.00	0.93	0	0.82330E-05	0.93	YES	363315.4	3807240.5	527.4
L0000298	0.00	0.93	0	0.82330E-05	0.93	YES	363316.2	3807238.7	527.5
L0000299	0.00	0.93	0	0.82330E-05	0.93	YES	363317.0	3807236.9	527.6
L0000300	0.00	0.93	0	0.82330E-05	0.93	YES	363317.8	3807235.0	527.8
L0000301	0.00	0.93	0	0.82330E-05	0.93	YES	363318.6	3807233.2	528.1
L0000302	0.00	0.93	0	0.82330E-05	0.93	YES	363319.4	3807231.4	528.3
L0000303	0.00	0.93	0	0.82330E-05	0.93	YES	363320.2	3807229.6	528.7
L0000304	0.00	0.93	0	0.82330E-05	0.93	YES	363321.0	3807227.7	529.0
L0000305	0.00	0.93	0	0.82330E-05	0.93	YES	363321.8	3807225.9	529.2
L0000306	0.00	0.93	0	0.82330E-05	0.93	YES	363322.6	3807224.1	529.0
L0000307	0.00	0.93	0	0.82330E-05	0.93	YES	363323.4	3807222.2	528.9
L0000308	0.00	0.93	0	0.82330E-05	0.93	YES	363324.2	3807220.4	528.8
L0000309	0.00	0.93	0	0.82330E-05	0.93	YES	363325.0	3807218.6	528.7
L0000310	0.00	0.93	0	0.82330E-05	0.93	YES	363325.8	3807216.7	528.6
L0000311	0.00	0.93	0	0.82330E-05	0.93	YES	363326.6	3807214.9	528.6
L0000312	0.00	0.93	0	0.82330E-05	0.93	YES	363327.4	3807213.1	528.6
L0000313	0.00	0.93	0	0.82330E-05	0.93	YES	363328.2	3807211.2	528.5
L0000314	0.00	0.93	0	0.82330E-05	0.93	YES	363329.0	3807209.4	528.5
L0000315	0.00	0.93	0	0.82330E-05	0.93	YES	363329.8	3807207.6	528.5
L0000316	0.00	0.93	0	0.82330E-05	0.93	YES	363330.7	3807205.7	528.6
L0000317	0.00	0.93	0	0.82330E-05	0.93	YES	363331.5	3807203.9	528.6
L0000318	0.00	0.93	0	0.82330E-05	0.93	YES	363332.3	3807202.1	528.7
L0000319	0.00	0.93	0	0.82330E-05	0.93	YES	363333.1	3807200.3	528.7
L0000320	0.00	0.93	0	0.82330E-05	0.93	YES	363333.9	3807198.4	528.8

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC) SZ (METERS)	SOURCE (METERS)	INIT. SCALAR VARY BY	URBAN (METERS)	EMISSION RATE X (METERS)	Y (METERS)	BASE ELEV. (METERS)
L0000321	0.00	0.93	0	0.82330E-05	0.93	YES	363334.7	3807196.6	528.9
L0000322	0.00	0.93	0	0.82330E-05	0.93	YES	363335.5	3807194.8	529.1
L0000323	0.00	0.93	0	0.82330E-05	0.93	YES	363336.3	3807192.9	529.3
L0000324	0.00	0.93	0	0.82330E-05	0.93	YES	363337.1	3807191.1	529.4
L0000325	0.00	0.93	0	0.82330E-05	0.93	YES	363337.9	3807189.3	529.4
L0000326	0.00	0.93	0	0.82330E-05	0.93	YES	363338.7	3807187.4	529.4
L0000327	0.00	0.93	0	0.82330E-05	0.93	YES	363339.5	3807185.6	529.4
L0000328	0.00	0.93	0	0.82330E-05	0.93	YES	363340.3	3807183.8	529.3
L0000329	0.00	0.93	0	0.82330E-05	0.93	YES	363341.1	3807181.9	529.2
L0000330	0.00	0.93	0	0.82330E-05	0.93	YES	363341.9	3807180.1	529.1
L0000331	0.00	0.93	0	0.82330E-05	0.93	YES	363342.7	3807178.3	529.1
L0000332	0.00	0.93	0	0.82330E-05	0.93	YES	363343.5	3807176.4	529.0
L0000333	0.00	0.93	0	0.82330E-05	0.93	YES	363344.3	3807174.6	528.9
L0000334	0.00	0.93	0	0.82330E-05	0.93	YES	363345.1	3807172.8	528.9
L0000335	0.00	0.93	0	0.82330E-05	0.93	YES	363345.9	3807171.0	528.8

L0000336	0.00	0.93	0	0.82330E-05	0.93	YES	363346.7	3807169.1	528.8
L0000337	0.00	0.93	0	0.82330E-05	0.93	YES	363347.5	3807167.3	528.7
L0000338	0.00	0.93	0	0.82330E-05	0.93	YES	363348.3	3807165.5	529.1
L0000339	0.00	0.93	0	0.82330E-05	0.93	YES	363349.1	3807163.6	529.6
L0000340	0.00	0.93	0	0.82330E-05	0.93	YES	363349.9	3807161.8	530.0
L0000341	0.00	0.93	0	0.82330E-05	0.93	YES	363350.8	3807160.0	530.4
L0000342	0.00	0.93	0	0.82330E-05	0.93	YES	363351.6	3807158.1	530.8
L0000343	0.00	0.93	0	0.82330E-05	0.93	YES	363352.4	3807156.3	531.1
L0000344	0.00	0.93	0	0.82330E-05	0.93	YES	363353.2	3807154.5	531.3
L0000345	0.00	0.93	0	0.82330E-05	0.93	YES	363354.0	3807152.6	531.4
L0000346	0.00	0.93	0	0.82330E-05	0.93	YES	363354.8	3807150.8	531.5
L0000347	0.00	0.93	0	0.82330E-05	0.93	YES	363355.6	3807149.0	531.6
L0000348	0.00	0.93	0	0.82330E-05	0.93	YES	363356.4	3807147.1	531.6
L0000349	0.00	0.93	0	0.82330E-05	0.93	YES	363357.2	3807145.3	531.5
L0000350	0.00	0.93	0	0.82330E-05	0.93	YES	363358.0	3807143.5	531.3
L0000351	0.00	0.93	0	0.82330E-05	0.93	YES	363358.8	3807141.7	531.2
L0000352	0.00	0.93	0	0.82330E-05	0.93	YES	363359.6	3807139.8	530.9
L0000353	0.00	0.93	0	0.82330E-05	0.93	YES	363360.4	3807138.0	530.6
L0000354	0.00	0.93	0	0.82330E-05	0.93	YES	363361.2	3807136.2	530.2
L0000355	0.00	0.93	0	0.82330E-05	0.93	YES	363362.0	3807134.3	529.7
L0000356	0.00	0.93	0	0.82330E-05	0.93	YES	363362.8	3807132.5	529.2
L0000357	0.00	0.93	0	0.82330E-05	0.93	YES	363363.6	3807130.7	528.6
L0000358	0.00	0.93	0	0.82330E-05	0.93	YES	363365.2	3807129.6	528.0
L0000359	0.00	0.93	0	0.82330E-05	0.93	YES	363367.0	3807128.7	527.2
L0000360	0.00	0.93	0	0.82330E-05	0.93	YES	363368.8	3807127.8	526.5

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC)	SOURCE SZ (METERS)	INIT. SY (METERS)	URBAN SOURCE BY	EMISSION RATE SCALAR VARY (METERS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)		
L0000361	0.00	0	0.82330E-05	0.93	0.93	YES		363370.6	3807127.0	526.0		
L0000362	0.00	0	0.82330E-05	0.93	0.93	YES		363372.4	3807126.1	525.4		
L0000363	0.00	0	0.82330E-05	0.93	0.93	YES		363374.2	3807125.2	524.8		
L0000364	0.00	0	0.82330E-05	0.93	0.93	YES		363376.0	3807124.3	524.3		
L0000365	0.00	0	0.82330E-05	0.93	0.93	YES		363377.8	3807123.5	523.8		
L0000366	0.00	0	0.82330E-05	0.93	0.93	YES		363379.6	3807122.6	523.3		
L0000367	0.00	0	0.82330E-05	0.93	0.93	YES		363381.4	3807121.7	522.8		
L0000368	0.00	0	0.82330E-05	0.93	0.93	YES		363383.2	3807120.8	522.3		
L0000369	0.00	0	0.82330E-05	0.93	0.93	YES		363385.0	3807120.0	521.8		
L0000370	0.00	0	0.82330E-05	0.93	0.93	YES		363386.8	3807119.1	521.3		
L0000371	0.00	0	0.82330E-05	0.93	0.93	YES		363388.6	3807118.2	520.9		
L0000372	0.00	0	0.82330E-05	0.93	0.93	YES		363390.4	3807117.3	520.4		
L0000373	0.00	0	0.82330E-05	0.93	0.93	YES		363392.2	3807116.5	520.0		
L0000374	0.00	0	0.82330E-05	0.93	0.93	YES		363394.0	3807115.6	519.5		
L0000375	0.00	0	0.82330E-05	0.93	0.93	YES		363395.8	3807114.7	519.1		

L0000376	0.00	0	0.82330E-05	0.93	0.93	YES		363397.6	3807113.8	518.7		
L0000377	0.00	0	0.82330E-05	0.93	0.93	YES		363399.4	3807113.0	518.3		
L0000378	0.00	0	0.82330E-05	0.93	0.93	YES		363401.2	3807112.1	518.0		
L0000379	0.00	0	0.82330E-05	0.93	0.93	YES		363403.0	3807111.2	517.8		
L0000380	0.00	0	0.82330E-05	0.93	0.93	YES		363404.8	3807110.3	517.5		
L0000381	0.00	0	0.82330E-05	0.93	0.93	YES		363406.6	3807109.5	517.3		
L0000382	0.00	0	0.82330E-05	0.93	0.93	YES		363408.4	3807108.6	517.1		
L0000383	0.00	0	0.82330E-05	0.93	0.93	YES		363410.2	3807107.7	516.9		
L0000384	0.00	0	0.82330E-05	0.93	0.93	YES		363412.0	3807106.8	516.7		
L0000385	0.00	0	0.82330E-05	0.93	0.93	YES		363413.8	3807106.0	516.7		
L0000386	0.00	0	0.82330E-05	0.93	0.93	YES		363415.6	3807105.1	516.8		
L0000387	0.00	0	0.82330E-05	0.93	0.93	YES		363417.4	3807104.2	516.8		
L0000388	0.00	0	0.82330E-05	0.93	0.93	YES		363419.2	3807103.3	516.9		
L0000389	0.00	0	0.82330E-05	0.93	0.93	YES		363421.0	3807102.5	516.9		
L0000390	0.00	0	0.82330E-05	0.93	0.93	YES		363422.8	3807101.6	517.0		
L0000391	0.00	0	0.82330E-05	0.93	0.93	YES		363424.5	3807100.7	517.0		
L0000392	0.00	0	0.82330E-05	0.93	0.93	YES		363426.3	3807099.8	517.1		
L0000393	0.00	0	0.82330E-05	0.93	0.93	YES		363428.1	3807099.0	517.1		
L0000394	0.00	0	0.82330E-05	0.93	0.93	YES		363429.9	3807098.1	517.2		
L0000395	0.00	0	0.82330E-05	0.93	0.93	YES		363431.7	3807097.2	517.2		
L0000396	0.00	0	0.82330E-05	0.93	0.93	YES		363433.5	3807096.3	517.3		
L0000397	0.00	0	0.82330E-05	0.93	0.93	YES		363435.3	3807095.5	517.3		
L0000398	0.00	0	0.82330E-05	0.93	0.93	YES		363437.1	3807094.6	517.4		
L0000399	0.00	0	0.82330E-05	0.93	0.93	YES		363438.9	3807093.7	517.4		
L0000400	0.00	0	0.82330E-05	0.93	0.93	YES		363440.7	3807092.8	517.5		

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. CATS.	NUMBER EMISSION RATE (GRAMS/SEC)	SOURCE SZ (METERS)	INIT. SY (METERS)	URBAN SOURCE BY	EMISSION RATE SCALAR VARY (METERS)	X (METERS)	Y (METERS)	BASE ELEV. (METERS)		
L0000401	0.00	0	0.82330E-05	0.93	0.93	YES		363442.5	3807092.0	517.5		
L0000402	0.00	0	0.82330E-05	0.93	0.93	YES		363444.3	3807091.1	517.6		
L0000403	0.00	0	0.82330E-05	0.93	0.93	YES		363445.3	3807091.3	517.4		
L0000404	0.00	0	0.82330E-05	0.93	0.93	YES		363445.0	3807093.2	517.0		
L0000405	0.00	0	0.82330E-05	0.93	0.93	YES		363444.7	3807095.2	516.5		
L0000406	0.00	0	0.82330E-05	0.93	0.93	YES		363444.3	3807097.2	516.0		
L0000407	0.00	0	0.82330E-05	0.93	0.93	YES		363444.0	3807099.1	515.5		
L0000408	0.00	0	0.82330E-05	0.93	0.93	YES		363443.6	3807101.1	515.0		
L0000409	0.00	0	0.82330E-05	0.93	0.93	YES		363443.3	3807103.1	514.5		
L0000410	0.00	0	0.82330E-05	0.93	0.93	YES		363442.9	3807105.0	514.0		
L0000411	0.00	0	0.82330E-05	0.93	0.93	YES		363442.6	3807107.0	513.6		
L0000412	0.00	0	0.82330E-05	0.93	0.93	YES		363442.3	3807109.0	513.4		
L0000413	0.00	0	0.82330E-05	0.93	0.93	YES		363441.9	3807111.0	513.2		
L0000414	0.00	0	0.82330E-05	0.93	0.93	YES		363441.6	3807112.9	513.1		
L0000415	0.00	0	0.82330E-05	0.93	0.93	YES		363441.2	3807114.9	512.9		

L0000416	0.00	0	0.82330E-05	0.93	0.93	YES		363440.9	3807116.9	512.8		
L0000417	0.00	0	0.82330E-05	0.93	0.93	YES		363440.5	3807118.8	512.6		
L0000418	0.00	0	0.82330E-05	0.93	0.93	YES		363440.2	3807120.8	512.4		
L0000419	0.00	0	0.82330E-05	0.93	0.93	YES		363439.9	3807122.8	512.3		
L0000420	0.00	0	0.82330E-05	0.93	0.93	YES		363439.5	3807124.8	512.1		
L0000421	0.00	0	0.82330E-05	0.93	0.93	YES		363439.2	3807126.7	511.9		
L0000422	0.00	0	0.82330E-05	0.93	0.93	YES		363438.8	3807128.7	511.8		
L0000423	0.00	0	0.82330E-05	0.93	0.93	YES		363438.5	3807130.7	511.6		
L0000424	0.00	0	0.82330E-05	0.93	0.93	YES		363438.2	3807132.6	511.5		
L0000425	0.00	0	0.82330E-05	0.93	0.93	YES		363437.8	3807134.6	511.3		
L0000426	0.00	0	0.82330E-05	0.93	0.93	YES		363437.5	3807136.6	511.1		
L0000427	0.00	0	0.82330E-05	0.93	0.93	YES		363437.1	3807138.5	511.6		
L0000428	0.00	0	0.82330E-05	0.93	0.93	YES		363436.8	3807140.5	512.2		
L0000429	0.00	0	0.82330E-05	0.93	0.93	YES		363436.4	3807142.5	512.7		
L0000430	0.00	0	0.82330E-05	0.93	0.93	YES		363436.1	3807144.5	513.3		
L0000431	0.00	0	0.82330E-05	0.93	0.93	YES		363435.8	3807146.4	513.9		
L0000432	0.00	0	0.82330E-05	0.93	0.93	YES		363435.4	3807148.4	514.5		
L0000433	0.00	0	0.82330E-05	0.93	0.93	YES		363435.1	3807150.4	515.1		
L0000434	0.00	0	0.82330E-05	0.93	0.93	YES		363434.7	3807152.3	515.7		
L0000435	0.00	0	0.82330E-05	0.93	0.93	YES		363434.4	3807154.3	516.3		
L0000436	0.00	0	0.82330E-05	0.93	0.93	YES		363434.0	3807156.3	517.0		
L0000437	0.00	0	0.82330E-05	0.93	0.93	YES		363433.7	3807158.2	517.6		
L0000438	0.00	0	0.82330E-05	0.93	0.93	YES		363433.4	3807160.2	518.3		
L0000439	0.00	0	0.82330E-05	0.93	0.93	YES		363433.0	3807162.2	519.0		
L0000440	0.00	0	0.82330E-05	0.93	0.93	YES		363432.7	3807164.2	519.7		

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. SY	INIT. SZ CATS.	URBAN SOURCE	NUMBER EMISSION RATE (GRAMS/SEC) SCALAR VARY BY	X (METERS)	Y (METERS)	BASE ELEV. (METERS)
L0000441	0.00	0.93	0.93	YES	0	0.82330E-05	363432.3	3807166.1	520.4
L0000442	0.00	0.93	0.93	YES	0	0.82330E-05	363432.0	3807168.1	520.9
L0000443	0.00	0.93	0.93	YES	0	0.82330E-05	363431.6	3807170.1	521.3
L0000444	0.00	0.93	0.93	YES	0	0.82330E-05	363431.3	3807172.0	521.7
L0000445	0.00	0.93	0.93	YES	0	0.82330E-05	363431.0	3807174.0	522.1
L0000446	0.00	0.93	0.93	YES	0	0.82330E-05	363430.6	3807176.0	522.5
L0000447	0.00	0.93	0.93	YES	0	0.82330E-05	363430.3	3807178.0	522.9
L0000448	0.00	0.93	0.93	YES	0	0.82330E-05	363429.9	3807179.9	523.3
L0000449	0.00	0.93	0.93	YES	0	0.82330E-05	363429.6	3807181.9	523.7
L0000450	0.00	0.93	0.93	YES	0	0.82330E-05	363429.2	3807183.9	524.1
L0000451	0.00	0.93	0.93	YES	0	0.82330E-05	363428.9	3807185.8	524.5
L0000452	0.00	0.93	0.93	YES	0	0.82330E-05	363428.6	3807187.8	524.9
L0000453	0.00	0.93	0.93	YES	0	0.82330E-05	363428.2	3807189.8	525.2
L0000454	0.00	0.93	0.93	YES	0	0.82330E-05	363427.9	3807191.7	525.5
L0000455	0.00	0.93	0.93	YES	0	0.82330E-05	363427.5	3807193.7	525.9

L0000456	0.00	0.93	0.93	YES	0	0.82330E-05	363427.2	3807195.7	526.2
L0000457	0.00	0.93	0.93	YES	0	0.82330E-05	363426.8	3807197.7	526.1
L0000458	0.00	0.93	0.93	YES	0	0.82330E-05	363426.5	3807199.6	525.8
L0000459	0.00	0.93	0.93	YES	0	0.82330E-05	363426.2	3807201.6	525.4
L0000460	0.00	0.93	0.93	YES	0	0.82330E-05	363425.8	3807203.6	525.0
L0000461	0.00	0.93	0.93	YES	0	0.82330E-05	363425.5	3807205.5	524.6
L0000462	0.00	0.93	0.93	YES	0	0.82330E-05	363425.1	3807207.5	524.2
L0000463	0.00	0.93	0.93	YES	0	0.82330E-05	363424.8	3807209.5	523.9
L0000464	0.00	0.93	0.93	YES	0	0.82330E-05	363424.4	3807211.5	523.5
L0000465	0.00	0.93	0.93	YES	0	0.82330E-05	363424.1	3807213.4	523.1
L0000466	0.00	0.93	0.93	YES	0	0.82330E-05	363423.8	3807215.4	522.7
L0000467	0.00	0.93	0.93	YES	0	0.82330E-05	363423.4	3807217.4	522.4
L0000468	0.00	0.93	0.93	YES	0	0.82330E-05	363423.1	3807219.3	522.0
L0000469	0.00	0.93	0.93	YES	0	0.82330E-05	363422.7	3807221.3	521.6
L0000470	0.00	0.93	0.93	YES	0	0.82330E-05	363422.4	3807223.3	521.2
L0000471	0.00	0.93	0.93	YES	0	0.82330E-05	363422.0	3807225.2	520.9
L0000472	0.00	0.93	0.93	YES	0	0.82330E-05	363421.7	3807227.2	520.5
L0000473	0.00	0.93	0.93	YES	0	0.82330E-05	363421.4	3807229.2	520.2
L0000474	0.00	0.93	0.93	YES	0	0.82330E-05	363421.0	3807231.2	519.9
L0000475	0.00	0.93	0.93	YES	0	0.82330E-05	363420.7	3807233.1	519.5
L0000476	0.00	0.93	0.93	YES	0	0.82330E-05	363420.3	3807235.1	519.2
L0000477	0.00	0.93	0.93	YES	0	0.82330E-05	363420.0	3807237.1	518.8
L0000478	0.00	0.93	0.93	YES	0	0.82330E-05	363419.6	3807239.0	518.4
L0000479	0.00	0.93	0.93	YES	0	0.82330E-05	363419.3	3807241.0	518.1
L0000480	0.00	0.93	0.93	YES	0	0.82330E-05	363419.0	3807243.0	517.7

*** VOLUME
SOURCE DATA ***

RELEASE HEIGHT	SOURCE ID	INIT. PART. SY	INIT. SZ CATS.	URBAN SOURCE	NUMBER EMISSION RATE (GRAMS/SEC) SCALAR VARY BY	X (METERS)	Y (METERS)	BASE ELEV. (METERS)
L0000481	0.00	0.93	0.93	YES	0	0.82330E-05	363418.6	3807244.9	517.3
L0000482	0.00	0.93	0.93	YES	0	0.82330E-05	363418.3	3807246.9	516.9
L0000483	0.00	0.93	0.93	YES	0	0.82330E-05	363417.9	3807248.9	516.5
L0000484	0.00	0.93	0.93	YES	0	0.82330E-05	363417.6	3807250.9	516.1
L0000485	0.00	0.93	0.93	YES	0	0.82330E-05	363417.2	3807252.8	515.6
L0000486	0.00	0.93	0.93	YES	0	0.82330E-05	363416.9	3807254.8	515.2
L0000487	0.00	0.93	0.93	YES	0	0.82330E-05	363416.6	3807256.8	514.8
L0000488	0.00	0.93	0.93	YES	0	0.82330E-05	363416.2	3807258.7	514.2
L0000489	0.00	0.93	0.93	YES	0	0.82330E-05	363415.9	3807260.7	513.7
L0000490	0.00	0.93	0.93	YES	0	0.82330E-05	363415.5	3807262.7	513.2
L0000491	0.00	0.93	0.93	YES	0	0.82330E-05	363415.2	3807264.7	512.7
L0000492	0.00	0.93	0.93	YES	0	0.82330E-05	363414.8	3807266.6	512.2
L0000493	0.00	0.93	0.93	YES	0	0.82330E-05	363414.5	3807268.6	511.7
L0000494	0.00	0.93	0.93	YES	0	0.82330E-05	363414.2	3807270.6	511.2
L0000495	0.00	0.93	0.93	YES	0	0.82330E-05	363413.8	3807272.5	510.8

L0000496	0.00	0.93	0.93	YES	0	0.82330E-05	363413.5	3807274.5	510.3
L0000497	0.00	0.93	0.93	YES	0	0.82330E-05	363413.1	3807276.5	509.8
L0000498	0.00	0.93	0.93	YES	0	0.82330E-05	363412.8	3807278.4	509.4
L0000499	0.00	0.93	0.93	YES	0	0.82330E-05	363412.5	3807280.4	508.9
L0000500	0.00	0.93	0.93	YES	0	0.82330E-05	363412.1	3807282.4	508.4
L0000501	0.00	0.93	0.93	YES	0	0.82330E-05	363411.8	3807284.4	508.0
L0000502	0.00	0.93	0.93	YES	0	0.82330E-05	363411.4	3807286.3	507.6
L0000503	0.00	0.93	0.93	YES	0	0.82330E-05	363411.1	3807288.3	507.1
L0000504	0.00	0.93	0.93	YES	0	0.82330E-05	363410.7	3807290.3	506.7
L0000505	0.00	0.93	0.93	YES	0	0.82330E-05	363410.4	3807292.2	506.2
L0000506	0.00	0.93	0.93	YES	0	0.82330E-05	363410.1	3807294.2	505.8
L0000507	0.00	0.93	0.93	YES	0	0.82330E-05	363409.7	3807296.2	505.3
L0000508	0.00	0.93	0.93	YES	0	0.82330E-05	363409.4	3807298.1	504.9
L0000509	0.00	0.93	0.93	YES	0	0.82330E-05	363409.0	3807300.1	504.4
L0000510	0.00	0.93	0.93	YES	0	0.82330E-05	363408.7	3807302.1	503.9
L0000511	0.00	0.93	0.93	YES	0	0.82330E-05	363408.3	3807304.1	503.4
L0000512	0.00	0.93	0.93	YES	0	0.82330E-05	363408.0	3807306.0	502.9
L0000513	0.00	0.93	0.93	YES	0	0.82330E-05	363407.7	3807308.0	502.4
L0000514	0.00	0.93	0.93	YES	0	0.82330E-05	363407.3	3807310.0	501.8
L0000515	0.00	0.93	0.93	YES	0	0.82330E-05	363407.0	3807311.9	501.3
L0000516	0.00	0.93	0.93	YES	0	0.82330E-05	363406.6	3807313.9	500.8
L0000517	0.00	0.93	0.93	YES	0	0.82330E-05	363406.3	3807315.9	500.2
L0000518	0.00	0.93	0.93	YES	0	0.82330E-05	363405.9	3807317.9	499.9
L0000519	0.00	0.93	0.93	YES	0	0.82330E-05	363405.6	3807319.8	499.8
L0000520	0.00	0.93	0.93	YES	0	0.82330E-05	363405.3	3807321.8	499.7

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER EMISSION RATE PART. CATS.	(GRAMS/SEC)	INIT. SZ (METERS)	INIT. SY (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY	X (METERS)	Y (METERS)	BASE ELEV. (METERS)
L0000521	0	0.82330E-05	0.00	0.93	0.93	YES	363404.9	3807323.8	499.6
L0000522	0	0.82330E-05	0.00	0.93	0.93	YES	363404.6	3807325.7	499.5
L0000523	0	0.82330E-05	0.00	0.93	0.93	YES	363404.2	3807327.7	499.4
L0000524	0	0.82330E-05	0.00	0.93	0.93	YES	363403.9	3807329.7	499.3
L0000525	0	0.82330E-05	0.00	0.93	0.93	YES	363403.5	3807331.6	499.2
L0000526	0	0.82330E-05	0.00	0.93	0.93	YES	363403.2	3807333.6	499.0
L0000527	0	0.82330E-05	0.00	0.93	0.93	YES	363402.9	3807335.6	498.9
L0000528	0	0.82330E-05	0.00	0.93	0.93	YES	363402.5	3807337.6	498.8
L0000529	0	0.82330E-05	0.00	0.93	0.93	YES	363402.2	3807339.5	498.7
L0000530	0	0.82330E-05	0.00	0.93	0.93	YES	363401.8	3807341.5	498.5
L0000531	0	0.82330E-05	0.00	0.93	0.93	YES	363401.5	3807343.5	498.4
L0000532	0	0.82330E-05	0.00	0.93	0.93	YES	363401.1	3807345.4	498.2
L0000533	0	0.82330E-05	0.00	0.93	0.93	YES	363400.8	3807347.4	498.1
L0000534	0	0.82330E-05	0.00	0.93	0.93	YES	363400.5	3807349.4	498.0
L0000535	0	0.82330E-05	0.00	0.93	0.93	YES	363400.1	3807351.4	497.9

L0000536	0	0.82330E-05	0.00	0.93	0.93	YES	363399.8	3807353.3	497.8
L0000537	0	0.82330E-05	0.00	0.93	0.93	YES	363399.4	3807355.3	497.7
L0000538	0	0.82330E-05	0.00	0.93	0.93	YES	363399.1	3807357.3	497.6
L0000539	0	0.82330E-05	0.00	0.93	0.93	YES	363398.7	3807359.2	497.6
L0000540	0	0.82330E-05	0.00	0.93	0.93	YES	363398.4	3807361.2	497.6
L0000541	0	0.82330E-05	0.00	0.93	0.93	YES	363398.1	3807363.2	497.6
L0000542	0	0.82330E-05	0.00	0.93	0.93	YES	363397.7	3807365.1	497.6
L0000543	0	0.82330E-05	0.00	0.93	0.93	YES	363397.4	3807367.1	497.6
L0000544	0	0.82330E-05	0.00	0.93	0.93	YES	363397.0	3807369.1	497.6
L0000545	0	0.82330E-05	0.00	0.93	0.93	YES	363396.7	3807371.1	497.6
L0000546	0	0.82330E-05	0.00	0.93	0.93	YES	363396.3	3807373.0	497.6
L0000547	0	0.82330E-05	0.00	0.93	0.93	YES	363396.0	3807375.0	497.6
L0000548	0	0.82330E-05	0.00	0.93	0.93	YES	363395.7	3807377.0	497.6
L0000549	0	0.82330E-05	0.00	0.93	0.93	YES	363395.3	3807378.9	497.6
L0000550	0	0.82330E-05	0.00	0.93	0.93	YES	363395.0	3807380.9	497.6
L0000551	0	0.82330E-05	0.00	0.93	0.93	YES	363394.6	3807382.9	497.6
L0000552	0	0.82330E-05	0.00	0.93	0.93	YES	363394.3	3807384.8	497.6
L0000553	0	0.82330E-05	0.00	0.93	0.93	YES	363393.9	3807386.8	497.6
L0000554	0	0.82330E-05	0.00	0.93	0.93	YES	363393.6	3807388.8	497.6
L0000555	0	0.82330E-05	0.00	0.93	0.93	YES	363393.3	3807390.8	497.6
L0000556	0	0.82330E-05	0.00	0.93	0.93	YES	363392.9	3807392.7	497.6
L0000557	0	0.82330E-05	0.00	0.93	0.93	YES	363392.6	3807394.7	497.6
L0000558	0	0.82330E-05	0.00	0.93	0.93	YES	363392.2	3807396.7	497.6
L0000559	0	0.82330E-05	0.00	0.93	0.93	YES	363391.9	3807398.6	497.6
L0000560	0	0.82330E-05	0.00	0.93	0.93	YES	363391.5	3807400.6	497.6

*** VOLUME SOURCE DATA ***

SOURCE ID	NUMBER EMISSION RATE PART. CATS.	(GRAMS/SEC)	INIT. SZ (METERS)	INIT. SY (METERS)	URBAN SOURCE	EMISSION RATE SCALAR VARY BY	X (METERS)	Y (METERS)	BASE ELEV. (METERS)
L0000561	0	0.82330E-05	0.00	0.93	0.93	YES	363391.2	3807402.6	497.7
L0000562	0	0.82330E-05	0.00	0.93	0.93	YES	363390.9	3807404.6	497.7
L0000563	0	0.82330E-05	0.00	0.93	0.93	YES	363390.5	3807406.5	497.7
L0000564	0	0.82330E-05	0.00	0.93	0.93	YES	363390.2	3807408.5	497.8
L0000565	0	0.82330E-05	0.00	0.93	0.93	YES	363389.8	3807410.5	497.9
L0000566	0	0.82330E-05	0.00	0.93	0.93	YES	363389.5	3807412.4	498.1
L0000567	0	0.82330E-05	0.00	0.93	0.93	YES	363389.1	3807414.4	498.2
L0000568	0	0.82330E-05	0.00	0.93	0.93	YES	363388.8	3807416.4	498.3
L0000569	0	0.82330E-05	0.00	0.93	0.93	YES	363388.5	3807418.3	498.4
L0000570	0	0.82330E-05	0.00	0.93	0.93	YES	363388.1	3807420.3	498.6
L0000571	0	0.82330E-05	0.00	0.93	0.93	YES	363387.8	3807422.3	498.7
L0000572	0	0.82330E-05	0.00	0.93	0.93	YES	363387.4	3807424.3	498.8
L0000573	0	0.82330E-05	0.00	0.93	0.93	YES	363387.1	3807426.2	498.9
L0000574	0	0.82330E-05	0.00	0.93	0.93	YES	363386.7	3807428.2	499.0
L0000575	0	0.82330E-05	0.00	0.93	0.93	YES	363386.4	3807430.2	499.1

L0000576	0	0.82330E-05	0.00	0.93	0.93	YES	363386.1	3807432.1	499.2
L0000577	0	0.82330E-05	0.00	0.93	0.93	YES	363385.7	3807434.1	499.2
L0000578	0	0.82330E-05	0.00	0.93	0.93	YES	363385.4	3807436.1	499.3
L0000579	0	0.82330E-05	0.00	0.93	0.93	YES	363385.0	3807438.0	499.4
L0000580	0	0.82330E-05	0.00	0.93	0.93	YES	363384.7	3807440.0	499.4
L0000581	0	0.82330E-05	0.00	0.93	0.93	YES	363384.3	3807442.0	499.4
L0000582	0	0.82330E-05	0.00	0.93	0.93	YES	363384.0	3807444.0	499.4
L0000583	0	0.82330E-05	0.00	0.93	0.93	YES	363383.7	3807445.9	499.4

*** SOURCE IDs
DEFINING SOURCE GROUPS ***

SRCGROUP ID SOURCE
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*** SOURCE IDs
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*** SOURCE IDs
DEFINING SOURCE GROUPS ***

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*** SOURCE IDs
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SRCGROUP ID SOURCE
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*** SOURCE IDs DEFINED
AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs
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		L0000009 , L0000010 , L0000011 , L0000012 , L0000013 , L0000014 , L0000015 , L0000016 ,
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*** SOURCE IDs DEFINED
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URBAN ID	URBAN POP	SOURCE IDs
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		L0000297 , L0000298 , L0000299 , L0000300 , L0000301 , L0000302 , L0000303 , L0000304 ,
		L0000305 , L0000306 , L0000307 , L0000308 , L0000309 , L0000310 , L0000311 , L0000312 ,
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*** SOURCE IDs DEFINED
AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs

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L0000329 , L0000330 , L0000331 ,
L0000332 , L0000333 , L0000334 , L0000335 ,
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L0000337 , L0000338 , L0000339 ,
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*** SOURCE IDs DEFINED
AS URBAN SOURCES ***

URBAN ID	URBAN POP	SOURCE IDs

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L0000577 , L0000578 , L0000579 ,
L0000580 , L0000581 , L0000582 , L0000583 ,

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 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\AERMOD View
\Golden Valley\Golden Valley.isc                  ***
03/16/22
 *** AERMET - VERSION  14134 ***   ***
***        16:20:06

PAGE  25
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                              *** DISCRETE
CARTESIAN RECEPTORS ***
                                            (X-COORD, Y-COORD,
ZELEV, ZHILL, ZFLAG)

(METERS)

     ( 363346.5, 3807759.3,     482.2,     587.0,       0.0);
( 363466.6, 3807637.3,     476.9,     605.0,       0.0);
     ( 363537.9, 3807346.4,     495.6,     605.0,       0.0);
( 363536.0, 3807273.2,     499.4,     605.0,       0.0);
     ( 363534.1, 3807186.9,     505.0,     605.0,       0.0);
```



```
 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\AERMOD View
\Golden Valley\Golden Valley.isc                  ***
03/16/22
 *** AERMET - VERSION  14134 ***   ***
***        16:20:06

PAGE  26
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                              *** METEOROLOGICAL
DAYS SELECTED FOR PROCESSING ***
                                                              (1
=YES; 0=NO)

            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
1 1 1 1 1   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
1 1 1 1 1   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
1 1 1 1 1   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
1 1 1 1 1   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
1 1 1 1 1   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
1 1 1 1 1   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1  1 1 1 1 1
1 1 1 1 1   1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1 1 1 1 1
            1 1 1 1 1 1 1 1 1 1  1 1 1 1 1 1

                NOTE:  METEOROLOGICAL DATA ACTUALLY PROCESSED
WILL ALSO DEPEND ON WHAT IS INCLUDED IN THE DATA FILE.



                                  *** UPPER BOUND OF FIRST
THROUGH FIFTH WIND SPEED CATEGORIES ***

(METERS/SEC)


                                                  1.54,   3.09,
5.14,   8.23,  10.80,
```



```
 *** AERMOD - VERSION 21112  ***   *** C:\Lakes\AERMOD View
\Golden Valley\Golden Valley.isc                  ***
03/16/22
 *** AERMET - VERSION  14134 ***   ***
***        16:20:06

PAGE  27
 *** MODELOPTs:    RegDFAULT  CONC  ELEV  URBAN

                                     *** UP TO THE FIRST 24 HOURS
OF METEOROLOGICAL DATA ***

   Surface file:   sclr8.sfc
Met Version:  14134
   Profile file:   sclr8.PFL
   Surface format: FREE
   Profile format: FREE
   Surface station no.:        0                  Upper air
station no.:     3190
                  Name: UNKNOWN
Name: UNKNOWN
                  Year:   2008
Year:   2008

 First 24 hours of scalar data
 YR MO DY JDY HR     H0     U*     W*  DT/DZ ZICNV ZIMCH  M-O LEN
Z0  BOWEN ALBEDO  REF WS   WD     HT  REF TA     HT
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -
 08 01 01   1 01 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  285.9    5.5
 08 01 01   1 02 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  285.4    5.5
 08 01 01   1 03 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  284.9    5.5
 08 01 01   1 04 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  284.2    5.5
 08 01 01   1 05 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  283.8    5.5
 08 01 01   1 06 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  283.8    5.5
 08 01 01   1 07 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  283.8    5.5
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 08 01 01   1 09   19.0 -9.000 -9.000 -9.000   50. -999. -99999.0
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 08 01 01   1 10   65.9 -9.000 -9.000 -9.000  138. -999. -99999.0
0.25   1.00   0.27  999.00  999.   -9.0  285.4    5.5
 08 01 01   1 11  104.1 -9.000 -9.000 -9.000  323. -999. -99999.0
0.25   1.00   0.24  999.00  999.   -9.0  285.9    5.5
 08 01 01   1 12  120.1 -9.000 -9.000 -9.000  539. -999. -99999.0
```



```
0.25   1.00   0.23  999.00  999.   -9.0  286.4    5.5
 08 01 01   1 13  119.6 -9.000 -9.000 -9.000  690. -999. -99999.0
0.25   1.00   0.23  999.00  999.   -9.0  287.0    5.5
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0.25   1.00   1.00  999.00  999.   -9.0  286.4    5.5
 08 01 01   1 20 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  286.4    5.5
 08 01 01   1 21 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
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 08 01 01   1 22 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  285.9    5.5
 08 01 01   1 23 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  285.4    5.5
 08 01 01   1 24 -999.0 -9.000 -9.000 -9.000 -999. -999. -99999.0
0.25   1.00   1.00  999.00  999.   -9.0  285.4    5.5


 First hour of profile data
 YR MO DY HR HEIGHT F  WDIR    WSPD AMB_TMP sigmaA  sigmaW
sigmaV
 08 01 01 01    5.5 0 -999.  -99.00   286.0
99.0  -99.00  -99.00
 08 01 01 01    9.1 1 -999.  -99.00  -999.0
99.0  -99.00  -99.00

 F indicates top of profile (=1) or below (=0)
```

*** THE ANNUAL AVERAGE CONCENTRATION VALUES
AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S):
L0000001 , L0000002 , L0000003 , L0000004 ,
L0000005 ,
L0000006 , L0000007 , L0000008 ,
L0000009 , L0000010 , L0000011 , L0000012 ,
L0000013 ,
L0000014 , L0000015 , L0000016 ,
L0000017 , L0000018 , L0000019 , L0000020 ,
L0000021 ,
L0000022 , L0000023 , L0000024 ,
L0000025 , L0000026 , L0000027 ,
L0000028 , . . . ,

*** DISCRETE
CARTESIAN RECEPTOR POINTS ***

** CONC OF DPM IN
MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC
363346.45	3807759.27	0.06453
363466.56	3807637.29	0.07193
363537.87	3807346.41	0.09006
363535.99	3807273.23	0.09820
363534.12	3807186.90	0.10481

*** THE SUMMARY OF MAXIMUM
ANNUAL RESULTS AVERAGED OVER 5 YEARS ***

** CONC OF DPM IN
MICROGRAMS/M**3 **

NETWORK
GROUP ID AVERAGE CONC
RECEPTOR (XR, YR, ZELEV, ZHILL, ZFLAG) OF TYPE GRID-ID

ALL 1ST HIGHEST VALUE IS 0.10481 AT (363534.12,
3807186.90, 504.97, 605.00, 0.00) DC
2ND HIGHEST VALUE IS 0.09820 AT (363535.99,
3807273.23, 499.37, 605.00, 0.00) DC
3RD HIGHEST VALUE IS 0.09006 AT (363537.87,
3807346.41, 495.56, 605.00, 0.00) DC
4TH HIGHEST VALUE IS 0.07193 AT (363466.56,
3807637.29, 476.94, 605.00, 0.00) DC
5TH HIGHEST VALUE IS 0.06453 AT (363346.45,
3807759.27, 482.24, 587.00, 0.00) DC
6TH HIGHEST VALUE IS 0.00000 AT (0.00,
0.00, 0.00, 0.00, 0.00)
7TH HIGHEST VALUE IS 0.00000 AT (0.00,
0.00, 0.00, 0.00, 0.00)
8TH HIGHEST VALUE IS 0.00000 AT (0.00,
0.00, 0.00, 0.00, 0.00)
9TH HIGHEST VALUE IS 0.00000 AT (0.00,
0.00, 0.00, 0.00, 0.00)
10TH HIGHEST VALUE IS 0.00000 AT (0.00,
0.00, 0.00, 0.00, 0.00)

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR

*** Message Summary : AERMOD Model Execution ***

--------- Summary of Total Messages --------

A Total of 0 Fatal Error Message(s)
A Total of 0 Warning Message(s)
A Total of 1397 Informational Message(s)

A Total of 43848 Hours Were Processed

A Total of 0 Calm Hours Identified

A Total of 1397 Missing Hours Identified (3.19
Percent)

******** FATAL ERROR MESSAGES ********
*** NONE ***

******** WARNING MESSAGES ********
*** NONE ***

****
*** AERMOD Finishes Successfully ***
****


IMPACT
SCIENCES

APPENDIX B-1
Biological Resources Assessment



Biological Resources Assessment

Santa Clarita TTM 68203

August 2025

Prepared For:
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24715 Oak Creek Road
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Prepared By:
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Principal Biologist - South Environmental
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Pasadena, California 91104
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mobile: 303-818-3632

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Appendices

Appendix A: Photograph Log and Site Plan
Appendix B: Special-Status Species Analysis

1. Introduction

This report includes the findings of a Biological Resources Assessment (BRA) conducted by South Environmental for a proposed mixed-use development on Tentative Tract Map (TTM) 68203 in the City of Santa Clarita, California. The purpose of this report is to identify and characterize biological resources that occur on the project site and surrounding 200-feet (survey area), quantify and assess potential impacts to protected biological resources, and propose regulatory compliance measures, mitigation, and avoidance measures to reduce impacts to a less than significant level. The scope of this report includes a description of the proposed development, methods used to assess the biological resources, the environmental setting including technical characterizations and maps of vegetation communities and jurisdictional features, an assessment of the potential for special-status plants and animals to occur on the survey area, a description of the regulatory setting, an analysis of the potential for the project to impact biological resources according to the thresholds in Appendix G of the California Environmental Quality Act (CEQA), and detailed recommendations for avoiding or mitigating impacts. Representative photographs of the survey area are in Appendix A.

1.1 Project Description

Location and Setting

The property proposed for development (project site) includes 28.13-acres consisting of 10 parcels located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita (see Figure 1 and Figure 2 below). The project site is on the United State Geologic Service (USGS) Mint Canyon 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North (T04N) and Range 15 West (R15W).

- Assessor's Parcel Numbers (APNs): 2836-013-106, 2836-013-107, 2836-013-111, 2836-013-128, 2836-013-133, 2836-013-141, 2836-020-058, 2836-020-078, 2836-020-086, 2836-020-087

Most of the property is undeveloped except for a single-family home and accessory structures with a street address 20101 Golden Valley Road. A windy paved driveway exists off Golden Valley Road provide access to the home, and a series of dirt roads provide access to the remaining undeveloped hills on the property. Adjacent uses include residential uses to the immediate north and east, vacant land to the south, and residential uses/Golden Valley High School to the west.



Source: ESRI USA Topo Maps 2020

Santa Clarita TTM 68203

Figure 1. Project Location

Project Site is on the USGS Mint Canyon 7.5-minute quadrangle map in the southeast corner of Township 04 North (T04N) and Range 15 West (R15W) Section 30 (S30).

Center Coordinate (decimal degrees):
Latitude: 34.3985N Longitude: -118.4861W

SOUTH ENVIRONMENTAL



Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Figure 2. Survey Area

SOUTH ENVIRONMENTAL

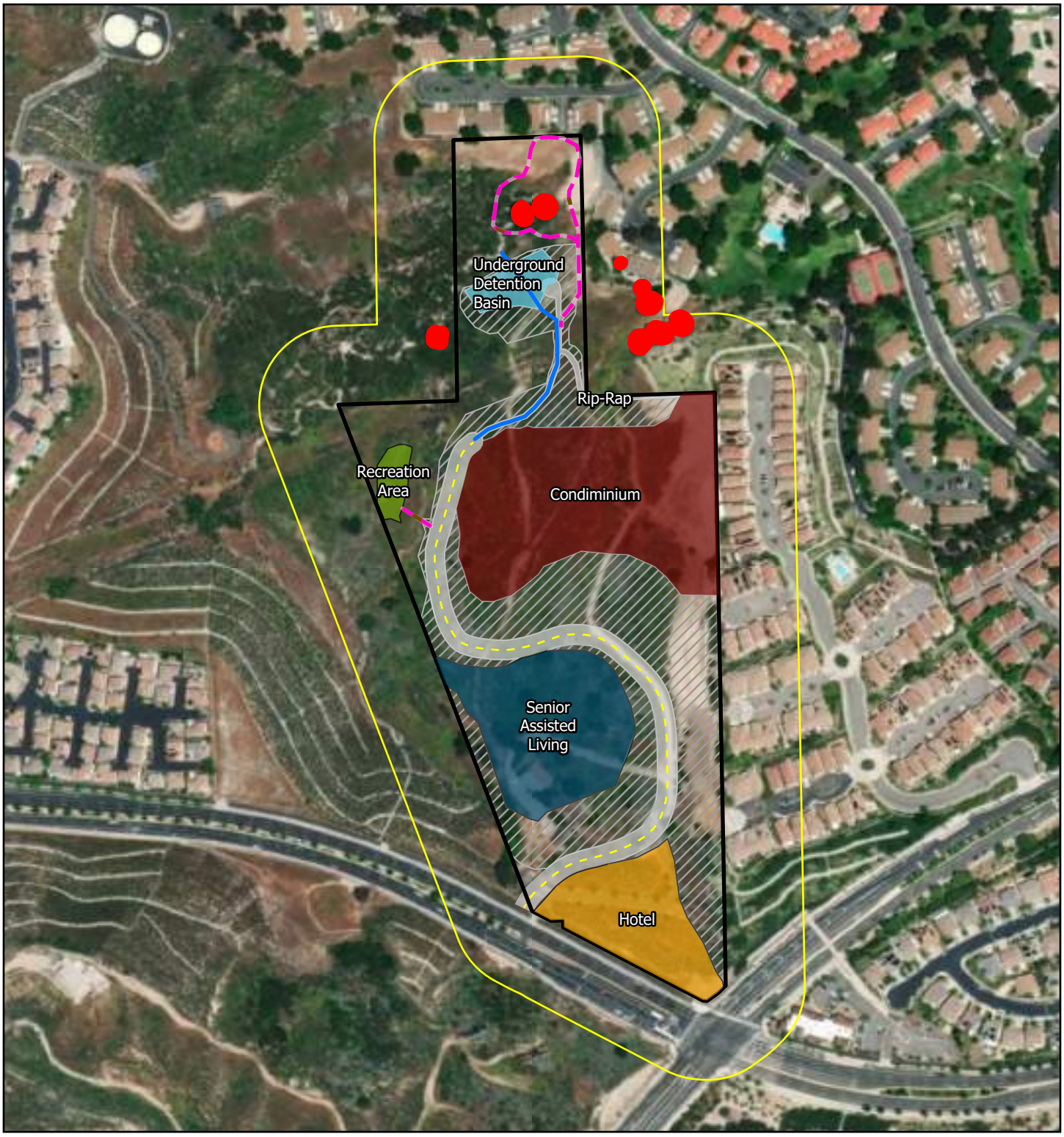
Proposed Development

The proposed development seeks to merge the 10 parcels and entitle a Tentative Tract Map 68203 for a four (4) lot subdivision consisting of the following (shown in Figure 3 below):

- One (1) 5.04-acre lot for a four (4) story building consisting of 154-unit senior assisted living units; the proposed four (4) story building will be 50-foot maximum height.
- One (1) 5.04-acre lot for a 100-room commercial hotel and retail building.
- One (1) 11.48-acre lot for 73 residential Condominium units consisting two, three, and four-plex buildings.
- One (1) 5.83-acre open space lot for L.I.D. storm water treatment with two discharge pipes, and an eight-foot wide riding and hiking trial.
- Proposed streets and circulations will result in approximately 0.73 acres of development.
- A Proposed Recreation Area and foot bridge access is proposed west of the condominium units.
- The project will require slope control surrounding all developments as shown in the Site Plan.

1.2 Methodology

This biological resource assessment is based on information compiled through a field reconnaissance, focused oak tree survey, jurisdictional delineation, and a review of appropriate reference materials and literature regarding the biological resources of the region. A general biological field reconnaissance and separate oak tree survey (South Environmental 2020a) and jurisdictional delineation (South Environmental 2020b) was conducted by South Environmental Certified Wildlife Biologist and Certified Arborist Matthew South. A botanical survey to identify the presence of any rare plants was conducted by South Environmental botanist Scott Altmann and South Environmental biologists AJ Samra and Dana Briggs between May and August of 2023. A coastal California gnatcatcher protocol survey was conducted by Dudek between May and June of 2023. The sources and literature referenced in this assessment are provided below in Section 6. Bibliography.



Source: ESRI Aerial Imagery 2025

Santa Clarita VTTM 68203 Project

Figure 3. Proposed Development

0 215 430 Feet

N

- Project Boundary
- Survey Area - 200-foot Buffer
- Oak Tree Protected Zone

Proposed Development

- Riding/Hiking Trail
- Drainage Pipe
- Road Centerline
- Hikinig Trail
- Condiminium
- Underground Detention Basin
- Hotel
- Senior Assisted Living
- Recreation Area
- Rip-Rap
- Bridge
- Road
- Slope Control

SOUTH ENVIRONMENTAL

Literature Review

The assessment of the project began with a review of literature relating to the biological resources that are known to occur in the vicinity of the parcel that included the following resources:

- The California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) was reviewed to identify special-status plants, animals, and natural communities that have previously recorded in the United State Geologic Service (USGS) Mint Canyon 7.5"quad in which the project site is located, and the eight surrounding USGS 7.5"quads: Warm Springs Mountain, Green Valley, Sleepy Valley, Newhall, Agua Dulce, Oat Mountain, San Fernando, and Sunland (CDFW 2020a).
- CDFW California Wildlife Habitat Relationships (CWHR) life history accounts and range maps (CDFW 2020b)
- United States Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS) Information for Planning and Consultation (IPaC) (USFWS 2020a)
- USFWS Designated and Proposed Critical Habitat GIS data (USFWS 2020b)
- California Native Plant Society (CNPS) online Inventory of Rare and Endangered Plants of California (CNPS 2020a).
- US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soils Database (USDA 2020)
- National Hydrography Dataset (USGS 2020a)
- National Wetlands Inventory (USFWS 2020c)
- California Protected Areas Database (CPAD 2020)
- South Coast Missing Linkages Project: A Linkage Design for the Santa Monica-Sierra Madre Connection (Penrod et al. 2006)
- Oak Tree Report prepared for the project (South Environmental 2020a)
- Jurisdictional Delineation Report prepared for the project (South Environmental 2020b)

Field Reconnaissance, Oak Tree Survey, & Jurisdictional Delineation

South Environmental biologist Matthew South conducted a field reconnaissance on October 10, 2020 to record plants and animals observed on the site, characterize and map plant communities according to A Manual of California Vegetation Online (CNPS 2020b), and assess the potential for special-status species to occur. A focused survey for oak trees was conducted on the project parcels on October 10, 2020 and within a 200-foot buffer surrounding the parcels on November 4, 2020. An Oak Tree Report was prepared that details the methods and results of the survey and a formal jurisdictional delineation of "waters of the U.S." and or wetlands and waters of the state was conducted on November 21, 2020, and a Jurisdictional Delineation report detailing the methods and results was completed that details the methods and results.

Focused Rare Plant Survey

The survey to identify special-status plants identified in the literature search — including federal and state rare, threatened, and endangered species — was conducted by South Environmental in the spring in May and the summer in August of 2023. The survey dates with the weather conditions and South Environmental biologists that conducted the surveys are below:

- May 8 and 9, 2023. Temperature 56-63° F, light air to light breeze (3-10 mph), fair to cloudy, no precipitation (Scott Altmann & AJ Samra)

- August 3 and 4, 2023. Temperature 70-95° F, calm to light breeze (0-10 mph), fair to clear, no precipitation (Scott Altmann and Dana Briggs)

During the surveys all plant species encountered were either identified at the time or in the case of unknown species a sample was collected and the species were identified using *The Jepson Manual of Vascular Plants of California* (Baldwin et al. 2012) and by comparing them with taxonomically-related species from the area using I-Naturalist and other online digital photo sources.

Whenever possible the survey was conducted according to the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* developed by the California Department of Fish and Wildlife (CDFW 2018) and the *Botanical Survey Guidelines* developed by the California Native Plant Society (CNPS 2001). The survey followed the standard botanical protocol for rare, threatened, or endangered plant species surveys of identifying all plant species encountered. Although the goal was to identify all plant species, field surveyors placed a special emphasis on discovery of the special-status species identified in the literature search with the potential to occur on the site.

2. Environmental Setting

2.1 Topography and Climate

The project site is a steeply sloping group of hills that is at an elevation of 1750-feet at the home site and 1560-feet in the northern tip. There is a hilltop that is at the northwest edge of the homesite and extends northeast through the project site and is steeply sloped on the east and west sides. Climate in the region is hot and dry, with average summer high temperatures in the mid-90s and average winter lows in the mid-30s. Average yearly rainfall is 14-inches (less than half the national average) and the wettest months are January – March, and almost no precipitation between May-August.

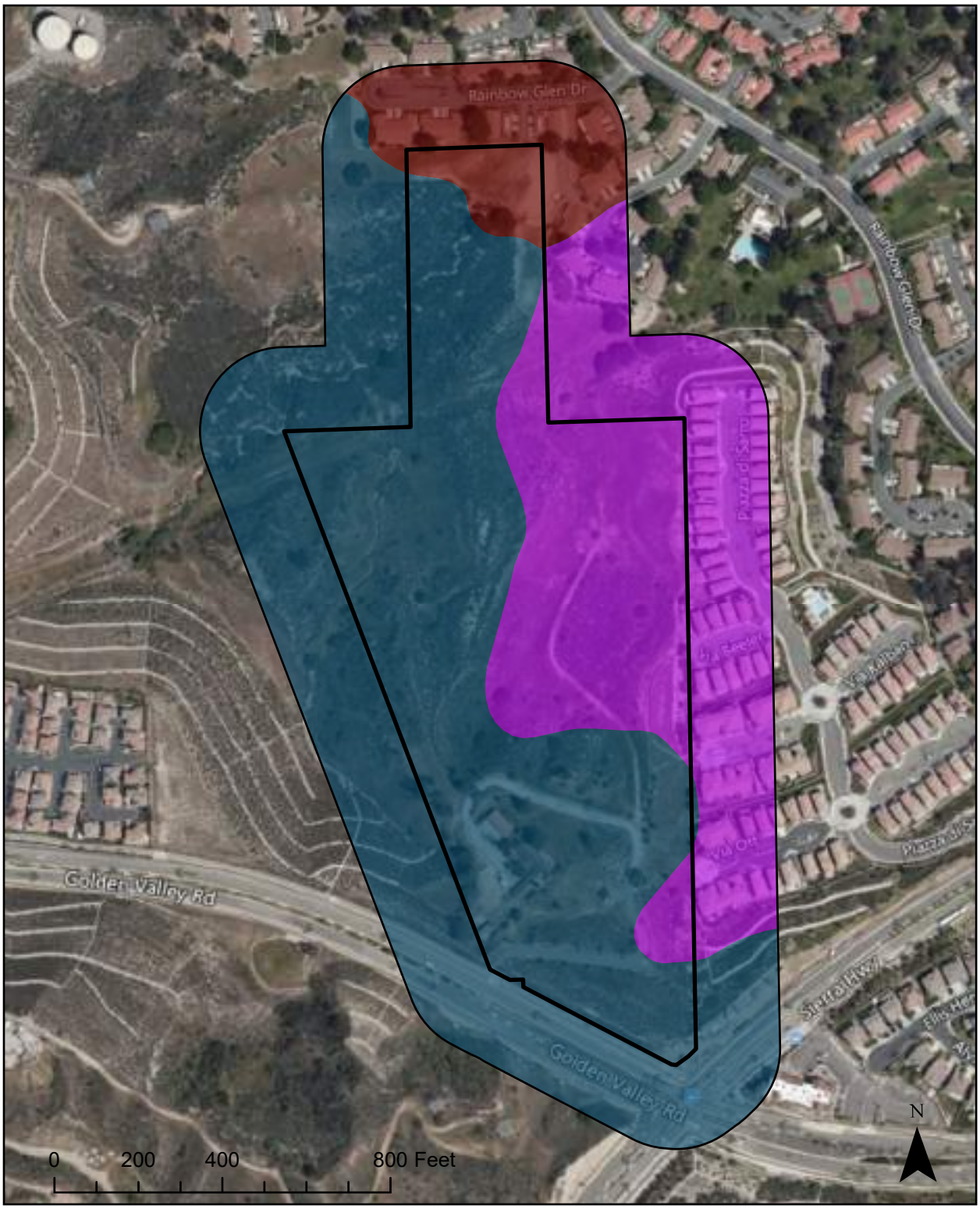
2.2 Geology

The geology in the survey area is dominated by Saugus Formation terrestrial fluviatile, weakly indurated, which is comprised in Pliocene and Pleistocene age geologic units (USGS 2020b, USGS 2020c). The primary rock type in this geologic unit is QTp light gray to light reddish-brown pebble-cobble conglomerate, sandstone, and siltstone; conglomerate composed of granitic, gneissic, metavolcanic, quartzitic gabbroic, anorthositic and volcanic detritus; deposited by westward flowing streams; probably mostly of Pleistocene age. A minor amount of alluvial gravel, sand and clay of valley areas (Qa) and landslide debris (Qls) also occurs in the survey area.

2.3 Soils

Three soils occur on the project site as shown in Figure 4:

- **Saugus loam, 30 to 50 percent slopes, eroded** is the most abundant soil type and occurs in the western half of the project site. This is an upland soil found on backslope of hills, and is well drained.
- **Castaic-Balcom silty clay loams, 15 to 30 percent slopes** is on the eastern portions of the project site. This soil type largely includes (99%) upland hills and backslopes and includes 1% of drainageways. This is a well-drained soil.
- **Zmora loam, 2 to 9 percent slopes** is on the northern tip of the project site. This soil type is typically found on terraces and backslopes and is well drained.



Source: BING Aerial Basemap 2020, USDA NRCS Soils GIS

Santa Clarita TTM 68203

Figure 4. Soils

Survey Area (200-foot Buffer)

Project Boundary

Soils

Castaic-Balcom silty clay loams, 15 to 30 % slopes

Saugus loam, 30 to 50 % slopes, eroded

Zamora loam, 2 to 9 % slopes

SOUTH ENVIRONMENTAL

2.3 Plant Communities

As shown in Figure 5, there are five plant communities or cover types in a 200-foot buffer surrounding the project site, and they are summarized in Table 1 below.

Table 1. Summary of Plant Communities in Survey Area

Plant Community	Acres	Global Rank (G) /State Rank (S)
California Sagebrush – (Purple Sage) Scrub	16.71	G5/S5
Chamise Chaparral	6.66	G5/S5
Installed Sage Scrub	2.50	G5/S5
Ruderal	13.44	not ranked
Developed	17.21	not ranked
Total	56.52	

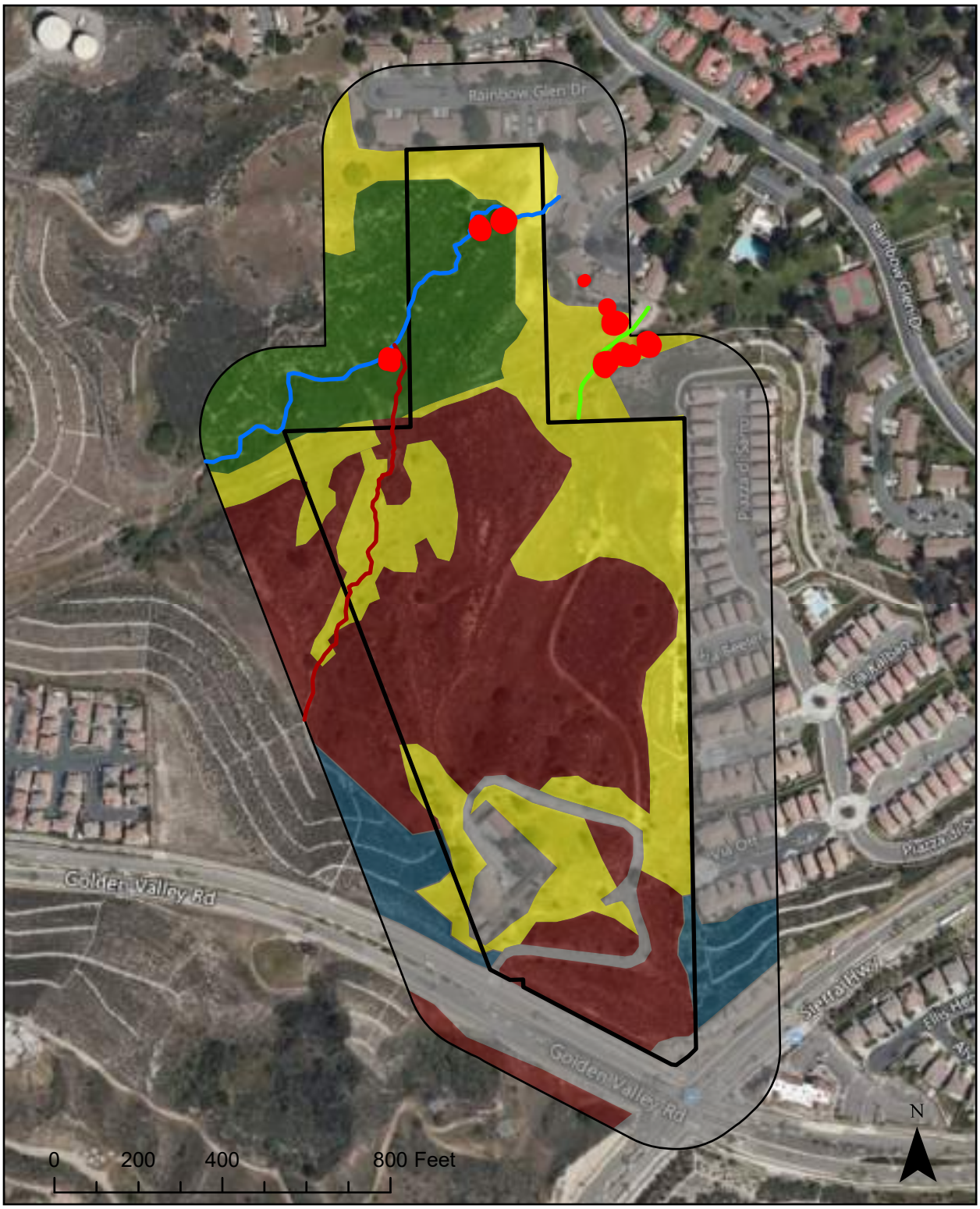
California Sagebrush – (Purple Sage) Scrub

California sagebrush – (purple sage) scrub [*Artemisia californica* – (*Salvia leucophylla*) Shrubland Alliance] as described by the Manual of California Vegetation Online occurs on 16.71-acres of the survey area. This community occurs in two Associations described by the Manual:

- ***Artemisia californica – Salvia leucophylla* Association** occurs on the central portions of the survey area and on the areas south of Golden Valley Road. This community is dominated by California sagebrush (*Artemisia californica*) and purple sage (*Salvia leucophylla*) is a sub-dominant species. Other prominent shrubs include California buckwheat (*Eriogonum fasciculatum*), black elderberry (Sambucus nigra), toyon (*Heteromeles arbutifolia*), and chaparral yucca (*Hesperoyucca whipplei*).
- ***Artemisia californica – Eriogonum fasciculatum* Association** occurs on the southern portions of the survey area between the house and the installed sage scrub. This community is co-dominated by California sagebrush and California buckwheat.

Chamise Chaparral

Chamise chaparral (*Adenostoma fasciculatum* Shrubland Alliance) as described by the Manual occurs in the northern portion of the survey area. Specifically, the *Adenostoma fasciculatum* – (*Ceanothus crassifolius*) Association occurs on the survey area and is dominated by chamise (*Adenostoma fasciculatum*) and hoary leaved ceanothus (*Ceanothus crassifolius*) is sub-dominant. Purple sage, coast live oak (*Quercus agrifolia*), and coast prickly pear (*Opuntia littoralis*) occur occassioinaly.



Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Figure 5. Plant Communities, Oaks, and Drainages

- Ephemeral Drainage #1
- Ephemeral Drainage #2
- Ephemeral Drainage #3
- Survey Area (200-foot Buffer)
- Project Boundary
- Protected Oak Tree
- California Sagebrush - (Purple Sage) Scrub
- Chamise Chaparral
- Installed Sage Scrub
- Ruderal
- Developed

SOUTH ENVIRONMENTAL

Installed Sage Scrub

Installed sage scrub occurs on hillsides adjacent to existing developments and are dominated by California buckwheat and have a variety of other landscaped species. These are managed areas that have a series of concrete drainage channels that direct surface water on the slopes away from the houses.

Ruderal

Ruderal areas occur throughout the survey area surrounding the house, on the hillsides adjacent to neighborhoods, and along the gas company easement. These areas are dominated by black mustard (Brassica nigra) and has a variety of other plants associated with disturbed area and landscaped species such as telegraph weed (*Heterotheca grandiflora*), California pepper tree (*Schinus molle*), olive tree (*Olea europaea*), Mexican fan palm (*Washingtonia robusta*), Canary Island date palm (*Phoenix canariensis*), blue gum eucalyptus (*Eucalyptus globulus*), and Aleppo pine (*Pinus halepensis*).

Developed

Developed areas include Golden Valley Road, Sierra Highway, paved driveway, the single-family residence on the project site, and the surrounding homes in the neighborhoods.

2.4 Wildlife

The following animals were detected on the parcel during the surveys: Anna's hummingbird (*Calypte anna*), Nuttall's woodpecker (*Picoides nuttallii*), California scrub-jay (*Aphelocoma californica*), northern mockingbird (*Mimus polyglotto*), spotted towhee (*Pipilo maculatus*), California towhee (*Melozone crissalis*), house finch (*Haemorhous mexicanus*), oak titmouse (*Baeolophus inornatus*), mourning dove (*Zenaida macroura*), white-crowned sparrow (*Zonotrichia leucophrys*), black phoebe (*Sayornis nigricans*), Eurasian collared dove (*Streptopelia decaocto*), bushtit (*Psaltriparus minimus*), western kingbird (*Tyrannus verticalis*), American crow (*Corvus brachyrhynchos*), California quail (*Callipepla californica*), lesser goldfinch (*Spinus psaltria*), red-tailed hawk (*Buteo jamaicensis*), European house sparrow (*Passer domesticus*), dark-eyed junco (*Junco hyemalis*), Audubon's cottontail (Sylvilagus audubonii), California ground squirrel (*Otospermophilus beecheyi*), and coyote (*Canis latrans*). Numerous other animals are anticipated to use the parcel throughout the year.

2.5 Special-Status Species

The survey area is not within any designated or proposed USFWS Critical Habitat units (USFWS 2020) and Cooper's hawk (*Accipiter cooperii*), a state watchlist species, is the only special-status species observed during the survey and none have been recorded to the CNDDB on the survey area

previously. According to the analysis presented in Appendix B there are 92 special-status species known to occur in the region, including 44-plants and 48-animals. A total of 9 special-status plants and 9 special-status animals are present or have a high or medium potential to occur in the survey area based on habitat suitability.

Special-Status Plants

A total of 92 plant species were observed in the study area during the focused rare plant survey conducted by South Environmental and are listed in Table 2 below. None of these species are considered special-status plants. Of these, 59 species (64.1%) were native to California and 33 species (35.9%) were non-native to California or the southern region of California. Of the non-native species, 22 (66.7%) are classified as invasive or are on invasive "watch" or "alert" by the California Invasive Plant Council (2023). Based on the habit classification system used by Calflora (2023) and other sources, the habit of the plants observed included tree, shrub, shrub (succulent), perennial, perennial herb, annual herb, annual grasslike herb, perennial grasslike herb, and vine. Important genera for which more than one species was observed included *Artemisia, Avena, Bromus, Camissoniopsis, Lupinus, Salvia, and Washingtonia.*

Table 2. List of plant species for Santa Clarita TTM 68203 Project in Santa Clarita, California

(CRPR = California Rare Plant Ranking, 2023; *invasive species per the California Invasive Plant Council, 2023.

Scientific name	Common name	Native/Non-native	Habit	CRPR
Acacia redolens	vanilla-scented wattle	Non-native	tree/shrub	--
Acmispon glaber	deerweed	Native	perennial herb	--
Acourtia microcephala	sacapellote	Native	perennial herb	--
Adenostoma fasciculatum	chamise	Native	tree or shrub	--
Agave attenuata	swan-neck agave	Non-native	shrub	--
Amsinckia menziesii	Menzies fiddleneck	Native	annual herb	--
Artemisia californica	California sagebrush	Native	shrub	--
Artemisia tridentata	big sagebrush	Native	shrub	--
Arundo donax	giant reed	*Non-native	perennial grasslike herb	--
Asclepias fascicularis	narrowleaf milkweed	Native	perennial herb	--
Astragalus trichopodus	Santa Barbara milkvetch	Native	perennial herb	--
Avena barbata	slender wild oat	*Non-native	annual grasslike herb	--
Avena fatua	wild oat	*Non-native	annual grasslike herb	--
Blitum californicum	California goosefoot	Native	perennial herb	--

Scientific name	Common name	Native/Non-native	Habit	CRPR
Bromus diandrus	ripgut brome	*Non-native	annual grasslike herb	--
Bromus hordeaceus	common soft brome	*Non-native	annual grasslike herb	--
Bromus rubens	red brome	*Non-native	annual grasslike herb	--
Calystegia macrostegia	coast morning glory	Native	perennial herb/vine	--
Camissoniopsis bistorta	California sun cup	Native	annual herb	--
Camissoniopsis micrantha	miniature suncup	Native	annual herb	--
Carduus tenuflorus	slender thistle	*Non-native	annual herb	--
Carya Illinoinensis	pecan	*Non-native	tree	--
Castilleja exserta	purple owl's clover	Native	annual herb	--
Ceanothus crassifolius	hoaryleaf ceanothus	Native	shrub	--
Chaenactis artemisiifolia	white pincushion	Native	annual herb	--
Cirsium occidentale	cobweb thistle	Native	perennial herb	--
Corethrogyne filaginifolia	California aster	Native	perennial herb	--
Cryptantha intermedia	clearwater cryptantha	Native	annual herb	--
Cupressus sempervirens	Mediterannean cypress	Non-native	tree	--
Deinandra fasciculata	clustered tarweed	Native	annual herb	--
Delphinium cardinale	scarlet larkspur	Native	perennial herb	--
Dipterostemon capitatus	blue dicks	Native	perennial herb	--
Emmenanthe penduliflora	whispering bells	Native	annual herb	--
Encelia californica	bush sunflower	Native	shrub	--
Encelia farinosa	brittlebush	Native	shrub	--
Eriodictyon crassifolium	thick-leaved yerba santa	Native	shrub	--
Eriogonum fasciculatum	California buckwheat	Native	shrub	--
Eriophyllum confertiflorum	golden yarrow	Native	shrub	--
Erodium cicutarium	redstem stork's bill	*Non-native	annual herb	--
Eschscholzia californica	California poppy	Native	annual herb	--
Eucalyptus camaldulensis	river redgum	*Non-native	tree	--
Eulobus californicus	California primrose	Native	annual herb	--
Eucrypta chrysanthemifolia	common eucrypta	Native	annual herb	--
Festuca myuros	rattail sixweeks grass	*Non-native	annual grasslike herb	--
Grevillea robusta	silk oak	*Non-native	tree	--
Hazardia squarrosa	saw-toothed goldenbush	Native	shrub	--
Heteromeles arbutifolia	toyon	Native	shrub	--
Heterotheca grandiflora	telegraphweed	Native	annual/perennial herb	--
Hesperoyucca whipplei	chaparral yucca	Native	shrub	--

Scientific name	Common name	Native/Non-native	Habit	CRPR
Hirschfeldia incana	shortpod mustard	*Non-native	perennial herb	--
Hordeum murinum	wall barley	*Non-native	annual grasslike herb	--
Juniperus californica	California juniper	Native	shrub	--
Lepidospartum squamatum	California broomsage	Native	shrub	--
Lonicera subspicata	southern honeysuckle	Non-native	shrub	--
Lupinus bicolor	miniature lupine	Native	perennial herb	--
Lupinus succulentus	arroyo lupine	Native	annual herb	--
Lysimachia arvensis	scarlet pimpernel	Non-native	annual herb	--
Marah macrocarpa	chilicothe	Native	perennial herb/vine	--
Malacothamnus marrubioides	horehound bush-mallow	Native	shrub	--
Marrubium vulgare	white horehound	*Non-native	perennial herb	--
Melaleuca citrina	crimson bottlebrush	Non-native	tree	--
Myoporum parvifolium	creeping myoporum	Non-native	tree/shrub	--
Nerium oleander	oleander	Non-native	shrub	--
Nicotiana glauca	tree tobacco	*Non-native	tree/shrub	
Olea europaea	European olive	*Non-native	tree	--
Opuntia basilaris var. *basilaris*	beavertail cactus	Native	shrub (stem succulent)	--
Paeonia californica	California peony	Native	perennial herb	--
Phacelia cicutaria	caterpillar phacelia	Native	annual herb	--
Phoenix canariensis	Canary Island date palm	*Non-native	Tree	--
Pinus halepensis	Aleppo pine	Non-native	tree	--
Pseudognaphalium californicum	California cudweed	Native	annual or perennial herb	--
Pyracantha angustifolia	narrowleaf firethorn	*Non-native	shrub	--
Quercus agrifolia	coast live oak	Native	Tree	--
Rhamnus crocea	redberry buckthorn	Native	shrub	--
Rhus aromatica	fragrant sumac	Native	shrub	--
Ribes aureum	golden currant	Native	shrub	--
Salvia leucophylla	purple sage	Native	shrub	--
Salvia mellifera	black sage	Native	shrub	--
Sambucus nigra ssp. *caerulea*	blue elderberry	Native	shrub or tree	--
Schinus molle	Peruvian peppertree	*Non-native	tree	--
Scrophularia californica	California beeplant	Native	perennial herb	--
Senecio flaccidus	shrubby ragwort	Native	shrub	--
Sisyrinchium bellum	western blue-eyed grass	Native	perennial herb	--

Scientific name	Common name	Native/Non-native	Habit	CRPR
Solanum xanti	purple nightshade	Native	perennial herb/shrub	--
Sonchus oleraceus	common sow thistle	Non-native	annual herb	--
Tetradymia comosa	hairy horsebrush	Native	shrub	--
Toxicoscordion fremontii	common star lily	Native	perennial herb	--
Trifolium hirtum	rose clover	*Non-native	annual herb	--
Uropappus lindleyi	silverpuffs	Native	annual herb	--
Verbena lasiostachys	western vervain	Native	perennial herb	--
Washingtonia filifera	California fan palm	Non-native (to coastal, southern California)	tree	--
Washingtonia robusta	Mexican fan palm	*Non-native	tree	--

No special-status plants occur on the survey area. A botanical survey of the vascular plants conducted in the spring (May) and in the summer (August) of 2023 on the site resulted in the observance and identification of 92 native and non-native plant species. Of these there was a dominance of native species (59 species; 64.1% of all species) although non-native species had an important presence (33 species; 35.9%). Of the non-native plants, 22 (66.7%), are classified as invasive, some of which have substantial cover at the ground level enough to restrict native plant colonization. Over the course of the botanical survey conducted in 2023, no special-status plants were observed and they are considered absent from the survey area.

Special-Status Animals

Table 3 shows a summary of the special-status animals that are present or have a high or medium potential to occur on the survey area.

Table 3. Special-Status Animals with a High or Medium Potential to Occur on the Survey Area

Species Name	Federal/State Status	Other Status	Habitat
Cooper's hawk (*Accipiter cooperii*)	--/--	WL	Woodland, chiefly of open, interrupted marginal type. Observed in large oak trees in north of survey area.
southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)	--/--	WL	Resident in Southern California coastal sage scrub and sparse mixed chaparral. Chaparral and coastal sage scrub habitats occur on the survey area.
Bell's sage sparrow (*Artemisiospiza belli belli*)	--/--	WL, BCC	Nests in chaparral dominated by fairly dense stands of chamise, similar to that found in the north end of the survey area. Dense chamise chaparral occurs in the northern portions of the survey area.
coastal California gnatcatcher (*Polioptila californica californica*)	FT/--	SSC	Obligate and permanent resident of coastal sage scrub below 2,500-feet in Southern California. This species was recorded to the CNDDB 1,000-feet to the south of

			the survey area. Sage scrub habitat occurs on the survey area.
crotch bumblebee (*Bombus crotchii*)	--/CE	--	Coastal California where food plants occur, genera such as *Eriogonum*, such as California buckwheat, which is abundant on the survey area.
western mastiff bat (*Eumops perotis californicus*)	--/--	SSC, BLMS	Many open, semi-arid to arid habitats, including conifer/deciduous woodlands, coastal scrub, grasslands, chaparral, etc. Roosts in crevices in cliff faces, high buildings, trees, and tunnels. The building and trees on the survey area provide suitable roosting sites for this species.
Vasquez shoulderband snail (*Helminthoglypta vasquezi*)	--/--	--	Little information is available regarding the life history of this species except that it is a terrestrial species, and is known to occur in the vicinity of the survey area.
coastal whiptail (*Aspidoscelis tigris stejnegeri*)	--/--	SSC	This species was observed on the site during a survey conducted in 2013 by LDC (LDC 2013)
coast horned lizard (*Phrynosoma blainvillii*)	--/--	SSC, BLMS	Frequents a wide variety of habitats, most common on lowlands along sandy washes with scattered low bushes. The areas surrounding Ephemeral Drainage #1 provide suitable habitat for this species.
San Diego desert woodrat (*Neotoma lepida intermedia*)	--/--	SSC	Typically found in coastal scrub.
BCC – USFWS Bird of Conservation Concern BLMS – Bureau of Land Management Sensitive SSC – California species of special concern WL – California watchlist species _____ FT – Federal threatened species CE – candidate for endangered species in California			

Coastal California Gnatcatcher

A focused survey for coastal California gnatcatcher was conducted by Dudek in 2023 (Dudek 2023). No California gnatcatchers were observed during the surveys and they are considered absent from the site.

2.6 Sensitive Natural Communities

CDFW 2018 *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* defines sensitive natural communities as those that are "of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects." CDFW considers a natural community sensitive if it has a Global or State rarity rank of 1-3, which includes communities that are vulnerable (G3/S3), imperiled (G2/S2), and critically imperiled (G1/S1). CDFW uses the alliances and groups described in the Manual of California Vegetation Online to characterize California's natural communities, and provides the California Natural Communities List online (most current is dated September 9, 2020) to list the current global and state rarity rank for each natural community characterized in the

Manual. The native chamise chaparral, California sagebrush – purple sage scrub, and installed sage scrub habitats on the survey area are ranked G5/S5 and are not considered sensitive.

2.7 Protected Oak Trees

According to the Oak Tree Report prepared for the project there are two (2) heritage oaks on the property and eight (8) off-property protected oaks (including 2 heritage oaks) within the 200-foot survey buffer. The location of the protected oaks Tree Protective Zones is in Figure 5.

2.8 Hydrology and Jurisdictional Features

According to the Jurisdictional Delineation report for the project, the project site is located within the Santa Clara watershed (HUC8) and within the Sand Canyon – Santa Clara River sub-watershed (HUC12). As shown in Figure 5, there are three ephemeral drainages in the survey area, two of which cross through the northern portion of the project site and one of which occurs in the 200-foot buffer surrounding the project site in the northeast. These drainages are named Ephemeral Drainages #1, #2, and #3 and Table 2 below summarizes the size of these drainages in the survey area.

Table 2. Summary of Jurisdictional Features in the Survey Area

Feature	Linear Feet	Wetlands (acres)	Non-Wetland Waters of the State RWQCB/CDFW (acres)	Permanent Impacts (square feet/linear feet)	Temporary Impacts (square feet/linear feet)
Ephemeral Drainage #1	1,315	0	0.33	15/10	206/20
Ephemeral Drainage #2	1,015	0	0.23	0	105/10
Ephemeral Drainage #3	350	0	0.13	1,175/67	0
Total	2,680	0	0.69	1190/77	311/30

These drainages flow into underground culverts at the northeastern portion of the survey area and outlet into a concrete-lined drainage channel just north of Avenue of the Oak and just east of Green Terrace Drive. The channel flows east along Avenue of the Oaks and then bends northeast through Friendly Valley Golf Course, and finally flows through a culvert under Via Princessa and into the Santa Clara River. This path is shown as a blue line by the National Wetland Inventory data shown in Figure 6. The Santa Clara River outlets to the Pacific Ocean approximately 45-miles to the southwest of the survey area. All three ephemeral drainages are considered non-wetland waters of the state under the jurisdiction of the Regional Water Quality Control Board (RWQCB) and the CDFW.

2.9 Habitat Linkages and Wildlife Migration Corridors

According to the South Coast Missing Linkages project, the survey area is not within an important habitat linkage or wildlife migration corridor. The survey area is approximately 1.5-miles north of the Santa Susana Mountains, which is an important linkage and migration corridor, but Antelope Valley Highway (14), Sierra Highway, and Golden Valley Road south of the survey area sever the connection between the two habitat areas. In addition, the survey area is surrounded by developments such as the Golden Valley High School to the west, residential neighborhoods to the north and east, and Golden Valley Road to the south which limit wildlife movement and isolate the survey area from open space in the Santa Susana Mountains to the south. For these reasons, the survey area is not considered an important habitat linkage or migration corridor for wildlife.

3. Impacts Analysis and Recommendations

For the purposes of this report, impacts to protected biological resources are analyzed within the context of the regulatory setting. Below is an overview of the federal, state, and local regulations pertaining to protected biological resources on the survey area, and an analysis of impacts to those resources that may occur as a result of the proposed development follows.

3.1 Regulatory Setting

Federal Regulations

Endangered Species Act

The Federal Endangered Species Act (FESA) of 1973 defines an endangered species as "any species which is in danger of extinction throughout all or a significant portion of its range." A threatened species is defined as "any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range." Under provisions of Section 9(a)(1)(B) of the FESA, unless properly permitted, it is unlawful to "take" any listed species. "Take" is defined in Section 3(18) of FESA: "...harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Further, the USFWS, through regulation, has interpreted the terms "harm" and "harass" to include certain types of habitat modification as forms of "take." These interpretations, however, are generally considered and applied on a case-by-case basis and often vary from species to species. In a case where a property owner seeks permission from a federal agency for an action which could affect a federally listed plant or animal species, the property owner and agency are required to consult with USFWS pursuant to Section 7 of the FESA if there is a federal nexus, or pursuant to Section 10 of the FESA. Section 9(a)(2)(b) of the FESA addresses the protections afforded to listed plants.

Clean Water Act Sections 404 and 401

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged and fill material into Waters of the United States, including wetlands. Activities in Waters of the US or wetlands regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into Waters of the US or wetlands.

Section 401 of the CWA requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States (such as a Clean Water Act Permit

under Section 404), must obtain a state water quality certification stating that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit may be issued by a federal agency until certification required by section 401 has been granted. Further, no license or permit may be issued if certification has been denied.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) protects individuals as well as any part, nest, or eggs of any bird listed as migratory. In practice, federal permits issued for activities that potentially impact migratory birds typically have conditions that require pre-disturbance surveys for nesting birds. In the event nesting is observed, a buffer area with a specified radius must be established, within which no disturbance or intrusion is allowed until the young have fledged and left the nest, or it has been determined that the nest has failed. If not otherwise specified in the permit, the size of the buffer area varies with species and local circumstances (e.g., presence of busy roads, intervening topography, etc.), and is based on the professional judgment of a monitoring biologist. A list of migratory bird species protected under the MBTA is published by USFWS.

California Regulations

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. CEQA applies to certain activities of state and local public agencies. A public agency must comply with CEQA when it undertakes an activity defined by CEQA as a "project." A project is an activity undertaken by a public agency or a private activity which must receive some discretionary approval (meaning that the agency has the authority to deny the requested permit or approval) from a government agency which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment.

An Initial Study (IS) is prepared when a proposed action is determined to be a "project" under CEQA. The IS is a checklist that asks specific questions about the project's level of environmental impacts in many categories, including biological resources. The checklist includes a series of questions to determine the projects level of potential impacts in each of the categories. The CEQA Checklist includes the following questions regarding biological resources:

- *Would the project:*
    - *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?*

- *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?*
- *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?*
- *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*
- *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance*
- *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*

Potential level of impact choices includes: No Impacts, Less Than Significant Impact, Less Than Significant with Mitigation Incorporated, and Potentially Significant Impact. For projects that have no impact or less than significant impact a Negative Declaration is prepared, for those with Less Than Significant with Mitigation Incorporated prepare a Mitigated Negative Declaration, and for those with a Potentially Significant Impact prepare an Environmental Impact Report (EIR).

State of California Fish and Game Code Section 1600

Fish and Game Code Section 1602 outlines the Lake and Streambed Alteration Agreement (LSAA) permitting process, and states:

- An entity shall not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake*, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake

Fish and Game Code Section 1602 requires any entity (defined as any person, State or local governmental agency, or public utility) to notify the CDFW before beginning any activity that will do one or more of the following:

- substantially divert or obstruct the natural flow of and river, stream, or lake, or
- substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake*, or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

A permit, known as a Lake or Streambed Alteration Agreement, from CDFW is required to conduct any of the activities described above.

State of California Fish and Game Code Section 3500

Section 3503.5 of the California Fish and Game Code states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes or Strigiformes (birds of prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Activities that result in the abandonment of an active bird of prey nest may also be considered in violation of this code. In addition, California Fish and Game Code, Section 3511 prohibits the taking of any bird listed as fully protected, and California Fish and Game Code, Section 3515 states that is it unlawful to take any non-game migratory bird protected under the MBTA.

California Migratory Bird Protection Act

The California Migratory Bird Protect Act (MBPA) was enacted in September 2019 to reinforce the MBTA at the state level. The Act states:

- "It is unlawful to take or possess any migratory nongame bird as designated in the federal Migratory Bird Treaty Act (16 U.S.C. Sec. 703 et seq.) before January 1, 2017, any additional migratory nongame bird that may be designated in that federal act after that date, or any part of a migratory nongame bird described in this section, except as provided by rules and regulations adopted by the United States Secretary of the Interior under that federal act before January 1, 2017, or subsequent rules or regulations adopted pursuant to that federal act, unless those rules or regulations are inconsistent with this code." This section is inactive on January 20, 2025 and the following language below will be adopted.

- "It is unlawful to take or possess any migratory nongame bird as designated in the federal Migratory Bird Treaty Act (16 U.S.C. Sec. 703 et seq.), or any part of a migratory nongame bird described in this section, except as provided by rules and regulations adopted by the United States Secretary of the Interior under that federal act." This section is operative starting on January 20, 2025.

Local Regulations

City of Santa Clarita General Plan

The City of Santa Clarita General Plan Conservation and Open Space Element requires conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources; and includes provisions for preservation of open space. The plan includes measures to minimize impacts to new development on biological resources that includes siting the project away from wetlands,

streams, and other sensitive resources as well as limiting night lighting, and avoiding developing wildlife movement corridors and habitat linkages, as well as other measures to preserve the value of biological resources.

City of Santa Clarita Oak Tree Preservation Ordinance

According to the City of Santa Clarita Oak Tree Preservation Ordinance no person "shall cut, prune, remove, relocate, endanger, damage or encroach into the protected zone of any oak tree" that is 6-inches in circumference when measured at a point 4.5-feet above the tree's natural grade "except in accordance with the conditions of a valid oak tree permit issued by the City". An oak tree report conforming to the City of Santa Clarita Oak Tree Preservation and Protection Guidelines is required for a permit application. Heritage oaks are further protected by the ordinance, which is defined as an oak with a circumference of 108-inches for one stem or 72-inches for each stem of a multi-stem tree.

3.2 Project Impacts and Recommended Mitigation

Plant Community Impacts

The impacts to plant communities are summarized in **Table 3**. The proposed development would impact 12.7-acres of California sagebrush-(purple sage) scrub, 1.10-acres of chamise chaparral, 0.38-acre of installed sage scrub, 8.49-acres of ruderal areas, and 1.88-acres of developed areas. Special-status plants and animals are known to occur or have the potential to occur on the native chaparral and scrub habitats, and the trees on the survey area.

Table 3. Summary of Impacts to Plant Communities

Plant Community	Structures & Buildings (acres)	Roads (acres)	Slope Control (acres)	Hiking Trail (acres)	Total Impacts (acres)
California sagebrush – (purple sage) scrub	6.31	1.31	5.08	0	12.70
Chamise Chaparral	0.51	0	0.53	0.06	1.10
Installed Sage Scrub	0	0.04	0.34	0	0.38
Ruderal	3.88	0.71	3.81	0.09	8.49
Developed	0.98	0.15	0.75	0	1.88
Total	11.68	2.21	10.51	0.15	24.55

According to the City of Santa Clarita General Plan developments impact biological resources by reducing habitat and foraging grounds, increasing nighttime lighting and noise, causing air and water pollution, changing ambient air and water temperatures, introducing invasive species and household pets into native habitats, and generating off-road vehicle use, all of which would result from constructing the proposed project. The following Recommended Mitigation Measure #1

includes measures recommended in the General Plan (CO-35 *Development Impacts on Biological Resources* section) and recommended by the US Green Building Council as part of its LEED program that will minimize impacts of the project on biological resources. These design measures are meant to generally lower the biological impacts of the project and are a requirement of the General Plan, and are not to mitigate significant impacts to a specific resource per CEQA.

Recommended Mitigation Measure #1: Project Design Measures to Reduce Impacts to Biological Resources

- Provide a high ratio of open space to development footprint to promote biodiversity. LEED recommends vegetated open space equal to 20 percent of the project's site area, which may include vegetated roof areas ("green roofs"). Pedestrian-oriented hardscape areas may also be included, provided they use permeable paving or include vegetated open space. Wetlands, vegetated swales, and ponds may also be included to meet open space requirements. Open space provides habitat for vegetation, which in turn provides habitat for local wildlife. Even small open spaces in urban areas can provide refuges for wildlife populations, which have become increasingly marginalized. Plants that specifically support local species such as insects and other pollinators can help sustain populations up the food chain.

- Use vegetated open space to reduce the urban heat island effect, increase stormwater infiltration, and provide the human population on the site with a connection to the outdoors.

- Provide connections between vegetated open space areas within a site and between adjacent sites; avoid isolated landscaped areas surrounded by paving to the extent possible.

- Minimize nighttime lighting to the extent possible, while maintaining adequate security lighting. Outdoor lighting is necessary for illuminating connections between buildings and support facilities such as sidewalks, parking lots, and roadways. However, light trespass can affect the nocturnal ecosystem and light pollution limits night sky access. Establishing time limits and maximum illumination levels for nighttime hours when businesses are closed is recommended to cut light pollution.

- When possible, prohibit new development within 100 feet of any wetlands as defined by federal, state or local regulations, or within 50 feet of a water body, including lakes, rivers and streams; or within any areas identified as habitat for threatened or endangered species, including wildlife corridors.

- For new development proposed on previously undeveloped sites ("greenfields"), perform a site survey to identify biological resources, and plan for resource protection in the site design. On sites where habitat areas are to be protected, establish disturbance boundaries

during construction; delineate stockpiles, lay- down, recycling and disposal areas. Use paved areas for staging, and erect construction fencing around the drip line of existing trees to protect them from soil compaction by construction vehicles.

- Minimize site disturbance to the extent feasible and restore previously degraded areas to their natural state. Preserve and enhance natural site elements, including water courses, trees and native vegetation, where possible.

- Choose appropriate native or adapted plant materials, and prohibit invasive or noxious weed species. Native and adapted plants require minimal or no irrigation following establishment, do not require active maintenance such as mowing or chemical inputs such as fertilizers, pesticides or herbicides, and provide habitat value and promote biodiversity through avoidance of monoculture plantings. Replace turf-grass with native or adapted plantings to promote biodiversity and habitat.

- Reduce the amount of site area devoted to paving when not functional or necessary, and replace paving with landscaped areas.

- Use landscaping to shade buildings and impervious areas, decrease cooling loads and energy expenditures, and reduce the heat-island effect. The term heat island refers to urban air and surface temperatures higher than nearby rural areas. Many cities have air temperatures up to 10 degrees (Fahrenheit) warmer than the surrounding natural landscape. Heat islands form as cities replace natural landscape with pavement, buildings, and other infrastructure. The heat island effect can be lowered by reducing the amount of surface parking lots and by replacing heat-absorbing surfaces with plants, groundcover, small trees, and green roofs. Some cities have developed parking areas below green space to reduce the overall heat island effect and provide for greater pedestrian connectivity.

- Minimize erosion to protect habitats and reduce stress on natural water systems by preserving vegetation and limiting development on any slopes greater than 15 percent.

Nesting Birds

The proposed development would require removal of trees, shrubs, and herbaceous plants that provide potential nesting habitat for birds protected by the MBTA, MBPA, and the Fish and Game Code. If present at the time of vegetation removal, active nests, eggs, or young could be destroyed or otherwise disturbed to a point at which the young do not survive, which would be a violation of the MBTA, MBPA, and the Fish and Game Code. In addition, indirect impacts from noise or vibration has the potential to disturb an active bird nest to the point of failure if the nest is within immediate proximity to project activities, and this would also be a violation of the MBTA and Fish and Game

Code. To avoid impacts to active bird nests, eggs, or young, preconstruction nesting bird surveys and monitoring is required as described in Regulatory Compliance Measure #2 below.

Regulatory Compliance Measure #2: Preconstruction Nesting Bird Survey

- If possible, ground disturbing activities and vegetation removal should be timed to occur between September 1 – January 31, which is outside the bird nesting season.

- If ground disturbing activities or vegetation removal (including tree trimming) are scheduled between February 1 – August 31, which is the bird nesting season, two preconstruction surveys for nesting birds should be conducted. One within 7 days prior to construction activity and the second within 72 hours prior to construction activities. The surveys should be conducted by a qualified biologist with prior experience conducting nesting bird surveys for construction projects. The survey area should include the affected area and suitable habitat within a 300-foot buffer, or a buffer size determined by the qualified biologist based on level of proposed disturbance and access. If no active nests are found, no additional measures are required.

- If active nests are found the biologist will map the location and document the species and nesting stage. A no-work buffer will be established around the active nest as determined by the qualified biologist and based on the species sensitivity to disturbance and the type and duration of the disturbance. No construction activities shall occur within the no-work buffer until the biologist has determined the nest is no longer active.

Special-Status Plants

Based on the findings of a focused rare plant survey no special-status plants occur on the project site and none would be impacted by the project.

Special-Status Animals

Cooper's Hawk, Southern California Rufous-Crowned Sparrow, & Bell's Sage Sparrow

Cooper's Hawk, southern California rufous-crowned sparrow, and Bell's sage sparrow are all California watchlist bird species, and Bell's sage sparrow is also a USFWS bird of conservation concern. Cooper's hawk has been observed using the oak trees in the northern areas on the project site during surveys conducted there for this report, and the sparrows both have a high potential to occur on the scrub habitats on the survey area. These habitats have a Global and State Rarity Ranking of 5, indicating that they area widespread, abundant, and secure. Therefore, similar habitat is available and abundant in other surrounding areas and in the region, and no significant impacts would occur to the these species from loss of habitat.

However, these birds are considered vulnerable during nesting season. If present at the time of vegetation removal, active nests, eggs, or young could be destroyed or otherwise disturbed to a point at which the young do not survive, which would be a violation of the MBTA, MBPA, and the Fish and Game Code. In addition, indirect impacts from noise or vibration has the potential to disturb an active bird nest to the point of failure if the nest is within immediate proximity to project activities, and this would also be a violation of the MBTA and Fish and Game Code. To avoid impacts to active nests, eggs, or young, preconstruction nesting bird surveys and monitoring described in Regulatory Compliance Measure #2 above is sufficient to avoid impacts to Cooper's hawk, southern California rufous-crowned sparrow, and Bell's sage sparrow.

Coastal California Gnatcatcher

A focused survey for coastal California gnatcatcher was conducted for the project and the species was determined to be absent from the project site and impact areas. Therefore, the project would have no impact to coastal California gnatcatcher.

Crotch Bumble Bee

Crotch bumble bee is a candidate for listing as endangered in California, and the species' food plants in the genera *Eriogonum*, such as California buckwheat, occur in the native habitats on the survey area, and therefore the species has a high potential to occur. If present during construction of the project this species would fly away to areas away from construction and no direct impacts would occur. The habitats that this species could use on the project site have a Global and State Rarity Ranking of 5, indicating that they area widespread, abundant, and secure. Therefore, similar habitat is available and abundant in other surrounding areas and in the region, and loss of this habitat would not be a significant impact to crotch bumble bee as a result. There is a potential for Crotch's bumblebee nests in the ground near foraging habitat. These nests are occupied and bumblebee colonies are active from April to August. If construction is occurring in these months impacts to Crotch' s bumblebee nests could occur. Protocol-level surveys and measure to avoid or mitigate potential impacts to Crotch's bumblebee are required as described in Mitigation Measure #3, which would reduce potential impacts to a less than significant level.

<u>Mitigation Measure #3: Crotch's Bumblebee Surveys and Avoidance</u>

- A qualified biologist shall conduct a habitat assessment to determine if the Project site or its immediate vicinity contains habitat suitable to support CBB. Potential nesting sites, which include all small mammal burrows, perennial bunch grasses, thatched annual grasses, brush piles, old bird nests, dead trees, and hollow logs would need to be documented as part of the assessment. If potentially suitable habitat is identified, a qualified biologist conduct focused surveys for CBB, and their requisite habitat features following the methodology

outlined in the Survey Considerations for California Endangered Species Act Candidate Bumble Bee Species (CDFW,2023).

- If CBB is detected, then all small mammal burrows and thatched/bunch grasses will be avoided by a minimum of 50 feet to avoid take and potentially significant impacts. If ground-disturbing activities will occur during the overwintering period (October through February), consultation with CDFW is warranted to discuss how to implement Project activities and avoid take. Any detection of CBB prior to or during Project implementation warrants consultation with CDFW to discuss how to avoid take.
- If CBB is detected, either during surveys or during Project construction, and take cannot be avoided, take authorization through the acquisition of an ITP, pursuant to Fish and Game Code section 2081 subdivision (b) is necessary to comply with CESA.

Western Mastiff Bat

Western mastiff bat is a California species of special concern and is a BLM Sensitive species. Preferred roosting habitat includes rock crevices, buildings, and trees, and the species need surrounding open habitats for foraging. This species is known to occur in a variety of habitats in California, and the house and tall trees surrounding the house provide potential roosting habitat for this species. If maternity roosts are disturbed during construction of the project that would be a significant impact according to CEQA. Preconstruction surveys for roosting bats and avoidance buffers are proposed in Mitigation Measure #4 to avoid or reduce impacts to western mastiff bat to a less than significant level.

Mitigation Measure #4: Roosting Bat Surveys and Avoidance Measures

- Construction activities shall occur outside the bat maternity season which occurs between April 1 through August 31, as feasible. Should construction timing not allow for it, a special-status bat habitat assessment survey shall be conducted by a qualified biologist no more than 5 days prior to any construction activities during the bat maternity season. The survey will document any evidence of special-status bat species that may occur in proposed work areas through direct observation (e.g., roosting bats) and/or sign (e.g., bat guano).

- If no observance and/or sign of special-status bats are detected during these surveys, then construction-related activities may proceed. If observance or sign of special-status bat species are detected during the survey, and construction activities occur during the bat maternity season (April 1 through August 31), special-status bat species emergence survey(s) will be conducted. Emergence surveys will be conducted in areas of suitable bat habitat (e.g., near buildings or trees) during the bat maternity season to document any special-status bat species emerging from features identified during the habitat assessment survey. Generally,

the emergence survey(s) will be conducted approximately one hour prior to sunset and last a minimum of two hours after sunset; however, the timing will be determined by the qualified biologist.

- Passive acoustic monitoring equipment will be utilized during the emergence surveys to identify bats to the species level. In the event multiple features were identified in the habitat assessment in which bats may occur, at the discretion of the qualified biologist, either multiple emergency surveys may be necessary or additional acoustic equipment may need to be set up in order to capture the acoustics of bats as they emerge at dusk.

- Roosting sites documented within or adjacent to a project site during the maternity season shall be avoided. Specifically, the qualified biologist will determine an appropriate buffer around the roost site where construction shall be avoided. The buffer typically ranges in size, between 100 to 300 feet around the roost site, depending on potential resulting project impacts and surrounding terrain. For example, if a project will result in high noise decibels and the roost site is exposed without surrounding trees or hills, the buffer may be increased to reduce disturbances to the roosting bats during breeding activities. Buffer distances may also be at the discretion of the USFWS and/or CDFW if special-status bat species are present in the maternity roost.

- Should special-status bat species be documented within a project site, and the roost site cannot be avoided by the project, a bat mitigation and/or management plan shall be developed for roost relocation. Mitigation and management plans will require consultation with and approval from the USFWS and/or CDFW prior to the commencement of construction.

Vasquez Shoulderband Snail

Vasquez shoulderband snail is tracked by the CDFW in the CNDDB at that is why it is in this project's analysis, but little is known about the life history of this species and it does not have a federal, state, or other protected status. Therefore, Vasquez shoulderband snail is not yet considered rare, threatened, or endangered, and impacts to this species would not be considered significant according to CEQA.

Coastal Whiptail, Coast Horned Lizard, and San Diego Desert Woodrat

Coastal whiptail, coast horned lizard, and San Diego desert woodrat are California species of special concern. Coastal whiptail was observed in the survey area during surveys conducted by LDC biologists in 2013, and coast horned lizard and San Diego desert woodrat have a high potential to occur on the native habitats there. If these species are present during construction, they could be

crushed or injured. To reduce the impacts to these lizards to a less than significant level, preconstruction surveys for terrestrial wildlife is proposed in Mitigation Measure #5 below.

Mitigation Measure #5: Preconstruction Surveys and Salvage of Special-Status Lizards and Mammals

- Surveys for coastal whiptail, coast horned lizard, and San Diego desert woodrat should be conducted within 48-hours prior to initiation of construction activities that would remove native vegetation. During the survey, individual lizards and woodrats will be captured (if possible) and removed from the impact area, and will be released into a predetermined area outside of construction and in the vicinity. The salvage program will continue while a biologist is monitoring the initial ground disturbance activities and will conclude when all of the habitat areas in the grading limits have been graded.
- A salvage plan that includes details of the methods used during the preconstruction salvage shall be prepared and submitted to CDFW for review prior to implementation of the project.

Jurisdictional Resources

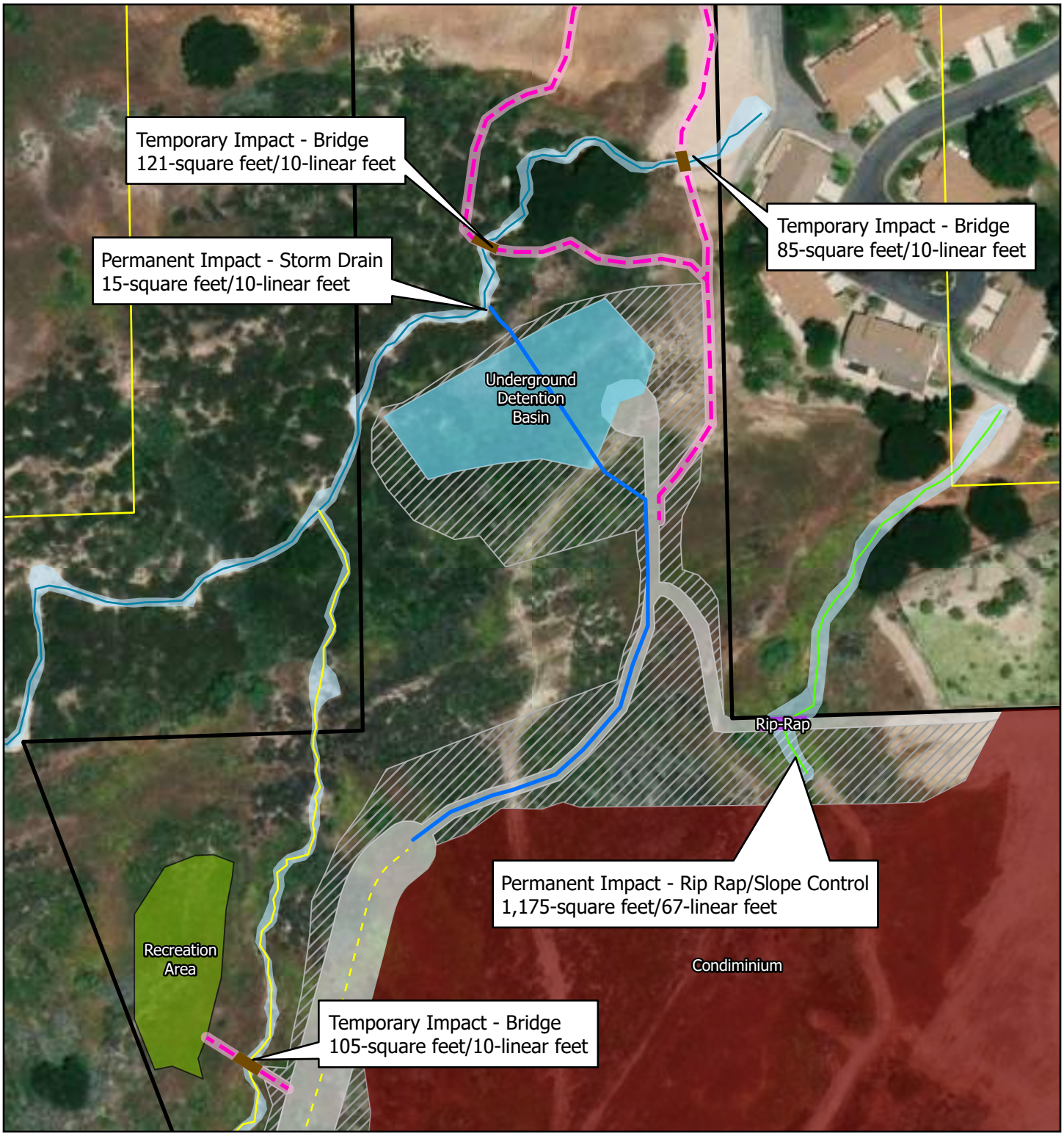
Permanent Impacts: As shown in Figure 6 and summarized in Table 2 above, the proposed development would result in a total permanent impact to 1,190-square feet (77-linear feet) of CDFW and RWQCB features from construction as follows:

- 15-square feet (10-linear feet) of Drainage #1 where the proposed storm drain outlet would be placed within the drainage. This drain may also outlet overflow water into the drainage.

- 1,175-square feet (67-linear feet) of Drainage #3 where the proposed fire access road, rip rap, and slope control associated with the new condominiums would be permanently developed at the south end of the drainage.

Temporary Impacts: As shown in Figure 8 and summarized in Table 2 above, the proposed development would result in a total of 311-square feet (30-linear feet) of temporary impacts to CDFW and RWQCB features from construction as follows:

- 105-square feet (10-linear feet) of pedestrian bridge will be constructed over the top of Drainage #2 between the proposed road and recreation area. The bridge would not fill the stream, and the stream would remain entirely intact beneath the bridge with no obstruction of the flow during construction or operation of the project.



Source: ESRI Aerial Imagery 2025

Santa Clarita VTTM 68203 Project

Figure 8. Impacts to Jurisdictional Features

0 75 150 Feet

N

- Project Boundary
- Survey Area - 200-foot Buffer

Proposed Development

- Riding/Hiking Trail
- Drainage Pipe
- Road Centerline
- Hikinig Trail
- Condiminium
- Underground Detention Basin
- Hotel
- Senior Assisted Living
- Recreation Area
- Rip-Rap
- Bridge
- Road
- Slope Control

Jurisdictional Features

- Ephemeral Drainage #1
- Ephemeral Drainage #2
- Ephemeral Drainage #3
- Streambed / OHWM

SOUTH ENVIRONMENTAL

- 121-square feet (10-linear feet) of pedestrian/horse bridge will be constructed over the top of Drainage #1 immediately north of the proposed underground detention basin.. The bridge would not fill the stream, and the stream would remain entirely intact beneath the bridge with no obstruction of the flow during construction or operation of the project.
- 85-square feet (10-linear feet) of pedestrian/horse bridge will be constructed over the top of Drainage #1 northeast of the proposed underground detention basin. The bridge would not fill the stream, and the stream would remain entirely intact beneath the bridge with no obstruction of the flow during construction or operation of the project.

The impacts from construction of the bridges would be temporary and only occur during construction. Following construction, the drainages would be unaffected by the new development and will function exactly as they do now. The bed and bank would not be altered as the footings for the bridge would be outside of the bank in upland areas that would not alter drainages in any way The discharged water from the underground detention basin will be treated prior to discharge which will reduce the potential for contaminants in the water, and the amount of discharged water would be similar to pre-construction runoff that would naturally runoff into the drainages. Nonetheless, these temporary and permanent impacts would be considered significant according to Porter Cologne Act and Section 1600 of the Fish and Game Code and permits and mitigations will be required to construct the project to reduce the impacts to a less than significant level.

Regulatory Compliance Measure #6. RWQCB and CDFW Permitting Impacts to Jurisdictional Features

- Report of Waste Discharge under California Water Code Section 13260 from the RWQCB, and a Streambed Alteration Agreement from the CDFW should be obtained prior to start of project activities.

- Permit conditions that may be required to compensate for impacts to jurisdictional features may include one or more of the following:

    - Restoration of temporarily impacted drainages.

    - On-site creation of jurisdictional areas of equal size and quality to what is impacted.

    - Enhancement of habitat in remaining jurisdictional areas at a ratio of 2:1 or greater.

    - Creation of jurisdictional habitat offsite where none currently exists.

    - Preservation of offsite jurisdictional habitat of similar size and quality through the direct purchase of credits from an approved conservation bank.

- A Storm Water Pollution Prevention Plan (SWPPP) will be prepared for the project and approved by the County prior to initiating project activities. Monitoring of the SWPPP measures by a qualified individual should be done monthly during the summer and weekly during the winter, and after each rain event. A monitoring report will be prepared and submitted to the County bi-annually or when measures are not being adequately implemented, as determined during monitoring.

Recommended Best Management Practices (BMPs)

- To prevent downstream impacts from residential runoff, onsite rainfall (the first 0.75-inches) must be captured and treated prior to release into the Santa Clara River watershed in accordance with Santa Clarita City Code Chapter 17.95: Standard Urban Stormwater Mitigation Plan Implementation. To achieve this, the following BMPs should be implemented:

    - Direct rooftop runoff to the yards or vegetated areas.
    - Lot runoff shall be infiltrated from the graded pad areas through on-site permeable soils in natural canyons and drainages.
    - Provide one-foot wide by one-foot deep gravel strip between back of driveway and sidewalk.
    - Use permeable materials for private sidewalks, private driveways, and private parking lots.
    - Convey runoff from the tops of slopes and stabilize disturbed slopes with landscaping per County standards.
    - Revegetate slopes with native drought tolerant plants to minimize erosion.
    - Infiltrate the runoff from off-site tracts through on-site debris basin bottoms.
    - Use extended detention facilities, which are dry between storms. During a storm, the basin fills and a bottom outlet releases the storm water slowly to provide time for sediments to settle.
    - Use biofilters such as a swale or a vegetated strip, where feasible. A swale is a vegetated channel that treats concentrated flow. A street strip (e.g. a parkway) treats flow and is placed parallel to the contributing surface.
    - Use infiltration systems on-site to capture and filter the first 0.75 inch of rainfall and all regular "nuisance" runoff. Infiltration refers to a family of systems in which the majority of the runoff from small storms is infiltrated into the ground rather than discharged to a surface water body. Infiltration methods include ponds, vaults, trenches, dry wells, porous pavement, concrete grids, and bioswales.
    - Street runoff shall be collected into catch basins with filtration units that remove floating debris, solids, and soluble/insoluble pollutants; such as deflection separator

units, oil/water separators, and/or media filters prior to outlet onto natural alluvial areas for infiltration.
- All catch basins and inlets shall be stenciled with "Warning! Drains to Ocean" notes and symbols per NPDES BMP standards, as approved by the Department of Public Works.
- Utilize riprap at the outlets of storm drains, culverts, and conduits to minimize erosion.

Protected Oak Trees

The Tree Protected Zones (TPZs) for all the oaks in the survey area are outside of the proposed construction and no impacts are expected to occur from construction. All the oaks would remain in place following the project. TPZs of two large oaks in the north area of the project site (shown in Figure 5 above) are 15-feet north of the proposed hiking and riding trail and 75-feet north of the underground detention basin and these trees could be endangered by project equipment if it goes outside of the proposed construction area. The proposed hiking and riding trail would be 8-feet wide and would remain 15-feet from onsite oaks TPZs, and therefore, no direct impacts are anticipated. To avoid impacts to on-site protected oaks the tree protective fencing in Mitigation Measure #7 shall be implemented, and to avoid impacts to off-site oak trees Mitigation Measure #7 that requires fencing at the limits of grading would result in avoidance of impacts to protected oak trees.

Mitigation Measure #7: Tree Protective Fencing

- Tree protective fencing that is at least 6-feet tall chain-link fencing should be placed at the TPZ of on-site oak trees near the proposed hiking trail. The fencing should be placed at least 5-feet from the dripline of the oaks and should be approved by a certified arborist prior to start of project activities. The fencing should remain in place throughout project construction, and should be monitored by a certified arborist on at least a monthly basis to ensure its continued effectiveness.

- The limits of grading shall be fenced so that construction equipment does not impact areas outside the approved grading limits.

Wildlife Movement Corridors and Habitat Linkages

As described in Section 2.9, the survey area is not considered an important habitat linkage or migration corridor for wildlife. Therefore, no impacts to wildlife movement corridors or habitat linkages will occur from the project construction or operation.

Cumulative Impacts

The project site is sited in between existing developments in an urbanized area, and the onsite native habitats have a Global and State Rarity Ranking of 5, indicating that they are widespread, abundant, and secure. Therefore, similar habitat is available and abundant in other surrounding areas and in the region. In addition, implementation of Mitigation and Regulatory Compliance Measures described in this section would result in the avoidance, minimization, or mitigation of impacts to nesting birds, special-status species, jurisdictional features, and protected oak trees to a less than significant level when considered alone or cumulatively.

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Appendix A

Photograph Log and Site Plan



Image 1: Depicts the California sagebrush-(purple sage) scrub habitat and slopes in the center of the survey area. Taken from the N part of the driveway facing N.



Image 2: Depicts the installed sage scrub in the SE portion of the survey area. Photo taken from the E point of the driveway facing SE.



Image 3: Depicts the house, driveway, and landscaped trees. Photo taken from the W end of the driveway near the house facing E.



Image 4: Depicts the chamise chaparral (dark plant community in back) surrounding the ephemeral drainage in the northern portion of the site. Taken from a dirt road near the N end of the survey area facing NW.



Image 5: Depicts the ruderal areas and sage scrub habitat surrounding Ephemeral Drainage #2 in the western edge of the survey area. Photo taken from the center of the survey are a facing SW.



Image 6: Depicts Ephemeral Drainage #1 where it flows away from the coast live oaks (on left) in the north end of the survey area and enters an underground culvert. Photo taken from the northern end of the survey area facing N.

TENTATIVE TRACT MAP No. 68203

LOCATED IN THE CITY OF SANTA CLARITA
STATE OF CALIFORNIA



LEGEND

- ③ – APPROXIMATE OVER-EXCAVATION
- ④ – APPROXIMATE REMEDIAL REMOVAL DEPTH
- Afu – ARTIFICIAL FILL-UNDOCUMENTED
- Cf – CERTIFIED FILL
- Qal – QUATERNARY ALLUVIUM (REMOVE ALL)
- Qls? – LANDSLIDE DEBRIS, QUERIED WHERE UNCERTAIN
- Qols – OLDER LANDSLIDE DEBRIS, CIRCLED WHERE BURIED
- Tsr – SAUGUS FORMATION, SUNSHINE RANCH MEMBER
- APPROXIMATE GEOLOGIC CONTACT
- APPROXIMATE DESIGN KEYWAY LOCATION
- LOCATION OF RESTRICTED USE AREA

LEGEND & ABBREVIATIONS:

- H.O.A. – HOMEOWNERS ASSOCIATION
- BVC – BEGINNING OF VERTICAL CURVE
- C.B. – CATCH BASIN
- ℄ – CENTER LINE
- DRWY – DRIVEWAY
- EL/ELEV – ELEVATION
- EVC – END OF VERTICAL CURVE
- EX./EXIST. – EXISTING
- FL – FLOW LINE
- FS – FINISH SURFACE
- GB – GRADE BREAK
- HP – HIGH POINT
- MIN. – MINIMUM
- MH – MANHOLE
- O.S. – OPEN SPACE
- PE – PAD ELEVATION
- PI – POINT OF INTERSECTION
- PL – PROPERTY LINE
- STD. – STANDARD
- TW – TOP OF WALL
- PP – POWER POLE
- TREE
- (LT #) – LOT #
- EX. STREET LIGHT
- OAK TREE WITH 5' PROTECTED ZONE
- OAK TREE TO REMAIN WITHIN 200' OF THE DEVELOPMENT
- (S) – EXISTING SEWER LINE
- (W) – EXISTING WATER LINE
- S – PROPOSED SEWER LINE
- W – PROPOSED WATER LINE
- SD – SD – PROPOSED STORM DRAIN
- GEOLOGICAL BUILDING SET BACK LINE
- DIRECTION OF FLOW
- FH – EXISTING FIRE HYDRANT
- PFH – PROPOSED FIRE HYDRANT (SEE SHEET 2)
- TRACT BOUNDARY
- 1390 – PROPOSED CONTOURS
- 1400 – EXISTING CONTOURS
- STREET & DRIVEWAY CENTERLINE
- DAYLIGHT LINE
- LOT LINE
- 2:1 – PROPOSED SLOPE AS INDICATED
- PROP. CONC. WALL

UTILITIES AND SERVICES:

1. WATER..... SANTA CLARITA WATER DISTRICT
2. SEWER..... SANITATION DISTRICT SANTA CLARITA VALLEY
3. GAS..... SOUTHERN CALIFORNIA GAS COMPANY
4. ELECTRIC..... SOUTHERN CALIFORNIA EDISON COMPANY
5. TELEPHONE..... ATT
6. CABLE TV..... SPECTRUM
7. SCHOOL..... SULPHUR SPRINGS SCHOOL DISTRICT & WILLIAM S HART UNION HIGH SCHOOL DISTRICT

SHEET INDEX

SHEET	DESCRIPTION
1	VTTM TR 68203, NOTES, LOT SUMMERY
2	DETAILED SITE PLAN
3	SECTIONS
4	EXIST. EASEMENT AND LEASE NOTES, LEGEND
5	EXISTING EASEMENTS AND LEGEND
6	EXISTING LEASES AND LEGEND



VICINITY MAP
N.T.S.
Source: 2004 TB Guide, p. 4551, D6 and E6
TRACT No. 061811

GENERAL NOTES:

1. CITY OF SANTA CLARITA GENERAL PLAN DESIGNATION..... MX-N (PD) MIXED USED NEIGHBORHOOD (PLANED DEVELOPMENT OVERLAY)
2. EXISTING ZONING (RESIDENTIAL SUBURBAN)..... MX-N MIXED USED NEIGHBORHOOD
3. PROPOSED ZONING..... MX-N MIXED USED NEIGHBORHOOD
4. AREA..... 28.13 ± AC. GROSS, 27.98 AC. NET
5. GROSS DENSITY (RESIDENTIAL)..... 0.11 D.U./AC.
6. NET DENSITY..... 0.11 D.U./AC.
7. EXISTING LAND USE..... SINGLE FAMILY RESIDENTIAL
8. PROPOSED LAND USE..... MULTI FAMILY, HOTEL, SENIOR ASSISTANT LIVING FACILITY
9. TOTAL NUMBER OF LOTS..... 4
10. TOTAL NUMBER OF RESIDENTIAL LOT/HOTEL..... 3
11. TOTAL NUMBER OF ATTACHED SINGLE FAMILY CONDOMINIUM UNITS..... 73
12. MINIMUM RESIDENTIAL LOT SIZE..... 3.76 AC.
13. AVERAGE RESIDENTIAL LOT SIZE..... 6.84 AC.
14. LOT SIZE AS SHOWN IN TABLE HEREON ARE GROSS & NET ACREAGES
15. UNIT PHASING IS REQUESTED
16. BOUNDARY LINE DIMENSIONS ARE TAKEN FROM RECORD DATA.
17. SUBDIVIDER RESERVES THE RIGHT TO FILE MULTIPLE FINAL MAPS PER SECTION 66456.1 OF THE GOVERNMENT CODE.
18. THE APPLICANT IS REQUESTING THE RIGHT TO ADJUST STREET AND BUILDING PAD ELEVATIONS UP TO 3 FEET ON THE FINAL GRADING PLAN.
19. TOPS AND TOES OF SLOPES ARE SUBJECT TO CHANGE IN FINAL ENGINEERING.
20. MAXIMUM SLOPE GRADE IS 2:1.
21. THE RIGHT IS RESERVED TO ADJUST LOT LINES AND MERGE LOTS ON THE FINAL MAP, SUBJECT TO THE APPROVAL OF THE DIRECTOR OF PLANNING AND BUILDING SERVICES, AND THE DIRECTOR OF COMMUNITY SERVICES AND DIRECTOR OF PUBLIC WORKS.
22. LOT SCHEDULE
    - CONDOMINIUM LOTS (73 UNITS) ____ 1
    - SENIOR ASSISTANT LOT (151 UNITS) ____ 1
    - HOTEL LOTS (60 ROOMS) ____ 1
    - OPEN SPACE LOT (REC. LOT) ____ 1
    - ____ 4
23. ALL INTERNAL TRAILS SHALL BE OWNED AND MAINTAINED BY H.O.A. OR PROPERTY OWNER'S ASSOCIATION
24. PRELIMINARY EARTHWORK QUANTITIES
    BULK CUT: 360,000 C.Y., FILL: 360,000 C.Y.
25. POST "NO PARKING-FIRE LANE" SIGNS ALONG ALL DRIVEWAYS WITH A CURB-TO-CURB WIDTH OF LESS THAN 34 FEET
26. NO GATES WILL BE INSTALLED INSTALLED ON FIRE ACCESS ROADS
27. ALL INTERIOR TRAILS, PASEOS AND OPEN SPACE PARCELS SHALL BE OWNED AND MAINTAINED BY H.O.A. OR PROPERTY OWNER'S ASSOCIATION
28. LANDSCAPE COVERAGE 2.82 AC

NOTES:

1. PROP. CROSS GUTTER PER S.P.P.W.C. STD. PLAN 122-3
2. PROP. MODIFIED CURB RAMP PER S.P.P.W.C. STD PLAN 111-5, CASE-C
3. SAWCUT AND JOIN
4. EXISTING CURB AND GUTTER TO REMAIN
5. REMOVE EXISTING CURB AND GUTTER
6. EXISTING STRUCTURES, FENCES DRIVEWAYS TO BE REMOVED
7. PROPOSED RETAINING WALL (HEIGHT PER PLAN)
8. PROPOSED WALL DRAIN
9. PROPOSED 8' WIDE HIKING TRAIL (H.O.A. MAINTAINED)
10. EXISTING FIRE HYDRANT
11. EXISTING STREET LIGHT TO REMAIN
12. EXISTING STREET LIGHT TO BE RELOCATED
13. PROPOSED RELOCATED STREET LIGHT LOCATION
14. PROPOSED STORM DRAIN (PUBLICLY MAINTAINED)
15. PROPOSED SEWER CONNECTION TO PC. 02-13
16. PROPOSED WATER CONNECTION
17. EXISTING 8" VCP SEWER PER PC. 02-13
18. EXISTING 12" PVC WATER MAIN
19. EXISTING 36" RCP PER MTD NO. 1699
20. EXISTING 36" RCP PER MTD NO. 1614
21. EXISTING 36" RCP PER MTD NO. 1671
22. EXISTING 36" RCP TO BE RELOCATED MTD NO. 1614
23. PROPOSED DRIVEWAY APPROACH, PER S.P.P.W.C. STANDARD PLAN 110-2, TYPE-C
24. PROPOSED 10' WIDE WESTBOUND U-TURN LANE
25. EXISTING TRAFFIC SIGNALS/SIGNS TO BE MODIFIED FOR U-TURN LANE
26. PROPOSED BUS STOP WITH 10'x25' CONCRETE PASSENGER WAITING PAD BEHIND SIDEWALK WITH SHELTER, BENCH AND TRASH RECEPTACLE, SHALL BE APPROVED BY CITY TRANSIT STAFF. (BUS STOP TURNOUT/PULLOUT DIMENSIONS TO BE DETERMINED BY THE DEPARTMENT OF PUBLIC WORKS AND THE CITY TRANSIT DIVISION)
27. PROPOSED KEYSTONE WALL
28. PROPOSED STREET DEDICATION
29. PROPOSED PEDESTRIAN BRIDGE/WALKWAY
30. PROPOSED 8" WATER MAIN (PRIVATELY MAINTAINED)
31. PROPOSED SEWER MAIN (PRIVATELY MAINTAINED)
32. PROPOSED UTILITY EASEMENT
33. SLOPE TO BE MAINTAINED BY H.O.A.
34. PROPOSED STORM DRAIN EASEMENT
35. PROPOSED SEWER MAIN (PUBLICLY MAINTAINED)
36. EXISTING DRIVEWAY TO BE REMOVED, REPLACED WITH SIDEWALK, CURB AND GUTTER
37. PROPOSED SPLASH WALL
38. PROPOSED PARKING STALLS (9'x18')
39. PROPOSED DELIVERY/LOADING STALLS (12'x20')
40. PROPOSED STORM DRAIN (PRIVATELY MAINTAINED)
41. PROPOSED EV STATION
42. PROPOSED LONG TERM/SHORT TERM BICYCLE PARKING
43. PROPOSED EMPLOYEE BREAK AREA
44. PROPOSED TRASH ENCLOSURE
45. PROPOSED DROPOFF AREA
46. REMOVE EXISTING OPENING, CONST. CURB AND GUTTER
47. PROPOSED 20' WIDE LEFT TURN OPENING OR PER TRAFFIC ENGINEER RECOMMENDATION
48. RIGHT TURN ONLY
49. PROPOSED PUBLIC 6"x4"x2 1/2" FIRE HYDRANT PER AMERICAN WATERWORKS ASSOCIATION STANDARDS, C503. FIRE FLOW REQUIREMENT 4000 GPM @ 20 PSI FOR 4 HOURS
50. CONCRETE SLOUGH WALL
51. PROPOSED 8" WATER MAIN
52. PROPOSED SLUMP STONE WALL (SEE SHEET NO. 3 FOR DETAILS)

LOT SUMMARY

DESIGNATION	LOT NO.	NO. OF LOTS	(A.C.)—
HOTEL, LOT 190 ROOMS	1	1	3.76
SENIOR ASSISTANT LOT (151 UNIT)	2	1	5.43
CONDOMINIUM LOT (73 UNITS)	3	1	13.09
OPEN SPACE LOT (REC. LOT)	4	1	5.8
PUBLIC STREET	-	-	0.74
TOTAL		4	28.13±

PARKING SUMMARY

DESIGNATION	REQUIRED	PROVIDED	STANDARD	COMPACT	HANDICAP STANDARD	HANDICAP VAN	CARPOOL
HOTEL, LOT 190 ROOMS	128	143	134	32	6	2	3
SENIOR ASSISTANT LOT (151 UNIT)	76	92	87	-	3	2	2
CONDOMINIUM LOT (73 UNITS)	152	193	51	105	6	1	-
TOTAL	406	428	272	73	15	5	5

Lot Schedule (AC.)

Lot No.	Lot Area (Gross)	Lot Area (Net)	Pad Area	Building Area (S.F.)
1	3.76	3.61	2.03	47,828
2	5.43	5.43	2.63	101,166
3	13.09	13.09	5.68	162,129
4	5.11	5.11	0.85	–

EV STATION

Lot No.	REQUIRED EV STA.	PROVIDED EV. STA.
1	6	6
2	3	3
3	–	–

Curve Table

Curve #	Length	Radius	Delta	Tangent
C1	370.73'	350.00'	060°41'20"	204.89'
C2	76.64'	400.00'	010°58'40"	38.44'
C3	234.64'	152.00'	088°26'50"	147.94'
C4	310.42'	150.00'	118°34'20"	252.49'

Line Table

Line #	Length	Direction
L1	119.23'	N29° 03' 52"E
L2	15.81'	S07° 08' 35"E
L3	192.86'	S03° 50' 07"W
L4	225.13'	S84° 36' 45"E
L5	213.69'	S33° 57' 37"W

DRAINAGE NOTES:

1. STORM DRAIN EASEMENT TO BE DEDICATED TO CITY OF SANTA CLARITA FOR FLOOD CONTROL PURPOSES.
2. NOT USED
3. CONCRETE SWALE/DOWNDRAIN TO BE MAINTAINED BY H.O.A.
4. STORMTECH MC-7200 CHAMBER SYSTEMS TO BE MAINTAINED BY H.O.A.
5. STORM DRAIN SYSTEM/EASEMENT TO BE MAINTAINED BY H.O.A.
6. CONCRETE TERRACE DRAIN TO BE MAINTAINED BY H.O.A.
7. MODULAR WETLANDS SYSTEM TO BE MAINTAINED BY H.O.A.

PEDESTRIAN BRIDGE SECTION
PRIVATELY MAINTAINED BRIDGE
NOT TO SCALE

GRAPHIC SCALE (IN FEET)
1 inch = 80 ft.
80 40 0 80 160 240

BENCH MARK
L.A.C.D.P.W. B.M. L 7131 ELEV. 1736.794 FEET
LACO DPW TAG IN W CB SIERRA HWY 2' N/O N END DRWY 43' W/O C/L & 0.2MI S/O GOLDEN VALLEY RD (62' N/O PP #4081379E)
NEWHALL QUAD. 2009 ADJUSTMENT NAVD 1988

DRAWN BY			
CHECKED BY			
DESIGNED BY			
DATE CHANGED	CHANGED BY	REVISION	

OWNER/DEVELOPER:
VELUZAT PRODUCTIONS
24715 OAK CREEK
NEWHALL, CA 91321
Ph.: (661) 259-9669 Fax: (661) 259-3788

LEGAL DESCRIPTION:
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 30, TOWNSHIP 4 NORTH, RANGE 15 WEST, SAN BERNARDINO MERIDIAN, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

SITE PLAN
MAJOR LAND DIVISION
TENTATIVE TRACT MAP NO.
068203
IN THE CITY OF SANTA CLARITA

PREPARED BY:
LAND DESIGN CONSULTANTS, INC.
Land Planning, Civil Engineering, Surveying & Environmental Services
800 Royal Oaks Drive, Suite 104, Monrovia, California 91016
Ph.: (626) 578-7000, Fax: (626) 578-7373
http://www.ldcla.com

ROBERT R. SIMS R.C.E. NO. 21649 — 5/27/2025 DATE

LDC
Proj. No. 92020-019
Sht 1 of 6

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Appendix B

Special-Status Species Analysis

Special-Status Species

Special-status species are those plants and animals that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as under threat from human-associated developments. Some of these species receive specific protection that is defined by federal or state endangered species legislation. Others have been designated as special-status based on adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. Special-status species include:

- Plants or wildlife listed or proposed for listing as threatened or endangered, or are candidates for possible future listing as threatened or endangered, under the federal Endangered Species Act or the California Endangered Species Act;
- Plants or wildlife that meet the definitions of rare or endangered under CEQA Guidelines Section 15380.
- Plants or wildlife covered under an adopted NCCP/HCP;
- Plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered (List 1A, 1B and 2 plants) in California;
- Plants listed by the CNPS as plants in which there is limited information about distribution (List 3);
- Plants listed as rare under the California Native Plant Protection Act (Fish and Game Code 1900 et seq.);
- Wildlife designated by CDFW as species of special concern;
- Wildlife "fully protected" in California (California Fish and Game Code Sections 3511, 4700, and 5050); and
- Wildlife protected by the Migratory Bird Treaty Act (MTBA).

Federally-Protected Status

All references to Federally-protected species in this BRA include the most current published status or candidate category to which each species has been assigned by USFWS. For purposes of this assessment the following acronyms are used for Federal status species, as applicable:

FE Federally-listed as Endangered
FT Federally-listed as Threatened
FPE Federally proposed for listing as Endangered
FPT Federally proposed for listing as Threatened
FPD Federally proposed for delisting
FC Federal candidate species (former C1 species)

State-Protected Status

For the purposes of this BRA, the following acronyms are used for State status species, as applicable:

SE State-listed as Endangered
ST State-listed as Threatened
SR State-listed as Rare
SCE State candidate for listing as Endangered
SCT State candidate for listing as Threatened
SFP State Fully Protected
SSC California Species of Special Concern

California Rare Plant Rank

The CNPS is a private plant conservation organization dedicated to the monitoring and protection of special-status species in California. CNPS has compiled an inventory comprised of the information focusing on geographic distribution and qualitative characterization of Rare, Threatened, or Endangered vascular plant species of California (CNPS 2018). The list serves as the candidate list for listing as Threatened and Endangered by CDFW. CNPS has developed six categories of rarity known as the California Rare Plant Rank (CRPR), of which Ranks 1A, 1B, 2A, and 2B are particularly considered sensitive:

Rank 1A Presumed extinct in California.
Rank 1B Plants Rare, Threatened, or Endangered in California and elsewhere.
Rank 2A Presumed extinct in California, but more common elsewhere.
Rank 2B Plants Rare, Threatened, or Endangered in California, but more common elsewhere.
Rank 3 Plants about which we need more information – a review list.
Rank 4 Plants of limited distribution – a watch list.

The CNPS recently added "threat ranks" which parallel the ranks used by the CNDDB. These ranks are added as a decimal code after the CNPS List (e.g., Rank 1B.1). The threat codes are as follows:

.1 Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat);
.2 Moderately threatened in California (20-80% occurrences threatened);
.3 Not very threatened in California (<20% of occurrences threatened or no current threats known).

Potential to Occur Assessment

Special-status species that **present** or are **likely** (high or medium potential) to occur within the parcel are a based on one or more of the following:

- the direct observation of the species within the parcel during any field surveys;
- a record reported in the CNDDB; and
- the parcel is within known distribution of a species and contains appropriate habitat.

Special-status species that are **unlikely** (low potential) to occur are based on one of the following:

- the parcel has the general habitat types but lacks necessary habitat elements such as suitable microhabitat or soils; or
- the parcel is outside the known elevation range or distribution of the species, and has otherwise suitable habitats;

Special-status species that have no potential to occur on the parcel are labeled as **none** due to the absence of suitable habitat.

Special-Status Plants

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Allium howellii var. clokeyi	Mt. Pinos onion	1B.3	None	None	Apr-Jun	4265	6070	Great Basin scrub, Meadows and seeps (edges), Pinyon and juniper woodland		None. No habitat for this species occurs on the survey area and the survey area is outside the known elevation for this species.
Astragalus brauntonii	Braunton's milk-vetch	1B.1	None	FE	Jan-Aug	10	2100	Chaparral, Coastal scrub, Valley and foothill grassland	recent burns or disturbed areas, usually sandstone with carbonate layers	Low. There are no recently burned areas on the survey area.
Berberis nevinii	Nevin's barberry	1B.1	CE	FE	(Feb)Mar-Jun	225	2705	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub	sandy or gravelly	Low. This conspicuous species was not observed during site surveys.
Calochortus catalinae	Catalina mariposa lily	4.2	None	None	(Feb)Mar-Jun	45	2295	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland		Medium. This species is has the potential to occur on the chaparral and coastal scrub on the project site.
Calochortus clavatus var. clavatus	club-haired mariposa lily	4.3	None	None	(Mar)May-Jun	245	4265	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland	usually serpentinite, clay, rocky	Medium. Suitable chaparral and scrub habitat for this species occur on the survey area.
Calochortus clavatus var. gracilis	slender mariposa lily	1B.2	None	None	Mar-Jun(Nov)	1045	3280	Chaparral, Coastal scrub, Valley and foothill grassland		High. Suitable chaparral and scrub habitat for this species occur on the survey area and the species was recorded nearby to the CNDDB.
Calochortus palmeri var. palmeri	Palmer's mariposa lily	1B.2	None	None	Apr-Jul	2325	7840	Chaparral, Lower montane coniferous forest, Meadows and seeps	mesic	None. The survey area is outside the known elevation for this species.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Calochortus plummerae	Plummer's mariposa lily	4.2	None	None	May-Jul	325	5575	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland	granitic, rocky	High. Suitable chaparral and scrub habitat for this species occur on the survey area and the species was recorded nearby to the CNDDB.
Calystegia peirsonii	Peirson's morning-glory	4.2	None	None	Apr-Jun	95	4920	Chaparral, Chenopod scrub, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland		Medium. Suitable chaparral habitat for this species occur on the survey area.
Canbya candida	white pygmy-poppy	4.2	None	None	Mar-Jun	1965	4790	Joshua tree woodland, Mojavean desert scrub, Pinyon and juniper woodland	gravelly, sandy, granitic	None. No suitable habitat for this species occurs in the survey area.
Centromadia parryi ssp. australis	southern tarplant	1B.1	None	None	May-Nov	0	1575	Marshes and swamps (margins), Valley and foothill grassland (vernally mesic), Vernal pools		None. No suitable habitat for this species occurs in the survey area.
Cercocarpus betuloides var. blancheae	island mountain-mahogany	4.3	None	None	Feb-May	95	1970	Closed-cone coniferous forest, Chaparral		Low. Although chaparral habitats occur on the survey area, this shrub was not observed on the survey area during surveys.
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	1B.1	CE	FC	Apr-Jul	490	4005	Coastal scrub (sandy), Valley and foothill grassland		None. No suitable habitat for this species occurs in the survey area.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Chorizanthe parryi var. parryi	Parry's spineflower	1B.1	None	None	Apr-Jun	900	4005	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland	sandy or rocky, openings	Low. This species is typically found in the San Gabriel Mountains to the southeast and at higher elevations to the north.
Deinandra minthornii	Santa Susana tarplant	1B.2	CR	None	Jul-Nov	915	2495	Chaparral, Coastal scrub	rocky	Low. This species is not known to occur in this specific region and is more isolated to areas to the west of I-5.
Deinandra paniculata	paniculate tarplant	4.2	None	None	(Mar)Apr-Nov(Dec)	80	3085	Coastal scrub, Valley and foothill grassland, Vernal pools	usually vernally mesic, sometimes sandy	None. No suitable habitat for this species occurs in the survey area.
Delphinium parryi ssp. purpureum	Mt. Pinos larkspur	4.3	None	None	May-Jun	3280	8530	Chaparral, Mojavean desert scrub, Pinyon and juniper woodland		Medium. Chaparral habitat on the survey area is suitable for this species.
Dodecahema leptoceras	slender-horned spineflower	1B.1	CE	FE	Apr-Jun	655	2495	Chaparral, Cismontane woodland, Coastal scrub (alluvial fan)	sandy	Medium. Chaparral habitat at the edges of drainages on the survey area is suitable for this species.
Galium grande	San Gabriel bedstraw	1B.2	None	None	Jan-Jul	1390	4920	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest		Low. This species is typically found in the San Gabriel Mountains to the southeast.
Harpagonella palmeri	Palmer's grapplinghook	4.2	None	None	Mar-May	65	3135	Chaparral, Coastal scrub, Valley and foothill grassland	Clay; open grassy areas within shrubland	High. Suitable chaparral occurs on the survey area and the species was recorded nearby to the cnddb.
Helianthus inexpectatus	Newhall sunflower	1B.1	None	None	Aug-Oct	1000	1000	Marshes and swamps, Riparian woodland	freshwater, seeps	None. No suitable habitat for this species occurs in the survey area.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Heuchera caespitosa	urn-flowered alumroot	4.3	None	None	May-Aug	3785	8695	Cismontane woodland, Lower montane coniferous forest, Riparian forest (montane), Upper montane coniferous forest	rocky	None. No suitable habitat for this species occurs in the survey area and the survey area is outside the known elevation range for this species.
Horkelia cuneata var. puberula	mesa horkelia	1B.1	None	None	Feb-Jul(Sep)	225	2655	Chaparral (maritime), Cismontane woodland, Coastal scrub	sandy or gravelly	Low. This species is not known to occur this far north and is more likely found in the San Gabriel Mountains and Santa Monica Mountains.
Hulsea vestita ssp. gabrielensis	San Gabriel Mountains sunflower	4.3	None	None	May-Jul	4920	8200	Lower montane coniferous forest, Upper montane coniferous forest	rocky	None. No suitable habitat for this species occurs in the survey area and the survey area is outside the known elevation range for this species.
Hulsea vestita ssp. parryi	Parry's sunflower	4.3	None	None	Apr-Aug	4490	9500	Lower montane coniferous forest, Pinyon and juniper woodland, Upper montane coniferous forest	granitic or carbonate, rocky, openings	None. No suitable habitat for this species occurs in the survey area and the survey area is outside the known elevation range for this species.
Juglans californica	Southern California black walnut	4.2	None	None	Mar-Aug	160	2955	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland	alluvial	Low. This species was not observed during a survey of the site and it is very conspicuous species.
Lepechinia fragrans	fragrant pitcher sage	4.2	None	None	Mar-Oct	65	4300	Chaparral		Low. This species is not known to occur this far north (aside from a few occurrences at higher elevatioins far to the north, and is more likely found in the San Gabriel Mountains and Santa Monica Mountains.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Lepechinia rossii	Ross' pitcher sage	1B.2	None	None	May-Sep	1000	2590	Chaparral		Low. This species is only known to occur at higher elevations north of Castaic and not in the vicinity of the survey area.
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	4.3	None	None	Jan-Jul	0	2905	Chaparral, Coastal scrub		Low. This species is typically found in the San Gabriel Mountains to the southeast.
Lilium humboldtii ssp. ocellatum	ocellated Humboldt lily	4.2	None	None	Mar-Jul(Aug)	95	5905	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Riparian woodland	openings	Low. This species is not known to occur this far north (aside from a few occurrences at higher elevatioins far to the north, and is more likely found in the San Gabriel Mountains and Santa Monica Mountains.
Lupinus paynei	Payne's bush lupine	1B.1	None	None	Mar-Apr(May-Jul)	720	1380	Coastal scrub, Riparian scrub, Valley and foothill grassland	Sandy	None. No suitable habitat for this species occurs in the survey area.
Malacothamnus davidsonii	Davidson's bush-mallow	1B.2	None	None	Jun-Jan	605	3740	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland		Medium. Chaparral habitat on the survey area is suitable for this species.
Navarretia fossalis	spreading navarretia	1B.1	None	FT	Apr-Jun	95	2150	Chenopod scrub, Marshes and swamps (assorted shallow freshwater), Playas, Vernal pools		None. No suitable habitat for this species occurs in the survey area.
Navarretia setiloba	Piute Mountains navarretia	1B.1	None	None	Apr-Jul	935	6890	Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland	clay or gravelly loam	None. No suitable habitat for this species occurs in the survey area.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Opuntia basilaris var. brachyclada	short-joint beavertail	1B.2	None	None	Apr-Jun(Aug)	1390	5905	Chaparral, Joshua tree woodland, Mojavean desert scrub, Pinyon and juniper woodland		Medium. Chaparral habitat on the survey area is suitable for this species.
Orcuttia californica	California Orcutt grass	1B.1	CE	FE	Apr-Aug	45	2165	Vernal pools		None. No suitable habitat for this species occurs in the survey area.
Phacelia hubbyi	Hubby's phacelia	4.2	None	None	Apr-Jul	0	3280	Chaparral, Coastal scrub, Valley and foothill grassland	gravelly, rocky, talus	Medium. Chaparral habitat on the survey area is suitable for this species.
Phacelia mohavensis	Mojave phacelia	4.3	None	None	Apr-Aug	4590	8200	Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Pinyon and juniper woodland	sandy or gravelly	None. No suitable habitat for this species occurs in the survey area and the survey area is outside the known elevation range for this species.
Pseudognaphalium leucocephalum	white rabbit-tobacco	2B.2	None	None	(Jul)Aug-Nov(Dec)	0	6890	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland	sandy, gravelly	Low. This species is typically found near the Santa Clara River and Castaic, as well as in some areas of the San Gabriel Mountains, and not in the vicinity of the survey area.
Quercus durata var. gabrielensis	San Gabriel oak	4.2	None	None	Apr-May	1475	3280	Chaparral, Cismontane woodland		None. This species was not observed during a focused oak tree survey conducted on the survey area.
Senecio aphanactis	chaparral ragwort	2B.2	None	None	Jan-Apr(May)	45	2625	Chaparral, Cismontane woodland, Coastal scrub	sometimes alkaline	Low. This species is only known to occur in the region from a few populations on the Santa Clara River, and is not likely to occur on the survey area due to a lak of alkaline habitat.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Streptanthus campestris	southern jewelflower	1B.3	None	None	(Apr)May-Jul	2950	7545	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland	rocky	None. The survey area is outside the known elevation for this species.
Symphyotrichum greatae	Greata's aster	1B.3	None	None	Jun-Oct	980	6595	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Riparian woodland	mesic	Low. This species typically is found in forest or woodland habitats.

Special-Status Animals

SciName	ComName	FedList	CalList	OthrStatus	GenHab	MicroHab	Potential to Occur
Anaxyrus californicus	arroyo toad	Endangered	None	CDFW_SSC-Species of Special Concern | IUCN_EN-Endangered	Semi-arid regions near washes or intermittent streams, including valley-foothill and desert riparian, desert wash, etc.	Rivers with sandy banks, willows, cottonwoods, and sycamores; loose, gravelly areas of streams in drier parts of range.	None. No suitable river habitat is on the survey area.
Rana draytonii	California red-legged frog	Threatened	None	CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation.	Requires 11-20 weeks of permanent water for larval development. Must have access to estivation habitat.	None. No suitable water source or deep water habitat is present.
Rana muscosa	southern mountain yellow-legged frog	Endangered	Endangered	CDFW_WL-Watch List | IUCN_EN-Endangered | USFS_S-Sensitive	Federal listing refers to populations in the San Gabriel, San Jacinto and San Bernardino mountains (southern DPS). Northern DPS was determined to warrant listing as endangered, Apr 2014, effective Jun 30, 2014.	Always encountered within a few feet of water. Tadpoles may require 2 - 4 yrs to complete their aquatic development.	None. No suitable water source is present for this species on the survey area.
Spea hammondii	western spadefoot	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_NT-Near Threatened	Occurs primarily in grassland habitats, but can be found in valley-foothill hardwood woodlands.	Vernal pools are essential for breeding and egg-laying.	None. No suitable vernal pools or other habitat is on the survey area.
Taricha torosa	Coast Range newt	None	None	CDFW_SSC-Species of Special Concern	Coastal drainages from Mendocino County to San Diego County.	Lives in terrestrial habitats & will migrate over 1 km to breed in ponds, reservoirs & slow moving streams.	None. No suitable breeding habitat is on or near the survey area.
Accipiter cooperii	Cooper's hawk	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern	Woodland, chiefly of open, interrupted or marginal type.	Nest sites mainly in riparian growths of deciduous trees, as in canyon bottoms on river flood-plains; also, live oaks.	Present. This species was observed on the survey area during a survey.

SciName	ComName	FedList	CalList	OthrStatus	GenHab	MicroHab	Potential to Occur
Agelaius tricolor	tricolored blackbird	None	Threatened	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_EN-Endangered | NABCI_RWL-Red Watch List | USFWS_BCC-Birds of Conservation Concern	Highly colonial species, most numerous in Central Valley & vicinity. Largely endemic to California.	Requires open water, protected nesting substrate, and foraging area with insect prey within a few km of the colony.	None. No open water habitat is present on the survey area.
Aimophila ruficeps canescens	southern California rufous-crowned sparrow	None	None	CDFW_WL-Watch List	Resident in Southern California coastal sage scrub and sparse mixed chaparral.	Frequents relatively steep, often rocky hillsides with grass and forb patches.	Medium. Suitable chaparral and scrub habitats occur on the survey area for this species.
Ammodramus savannarum	grasshopper sparrow	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes.	Favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.	None. No native grasslands occur on the survey area.
Artemisiospiza belli belli	Bell's sage sparrow	None	None	CDFW_WL-Watch List | USFWS_BCC-Birds of Conservation Concern	Nests in chaparral dominated by fairly dense stands of chamise. Found in coastal sage scrub in south of range.	Nest located on the ground beneath a shrub or in a shrub 6-18 inches above ground. Territories about 50 yds apart.	High. Suitable dense chamise chaparral occurs on the survey area.
Athene cunicularia	burrowing owl	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation.	Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	None. No suitable open areas or areas with appropriate burrowing mammals is on the survey area.
Buteo swainsoni	Swainson's hawk	None	Threatened	BLM_S-Sensitive | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, & agricultural or ranch lands with groves or lines of trees.	Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields supporting rodent populations.	None. No suitable habitat for this species occurs on the survey area.

SciName	ComName	FedList	CalList	OthrStatus	GenHab	MicroHab	Potential to Occur
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Threatened	Endangered	BLM_S-Sensitive | NABCI_RWL-Red Watch List | USFS_S-Sensitive | USFWS_BCC-Birds of Conservation Concern	Riparian forest nester, along the broad, lower flood-bottoms of larger river systems.	Nests in riparian jungles of willow, often mixed with cottonwoods, with lower story of blackberry, nettles, or wild grape.	None. No suitable habitat for this species occurs on the survey area.
Elanus leucurus	white-tailed kite	None	None	BLM_S-Sensitive | CDFW_FP-Fully Protected | IUCN_LC-Least Concern	Rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland.	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	None. No suitable habitat for this species occurs on the survey area.
Empidonax traillii extimus	southwestern willow flycatcher	Endangered	Endangered	NABCI_RWL-Red Watch List	Riparian woodlands in Southern California.		None. No suitable habitat for this species occurs on the survey area.
Eremophila alpestris actia	California horned lark	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern	Coastal regions, chiefly from Sonoma County to San Diego County. Also main part of San Joaquin Valley and east to foothills.	Short-grass prairie, "bald" hills, mountain meadows, open coastal plains, fallow grain fields, alkali flats.	None. No suitable habitat for this species occurs on the survey area.
Falco mexicanus	prairie falcon	None	None	CDFW_WL-Watch List | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Inhabits dry, open terrain, either level or hilly.	Breeding sites located on cliffs. Forages far afield, even to marshlands and ocean shores.	None. No suitable breeding habitat occurs for this species.
Lanius ludovicianus	loggerhead shrike	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFWS_BCC-Birds of Conservation Concern	Broken woodlands, savannah, pinyon-juniper, Joshua tree, and riparian woodlands, desert oases, scrub & washes.	Prefers open country for hunting, with perches for scanning, and fairly dense shrubs and brush for nesting.	None. No suitable habitat for this species occurs on the survey area.
Polioptila californica californica	coastal California gnatcatcher	Threatened	None	CDFW_SSC-Species of Special Concern | NABCI_YWL-Yellow Watch List	Obligate, permanent resident of coastal sage scrub below 2500 ft in Southern California.	Low, coastal sage scrub in arid washes, on mesas and slopes. Not all areas classified as coastal sage scrub are occupied.	High. This species was recorded to the CNDDB within 1000-feet south of the survey area.

SciName	ComName	FedList	CalList	OthrStatus	GenHab	MicroHab	Potential to Occur
Vireo bellii pusillus	least Bell's vireo	Endangered	Endangered	IUCN_NT-Near Threatened | NABCI_YWL-Yellow Watch List	Summer resident of Southern California in low riparian in vicinity of water or in dry river bottoms; below 2000 ft.	Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.	None. No suitable habitat for this species occurs on the survey area.
Branchinecta lynchi	vernal pool fairy shrimp	Threatened	None	IUCN_VU-Vulnerable	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools.	Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	None. No suitable habitat for this species occurs on the survey area.
Catostomus santaanae	Santa Ana sucker	Threatened	None	AFS_TH-Threatened | IUCN_VU-Vulnerable	Endemic to Los Angeles Basin south coastal streams.	Habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.	None. No suitable habitat for this species occurs on the survey area.
Gasterosteus aculeatus williamsoni	unarmored threespine stickleback	Endangered	Endangered	AFS_EN-Endangered | CDFW_FP-Fully Protected	Weedy pools, backwaters, and among emergent vegetation at the stream edge in small Southern California streams.	Cool (<24 C), clear water with abundant vegetation.	None. No suitable habitat for this species occurs on the survey area.
Gila orcuttii	arroyo chub	None	None	AFS_VU-Vulnerable | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Native to streams from Malibu Creek to San Luis Rey River basin. Introduced into streams in Santa Clara, Ventura, Santa Ynez, Mojave & San Diego river basins.	Slow water stream sections with mud or sand bottoms. Feeds heavily on aquatic vegetation and associated invertebrates.	None. No suitable habitat for this species occurs on the survey area.
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	None	None	AFS_TH-Threatened | CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Headwaters of the Santa Ana and San Gabriel rivers. May be extirpated from the Los Angeles River system.	Requires permanent flowing streams with summer water temps of 17-20 C. Usually inhabits shallow cobble and gravel riffles.	None. No suitable habitat for this species occurs on the survey area.

SciName	ComName	FedList	CalList	OthrStatus	GenHab	MicroHab	Potential to Occur
Bombus crotchii	Crotch bumble bee	None	Candidate Endangered		Coastal California east to the Sierra-Cascade crest and south into Mexico.	Food plant genera include Antirrhinum, Phacelia, Clarkia, Dendromecon, Eschscholzia, and Eriogonum.	Medium. Suitable chaparral and scrub habitats with Eriogonum spp. occur on the survey area for this species.
Danaus plexippus pop. 1	monarch - California overwintering population	None	None	USFS_S-Sensitive	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico.	Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	None. No suitable rooting locations occur on the survey area.
Euphydryas editha quino	quino checkerspot butterfly	Endangered	None		Sunny openings within chaparral & coastal sage shrublands in parts of Riverside & San Diego counties.	Hills and mesas near the coast. Need high densities of food plants Plantago erecta, P. insularis, and Orthocarpus purpurescens.	None. The survey area is outside the known range for this species.
Antrozous pallidus	pallid bat	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Deserts, grasslands, shrublands, woodlands and forests. Most common in open, dry habitats with rocky areas for roosting.	Roosts must protect bats from high temperatures. Very sensitive to disturbance of roosting sites.	Low. No rocky areas for roosting occur and the site is subject to significant disturbance from nearby roads and developments.
Corynorhinus townsendii	Townsend's big-eared bat	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive | WBWG_H-High Priority	Throughout California in a wide variety of habitats. Most common in mesic sites.	Roosts in the open, hanging from walls and ceilings. Roosting sites limiting. Extremely sensitive to human disturbance.	Low. The site lacks mesic areas for the majority of the year and the survey area is subject to human disturbances from the adjacent roads and developments.
Euderma maculatum	spotted bat	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | WBWG_H-High Priority	Occupies a wide variety of habitats from arid deserts and grasslands through mixed conifer forests.	Feeds over water and along washes. Feeds almost entirely on moths. Needs rock crevices in cliffs or caves for roosting.	Low. The survey area lacks rock crevices and caves this species needs for roosting, and has water only seasonally.

SciName	ComName	FedList	CalList	OthrStatus	GenHab	MicroHab	Potential to Occur
Eumops perotis californicus	western mastiff bat	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | WBWG_H-High Priority	Many open, semi-arid to arid habitats, including conifer & deciduous woodlands, coastal scrub, grasslands, chaparral, etc.	Roosts in crevices in cliff faces, high buildings, trees and tunnels.	Medium. The house and tall trees on the survey area provide suitable roosting sites.
Lasiurus cinereus	hoary bat	None	None	IUCN_LC-Least Concern | WBWG_M-Medium Priority	Prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding.	Roosts in dense foliage of medium to large trees. Feeds primarily on moths. Requires water.	Low. The lack of a permanent water source limits this species ability to persist on the survey area.
Lepus californicus bennettii	San Diego black-tailed jackrabbit	None	None	CDFW_SSC-Species of Special Concern	Intermediate canopy stages of shrub habitats & open shrub / herbaceous & tree / herbaceous edges.	Coastal sage scrub habitats in Southern California.	Low. The survey area has mature and dense scrub and chaparral and lacks the open areas this species prefers.
Macrotus californicus	California leaf-nosed bat	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | WBWG_H-High Priority	Desert riparian, desert wash, desert scrub, desert succulent scrub, alkali scrub and palm oasis habitats.	Needs rocky, rugged terrain with mines or caves for roosting.	None. No suitable habitat for this species occurs on the survey area.
Neotamias speciosus speciosus	lodgepole chipmunk	None	None		Summits of isolated Piute, San Bernardino, & San Jacinto mountains. Usually found in open-canopy forests.	Habitat is usually lodgepole pine forests in the San Bernardino Mts & chinquapin slopes in the San Jacinto Mts.	None. No suitable habitat for this species occurs on the survey area.
Neotoma lepida intermedia	San Diego desert woodrat	None	None	CDFW_SSC-Species of Special Concern	Coastal scrub of Southern California from San Diego County to San Luis Obispo County.	Moderate to dense canopies preferred. They are particularly abundant in rock outcrops, rocky cliffs, and slopes.	Medium. This species has the potential to be found on the project site within the coastal scrub habitats.
Onychomys torridus ramona	southern grasshopper mouse	None	None	CDFW_SSC-Species of Special Concern	Desert areas, especially scrub habitats with friable soils for digging. Prefers low to moderate shrub cover.	Feeds almost exclusively on arthropods, especially scorpions and orthopteran insects.	None. No suitable desert habitat for this species occurs on the survey area.

SciName	ComName	FedList	CalList	OthrStatus	GenHab	MicroHab	Potential to Occur
Taxidea taxus	American badger	None	None	CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats, with friable soils.	Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	Low. The survey area lacks open stage haitats and has more dense, mature stage habitat than this species prefers.
Helminthoglypta vasquezi	Vasquez shoulderband	None	None		Terrestrial		Medium. This species is known to occur in the region, however, little information is available about habitat preference.
Anniella spp.	California legless lizard	None	None	CDFW_SSC-Species of Special Concern	Contra Costa County south to San Diego, within a variety of open habitats.This element represents California records of Anniella not yet assigned to new species within the Anniella pulchra complex.	Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	Low. The survey area is typically dry and lack moist areas this species prefers, except seasonally within the drainages.
Anniella stebbinsi	Southern California legless lizard	None	None	CDFW_SSC-Species of Special Concern | USFS_S-Sensitive	Generally south of the Transverse Range, extending to northwestern Baja California. Occurs in sandy or loose loamy soils under sparse vegetation. Disjunct populations in the Tehachapi and Piute Mountains in Kern County.	Variety of habitats; generally in moist, loose soil. They prefer soils with a high moisture content.	Low. The survey area is typically dry and lack moist areas this species prefers, except seasonally within the drainages.
Arizona elegans occidentalis	California glossy snake	None	None	CDFW_SSC-Species of Special Concern	Patchily distributed from the eastern portion of San Francisco Bay, southern San Joaquin Valley, and the Coast, Transverse, and Peninsular ranges, south to Baja California.	Generalist reported from a range of scrub and grassland habitats, often with loose or sandy soils.	Low. The survey area lacks loos or sandy soils for this species.
Aspidoscelis tigris stejnegeri	coastal whiptail	None	None	CDFW_SSC-Species of Special Concern	Found in deserts and semi-arid areas with sparse vegetation and open areas. Also found in woodland & riparian areas.	Ground may be firm soil, sandy, or rocky.	Present. This species was observed on the survey area during a survey conducted in 2013. (LDC 2013)

SciName	ComName	FedList	CalList	OthrStatus	GenHab	MicroHab	Potential to Occur
Emys marmorata	western pond turtle	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_VU-Vulnerable | USFS_S-Sensitive	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation.	Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	None. No suitable habitat for this species occurs on the survey area.
Phrynosoma blainvillii	coast horned lizard	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes.	Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Medium. The areas surrounding Ephemeral drainage #1 are suitable for this species to occur.
Thamnophis hammondii	two-striped gartersnake	None	None	BLM_S-Sensitive | CDFW_SSC-Species of Special Concern | IUCN_LC-Least Concern | USFS_S-Sensitive	Coastal California from vicinity of Salinas to northwest Baja California. From sea to about 7,000 ft elevation.	Highly aquatic, found in or near permanent fresh water. Often along streams with rocky beds and riparian growth.	None. No suitable habitat for this species occurs on the survey area.

APPENDIX B-2
Botanical Survey

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

August 24, 2023

Renaud & Sue Veluzat
24715 Oak Creek Road
Newhall, California 91321

RE: Botanical Survey for Santa Clarita TTM 68203 Project in the City of Santa Clarita, California

Dear Renaud and Sue:

This letter includes the results of a botanical survey on a 28.13-acres project site which is mostly undeveloped native plant communities in the City of Santa Clarita, California (Figure 1 and 2). There is an uninhabited single family home development on the southern edge of the site that has associated parking areas and paved driveway, and the remaining areas of the site are undeveloped native plant communities. The project site located at the northwest corner of Golden Valley Road and Sierra Highway has a proposed development in which 10 parcels will be merged into 4 lot subdivisions on which infrastructure is planned made up of an assisting living building; commercial hotel and retail building; residential condominium building; storm water treatment area; and; riding and hiking trail. The project site is located on private property, and the focus of the botanical survey was to identify special-status species as classified by the California Department of Fish and Wildlife (CDFW) and the California Native Plant Society (CNPS) with the potential to exist on the site.

The survey was conducted to assess potential impacts to special-status plants in the area of development. The plant survey involved first identifying the potential special-status plants with potential to occur on the site and then conducting the survey. Nine (9) special-status plant species were assessed with a medium to high potential to occur on the site based on habitat and past occurrences in the area: **club-haired mariposa-lily**, **slender mariposa-lily**, **Plummer's mariposa lily**, **Peirson's morning-glory**, **Mt. Pinos larkspur**, **slender-horned spineflower**, **Palmer's grapplinghook**, **short-joint beavertail**, and **Hubby's phacelia**. The site was surveyed on four dates in May and August corresponding with coverage of the blooming period of the 9 special-status species. The report includes a complete list of the species observed on the site indicating their habit, providence (native vs non-native), and California Rare Plant Rank (CRPR). It also relates data relevant to potential special-status species occurring at the site based on Jepson Manual analysis (Baldwin et al. 2012).



Source: ESRI USA Topo Maps 2020

Santa Clarita TTM 68203

Figure 1. Project Location

Project Site is on the USGS Mint Canyon 7.5-minute quadrangle map in the southeast corner of Township 04 North (T04N) and Range 15 West (R15W) Section 30 (S30).

Center Coordinate (decimal degrees):
Latitude: 34.3985N Longitude: -118.4861W

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Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Figure 2. Survey Area

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Background

Project Site Description

The property proposed for development (project site) includes 28.13-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita (Figures 1 and 2). The project site is on the United States Geological Survey (USGS) Mint Canyon 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North (T04N) and Range 15 West (R15W). The associated APNs are: 2836-013-106, 2836-013-107, 2836-013-111, 2836-013-128, 2836-013-133, 2836-013-141, 2836-020-058, 2836-020-078, 2836-020-086, 2836-020-087.

Most of the project site is undeveloped except for a single-family home and accessory structures. The street address is recorded as 20101 Golden Valley Road with an Assessor's address of 25800 Sierra Highway. A windy paved driveway exists off Golden Valley Road provides access to the home, and a series of dirt roads provide access to the remaining undeveloped hills on the property. Adjacent uses include residential uses to the immediate north and east, vacant land to the south, and residential uses/Golden Valley High School to the west.

Proposed Development

The proposed development (Figure 3) seeks to merge the 10 parcels and entitle a Tentative Tract Map 68203 for a four (4) lot subdivision consisting of the following:

- One (1) 5.04-acre lot for a four (4) story building consisting of 154-unit senior assisted living units; the proposed four (4) story building will be 50-foot maximum height.
- One (1) 5.04-acre lot for a 100-room commercial hotel and retail building.
- One (1) 11.48-acre lot for 73 residential Condominium units consisting of two, three, and four-plex buildings.
- One (1) 5.83-acre open space lot for L.I.D. storm water treatment with two discharge pipes, and an eight-foot wide riding and hiking trial.
- Proposed streets and circulations will result in approximately 0.73 acres of development.

Topography and Climate

The project site is a steeply sloping group of hills that is at an elevation of 1750-feet at the home site and 1560-feet in the northern tip. There is a hilltop that is at the northwest edge of the



Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Figure 3. Proposed Development

SOUTH ENVIRONMENTAL

homesite and extends northeast through the project site and is steeply sloped on the east and west sides. Climate in the region is hot and dry, with average summer high temperatures in the mid-90s and average winter lows in the mid-30s. Average yearly rainfall is 14-inches (less than half the national average) and the wettest months are January – March, and there is almost no precipitation between May-August.

Soils

Three soils occur on the project site as shown in Figure 4:

- **Saugus loam, 30 to 50 percent slopes, eroded** is the most abundant soil type and occurs in the western half of the project site. This is an upland soil found on backslope of hills, and is well drained.
- **Castaic-Balcom silty clay loams, 15 to 30 percent slopes** is on the eastern portions of the project site. This soil type largely includes (99%) upland hills and backslopes and includes 1% of drainageways. This is a well-drained soil.
- **Zmora loam, 2 to 9 percent slopes** is on the northern tip of the project site. This soil type is typically found on terraces and backslopes and is well drained.

Plant Communities

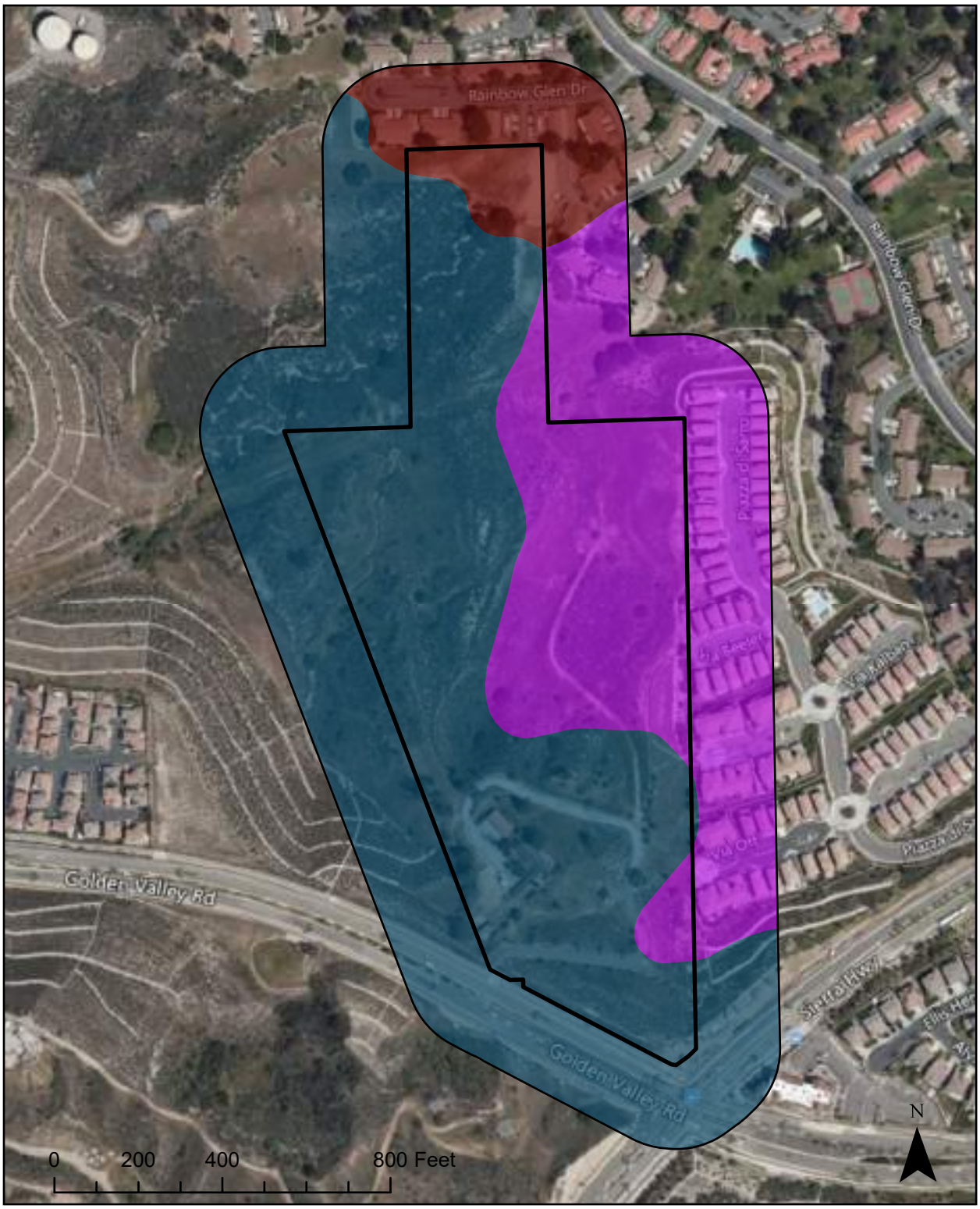
As shown in Figure 5, there are five plant communities or cover types on the project site and within a 200-ft buffer surrounding the project site, and they are summarized in Table 1 below.

Table 1. Summary of Plant Communities in Survey Area

Plant Community	Acres Project Site and 200-ft buffer	Acres Project Site	Global Rank (G) /State Rank (S)
California Sagebrush – (Purple Sage) Scrub	16.71	12.87	G5/S5
Chamise Chaparral	7.64	1.37	G5/S5
Installed Sage Scrub	2.50	0.19	G5/S5
Ruderal	13.44	11.73	not ranked
Developed	17.21	1.97	not ranked
Total	56.52	28.13	

California Sagebrush – (Purple Sage) Scrub

California sagebrush – (purple sage) scrub [*Artemisia californica* – (*Salvia leucophylla*) Shrubland Alliance] as described by the Manual of California Vegetation Online occurs on 16.71-acres of the survey area. This community occurs in two Associations described by the Manual:



Source: BING Aerial Basemap 2020, USDA NRCS Soils GIS

Santa Clarita TTM 68203

Figure 4. Soils

Survey Area (200-foot Buffer)

Project Boundary

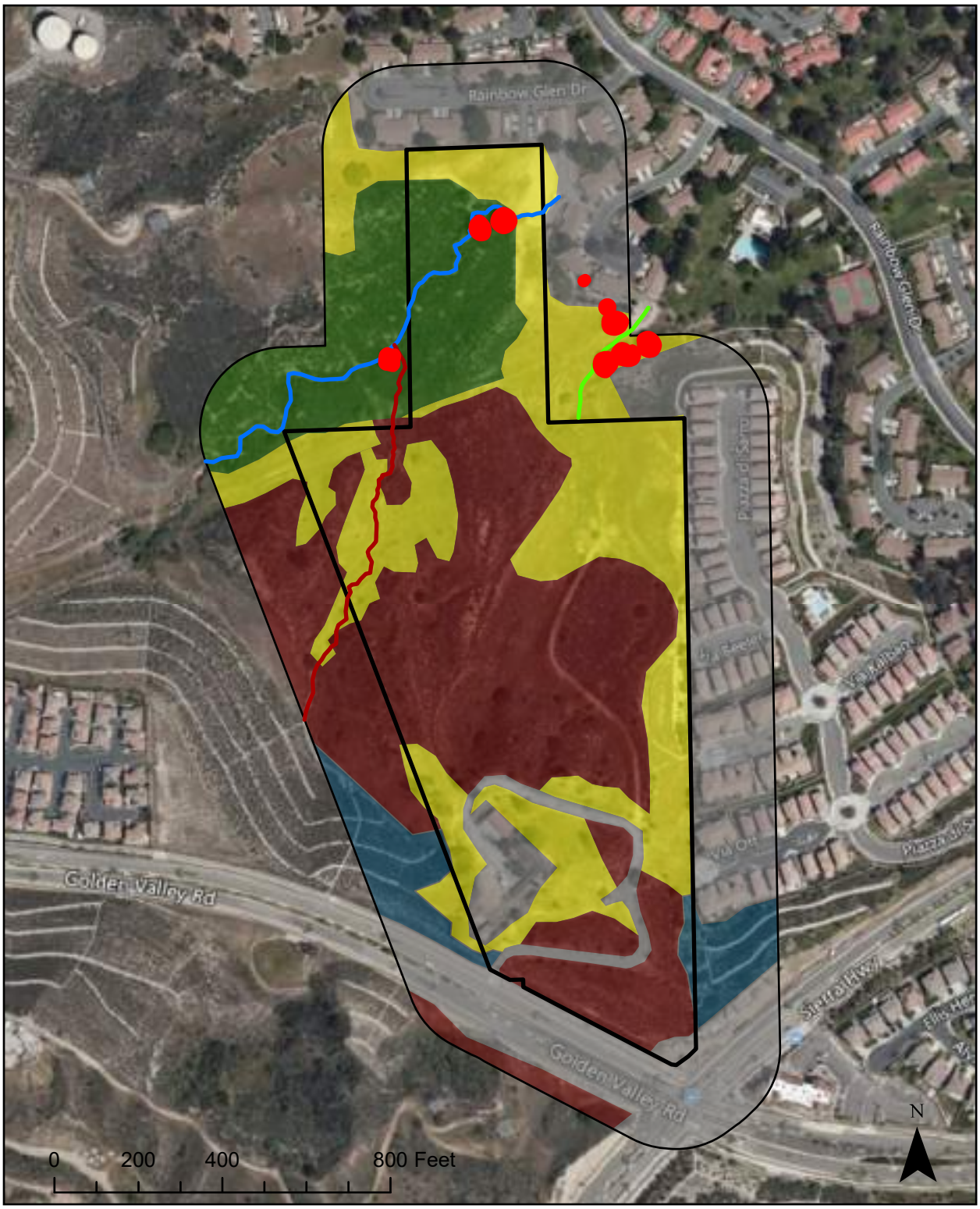
Soils

Castaic-Balcom silty clay loams, 15 to 30 % slopes

Saugus loam, 30 to 50 % slopes, eroded

Zamora loam, 2 to 9 % slopes

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Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Figure 5. Plant Communities, Oaks, and Drainages

- Ephemeral Drainage #1
- Ephemeral Drainage #2
- Ephemeral Drainage #3
- Survey Area (200-foot Buffer)
- Project Boundary
- Protected Oak Tree
- California Sagebrush - (Purple Sage) Scrub
- Chamise Chaparral
- Installed Sage Scrub
- Ruderal
- Developed

SOUTH ENVIRONMENTAL

- ***Artemisia californica – Salvia leucophylla* Association** occurs on the central portions of the survey area and on the areas south of Golden Valley Road. This community is dominated by California sagebrush (*Artemisia californica*) and purple sage (*Salvia leucophylla*) is a sub-dominant species. Other prominent shrubs include California buckwheat (*Eriogonum fasciculatum*), black elderberry (*Sambucus nigra ssp. caerulea*), toyon (*Heteromeles arbutifolia*), and chaparral yucca (*Hesperoyucca whipplei*).

- ***Artemisia californica – Eriogonum fasciculatum* Association** occurs on the southern portions of the survey area between the house and the installed sage scrub. This community is co-dominated by California sagebrush and California buckwheat.

Chamise Chaparral

Chamise chaparral (*Adenostoma fasciculatum* Shrubland Alliance) as described by the Manual occurs in the northern portion of the survey area. Specifically, the *Adenostoma fasciculatum* – (*Ceanothus crassifolius*) Association occurs on the survey area and is dominated by chamise (*Adenostoma fasciculatum*) and hoary leaved ceanothus (*Ceanothus crassifolius*) is sub-dominant. Purple sage, coast live oak (*Quercus agrifolia*), and beavertail cactus (*Opuntia basilaris var. basilaris*) occur occasionally.

Installed Sage Scrub

Installed sage scrub occurs on hillsides adjacent to existing developments and are dominated by California buckwheat and have a variety of other landscaped species. These are managed areas that have a series of concrete drainage channels that direct surface water on the slopes away from the houses.

Ruderal

Ruderal areas occur throughout the survey area surrounding the house, on the hillsides adjacent to neighborhoods, and along the gas company easement. These areas are dominated by black mustard (*Brassica nigra*) and has a variety of other plants associated with disturbed area and landscaped species such as telegraph weed (*Heterotheca grandiflora*), Peruvian pepper tree (*Schinus molle*), European olive (*Olea europaea*), Mexican fan palm (*Washingtonia robusta*), Canary Island date palm (*Phoenix canariensis*), blue gum eucalyptus (*Eucalyptus globulus*), and Aleppo pine (*Pinus halepensis*).

Developed

Developed areas include Golden Valley Road, Sierra Highway, paved driveway, the single-family residence on the project site, and the surrounding homes in the neighborhoods.

Methodology

Literature Review

The California Native Plant Society (CNPS) and the California Department of Fish and Wildlife (CDFW) are the primary authorities in the State of California for recording and tracking endangered, threatened, and rare plants (i.e., special-status) in the state. The CNPS "Inventory of Rare Plants" online (CNPS 2023) and the CDFW California Natural Diversity Database (CNDDB) online (CDFW 2023) are query tools that identify rare, endangered, and threatened plants and their occurrence based on the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangles for the state. Basic information is provided for each special-status plant species including conservation status, local areas of occurrence, macro and micro habitat, elevation range, and blooming period. Plants considered by the CNPS and CDFW to be rare, threatened, and endangered species are based on specific criteria of state and federal legislation and are summarized in **Appendix A**. The geographic location of occurrences of special-status plants can also be queried directly through the Biogeographic Information and Observation System (BIOS) online (CDFW 2023a).

For the survey, both databases were queried for special-status plants that have previously been recorded in the Mint Canyon 7.5" quad in which the project site is located, and the eight surrounding USGS 7.5"quads: Warm Springs Mountain, Green Valley, Sleepy Valley, Newhall, Agua Dulce, Oat Mountain, San Fernando, and Sunland. Following the online queries, the rare, threatened, and endangered species identified in each query were combined into a comprehensive list for the region. These species were considered as potential special-status species to occur on the survey site. Next, an additional assessment was conducted to determine their potential to occur on the survey area based on specific habitat and micro-habitat requirements for the species and their occurrences in the area in relation to the survey area. Based on this assessment, the special-status species were designated a "none", "low", "medium", or "high" potential to occur on the project site (**Appendix A**).

Using the nine 7.5" quads a total of 43 special-status plant species were identified for the area (Appendix B). Of these species, nine (9) were assessed with a medium to high potential to occur on the project site: **club-haired mariposa-lily**, **slender mariposa-lily**, **Plummer's mariposa lily**, **Peirson's morning-glory**, **Mt. Pinos larkspur**, **slender-horned spineflower**, **Palmer's grapplinghook**, **short-joint beavertail**, and **Hubby's phacelia** (Table 2). Plants were assessed with the potential to occur on the project site based primarily on their habitat requirements and past occurrences in the immediate area.

Table 2. Special-status plants including rare, threatened, and endangered species with the potential to occur on the project site

(CRPR = California Rare Plant Ranking)

Scientific name	Common name	Life Form	Federal/State Listing	CRPR
Calochortus clavatus var. *clavatus*	club-haired mariposa lily	perennial herb	--/--	4.3
Calochortus clavatus var. *gracilis*	slender mariposa-lily	perennial herb	--/--	1B.2
Calochortus plummerae	Plummer's mariposa lily	perennial herb	--/--	4.2
Calystegia peirsonii	Peirson's morning glory	perennial herb	--/--	4.2
Delphinium parryi ssp. *pupureum*	Mt. Pinos larkspur	perennial herb	--/--	4.3
Dodecahema leptoceras	slender-horned spineflower	annual herb	FE/SE	1B.1
Harpagonella palmeri	Palmer's grapplinghook	annual herb	--/--	4.2
Opuntia basilaris var. *brachyclada*	short-joint beavertail	shrub (succulent)	--/--	1B.2
Phacelia hubbyi	Hubby's phacelia	annual herb	--/--	4.2

1B.1 – plants rare, threatened, or endangered in California and elsewhere, seriously threatened in California
1B.2 – plants rare, threatened, or endangered in California and elsewhere, fairly threatened in California
4.2 – plants of limited distribution; fairly threatened in California (Watchlist plant)
4.3 – plants of limited distribution; not very threatened in California (Watchlist plant)
FE – Federal endangered species
SE – California endangered species

Field Survey

The survey to identify special-status plants identified in the literature search — including federal and state rare, threatened, and endangered species — was conducted by South Environmental in the spring in May and the summer in August of 2023. The survey dates with the weather conditions and South Environmental biologists that conducted the surveys are below:

- May 8 and 9, 2023. Temperature 56-63° F, light air to light breeze (3-10 mph), fair to cloudy, no precipitation (Scott Altmann & AJ Samra)

- August 3 and 4, 2023. Temperature 70-95° F, calm to light breeze (0-10 mph), fair to clear, no precipitation (Scott Altmann and Dana Briggs)

During the surveys all plant species encountered were either identified at the time or in the case of unknown species a sample was collected and the species were identified using *The Jepson Manual of Vascular Plants of California* (Baldwin et al. 2012) and by comparing them with

taxonomically-related species from the area using I-Naturalist and other online digital photo sources.

Whenever possible the survey was conducted according to the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* developed by the California Department of Fish and Wildlife (CDFW 2018) and the *Botanical Survey Guidelines* developed by the California Native Plant Society (CNPS 2001). The survey followed the standard botanical protocol for rare, threatened, or endangered plant species surveys of identifying all plant species encountered. Although the goal was to identify all plant species, field surveyors placed a special emphasis on discovery of the special-status species identified in the literature search with the potential to occur on the site.

Results

A total of 92 plant species were observed in the study area. None of these species are considered special-status plants. Of these, 59 species (64.1%) were native to California and 33 species (35.9%) were non-native to California or the southern region of California. Of the non-native species, 22 (66.7%) are classified as invasive or are on invasive "watch" or "alert" by the California Invasive Plant Council (2023). Based on the habit classification system used by Calflora (2023) and other sources, the habit of the plants observed included tree, shrub, shrub (succulent), perennial, perennial herb, annual herb, annual grasslike herb, perennial grasslike herb, and vine. Important genera for which more than one species was observed included *Artemisia, Avena, Bromus, Camissoniopsis, Lupinus, Salvia, and Washingtonia.* A list of the species observed on the site is presented below in Table 3.

Table 3. List of plant species for Santa Clarita TTM 68203 Project in Santa Clarita, California

(CRPR = California Rare Plant Ranking, 2023; *invasive species per the California Invasive Plant Council, 2023.

Scientific name	Common name	Native/Non-native	Habit	CRPR
Acacia redolens	vanilla-scented wattle	Non-native	tree/shrub	--
Acmispon glaber	deerweed	Native	perennial herb	--
Acourtia microcephala	sacapellote	Native	perennial herb	--
Adenostoma fasciculatum	chamise	Native	tree or shrub	--
Agave attenuata	swan-neck agave	Non-native	shrub	--
Amsinckia menziesii	Menzies fiddleneck	Native	annual herb	--
Artemisia californica	California sagebrush	Native	shrub	--
Artemisia tridentata	big sagebrush	Native	shrub	--

Scientific name	Common name	Native/Non-native	Habit	CRPR
Arundo donax	giant reed	*Non-native	perennial grasslike herb	--
Asclepias fascicularis	narrowleaf milkweed	Native	perennial herb	--
Astragalus trichopodus	Santa Barbara milkvetch	Native	perennial herb	--
Avena barbata	slender wild oat	*Non-native	annual grasslike herb	--
Avena fatua	wild oat	*Non-native	annual grasslike herb	--
Blitum californicum	California goosefoot	Native	perennial herb	--
Bromus diandrus	ripgut brome	*Non-native	annual grasslike herb	--
Bromus hordeaceus	common soft brome	*Non-native	annual grasslike herb	--
Bromus rubens	red brome	*Non-native	annual grasslike herb	--
Calystegia macrostegia	coast morning glory	Native	perennial herb/vine	--
Camissoniopsis bistorta	California sun cup	Native	annual herb	--
Camissoniopsis micrantha	miniature suncup	Native	annual herb	--
Carduus tenuflorus	slender thistle	*Non-native	annual herb	--
Carya Illinoinensis	pecan	*Non-native	tree	--
Castilleja exserta	purple owl's clover	Native	annual herb	--
Ceanothus crassifolius	hoaryleaf ceanothus	Native	shrub	--
Chaenactis artemisiifolia	white pincushion	Native	annual herb	--
Cirsium occidentale	cobweb thistle	Native	perennial herb	--
Corethrogyne filaginifolia	California aster	Native	perennial herb	--
Cryptantha intermedia	clearwater cryptantha	Native	annual herb	--
Cupressus sempervirens	Mediterannean cypress	Non-native	tree	--
Deinandra fasciculata	clustered tarweed	Native	annual herb	--
Delphinium cardinale	scarlet larkspur	Native	perennial herb	--
Dipterostemon capitatus	blue dicks	Native	perennial herb	--
Emmenanthe penduliflora	whispering bells	Native	annual herb	--
Encelia californica	bush sunflower	Native	shrub	--
Encelia farinosa	brittlebush	Native	shrub	--
Eriodictyon crassifolium	thick-leaved yerba santa	Native	shrub	--
Eriogonum fasciculatum	California buckwheat	Native	shrub	--
Eriophyllum confertiflorum	golden yarrow	Native	shrub	--
Erodium cicutarium	redstem stork's bill	*Non-native	annual herb	--
Eschscholzia californica	California poppy	Native	annual herb	--
Eucalyptus camaldulensis	river redgum	*Non-native	tree	--

Scientific name	Common name	Native/Non-native	Habit	CRPR
Eulobus californicus	California primrose	Native	annual herb	--
Eucrypta chrysanthemifolia	common eucrypta	Native	annual herb	--
Festuca myuros	rattail sixweeks grass	*Non-native	annual grasslike herb	--
Grevillea robusta	silk oak	*Non-native	tree	--
Hazardia squarrosa	saw-toothed goldenbush	Native	shrub	--
Heteromeles arbutifolia	toyon	Native	shrub	--
Heterotheca grandiflora	telegraphweed	Native	annual/perennial herb	--
Hesperoyucca whipplei	chaparral yucca	Native	shrub	--
Hirschfeldia incana	shortpod mustard	*Non-native	perennial herb	--
Hordeum murinum	wall barley	*Non-native	annual grasslike herb	--
Juniperus californica	California juniper	Native	shrub	--
Lepidospartum squamatum	California broomsage	Native	shrub	--
Lonicera subspicata	southern honeysuckle	Non-native	shrub	--
Lupinus bicolor	miniature lupine	Native	perennial herb	--
Lupinus succulentus	arroyo lupine	Native	annual herb	--
Lysimachia arvensis	scarlet pimpernel	Non-native	annual herb	--
Marah macrocarpa	chilicothe	Native	perennial herb/vine	--
Malacothamnus marrubioides	horehound bush-mallow	Native	shrub	--
Marrubium vulgare	white horehound	*Non-native	perennial herb	--
Melaleuca citrina	crimson bottlebrush	Non-native	tree	--
Myoporum parvifolium	creeping myoporum	Non-native	tree/shrub	--
Nerium oleander	oleander	Non-native	shrub	--
Nicotiana glauca	tree tobacco	*Non-native	tree/shrub	
Olea europaea	European olive	*Non-native	tree	--
Opuntia basilaris var. *basilaris*	beavertail cactus	Native	shrub (stem succulent)	--
Paeonia californica	California peony	Native	perennial herb	--
Phacelia cicutaria	caterpillar phacelia	Native	annual herb	--
Phoenix canariensis	Canary Island date palm	*Non-native	Tree	--
Pinus halepensis	Aleppo pine	Non-native	tree	--
Pseudognaphalium californicum	California cudweed	Native	annual or perennial herb	--
Pyracantha angustifolia	narrowleaf firethorn	*Non-native	shrub	--
Quercus agrifolia	coast live oak	Native	Tree	--
Rhamnus crocea	redberry buckthorn	Native	shrub	--
Rhus aromatica	fragrant sumac	Native	shrub	--
Ribes aureum	golden currant	Native	shrub	--

Scientific name	Common name	Native/Non-native	Habit	CRPR
Salvia leucophylla	purple sage	Native	shrub	--
Salvia mellifera	black sage	Native	shrub	--
Sambucus nigra ssp. *caerulea*	blue elderberry	Native	shrub or tree	--
Schinus molle	Peruvian peppertree	*Non-native	tree	--
Scrophularia californica	California beeplant	Native	perennial herb	--
Senecio flaccidus	shrubby ragwort	Native	shrub	--
Sisyrinchium bellum	western blue-eyed grass	Native	perennial herb	--
Solanum xanti	purple nightshade	Native	perennial herb/shrub	--
Sonchus oleraceus	common sow thistle	Non-native	annual herb	--
Tetradymia comosa	hairy horsebrush	Native	shrub	--
Toxicoscordion fremontii	common star lily	Native	perennial herb	--
Trifolium hirtum	rose clover	*Non-native	annual herb	--
Uropappus lindleyi	silverpuffs	Native	annual herb	--
Verbena lasiostachys	western vervain	Native	perennial herb	--
Washingtonia filifera	California fan palm	Non-native (to coastal, southern California)	tree	--
Washingtonia robusta	Mexican fan palm	*Non-native	tree	--

Conclusion

No special-status plants occur on the survey area. A botanical survey of the vascular plants conducted in the spring (May) and in the summer (August) of 2023 on the site resulted in the observance and identification of 92 native and non-native plant species. Of these there was a dominance of native species (59 species; 64.1% of all species) although non-native species had an important presence (33 species; 35.9%). Of the non-native plants, 22 (66.7%), are classified as invasive, some of which have substantial cover at the ground level enough to restrict native plant colonization. Over the course of the botanical survey conducted in 2023, no special-status plants were observed and they are considered absent from the survey area.

If you have any questions regarding the information in this report, please contact Matthew South by email: msouth@southenvironmental.com or by mobile phone: 303-818-3632.

Sincerely,



Matthew R. South
Principal Biologist

List of Attachments

1. **Attachment A**. Special-Status Species Analysis

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Appendix A:
Special-Status Species Analysis

Special-Status Species Analysis

Special-status plant species are those plants that, because of their recognized rarity or vulnerability to various causes of habitat loss or population decline, are recognized by federal, state, or other agencies as under threat from human-associated developments. Some of these species receive specific protection that is defined by federal or state endangered species legislation. Others have been designated as special-status based on adopted policies and expertise of state resource agencies or organizations with acknowledged expertise, or policies adopted by local governmental agencies such as counties, cities, and special districts to meet local conservation objectives. Special-status species include:

- Plants or wildlife listed or proposed for listing as threatened or endangered, or are candidates for possible future listing as threatened or endangered, under the federal Endangered Species Act or the California Endangered Species Act;

- Plants or wildlife that meet the definitions of rare or endangered under CEQA Guidelines Section 15380.

- Plants or wildlife covered under an adopted NCCP/HCP;

- Plants considered by the California Native Plant Society (CNPS) to be rare, threatened, or endangered (List 1A, 1B and 2 plants) in California;

- Plants listed by the CNPS as plants in which there is limited information about distribution (List 3);

- Plants listed as rare under the California Native Plant Protection Act (Fish and Game Code 1900 et seq.);

Federally-Protected Status

All references to Federally-protected species in this BRA include the most current published status or candidate category to which each species has been assigned by USFWS. For purposes of this assessment the following acronyms are used for Federal status species, as applicable:

FE Federally-listed as Endangered
FT Federally-listed as Threatened
FPE Federally proposed for listing as Endangered
FPT Federally proposed for listing as Threatened
FPD Federally proposed for delisting
FC Federal candidate species (former C1 species)

State-Protected Status

For the purposes of this BRA, the following acronyms are used for State status species, as applicable:

SE State-listed as Endangered
ST State-listed as Threatened
SR State-listed as Rare
SCE State candidate for listing as Endangered
SCT State candidate for listing as Threatened
SFP State Fully Protected
SSC California Species of Special Concern

California Rare Plant Rank

The CNPS is a private plant conservation organization dedicated to the monitoring and protection of special-status species in California. CNPS has compiled an inventory comprised of information focusing on geographic distribution and qualitative characterization of Rare, Threatened, or Endangered vascular plant species of California (CNPS 2018). The list serves as the candidate list for listing as Threatened and Endangered by CDFW. CNPS has developed six categories of rarity known as the California Rare Plant Rank (CRPR), of which Ranks 1A, 1B, 2A, and 2B are particularly considered sensitive:

Rank 1A Presumed extinct in California.
Rank 1B Plants Rare, Threatened, or Endangered in California and elsewhere.
Rank 2A Presumed extinct in California, but more common elsewhere.
Rank 2B Plants Rare, Threatened, or Endangered in California, but more common elsewhere.
Rank 3 Plants about which we need more information – a review list.
Rank 4 Plants of limited distribution – a watch list.

The CNPS recently added "threat ranks" which parallel the ranks used by the CNDDB. These ranks are added as a decimal code after the CNPS List (e.g., Rank 1B.1). The threat codes are as follows:

.1 Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat);
.2 Moderately threatened in California (20-80% occurrences threatened);
.3 Not very threatened in California (<20% of occurrences threatened or no current threats known).

Potential to Occur Assessment

Special-status species that are **present** or are **high** or **medium** potential to occur within the parcel are a based on one or more of the following:

- the direct observation of the species within the parcel during any field survey;
- a record reported in the CNDDB; and
- the parcel is within known distribution of a species and contains appropriate habitat.
- present means the species is known to occur, high potential indicates the habitat is ideal and near known occurrences of the species, and medium indicates that the habitat may be less than ideal due to some lacking element but still usable by the species and within the known range.

Special-status species that are **low** potential) to occur are based on one of the following:

- the parcel has the general habitat types but lacks necessary habitat elements such as suitable microhabitat or soils; or
- the parcel is outside the known elevation range or distribution of the species, and has otherwise suitable habitats;

Special-status species that have no potential to occur on the parcel are labeled as **none** due to the absence of suitable habitat.

Special-status species with a potential to occur on the survey area are listed below.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Allium howellii var. clokeyi	Mt. Pinos onion	1B.3	None	None	Apr-Jun	4265	6070	Great Basin scrub, Meadows, and seeps (edges), Pinyon and juniper woodland		None. No habitat for this species occurs on the survey area and the survey area is outside the known elevation for this species.
Astragalus brauntonii	Braunton's milk-vetch	1B.1	None	FE	Jan-Aug	10	2100	Chaparral, Coastal scrub, Valley and foothill grassland	recent burns or disturbed areas, usually sandstone with carbonate layers	Low. There are no recently burned areas on the survey area.
Berberis nevinii	Nevin's barberry	1B.1	CE	FE	(Feb)Mar-Jun	225	2705	Chaparral, Cismontane woodland, Coastal scrub, Riparian scrub	sandy or gravelly	Low. This conspicuous species was not observed during site surveys.
Calochortus catalinae	Catalina mariposa lily	4.2	None	None	(Feb)Mar-Jun	45	2295	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland		Low. This species is typically found on Catalina Island.
Calochortus clavatus var. clavatus	club-haired mariposa lily	4.3	None	None	(Mar)May-Jun	245	4265	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland	usually serpentinite, clay, rocky	Medium. Suitable chaparral and scrub habitat for this species occur on the survey area.
Calochortus clavatus var. gracilis	slender mariposa lily	1B.2	None	None	Mar-Jun(Nov)	1045	3280	Chaparral, Coastal scrub, Valley and foothill grassland		High. Suitable chaparral and scrub habitat for this species occur on the survey area and the species was recorded nearby to the CNDDB.
Calochortus palmeri var. palmeri	Palmer's mariposa lily	1B.2	None	None	Apr-Jul	2325	7840	Chaparral, Lower montane coniferous forest, Meadows and seeps	mesic	None. The survey area is outside the known elevation for this species.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Calochortus plummerae	Plummer's mariposa lily	4.2	None	None	May-Jul	325	5575	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland	granitic, rocky	High. Suitable chaparral and scrub habitat for this species occur on the survey area and the species was recorded nearby to the CNDDB.
Calystegia peirsonii	Peirson's morning-glory	4.2	None	None	Apr-Jun	95	4920	Chaparral, Chenopod scrub, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Valley and foothill grassland		Medium. Suitable chaparral habitat for this species occur on the survey area.
Canbya candida	white pygmy-poppy	4.2	None	None	Mar-Jun	1965	4790	Joshua tree woodland, Mojavean desert scrub, Pinyon and juniper woodland	gravelly, sandy, granitic	None. No suitable habitat for this species occurs in the survey area.
Centromadia parryi ssp. australis	southern tarplant	1B.1	None	None	May-Nov	0	1575	Marshes and swamps (margins), Valley and foothill grassland (vernally mesic), Vernal pools		None. No suitable habitat for this species occurs in the survey area.
Cercocarpus betuloides var. blancheae	island mountain-mahogany	4.3	None	None	Feb-May	95	1970	Closed-cone coniferous forest, Chaparral		Low. Although chaparral habitats occur on the survey area, this shrub was not observed on the survey area during surveys.
Chorizanthe parryi var. fernandina	San Fernando Valley spineflower	1B.1	CE	FC	Apr-Jul	490	4005	Coastal scrub (sandy), Valley and foothill grassland		None. No suitable habitat for this species occurs in the survey area.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Chorizanthe parryi var. parryi	Parry's spineflower	1B.1	None	None	Apr-Jun	900	4005	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland	sandy or rocky, openings	Low. This species is typically found in the San Gabriel Mountains to the southeast and at higher elevations to the north.
Deinandra minthornii	Santa Susana tarplant	1B.2	CR	None	Jul-Nov	915	2495	Chaparral, Coastal scrub	rocky	Low. This species is not known to occur in this specific region and is more isolated to areas to the west of I-5.
Deinandra paniculata	paniculate tarplant	4.2	None	None	(Mar)Apr-Nov(Dec)	80	3085	Coastal scrub, Valley and foothill grassland, Vernal pools	usually vernally mesic, sometimes sandy	None. No suitable habitat for this species occurs in the survey area.
Delphinium parryi ssp. purpureum	Mt. Pinos larkspur	4.3	None	None	May-Jun	3280	8530	Chaparral, Mojavean desert scrub, Pinyon and juniper woodland		Medium. Chaparral habitat on the survey area is suitable for this species.
Dodecahema leptoceras	slender-horned spineflower	1B.1	CE	FE	Apr-Jun	655	2495	Chaparral, Cismontane woodland, Coastal scrub (alluvial fan)	sandy	Medium. Chaparral habitat at the edges of drainages on the survey area is suitable for this species.
Galium grande	San Gabriel bedstraw	1B.2	None	None	Jan-Jul	1390	4920	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest		Low. This species is typically found in the San Gabriel Mountains to the southeast.
Harpagonella palmeri	Palmer's grapplinghook	4.2	None	None	Mar-May	65	3135	Chaparral, Coastal scrub, Valley and foothill grassland	Clay; open grassy areas within shrubland	High. Suitable chaparral occurs on the survey area and the species was recorded nearby to the cnddb.
Helianthus inexpectatus	Newhall sunflower	1B.1	None	None	Aug-Oct	1000	1000	Marshes and swamps, Riparian woodland	freshwater, seeps	None. No suitable habitat for this species occurs in the survey area.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Heuchera caespitosa	urn-flowered alumroot	4.3	None	None	May-Aug	3785	8695	Cismontane woodland, Lower montane coniferous forest, Riparian forest (montane), Upper montane coniferous forest	rocky	None. No suitable habitat for this species occurs in the survey area and the survey area is outside the known elevation range for this species.
Horkelia cuneata var. puberula	mesa horkelia	1B.1	None	None	Feb-Jul(Sep)	225	2655	Chaparral (maritime), Cismontane woodland, Coastal scrub	sandy or gravelly	Low. This species is not known to occur this far north and is more likely found in the San Gabriel Mountains and Santa Monica Mountains.
Hulsea vestita ssp. gabrielensis	San Gabriel Mountains sunflower	4.3	None	None	May-Jul	4920	8200	Lower montane coniferous forest, Upper montane coniferous forest	rocky	None. No suitable habitat for this species occurs in the survey area and the survey area is outside the known elevation range for this species.
Hulsea vestita ssp. parryi	Parry's sunflower	4.3	None	None	Apr-Aug	4490	9500	Lower montane coniferous forest, Pinyon and juniper woodland, Upper montane coniferous forest	granitic or carbonate, rocky, openings	None. No suitable habitat for this species occurs in the survey area and the survey area is outside the known elevation range for this species.
Juglans californica	Southern California black walnut	4.2	None	None	Mar-Aug	160	2955	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland	alluvial	Low. This species was not observed during a survey of the site and it is very conspicuous species.
Lepechinia fragrans	fragrant pitcher sage	4.2	None	None	Mar-Oct	65	4300	Chaparral		Low. This species is not known to occur this far north (aside from a few occurrences at higher elevatioins far to the north, and is more likely found in the San Gabriel Mountains and Santa Monica Mountains.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Lepechinia rossii	Ross' pitcher sage	1B.2	None	None	May-Sep	1000	2590	Chaparral		Low. This species is only known to occur at higher elevations north of Castaic and not in the vicinity of the survey area.
Lepidium virginicum var. robinsonii	Robinson's pepper-grass	4.3	None	None	Jan-Jul	0	2905	Chaparral, Coastal scrub		Low. This species is typically found in the San Gabriel Mountains to the southeast.
Lilium humboldtii ssp. ocellatum	ocellated Humboldt lily	4.2	None	None	Mar-Jul(Aug)	95	5905	Chaparral, Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Riparian woodland	openings	Low. This species is not known to occur this far north (aside from a few occurrences at higher elevatioins far to the north, and is more likely found in the San Gabriel Mountains and Santa Monica Mountains.
Lupinus paynei	Payne's bush lupine	1B.1	None	None	Mar-Apr(May-Jul)	720	1380	Coastal scrub, Riparian scrub, Valley and foothill grassland	Sandy	None. No suitable habitat for this species occurs in the survey area.
Malacothamnus davidsonii	Davidson's bush-mallow	1B.2	None	None	Jun-Jan	605	3740	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland		Medium. Chaparral habitat on the survey area is suitable for this species.
Navarretia fossalis	spreading navarretia	1B.1	None	FT	Apr-Jun	95	2150	Chenopod scrub, Marshes and swamps (assorted shallow freshwater), Playas, Vernal pools		None. No suitable habitat for this species occurs in the survey area.
Navarretia setiloba	Piute Mountains navarretia	1B.1	None	None	Apr-Jul	935	6890	Cismontane woodland, Pinyon and juniper woodland, Valley and foothill grassland	clay or gravelly loam	None. No suitable habitat for this species occurs in the survey area.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Opuntia basilaris var. brachyclada	short-joint beavertail	1B.2	None	None	Apr-Jun(Aug)	1390	5905	Chaparral, Joshua tree woodland, Mojavean desert scrub, Pinyon and juniper woodland		Medium. Chaparral habitat on the survey area is suitable for this species.
Orcuttia californica	California Orcutt grass	1B.1	CE	FE	Apr-Aug	45	2165	Vernal pools		None. No suitable habitat for this species occurs in the survey area.
Phacelia hubbyi	Hubby's phacelia	4.2	None	None	Apr-Jul	0	3280	Chaparral, Coastal scrub, Valley and foothill grassland	gravelly, rocky, talus	Medium. Chaparral habitat on the survey area is suitable for this species.
Phacelia mohavensis	Mojave phacelia	4.3	None	None	Apr-Aug	4590	8200	Cismontane woodland, Lower montane coniferous forest, Meadows and seeps, Pinyon and juniper woodland	sandy or gravelly	None. No suitable habitat for this species occurs in the survey area and the survey area is outside the known elevation range for this species.
Pseudognaphalium leucocephalum	white rabbit-tobacco	2B.2	None	None	(Jul)Aug-Nov(Dec)	0	6890	Chaparral, Cismontane woodland, Coastal scrub, Riparian woodland	sandy, gravelly	Low. This species is typically found near the Santa Clara River and Castaic, as well as in some areas of the San Gabriel Mountains, and not in the vicinity of the survey area.
Quercus durata var. gabrielensis	San Gabriel oak	4.2	None	None	Apr-May	1475	3280	Chaparral, Cismontane woodland		None. This species was not observed during a focused oak tree survey conducted on the survey area.
Senecio aphanactis	chaparral ragwort	2B.2	None	None	Jan-Apr(May)	45	2625	Chaparral, Cismontane woodland, Coastal scrub	sometimes alkaline	Low. This species is only known to occur in the region from a few populations on the Santa Clara River, and is not likely to occur on the survey area due to a lak of alkaline habitat.

Scientific Name	Common Name	CRPR	CESA	FESA	Blooming Period	Low (ft)	High (ft)	Habitat	Micro Habitat	Potential to Occur
Streptanthus campestris	southern jewelflower	1B.3	None	None	(Apr)May-Jul	2950	7545	Chaparral, Lower montane coniferous forest, Pinyon and juniper woodland	rocky	None. The survey area is outside the known elevation for this species.
Symphyotrichum greatae	Greata's aster	1B.3	None	None	Jun-Oct	980	6595	Broadleafed upland forest, Chaparral, Cismontane woodland, Lower montane coniferous forest, Riparian woodland	mesic	Low. This species typically is found in forest or woodland habitats.

APPENDIX B-3
Jurisdictional Delineation

August 13, 2025

Renaud & Sue Veluzat
24715 Oak Creek Road
Newhall, California 91321

RE: Jurisdictional Delineation for Tentative Tract Map (TTM) 68203 in Santa Clarita, California

Dear Mr. & Mrs. Veluzat,

This letter includes results of a Jurisdictional Delineation and an assessment of impacts to jurisdictional features from a proposed mixed-use development on Tentative Tract Map (TTM) 68203 in the City of Santa Clarita, California. The scope of this letter report includes a description of the project, methodology, results of the survey, a delineation of the jurisdictional resources on the survey area, and an assessment of potential impacts to jurisdictional features.

Project Description

Project Location and Setting

The property proposed for development (project site) includes 28.13-acres consisting of 10 parcels located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita (see Figure 1 and Figure 2 below). The project site is on the United State Geologic Service (USGS) Mint Canyon 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North (T04N) and Range 15 West (R15W).

- Assessor's Parcel Numbers (APNs): 2836-013-106, 2836-013-107, 2836-013-111, 2836-013-128, 2836-013-133, 2836-013-141, 2836-020-058, 2836-020-078, 2836-020-086, 2836-020-087



Source: ESRI USA Topo Maps 2020

Santa Clarita TTM 68203

Figure 1. Project Location

Project Site is on the USGS Mint Canyon 7.5-minute quadrangle map in the southeast corner of Township 04 North (T04N) and Range 15 West (R15W) Section 30 (S30).

Center Coordinate (decimal degrees):
Latitude: 34.3985N Longitude: -118.4861W

SOUTH ENVIRONMENTAL



Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Figure 2. Survey Area

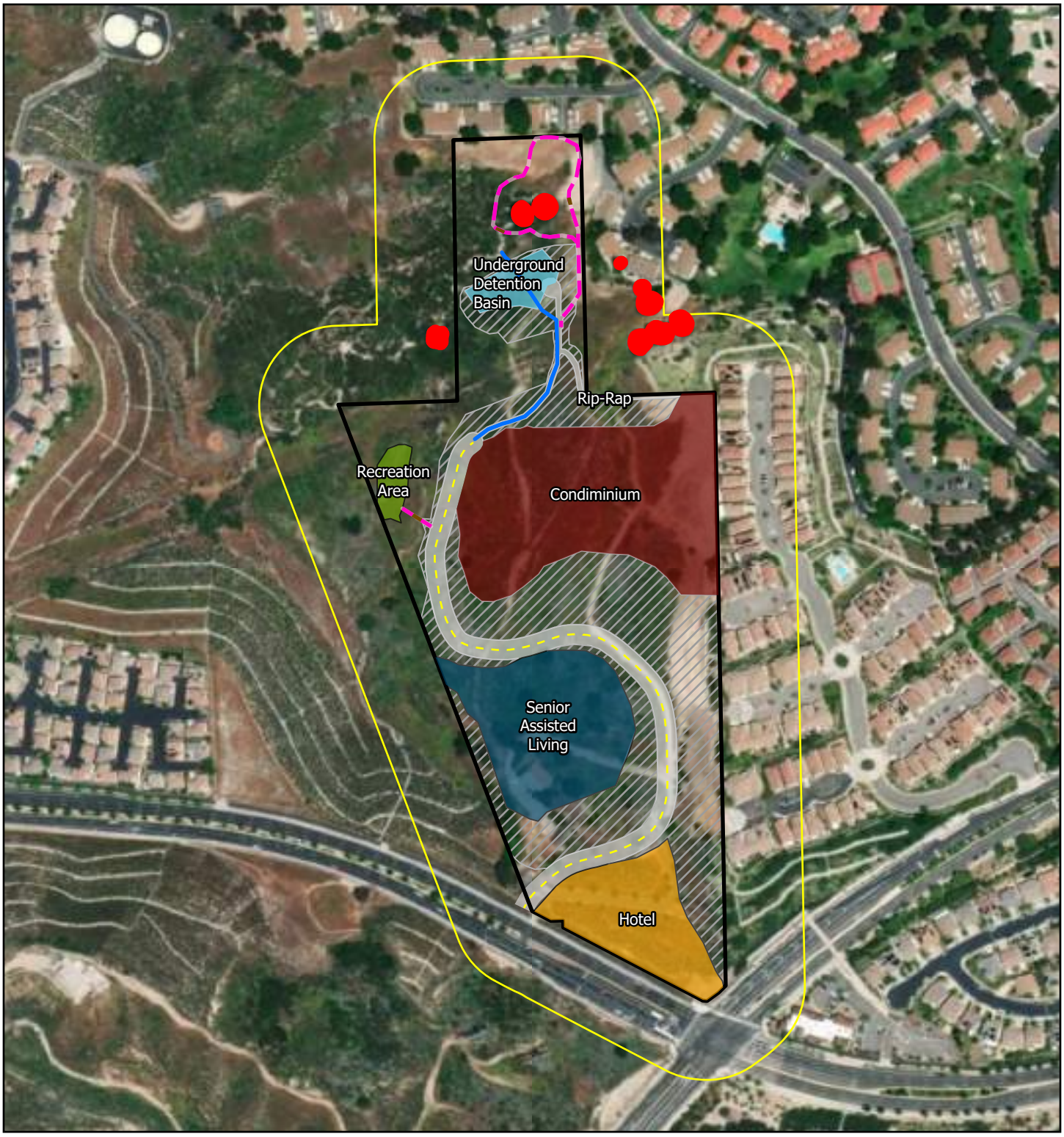
SOUTH ENVIRONMENTAL

Most of the property is undeveloped except for a single-family home and accessory structures with a street address 20101 Golden Valley Road. A windy paved driveway exists off Golden Valley Road provide access to the home, and a series of dirt roads provide access to the remaining undeveloped hills on the property. Adjacent uses include residential uses to the immediate north and east, vacant land to the south, and residential uses/Golden Valley High School to the west.

Proposed Development

The proposed development seeks to merge the 10 parcels and entitle a Tentative Tract Map 68203 for a four (4) lot subdivision consisting of the following (shown in Figure 3 below):

- One (1) 5.04-acre lot for a four (4) story building consisting of 154-unit senior assisted living units; the proposed four (4) story building will be 50-foot maximum height.
- One (1) 5.04-acre lot for a 100-room commercial hotel and retail building.
- One (1) 11.48-acre lot for 73 residential Condominium units consisting two, three, and four-plex buildings.
- One (1) 5.83-acre open space lot for L.I.D. storm water treatment and an eight-foot wide riding and hiking trial.
- Proposed streets and circulations will result in approximately 0.73 acres of development.
- A Proposed Recreation Area and foot bridge access is proposed west of the condominium units.
- The project will require slope control surrounding all developments as shown in the Site Plan.



Source: ESRI Aerial Imagery 2025

Santa Clarita VTTM 68203 Project

Figure 3. Proposed Development

0 215 430 Feet

N

- Project Boundary
- Survey Area - 200-foot Buffer
- Oak Tree Protected Zone

Proposed Development

- Riding/Hiking Trail
- Drainage Pipe
- Road Centerline
- Hikinig Trail
- Condiminium
- Underground Detention Basin
- Hotel
- Senior Assisted Living
- Recreation Area
- Rip-Rap
- Bridge
- Road
- Slope Control

SOUTH ENVIRONMENTAL

Regulatory Setting

Federal Regulations

Clean Water Act Sections 404 and 401

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged and fill material into Waters of the United States, including wetlands. Activities in Waters of the US or wetlands regulated under this program include fill for development, water resource projects (such as dams and levees), infrastructure development (such as highways and airports) and mining projects. Section 404 requires a permit before dredged or fill material may be discharged into Waters of the US or wetlands.

Section 401 of the CWA requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States (such as a Clean Water Act Permit under Section 404), must obtain a state water quality certification stating that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit may be issued by a federal agency until certification required by section 401 has been granted. Further, no license or permit may be issued if certification has been denied.

California Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act requires the adoption of water quality control plans (basin plans) that give direction to managing water pollution in California. The basin plans get adopted and administered by the Regional Water Quality Control Board (RWQCB). The plans incorporate the beneficial uses of the waters of the State and then provide objectives that should be met to maintain and protect these uses. Along with the Regional Water Boards, the State Water Resources Board can issue and enforce permits containing waste discharge requirements to maintain clean surface water and groundwater. Each basin plan identifies the specific beneficial uses of water in their region for the past, present, and future. These basin plans also all have objectives for which the plan clearly states steps that are being taken or will be taken to meet the objectives. These objectives are created for the purpose of keeping the water clean and safe to use beneficially. The Regional Board has the authority to give out permits for the purpose of waste disposal or waste assimilation.

Waters of the State (WSC) 401 Water Quality Certification

The RWQCB regulates activities pursuant to Section 401(a)(1) of the CWA. Section 401 of the CWA specifies that certification from the State is required for any applicant requesting a federal license or permit including a Section 404 permit. The RWQCB' s delegated authority over Section 401 requires a Water Quality Certification consistent with the USACE of Engineers definition of waters of the US.

The State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State was adopted in April 2020 and put into effect statewide on May 28, 2020 (State Water Resources Control Board [SWRCB] 2020a). The Water Boards define wetlands as follows:

"An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area' s vegetation is dominated by hydrophytes or the area lacks vegetation."

The Water Code defines Waters of the State of California (WSC) broadly to include "any surface water or groundwater, including saline waters, within the boundaries of the state." In the 2020 state wetland definition, the State did not define non-wetland WSC, rather they are relying on regional characterizations of jurisdiction was delegated to the Regional Boards.

The following wetlands are WSC based on the 2020 Procedures:

1. Natural wetlands;
2. Wetlands created by modification of a surface water of the state; and
3. Artificial wetlands that meet any of the following criteria:
    a. Approved by an agency as compensatory mitigation for impacts to other WSC, except where the approving agency explicitly identifies the mitigation as being of limited duration;
    b. Specifically identified in a water quality control plan as a wetland or other water of the state;
    c. Resulted from historic human activity, is not subject to ongoing operation and maintenance, and has become a relatively permanent part of the natural landscape; or
    d. Greater than or equal to one acre in size, unless the artificial wetland was constructed, and is currently used and maintained, primarily for one or more of the following purposes (i.e., the following artificial wetlands are not WSC unless they also satisfy the criteria set forth in 2, 3a, or 3b):
        i. Industrial or municipal wastewater treatment or disposal;
        ii. Settling of sediment;

iii. Detention, retention, infiltration, or treatment of stormwater runoff and other pollutants or runoff subject to regulation under a municipal, construction, or industrial stormwater permitting program,
iv. Treatment of surface waters;
v. Agricultural crop irrigation or stock watering;
vi. Fire suppression;
vii. Industrial processing or cooling;
viii. Active surface mining – even if the site is managed for interim wetlands functions and values;
ix. Log storage;
x. Treatment, storage, or distribution of recycled water;
xi. Maximizing groundwater recharge (this does not include wetlands that have incidental groundwater recharge benefits); or
xii. Fields flooded for rice growing.

All artificial wetlands that are less than 1 acre in size and do not satisfy the criteria set forth in 2, 3.a, 3.b, or 3.c are not WSC.

State of California Fish and Game Code Section 1600

Fish and Game Code Section 1602 outlines the Lake and Streambed Alteration Agreement (LSAA) permitting process, and states:

- An entity shall not substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake

Fish and Game Code Section 1602 requires any entity (defined as any person, State or local governmental agency, or public utility) to notify the CDFW before beginning any activity that will do one or more of the following:

- substantially divert or obstruct the natural flow of and river, stream, or lake, or
- substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or
- deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

A permit, known as a Lake or Streambed Alteration Agreement, from CDFW is required to conduct any of the activities described above.

Methodology

This jurisdictional delineation is based on information compiled through a field survey and a review of appropriate reference materials and literature regarding the resources of the region. The jurisdictional delineation was conducted by South Environmental principal biologist Matthew South and the sources and literature referenced in this assessment are provided below in Section 4. Bibliography.

Literature Review

The assessment of the jurisdictional features began with a review of literature relating to the topography, soils, biological resources, and hydrology that are known to occur on and in the vicinity of the project site, and include the following sources:

- United States Geologic Service (USGS) Mint Canyon 7.5"quad topographic map,
- US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soils Database (USDA 2020)
- National Hydrography Dataset (USGS 2020a)
- National Wetlands Inventory (USFWS 2020)
- National Watershed Boundary Dataset (USGS 2020b)
- Historic aerial photographs (historicaerials.com),
- Biological Resources Assessment (South Environmental 2020).

Jurisdictional Delineation

A formal delineation of "waters of the U.S." and "waters of the state" was conducted on November 21, 2020 by South Environmental biologist Matthew South on the project site and a 200-foot buffer (survey area). The limits of jurisdictional features were recorded in the field using Arc Collector mobile application and a Trimble R1 GPS Receiver was used to ensure that the accuracy of the measurements was less than 36-inches of error.

Waters of the U.S.

Guidance documents released by the US Army Corps of Engineers (USACE) following the US Supreme Courts' 2006 Rapanos Decision define waters of the US as any of the following:

- Traditional Navigable Waters (TNWs),
- wetlands adjacent to TNWs,
- tributaries of TNWs (relatively permanent, minimum of a 3-month seasonal flow)

- wetlands directly adjacent to tributaries of TNWs.

Wetlands

The biologist used methods described in the USACE 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Arid West Region (Version 2.0)* (USACE 2008) to determine the presence or absence of wetlands. During the site survey the following three wetland indicators were evaluated:

1. Dominance of wetland vegetation,
2. Presence of hydric soils, and
3. Periods of surface flooding or ponding water (visible surface water or saturated soils).

The USACE Arid West 2016 *Regional Wetland Plant List* was used to determine the wetland indicator status of plants that were observed in the survey area, and changes in vegetation, soils, or hydrologic features are used to identify boundaries of wetlands, when present. Completed *Wetland Determination Data Form – Arid West Region* worksheet were completed for the project and are included in Appendix B.

Non-Wetland Waters

Non-wetland waters of the US are waters that lack wetland vegetation or hydric soils and have a clearly defined Ordinary High-Water Mark (OHWM), which indicates periods of surface flow. The OHWM was delineated using the methods in two USACE guidance documents: *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Lichvar and McColley 2008) and *Updated Datasheet for the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (USACE 2010). A completed Datasheet for Identification of the OHWM is found in Appendix B.

Waters of the State

Los Angeles Regional Water Quality Control Board

South Environmental assumes all waters of the US are also considered waters of the state and are under the jurisdiction of the Los Angeles Regional Water Quality Control Board (RWQCB). The limits of wetlands, or the OHWM for non-wetland waters delineated on the project site will also be considered the limits of waters of the state under the jurisdiction of the RWQCB.

California Department of Fish and Wildlife (CDFW)

Waters of the state that are under the jurisdiction of the California Department of Fish and Wildlife (CDFW) are delineated at the top of the bank of a stream and extend to riparian habitats or vegetation associated with watercourses. Riparian vegetation is that which depends on surface or

groundwater associated with the stream to exist and other vegetation that is either more dense or vigorous than the surrounding communities will also be considered under the jurisdiction of the CDFW.

Results

Topography and Climate

The project site is a steeply sloping group of hills that is at an elevation of 1750-feet at the home site and 1560-feet in the northern tip. There is a hilltop that is at the northwest edge of the homesite and extends northeast through the project site and is steeply sloped on the east and west sides. Climate in the region is hot and dry, with average summer high temperatures in the mid-90s and average winter lows in the mid-30s. Average yearly rainfall is 14-inches (less than half the national average) and the wettest months are January – March, and almost no precipitation between May-August.

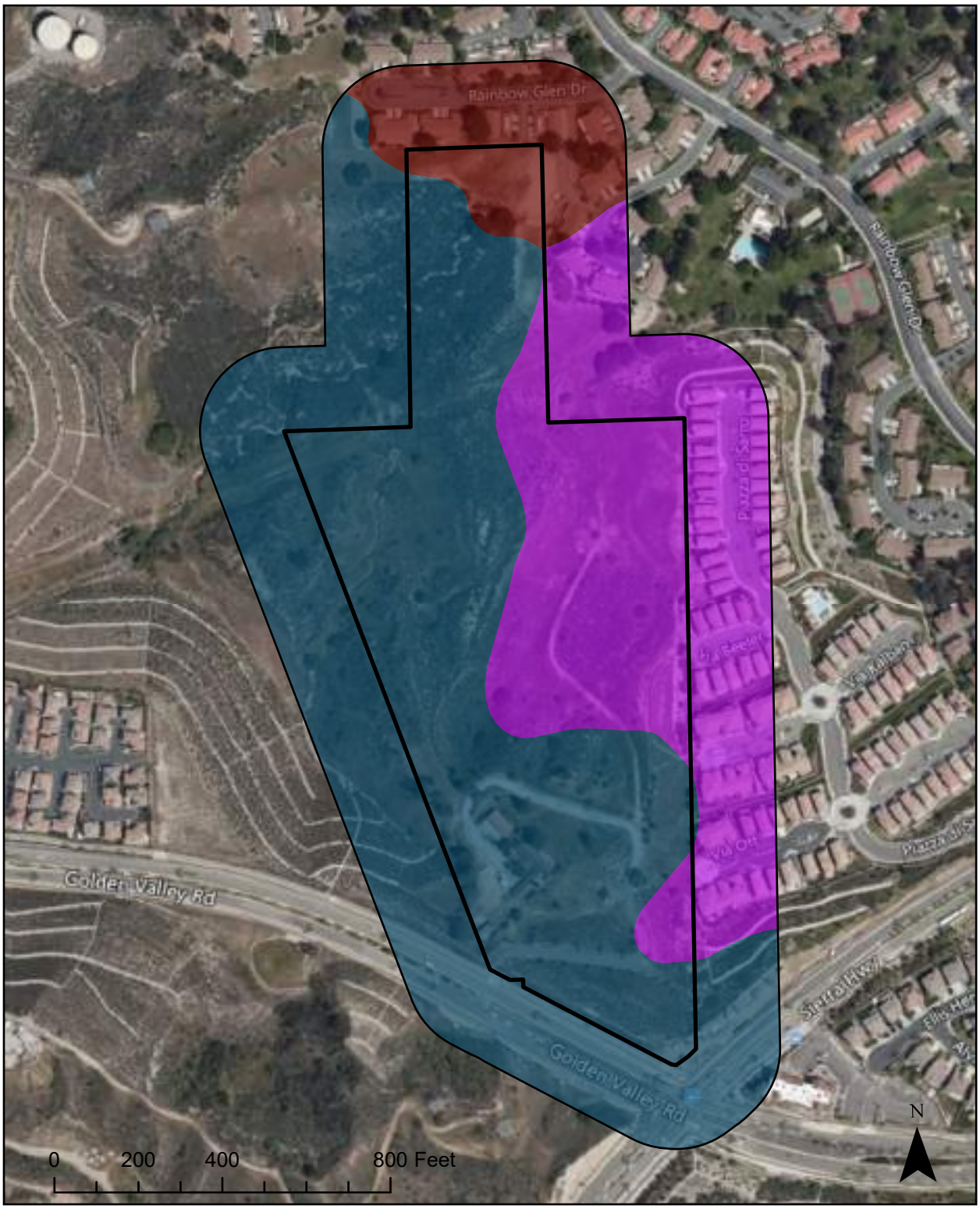
Soils

Three soils occur on the project site as shown in Figure 4:

- **Saugus loam, 30 to 50 percent slopes, eroded** is the most abundant soil type and occurs in the western half of the project site. This is an upland soil found on backslope of hills, and is well drained.
- **Castaic-Balcom silty clay loams, 15 to 30 percent slopes** is on the eastern portions of the project site. This soil type largely includes (99%) upland hills and backslopes and includes 1% of drainageways. This is a well-drained soil.
- **Zmora loam, 2 to 9 percent slopes** is on the northern tip of the project site. This soil type is typically found on terraces and backslopes and is well drained.

Plant Communities

As shown in Figure 5, there are five plant communities or cover types in a 200-foot buffer surrounding the project site, and they are summarized in Table 1 below.



Source: BING Aerial Basemap 2020, USDA NRCS Soils GIS

Santa Clarita TTM 68203

Figure 4. Soils

Survey Area (200-foot Buffer)

Project Boundary

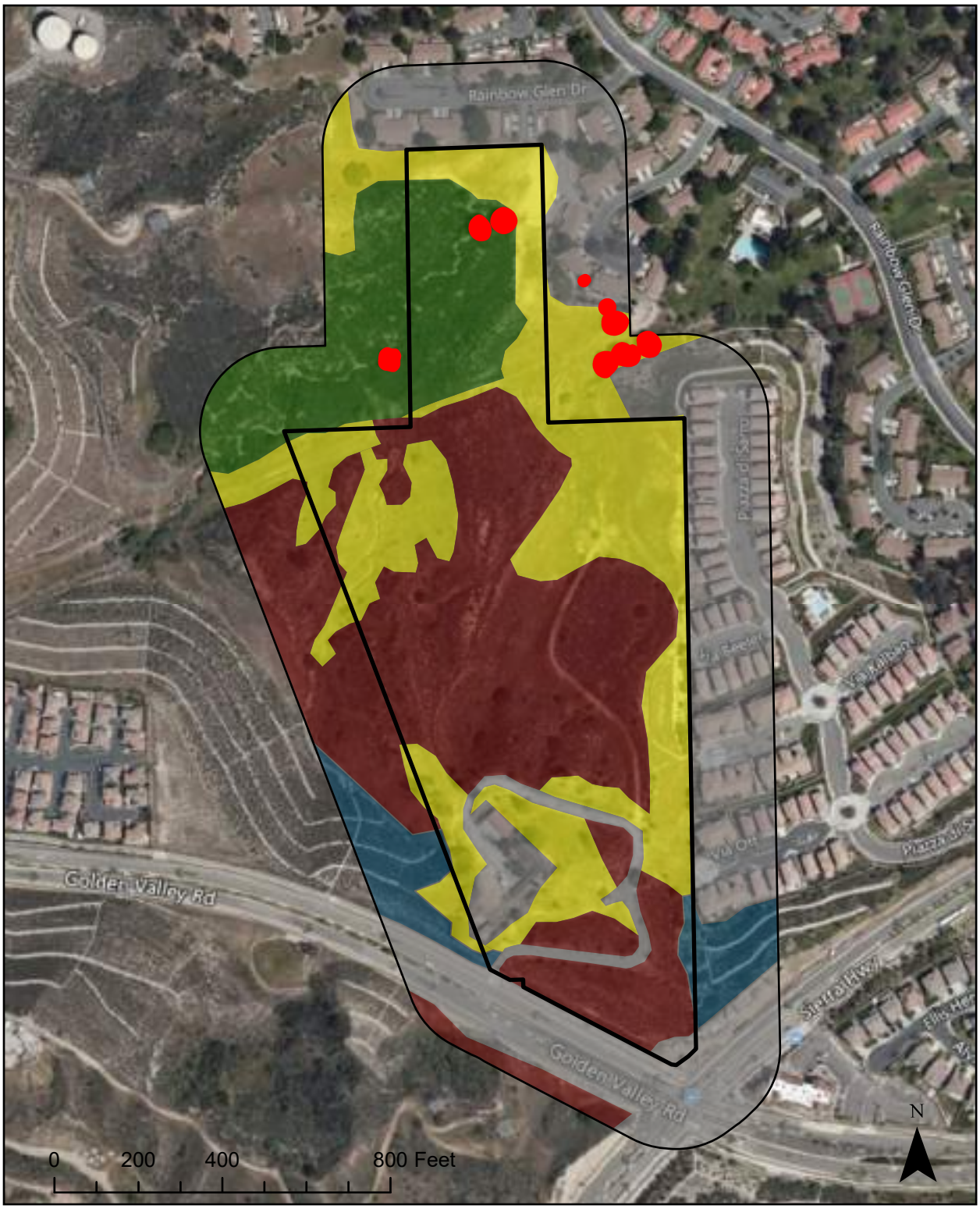
Soils

Castaic-Balcom silty clay loams, 15 to 30 % slopes

Saugus loam, 30 to 50 % slopes, eroded

Zamora loam, 2 to 9 % slopes

SOUTH ENVIRONMENTAL



Source: BING Aerial Basemap 2020, USDA NRCS Soils GIS

Santa Clarita TTM 68203

Figure 5. Plant Communities

- Survey Area (200-foot Buffer)
- Project Boundary
- Protected Oak Tree
- California Sagebrush - (Purple Sage) Scrub
- Chamise Chaparral
- Installed Sage Scrub
- Ruderal
- Developed

SOUTH ENVIRONMENTAL

Table 1. Summary of Plant Communities in Survey Area

Plant Community	Acres	Global Rank (G) /State Rank (S)
California Sagebrush – (Purple Sage) Scrub	16.71	G5/S5
Chamise Chaparral	6.66	G5/S5
Installed Sage Scrub	2.50	G5/S5
Ruderal	13.44	not ranked
Developed	17.21	not ranked
Total	56.52	

California Sagebrush – (Purple Sage) Scrub

California sagebrush – (purple sage) scrub [*Artemisia californica* – (*Salvia leucophylla*) Shrubland Alliance] as described by the Manual of California Vegetation Online occurs on 16.71-acres of the survey area. This community occurs in two Associations described by the Manual:

- ***Artemisia californica – Salvia leucophylla* Association** occurs on the central portions of the survey area and on the areas south of Golden Valley Road. This community is dominated by California sagebrush (*Artemisia californica*) and purple sage (*Salvia leucophylla*) is a sub-dominant species. Other prominent shrubs include California buckwheat (*Eriogonum fasciculatum*), black elderberry (Sambucus nigra), toyon (*Heteromeles arbutifolia*), and chaparral yucca (*Hesperoyucca whipplei*).
- ***Artemisia californica – Eriogonum fasciculatum* Association** occurs on the southern portions of the survey area between the house and the installed sage scrub. This community is co-dominated by California sagebrush and California buckwheat.

Chamise Chaparral

Chamise chaparral (*Adenostoma fasciculatum* Shrubland Alliance) as described by the Manual occurs in the northern portion of the survey area. Specifically, the *Adenostoma fasciculatum* – (*Ceanothus crassifolius*) Association occurs on the survey area and is dominated by chamise (*Adenostoma fasciculatum*) and hoary leaved ceanothus (*Ceanothus crassifolius*) is sub-dominant. Purple sage, coast live oak (*Quercus agrifolia*), and coast prickly pear (*Opuntia littoralis*) occur occassioinaly.

Installed Sage Scrub

Installed sage scrub occurs on hillsides adjacent to existing developments and are dominated by California buckwheat and have a variety of other landscaped species. These are managed areas that have a series of concrete drainage channels that direct surface water on the slopes away from the houses.

Ruderal

Ruderal areas occur throughout the survey area surrounding the house, on the hillsides adjacent to neighborhoods, and along the gas company easement. These areas are dominated by black mustard (Brassica nigra) and has a variety of other plants associated with disturbed area and landscaped species such as telegraph weed (*Heterotheca grandiflora*), California pepper tree (*Schinus molle*), olive tree (*Olea europaea*), Mexican fan palm (*Washingtonia robusta*), Canary Island date palm (*Phoenix canariensis*), blue gum eucalyptus (*Eucalyptus globulus*), and Aleppo pine (*Pinus halepensis*).

Developed

Developed areas include Golden Valley Road, Sierra Highway, paved driveway, the single-family residence on the project site, and the surrounding homes in the neighborhoods.

Hydrology & Jurisdictional Features

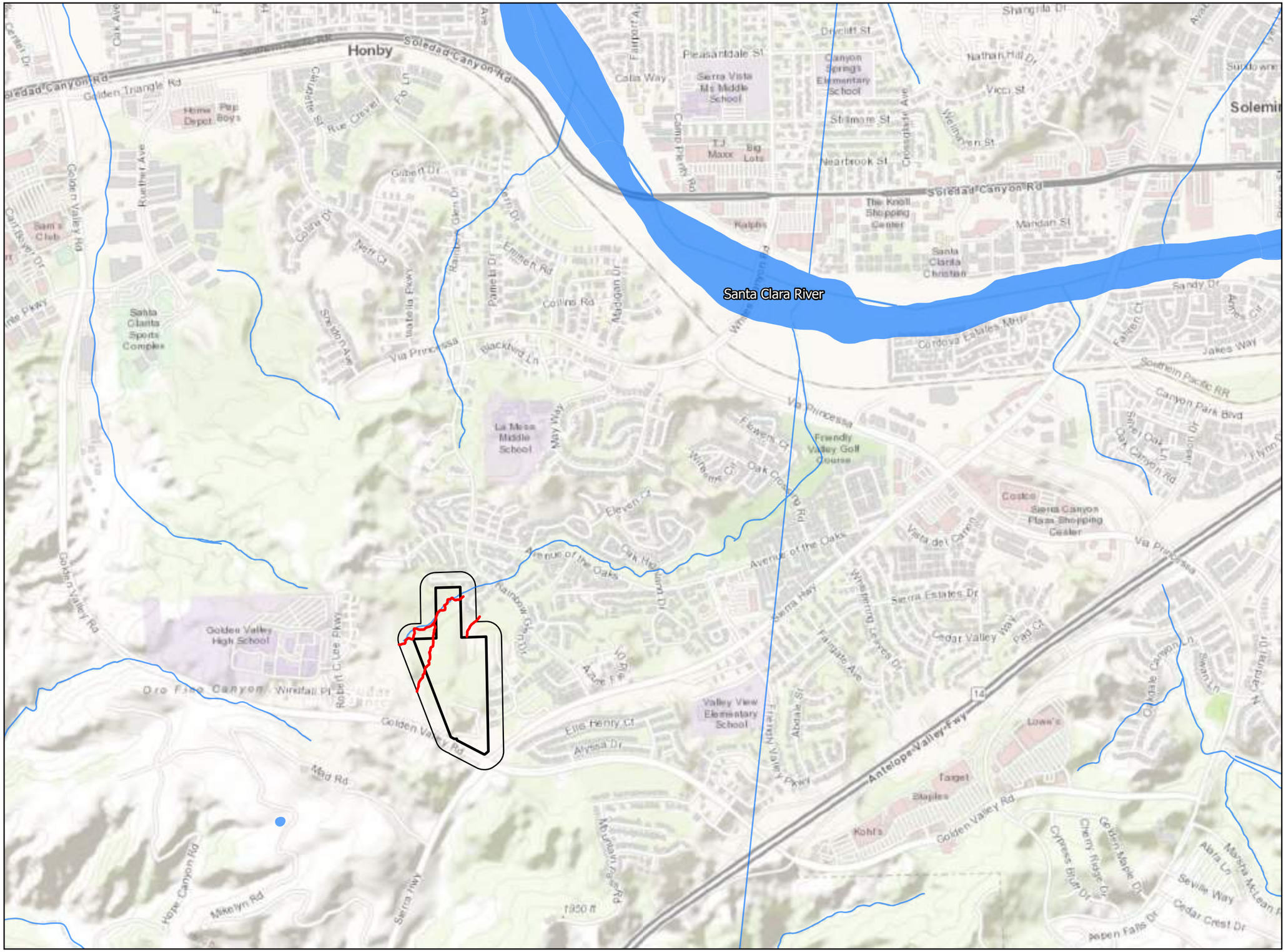
The project site is located within the Santa Clara watershed (HUC8) and within the Sand Canyon – Santa Clara River sub-watershed (HUC12). As shown in Figure 6 and Figure 7, there are three ephemeral drainages in the survey area, two of which cross through the northern portion of the project site and one of which occurs in the 200-foot buffer surrounding the project site in the northeast. These drainages are named Ephemeral Drainages #1, #2, and #3 and Table 2 below summarizes the size of these drainages in the survey area.

Table 2. Summary of Jurisdictional Features in the Survey Area

Feature	Linear Feet	Wetlands (acres)	Non-Wetland Waters of the State RWQCB/CDFW (acres)	Permanent Impacts (square feet/linear feet)	Temporary Impacts (square feet/linear feet)
Ephemeral Drainage #1	1,315	0	0.33	15/10	206/20
Ephemeral Drainage #2	1,015	0	0.23	0	105/10
Ephemeral Drainage #3	350	0	0.13	1,175/67	0
Total	2,680	0	0.69	1190/77	311/30

Figure 6.
Regional Hydrology

- Ephemeral Drainage
- National Wetlands Inventory
- Survey Area (200-foot buffer)
- Project Boundary

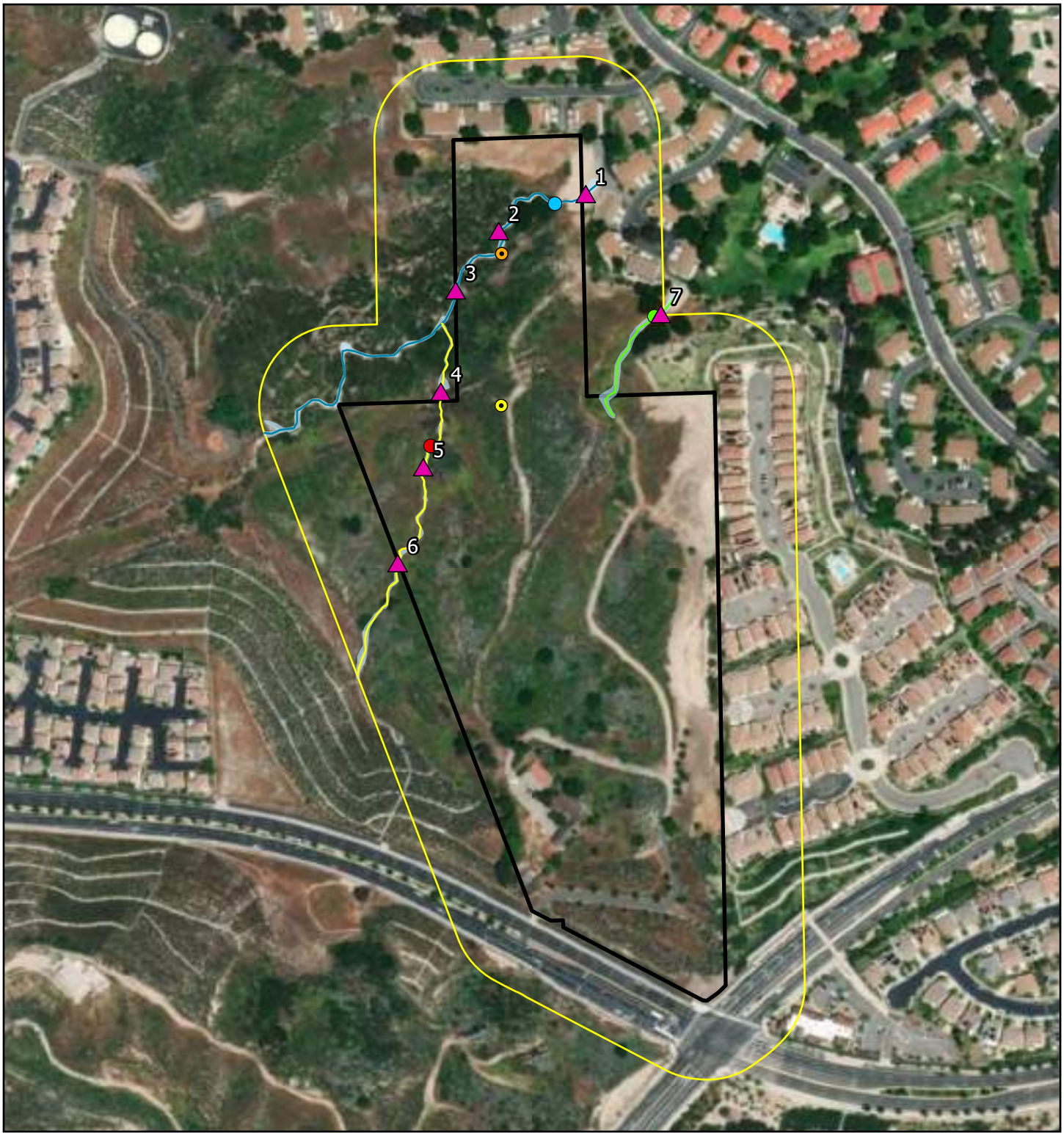


Source: ESRI World Topo 2020,
National Wetlands Inventory, 2020

0 500 1,000 2,000 Feet

N

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Source: ESRI Aerial Imagery 2025

Santa Clarita VTTM 68203 Project

Figure 7. Jurisdictional Delineation

0 215 430 Feet

N

- Photo Points
- OHWM Form #1
- OHWM Form #2
- OHWM Form #3
- Upland Data Form
- Wetland Data Form
- Project Boundary
- Survey Area - 200-foot Buffer

Jurisdictional Features

- Ephemeral Drainage #1
- Ephemeral Drainage #2
- Ephemeral Drainage #3
- Streambed / OHWM

SOUTH ENVIRONMENTAL

These drainages flow into underground culverts at the northeastern portion of the survey area and outlet into a concrete-lined drainage channel just north of Avenue of the Oak and just east of Green Terrace Drive. The channel flows east along Avenue of the Oaks and then bends northeast through Friendly Valley Golf Course, and finally flows through a culvert under Via Princessa and into the Santa Clara River. This path is shown as a blue line by the National Wetland Inventory data shown in Figure 6. The Santa Clara River outlets to the Pacific Ocean approximately 45-miles to the southwest of the survey area.

Ephemeral Drainage #1

A total of 1,315-feet (0.33-acre) of Ephemeral Drainage #1 is aboveground in the survey area. This drainage originates approximately 300-feet southwest of where it enters the survey area where a series of concrete v-ditches on the developed hillslope outlets. The drainage flows toward the northeast and into a large underground culvert and ultimately into the Santa Clara River. The drainage varies in width from about 2-feet to 25-feet and has a well-defined bed and bank, which is also the limits of the OHWM. The streambed consists of boulder and cobble substrate throughout that is contained in abrupt banks from 6-inches to 2.5-feet tall. The drainage typically lacks a floodplain, except at a few areas where the drainage turns there is a sandy floodplain that is entirely vegetated with upland plants. The drainage has dense chaparral dominated by chamise along most of the aboveground areas except near the culvert where vegetation removal occurs regularly. The drainage is also underneath the canopy of a few large coast live oaks, and other plants present include hoary leaved ceanothus, coastal prickly pear, California buckwheat, and black elderberry. Ephemeral Drainage #1 is waters of the state under the jurisdiction of the RWQCB and the CDFW. This is not waters of the U.S. because it is not relatively permanent as it only flows periodically in response to rain events.

Ephemeral Drainage #2

A total of 1,015-feet (0.23-acre) of Ephemeral Drainage #2 is on the survey area. This drainage originates on the western edge of the survey area where a series of concrete v-ditches on the developed hillslope outlets, and outlets into Ephemeral Drainage #1 in the north of the survey area. Typically, this drainage has an extremely steep and well-defined bank that is from 6-inches to 6-feet tall and typically between 1-foot and 5-feet wide, except at one point where it crosses a gas pipeline easement that was previously filled, the drainage flows over the easement and then enters a large boulder rip-rap area before continuing into a well-defined streambed again. The drainage has no floodplain and is entirely contained in the banks. The streambed consists of a cobble substrate and the surrounding area are vegetated with a dense mat of black mustard (upland species) in some areas, and native upland shrubs dominate in other areas, including California buckwheat, California sagebrush, and purple sage. As it gets closer to the endpoint the vegetation becomes dominated by chamise chaparral that covers the entire streambed.

Ephemeral Drainage #2 is waters of the state under the jurisdiction of the RWQCB and the CDFW. This is not waters of the U.S. because it is not relatively permanent as it only flows periodically in response to rain events.

Ephemeral Drainage #3

A total of 350-feet (0.13-acre) of Ephemeral Drainage #3 is on the survey area. The drainage originates at the edge of the project site where a graded dirt road on the project site drops stopes steeply to create a "U" shaped drainage that is entirely dirt lined and heavily vegetated with mostly black mustard. Purple sage also occurs in the channel, particularly in the area that is passes by several large coast live oaks. The drainage ends at an underground culvert near the northeastern edge of the survey area, and eventually joins Ephemeral Drainage #1 underground and ultimately into the Santa Clara River. This drainage has fewer surrounding slopes to direct water into it and is less well defined as a result. Ephemeral Drainage #2 is waters of the state under the jurisdiction of the RWQCB and the CDFW. This is not waters of the U.S. because it is not relatively permanent as it only flows periodically in response to rain events.

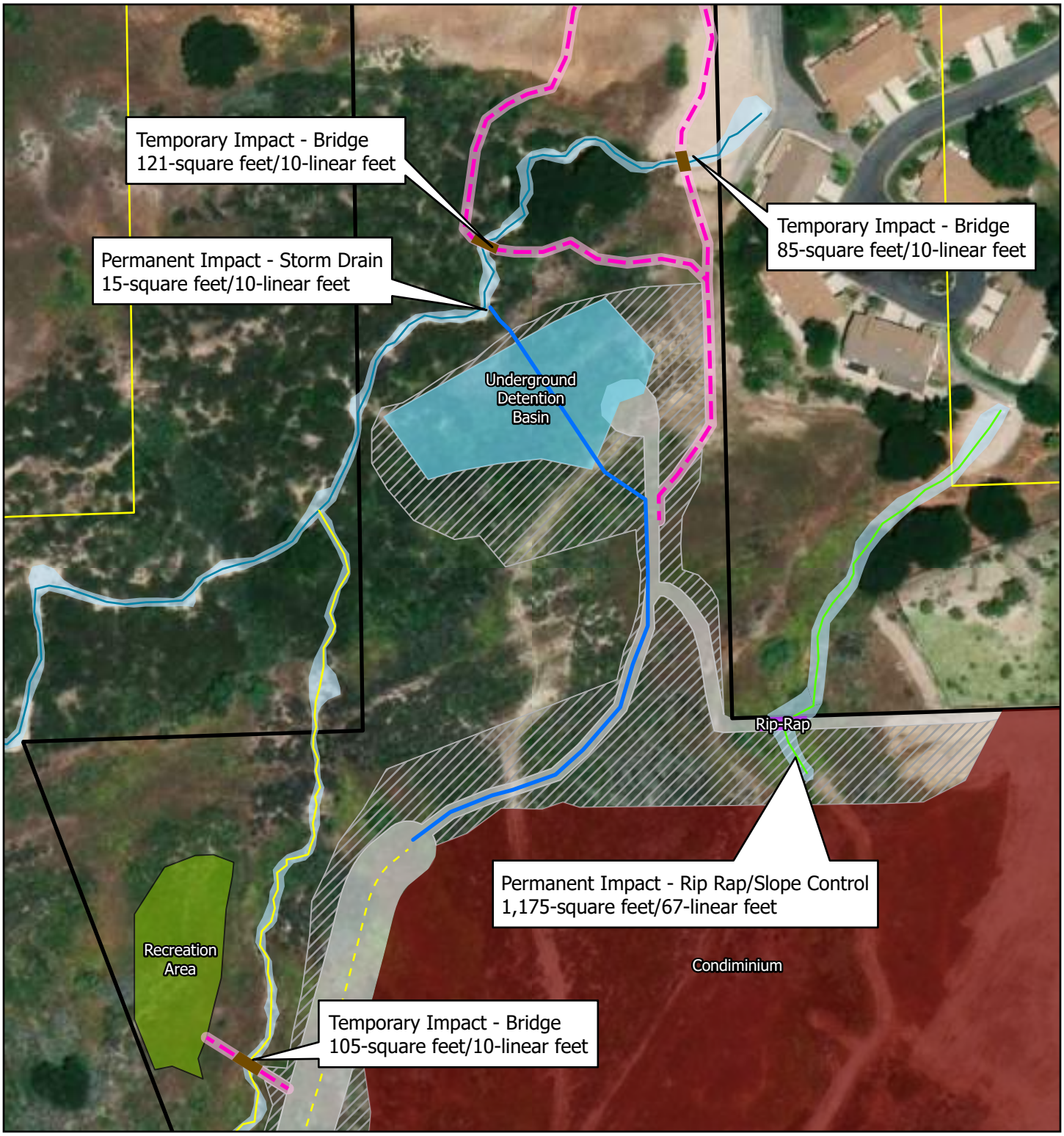
Impacts Analysis

Permanent Impacts: As shown in Figure 8 and summarized in Table 2 above, the proposed development would result in a total permanent impact to 1,190-square feet (77-linear feet) of CDFW and RWQCB features from construction as follows:

- 15-square feet (10-linear feet) of Drainage #1 where the proposed storm drain outlet would be placed within the drainage. This drain may also outlet overflow water into the drainage.
- 1,175-square feet (67-linear feet) of Drainage #3 where the proposed fire access road, rip rap, and slope control associated with the new condominiums would be permanently developed at the south end of the drainage.

Temporary Impacts: As shown in Figure 8 and summarized in Table 2 above, the proposed development would result in a total of 311-square feet (30-linear feet) of temporary impacts to CDFW and RWQCB features from construction as follows:

- 105-square feet (10-linear feet) of pedestrian bridge will be constructed over the top of Drainage #2 between the proposed road and recreation area. The bridge would not fill the stream, and the stream would remain entirely intact beneath the bridge with no obstruction of the flow during construction or operation of the project.



Source: ESRI Aerial Imagery 2025

Santa Clarita VTTM 68203 Project

Figure 8. Impacts to Jurisdictional Features

0 75 150 Feet

N

- Project Boundary
- Survey Area - 200-foot Buffer

Proposed Development

- Riding/Hiking Trail
- Drainage Pipe
- Road Centerline
- Hikinig Trail
- Condiminium
- Underground Detention Basin
- Hotel
- Senior Assisted Living
- Recreation Area
- Rip-Rap
- Bridge
- Road
- Slope Control

Jurisdictional Features

- Ephemeral Drainage #1
- Ephemeral Drainage #2
- Ephemeral Drainage #3
- Streambed / OHWM

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- 121-square feet (10-linear feet) of pedestrian/horse bridge will be constructed over the top of Drainage #1 immediately north of the proposed underground detention basin.. The bridge would not fill the stream, and the stream would remain entirely intact beneath the bridge with no obstruction of the flow during construction or operation of the project.
- 85-square feet (10-linear feet) of pedestrian/horse bridge will be constructed over the top of Drainage #1 northeast of the proposed underground detention basin. The bridge would not fill the stream, and the stream would remain entirely intact beneath the bridge with no obstruction of the flow during construction or operation of the project.

The impacts from construction of the bridges would be temporary and only occur during construction. Following construction, the drainages would be unaffected by the new development and will function exactly as they do now. The bed and bank would not be altered as the footings for the bridge would be outside of the bank in upland areas that would not alter drainages in any way The discharged water from the underground detention basin will be treated prior to discharge which will reduce the potential for contaminants in the water, and the amount of discharged water would be similar to pre-construction runoff that would naturally runoff into the drainages. Nonetheless, these temporary and permanent impacts would be considered significant according to Porter Cologne Act, Section 401 of the Clean Water Act, and Section 1600 of the Fish and Game Code and permits and mitigations will be required to construct the project to reduce the impacts to a less than significant level.

Recommendations:

- Prior to construction the project shall obtain a Lake and Streambed Alteration Agreement from CDFW and a water quality certification and Waste Discharge Requirements from RWQCB.

Conclusion

Three ephemeral drainages occur in the survey area that are under the jurisdiction of the RWQCB, and the CDFW. Permits should be sought for impacts to these features. Permit conditions should be followed to compensate or mitigate for the impacts, and to avoid impacts to the remaining features during construction and operation of the development. If you have any questions regarding the information in this report, please contact Matthew South by email: msouth@southenvironmental.com or by mobile phone: 303.818-3632.

Sincerely,



Matthew R. South

List of Attachments

1. **Attachment A**. Photograph Exhibit
2. **Attachment B**. Wetland Determination Data Forms – Arid West Region and Arid West Ephemeral and Intermittent Streams OHWM Datasheets

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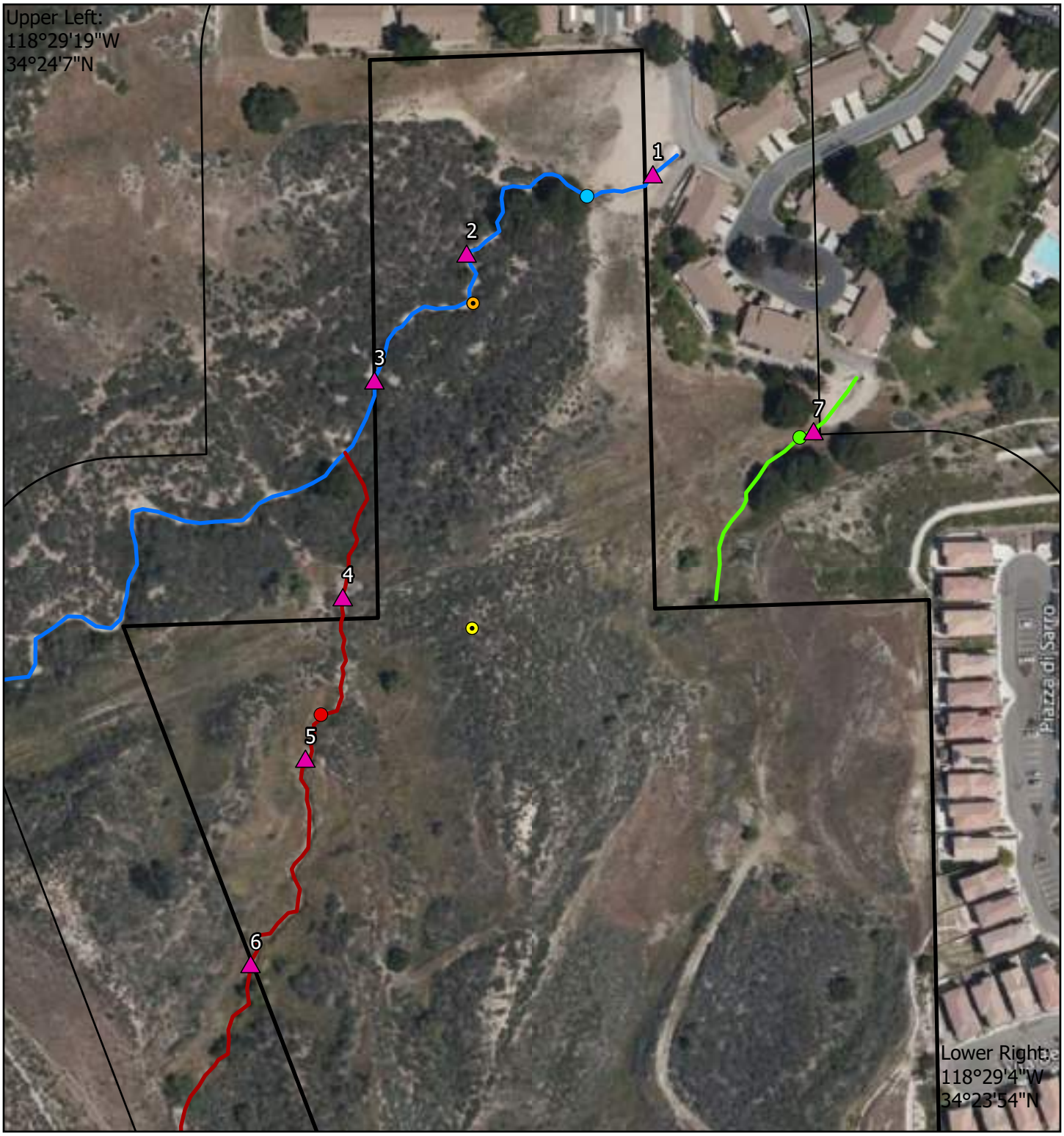
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Attachment A

Photograph Exhibit



Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Photograph Points

0 70 140 280 Feet

N

- Photo Points
- OHWM Form #1
- OHWM Form #2
- OHWM Form #3
- Upland Data Form
- Wetland Data Form
- Ephemeral Drainage #1 (1,315-ft / 0.33-acre)
- Ephemeral Drainage #2 (1,015-ft / 0.23-acre)
- Ephemeral Drainage #3 (326-ft / 0.12-acre)
- Project Boundary
- Survey Area (200-foot buffer)

SOUTH ENVIRONMENTAL

Photo Point #1 facing NE



Photo Point #1 facing SW (OHWM Data Point Location)



Photo Point #2 facing NE



Photo Point #2 facing S



Photo Point #3 facing N



Photo Point #3 facing S



Photo Point #4 facing N



Photo Point #4 facing S



Photo Point #5 facing S



Photo Point #5 facing E into drainage bottom



Photo Point #6 facing S



Photo Point #6 facing N



Photo Point #7 facing NE



Photo Point #7 facing SW



TENTATIVE TRACT MAP No. 68

LOCATED IN THE CITY OF SANTA CLARITA
STATE OF CALIFORNIA

LEGEND

- –APPROXIMATE OVER–EXCAVATION
- –APPROXIMATE REMEDIAL REMOVAL DEPTH
- Afu –ARTIFICIAL FILL–UNDOCUMENTED
- Cf –CERTIFIED FILL
- Qal –QUATERNARY ALLUVIUM (REMOVE ALL)
- Qls? –LANDSLIDE DEBRIS, QUERIED WHERE UNCERTAIN
- Qols –OLDER LANDSLIDE DEBRIS, CIRCLED WHERE BURIED
- Tsr –SAUGUS FORMATION, SUNSHINE RANCH MEMBER
- –APPROXIMATE GEOLOGIC CONTACT
- –APPROXIMATE DESIGN KEYWAY LOCATION
- –LOCATION OF RESTRICTED USE AREA



Curve Table				
Curve #	Length	Radius	Delta	Tangent
C1	370.73'	350.00'	060°41'20"	204.89'
C2	76.64'	400.00'	010°58'40"	38.44'
C3	234.64'	152.00'	088°26'50"	147.94'
C4	310.42'	150.00'	118°34'20"	252.49'

Line Table		
Line #	Length	Direction
L1	119.23'	N29° 03' 52"E
L2	15.81'	S07° 08' 35"E
L3	192.86'	S03° 50' 07"W
L4	225.13'	S84° 36' 45"E
L5	213.69'	S33° 57' 37"W

DRAINAGE NOTES:

1. STORM DRAIN EASEMENT TO BE DEDICATED TO CITY OF SANTA CLARITA FOR FLOOD CONTROL PURPOSES.
2. NOT USED
3. CONCRETE SWALE/DOWNDRAIN TO BE MAINTAINED BY H.O.A.
4. STORMTECH MC–7200 CHAMBER SYSTEMS TO BE MAINTAINED BY H.O.A.
5. STORM DRAIN SYSTEM/EASEMENT TO BE MAINTAINED BY H.O.A.
6. CONCRETE TERRACE DRAIN TO BE MAINTAINED BY H.O.A.
7. MODULAR WETLANDS SYSTEM TO BE MAINTAINED BY H.O.A.

BENCH MARK

L.A.C.D.P.W. B.M. L 7131 ELEV. 1736.794 FEET

LACO DPW TAG IN W CB SIERRA HWY 2' N/O N END DRWY 43' W/O C/L & 0.2MI S/O GOLDEN VALLEY RD (62' N/O PP #4081379E)

NEWHALL QUAD. 2009 ADJUSTMENT NAVD 1988

PEDESTRIAN BRIDGE SECTION
PRIVATELY MAINTAINED BRIDGE
NOT TO SCALE

80 40 0 80 160 240
GRAPHIC SCALE (IN FEET)
1 inch = 80 ft.

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Attachment B

Wetland Determination Data Forms – Arid West Region and Arid West Ephemeral and Intermittent Streams OHWM Datasheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Wetland Sample Point

Project/Site: Santa Clarita VTTM City/County: Santa Clarita/Los Angeles Sampling Date: 11/11/20

Applicant/Owner: Velvet CA State: CA Sampling Point: #1-cactus

Investigator(s): Matthew South Section, Township, Range: S30, T04N, R15W

Landform (hillslope, terrace, etc.): streambed Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): Lat: 34.4009 N Long: -118.4866 W Datum: Dec. Degrees

Soil Map Unit Name: NWI classification: Riverine ephemeral

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.) – Dry Season

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
This area is a stream, w/ boulder/gravel bottom, sandy sides

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. blue elderberry (1)	6	Y	FACU
2.			
3.			
4.			
	6 = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. chamise	50	Y	UPL
2. hoary ceanothus	20	Y	UPL
3. Cal. buckwheat	2	N	UPL
4.			
5.			
	72 = Total Cover		
Herb Stratum (Plot size: ____)			
1. Opuntia	1	N	UPL
2. Red leafy	3	N	T
3.			
4.			
5.			
6.			
7.			
8.			
	4 = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 20 % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	6	x 4 =	24
UPL species	73	x 5 =	365
Column Totals:	79 (A)		389 (B)

Prevalence Index = B/A = 4.92

Hydrophytic Vegetation Indicators:

N Dominance Test is >50%

N Prevalence Index is ≤3.0[1]

N Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

N Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
Upland vegetation

Wetland sampling point

Sampling Point: _____

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	10YR 4/6	100					coarse sandy loam	Boulders

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No _____

Remarks:

Boulders, sandy, gravelly, very loose alluvial material
no significant hydric soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- X Water Marks (B1) (Riverine)
- X Sediment Deposits (B2) (Riverine)
- X Drift Deposits (B3) (Riverine)
- X Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No _____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

This is a streambed, visible bed + bank ~ 10-15 ft wide
walls 1-3 ft on upslope

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: SantaClaritaVTTM City/County: Santa Clarita/Los Angeles Sampling Date: 11/21/23
Applicant/Owner: Valley Oak State: _____ Sampling Point: Upland Sampling Point
Investigator(s): Matthew Smith Section, Township, Range: S30, T04N, R15W
Landform (hillslope, terrace, etc.): on top of hill/mesa Local relief (concave, convex, none): convex Slope (%): 5
Subregion (LRR): _____ Lat: 34.3999 Long: -118.4866 Datum: Decimal Degrees
Soil Map Unit Name: _____ NWI classification: not mapped
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____	No X	Is the Sampled Area within a Wetland? Yes _____ No X
Hydric Soil Present?	Yes _____	No X	
Wetland Hydrology Present?	Yes _____	No X	

Remarks:
This is on a peak above the drainages surveyed

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
			= Total Cover
Sapling/Shrub Stratum (Plot size: 30ft radius)			
1. California sagebrush	65	Y	UPL
2. purple sage	20	Y	UPL
3. Deerweed	2		UPL
4.			
5.			
	87		= Total Cover
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
			= Total Cover
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
			= Total Cover

% Bare Ground in Herb Stratum 15 % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet:

Total % Cover of		Multiply by:	
OBL species	0	x 1 =	—
FACW species	0	x 2 =	—
FAC species	0	x 3 =	—
FACU species	0	x 4 =	—
UPL species	87	x 5 =	
Column Totals:	87	(A)	(B)

Prevalence Index = B/A = 5.0

Hydrophytic Vegetation Indicators:
N Dominance Test is >50%
N Prevalence Index is ≤3.0[1]
N Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
N Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:
purple sage scrub upland habitat
dominated by Cal. sagebrush + purple sage

SOIL

Sampling Point: upland sampling point

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18	7.5 5/3	100	none				Sandy loam	no of gravel layer no gypsum/carbonate

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR C)
- ___ 1 cm Muck (A9) (LRR D)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (LRR C)
- ___ 2 cm Muck (A10) (LRR B)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Non-hydric soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (Nonriverine)
- ___ Sediment Deposits (B2) (Nonriverine)
- ___ Drift Deposits (B3) (Nonriverine)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (Riverine)
- ___ Sediment Deposits (B2) (Riverine)
- ___ Drift Deposits (B3) (Riverine)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicator

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Clarita UTM 68203 **Date:** 11/21/2020 **Time:**
Project Number: **Town:** Santa Clarita **State:** CA
Stream: Ephemeral Drainage #1 **Photo begin file#:** **Photo end file#:**
Investigator(s): Matthew South

Y ☑ / N ☐ Do normal circumstances exist on the site?

Y ☐ / N ☒ Is the site significantly disturbed?

Location Details:

Projection: Decimal Degrees **Datum:**
Coordinates: Lat: 34.4013 N Long: -118.4842 W

Potential anthropogenic influences on the channel system:

This receives water from drainages on the slope / neighborhood surfaces.

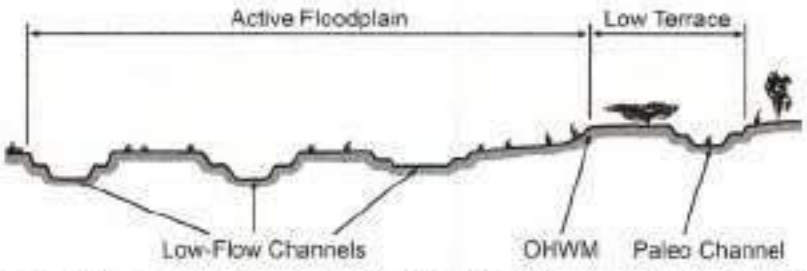
Brief site description:

Drainage flows through chamise chaparral and into underground culvert near the OHWM point to NE.

Checklist of resources (if available):

- ☒ Aerial photography
  Dates:
- ☒ Topographic maps
- ☒ Geologic maps
- ☒ Vegetation maps
- ☒ Soils maps
- ☐ Rainfall/precipitation maps
- ☐ Existing delineation(s) for site
- ☒ Global positioning system (GPS)
- ☐ Other studies
- ☐ Stream gage data
  Gage number:
  Period of record:
- ☐ History of recent effective discharges
- ☐ Results of flood frequency analysis
- ☐ Most recent shift-adjusted rating
- ☐ Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



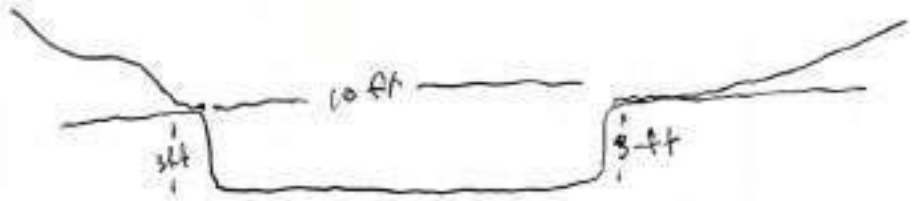
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - ☒ Mapping on aerial photograph
   - ☒ Digitized on computer
   - ☒ GPS
   - ☐ Other:

Ephemeral

roject ID: Cross section ID: Drainage #1 Date: 11/21/2020 Time:

Cross section drawing:



OHWM

GPS point: OHWM Form #1 Lat: 34.4013N Long: -118.4862W

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

The channel is well defined bed + bank where OHWM is contained

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____ None

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Clarita VTTM 68203
Project Number:
Stream: Ephemeral Drainage #2
Investigator(s): Matthew South

Date: 11/21/2020 **Time:**
Town: Santa Clarita **State:** CA
Photo begin file#: **Photo end file#:**

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [ ] / N [X] Is the site significantly disturbed?

Location Details:

Projection: Decimal Degrees **Datum:**
Coordinates: Lat. 34.3796N Long: -118.4872W

Potential anthropogenic influences on the channel system:

Recieves water from drainage channels on slopes upstream

Brief site description:

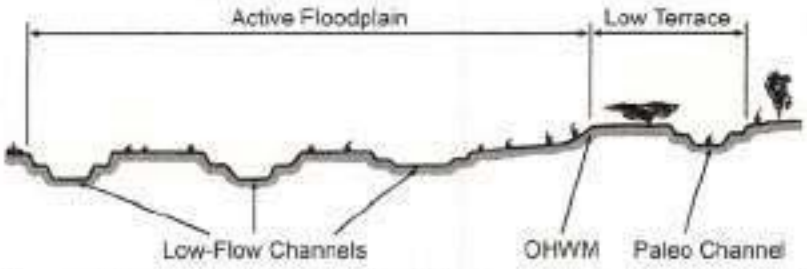
Drainage flows through sagebrush & bedrock scrub. Well defined channel w/ no flood plain

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [X] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies

- [ ] Stream gage data
  Gage number:
  Period of record:
- [ ] History of recent effective discharges
- [ ] Results of flood frequency analysis
- [ ] Most recent shift-adjusted rating
- [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units

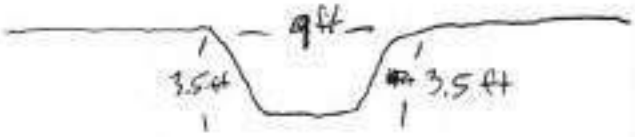


Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [X] Mapping on aerial photograph
   - [X] Digitized on computer
   - [X] GPS
   - [ ] Other:

Project ID: Cross section ID: Ephemeral Drainage #2 Date: 11/21/2020 Time:

Cross section drawing:



OHWM

GPS point: OHWM Form #2 Lat: 34.3596N Long: -118.4872W

Indicators:

- ☐ Change in average sediment texture
- ☐ Change in vegetation species
- ☐ Change in vegetation cover
- ☒ Break in bank slope
- ☐ Other: _____
- ☐ Other: _____

Comments:

The channel is well defined w/ steep banks heavily vegetated, no floodplain

Floodplain unit: ☐ Low-Flow Channel ☐ Active Floodplain ☐ Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: _____ % Tree: _____ % Shrub: _____ % Herb: _____ %

Community successional stage:

- ☐ NA
- ☐ Early (herbaceous & seedlings)
- ☐ Mid (herbaceous, shrubs, saplings)
- ☐ Late (herbaceous, shrubs, mature trees)

Indicators:

- ☐ Mudcracks
- ☐ Ripples
- ☐ Drift and/or debris
- ☐ Presence of bed and bank
- ☐ Benches
- ☐ Soil development
- ☐ Surface relief
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

Comments:

Arid West Ephemeral and Intermittent Streams OHWM Datasheet

Project: Santa Clarita UTM 68203 **Date:** 11/21/2020 **Time:**
Project Number: **Town:** Santa Clarita **State:** CA
Stream: Ephemeral Drainage #3 **Photo begin file#:** **Photo end file#:**
Investigator(s): Matthew South

Y [X] / N [ ] Do normal circumstances exist on the site?

Y [X] / N [ ] Is the site significantly disturbed?

Location Details: near underground culvert @ edge of neighborhood

Projection: Dec. Degrees **Datum:**
Coordinates: Lat: 34.4005N Long: -118.485°3W

Potential anthropogenic influences on the channel system:

near residential development and in a gas line easement

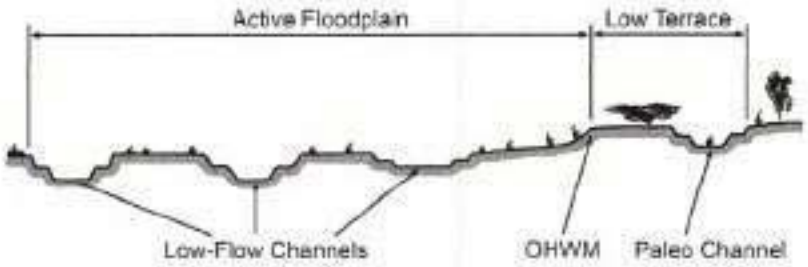
Brief site description:

Area w/ const Live oaks + black mustard + purple sage near residential development

Checklist of resources (if available):

- [X] Aerial photography
  Dates:
- [X] Topographic maps
- [X] Geologic maps
- [X] Vegetation maps
- [X] Soils maps
- [ ] Rainfall/precipitation maps
- [ ] Existing delineation(s) for site
- [X] Global positioning system (GPS)
- [ ] Other studies
- [ ] Stream gage data
  Gage number:
  Period of record:
  - [ ] History of recent effective discharges
  - [ ] Results of flood frequency analysis
  - [ ] Most recent shift-adjusted rating
  - [ ] Gage heights for 2-, 5-, 10-, and 25-year events and the most recent event exceeding a 5-year event

Hydrogeomorphic Floodplain Units



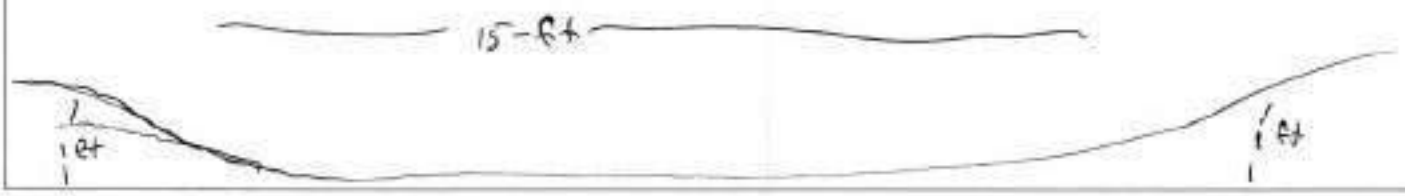
Procedure for identifying and characterizing the floodplain units to assist in identifying the OHWM:

1. Walk the channel and floodplain within the study area to get an impression of the geomorphology and vegetation present at the site.
2. Select a representative cross section across the channel. Draw the cross section and label the floodplain units.
3. Determine a point on the cross section that is characteristic of one of the hydrogeomorphic floodplain units.
   a) Record the floodplain unit and GPS position.
   b) Describe the sediment texture (using the Wentworth class size) and the vegetation characteristics of the floodplain unit.
   c) Identify any indicators present at the location.
4. Repeat for other points in different hydrogeomorphic floodplain units across the cross section.
5. Identify the OHWM and record the indicators. Record the OHWM position via:
   - [X] Mapping on aerial photograph
   - [X] Digitized on computer
   - [X] GPS
   - [ ] Other:

Ephemeral Draining

Project ID: **Cross section ID:** #3 **Date:** **Time:**

Cross section drawing:



OHWM

GPS point: OHWM Form #3 Lat: 34.4005 N Long: -118.4853

Indicators:

- [ ] Change in average sediment texture
- [ ] Change in vegetation species
- [ ] Change in vegetation cover
- [x] Break in bank slope
- [ ] Other: _____
- [ ] Other: _____

Comments:

Shallow depression that spreads out near culvert underground

Floodplain unit: [ ] Low-Flow Channel [ ] Active Floodplain [ ] Low Terrace

GPS point: _____

Characteristics of the floodplain unit:

Average sediment texture: _____

Total veg cover: ____ % Tree: ____ % Shrub: ____ % Herb: ____ %

Community successional stage:

- [ ] NA
- [ ] Early (herbaceous & seedlings)
- [ ] Mid (herbaceous, shrubs, saplings)
- [ ] Late (herbaceous, shrubs, mature trees)

Indicators:

- [ ] Mudcracks
- [ ] Ripples
- [ ] Drift and/or debris
- [ ] Presence of bed and bank
- [ ] Benches
- [ ] Soil development
- [ ] Surface relief
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

Comments:

APPENDIX B-4
Oak Tree Report

December 30, 2020 (updated August 13, 2025)

Renaud & Sue Veluzat
24715 Oak Creek Road
Newhall, California 91321

RE: Oak Tree Report for Tentative Tract Map (TTM) 68203 in Santa Clarita, California

Dear Mr. & Mrs. Veluzat,

This letter includes results of a focused oak tree survey and an assessment of impacts to oaks protected by the City of Santa Clarita Oak Tree Preservation Ordinance from a proposed mixed-use development on Tentative Tract Map (TTM) 68203 in the City of Santa Clarita, California. The scope of this letter report includes a description of the project, methodology, results of the survey, an assessment of potential impacts to protected oaks, and required and recommended mitigation to reduce or avoid potential impacts.

Project Description

Project Location and Setting

The property proposed for development (property) includes 28.13-acres consisting of 10 parcels located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita (see Figure 1 below).

- Assessor's Parcel Numbers (APNs): 2836-013-106, 2836-013-107, 2836-013-111, 2836-013-128, 2836-013-133, 2836-013-141, 2836-020-058, 2836-020-078, 2836-020-086, 2836-020-087



Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Figure 1. Project Location

SOUTH ENVIRONMENTAL

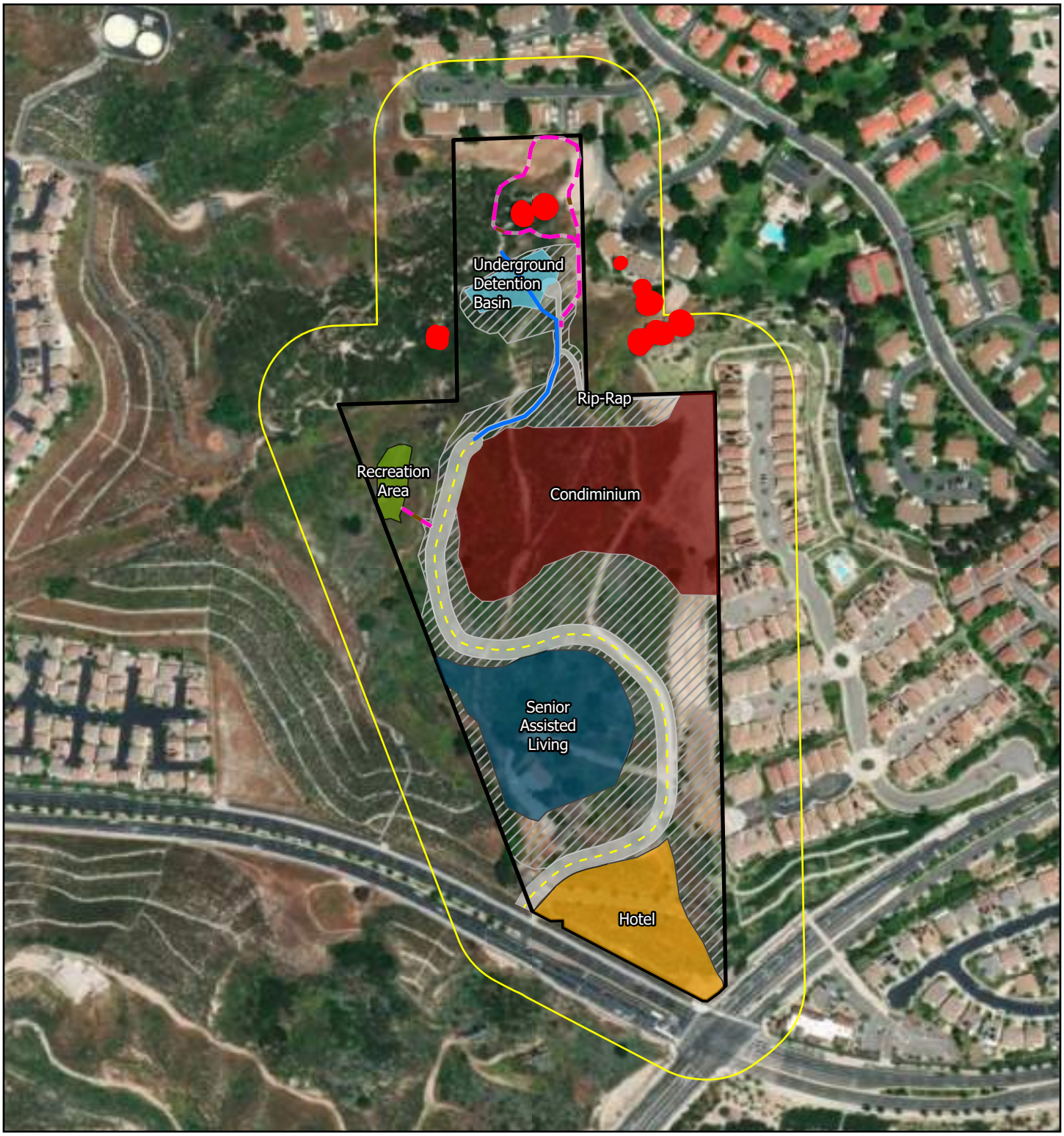
Most of the property is undeveloped except for a single-family home and accessory structures with a street address 20101 Golden Valley Road. A windy paved driveway exists off Golden Valley Road provided access to the home, and a series of dirt roads provide access to the remaining undeveloped hills on the property. Adjacent uses include residential uses to the immediate north and east, vacant land to the south, and residential uses/Golden Valley High School to the west.

The undeveloped areas of the property are largely covered with coastal sage scrub plant communities on the slopes and a chamise chaparral in the very northern parcel that surrounds a drainage which flows into a culvert at the northeastern corner of the property. Disturbed areas are also on the parcel where past grading for utility corridors and near the adjacent housing developments that are dominated by non-native grasses and invasive mustard.

Proposed Development

The proposed development seeks to merge the 10 parcels and entitle a Tentative Tract Map 68203 for a four (4) lot subdivision consisting of the following (shown in Figure 2 below and in the attached Site Plan):

- One (1) 5.04-acre lot for a four (4) story building consisting of 154-unit senior assisted living units; the proposed four (4) story building will be 50-foot maximum height.
- One (1) 5.04-acre lot for a 100-room commercial hotel and retail building.
- One (1) 11.48-acre lot for 73 residential Condominium units consisting two, three, and four-plex buildings.
- One (1) 5.83-acre open space lot for L.I.D. storm water treatment and an eight-foot wide riding and hiking trial.
- Proposed streets and circulations will result in approximately 0.73 acres of development.
- A Proposed Recreation Area and foot bridge access is proposed west of the condominium units.
- The project will require slope control surrounding all developments as shown in the Site Plan.



Source: ESRI Aerial Imagery 2025

Santa Clarita VTTM 68203 Project

Figure 2. Proposed Development

0 215 430 Feet

N

- Project Boundary
- Survey Area - 200-foot Buffer
- Oak Tree Protected Zone

Proposed Development

- Riding/Hiking Trail
- Drainage Pipe
- Road Centerline
- Hikinig Trail
- Condiminium
- Underground Detention Basin
- Hotel
- Senior Assisted Living
- Recreation Area
- Rip-Rap
- Bridge
- Road
- Slope Control

SOUTH ENVIRONMENTAL

Methodology

Focused Oak Tree Surveys

A focused survey for oak trees was conducted within the project parcels on October 10, 2020 and another focused survey for oak trees was conducted within a 200-foot buffer surrounding the parcels on November 4, 2020 by South Environmental certified arborist Matthew South (International Society for Arboriculture [ISA] WE-12564A). The surveys were conducted in accordance with the City of Santa Clarita Oak Tree Preservation Ordinance and Oak Tree Preservation and Protection Guidelines (City of Santa Clarita 1990).

City of Santa Clarita Oak Tree Preservation Ordinance

According to the City of Santa Clarita Oak Tree Preservation Ordinance no person "shall cut, prune, remove, relocate, endanger, damage or encroach into the protected zone of any oak tree" that is 6-inches in circumference when measured at a point 4.5-feet above the tree's natural grade "except in accordance with the conditions of a valid oak tree permit issued by the City". An oak tree report conforming to the City of Santa Clarita Oak Tree Preservation and Protection Guidelines is required for a permit application. Heritage oaks are further protected by the ordinance, which is defined as an oak with a circumference of 108-inches for one stem or 72-inches for each stem of a multi-stem tree.

City of Santa Clarita Oak Tree Preservation and Protection Guidelines

This letter report is written per the City of Santa Clarita Oak Tree Preservation and Protection Guidelines and includes the following information for each protected oak tree:

- Physical Evaluation of each protected oak that includes location of the tree (South Environmental uses a Trimble R1 GPS unit with sub-meter accuracy), circumference of the trunk at 4.5-feet above grade, diameter of canopy at 8 compass points, protected zone of the tree (measured 5-feet from the canopy or 15-feet from trunk at a minimum), mean natural grade at base, height, symmetry rating A-F scale, tree environment, physical structure, and canopy clearance from grade for each compass point.

- Horticultural Evaluation of each protected oak that includes physical evidence of disease (exfoliation, leaf scorch, exudations), identification of pests, and an evaluation of vigor.

- Recommended Mitigation Measures for correcting physical or horticultural problems or for reducing or avoiding impacts from the proposed project to protected oaks.

- Oak Tree Rating System definitions will be used to describe the condition of each protected oak:

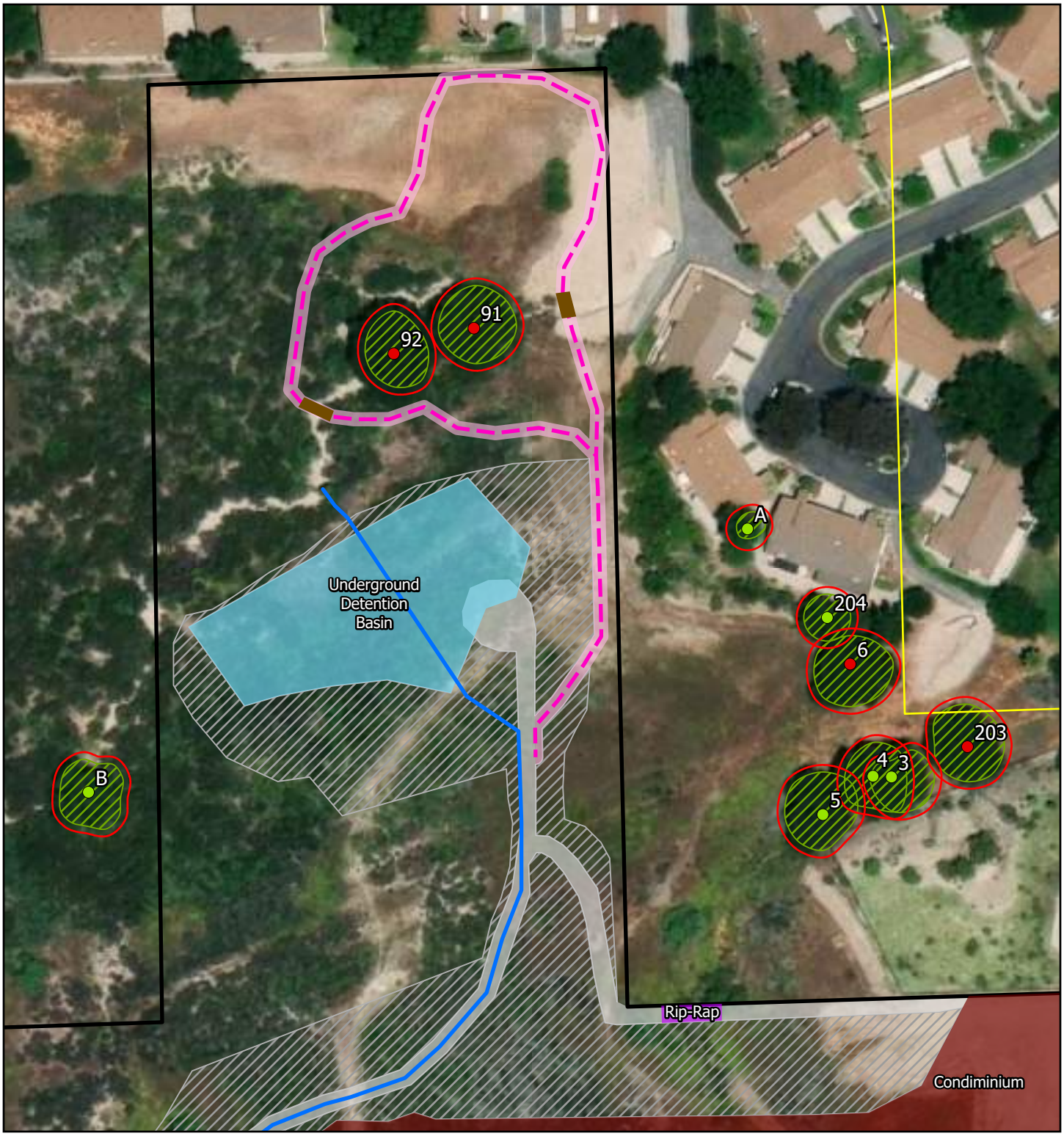
    - **A = Outstanding:** A healthy and vigorous tree characteristic of its species and reasonably free of any visible signs of stress, disease or pest infestation.
    - **B = Above Average:** A healthy and vigorous tree with minor visible signs of stress, disease and/or pest infestation.
    - **C = Average:** Although healthy in overall appearance there is an abnormal amount of stress or disease and/or pest infestation.
    - **D = Below Average/Poor:** This tree is characterized by exhibiting a greater degree of stress, disease and/or pest infestation than normal and appears to be in a state of rapid decline. The degree of decline may vary greatly in signs of dieback, disease and pest infestation and appears to be in an advanced state of decline.
    - **F = Dead:** This tree exhibits no signs of life whatsoever.

Results

As shown in Figure 3 below, there are two (2) heritage oaks on the property and eight (8) off-property protected oaks (including 2 heritage oaks) within the 200-foot survey buffer. Oak #91, #92, and #3-#6 were already tagged and numbered. Tags were applied to Oak #203 and #204 during the survey. Oak A was on private property and Oak B was surrounded by dense chaparral, making them inaccessible during the survey, therefore, the measurements and assessment for these trees were estimated as best as possible from the nearest vantage point. The measurements and data collected for each oak is included in the table in Attachment A and a photograph of each oak is in Attachment B.

Impact Analysis

As shown in Figure 3, the Tree Protected Zones (TPZs) for all the oaks are outside of the proposed construction and no impacts are expected to occur from construction. All the oaks would remain in place following the project. TPZs of oaks #91 and #92 are 15-feet north of the proposed hiking and riding trail, 15-feet west of stormwater overflow outlet, and 75-feet north of the underground detention basin and these trees could be endangered by project equipment if it goes outside of the proposed construction area. All of the proposed project features are proposed to be constructed greater than 15-feet from onsite oaks TPZs, and therefore, no direct impacts are anticipated. Drawn sections of these trees are not included because there are no direct impacts to protected zone above or below ground.



Source: ESRI Aerial Imagery 2025

Santa Clarita VTTM 68203 Project

Figure 3. Oak Tree Survey

0 60 120 Feet

N

Project Boundary

Survey Area - 200-foot Buffer

Oak Tree

Oak Tree

Heritage Oak

Canopy

Oak Tree Protected Zone

Proposed Development

Riding/Hiking Trail

Drainage Pipe

Road Centerline

Hikinig Trail

Condiminium

Underground Detention Basin

Hotel

Senior Assisted Living

Recreation Area

Rip-Rap

Bridge

Road

Slope Control

SOUTH ENVIRONMENTAL

Recommendations

Protective fencing shown in Figure 3 is recommended to avoid impacts to onsite oaks during construction. Similarly, off-property oaks are between 50-200 feet from proposed project and fencing to delineate the edge of construction described in the mitigation below is recommended to ensure construction equipment avoids impacts to off-property oaks by staying within the project limits. Additional mitigation from the City's Ordinance and Guidelines are below.

To avoid impacts to protected oaks on the property the following mitigation is recommended:

- Apply for and receive a valid Oak Tree Permit from the City of Santa Clarita because the project endangers on-site protected heritage oak trees due to proximity of construction activities. All oak trees should be protected during construction and remain following completion.

- No work shall occur within the protected zones of protected oaks.

- The area surrounding the oaks should remain natural and no new plantings should be introduced within the protected zones of protected oaks.

- Protective fencing should be placed around protected heritage oaks on the project site. The fencing should be a highly visible material at least 5-feet high but should avoid damaging the surrounding native shrubs. No footings or chain-link fencing is proposed due to the potential to impact the native chaparral surrounding the oaks. Fencing should be a plastic or other similar fencing that has high visibility and small posts should be used to install the fencing without damaging the shrubs. Fencing should be inspected by the project arborist prior to commencement of work and should remain in place throughout the construction of the project.

- Signs should be installed on the fence in four locations around the trees. The signs must be a minimum of 2-feet by 2-feet square and must contain the following:
    - "Warning: This fence is for the protection of these trees and shall not be removed or relocated without written authorization from the City of Santa Clarita Community Development Department"

- All oak tree protection measures implemented during the project should be certified by an oak tree preservation consultant following completion of the project. Approval and certification of oak tree work by the City of Santa Clarita Community Development Department should also be completed after construction of the project.

To avoid impacts to off-property protected oak the following mitigation is recommended:

- Limits of construction should be delineated clearly using a visible fencing and project equipment should remain inside the approved project limits for the duration of construction. No driving, materials staging, project personnel, or other activities should be located outside of the project limits during construction.

Certification Statement

I, Matthew South, certify that I have inspected the trees described in this report personally and have accurately stated my findings. The analysis, assessments, and conclusions were prepared using accepted arboricultural practices. I performed the work myself and I have no current or future interest in the property or project. If you have any questions regarding the information in this report, please contact Matthew South by email: msouth@southenvironmental.com or by mobile phone: 303.818-3632.

Sincerely,



Matthew R. South
ISA Certified Arborist (WE-12564A)

Bibliography

City of Calabasas. 1990. City of Santa Clarita Oak Tree Preservation and Protection Guidelines

List of Attachments

1. **Attachment A**. Oak Tree Data Summary Table
2. **Attachment B**. Photograph Exhibit
3. **Attachment C**. Site Plan

Attachment A

Oak Tree Data Summary Table

					Canopy (Spread[ft]/Distance to Ground [ft])											
ID#	**Latin Name**	**Heritage**	**CBH**	**Ht (ft)**	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**Physical Evaluation**	**Horticultural Evaluation**	**Health**	**Impacts**	**Notes**
91	*Quercus agrifolia*	Y	81,85	30	30/0	30/0	30/0	28/0	25/0	22/0	20/0	25/0	low horizontal branching, some branches on ground, interior branches some broken and colluded, overall structure is well balanced	no visible pests or disease, high vigor	B	Remain	Slight grade change under canopy slopes to N into a channelized dirt drainage. Woodrat middens under canopy. Tag already on tree. Surrounded by dense chaparral except on E where area is cleared of vegetation for fuel modification for nearby houses.
92	*Quercus agrifolia*	Y	75,107	35	28/0	22/0	25/0	28/0	25/0	20/0	20/0	22/0	some broken interior branches on ground. Overall structure is very balanced.	no visible pests or disease, high vigor	A	Remain	Drainage underneath canopy, slight slope into drainage. Vegetation growing underneath such as opuntia cactus. Tag alread on tree. Surrounded by dense chaparral except on E where area is cleared of vegetation for fuel modification for nearby houses.
op3	*Quercus agrifolia*	N	75	40	10/20	25/8	30/2	30/0	25/0	15/20	15/25	15/25	unbalanced crown, lean to SE, suppressed by op4.	High vigor	B	Remain	on a N facing slope where small mammal burrows under canopy, also has a lot of shrub growth under canopy. Area is disturbed habitat near houses that has non-native grasses and limited shrub cover.
op4	*Quercus agrifolia*	N	44,50,53	40	25/15	25/4	30/0	30/0	20/0	25/0	20/15	20/6	minor dieback of interior branches	High vigor. Boring insects on dead interior wood.	B	Remain	on N facing slope, small mammal burrows and woodrat middens under canopy, shrubs under canopy. Mostly non-native grasses in habitat near houses.
op5	*Quercus agrifolia*	N	91	40	25/10	30/1	25/15	20/8	20/2	20/1	25/3	25/2	minor dieback of interior branches	High vigor. Boring insects on dead interior wood.	A	Remain	on slope, small mammal burrows and woodrat middens under canopy. Area has some shrub cover in nearby drainage to the S, but immediate vicinity is graded and covered with non-native grassess and mustad.
op6	*Quercus agrifolia*	Y	113	40	20/3	20/2	25/1	25/4	25/0	25/1	20/2	20/0	very well balanced	High vigor. Boring insects on dead interior wood.	A	Remain	on flat area
op203	*Quercus agrifolia*	Y	~188	30	30/0	30/0	25/0	25/0	25/0	25/0	30/0	30/0	lots of broken branches and dieback, main branch broke from stem and on ground	canopy growth remains good	C	Remain	huge woodrat midden in tree. Near housing and a culvert where a drainage enters. Area has non-native grasses and mustard.
op204	*Quercus agrifolia*	N	25,31,37	25	15/0	15/0	15/0	15/0	15/0	15/0	15/0	15/0	slightly unbalanced	high vigor	A	Remain	near house on flat ground. Area is graded and has no native plants, has some non-neative grasses.
opA	*Quercus agrifolia*	N	--	30	10/10	10/10	10/10	10/10	10/10	10/10	10/10	10/10		high vigor	A	Remain	not tagged and measurements estimated due to being in backyard on private property. In landscaped area
opB	*Quercus agrifolia*	unknown	--	35	20/0	20/0	20/0	20/0	20/0	20/0	20/0	20/0		high vigor	A	Remain	not tagged and measurements estimated due to being surrounded by dense chaparral and innaccessible. Along a drainage and surrounded by native chamise chaparral. At the base of a slope into the drainage.

Attachment B

Photograph Exhibit

Oak #91 (right) and #92 (left)



Oak #91



Oak #92


CAUTION
HIGH PRESSURE
GAS PIPELINE
CALL COLLECT
805-759-2017

Oak #op3



Oak #op4



Oak #op5



Oak #op6 (right) and #op204 (left)



Oak #op203



Oak #op203



Oak #opB



Attachment C

Site Plan

TENTATIVE TRACT MAP No. 68203

LOCATED IN THE CITY OF SANTA CLARITA
STATE OF CALIFORNIA



LEGEND

- ③ – APPROXIMATE OVER-EXCAVATION
- ④ – APPROXIMATE REMEDIAL REMOVAL DEPTH
- Afu – ARTIFICIAL FILL-UNDOCUMENTED
- Cf – CERTIFIED FILL
- Qal – QUATERNARY ALLUVIUM (REMOVE ALL)
- Qls? – LANDSLIDE DEBRIS, QUERIED WHERE UNCERTAIN
- Qols – OLDER LANDSLIDE DEBRIS, CIRCLED WHERE BURIED
- Tsr – SAUGUS FORMATION, SUNSHINE RANCH MEMBER
- APPROXIMATE GEOLOGIC CONTACT
- APPROXIMATE DESIGN KEYWAY LOCATION
- LOCATION OF RESTRICTED USE AREA

LEGEND & ABBREVIATIONS:

- H.O.A. – HOMEOWNERS ASSOCIATION
- BVC – BEGINNING OF VERTICAL CURVE
- C.B. – CATCH BASIN
- ℄ – CENTER LINE
- DRWY – DRIVEWAY
- EL/ELEV – ELEVATION
- EVC – END OF VERTICAL CURVE
- EX./EXIST. – EXISTING
- FL – FLOW LINE
- FS – FINISH SURFACE
- GB – GRADE BREAK
- HP – HIGH POINT
- MIN. – MINIMUM
- MH – MANHOLE
- O.S. – OPEN SPACE
- PE – PAD ELEVATION
- PI – POINT OF INTERSECTION
- PL – PROPERTY LINE
- STD. – STANDARD
- TW – TOP OF WALL
- PP – POWER POLE
- TREE
- (LT #) – LOT #
- EX. STREET LIGHT
- OAK TREE WITH 5' PROTECTED ZONE
- OAK TREE TO REMAIN WITHIN 200' OF THE DEVELOPMENT
- (S) – EXISTING SEWER LINE
- (W) – EXISTING WATER LINE
- S – PROPOSED SEWER LINE
- W – PROPOSED WATER LINE
- SD – SD – PROPOSED STORM DRAIN
- GEOLOGICAL BUILDING SET BACK LINE
- DIRECTION OF FLOW
- FH – EXISTING FIRE HYDRANT
- PFH – PROPOSED FIRE HYDRANT (SEE SHEET 2)
- TRACT BOUNDARY
- 1390 – PROPOSED CONTOURS
- 1400 – EXISTING CONTOURS
- STREET & DRIVEWAY CENTERLINE
- DAYLIGHT LINE
- LOT LINE
- 2:1 – PROPOSED SLOPE AS INDICATED
- PROP. CONC. WALL

UTILITIES AND SERVICES:

1. WATER..... SANTA CLARITA WATER DISTRICT
2. SEWER..... SANITATION DISTRICT SANTA CLARITA VALLEY
3. GAS..... SOUTHERN CALIFORNIA GAS COMPANY
4. ELECTRIC..... SOUTHERN CALIFORNIA EDISON COMPANY
5. TELEPHONE..... ATT
6. CABLE TV..... SPECTRUM
7. SCHOOL..... SULPHUR SPRINGS SCHOOL DISTRICT & WILLIAM S HART UNION HIGH SCHOOL DISTRICT

SHEET INDEX

SHEET	DESCRIPTION
1	VTTM TR 68203, NOTES, LOT SUMMERY
2	DETAILED SITE PLAN
3	SECTIONS
4	EXIST. EASEMENT AND LEASE NOTES, LEGEND
5	EXISTING EASEMENTS AND LEGEND
6	EXISTING LEASES AND LEGEND



VICINITY MAP
N.T.S.
Source: 2004 TB Guide, p. 4551, D6 and E6
TRACT No. 061811

GENERAL NOTES:

1. CITY OF SANTA CLARITA GENERAL PLAN DESIGNATION..... MX-N (PD) MIXED USED NEIGHBORHOOD (PLANED DEVELOPMENT OVERLAY)
2. EXISTING ZONING (RESIDENTIAL SUBURBAN)..... MX-N MIXED USED NEIGHBORHOOD
3. PROPOSED ZONING..... MX-N MIXED USED NEIGHBORHOOD
4. AREA..... 28.13 ± AC. GROSS, 27.98 AC. NET
5. GROSS DENSITY (RESIDENTIAL)..... 0.11 D.U./AC.
6. NET DENSITY..... 0.11 D.U./AC.
7. EXISTING LAND USE..... SINGLE FAMILY RESIDENTIAL
8. PROPOSED LAND USE..... MULTI FAMILY, HOTEL, SENIOR ASSISTANT LIVING FACILITY
9. TOTAL NUMBER OF LOTS..... 4
10. TOTAL NUMBER OF RESIDENTIAL LOT/HOTEL..... 3
11. TOTAL NUMBER OF ATTACHED SINGLE FAMILY CONDOMINIUM UNITS..... 73
12. MINIMUM RESIDENTIAL LOT SIZE..... 3.76 AC.
13. AVERAGE RESIDENTIAL LOT SIZE..... 6.84 AC.
14. LOT SIZE AS SHOWN IN TABLE HEREON ARE GROSS & NET ACREAGES
15. UNIT PHASING IS REQUESTED
16. BOUNDARY LINE DIMENSIONS ARE TAKEN FROM RECORD DATA.
17. SUBDIVIDER RESERVES THE RIGHT TO FILE MULTIPLE FINAL MAPS PER SECTION 66456.1 OF THE GOVERNMENT CODE.
18. THE APPLICANT IS REQUESTING THE RIGHT TO ADJUST STREET AND BUILDING PAD ELEVATIONS UP TO 3 FEET ON THE FINAL GRADING PLAN.
19. TOPS AND TOES OF SLOPES ARE SUBJECT TO CHANGE IN FINAL ENGINEERING.
20. MAXIMUM SLOPE GRADE IS 2:1.
21. THE RIGHT IS RESERVED TO ADJUST LOT LINES AND MERGE LOTS ON THE FINAL MAP, SUBJECT TO THE APPROVAL OF THE DIRECTOR OF PLANNING AND BUILDING SERVICES, AND THE DIRECTOR OF COMMUNITY SERVICES AND DIRECTOR OF PUBLIC WORKS.
22. LOT SCHEDULE
    - CONDOMINIUM LOTS (73 UNITS) ____ 1
    - SENIOR ASSISTANT LOT (151 UNITS) ____ 1
    - HOTEL LOTS (60 ROOMS) ____ 1
    - OPEN SPACE LOT (REC. LOT) ____ 1
    - ____ 4
23. ALL INTERNAL TRAILS SHALL BE OWNED AND MAINTAINED BY H.O.A. OR PROPERTY OWNER'S ASSOCIATION
24. PRELIMINARY EARTHWORK QUANTITIES
    BULK CUT: 360,000 C.Y., FILL: 360,000 C.Y.
25. POST "NO PARKING-FIRE LANE" SIGNS ALONG ALL DRIVEWAYS WITH A CURB-TO-CURB WIDTH OF LESS THAN 34 FEET
26. NO GATES WILL BE INSTALLED INSTALLED ON FIRE ACCESS ROADS
27. ALL INTERIOR TRAILS, PASEOS AND OPEN SPACE PARCELS SHALL BE OWNED AND MAINTAINED BY H.O.A. OR PROPERTY OWNER'S ASSOCIATION
28. LANDSCAPE COVERAGE 2.82 AC

NOTES:

1. PROP. CROSS GUTTER PER S.P.P.W.C. STD. PLAN 122-3
2. PROP. MODIFIED CURB RAMP PER S.P.P.W.C. STD PLAN 111-5, CASE-C
3. SAWCUT AND JOIN
4. EXISTING CURB AND GUTTER TO REMAIN
5. REMOVE EXISTING CURB AND GUTTER
6. EXISTING STRUCTURES, FENCES DRIVEWAYS TO BE REMOVED
7. PROPOSED RETAINING WALL (HEIGHT PER PLAN)
8. PROPOSED WALL DRAIN
9. PROPOSED 8' WIDE HIKING TRAIL (H.O.A. MAINTAINED)
10. EXISTING FIRE HYDRANT
11. EXISTING STREET LIGHT TO REMAIN
12. EXISTING STREET LIGHT TO BE RELOCATED
13. PROPOSED RELOCATED STREET LIGHT LOCATION
14. PROPOSED STORM DRAIN (PUBLICLY MAINTAINED)
15. PROPOSED SEWER CONNECTION TO PC. 02-13
16. PROPOSED WATER CONNECTION
17. EXISTING 8" VCP SEWER PER PC. 02-13
18. EXISTING 12" PVC WATER MAIN
19. EXISTING 36" RCP PER MTD NO. 1699
20. EXISTING 36" RCP PER MTD NO. 1614
21. EXISTING 36" RCP PER MTD NO. 1671
22. EXISTING 36" RCP TO BE RELOCATED MTD NO. 1614
23. PROPOSED DRIVEWAY APPROACH, PER S.P.P.W.C. STANDARD PLAN 110-2, TYPE-C
24. PROPOSED 10' WIDE WESTBOUND U-TURN LANE
25. EXISTING TRAFFIC SIGNALS/SIGNS TO BE MODIFIED FOR U-TURN LANE
26. PROPOSED BUS STOP WITH 10'x25' CONCRETE PASSENGER WAITING PAD BEHIND SIDEWALK WITH SHELTER, BENCH AND TRASH RECEPTACLE, SHALL BE APPROVED BY CITY TRANSIT STAFF. (BUS STOP TURNOUT/PULLOUT DIMENSIONS TO BE DETERMINED BY THE DEPARTMENT OF PUBLIC WORKS AND THE CITY TRANSIT DIVISION)
27. PROPOSED KEYSTONE WALL
28. PROPOSED STREET DEDICATION
29. PROPOSED PEDESTRIAN BRIDGE/WALKWAY
30. PROPOSED 8" WATER MAIN (PRIVATELY MAINTAINED)
31. PROPOSED SEWER MAIN (PRIVATELY MAINTAINED)
32. PROPOSED UTILITY EASEMENT
33. SLOPE TO BE MAINTAINED BY H.O.A.
34. PROPOSED STORM DRAIN EASEMENT
35. PROPOSED SEWER MAIN (PUBLICLY MAINTAINED)
36. EXISTING DRIVEWAY TO BE REMOVED, REPLACED WITH SIDEWALK, CURB AND GUTTER
37. PROPOSED SPLASH WALL
38. PROPOSED PARKING STALLS (9'x18')
39. PROPOSED DELIVERY/LOADING STALLS (12'x20')
40. PROPOSED STORM DRAIN (PRIVATELY MAINTAINED)
41. PROPOSED EV STATION
42. PROPOSED LONG TERM/SHORT TERM BICYCLE PARKING
43. PROPOSED EMPLOYEE BREAK AREA
44. PROPOSED TRASH ENCLOSURE
45. PROPOSED DROPOFF AREA
46. REMOVE EXISTING OPENING, CONST. CURB AND GUTTER
47. PROPOSED 20' WIDE LEFT TURN OPENING OR PER TRAFFIC ENGINEER RECOMMENDATION
48. RIGHT TURN ONLY
49. PROPOSED PUBLIC 6"x4"x2 1/2" FIRE HYDRANT PER AMERICAN WATERWORKS ASSOCIATION STANDARDS, C503. FIRE FLOW REQUIREMENT 4000 GPM @ 20 PSI FOR 4 HOURS
50. CONCRETE SLOUGH WALL
51. PROPOSED 8" WATER MAIN
52. PROPOSED SLUMP STONE WALL (SEE SHEET NO. 3 FOR DETAILS)

LOT SUMMARY

DESIGNATION	LOT NO.	NO. OF LOTS	(A.C.)—
HOTEL, LOT 190 ROOMS	1	1	3.76
SENIOR ASSISTANT LOT (151 UNIT)	2	1	5.43
CONDOMINIUM LOT (73 UNITS)	3	1	13.09
OPEN SPACE LOT (REC. LOT)	4	1	5.8
PUBLIC STREET	-	-	0.74
TOTAL		4	28.13±

PARKING SUMMARY

DESIGNATION	REQUIRED	PROVIDED	STANDARD	COMPACT	HANDICAP STANDARD	HANDICAP VAN	CARPOOL
HOTEL, LOT 190 ROOMS	128	143	134	32	6	2	3
SENIOR ASSISTANT LOT (151 UNIT)	76	92	87	-	3	2	2
CONDOMINIUM LOT (73 UNITS)	152	193	51	105	6	1	-
TOTAL	406	428	272	73	15	5	5

Lot Schedule (AC.)

Lot No.	Lot Area (Gross)	Lot Area (Net)	Pad Area	Building Area (S.F.)
1	3.76	3.61	2.03	47,828
2	5.43	5.43	2.63	101,166
3	13.09	13.09	5.68	162,129
4	5.11	5.11	0.85	–

EV STATION

Lot No.	REQUIRED EV STA.	PROVIDED EV. STA.
1	6	6
2	3	3
3	–	–

Curve Table

Curve #	Length	Radius	Delta	Tangent
C1	370.73'	350.00'	060°41'20"	204.89'
C2	76.64'	400.00'	010°58'40"	38.44'
C3	234.64'	152.00'	088°26'50"	147.94'
C4	310.42'	150.00'	118°34'20"	252.49'

Line Table

Line #	Length	Direction
L1	119.23'	N29° 03' 52"E
L2	15.81'	S07° 08' 35"E
L3	192.86'	S03° 50' 07"W
L4	225.13'	S84° 36' 45"E
L5	213.69'	S33° 57' 37"W

DRAINAGE NOTES:

1. STORM DRAIN EASEMENT TO BE DEDICATED TO CITY OF SANTA CLARITA FOR FLOOD CONTROL PURPOSES.
2. NOT USED
3. CONCRETE SWALE/DOWNDRAIN TO BE MAINTAINED BY H.O.A.
4. STORMTECH MC-7200 CHAMBER SYSTEMS TO BE MAINTAINED BY H.O.A.
5. STORM DRAIN SYSTEM/EASEMENT TO BE MAINTAINED BY H.O.A.
6. CONCRETE TERRACE DRAIN TO BE MAINTAINED BY H.O.A.
7. MODULAR WETLANDS SYSTEM TO BE MAINTAINED BY H.O.A.

PEDESTRIAN BRIDGE SECTION
PRIVATELY MAINTAINED BRIDGE
NOT TO SCALE

GRAPHIC SCALE (IN FEET)
1 inch = 80 ft.
80 40 0 80 160 240

BENCH MARK
L.A.C.D.P.W. B.M. L 7131 ELEV. 1736.794 FEET
LACO DPW TAG IN W CB SIERRA HWY 2' N/O N END DRWY 43' W/O C/L & 0.2MI S/O GOLDEN VALLEY RD (62' N/O PP #4081379E)
NEWHALL QUAD. 2009 ADJUSTMENT NAVD 1988

DRAWN BY			
CHECKED BY			
DESIGNED BY			
DATE CHANGED	CHANGED BY	REVISION	

OWNER/DEVELOPER:
VELUZAT PRODUCTIONS
24715 OAK CREEK
NEWHALL, CA 91321
Ph.: (661) 259-9669 Fax: (661) 259-3788

LEGAL DESCRIPTION:
A PORTION OF THE SOUTHEAST QUARTER OF SECTION 30, TOWNSHIP 4 NORTH, RANGE 15 WEST, SAN BERNARDINO MERIDIAN, COUNTY OF LOS ANGELES, STATE OF CALIFORNIA

SITE PLAN
MAJOR LAND DIVISION
TENTATIVE TRACT MAP NO.
068203
IN THE CITY OF SANTA CLARITA

PREPARED BY:
LAND DESIGN CONSULTANTS, INC.
Land Planning, Civil Engineering, Surveying & Environmental Services
800 Royal Oaks Drive, Suite 104, Monrovia, California 91016
Ph.: (626) 578-7000, Fax: (626) 578-7373
http://www.ldcla.com

ROBERT R. SIMS R.C.E. NO. 21649 — 5/27/2025 DATE

LDC
Proj. No. 92020-019
Sht 1 of 6

C:\Users\rsims\AppData\Local\Temp\AcPublish_30660\VTTM.dwg May 27, 2025 8:29 am RSIMS

APPENDIX B-5
Focused Gnatcatcher Survey

DUDEK
38 NORTH MARENGO AVENUE
PASADENA, CALIFORNIA 91101
T 626.204.9800 F 626.204.9834

August 11, 2023 15283

U.S. Fish and Wildlife Service
Attn: Recovery Permit Coordinator
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

Subject: Focused California Gnatcatcher Survey Results for the Santa Clarita Vesting Tentative Tract Map 68203 Project, Santa Clarita, California

Dear Recovery Permit Coordinator:

This report documents the results of protocol-level presence/absence surveys for the coastal California gnatcatcher (*Polioptila californica californica*; hereafter, gnatcatcher). Focused surveys were conducted throughout all areas of suitable habitat for the Santa Clarita Vesting Tentative Tract Map 68203 Project (Project) located in the city of Santa Clarita in Los Angeles County (Figure 1, Project Location). There are approximately 33 acres of suitable habitat for gnatcatcher in the Project site and surrounding 500-feet study area (Figure 2).

The gnatcatcher is a federally listed threatened species and a California Department of Fish and Wildlife (CDFW) Species of Special Concern (SSC). It is closely associated with coastal sage scrub habitat and typically occurs below 950 feet elevation and on slopes less than 40% (Atwood 1990), but gnatcatchers have been observed at elevations greater than 2,000 feet. The species is threatened primarily by loss, degradation, and fragmentation of coastal sage scrub habitat, and is also impacted by brown-headed cowbird (*Molothrus ater*) nest parasitism (Braden et al. 1997).

1 Location and Existing Conditions

The Project site is in the city of Santa Clarita, northwest of the intersection of Sierra Highway and Golden Valley Road, northwestern portion of Los Angeles County (Figure 1, Project Location). The site encompasses approximately 28 acres and is located on ten parcels (Assessor Parcel Numbers 2836-013-106, 2836-013-107, 2836-013-111, 2836-013-128, 2836-013-141, 2836-013-175, 2836-020-058, 2836-020-078, 2836-020-086, and 2836-020-087). The Project site is located on the U.S. Geologic Survey's (USGS) Newhall 7.5-minute topographic quadrangle (USGS 2018).

The proposed project seeks to merge 10 parcels and entitle TTM 68203 for a four-lot subdivision on an approximately 28-acre site. The subdivisions include the following developments: senior assisted residential units, commercial hotel and retail building, residential condominiums, open space for storm water treatment and riding/hiking trails, and associated access roads and appurtenant features.

The Study Area consists of mostly loamy soils with clay soils characterizing the eastern portion of the site (NRCS USDA 2023). The Study Area includes some terraced slopes in the western portion and moderately steep hillsides

in the central area. The Santa Clara River lies to the north of the Project Site. Elevations in the Study Area range from approximately 1,570 feet above mean sea level at the north side to 1,850 feet above mean sea level in the southern portion of the project (CalTopo 2023). The Project region has a Mediterranean climate with cool, wet winters and hot, dry summers. Rainfall occurs primarily between October and April (LACPW 2022).

2 Vegetation Communities

Vegetation communities and land uses within the Study Area were mapped in the field using the ESRI Collector mobile application. Following completion of the fieldwork, all vegetation polygons were digitized using ESRI ArcGIS software and a geographic information system (GIS) coverage was created. Once in ArcGIS, the acreage of each vegetation community and land cover present on site was determined. Natural vegetation communities were classified using the California Natural Community List (CDFW 2023), which is based on A Manual of California Vegetation, Second Edition (Sawyer et al. 2009) and A Manual of California Vegetation, Online Edition (CNPS 2023), where feasible, with modifications to accommodate the lack of conformity of the observed communities.

The Study Area includes a variety of native and non-native upland vegetation communities and developed areas. Five vegetation communities and land covers were identified within the Study Area, which are shown in Figure 3 and summarized in Table 1. Three of these vegetation communities were identified as potentially suitable gnatcatcher habitat, including California sagebrush-purple sage, chamise chaparral, and installed sage scrub. Suitable habitat within the study area is described in Table 1 and detailed below.

Table 1. Suitable Vegetation Communities in the Study Area[1]

Vegetation Community/Land Cover Type	Alliance	Association	Ranking[2] (Global/State)	Study Area Acreage	Project Site Acreage
Native Vegetation Communities					
Scrub					
California Sagebrush Scrub	*Artemisia californica* Shrubland	*Artemisia californica* (Installed)	G5/S5	9.06	0.19
		Artemisia californica- Salvia leucophylla	G4/S5	24.14	17.80
			Total[3]	*33.21*	*17.99*

Table 1 Notes:

[1] Study Area includes the project site plus a 500-foot buffer.

[2] The ranking of a vegetation community is designated by a number from 1 to 5, preceded by a letter reflecting the appropriate geographic scale of the assessment (G = global and S = State). The numerical component of the rankings are described below. Natural Communities with ranks of S1-S3 are considered Sensitive Natural Communities (CDFW 2022b). Vegetation communities and land covers not identified in A Manual of California Vegetation (Sawyer et al. 2009) are not assigned a rarity rank.

1 = critically imperiled
2 = imperiled
3 = vulnerable to extirpation or extinction
4 = apparently secure
5 = demonstrably widespread, abundant, and secure

[3] Totals may not sum due to rounding.

NA = not applicable

Coastal Scrub

Installed Sagebrush Scrub

The California sagebrush scrub (*Artemisia californica*) alliance includes California sagebrush as the dominant or co-dominant species in the shrub canopy, when comprising at least 60% of the relative cover in the shrub canopy. California sagebrush scrub has an intermittent to continuous shrub canopy that is two-tiered: one tier includes shrubs less than 2 meters (7 feet) in height, and the second tier includes shrubs less than 5 meters (16 feet) in height. The herbaceous layer is variable both seasonally and annually. California sagebrush scrub is usually found on steep slopes that are rarely flooded and on low-gradient deposits along streams (Sawyer et al. 2009).

This California sagebrush alliance was mapped on terraced hills in the western portion of the Study Area (Figure 2). This vegetation community occurs throughout the site, with 0.19 acres within the Project Boundary and 9.06 acres within the Study Area.

California Sagebrush–(Purple Sage) Scrub

California sagebrush–(purple sage) scrub communities (*Artemisia californica–Salvia leucophylla* shrubland alliance) include California sagebrush and/or purple sage (*Salvia leucophylla*) as dominant or co-dominant shrubs in an intermittent to continuous shrub layer less than 2 meters (7 feet) in height or in two tiers with the second tier less than 5 meters (16 feet) in height. Species associated with the California sagebrush scrub alliance include chamise, coyotebrush, bladderpod (*Peritoma arborea*), bush monkeyflower, California brittle bush, brittle bush (*Encelia farinosa*), California jointfir (*Ephedra californica*), narrowleaf goldenbush (*Ericameria linearifolia*), ashy buckwheat (*Eriogonum cinereum*), California buckwheat, chaparral yucca, golden-yarrow (*Eriophyllum confertiflorum*), Menzies' goldenbush, common deerweed, heartleaf keckiella (*Keckiella cordifolia*), southern honeysuckle (*Lonicera subspicata*), bush mallow, laurel sumac, coast prickly pear (*Opuntia littoralis*), hollyleaf redberry (*Rhamnus ilicifolia*), lemonade berry (*Rhus integrifolia*), sugarbush, white sage, black sage, and poison oak (*Toxicodendron diversilobum*) (CNPS 2022). These communities typically occur on steep slopes or rarely flooded terraces along streams in alluvial- or colluvial-derived soils (CNPS 2022). This vegetation community occurs throughout the project and in the northern portion of the Study Area, with 17.80 acres within the Project Boundary and 33.21 acres within the Study Area.

3 Methods

The focused surveys for gnatcatcher were conducted between May 12 and June 27, 2023, by Melissa Blundell (TE-97717A) and Tsutomu (Tommy) Molioo (TE-02412D-0) (Table 2). The surveys were conducted following the currently accepted protocol of the U.S. Fish and Wildlife Service (USFWS) *Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Protocol* (USFWS 1997). The surveys included six survey passes at a minimum of 7-day intervals during the breeding season.

In accordance with the protocol, no more than 80 acres of suitable habitat were surveyed by a single permitted biologist during each site visit conducted. Survey routes are shown on Figure 3 and allowed for complete audible and visual coverage of all suitable gnatcatcher habitat on site. Birding binoculars (e.g., 8x42 magnification) were used to aid in detecting and identifying bird species. Recorded vocalizations were used frequently in order to elicit

a response from the species. The tape was played approximately every 50 to 100 feet. If gnatcatchers would have been detected, the playing of the tape would have ceased to avoid harassment.

A digital aerial map overlain with vegetation polygons and the site area was used for the survey. The digital mobile map was also utilized during the surveys to assist in navigating and mapping any gnatcatchers present. Weather conditions, time of day, and season were appropriate for the detection of gnatcatchers and are provided in Table 2.

Table 2. Survey Dates and Conditions

Survey Pass	Date	Biologist's Initials[1]	Time	Survey Conditions[2]
1	5/12/2023	MB	0825-1045	62–78°F; 0% cc; 0–3 mph wind
2	5/19/2023	MB	0855-1120	66–81°F; 0–100% cc; 0–3 mph wind
3	6/2/2023	MB	0610-0825	60°F; 60–90% cc; 0–3 mph wind
4	6/9/2023	TM	1030-1200	64–67°F; 100% cc; 0–2 mph wind
5	6/16/2023	MB	0640-0905	60–70°F; 100% cc; 0–5 mph wind
6	6/27/2023	TM	0630-0815	60–68°F; 100% cc; 0–3 mph wind

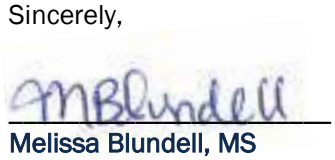
[1]Biologist Initials: MB = Melissa Blundell; TM = Tommy Molioo
[2]Survey Conditions: °F = degrees Fahrenheit; % cc = percent cloud cover; mph = mile per hour

4 Results

No California gnatcatchers were observed during the focused surveys. Five special-status species were observed during the surveys including Costa's hummingbird (*Calypte costae*; USFWS Bird of Conservation Concern [BCC]), wrentit (*Chamaea fasciata*; BCC), Lawrence's goldfinch (*Spinus lawrencei*, BCC), California thrasher (*Toxostoma redivivum*, BCC), and Nuttall's woodpecker (*Dryobates nuttallii*; BCC). Overall, 30 avian species were observed during the surveys. A full list of avian species observed during the survey is provided in Attachment A. Photo documentation of the Survey Area is provided in Attachment B.

Please feel free to contact Melissa Blundell (mblundell@dudek.com, 760-214-1878, cell) or Tommy Molioo (tmolioo@dudek.com, 949-373-8308) with questions or if you require additional information regarding this survey. I certify that the information in this survey report and attached exhibits fully and accurately represent my work.

Sincerely,



Melissa Blundell, MS
Biologist (TE-97717A)



Tommy Molioo
Sr. Biologist (TE-06873C)

Att.: *Figures 1-3*
A – List of Bird Species Observed
B – Photo Log

cc: *Mike Cady (mcady@dudek.com)*

5 References

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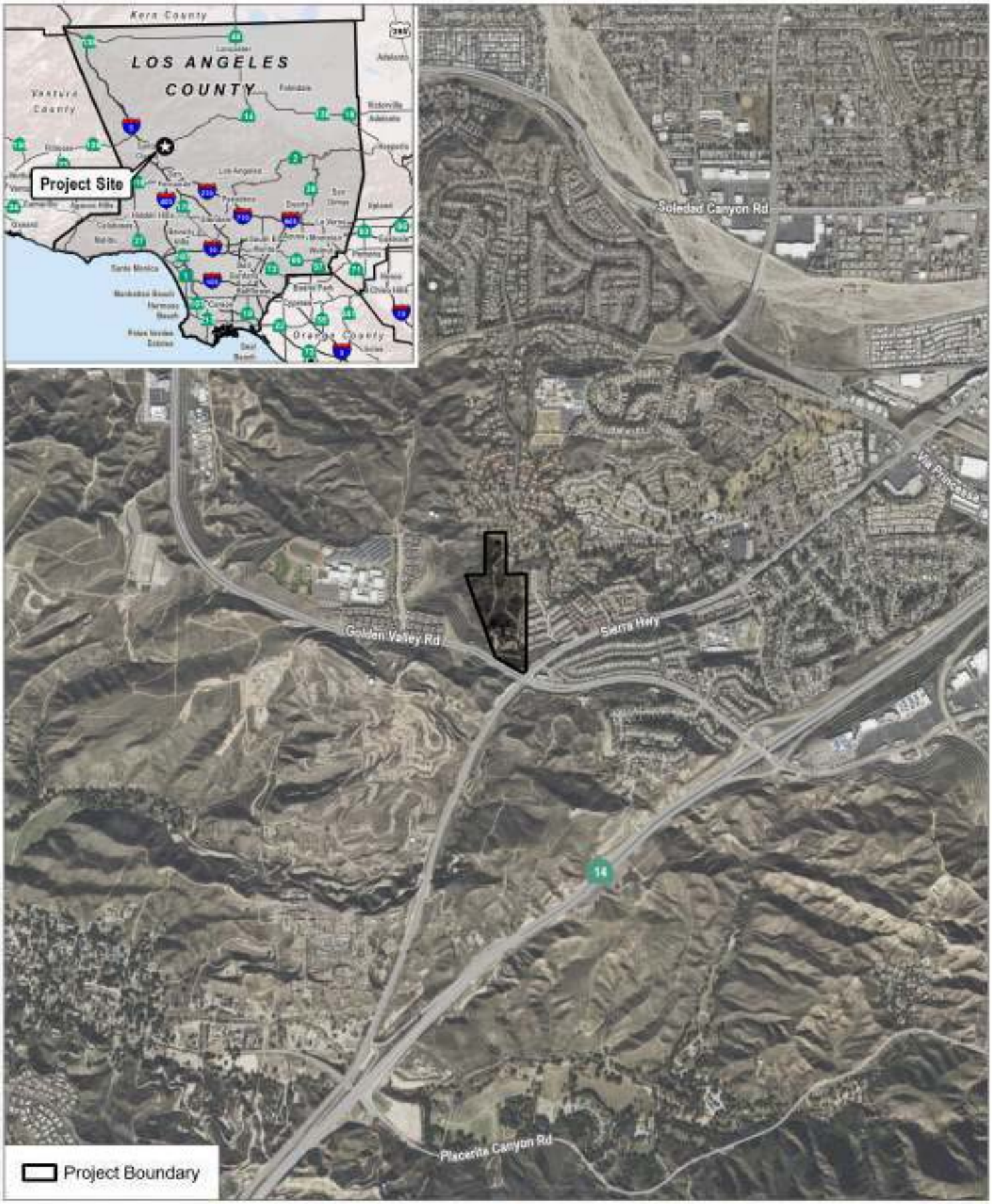
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SOURCE: Bing Maps Aerial (accessed 2023)

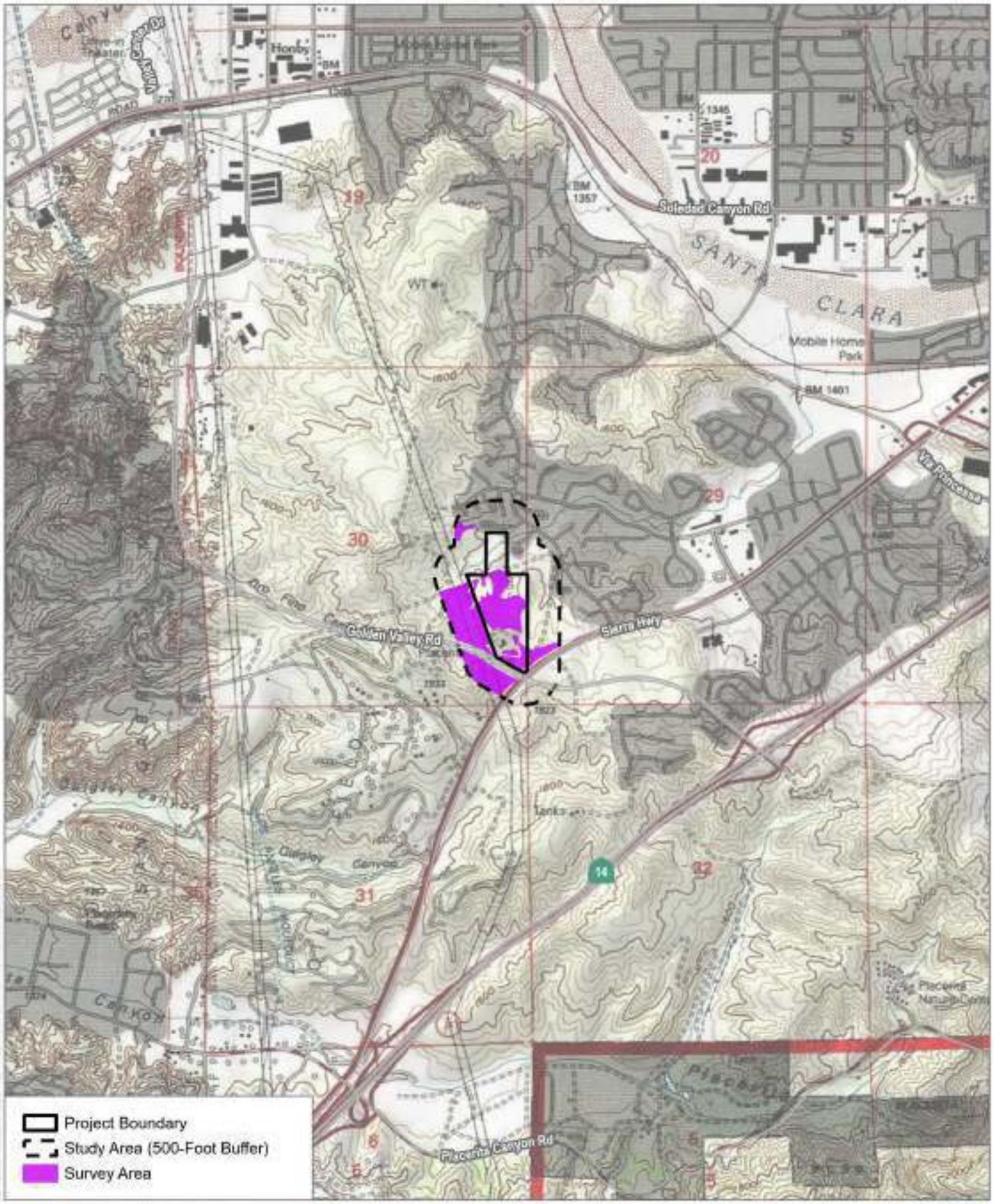
DUDEK

0 1,000 2,000 Feet

FIGURE 1

Project Location

Santa Clarita VTTM 68203 CAGN Survey Project



SOURCE: USGS 7.5 Mint Canyon Quadrangle

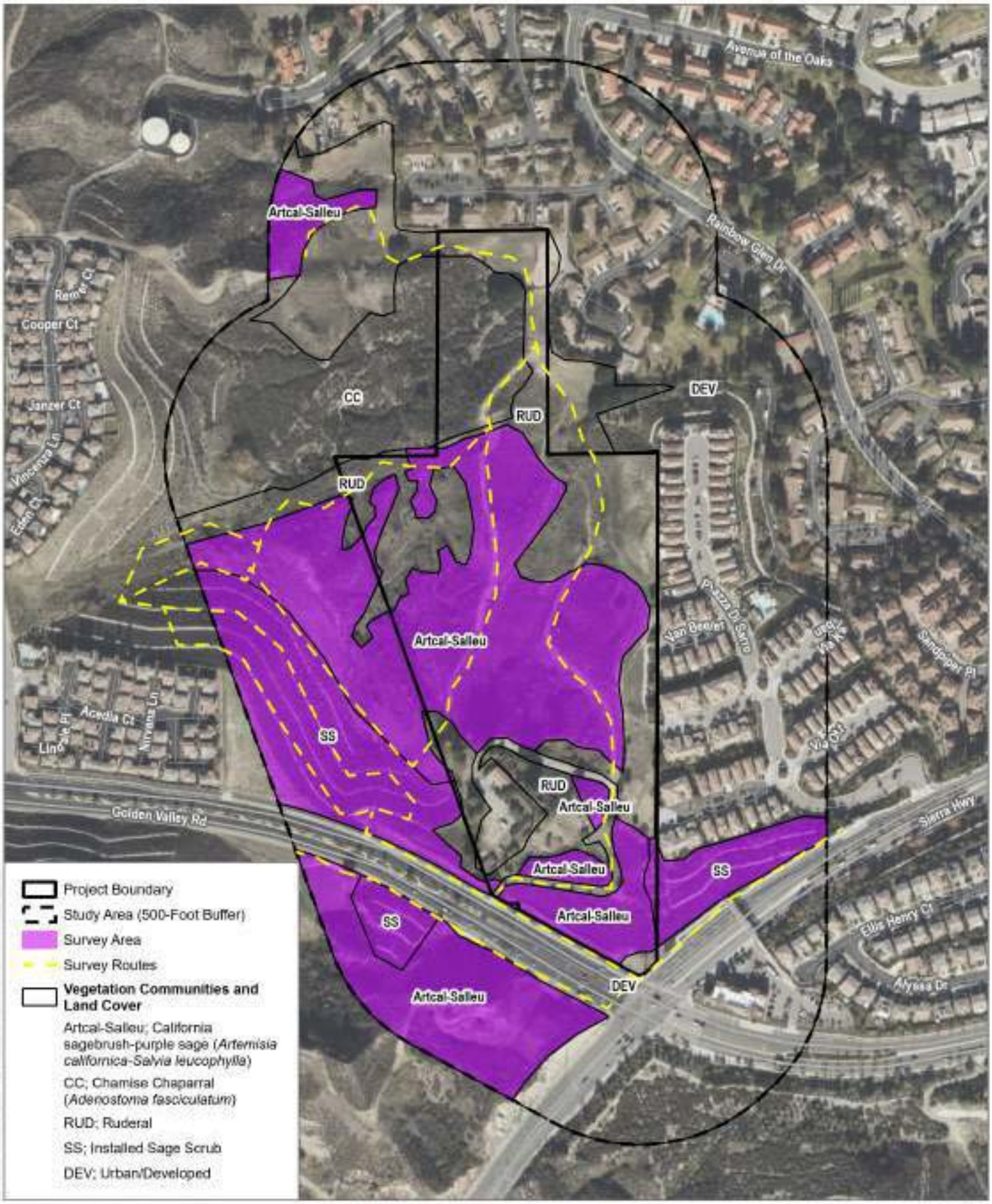
DUDEK

0 1,000 2,000 Feet

FIGURE 2

Coastal California Gnatcatcher (CAGN) Survey Areas

Santa Clarita VTTM 68203 CAGN Survey Project



SOURCE: Bing Maps Aerial (accessed 2023)

DUDEK

0 100 200 Feet

FIGURE 3

Survey Results

Santa Clarita VTTM 68203 CAGN Survey Project

Attachment A

List of Bird Species Observed

Bird Species Observed

AEGITHALIDAE—LONG-TAILED TITS & BUSHTITS

Psaltriparus minimus—bushtit

APODIDAE—SWIFTS

Aeronautes—white-throated swift

Cathartes aura—turkey vulture

COLUMBIDAE—PIGEONS & DOVES

Zenaida macroura—mourning dove

Columba livia—rock pigeon (rock dove)

Streptopelia decaocto—Eurasian collared-dove*

CORVIDAE—CROWS & JAYS

Aphelocoma californica—California scrub-jay

Corvus brachyrhynchos—American crow

Corvus corax—common raven

FRINGILLIDAE—FRINGILLINE & CARDUELINE FINCHES & ALLIES

Haemorhous mexicanus—house finch

Spinus lawrencei—Lawrence's goldfinch

Spinus psaltria—lesser goldfinch

Spinus tristis—American goldfinch

ICTERIDAE—BLACKBIRDS, ORIOLES & ALLIES

Icterus cucullatus—hooded oriole

MIMIDAE—MOCKINGBIRDS & THRASHERS

Mimus polyglottos—northern mockingbird

Toxostoma redivivum—California thrasher

ODONTOPHORIDAE—NEW WORLD QUAIL

Callipepla californica—California quail

PASSERELLIDAE—NEW WORLD SPARROWS

Melospiza melodia—song sparrow

Melozone crissalis—California towhee

Pipilo maculatus—spotted towhee

PASSERIDAE—OLD WORLD SPARROWS

Passer domesticus—house sparrow*

PICIDAE—WOODPECKERS & ALLIES

Dryobates nuttallii—Nuttall's woodpecker

PTILOGONATIDAE—SILKY-FLYCATCHERS

Phainopepla nitens—phainopepla

SYLVIIDAE—SYLVIID WARBLERS

Chamaea fasciata—wrentit

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna's hummingbird

Calypte costae—Costa's hummingbird

Selasphorus sasin—Allen’s hummingbird

TROGLODYTIDAE—WRENS

Thryomanes bewickii—Bewick's wren

TYRANNIDAE—TYRANT FLYCATCHERS

Tyrannus verticalis—western kingbird

Tyrannus vociferans—Cassin’s kingbird

* signifies introduced (non-native) species

Attachment B

Photo Documentation



Photo 1. View of California sagebrush-purple sage scrub (foreground) and installed sage scrub (background) in the central and western portion of the Study Area, respectively. Photo facing southwest. June 16, 2023



Photo 2. View of California sagebrush-purple sage scrub in the northeastern portion of the project boundary. Photo facing west. June 16, 2023



Photo 3. View of California sagebrush-purple sage scrub along the western project boundary. Photo facing west. June 16, 2023



Photo 4. View of installed sagebrush scrub in the western portion of the project boundary. Photo facing southeast. June 16, 2023

APPENDIX B-6
Biological Studies Peer Review

January 12, 2026

City of Santa Clarita
23920 Valencia Blvd., Suite 300
Santa Clarita, CA 91355

Attn: Ms. Erika Iverson, Senior Planner

Subj: Peer Review of Biological Resources Technical Reports for Tentative Tract Map No. 68203 (*Envicom Project #2022-105-01*)

Dear Ms. Iverson:

I reviewed the revised August 2025 biological technical reports from South Environmental including the Biological Resources Assessment, the Jurisdictional Delineation, and the Oak Tree Report for Tentative Tract Map No. 68203. The reports have adequately addressed prior comments, however, there are two items that require attention. The technical reports do not require revision, noting these items in the completed IS/MND is sufficient.

First, according to the August 2023 botanical survey report horehound bush mallow (*Malacothamnus marrubioides*) [also referred to as Santa Clarita bush mallow] occurs at the project site. This plant species was recently placed on the California Native Plant Society (CNPS) CRPR 4 list in September 2025, which is a "watch list" of species with limited distribution. The botanical survey does not require revision to note this.

CRPR 4 plants are not considered rare, but they may be significant locally. CNPS recommends CRPR 4 plants be evaluated for consideration during preparation of environmental documents, which may be particularly appropriate for the type locality of a CRPR 4 plant; populations at the periphery of a species' range; areas where the taxon is especially uncommon; areas where the taxon has sustained heavy losses; or populations exhibiting unusual morphology or occurring on unusual substrates. In this case, horehound bush mallow is relatively secure locally and does not meet the above criteria to be considered locally significant. Therefore, project impacts to horehound bush mallow would be less than significant.

Second, we feel an expansion of the identified mitigation measures is necessary in order to bring them in line with industry standards, remove any ambiguities, and ensure all potential significant impacts are mitigated. We propose the addition of the following mitigation measures to the project. There is no need to revise the biological reports, these can be added to the IS/MND.

BIO-1 Biological Monitoring

Prior to issuance of a grading permit, the Applicant shall retain a qualified biologist as the lead biological monitor subject to approval by the City of Santa Clarita Planning Division. The lead biological monitor shall ensure that impacts to biological resources are avoided

or minimized and shall conduct (or supervise) field surveys for species that may be impacted by grading and construction activities. The lead biological monitor shall ensure that all surveys are conducted by qualified personnel (e.g., avian biologists for bird surveys, herpetologists for reptile surveys, etc.) and that they possess all necessary permits and memoranda of understanding with the appropriate agencies for the handling of potentially occurring special-status species. During grading as well as other ground disturbing and vegetation removal activities the biological monitor shall be present to inspect and enforce all biological mitigation requirements and to relocate any species that may come into harm's way to an appropriate safe location with similar habitat (unless such relocation would require an Incidental Take Permit for take of a listed species, in which case the appropriate trustee agencies (CDFW or USFWS) will be consulted first). The biological monitor shall be onsite daily throughout rough grading and other vegetation removal activities and shall then conduct periodic site visits as necessary throughout the remainder of project construction.
The biological monitor shall be authorized to stop specific grading or construction activities if violations of mitigation measures or any local, state, or federal laws are suspected.

The biological monitor shall ensure that daily monitoring reports (e.g., survey results, protective actions, results of protective actions, adaptive measures, etc.) are prepared, which shall be made available to the City of Santa Clarita Planning Division and CDFW at their request. The biological monitor shall file a final report of monitoring activities with City of Santa Clarita Planning Division and CDFW. The final report of monitoring activities shall be filed within one month of completion of construction.

BIO-2 Protection Measures During Grading and Construction

The Applicant must implement the following measures during grading and construction to avoid and minimize potential impacts to native habitats and associated flora and fauna:

- Prior to initiation of grading and construction activities, the Applicant must demarcate the project limits of disturbance with temporary exclusionary fencing to prevent encroachment of project activities into adjacent native habitats and jurisdictional waterways, and to dissuade wildlife from entering the construction area. The fencing must be marked with highly visible flagging. Temporary signs must be posted or placed at regular intervals along the fencing prohibit access beyond the project limits. The temporary fencing must be routinely inspected and maintained in functional condition for the duration of project grading and construction.
- Tree protective fencing that is at least 6-feet tall chain-link fencing should be placed at the Tree Protection Zone of on-site oak trees near the proposed hiking trail. The fencing should be placed at least 5 feet from the dripline of the oaks and should be approved by a certified arborist approved by the City of Santa Clarita Planning Division prior to start of project activities. The fencing should remain in place throughout project construction and should be monitored by the certified

arborist on at least a monthly basis to ensure its continued effectiveness.

- No construction and maintenance activities may occur during nighttime hours, except in an emergency or if authorized by the City of Santa Clarita Planning Division, or designee.
- If construction lighting is required, then lighting must be pointed away from native habitats and be pointed downward and shielded to the extent practicable.
- The Applicant shall implement standard measures to avoid excessive construction noise at the construction site.
- No pets are allowed on the project site.
- Trash must be disposed of in closed-containers, and all food-related trash must be disposed of in closed animal-proof containers. The Applicant must provide sufficient containers on-site during construction.
- Standard measures to control fugitive dust shall be implemented at the construction site, including sufficient watering of disturbed areas and reduced vehicle speeds below 15 m.p.h.
- All trenches must be filled within the same day or escape ramps for animals shall be constructed if trenches are to be left open overnight.
- All project related equipment and vehicles must be cleaned and decontaminated of weeds and soils before entering the project site to reduce the potential for the spread and introduction of invasive and noxious weeds.
- The project must obtain and implement a Stormwater Pollution Prevention Plan to prevent discharge and runoff of pollutants into streams and riparian habitats as well as the natural habitats adjacent to the construction footprint.

The Applicant shall implement the required measures throughout grading and construction. The biological monitor required by MM BIO-1 must maintain a record of monitoring notes including construction activities and observations related to the requirements of this mitigation measure for submittal to the City of Santa Clarita Planning Division and CDFW, when requested. The biological monitor shall file a final report of monitoring activities with the City of Santa Clarita Planning Division and CDFW. The final monitoring report shall be submitted within one month of completion of construction.

BIO-3 Nesting Birds

- If possible, ground disturbing activities and vegetation removal should be timed to occur between September 1 – January 31, which is outside the bird nesting season.
- If ground disturbing activities or vegetation removal (including tree trimming) are scheduled between February 1 – August 31, which is the bird nesting season, two preconstruction surveys for nesting birds should be conducted. One within 7 days prior to construction activity and the second within 72 hours prior to construction activities. The surveys should be conducted by a qualified biologist with prior experience conducting nesting bird surveys for construction projects. The survey

area should include the area of ground disturbing activities and vegetation removal as well as suitable nesting habitat within a 300-foot buffer, or a buffer size determined by the qualified biologist based on level of proposed disturbance and access. A letter report summarizing the methods and results of the nesting bird surveys must be submitted to the City of Santa Clarita Planning Division, or designee, before commencement of project activities. If no active nests are found, no additional measures are required.

- If active nests are found the biologist will map the location and document the species and nesting stage. A no-work buffer will be established around the active nest as determined by the qualified biologist and based on the species sensitivity to disturbance and the type and duration of the disturbance. No construction activities shall occur within the no-work buffer until the biologist has determined the nest is no longer active.

BIO-4 Crotch's Bumble Bee

Pre-Project Habitat Assessment and Protocol Surveys

Prior to issuance of a grading permit, the Applicant shall retain a qualified biologist to conduct a habitat assessment to determine if the Project site contains suitable habitat for Crotch's bumble bee. If it is determined that the Project site contains suitable habitat, prior to issuance of a grading permit the qualified biologist shall conduct a protocol survey of the Project site for Crotch's bumble bee. The protocol survey shall be conducted during the Colony Active Period (April 1 through August 31) and shall follow CDFW's *Survey Considerations for California Endangered Species Act (CESA) Candidate Bumble Bee Species* (June 6, 2023), or other survey protocol approved by California Department of Fish and Wildlife (CDFW). The qualified biologist shall prepare and submit a report with the methods and results of the survey to City of Santa Clarita Planning Division and CDFW.

If Crotch's bumble bee(s) are not detected during the pre-project protocol survey, no additional mitigation is required provided the Project commences within one year of completion of the survey. If the Project does not commence within one year of completion of the survey, an additional protocol survey of the Project site shall be conducted and the survey results submitted to the City of Santa Clarita Planning Division and CDFW.

If a Crotch's bumble bee(s) is found during the protocol survey, the Applicant shall notify the City of Santa Clarita Planning Division and initiate consultation with CDFW to determine if an Incidental Take Permit (ITP) for Crotch's bumble bee will be required for the Project. If required, the Applicant shall obtain an ITP from CDFW prior to issuance of a grading permit. The Applicant shall comply will the conditions of the ITP.

If a Crotch's bumble bee(s) is found at the Project site during the protocol surveys, mitigation to avoid and minimize Project impacts as well as to compensate for loss of habitat for the species shall include the following, or as otherwise determined by CDFW:

Project Timing

To the extent feasible, initial ground-disturbing and vegetation removal activities shall be scheduled after Crotch's bumble bee nectar sources have stopped blooming in the fall, as determined by the qualified biologist, and outside of the Queen Flight Season (February 1 through March 30) and the Colony Active Period (April 1 through August 31).

Pre-Construction Surveys

Prior to initial ground-disturbing or vegetation removal activities that would occur during the Queen Flight Season (February 1 through March 30) and the Colony Active Period (April 1 through August 31), including but not limited to grading and fuel modification, a qualified biologist shall conduct two (2) visual surveys for Crotch's bumble bee within the development and fuel modification areas, plus 50 feet. Surveys shall occur no more than 10 days prior to commencement of ground-disturbing and vegetation removal activities. The surveys shall be at least four (4) days apart, with the second survey completed within two (2) days of starting work. Surveys shall be conducted at a minimum effort of one (1) person-hour per three (3) acres of habitat. Survey effort shall focus on blooming nectar and pollen resources and potential nesting substrates (burrows, grasses, brush piles, old bird nests, dead trees, hollow logs). If the biologist detects any nesting Crotch's bumble bees during the pre-construction survey, a 50-foot exclusionary buffer in which no activities would be allowed to occur shall be established around the nesting bee(s). All Project personnel shall be notified of the buffer, and the City of Santa Clarita Planning Division and CDFW shall be notified within 24 hours of detection of nesting Crotch's bumble bee(s). The exclusionary buffer shall be maintained until the Crotch bumble bee(s) are no longer nesting, as determined by the biologist. Within 14 days of completion of the pre-construction surveys, the surveying biologist shall prepare and submit a report documenting the methods and results of the pre-construction surveys to the City of Santa Clarita Planning Division and CDFW.

Biological Monitoring

A qualified biologist shall monitor initial ground disturbance and vegetation removal activities occurring at any time of year to ensure that the Project does not result in take of Crotch's bumble bee. Biological monitoring during the Queen Flight Season (February 1 through March 30) and the Colony Active Period (April 1 through August 31) shall include searches for nests, which shall include observations of ground animal burrows, bunch grasses, thatched annual grasses, brush piles, old bird nests, dead trees, and hollow logs. Biological monitoring conducted during the Overwintering Season for Crotch's bumble bee (November 1 through January 31) shall include searches of potential hibernacula. If the biological monitor detects any nesting or overwintering Crotch's bumble bees during monitoring activities, a 50-foot exclusionary buffer in which no activities would be allowed to occur shall be established around the nesting or overwintering

bee(s). All Project personnel shall be notified of the buffer, and the City of Santa Clarita Planning Division and CDFW shall be notified within 24 hours of detection of the nesting or overwintering Crotch's bumble bee(s). The exclusionary buffer shall be maintained until the Crotch bumble bee(s) are no longer nesting or overwintering, as determined by the biologist. The monitoring biologist shall maintain daily field notes, including the locations of nesting and overwintering bees and collect photographs and other appropriate information. Within one month of completion of all biological monitoring activities, the biological monitor shall prepare and submit a monitoring report documenting the methods and outcome of monitoring activities to the City of Santa Clarita Planning Division and CDFW. The biological monitor's field notes shall be attached to the report.

Compensatory Mitigation for Loss of Habitat

If Crotch's bumble bee is found on the Project site during the pre-project protocol surveys, the qualified biologist shall delineate the extent of suitable habitat for the species and quantify the extent of Project impacts. The Applicant shall mitigate for permanent and temporary impacts to suitable habitat at a 1:1 ratio. Suitable habitats that are temporarily impacted shall be restored to pre-project or better conditions and shall contain locally native nectar sources for Crotch's bumble bee. Suitable habitats that are permanently impacted shall be mitigated by restoration and/or enhancement of onsite habitats suitable for Crotch's bumble bee, as well as permanent preservation of the mitigation area(s) by deed restriction or conservation easement. If onsite restoration or enhancement is not feasible, offsite restoration or enhancement at a location acceptable to the City of Santa Clarita Planning Division and CDFW would be sufficient. Alternatively, the Applicant can mitigate for permanent impacts to suitable habitat via contribution to an in-lieu fee program or mitigation bank approved by the City of Santa Clarita Planning Division and CDFW. In-lieu fees or mitigation bank credits shall be used for restoration and/or enhancement and permanent protection of suitable habitats for Crotch's bumble bee. A Mitigation and Monitoring Plan that compensates for permanent and temporary impacts to suitable habitats for Crotch's bumble bee shall be prepared by a qualified restoration ecologist and shall include the following:

1. Plant Palette: The Applicant shall compile a plant palette(s) of local native species that is appropriate for the habitats being restored or enhanced. The plant palette(s) shall include a diverse assemblage of locally native nectar resources for Crotch's bumble bee that can be expected to be blooming during the Colony Active Period for Crotch's bumble bee. Nectar and pollen-producing plants for Crotch's bumble bee in the plant palette may include, but would not be limited to, the genera *Chaenactis, Lupinus, Phacelia,* and *Salvia* and other suitable flowering plants in the families Fabaceae, Apocynaceae, Asteraceae, Lamiaceae, Hydrophyllaceae, Plantaginaceae, Onograceae, Papaveraceae, Polygonaceae, and Boraginaceae. Seeding may be utilized as a method of plant establishment

given that seed mixes consist of only locally native species. Seeds to be used shall be collected locally from the region.

2. Timing: The Mitigation and Monitoring Plan shall be approved by the City of Santa Clarita Planning Division and CDFW prior to issuance of a grading permit. The Applicant shall begin implementation of restoration and/or enhancement activities during the rainy season (October to March), or prior to the onset of the first rain event. This will ensure proper establishment of the planted species.
3. Performance Standards: The restoration and/or enhancement area shall provide a minimum absolute cover of native plant species by the end of the required monitoring period that is not less than the absolute cover of native species found at high quality reference sites found onsite or in the surrounding area and approved by the City of Santa Clarita Planning Division and CDFW. Species richness, diversity, abundance, and frequency/density within each restoration and enhancement area shall be roughly proportionate to that of the reference sites. Non-native species shall not exceed 5% cover of the restoration and/or enhancement area by the end of the required monitoring period.
4. Monitoring and Maintenance: The Applicant shall monitor and maintain restoration and/or enhancement areas for a period of 5 years or until performance standards have been met. The Applicant shall perform periodic maintenance of the site including weeding, repairing irrigation or other associated components, and replanting or re-seeding dead plants. Monitoring shall involve qualitative and quantitative methods to document site conditions and success. The monitoring period shall begin immediately following initial implementation activities including seeding, weeding, and establishment of appropriate irrigation and other restoration components. Replacement plantings shall be monitored with the same survival and growth requirements for three years after planting.
5. Reporting: The Applicant shall submit annual reports to the City of Santa Clarita Planning Division and CDFW documenting mitigation activities no later than January 31 of each year until performance standards have been met.
6. Adaptive Management: The Applicant will implement adaptive management/contingency measures as needed throughout the duration of the monitoring period to ensure that performance standards are met, at the direction of the restoration ecologist.

If impacts are mitigated by purchasing credits from a mitigation bank or by contribution to an in-lieu fee program, the Applicant must provide written documentation to the City of Santa Clarita Planning Division and CDFW of purchase of mitigation credits or payment of the in-lieu fee prior to issuance of a grading permit.

BIO-5 Roosting Bat Surveys and Avoidance Measures

- Construction activities including demolition, grading, and vegetation removal shall occur outside the bat maternity season, which occurs between April 1 through August 31, as feasible. If the bat maternity season cannot be avoided, a bat habitat assessment survey shall be conducted by a qualified biologist no more than 14 days prior to the start of construction activities. The habitat assessment survey shall document the locations of potential bat roosting habitat as well as evidence of bat species that may occur in the proposed Project limits through direct observation (e.g., roosting bats) and/or sign (e.g., bat guano).
- No more than 5 days prior to the start of construction activities, emergence bat surveys shall be conducted during the bat maternity season in areas of suitable bat habitat identified during the habitat assessment survey (e.g., near vacant structures or suitable roosting trees) to document any bat species emerging from these features. Generally, the emergence survey(s) will be conducted approximately one hour prior to sunset and last a minimum of two hours after sunset; however, the timing will be determined by the qualified biologist. Passive acoustic monitoring equipment will be utilized during the emergence surveys to identify bats to the species level. In the event multiple features were identified in the habitat assessment in which bats may occur, at the discretion of the qualified biologist, either multiple emergence surveys may be necessary or additional acoustic equipment may need to be set up to capture the acoustics of bats as they emerge at dusk.
- Prior to the start of Project activities, the qualified biologist shall prepare and submit a letter report documenting the methods and results of the habitat assessment and emergence surveys to the City of Santa Clarita Planning Division and CDFW.
- If no bats are detected during the habitat assessment or emergence surveys, then construction activities may proceed. If roosting bats are detected during the habitat assessment or emergence surveys, the roost sites and roosting bats shall be avoided during the maternity season. The qualified biologist shall determine an appropriate buffer around the roost site where construction shall be avoided. The buffer typically ranges in size, between 100 to 300 feet around the roost site, depending on potential for project impacts and surrounding terrain. For example, if a project will result in high noise decibels and the roost site is exposed without surrounding trees or hills, the buffer may be increased to reduce disturbances to the roosting bats during breeding activities. CDFW shall be consulted regarding the buffer distances around roosts containing special-status bat species. Features such as trees or structures determined to be active roosts shall be left in place throughout the maternity season.
- If an active roost site cannot be avoided by the Project, including within or outside of the maternity season, a bat mitigation and management plan shall be developed by a qualified biologist for roost relocation. Roost relocation shall involve eviction by non-invasive means and only in exceptional circumstances should involve the direct capture and transfer of bats to appropriate natural or artificial bat roosting

habitat in the surrounding area. Mitigation and management plans shall require consultation with and approval from the City of Santa Clarita Planning Division and CDFW.

- If confirmed occupied special-status bat roosting habitat is destroyed, artificial bat roosts of comparable size and quality shall be constructed and maintained at a suitable undisturbed area, preferably on the subject property. The design and location of the artificial bat roosts shall be determined by the qualified bat biologist in consultation with CDFW.
- No more than one month following completion of all bat survey, monitoring, and mitigation activities, the qualified biologist shall prepare and submit a summary report of the methods and results of these activities to the City of Santa Clarita Planning Division and CDFW.

BIO-6 Pre-Construction Surveys and Salvage of Special-Status Lizards and Mammals

Prior to issuance of a grading permit, a salvage plan that includes the details of the methods to be used to capture and relocate special-status wildlife species occurring within the Project area, including coastal whiptail, coast horned lizard, and San Diego desert woodrat, shall be prepared by a qualified biologist and submitted to the City of Santa Clarita Planning Division and CDFW for review and approval.

Pre-construction surveys for potentially occurring special-status wildlife species including but not limited to coastal whiptail, coast horned lizard, and San Diego desert woodrat shall be conducted by a qualified biologist within 48 hours prior to initiation of Project activities that would result in ground disturbance or removal of vegetation. If a special-status wildlife species is found, avoidance is the preferred option (e.g., waiting for the animal(s) to leave the impact area). If avoidance is not feasible, the species shall be captured (if possible) and released into a predetermined area containing appropriate habitat and at a location where they would not be harmed by Project activities. The salvage program shall continue throughout initial ground disturbance and vegetation removal activities and will conclude when all suitable habitat within the grading limits has been removed. If a federal or State listed species is found, Project activities shall be delayed until USFWS and/or CDFW, as applicable, have been consulted regarding the presence of the listed species. Within 14 days following completion of the pre-construction surveys and monitoring activities, a letter report summarizing the methods and results of the surveys and salvage efforts shall be submitted to the City of Santa Clarita Planning Division, CDFW, and USFWS, as applicable.

BIO-7 Resource Agency Permitting for Impacts to Jurisdictional Features

Prior to issuance of a grading permit, to ensure compliance with resource agency permitting requirements related to impacts to jurisdictional waters and riparian habitat, the Applicant shall submit applications and obtain permits, if required, from USACE, RWQCB, and CDFW for any excavation, fill, or other land and vegetation disturbing activities within the

streams at the site. If required, a CWA Section 404 permit shall be obtained from the USACE, a Streambed Alteration Agreement shall be entered into with the CDFW under Section 1602 of the California Fish and Game Code, and a CWA Section 401 Water Quality Certification or Wastewater Discharge Permit shall be obtained from the RWQCB. The Applicant shall comply with the permit conditions. Mitigation for unavoidable impacts to jurisdictional waters and habitat shall be provided through implementation of the Habitat Mitigation and Monitoring Program required by mitigation measure BIO-8, or as otherwise required by USACE, RWQCB, and/or CDFW, as applicable. The Applicant shall provide written proof or documentation to the City of Santa Clarita Planning Division that the required permits from USACE, RWQCB, and/or CDFW have been obtained or written verification from USACE, RWQCB, and CDFW stating the permit is not required.

BIO-8 Habitat Mitigation and Monitoring Program

To mitigate for permanent significant impacts to jurisdictional waters and riparian habitat, the project must prepare a Habitat Mitigation and Monitoring Program. The Program must be developed by a qualified restoration ecologist approved by the City of Santa Clarita Planning Division, RWQCB, CDFW, and USACE, as applicable, in compliance with the Porter-Cologne Water Quality Control Act, CWA Sections 401 and 404, and Fish and Game Code 1602 and supporting regulations. The Habitat Mitigation and Monitoring Program must be submitted and approved prior to issuance of a grading permit. The Habitat Mitigation and Monitoring Program must mitigate for permanent impacts to jurisdictional waters and habitats at a 2:1 ratio by the restoration or enhancement of degraded in-kind jurisdictional habitats. The project must also mitigate for temporary significant impacts to jurisdictional waters and habitat at a 1:1 ratio, which shall consist restoration of the habitats that are temporarily disturbed by the project to in-kind habitat. The Program may also mitigate impacts by purchase of mitigation bank credits or by contribution to an in-lieu fee program approved by the City of Santa Clarita Planning Division, RWQCB, CDFW, and USACE, as applicable.

To the extent possible, mitigation must be accomplished on-site. If the mitigation will be performed off-site, to the extent feasible the mitigation sites should be implemented within the Santa Clara River watershed. Off-site mitigation must also be compensated for at a minimum 2:1 replacement ratio, or as recommended by RWQCB, CDFW, and USACE, as applicable. If impacts are mitigated by purchasing credits from a mitigation bank or by contribution to an in-lieu fee program, the Permittee must provide evidence of purchase of mitigation credits or payment of the in-lieu fee prior to issuance of a grading permit. To the extent feasible, in-lieu fees must be used for the creation and/or restoration of in-kind jurisdictional habitat within the Santa Clara River watershed.

The Habitat Mitigation and Monitoring Program (at a minimum) shall include:

- Description of the project/impact and mitigation sites;
- Specific objectives;
- Success criteria;

- Plant palette;
- Implementation plan;
- Maintenance activities;
- Monitoring plan; and
- Contingency measures.

The mitigation project must be implemented over a five-year period. To the extent feasible, the mitigation project must be initiated prior to development of the project. Success criteria are (at a minimum) evaluated based on appropriate survival rates and percent cover of planted native species, as well as eradication and control of invasive species within the restoration or enhancement areas. The target species and native plant palette, as well as the specific methods for evaluating whether the project was successful at meeting the above-mentioned success criteria shall be determined by the qualified restoration ecologist and included in the mitigation program.

Annual reports discussing the implementation, monitoring, and management of the mitigation project must be submitted to the City of Santa Clarita Planning Division, RWQCB, CDFW, and USACE, as applicable. The annual monitoring reports and the final monitoring report shall be submitted by the month / day the mitigation project was first initiated. Five years after project start, a final report must be submitted to the City of Santa Clarita Planning Division, RWQCB, CDFW, and USACE, as applicable, which (at a minimum) discusses the implementation, monitoring and management of the mitigation project over the five-year period and indicate whether the mitigation project has been successful based on established success criteria. The mitigation project must be extended if success criteria have not been met at the end of the five-year period to the satisfaction of the City of Santa Clarita Planning Division, RWQCB, CDFW, and USACE, as applicable.

Please contact me if you have any questions.

Sincerely,



Jim Anderson
Principal Biologist

APPENDIX C
Cultural Resources Technical Report

Cultural Resources Technical Report

Santa Clarita TTM 68203 Project,
City of Santa Clarita, Los Angeles County, California

December 2021

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Executive Summary

South Environmental was retained to complete a cultural resources technical report for the Tentative Tract Map (TTM) 68203 Project (proposed project) located in the City of Santa Clarita, Los Angeles County, California. This study includes the results of a California Historical Resources Information Center (CHRIS) records search of the project site and a one-mile radius; a California Native American Heritage Commission (NAHC) Sacred Lands File search and informational letters to local tribes; an intensive pedestrian survey of the project site by a qualified archaeologist and architectural historian; building development and archival research; and recordation and evaluation of the existing single-family residence (built 1966) for historical significance and integrity in consideration of California Register of Historical Resources (CRHR) and City of Santa Clarita designation criteria. This study was completed in compliance with the California Environmental Quality Act (CEQA), including Public Resources Code (PRC) Section 5024.1, Title 14 California Code of Regulations (CCR) Section 15064.5 of the CEQA Guidelines, and PRC Sections 21083.2 and 21084.1.

No archaeological resources were identified within the project site as a result of the CHRIS records search, NAHC Sacred Lands File search, Native American outreach letters, or pedestrian survey by a qualified archaeologist. Further, significant portions of the project site have been disturbed by construction of the existing residence, the construction of Golden Valley Road, recent grading in the northeastern portion of the site, road cuts, and ephemeral drainages that have moved soils overtime. Therefore, the project site is unlikely to contain intact buried archaeological deposits. Still, it is always possible to encounter resources during ground disturbance. Standard unanticipated discovery measures for archaeological resources and human remains have been provided in Section 6.1.2.

The existing residence located at 25800 Sierra Highway/20101 Golden Valley Road was evaluated by a qualified architectural historian for historical significance in consideration of CRHR and City designation criteria and integrity requirements. As a result of the property significance evaluation, the subject property is recommended not eligible under all CRHR and City designation criteria due to a lack of significant historical associations and compromised integrity. Therefore, the residence and its related built environment is not considered an historical resource under CEQA Guidelines Section 15064.5, and no additional study or management recommendations are necessary.

1 Introduction

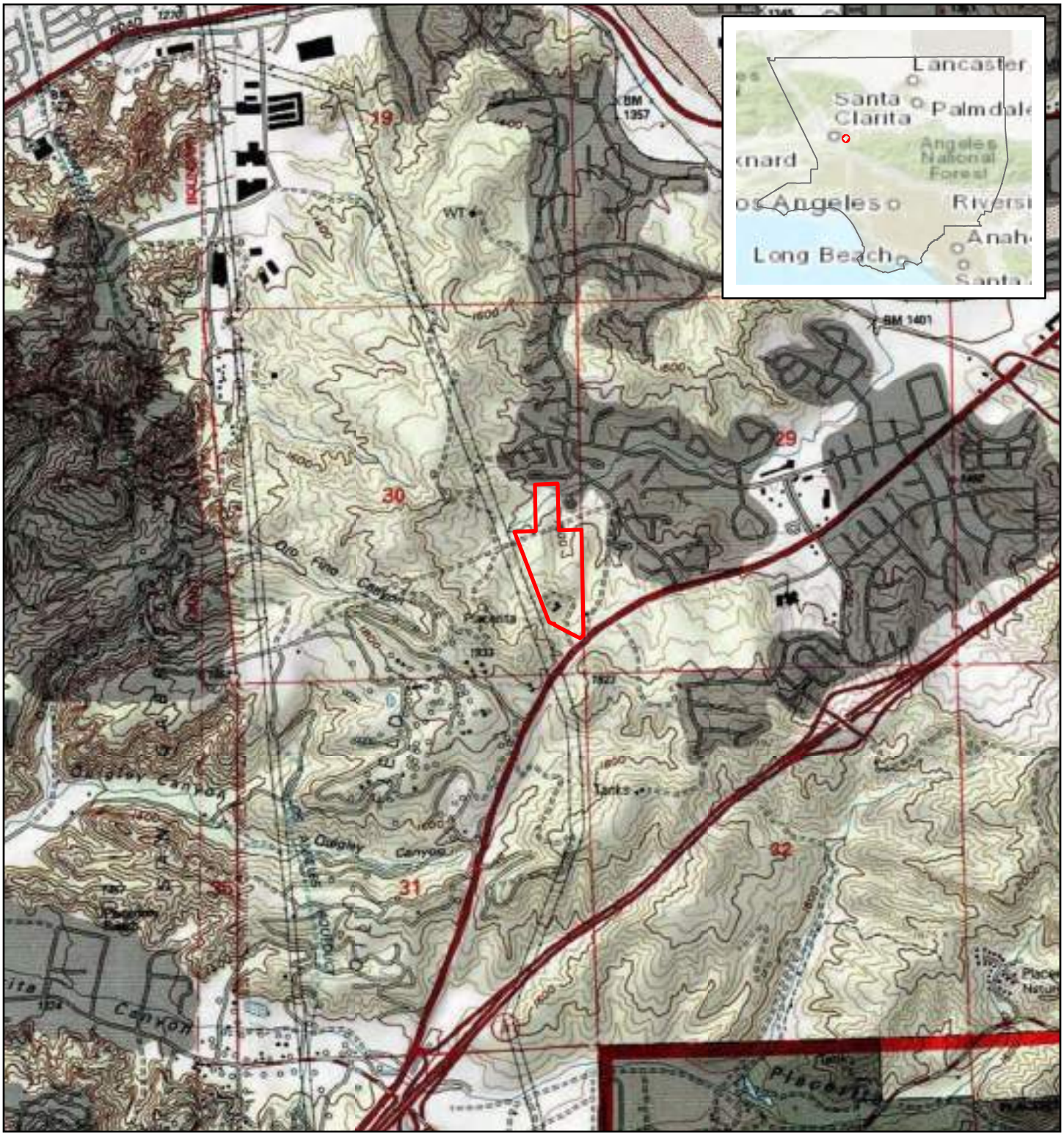
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1.1 Project Location Description

1.1.1 Project Location

The property proposed for development (project site) includes 28.13-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita (Figures 1 and 2). The project site is on the United States Geological Survey (USGS) Mint Canyon 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North (T04N) and Range 15 West (R15W). The associated APNs are: 2836-013-106, 2836-013-107, 2836-013-111, 2836-013-128, 2836-013-133, 2836-013-141, 2836-020-058, 2836-020-078, 2836-020-086, 2836-020-087.

Most of the project site is undeveloped except for a single-family home and accessory structures with a street address of 20101 Golden Valley Road and an Assessor's address of 25800 Sierra Highway. A windy paved driveway exists off Golden Valley Road provide access to the home, and a series of dirt roads provide access to the remaining undeveloped hills on the property. Adjacent uses include residential uses to the immediate north and east, vacant land to the south, and residential uses/Golden Valley High School to the west.



Source: ESRI USA Topo Maps and World Topo Map 2021

Santa Clarita VTTM 68203 Project

Figure 1. Project Location

Project Site



0 1,000 2,000 Feet

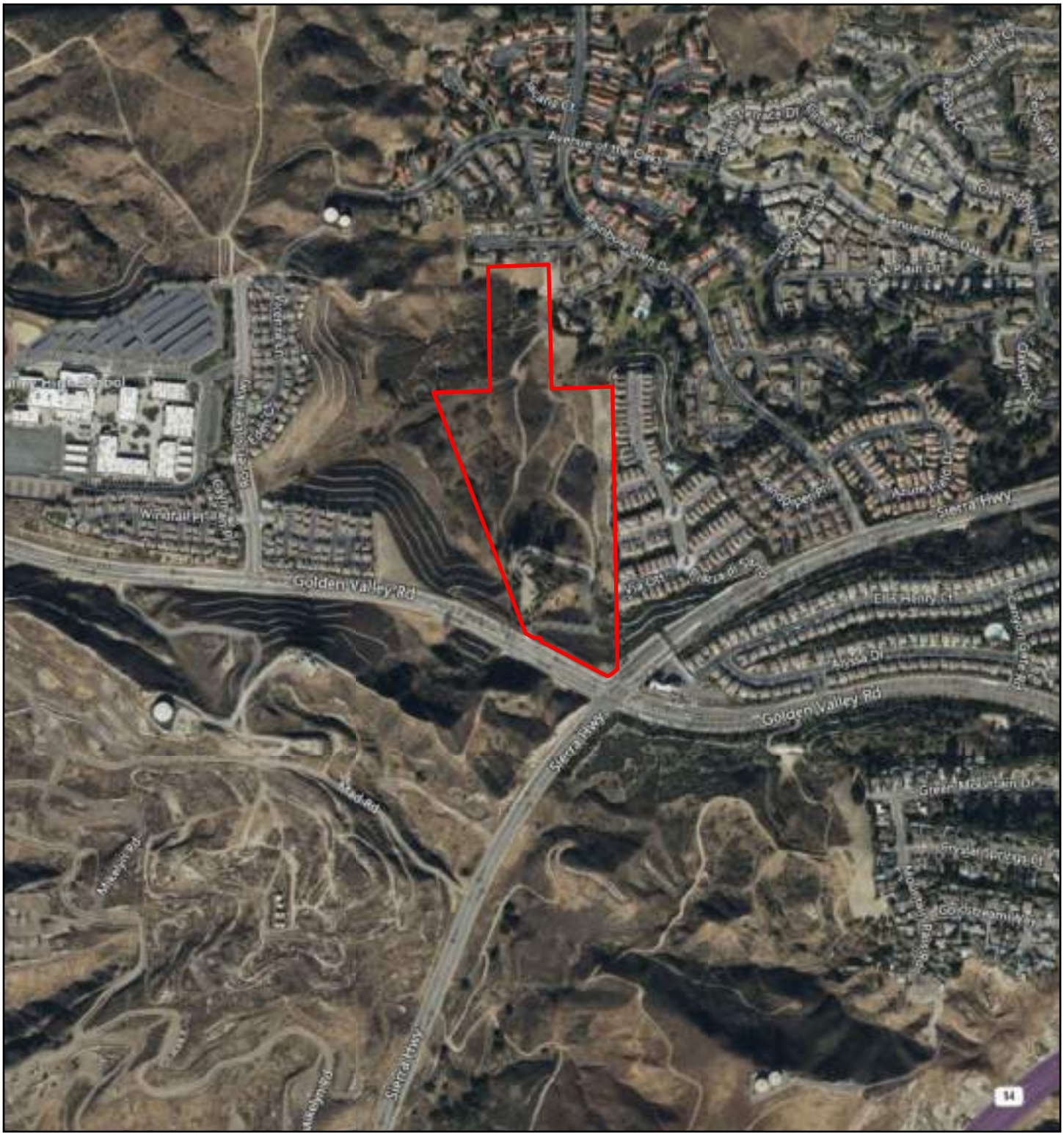
Scale: 1:24,000

N

Project Site is within the City of Santa Clarita, California, in Los Angeles County on the USGS Mint Canyon 7.5-minute quadrangle map in Section 30 of Township 04 North (T04N) and Range 15 West (R15W)

Center Coordinate (Decimal Degrees):
Latitude: 34.3985N Longitude: -188.4861W

SOUTH ENVIRONMENTAL



Source: BING Aerial Basemap accessed Sept 2021

Santa Clarita VTTM 68203 Project

Figure 2. Project Site Detail

0 450 900 Feet

N

Project Site

SOUTH ENVIRONMENTAL

1.1.2 Project Description

The proposed development seeks to merge the 10 parcels and entitle TTM 68203 for a four (4) lot subdivision consisting of the following:

- One (1) 5.04-acre lot for a four (4) story building consisting of 154-unit senior assisted living units; the proposed four (4) story building will be 50-foot maximum height.
- One (1) 5.04-acre lot for a 100-room commercial hotel and retail building.
- One (1) 11.48-acre lot for 73 residential Condominium units consisting two, three, and four-plex buildings.
- One (1) 5.83-acre open space lot for L.I.D. storm water treatment with two discharge pipes, and an eight-foot wide riding and hiking trial.
- Proposed streets and circulations will result in approximately 0.73 acres of development.

1.1.3 Project Study Area

The archaeological study area is the entirety of the project site and includes all areas where ground disturbance is expected to occur as a result of demolition and new construction. The built environment study area includes the developed portion of the project site that contains the single-family residence built in 1966 and its related garage/storage structures.

1.2 Regulatory Setting

1.2.1 State

California Register of Historical Resources

In California, the term "historical resource" includes but is not limited to "any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (California PRC Section 5020.1(j)). In 1992, the California legislature established the CRHR "to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change" (California PRC Section 5024.1(a)). The criteria for listing resources on the CRHR were expressly developed to be in accordance with previously established criteria developed for listing in the National Register of Historic Places (NRHP), enumerated below. According to California PRC Section 5024.1(c)(1–4), a resource is considered historically significant if it (i) retains "substantial integrity," and (ii) meets at least one of the following criteria:

(1) Is associated with events that have made a significant contribution to the broad patterns of California' s history and cultural heritage.

(2) Is associated with the lives of persons important in our past.

(3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

(4) Has yielded, or may be likely to yield, information important in prehistory or history.

In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than 50 years old may be considered for listing in the CRHR if it can be demonstrated that sufficient time has passed to understand its historical importance (see 14 CCR 4852(d)(2)).

The CRHR protects cultural resources by requiring evaluations of the significance of prehistoric and historic resources. The criteria for the CRHR are nearly identical to those for the NRHP, and properties listed or formally designated as eligible for listing in the NRHP are automatically listed in the CRHR, as are the state landmarks and points of interest. The CRHR also includes properties designated under local ordinances or identified through local historical resource surveys.

California Environmental Quality Act

As described further below, the following CEQA statutes and CEQA Guidelines are of relevance to the analysis of archaeological, historic, and tribal cultural resources:

- California PRC Section 21083.2(g) defines "unique archaeological resource."
- California PRC Section 21084.1 and CEQA Guidelines Section 15064.5(a) define "historical resources." In addition, CEQA Guidelines Section 15064.5(b) defines the phrase "substantial adverse change in the significance of an historical resource." It also defines the circumstances when a project would materially impair the significance of an historical resource.
- California PRC Section 21074(a) defines "tribal cultural resources."
- California PRC Section 5097.98 and CEQA Guidelines Section 15064.5(e) set forth standards and steps to be employed following the accidental discovery of human remains in any location other than a dedicated ceremony.
- California PRC Sections 21083.2(b)-(c) and CEQA Guidelines Section 15126.4 provide information regarding the mitigation framework for archaeological and historic resources, including examples of preservation-in-place mitigation measures; preservation-in-place is the preferred manner of mitigating impacts to significant archaeological sites because it maintains the relationship between artifacts and the archaeological context and may also help avoid conflict with religious or cultural values of groups associated with the archaeological site(s).

More specifically, under CEQA, a project may have a significant effect on the environment if it may cause "a substantial adverse change in the significance of an historical resource" (California PRC Section 21084.1; CEQA Guidelines Section 15064.5(b).) If a site is either listed or eligible for listing in the CRHR, or if it is included in a local register of historic resources or identified as significant in a historical resources survey (meeting the requirements of California PRC Section 5024.1(q)), it

is a "historical resource" and is presumed to be historically or culturally significant for purposes of CEQA (California PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)). The lead agency is not precluded from determining that a resource is a historical resource even if it does not fall within this presumption (California PRC Section 21084.1; CEQA Guidelines Section 15064.5(a)).

A "substantial adverse change in the significance of an historical resource" reflecting a significant effect under CEQA means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" (CEQA Guidelines Section 15064.5(b)(1); California PRC Section 5020.1(q)). In turn, CEQA Guidelines section 15064.5(b)(2) states the significance of an historical resource is materially impaired when a project:

1. Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
2. Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to section 5020.1(k) of the PRC or its identification in an historical resources survey meeting the requirements of section 5024.1(g) of the PRC, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
3. Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

Pursuant to these sections, the CEQA inquiry begins with evaluating whether a project site contains any "historical resources," then evaluates whether that project will cause a substantial adverse change in the significance of a historical resource such that the resource's historical significance is materially impaired.

If it can be demonstrated that a project will cause damage to a unique archaeological resource, the lead agency may require reasonable efforts be made to permit any or all of these resources to be preserved in place or left in an undisturbed state. To the extent that they cannot be left undisturbed, mitigation measures are required (California PRC Section 21083.2[a], [b], and [c]).

California PRC Section 21083.2(g) defines a unique archaeological resource as an archaeological artifact, object, or site about which it can be clearly demonstrated that without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Impacts to non-unique archaeological resources are generally not considered a significant environmental impact (California PRC section 21083.2(a); CEQA Guidelines Section 15064.5(c)(4)). However, if a non-unique archaeological resource qualifies as tribal cultural resource (California PRC Section 21074(c), 21083.2(h)), further consideration of significant impacts is required. CEQA Guidelines Section 15064.5 assigns special importance to human remains and specifies procedures to be used when Native American remains are discovered. As described below, these procedures are detailed in California PRC Section 5097.98.

California State Assembly Bill 52 (AB 52)

AB 52 amended PRC Section 5097.94 and added PRC Sections 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2, and 21084.3. Section 4 of AB 52 adds Sections 21074(a) and (b) to the PRC, which address tribal cultural resources and cultural landscapes. Section 21074(a) defines tribal cultural resources as one of the following:

(1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following:

(A) Included or determined to be eligible for inclusion in the California Register of Historical Resources.

(B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1.

(2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.

Section 1(a)(9) of AB 52 establishes that "a substantial adverse change to a tribal cultural resource has a significant effect on the environment." Effects on tribal cultural resources should be considered under CEQA. Section 6 of AB 52 adds Section 21080.3.2 to the PRC, which states that parties may propose mitigation measures "capable of avoiding or substantially lessening potential

significant impacts to a tribal cultural resource or alternatives that would avoid significant impacts to a tribal cultural resource."

California Health and Safety Code Section 7050.5

California law protects Native American burials, skeletal remains, and associated grave goods, regardless of their antiquity, and provides for the sensitive treatment and disposition of those remains. California Health and Safety Code Section 7050.5 requires that if human remains are discovered in any place other than a dedicated cemetery, no further disturbance or excavation of the site or nearby area reasonably suspected to contain human remains can occur until the county coroner has examined the remains (Health and Safety Code Section 7050.5(b)). PRC Section 5097.98 also outlines the process to be followed in the event that remains are discovered. If the coroner determines or has reason to believe the remains are those of a Native American, the coroner must contact the NAHC within 24 hours (Health and Safety Code Section 7050.5(c)). The NAHC will notify the "most likely descendant." With the permission of the landowner, the most likely descendant may inspect the site of discovery. The inspection must be completed within 48 hours of notification of the most likely descendant by the NAHC. The most likely descendant may recommend means of treating or disposing of, with appropriate dignity, the human remains and items associated with Native Americans.

1.2.2 Local

City of Santa Clarita Municipal Code Chapter 17.64 (Historic Preservation)

17.64.030 Commission Resolution Findings for Designating a Historic Resource.

A building, structure, or object may be designated by the Commission as a historic resource if it possesses sufficient character-defining features and integrity, and meets at least one (1) of the following criteria:

A. Is associated with events that have made a significant contribution to the historical, archaeological, cultural, social, economic, aesthetic, engineering, or architectural development of the City, State or nation; or

B. Is associated with persons significant in the history of the City, State or nation; or

C. Embodies distinctive characteristics of a style, type, period, or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship; or

D. Has a unique location, singular physical characteristic(s), or is a landscape, view or vista representing an established and familiar visual feature of a neighborhood, community, or the City; or

E. Has yielded, or has the potential to yield, information important to the history or prehistory of the City, State, or nation. (Ord. 13-8 § 4 (Exh. A), 6/11/13)

City of Santa Clarita General Plan

Conservation and Open Space Element

This combined Element establishes a policy framework for the designation and long-term preservation of open space within the planning area and addresses the wide range of community benefits derived from open space. In addition to providing land for park and recreational facilities, open spaces provide the benefits of wildlife habitat preservation, scenic views, water recharge and watershed protection, enhancement of air quality, protection of cultural and historical resources, moderation of microclimates, and enhanced property values. In addition, preservation of scenic and accessible open spaces around the urbanized portions of the Valley, and between neighborhoods and districts, contributes to community character and the distinctive sense of place enjoyed by Santa Clarita Valley residents.

2 Background Research

2.1 CHRIS Records Search

On November 5, 2021, staff at the South Central Coastal Information Center (SCCIC) completed a CHRIS records search of the project site and a one-mile search radius. This search included their collections of mapped prehistoric and historic archaeological resources and historic built-environment resources, State of California Department of Parks and Recreation Site Records (DPR forms), technical reports, archival resources, and ethnographic references. Additional consulted sources include historical maps of the study area, the NRHP, the CRHR, the lists of California State Historical Landmarks, California Points of Historical Interest, and the Archaeological Determinations of Eligibility. The results of the records search are presented in Confidential Appendix A.

2.1.1 Previously Conducted Cultural Resource Studies

The SCCIC records search results indicate that three (3) previously conducted cultural resources studies intersect the project site. An additional 29 studies were identified outside the project site within the one-mile records search radius. A list of all previously conducted studies identified within the records search radius is provided in Table 1, and summaries of the three studies that intersect the project site are provided following the table.

Table 1. Previous Cultural Resources Investigations Within 1-Mile of the Project Site

SCCIC Report Number	Author	Year	Report Title	Proximity to Project Site
LA-00274	Rice, Glen E.	1977	An Archaeological Survey of Tract 324558, Santa Clarita Valley Los Angeles	Outside
LA-01032	Van Horn, David M.	1981	Archaeological Survey Report: a 285+ Acre Parcel Located Near Saugus and Newhall in an Unincorporated Portion of Los Angeles County, California	Outside
LA-01117	Anonymous	1979	Preliminary Draft Environmental Impact Report for Zone Case No 6406, Soledad Canyon Area, California	Outside
LA-01322	Wessel, Richard L.	1979	Assessment of the Impact Upon Cultural Resources by the Proposed Zone Change 6406 for Tract Number 35984, 102.4 Acres Centered at the Section Corner of Sections 19, 20, 29 and 30 Series USGS Topographic Map in Friendly Valley of Los Angeles	Outside

Table 1. Previous Cultural Resources Investigations Within 1-Mile of the Project Site

SCCIC Report Number	Author	Year	Report Title	Proximity to Project Site
LA-01466	Taylor, Thomas T.	1985	Tosco Cogeneration Project Transmission Line: Archaeological Survey and Native American Contacts	**Within**
LA-01515	Bissell, Ronald M.	1986	Cultural Resources Assessment of the Mitchell Properties, Santa Clarita Valley Area, Los Angeles County, California	Outside
LA-02193	Romani, John F.	1990	Archaeological Assessment for the Proposed Santa Fe Specific Plan Southeast and Adjacent to the City of Santa Clarita Los Angeles County, California	Outside
LA-02503	Romani, John F., Roberta S. Greenwood, Portia Lee, and Gwen Romani	1992	Historic Property Survey Report & Archaeological Survey Report & Historic Architectural Survey Report for the Route 126 Location Study (easterly Extension) From I-5 to SR-14, Santa Clarita Valley, Los Angeles County, California 07-la-126-5.8/12.7. Final	Outside
LA-02979	Whitley, David S.	1993	Phase I Archaeological Survey and Cultural Resources Assessment for the Porta Bella Specific Plan Study Area, Santa Clarita, Los Angeles County, California	Outside
LA-03690	Wlodarski, Robert J.	1997	Cultural Resources Evaluation City of Santa Clarita Circulation Element EIR	**Within**
LA-03895	Pence, Robert L.	1977	Archaeological Assessment of the Proposed Oxnard Lng Pipeline Route From La Vista, Ventura County, to Quiqley, Los Angeles County	Outside
LA-04008	Unknown	1996	Cultural Resources Investigation Pacific Pipeline Emidio Route	Outside
LA-04058	Wlodarski, Robert J.	1998	Cultural Resources Evaluation: Golden Valley Ranch EIR City of Santa Clarita, Los Angeles County, California	Outside
LA-04104	Macko, Michael E.	1993	Cultural Resource Evaluation of the LADWP Power Plant 1--olive Line 1 Transmission Line Maintenance Project Los Angeles County, California	Outside
LA-04200	Maxon, Patrick O.	1998	Cultural Resources Reconnaissance of Tentative Tract 48892, a 62.2 Acre Parcel in Santa Clarita, Los Angeles County, California	Outside
LA-04250	Wlodarski, Robert J.	1998	A Phase I Archaeological Study: City of Santa Clarita Golden Valley Road/ High School EIR, Los Angeles County, California	Outside
LA-06917	Bricker, Lauren W. and Janet L. Tearnen	1998	Historic Property Clearance Report for the Magic Mountain Parkway Via Princessa Improvement Project in the City of Santa Clarita, Los Angeles County, California	Outside

Table 1. Previous Cultural Resources Investigations Within 1-Mile of the Project Site

SCCIC Report Number	Author	Year	Report Title	Proximity to Project Site
LA-07486	McKenna, Jeanette A.	2005	A Phase I Cultural Resources Investigation of the Soledad Circle Estates Project Area (Tract Map 62343), Located in the Santa Clarita Area of Los Angeles County, California	Outside
LA-07500	Kirkish, Alex	2002	Highway Project for Drainage Improvement Project on the Southbound SR-14 Off-ramp at KP 45.7 (pm 28.4)	Outside
LA-08782	Bonner, Wayne H.	2006	Cultural Resources Records Search and Site Visit Results for Cingular Wireless Candidate NI-0206-01 (berry Petroleum), 22116 Soledad Canyon Road, Santa Clarita, Los Angeles County, California	Outside
LA-08792	Bonner, Wayne H. and Sarah A. Williams	2006	Cultural Resources Records Search Results and Site Visit for T-Mobile USA Candidate Sv01459b (Spectrasite Collocation) 25521 Mountain Pass Road, Santa Clarita, Los Angeles County, California	Outside
LA-08958	Tsunoda, Koji and Moreno, A.	2007	Archaeological Survey Report for Southern California Edison Company Saugus-north Oaks FO Cable Project Los Angeles County, California (wo#8456-0639, Jo#6155)	**Within**
LA-09038	Wlodarski, Robert J.	2006	A Phase I Archaeological Study for the Proposed Sports Complex Expansion Project a 38-acre Site Located in the City of Santa Clarita, County of Los Angeles, California	Outside
LA-09102	Bonner, Wayne H.	2007	Cultural Resources Records Search and Site Visit Results for T-Mobile USA Candidate SV01459B (Cingular Collocation), 25529 1/2 Mountain Pass Road, Santa Clarita, Los Angeles County, California	Outside
LA-09103	Bonner, Wayne H.	2007	Cultural Resources Records Search and Site Visit Results for T-Mobile Candidate SV01563A-R (Caltrans Monopalm), Golden Valley Road and Highway 14, Santa Clarita, Los Angeles County, California	Outside
LA-10560	Hunt, Kevin and Richard D. Schultz	2005	Final Confidential: Cultural Resources Study for the Upper Santa Clara River Watershed Arundo and Tamarisk Removal Program Long-term Implementation Plan, Program Environmental Impact Report/Environmental Assessment, Los Angeles County, California	Outside
LA-10578	Fortier, Jana	2009	TEA21 Rural Roadside Inventory: Native American Consultation and Ethnographic Study Caltrans District 7, County of Los Angeles	Outside

Table 1. Previous Cultural Resources Investigations Within 1-Mile of the Project Site

SCCIC Report Number	Author	Year	Report Title	Proximity to Project Site
LA-10642	Tang, Bai "Tom"	2010	Preliminary Historical/Archaeological Resources Study, Antelope Valley line Positive Train Control (PTC) Project Southern California Regional Rail Authority, Lancaster to Glendale, Los Angeles County, California	Outside
LA-10952	Bonner, Wayne	2011	Cultural Resources Records Search and Site Visit Results for AT&T Mobility, LLC Candidate LAC009-01, USID #11629 (Soledad Overlay-C009), 25529-1/2 Mountain Pass Road, Newhall, Los Angeles County, California	Outside
LA-11228	Unknown	2004	Environmental Analysis - Onshore Component of BHP Billiton LNG International Inc. Cabrillo Port Project	Outside
LA-12815	Letter, Rachael J.	2016	Cultural Resources Report Sierra Canyon Technical Campus Project, City of Santa Clarita Los Angeles County, California	Outside
LA-13110	Anonymous	2010	Class III Inventory I Phase I Archaeological Survey of the Via Princessa Road Extension, City of Santa Clarita, Los Angeles County, California	Outside

LA-01466

Tosco Cogeneration Project Transmission Line: Archaeological Survey and Native American Contacts (Taylor 1985). This archaeological survey report barely intersects the southern tip of the current project site and included a transmission line alignment survey between a plant site in Placerita Canyon to the Southern California Edison (SCE) North Oaks Substation. No archaeological resources were identified as a result of the archaeological survey and no further management recommendations were considered.

LA-03690

Cultural Resources Evaluation City of Santa Clarita Circulation Element EIR (Wlodarski 1997). The SCCIC did not have this report digitized and it could not be provided with the records search results. However, the SCCIC explained that this report consisted of a literature review only and did not include a survey or additional study and would therefore be unlikely to contain any useful information.

LA-08958

Archaeological Survey Report for Southern California Edison Company Saugus-north Oaks FO Cable Project Los Angeles County, California (wo#8456-0639, Jo#6155) (Moreno and Tsunoda 2007). This archaeological survey report barely intersects the southern tip of the current project site and included a survey of approximately 374 acres of private land in support of an SCE fiber optic cable project. No new cultural resources were identified as a result of the pedestrian survey, however three previously recorded resources (P-19-002898, CA-LAN-2105H, and CA-LAN-2132H) were updated as part of the study. Avoidance was recommended for these three resources and no further mitigation was required.

2.1.2 Previously Recorded Cultural Resources

The SCCIC records search results indicate that no previously recorded cultural resources exist within the project site. Three (3) previously recorded cultural resources were identified within the one-mile records search radius (Table 2).

Table 2. Previously Recorded Cultural Resources Within 1-Mile of the Project Site

Primary Number	Trinomial	Resource Description	Resource Eligibility	Recorded by and Year	Proximity to Project Site
P-19-002105	CA-LAN-002105H	Los Angeles Aqueduct	Eligible for NRHP and CRHR	1992 (A. Cole, D. McDowell, and D. Shelton); 1992 (J. Costello, J. Marvin, and J. Tordoff); 2007 (A. Moreno, K. Tsunoda); 2009 (K. Anderson); 2011 (N. Lawson, M. Kaye); 2017 (A. Stevenson)	Outside
P-19-002132	CA-LAN-002132H	LA Aqueduct Transmission Line / Olive-Power Plant 1-Transmission Line	Eligible for NRHP and CRHR	1992 (A. Cole, D. McDowell, and D. Shelton); 1993 (M. Macko); 2004 (Whitley, DS); 2007 (K. Tsunoda); 2010 (J.M. Simon)	Outside
P-19-003582	CA-LAN-003582H	Southern Pacific/Santa Fe Railroad	6Z (not eligible)	2005 (J.A. McKenna)	Outside

2.2 Native American Coordination

On October 6, 2021, the California NAHC responded to South Environmental's request for a Sacred Lands File Search of the project site. The results of the search were negative, but because the NAHC does not maintain an exhaustive list of Native American cultural resources, it was recommended that other sources be contacted for information regarding cultural resources within the project site. The NAHC provided a list of 17 contacts who may have knowledge of cultural resources in the project site and should be contacted for additional information. On October 7, 2021, South Environmental sent informational outreach letters to all 17 of these contacts (Table 3).

One response was received to the outreach letters. On October 7, 2021, Jairo Avila, Tribal Historic and Cultural Preservation Officer for the Fernandeño Tataviam Band of Mission Indians stated that "This project is of interest to the FTBMI and the tribe wishes to provide confidential information during the consultation process with the Lead Agency." No other responses have been received to date. All Native American outreach completed by South Environmental is documented in Appendix B. This outreach was conducted for informational purposes only and does not constitute government-to-government consultation as specified by AB 52.

Table 3. Summary of Native American Outreach

Native American Tribal Contact	Method of Notification/Date	Response Received
Gabrielino-Tongva Tribe Charles Alvarez 23454 Vanowen Street West Hills, CA, 91307 roadkingcharles@aol.com	Emailed on October 7, 2021	No response received to date
Fernandeno Tataviam Band of Mission Indians Jairo Avila, Tribal Historic and Cultural Preservation Officer 1019 Second Street, Suite 1 San Fernando, CA, 91340 jairo.avila@tataviam-nsn.us	Emailed on October 7, 2021	Email response received on October 7, 2021: "This project is of interest to the FTBMI and the tribe wishes to provide confidential information during the consultation process with the Lead Agency."

Table 3. Summary of Native American Outreach

Native American Tribal Contact	Method of Notification/Date	Response Received
Barbareno/Ventureno Band of Mission Indians Annette Ayala 188 S. Santa Rosa Street Ventura, CA, 93001 annetteayala78@yahoo.com	Emailed on October 7, 2021	No response received to date
Northern Chumash Tribal Council Fred Collins, Spokesperson P.O. Box 6533 Los Osos, CA, 93412 fcollins@northernchumash.org	Emailed on October 7, 2021	No response received to date
Gabrielino Tongva Indians of California Tribal Council Christina Conley, Tribal Consultant and Administrator P.O. Box 941078 Simi Valley, CA, 93094 christina.marsden@alumni.usc.edu	Emailed on October 7, 2021	No response received to date
Gabrielino Tongva Indians of California Tribal Council Robert Dorame, Chairperson P.O. Box 490 Bellflower, CA 90707 gtongva@gmail.com	Emailed on October 7, 2021	No response received to date
Gabrielino /Tongva Nation Sandonne Goad, Chairperson 106 1/2 Judge John Aiso St., #231 Los Angeles, CA, 90012 sgoad@gabrielino-tongva.com	Emailed on October 7, 2021	No response received to date
Barbareno/Ventureno Band of Mission Indians Brenda Guzman 58 N. Ann Street, #8 Ventura, CA, 93001 brendamguzman@gmail.com	Emailed on October 7, 2021	No response received to date
Santa Ynez Band of Chumash Indians Kenneth Kahn, Chairperson P.O. Box 517 Santa Ynez, CA, 93460 kkahn@santaynezchumash.org	Emailed on October 7, 2021	No response received to date
Gabrieleno/Tongva San Gabriel Band of Mission Indians Anthony Morales, Chairperson P.O. Box 693 San Gabriel, CA 91778 GTTribalcouncil@aol.com	Emailed on October 7, 2021	No response received to date

Table 3. Summary of Native American Outreach

Native American Tribal Contact	Method of Notification/Date	Response Received
Chumash Council of Bakersfield Julio Quair, Chairperson 729 Texas Street Bakersfield, CA, 93307 chumashtribe@sbcglobal.net	U.S. Mail on October 7, 2021	No response received to date
Gabrieleno Band of Mission Indians - Kizh Nation Andrew Salas, Chairperson P.O. Box 393 Covina, CA, 91723 admin@gabrielenoindians.org	Emailed on October 7, 2021	No response received to date
Coastal Band of the Chumash Nation Mariza Sullivan, Chairperson P. O. Box 4464 Santa Barbara, CA, 93140 cbcntribalchair@gmail.com	Emailed on October 7, 2021	No response received to date
Barbareno/Ventureno Band of Mission Indians Attn: Patrick Tumamait 992 El Camino Corto Ojai, CA 93023	U.S. Mail on October 7, 2021	No response received to date
Barbareno/Ventureno Band of Mission Indians Julie Tumamait-Stenslie, Chairperson 365 North Poli Ave Ojai, CA 93023	Emailed on October 7, 2021	No response received to date
San Luis Obispo County Chumash Council Mark Vigil, Chief 1030 Ritchie Road Grover Beach, CA 93433	U.S. Mail on October 7, 2021	No response received to date
San Fernando Band of Mission Indians Donna Yocum, Chairperson P.O. Box 221838 Newhall, CA, 91322 ddyocum@comcast.net	Emailed on October 7, 2021	No response received to date

2.3 Background Research

Additional background research was completed on the project site in an effort to establish a thorough and accurate historic context, and to confirm the building development history of the property.

2.3.1 Los Angeles County Office of the Assessor

According to Los Angeles County Assessor records, the single-family residence, storage building, and garage occupy two parcels, both associated with the address 25800 Sierra Highway (the residence's original address prior to construction of Golden Valley Road) The single-family residence and storage building are located on APN 2836-013-141. The residence is described by the Assessor as a 2 bedroom/3 bathroom 3,182-square foot home constructed in 1966. Adjacent to the east, APN 2836-013-111 is also associated with this address. The garage is adjacent to the north on APN 2836-013-133. Undeveloped parcels were not included in this search.

2.3.2 City of Santa Clarita Building Permits

South Environmental reviewed all available building permits online via the City of Santa Clarita's ePermit system. The search included all APNs (2836-013-141, 2836-013-111, and 2836-013-133) and all addresses (25800 Sierra Highway and 20101 Golden Valley Road) associated with the single-family residence. Undeveloped parcels were not included in this search. Only APN 2836-013-141 yielded information concerning previous alterations to the property, as described below:

- 1996: Construct new 6-car garage (Record 29604853).
- 2001: Add 55-foot-long, 4-foot-high slumpstone retaining wall with three square pilasters with precast stone veneer and 10 foot high slumpstone wall (Record 30013747).

2.3.3 Los Angeles County Public Works

The City of Santa Clarita was not incorporated until 1987. Therefore, South Environmental searched for additional building permits via the Los Angeles County Public Work's online Building Permit Viewer Application and Land Records Viewer. No additional building permits were identified under any of the current/former addresses or APNs associated with the single-family residence.

2.3.4 Historical Newspaper Search

South Environmental reviewed historical newspapers via newspapers.com and the California Digital Newspaper Collection covering the Los Angeles area in an effort to understand the development of the project site and surrounding area.

2.3.5 Sanborn Fire Insurance Maps

No Sanborn Maps were identified for the project site among the Los Angeles County Sanborn Fire Insurance Company maps available on the Los Angeles Public Library website.

2.3.6 Historical Topographic Map and Aerial Photograph Review

Historic topographic maps and aerial photographs of the project site were available from Nationwide Environmental Title Research (NETR 2021) LLC. These included topographic maps for the years 1900, 1905, 1910, 1914, 1924, 1925, 1928, 1929, 1930, 1935, 1944, 1945, 1955, 1961, 1964, 1975, 1988, 1994, 1999, 2012, 2015, 2018; aerial imagery for the years 1947, 1952, 1959, 1969, 1974, 1977, 1994, 2000, 2002, 2003, 2005, 2009, 2010, 2012, 2014, 2016, and 2018, and from the University of California, Santa Barbara (UCSB), FrameFinder Maps for the years 1928, 1930, 1968, 1976, and 1986 (UCSB 2021).

3 Cultural Context

3.1 Environmental Setting

The project site is a steeply sloping group of hills at an elevation of 1,750-feet above mean sea level (at the residence) and 1,560-feet at the northern tip. There is a hilltop at the northwest edge of the residence that extends northeast through the project site and is steeply sloped on the east and west sides. Ephemeral drainages travel through the northern portion of the project site and flow into nearby underground culverts.

The geology in the project site is dominated by Saugus Formation terrestrial fluviatile, weakly indurated, which is comprised in Pliocene and Pleistocene age geologic units (USGS 2020a, USGS 2020b). The primary rock type in this geologic unit is QTp light gray to light reddish-brown pebble-cobble conglomerate, sandstone, and siltstone; conglomerate composed of granitic, gneissic, metavolcanic, quartzitic gabbroic, anorthositic and volcanic detritus; deposited by westward flowing streams; probably mostly of Pleistocene age. A minor amount of alluvial gravel, sand and clay of valley areas (Qa) and landslide debris (Qls) also occurs in the project site.

Soils within the project site include:

- Saugus loam, 30 to 50 percent slopes, eroded is the most abundant soil type and occurs in the western half of the project site. This is an upland soil found on backslope of hills, and is well drained.
- Castaic-Balcom silty clay loams, 15 to 30 percent slopes is on the eastern portions of the project site. This soil type largely includes (99%) upland hills and backslopes and includes 1% of drainageways. This is a well-drained soil.
- Zmora loam, 2 to 9 percent slopes is on the northern tip of the project site. This soil type is typically found on terraces and backslopes and is well drained.

Climate in the region is hot and dry, with average summer high temperatures in the mid-90s and average winter lows in the mid-30s. Average yearly rainfall is 14-inches (less than half the national average) and the wettest months are January – March, and almost no precipitation between May-August.

3.2 Prehistoric Context

While many chronological sequences have been developed to describe cultural changes in Southern California, the following builds on Wallace (1955, 1978), who developed a prehistoric chronology for the Southern California coastal region that is still widely used today. Four periods

are presented in this sequence: Early Man, Milling Stone, Intermediate, and Late Prehistoric. The summary of prehistoric chronological sequences for Southern California coastal and near-coastal areas presented below is a combination of Wallace (1955) and Warren (1968) as well as more recent studies.

3.2.1 Early Man Horizon (ca. 10,000 – 6,000 B.C.)

Numerous pre-8,000 B.C. sites have been identified along the mainland coast and Channel Islands of Southern California (Moratto 1984; Erlandson 1991; Rick et al. 2001; Johnson et al. 2002; Jones and Klar 2007). The Arlington Springs site on Santa Rosa Island produced human femurs dated to approximately 13,000 years ago (Johnson et al. 2002). The most widely accepted dates for archaeological sites on the southern California coast are from two of the northern Channel Islands, located off the coast of Santa Barbara. On San Miguel Island, Daisy Cave clearly establishes the presence of people in this area about 10,000 years ago (Erlandson 1991:105).

Early Man Horizon sites are generally associated with a greater emphasis on hunting than later horizons. Recent data indicate that the Early Man economy was a diverse mixture of hunting and gathering, including a significant focus on aquatic resources in coastal areas and on inland Pleistocene lakeshores (Moratto 1984).

3.2.2 Milling Stone Horizon (6,000 – 3,000 B.C.)

Set during the Altithermal, which began around 6,000 B.C., the Milling Stone Horizon is characterized by changing subsistence strategies in response to drier climate. This included a greater emphasis on plant foods and small game. Extensive seed processing is evident in the dominance of stone grinding implements in contemporary archaeological assemblages; namely, milling stones (metates) and handstones (manos). The mortar and pestle, associated with acorns or other foods processed through pounding, were first used during the Milling Stone Horizon and increased dramatically in later periods (Wallace 1955, 1978; Warren 1968). Other food resources including small and large terrestrial mammals, sea mammals, birds, shellfish and other littoral and estuarine species, near-shore fishes, yucca, agave, and seeds and other plant products (Kowta 1969). Depending on the environmental setting (coastal or inland), food procurement strategies are found to be highly variable (Byrd and Raab 2007:220).

3.2.3 Intermediate Horizon (3,000 B.C. – A.D. 500)

The Intermediate Horizon is characterized by a shift toward a hunting and maritime subsistence strategy, as well as greater use of plant foods. During the Intermediate Horizon, a noticeable trend occurred towards a greater adaptation to local resources including a broad variety of fish, land mammals, and sea mammals along the coast. This diversity was reflected in tool kits for hunting,

fishing, and processing food and materials, with flake scrapers, drills, various projectile points, and shell fishhooks being manufactured. Mortars and pestles became more common during this period, gradually replacing manos and metates as the dominant milling tool. This change in milling stone technology indicates a transition from the processing and consumption of hard seed resources to the increased reliance on acorns (Glassow et al. 1988; True 1993).

3.2.4 Late Prehistoric Horizon (A.D. 500 – Historic Contact)

The Late Prehistoric Horizon is characterized by an increased diversity of plant food resources and land and sea mammal hunting. Material culture became more complex as demonstrated through more diverse classes of artifacts. During this period, the northern Channel Islands populations further developed craft specializations, including shell bead manufacture, that sustained trade with mainland settlements and with further trading partners to the east, creating a regional economy. Steatite quarried on Santa Catalina Island was used to make stone bowls, pipes, comals, sucking tubes, pendants, beads, and effigies. The lack of pottery in coastal and near-coastal sites implies that ceramic technology was not widely used, or that ceramics were obtained by trade with neighboring groups to the south and east. The lack of widespread pottery manufacture may also be due to the utility of tightly woven and watertight basketry that functioned in much the same way as ceramic vessels.

In areas of inland settlement, by the end of the Intermediate Period, mobility and long-distance migration towards the coast from seasonal camps was replaced by the development of permanent settlements. The period between A.D. 500 and historic contact is divided into three regional patterns: Chumash (Santa Barbara and Ventura counties), Takic/Numic (Los Angeles, Orange, and western Riverside counties), and Yuman (San Diego County). Modern Gabrielino/Tongva, Juaneño, and Luiseño people in this region are considered to be the descendants of the Uto-Aztecan, Takic-speaking populations that settled along the California coast during this period (Warren 1968).

3.3 Ethnographic Context

The following ethnographic context was originally presented in Murray and Hale 2015:

The proposed project site falls within the ethnographic boundary of the Tataviam (Johnson and Earle 1990; King and Blackburn 1978; Kroeber 1925). Tataviam territories included the upper reaches of the Santa Clara River drainage east of Piru Creek, but also encompassed the Sawmill Mountains to the north and the southwestern portion of the Antelope Valley (King and Blackburn 1978). Tataviam territory is bounded by various branches of Chumash to the north and west (including the Ventureño to the west, and Castac and Emigdiano to the northwest), Kitanemuk to the northeast, Serrano to the east, and Gabrielino to the south (King and Blackburn 1978).

Note that there is almost no ethnographic data (i.e., data acquired by means of observation or taken from persons who practiced native lifeways) in existence concerning the Tataviam and their native lifeways. Most of what is known today about the Tataviam comes in the form of ethnohistory (i.e., historical accounts developed through examination of historical records and oral histories) as presented in the works of anthropologists Alfred L. Kroeber (1925) and John P. Harrington (1935). Their data is largely based on interviews conducted in the early 1900s with a Native American consultant named Juan José Fustero, a man who spoke Kitanemuk and claimed that his grandparents were born near the town of Newhall and spoke a language that is no longer extant (Bright 1975). Most of the subsequent works published on the Tatatviam (Bright 1975; Hudson 1982; King and Blackburn 1978), including discussions of their cultural and geographic affiliations, were based on the Kroeber and Harrington interviews with Fustero and several other Kitanemuk consultants. Other studies have analyzed Spanish mission baptismal, marriage, and burial registers in an attempt to better understand the distribution of historic village settlements and kinship ties between settlements (Johnson 1978, 1997; NEA and King 2004).

Early ethnologies referred to the Tataviam as Ataplili'ish (Kroeber 1915), but Kroeber found this name to be too general since it had already been used to describe other indigenous groups (namely the Gabrielino). Kroeber (1925) changed the term to Alliklik, which was noted to be a Ventureño Chumash name for the group (although it is believed to be a derogatory term for the sound of the language), but offered almost no information concerning their native lifeways, saying, "In fact, there is nothing known about them except that they held the river up from a point between Sespe and Piru, most of Piru Creek, Castac Creek, and probably Pastoria Creek across the mountains in the San Joaquin Valley drainage and adjacent to the Yokuts" (Kroeber 1925:613–614).

The Tataviam are linguistically classified as an Uto-Aztecan Serran sub-branch of Takic speaking groups consisting of Kitanemuk, Serrano (including Vanyume), and Tataviam (Golla 2011; Sutton 1980). William Bright has suggested that Tataviam was actually a separate language with Takic affinities, or perhaps a "remnant, influenced by Takic, of a language family otherwise unknown in southern California" (Bright 1975:230). However, the current and most widely accepted view is that Tataviam is in fact a Takic language (King and Blackburn 1978; Johnson and Earle 1990; Sutton 1980).

King and Blackburn (1978:536) noted several Tataviam settlements based on information provided by Harrington and other sources, including mission registers. Among these is the putative village of *tsawayung* (also referred to as *Chaguayabit, Chaguayanga, takuyama'm*), which some believe was located near Castaic Junction at the site of Rancho San Francisco. However, there is a lack of consensus as to its exact location. Harrington's own notes reflect this confusion: "Jose Juan Olivas thinks it is over by San Francisquito [Rancho San Francisco] but does not know and never did

know just where" (NEA and King 2004:119). Based on diary entries from the Portolá Expedition (Perkins 1957), some have hypothesized that Estancia San Francisco de Xavier (often incorrectly referred to as an asistencia) was placed at the location of the village of *tsawayang*, but this is based on descriptive diary entries and has never been confirmed by archaeological or other historic evidence. In fact, no physical evidence of the village has ever been found. Other mapped Tataviam villages include *tikatsing* located on upper Castaic Creek, and *pi'ing* located where Castaic Creek meets Elizabeth Lake Canyon. The village of *Tochonaga* was recorded on an 1843 land grant map. This site appears to be located to the southeast of Newhall, but its precise location has also never been confirmed: "Tochononga was located in the mountains northwest of San Fernando···over by Los Alamos somewhere here in the Tejon Ranch" (NEA and King 2004:117). Other villages and seasonal campsites identified by Harrington include *akure'eng*, which was located at the original Newhall townsite; *apatsitsing,* located on upper Castaic Creek; and *naqava'atang*, located east of Townsend Peak. Piru Creek also contained several village and rancheria sites, located on the northern edge of Tataviam territory (Johnson and Earle 1990).

Pedro Fage's account of the 1769 Portola expedition indicates that the first Chumash settlement encountered upon leaving Tataviam territory was located west of the mouth of Piru Creek. The village of *kamulus* (Camulos), located east of Piru Canyon, bears a Chumash name (Johnson and Earle 1990), leading to speculation that this village consisted of a mixed Chumash-Tataviam population. There has been much discussion regarding Chumash ties to areas generally accepted as Tataviam territory (Beeler and Klar 1977).

More recent studies have examined additional Tataviam investigations conducted by Harrington with neighboring groups (Johnson and Earle 1990). These studies support the original Kroeber and Harrington findings that the Tataviam were a distinct group.

> The correspondence between (1) ancestral villages traced using genealogical evidence and (2) independently elicited information regarding Tataviam territoriality builds confidence in the reliability of the ethnographic record compiled by Kroeber and Harrington. The distinctiveness of the Tataviam as an ethnic entity, separate from the Kitanemuk and Fernandeño, is supported by research (Johnson and Earle 1990:209).

The preponderance of evidence indicates that the Tataviam inhabited the Santa Clarita Valley at the time of Spanish Contact in the 1700s and for some time thereafter, and that there is no demonstrable link indicating direct and prolonged occupation by neighboring Chumash, Kitanemuk, Gabrielino, Serrano, or other ethnohistorically known native groups. The archaeological record contains artifacts that are commonly found in both coastal and desert regions, which is not surprising since Santa Clarita Valley is in the midst of natural corridors connecting the Ventura Coast, southern San Joaquin Valley, and Mojave Desert. The commonality

of coastal artifacts in the desert and desert artifacts at the coast testifies to extensive movement of these items. Artifact translocation primarily occurred through trade and exchange. The widespread manifestation of earlier Milling Stone assemblages throughout all parts of Southern California indicates that human populations were strongly established during the early Holocene, likely resulting in the development of ethnic borders and some degree of territoriality. The ethnographic and ethnohistoric record in California indicates that such sociocultural conditions are more conducive to trade and exchange than to open travel through multiethnic territories by unaffiliated individuals or groups.

Considering the ethnohistorically mapped aboriginal villages, any efforts to rectify mapped locations with archaeological deposits would be wrought with tenuous assumptions. Ethnohistoric village location maps for the Santa Clarita Valley were developed through interviews with persons far removed from any aboriginal occupation of those settlements and are estimates only. Discovering an archaeological deposit near a mapped village location does not itself prove that the ethnohistoric village has been located.

With respect to the putative Tataviam village of *tsawayung*, it was mapped using ethnohistorical data only; no archaeological evidence exists that could confirm its location. Even if archaeological deposits dating to the last few hundred years are identified in the general area, those deposits must be studied to first address basic anthropological questions of settlement, subsistence, and general socioeconomic adaptations, followed by a test of expectations regarding what the ethnohistoric settlement may have looked like. The devastating effect of introduced disease, along with Missionization of California Indians, would have certainly modified the nature of aboriginal occupation of any village, creating an archaeological signature distinct from the traditional Late Prehistoric record. Moreover, the ethnohistoric period archaeological record from neighboring regions can only be used as a proxy for the kinds of archaeological patterns that may appear in the Santa Clarita Valley. Socioeconomic adaptations in Chumash and Kitanemuk territories were regionally specific and can be expected to have responded differently to the effects of introduced disease, Missionization, and integration into Mexican and American economies—all of which preceded development of the ethnographic and ethnohistoric records of Southern California aboriginal groups during the early 1900s.

3.4 Historic Context

Post-Contact history for the state of California is generally divided into three periods: the Spanish Period (1769–1822), Mexican Period (1822–1848), and American Period (1848–present).

3.4.1 Spanish Period (1769–1822)

In search of the legendary Northwest Passage, Spanish explorer Juan Rodríquez Cabríllo stopped in 1542 at present-day San Diego Bay. Cabríllo explored the shorelines of present-day Catalina Island as well as San Pedro and Santa Monica Bays. Much of the present California and Oregon coastline was mapped and recorded in the next half-century by Spanish naval officer Sebastián Vizcaíno. Spain laid claim to California based on the surveys conducted by Cabríllo and Vizcaíno (Bancroft 1885:96–99; Gumprecht 1999:35).

The 1769 overland expedition by Captain Gaspar de Portolá marks the start of California's Historic period. With a band of 64 soldiers, missionaries, Baja (lower) California Native Americans, and Mexican civilians, Portolá established the Presidio of San Diego, a fortified military outpost, as the first Spanish settlement in Alta California. In July of 1769, while Portolá was exploring southern California, Franciscan Fr. Junípero Serra founded Mission San Diego de Alcalá at Presidio Hill, the first of the 21 missions that would be established in Alta California by the Spanish and the Franciscan Order between 1769 and 1823.

The Portolá expedition first reached the present-day boundaries of Los Angeles in August 1769, thereby becoming the first Europeans to visit the area. Father Juan Crespí, a member of the expedition, named "the campsite by the river Nuestra Señora la Reina de los Angeles de la Porciúncula" or "Our Lady the Queen of the Angeles of the Porciúncula." Two years later, Friar Junípero Serra returned to the valley to establish a Catholic mission, the Mission San Gabriel Arcángel, on September 8, 1771 (Kyle 2002:151).

A major emphasis during the Spanish Period in California was the construction of missions and associated presidios to integrate the Native American population into Christianity and communal enterprise. Incentives were also provided to bring settlers to pueblos or towns, but just three pueblos were established during the Spanish Period, only two of which were successful and remain as California cities (San José and Los Angeles).

3.4.2 Mexican Period (1822–1848)

After more than a decade of intermittent rebellion and warfare, New Spain (Mexico and the California territory) won independence from Spain in 1821. In 1822, the Mexican legislative body in California ended isolationist policies designed to protect the Spanish monopoly on trade, and decreed California ports open to foreign merchants (Dallas 1955:14).

Extensive land grants were established in the interior during the Mexican Period, in part to increase the population inland from the more settled coastal areas where the Spanish had first concentrated their colonization efforts. The secularization of the missions following Mexico's

independence from Spain resulted in the subdivision of former mission lands and establishment of many additional ranchos. During the supremacy of the ranchos (1834–1848), landowners largely focused on the cattle industry and devoted large tracts to grazing. Cattle hides became a primary southern California export, providing a commodity to trade for goods from the east and other areas in the United States and Mexico. The number of nonnative inhabitants increased during this period because of the influx of explorers, trappers, and ranchers associated with the land grants. The rising California population contributed to the introduction and rise of diseases foreign to the Native American population, who had no associated immunities.

War in 1846 between Mexico and the United States precipitated the Battle of Chino, a clash between resident Californios and Americans in the San Bernardino area.

3.4.3 American Period (1848–Present)

The Mexican–American War ended with the Treaty of Guadalupe Hidalgo in 1848, ushering California into its American Period. California officially became a state with the Compromise of 1850, which also designated Utah and New Mexico (with present-day Arizona) as U.S. Territories.

The Gold Rush began in 1848, and with the influx of people seeking gold, cattle were no longer desired mainly for their hides but also as a source of meat and other goods. During the 1850s cattle boom, rancho vaqueros drove large herds from southern to northern California to feed that region's burgeoning mining and commercial boom. The cattle boom ended for southern California as neighbor states and territories drove herds to northern California at reduced prices. Operation of the huge ranchos became increasingly difficult, and droughts severely reduced their productivity (Cleland 2005:102–103).

Historical Overview of Santa Clarita

In 1795, Fr. Fermin Lasuen ordered a new report on possible mission sites, and the Francisco Reyes Rancho was ultimately chosen as the new mission site, with Mission San Fernando Rey de España being formally founded in 1797 (Perkins 1957). Shortly thereafter, many of the local Tataviam people were removed from their homeland, relocated to the mission, and their native lifeways taken away.

Despite the fact that the new mission was to be built elsewhere, Mission San Fernando acquired the headwaters of the Santa Clara River east from Piru and named the land Rancho San Francisco. When Mission padres learned that Francisco Avila had claimed a large portion of this land as his own, they protested to Governor José Arrillaga at Monterey, insisting the land belonged to the church and not Avila. After acknowledging the church's title to the land, Avila's land grant was

rescinded and the padres quickly made plans to build in the area in order to more clearly establish their presence (Perkins 1957).

Using Native American labor in 1804, the church built what many have termed as an "asistencia" at the location that Fr. Crespi has first noted in his diary entry (Perkins 1957). However, it is important to note that mission records suggest that this was actually an outpost known as Estancia San Francisco de Xavier, and that it was likely never elevated to the status of asistencia or sub-mission.

By 1813, Rancho San Francisco had increased its production and herds of cattle had grown larger. It became necessary to construct a fence to keep mission cattle separate from neighboring cattle. The fence was erected at Piru Creek across the river, establishing a formal boundary between San Francsico and Triunfo ranches. An irrigation canal was dug, and a small dam was built at the eastern boundary of the rancho to provide the western side of the rancho with much needed water (Perkins 1957).

Following secularization of the missions in 1833, the Mexican government confiscated all mission land holdings and commissioned Lieutenant Antonio Del Valle to take over Mission San Fernando by inventory from the incumbent Padre, Fr. Ybarra in 1834. After meeting his wife Doña Jacoba Felix and having two children, Del Valle decided to settle his family on a piece of land. In 1838, he resigned his army commission and petitioned the Mexican government for Rancho San Francisco (despite the fact that the land was supposed to revert back to Native Americans). On January 22, 1839, the request was granted, and Del Valle became the owner of 48,829 acres of Rancho San Francisco. Just 2 years later, Antonio Del Valle died, leaving behind thousands of heads of livestock, over 75 square miles of land, and no legal will. Legal battles ensued between his widow Jacoba Felix Del Valle and his oldest son Ygnacio Del Valle, with a judge eventually dividing up the land amongst the parties and their children (Reynolds 1998).

Ygnacio would go on to build his own corral on the western edge of the property (in present-day Ventura County in Piru) surrounding the former village of kamulus (Rasmussen 2001). The Camulos Rancho was formerly established by Ygnacio in 1853.

Rancho San Francisco was owned and operated by Ygnacio Del Valle until 1865, by which time it was deep in debt as a result of 2 years of drought, which killed most of the cattle. Del Valle eventually lost the rancho to his financiers who then sold it to oil speculators. This resulted in the first major discovery of oil on the Rancho, and just seven weeks later, the first oil well was installed on the south side of the Santa Clara River near the Del Valle residence. The region eventually be surrounded by oil fields including the Hasley Canyon and Castaic Junction Oil Fields to the north and the historic Pico Oil Field to the south.

The land changed hands a few more times until Henry Mayo Newhall acquired it in 1875. Shortly thereafter in 1876, a new town-site known as "Newhall" was founded and a Southern Pacific Railroad right-of-way was granted across the rancho (Perkins 1957). In 1875, work had already begun on the San Fernando Railroad Tunnel, which was constructed by over 1,000 Chinese and 500 white laborers, and overseen Frank Frates. The completion of the tunnel in 1876 resulted in the completion of the Southern Pacific Railroad at Lang Station. A Golden Spike ceremony was held the day the final pieces of track were laid (Pollack 2010). That same year the Newhall station was built, although adverse conditions from sand storms would result in the building (and the rest of the town-site) being moved 3 miles to the south. In 1882, Henry Mayo Newhall was killed in a riding accident on his ranch (Perkins 2010).

In 1928, the Santa Clarita Valley experienced a disaster of monumental proportions when the concrete walls of the St. Francis Dam in San Francisquito Canyon broke. Noted to be one of the worst American civil engineering disasters of the twentieth century and second greatest loss of life in California after the San Francisco earthquake, the torrent of water that swept through the valley resulted in the death of hundreds of people and thousands of animals. Newhall Land and Farming Company released a report on the St. Francis Dam Flood just weeks after the disaster occurred and noted that a total of 1,720 acres of farmland were destroyed as a result.

The Newhall area originally founded by Mayo Newhall was eventually split up into separate communities, including Newhall, Valencia, Saugus, and Canyon Country. The contemporary City of Santa Clarita would not officially incorporate all these areas until 1987. Today the City is home to over 200,000 residents, ranking it the third-largest city in the County.

The Sierra Highway through Santa Clarita

From 1910 to 1938, the main road into the Santa Clarita Valley was via the Newhall tunnel under the present-day Sierra Highway next to the old Beale's Cut Stagecoach Pass (Boston 2009). Originally known as U.S. Route 6 or the Grand Army of the Republic Highway in honor of Civil War veterans, the highway currently runs between Provincetown Massachusetts and Bishop, California. The highway arrived out west in 1937 when U.S. 6 was extended from Denver, Colorado to Long Beach (Buttelman 2019). The Sierra Highway is a small portion of Route 6, beginning where it intersects with San Fernando Road and The Old Road, near the present-day Golden State and Antelope Valley Freeways, and continuing into Palmdale. By 1938, the Newhall tunnel was abandoned to make way for the Sierra Highway through the Santa Clarita Valley. The Sierra Highway between Canyon Country to Newhall was constructed with three lanes and included a bridge over Placerita Canyon Road.

Between its initial construction in the late 1930s and prior to the construction of the first leg of the Antelope Valley Freeway in 1963, the Sierra Highway served as the primary route between Los

Angeles and the Mojave Desert. Over the next several decades, the Sierra Highway developed an eclectic assortment of businesses to support the motorists who braved the windy thoroughfare, including the now famed eateries of the Backwoods Inn, The Halfway House Café, and Le Chene, which have appeared in countless movies. Other properties along the route come with intriguing backstories, like the now abandoned Tony Alamo Christian Church property, which was once the home of a religious cult; or Callahan's Old West and Sierra Inn, which originally served as a replica frontier town started by Robert Callahan and later became movie ranch (Padilla 1989, Buttelman 2019).

In 1968, Sierra Highway was widened to a four-lane divided highway from Soledad Canyon Road to Interstate (I)-5, which included the portion adjacent to the subject property. Over the next several decades, the setting of the Sierra Highway in Santa Clarita was largely overtaken by new residential housing developments and left unrecognizable. However, the northern portion of the highway in unincorporated Los Angeles County and in Agua Dulce contain some of the more storied historic locations and have largely maintained their rural settings.

3.5 Project Site Context

3.5.1 Development History

Historic aerial photographs of the subject property and its setting from 1928 and 1930 shows that land south of the Santa Clara River was entirely undeveloped but for the Southern Pacific Railroad, the Los Angeles Aqueduct, and smaller roads through Placerita Canyon and Sand Canyon. North of the river, agricultural development had taken hold around the aqueduct as evidenced by fields with sparse buildings and structures. By the 1947 aerial photograph, the Sierra Highway through the Santa Clarita Valley was constructed adjacent to the subject property, winding its way north through the rural landscape. There is still almost no development south of the Santa Clara River at this time. In the 1952 aerial photograph, the most noticeable change to the setting is the presence of a large oil field directly south of the subject property. This oil field persists to the present-day, occupying most of the land south of Golden Valley Road. Despite this new industrial development, the area south the Santa Clara River remains largely undeveloped throughout the 1950s.

By the 1968 aerial photograph, the residence at the subject property has been constructed and is visible in its L-shape plan. At this time, the residence was accessed via a long driveway off Sierra Highway, as Golden Valley Road would not be constructed for another 34 years. The 1968 aerial also reveals that the first major residential subdivision has been constructed directly east of the subject property, with large sections containing newly constructed homes and others appearing to be in the process of grading/new construction. By the 1969 aerial photograph, the Antelope Valley Freeway can be seen under construction just south of the subject property. By 1974, the

Antelope Valley Freeway has been constructed, running northeast along the southern edge of the newly developed residential subdivisions. Throughout the 1970s, residential development continued to expand to the northeast. The 1976 and 1977 aerial photographs also show the presence of more formal landscaping around the residence on the subject property, with manicured lawns and mature trees visible. By the 1986 aerial photograph, suburban sprawl has continued, and the subject property appears far less isolated than it ever has before. More homes continued to be added northeast of the subject property well into the 1990s. In 1996, a rectangular-plan garage is constructed northwest of the residence.

The 2000 aerial photograph shows the beginning of the construction of Golden Valley Road south of the subject property. This photograph reveals that the subject property underwent significant changes at this time, with its entire southern and eastern boundary cut and graded, obliterating the original driveway on the eastern side of the property and the natural hillside to the west, which was completely graded and terraced, resulting in the biggest change to the property's setting to date. By the 2002 aerial, Golden Valley Road was completed between Soledad Canyon Road to the north and Sierra Highway to the south, and the subject property's driveway was reoriented to its present-day configuration. Golden Valley High School was under construction at this time, as was the large residential development located southeast of the subject property that sits between present-day Sierra Highway to the north and Golden Valley Road to the south. By 2005, Golden Valley High was constructed, Golden Valley Road was continued east of Sierra Highway to the Antelope Valley Freeway, and the new large residential development southeast of the subject property had started to be developed with homes. Also in 2005, the properties adjacent to the east and west of the subject property were graded and prepped for new housing developments. By 2009, the subject property's setting looks almost exactly as it does today, but for the development of the remaining homes in the adjacent lot to the east, which were completed by 2016.

3.5.2 Previous Owners/Occupants

The following presents a summary of known owners/occupants living at the subject property's original address of 25800 Sierra Highway since its construction in 1966, based on publicly available records.

- 1966: William Edward Rider and Clara H. Rider
- 1966-c. 1982: Clara H. Rider
- 1982: Trustee's Sale by Major Assurance Corp
- 1990: Shantel S. Hudson
- 1993-present: Veluzat Paul R. and Carol S. TRS Veluzat Trust

The Rider Family (1966-c. 1982)

The original owners who commissioned the residence at 25800 Sierra Highway in 1966 were William Edward (W.E.) Rider, born in Kansas City, Missouri in 1900, and his wife Clara H. Rider, born in Vernon, Texas in 1908. W.E. got his start working as milker in a Missouri dairy "and drove his way upward through sheer ability, energy, and determination" (The Signal 1959a). It is unclear where and when William and Clara were married. The couple had one child together, Robert W. Rider, who was born in 1933.

In 1942, the family was living at 6045 Carpenter Avenue in North Hollywood, with W.E. employed at McKessens Robins Co., one of the largest U.S. distributors of wholesale pharmaceutical drugs, beverages and chemicals. By 1948, the Riders were living at another North Hollywood home at 12309 Emelita Street. By the 1950s, the Riders moved yet again to a North Hollywood residence at 7002 Sunnyslope Avenue.

In the 1950s W.E. would go on to start his own pharmaceuticals company, Riders Limited (Ltd), with a production plant located at 7234 Varna Avenue in North Hollywood (LAT 1955). In 1959, Riders Ltd. suffered a major loss when their plant was destroyed in a two-alarm chemical fire, resulting in an estimated $200,000 in damages (Citizen-News 1959). That same year, W.E. moved his business to the Golden Triangle Industrial Park at 21020 Soledad Canyon Road in what was then known as the Saugus-Newhall area (The Signal 1959b, Valley Times Today 1961). Riders Ltd. was one of two large additions made to the 600-acre industrial park. At the ground-breaking ceremony, W.E. explained that this plant would replace the North Hollywood plant and would contain 80,000 square feet of space (The Signal 1959b). Starting out with 48 employees, he expected the number to double once machines and personnel from the old North Hollywood plant could be moved (The Signal 1959a). At the time, the Rider family was still living at their home on Sunnyslope Avenue in North Hollywood (The Van Nuys News and Valley Green Sheet 1960)."

The Riders relocated to the Santa Clarita Valley around 1964 (The Signal 1973). It is unknown when exactly the Riders commissioned the house on Sierra Highway or who designed/constructed the home. Assessor's records indicate that the house was constructed in 1966. Shortly after moving into the house, W.E. passed in December 1966.

In the years following her husband's death, Clara would go on to become a prominent figure in the Santa Clarita Valley's political and social circles, with her first name appearing as "Claire" in dozens of local newspaper articles over the next decade (Figure 3). Her involvement in the Republican Party included throwing her support behind then candidate for the U.S. House of Representatives, Barry Goldwater, Jr. In March 1969, Rider hosted a massive party at her Sierra Highway home for Goldwater, Jr. in what was called "the biggest political (and possibly even social) bash ever seen in Valencia Valley." Fancy cars and limousines "poured through the gates of the

Rider mansion, the imposing lonely white house just off Highway 14 north of "confusion hill"" (The Signal 1969). It was reported that "...a great many of the people who turned up Wednesday night had come just so they could see the inside of the Clara Rider home, an intriguing landmark for thousands of persons who travel Highway 14" (The Signal 1969).

Goldwater, Jr. was elected to the U.S. House of Representatives in 1969 and would go on to serve six consecutive terms until 1983. During his time in office, Rider served as a committeewoman for Goldwater, Jr's Finance Committee (The Signal 1973) and hosted numerous parties for Goldwater, Jr. at her home on Sierra Highway including a reception for approximately 40 guests including Goldwater, Jr. and his staff in 1970 (The Signal 1970a); an evening called "62 for 72" hosted by the 62nd Assembly District Republican Coordinating Council in 1972 (The Signal 1972a); "Dinner with Barry" in 1974 which was sponsored by the Republican Women's Club (The Signal 1974); and "An Evening with Barry" in 1976 with the public invited to attend (The Signal 1976). A 1972 gossip column reported that Goldwater, Jr. and his girlfriend Susie Gherman were "planning to buy that palatial pad on Highway 14 from that vivacious redhead, Claire Rider, and set up housekeeping" (The Signal 1972b), but such a real estate transaction would never occur.

In 1970, Rider simultaneously threw her support to another political cause – the campaign of Haig Kehiayan for Newhall Municipal Court Judge, throwing a 300-guest party at her house. "Mrs. Rider graciously greeted her guests in a stunning green-knit hostess gown, accented by semi-precious jewels at the neck" (The Signal 1970b). In 1972, Rider supported Congressman John H. Rousselot (served in the U.S. House of Representatives from 1970-1983) by throwing a gala at "her spectacular hilltop home overlooking Friendly Valley and most of Canyon Country" to introduce him to the voters of the Santa Clarita Valley (Valley News 1972).

In 1971, a tongue-in-cheek newspaper article announced that "the vivacious and gracious redhead Claire Rider" was planning to sell the Riders Ltd. for a "price that's plenty good medicine, and enough that it should provide a rose-colored view out of every one of the giant windows of Mrs. Rider's palatial hilltop home overlooking Friendly Valley" (The Signal 1971). At this time, Rider still owned the Olive Avenue Medical Pharmacy in Burbank (The Signal 1973).

Parallel to her busy political life, Rider was one of the early members of the governing board of Henry Mayo Newhall Memorial Hospital (The Signal 1988). In 1972, Rider donated $15,000 for a new nursing room to be named in honor of her late husband William E. Rider (The Signal 1972c). In 1973, Rider became a candidate herself when she successfully ran for and was elected as "Honorary Mayor" of the Santa Clarita Valley with support from the Newhall-Saugus-Elks Lodge and the Local Rotary Club (The Signal 1973 and 1988).

Rider moved to Kailua, Hawaii in the mid-1980s. After the death of her son Robert in 1986, her health declined, and she moved to New Mexico to live with her sisters in a retirement home where

she died in 1988. In addition to noting her many personal accomplishments, her obituary states that Rider "lived in the Santa Clarita Valley for 25 years. She and her husband built one of the early dramatic homes here, off Sierra highway overlooking all of Canyon Country" (The Signal 1988). The Rider family is entombed at the Eternal Valley Memorial Park Mausoleum in Newhall.



Claire Rider hostesses reception for Barry Goldwater Jr. and staff. Some forty guests enjoyed an evening of cocktails and hors d' oeuvres.



Chuck White and Hostess Claire Rider cheered Haig Kehaiyan (see January Jones' column).



Congressman Barry Goldwater, Jr. presented a gift certificate recently to Mrs. Prudy Thatcher, which she won at a recent fund-raising cocktail party held at the home of Claire Rider (left). Chet Fortin, chairman of the event, looks on. Over 100 people attended the party held just before the re-election of the congressman.



A farewell hug for Barry from hostess Claire Rider. (See January Jones)

Figure 3. Political Events at the Rider House

Clockwise from top left: Rider and Goldwater in 1970, Rider and Haig in 1970; Rider and Goldwater on front porch in 1972; Rider and Goldwater in 1976 (The Signal)

3.5.3 Architectural Style

Ranch (c. 1935–1975)

The Ranch house is a style of architecture that was popular starting in the 1930s and fell out of popularity by the 1980s. In the 1930s and early 1940s, the Ranch house was part of the Small House Movement that was brought into fashion by the Federal Housing Administration. Like the Minimal Traditional house, the Ranch house could be constructed quickly and use modern materials that could be mass-produced. The style provided an easy option for large-scale housing tracts during the 1930s and 1940s to meet the needs of relocated war-effort workers and those of soldiers returning home and starting families. Following the war years, a new era of prosperity brought about a departure from the Small House Movement. In the 1950s, post-war prosperity combined with increased lot sizes made the larger "rambling" Ranch house possible. The rambling form maximizes the façade's width, often further broadened by attached garages.

The ability of the Ranch house to exist in different sizes and arrangements made it one of the most popular house choices throughout the United States across multiple social classes into the 1970s. Key characteristics of the Ranch style of architecture are the following (Gottfried and Jennings 2009; Hess 2004; McAlester 2013):

- One story in height
- Gabled or hipped roofs constructed with a low pitch and moderate overhang
- Offset entry points causing asymmetry in the façade
- Focus on horizontal and rambling forms
- Focus on informality
- Entry points are typically placed under the roof overhang on the façade
- Use of large picture-style windows on the façade
- Variations on the eave overhang, typically boxed eaves or exposed rafter tails, or the less-common boxed rafters
- Large chimneys
- Variety of exterior cladding, including brick and stone
- Attached garage, typically incorporated into the façade
- Front and rear yards
- Large rectangular blocks are the basis for the plan design, and could be simply rectangular or a combination of rectangular blocks to create L, U, and T shapes in plan

4 Survey

4.1 Methods and Results

Principal archaeologist and architectural historian Samantha Murray, MA, RPA, conducted a pedestrian survey of the project site on November 29, 2021. Fieldwork included taking field notes, digital photography, and examination of close-scale field maps and aerial photographs. Photographs were taken with an Olympus OM-D digital camera.

4.1.1 Archaeological Survey

During the archaeological survey, Ms. Murray examined the ground surface for the presence of prehistoric artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools), historical artifacts (e.g., metal, glass, ceramics), sediment discolorations that might indicate the presence of a cultural midden, depressions, and other features that might indicate the former presence of structures or buildings (e.g., post holes, foundations).

All accessible, undeveloped portions of the project site were subject to an intensive-level pedestrian survey which consisted of walking parallel transects spaced no more than 10 meters apart. These areas were limited to the access roads (Photograph 1), a large unpaved/disturbed area directly in front of the existing residence (Photograph 2), unpaved areas directly to the rear (northwest) of the residence (Photograph 3), areas in the northeastern portion of the project site that were cleared and graded (Photograph 4), and a cleared strip along the eastern boundary of the project site (Photograph 5). Steep slopes with dense vegetation in the central and western portions of the project site were largely inaccessible, making examination of the ground surface impossible in most of these areas (Photographs 6-8). Where gaps in the vegetation allowed, Ms. Murray spot-checked the ground surface.

Ground surface visibility throughout the proposed project site was low (approximately 0%–15%) due to the presence of dense vegetation comprised of California sagebrush, chamise chaparral, and ruderal areas. Mature trees observed during the survey included oak trees, California pepper tree (*Schinus molle*), olive tree (*Olea europaea*), Mexican fan palm (*Washingtonia robusta*), Canary Island date palm (*Phoenix canariensis*), blue gum eucalyptus (*Eucalyptus globulus*), and Aleppo pine (*Pinus halepensis*). Soils in the proposed project site were variable and ranged from a medium grayish brown clayey loam to reddish-yellow brown loamy sand. There were gravel inclusions throughout the soils present in the site. Paved areas were limited to the driveway and parking area directly in front of the residence. No archaeological resources were identified within the proposed project site as a result of the pedestrian survey.



Photograph 1. Example of an access road with visibility surrounded by dense vegetation, view to north



Photograph 2. Unpaved area directly in front of residence, view to southeast



Photograph 3. Unpaved area with some visibility to the rear of the residence, view to northeast



Photograph 4. Graded area in northeastern portion of project site, view to west



Photograph 5. Overview of areas with visibility along the eastern border of the project site, view to west



Photograph 6. Overview of project site showing vegetation coverage, view to north



Photograph 7. Overview of steep slopes and dense vegetation in central portion of project site, view to northwest



Photograph 8. Overview of project site, view to south

4.1.2 Built Environment Survey

The built environment survey entailed walking the exterior of accessible portions of the vacant single-family residence, storage building, and garage. Each building/structure was documented with notes and photographs, specifically noting any character-defining features, spatial relationships, observed alterations, and landscaping features. The Significance Evaluation (Section 5) provides a detailed physical description and photographs of residence as well as a significance evaluation in consideration of CRHR and City designation criteria and integrity requirements.

5 Significance Evaluation

5.1 25800 Sierra Highway

5.1.1 Property Description

The subject property is a Ranch-style single-family residence constructed in 1966 (architect/builder unknown) (Photograph 9). The residence is accessed via a driveway off Golden Valley Road behind a brick and stone wall (built in 2000) with a wrought iron gate. Behind the gate is a paved road that winds its way below and around the eastern side of the residence, until curving to the northwest where it meets with a flat paved area at the top of the hill that contains the main residence (1966), the detached garage (1996), and a wooden storage building (c. 1976-1994).

The residence is L-shape in plan with a cross-gabled roof clad in wood shingles. The main exterior materials are stucco with brick and wood panel details. The main entrance (Photograph 10) is located on the west elevation and is accessed via a concrete walk. The entrance is recessed beneath a front-gabled roof supported by decorative wooden posts and beams, creating a partial-width porch; and is surrounded by painted brick veneer, vertical wood panel detailing above the doors, and original light fixtures. The entrance consists of diagonal wood panel doors with boarded-up lites. The northernmost portion of the west elevation features an integrated brick planter that continues until it becomes flush with the veneer wall cladding (Photograph 11). All windows on the west elevation are aluminum-framed horizontal sliders and all have been boarded-up. The windows are surrounded by board-and-batten siding, with one of the windows containing a decorative wood surround (Photograph 12). A low brick planter follows the outline of the southern half of the west elevation. The north and south elevations represent the gabled ends of each L-shape wing and exhibit no details, but for one louvred door on the north elevation. The southernmost portion of the east elevation features a shed roof extension supported by wooden posts, creating a partial width rear porch. Most of the fenestration is boarded-up and not visible but for one small aluminum-framed horizontal slider (Photograph 13). The northernmost portion of the east elevation was only visible from the bottom of the hill and features a brick eave-wall chimney and a prominent partial-width porch with an integrated shed roof supported by wooden posts and decorative beams, and a low brick retaining wall. This porch represents the primary viewpoint of the house, with a continuous wall of floor-to-ceiling glass windows/doors, all of which were boarded-up (Photograph 14).

Other buildings on the property include the 6-car garage adjacent to the residence's north elevation, which features a tiled, side-gabled roof with stucco exterior walls and metal roll-up

doors (Photograph 15); and a wooden storage building adjacent to the residence's south elevation, which features flat angled roof and two industrial door openings (Photograph 16).

Although there is no formal landscaping on the property, the triangular-shaped pad at the top of the hill that contains the buildings is surrounded by a variety of mature trees including olive, palm, pine, and California pepper trees.



Photograph 9. Overview of main (west) elevation, view to southeast



Photograph 10. Main entrance on west elevation, view to east



Photograph 11. Integrated brick planter on west elevation, view to southeast



Photograph 12. Southern half of west elevation showing decorative window surround, view to south



Photograph 13. Southern half of east elevation showing partial-width porch, view to northeast



Photograph 14. Northern half of east elevation showing partial-width porch and chimney, view to south



Photograph 15. Overview of garage west elevation, facing east



Photograph 16. Overview of wooden storage building north elevation, facing southwest

5.1.2 Application of CRHR and City Designation Criteria

The following provides an evaluation of the subject property in consideration of CRHR and City of Santa Clarita designation criteria. Given the similarities in the criteria of these two programs, the criteria are addressed together to avoid duplicative text. A DPR form set for the property is provided in Appendix C.

CRHR Criterion 1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

City Criterion A. Is associated with events that have made a significant contribution to the historical, archaeological, cultural, social, economic, aesthetic, engineering, or architectural development of the City, State or nation.

The subject property was constructed in 1966 just prior to the development boom that started in the eastern portion of what is now the City of Santa Clarita, south of Canyon Country, in the late 1960s and is not associated with a larger pattern of planned residential development in the Santa Clarita Valley. At the time of its construction, the subject property appears to have been one of the first residences in the area. However, due to extensive alteration of the surrounding setting over the last several decades, the residence struggles to convey its early association as a lone residence atop a hill surrounded by a rural landscape.

The subject property hosted numerous Republican political events/parties during the 1960s and 1970s that were organized by the residence's owner, local socialite Clara Rider. Many of these parties featured prominent political candidates including Barry Goldwater, Jr. who was elected to the U.S. House of Representatives in 1969 and would go on to serve six-consecutive terms until 1983. Just prior to his election, Rider hosted for Goldwater, Jr. what was called "the biggest political (and possibly even social) bash ever seen in Valencia Valley" (The Signal 1969). Although the subject property hosted large parties that were attended by prominent political and social figures, these events cannot be said to have made a significant contribution to the cultural or social development of the City, State, or nation. The parties were singular political gatherings that did not go on to influence the development of local politics or the community. For these reasons, the subject property is recommended not eligible under CRHR Criterion 1 and City Criterion A.

CRHR Criterion 2. Is associated with the lives of persons important in our past.

City Criterion B. Is associated with persons significant in the history of the City, State or nation.

The subject property's original owner was Clara Rider, who lived at the residence between 1966 and c. 1982 and became a prominent figure in Santa Clarita Valley social and political circles in the late 1960s through 1970s, hosting numerous high-profile political fundraising events at her home and even serving as Honorary Mayor of the Santa Clarita Valley in 1973. However, Rider's contributions to local fundraising and larger political campaigns cannot be said to have made a significant impact on the City's history, and although she was a well-known socialite with a local party house, she does not appear to rise to the level of significance required under this criterion. Therefore, the subject property is recommended not eligible under CRHR Criterion 2 and City Criterion B.

CRHR Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

City Criterion C. Embodies distinctive characteristics of a style, type, period, or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship.

The subject property embodies the distinctive characteristics of the Ranch style of architecture, which became one of the most popular and prolific styles of residential architecture between the 1930s and 1970s. Constructed in 1966, the subject property is an example of the larger "rambling" Ranch-style house that became possible in the postwar years as lot sizes increased and people moved away from crowded cities. The rambling Ranch maximizes the façade's width, as seen in the subject property with its cross-gabled L-shape plan that creates a long, dominant west elevation. The subject property features several character-defining features of the style including

its one-story, rambling, L-shape plan; cross-gabled roof with moderate eave overhang; focus on horizontal forms; front entry sheltered beneath a gabled porch; its mixture of exterior cladding including stucco, brick, and wood; its use of integrated brick planters; and the prominent rear balcony with a window wall looking out over the property and beyond. Although most of residence's original materials appear to be intact, many of these materials, including the roof shingles and rear porches, were found to be in poor condition. Alterations since the residence was built include removal of original landscaping, construction of an incompatible Spanish-style garage in 1996, as well as significant changes to the property's main path of circulation with the construction of Golden Valley Road, which shifted the driveway entrance from Sierra Highway to its current location. A brick and stone wall was also added along the southern boundary of the property in 2001. Although the original plans for the house could not be located and the original architect and builder are unknown, there is no indication that the property is the work of an important creative individual. In Clara Rider's (the original owner's) obituary, it states that "she and her husband built one of the early dramatic homes here" but it is assumed that someone was commissioned to design and construct the home. Despite the subject property's relatively high integrity of original materials, design, and workmanship, it is not considered an important or valuable example of the Ranch style of architecture, which produced countless examples of the rambling ranch during the mid-century and beyond. Given the prolific nature of the style, the property's overall condition, and alterations to its setting, the subject property does not rise to the level of significance required under this criterion. Therefore, the subject property is recommended not eligible under CRHR Criterion 3 and City Criterion C.

City Criterion D. Has a unique location, singular physical characteristic(s), or is a landscape, view or vista representing an established and familiar visual feature of a neighborhood, community, or the City.

At the time of the subject property's construction, it stood as a single house on a hill amidst a largely undeveloped rural landscape, referred to as "the imposing lonely white house just off Highway 14" and "an intriguing landmark for thousands of persons who travel Highway 14" (The Signal 1969). The house was also known for its rear view off the back porch "overlooking Friendly Valley and most of Canyon Country" (Valley News 1972). Other newspaper articles described the subject property as a "palatial hilltop home" with "giant windows" (The Signal 1971). It appears that the subject property did, at one time, function as somewhat of a local landmark along Sierra Highway. However, extensive development all around the subject property, the construction of Golden Valley Road, and the reorientation of the approach to the residence have completely altered the original setting of the residence, such that it can longer convey itself as an established or familiar visual feature of the neighborhood. Therefore, the subject property is recommended not eligible under City Criterion D.

CRHR Criterion 4. Has yielded, or may be likely to yield, information important in prehistory or history.

City Criterion E. Has yielded, or has the potential to yield, information important to the history or prehistory of the City, State, or nation.

The property is not significant as a source, or likely source, of important historical information nor does it appear likely to yield important information about historic construction methods, materials or technologies. Therefore, the property is not eligible under CRHR Criterion 4 or City Criterion E.

5.1.3 Integrity Discussion

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the CRHR must meet one of the designation criteria and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. It must also be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Location: The subject property retains integrity of location. The residence is located in the place it was originally constructed.

Design: The subject property retains integrity of design. All major Ranch-style design elements are still present. The essential elements of form, space, structure and style have all been retained and the property can be identified as a Ranch-style home from the 1960s.

Setting: The subject property lacks integrity of setting. Since the subject property's construction in 1966, numerous residential developments have been constructed on nearly all sides of the property, with surrounding homes visible from all angles. At the time of its construction, the subject property was a lone residence in a largely undeveloped and rural landscape. Further, the driveway orientation was changed with the construction of Golden Valley Road in the early 2000s, which also greatly changed the subject property's setting.

Materials: The subject property retains integrity of materials. Although there are condition issues present throughout the property, the residence retains the vast majority of its original materials including its wood shingle roof, brick and wood panel-clad stucco walls, doors, and windows.

Workmanship: The subject property retains integrity of workmanship. The physical evidence of the craftsmanship required to create the Ranch-style residence has been retained.

Feeling: The subject property lacks integrity of feeling. Although the residence itself maintains integrity of design, materials, and workmanship, alterations to the immediate setting prevent the property from conveying its historic feeling as a relatively rural and isolated property with uninterrupted views to Canyon County.

Association: The subject property lacks integrity of association. The property has no important associations with events, people, or important patterns of development in the City.

5.1.4 Significance Evaluation Findings

As a result of the property significance evaluation, the subject property at 25800 Sierra Highway/20101 Golden Valley Road is recommended not eligible under all CRHR and City designation criteria due to a lack of significant historical associations and compromised integrity.

6 Findings and Conclusions

6.1 Archaeological Resources

6.1.1 Findings

No archaeological resources were identified within the project site as a result of the CHRIS records search, NAHC Sacred Lands File search, or pedestrian survey by a qualified archaeologist. Further, significant portions of the project site have been disturbed by construction of the existing residence, the construction of Golden Valley Road, recent grading in the northeastern portion of the site, road cuts, and ephemeral drainages that have moved soils overtime. Therefore, the project site is unlikely to contain intact buried archaeological deposits. Still, it is always possible to encounter resources during ground disturbance. Standard unanticipated discovery measures for archaeological resources and human remains have been provided below.

6.1.2 Recommendations

Unanticipated Discovery of Cultural Resources

Should archaeological resources (sites, features, or artifacts) be exposed during construction activities for the proposed project, all construction work occurring within 100 feet of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether or not additional study is warranted. Depending upon the significance of the find, the archaeologist may simply record the find and allow work to continue. If the discovery proves significant under CEQA, additional work such as preparation of an archaeological treatment plan, testing, or data recovery may be warranted.

Unanticipated Discovery of Human Remains

In accordance with Section 7050.5 of the California Health and Safety Code, if human remains are found, the County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the remains are determined to be Native American, the Coroner shall notify the NAHC in Sacramento within 24 hours. In accordance with California PRC, Section 5097.98, the NAHC must immediately notify those persons it believes to be the Most Likely Descendant (MLD) from the deceased Native American. The MLD shall complete their inspection within 48 hours of being granted access to the

site. The MLD would then determine, in consultation with the property owner, the disposition of the human remains.

6.2 Historic Built Environment Resources

6.2.1 Findings

The existing residence located at 25800 Sierra Highway/20101 Golden Valley Road was evaluated by a qualified architectural historian for historical significance in consideration of CRHR and City designation criteria and integrity requirements. As a result of the property significance evaluation, the subject property is recommended not eligible under all CRHR and City designation criteria due to a lack of significant historical associations and compromised integrity. Therefore, the residence and its related built environment is not considered an historical resource under CEQA Guidelines Section 15064.5, and no additional study or management recommendations are necessary.

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Appendix A: CONFIDENTIAL Records Search Results

Not for public distribution

Appendix B:
Native American Coordination

NATIVE AMERICAN HERITAGE COMMISSION

CHAIRPERSON
Laura Miranda
Luiseño

VICE CHAIRPERSON
Reginald Pagaling
Chumash

SECRETARY
Merri Lopez-Keifer
Luiseño

PARLIAMENTARIAN
Russell Attebery
Karuk

COMMISSIONER
William Mungary
Paiute/White Mountain Apache

COMMISSIONER
Julie Tumamait-Stenslie
Chumash

COMMISSIONER
[**Vacant**]

COMMISSIONER
[**Vacant**]

COMMISSIONER
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EXECUTIVE SECRETARY
Christina Snider
Pomo

NAHC HEADQUARTERS
1550 Harbor Boulevard
Suite 100
West Sacramento,
California 95691
(916) 373-3710
nahc@nahc.ca.gov
NAHC.ca.gov

October 6, 2021

Sam Murray
South Environmental

Via Email to: smurray@southenvironmental.com

Re: Santa Clarita VTTM 68203 Project, Los Angeles County

Dear Ms. Murray:

A record search of the Native American Heritage Commission (NAHC) Sacred Lands File (SLF) was completed for the information you have submitted for the above referenced project. The results were negative. However, the absence of specific site information in the SLF does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Attached is a list of Native American tribes who may also have knowledge of cultural resources in the project area. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated; if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call or email to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from tribes, please notify me. With your assistance, we can assure that our lists contain current information.

If you have any questions or need additional information, please contact me at my email address: Andrew.Green@nahc.ca.gov.

Sincerely,

Andrew Green

Andrew Green
Cultural Resources Analyst

Attachment

Native American Heritage Commission
Native American Contact List
Los Angeles County
10/6/2021

Barbareno/ Ventureno Band of Mission Indians
Patrick Tumamait,
992 El Camino Corto — Chumash
Ojai, CA, 93023
Phone: (805) 216 - 1253

Barbareno/ Ventureno Band of Mission Indians
Annette Ayala,
188 S. Santa Rosa Street — Chumash
Ventura, CA, 93001
Phone: (805) 515 - 9844
annetteayala78@yahoo.com

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

Barbareno/ Ventureno Band of Mission Indians
Brenda Guzman,
58 N. Ann Street, #8 — Chumash
Ventura, CA, 93001
Phone: (209) 601 - 4676
brendamguzman@gmail.com

Chumash Council of Bakersfield
Julio Quair, Chairperson
729 Texas Street — Chumash
Bakersfield, CA, 93307
Phone: (661) 322 - 0121
chumashtribe@sbcglobal.net

Coastal Band of the Chumash Nation
Mariza Sullivan, Chairperson
P. O. Box 4464 — Chumash
Santa Barbara, CA, 93140
Phone: (805) 665 - 0486
cbcntribalchair@gmail.com

Fernandeno Tataviam Band of Mission Indians
Jairo Avila, Tribal Historic and Cultural Preservation Officer
1019 Second Street, Suite 1 — Tataviam
San Fernando, CA, 91340
Phone: (818) 837 - 0794
Fax: (818) 837-0796
jairo.avila@tataviam-nsn.us

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393 — Gabrieleno
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693 — Gabrieleno
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231 — Gabrielino
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com

Gabrielino Tongva Indians of California Tribal Council
Christina Conley, Tribal Consultant and Administrator
P.O. Box 941078 — Gabrielino
Simi Valley, CA, 93094
Phone: (626) 407 - 8761
christina.marsden@alumni.usc.edu

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

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Santa Clarita VTTM 68203, Los Angeles County.

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490 — Gabrielino
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com

Gabrielino-Tongva Tribe
Charles Alvarez,
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West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com

Northern Chumash Tribal Council
Fred Collins, Spokesperson
P.O. Box 6533 — Chumash
Los Osos, CA, 93412
Phone: (805) 801 - 0347
fcollins@northernchumash.org

San Fernando Band of Mission Indians
Donna Yocum, Chairperson
P.O. Box 221838 — Kitanemuk
Newhall, CA, 91322 — Vanyume
Phone: (503) 539 - 0933 — Tataviam
Fax: (503) 574-3308
ddyocum@comcast.net

San Luis Obispo County Chumash Council
Mark Vigil, Chief
1030 Ritchie Road — Chumash
Grover Beach, CA, 93433
Phone: (805) 481 - 2461
Fax: (805) 474-4729

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

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

This list is only applicable for contacting local Native Americans with regard to cultural resources assessment for the proposed Santa Clarita VTTM 68203, Los Angeles County.

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Gabrielino-Tongva Tribe
Charles Alvarez
23454 Vanowen Street
West Hills, CA, 91307
roadkingcharles@aol.com

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Mr. Alvarez:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

The Native American Heritage Commission (NAHC) conducted a Sacred Lands File search with negative results, and a California Historical Resources Information System records search is currently underway. The NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by the proposed project. If you have any knowledge of cultural resources that may exist within or near the project site, please contact me directly either by phone at (818) 458-1162, by email at smurray@southenvironmental.com, or by mail at the address above.

Please note that the request herein is for informational purposes only and does not constitute Assembly Bill (AB) 52 notification or initiation of consultation.

Thank you for assistance with this information request.

Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Fernandeno Tataviam Band of Mission Indians
Jairo Avila, Tribal Historic and Cultural Preservation Officer
1019 Second Street, Suite 1
San Fernando, CA, 91340
jairo.avila@tataviam-nsn.us

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Mr. Avila:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Barbareno/Ventureno Band of Mission Indians
Annette Ayala
188 S. Santa Rosa Street
Ventura, CA, 93001
Email: annetteayala78@yahoo.com

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Ms. Ayala:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle a Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Respectfully Submitted,

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Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Northern Chumash Tribal Council
Fred Collins, Spokesperson
P.O. Box 6533
Los Osos, CA, 93412
fcollins@northernchumash.org

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Mr. Collins:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Gabrielino Tongva Indians of California Tribal Council
Christina Conley, Tribal Consultant and Administrator
P.O. Box 941078
Simi Valley, CA, 93094
christina.marsden@alumni.usc.edu

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Ms. Conley:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490
Bellflower, CA 90707
gtongva@gmail.com

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Dorame:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231
Los Angeles, CA, 90012
sgoad@gabrielino-tongva.com

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Goad:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Barbareno/Ventureno Band of Mission Indians
Brenda Guzman
58 N. Ann Street, #8
Ventura, CA, 93001
brendamguzman@gmail.com

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Ms. Guzman:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Santa Ynez Band of Chumash Indians
Kenneth Kahn, Chairperson
P.O. Box 517
Santa Ynez, CA, 93460
kkahn@santaynezchumash.org

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Kahn:

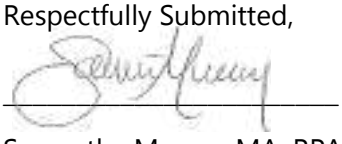
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Respectfully Submitted,



Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, CA 91778
GTTribalcouncil@aol.com

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Morales:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Chumash Council of Bakersfield
Julio Quair, Chairperson
729 Texas Street
Bakersfield, CA, 93307
chumashtribe@sbcglobal.net

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Quair:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393
Covina, CA, 91723
admin@gabrielenoindians.org

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Salas:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Coastal Band of the Chumash Nation
Mariza Sullivan, Chairperson
P. O. Box 4464
Santa Barbara, CA, 93140
cbcntribalchair@gmail.com

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Sullivan:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Barbareno/Ventureno Band of Mission Indians
Attn: Patrick Tumamait
992 El Camino Corto
Ojai, CA 93023

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Mr. Tumamait:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle a Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

Barbareno/Ventureno Band of Mission Indians
Julie Tumamait-Stenslie, Chairperson
365 North Poli Ave
Ojai, CA 93023
Email: jtumamait@hotmail.com

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Tumamait-Stenslie:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

The Native American Heritage Commission (NAHC) conducted a Sacred Lands File search with negative results, and a California Historical Resources Information System records search is currently underway. The NAHC recommended that we contact you regarding your knowledge of the presence of cultural resources that may be impacted by the proposed project. If you have any knowledge of cultural resources that may exist within or near the project site, please contact me directly either by phone at (818) 458-1162, by email at smurray@southenvironmental.com, or by mail at the address above.

Please note that the request herein is for informational purposes only and does not constitute Assembly Bill (AB) 52 notification or initiation of consultation.

Thank you for assistance with this information request.

Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

San Luis Obispo County Chumash Council
Mark Vigil, Chief
1030 Ritchie Road
Grover Beach, CA 93433

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chief Vigil:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle a Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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Thank you for assistance with this information request.

Respectfully Submitted,

_____

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location

SOUTH ENVIRONMENTAL
1443 E. Washington Blvd., #288 Pasadena, California 91104 / www.southenvironmental.com

October 7, 2021

San Fernando Band of Mission Indians
Donna Yocum, Chairperson
P.O. Box 221838
Newhall, CA, 91322
ddyocum@comcast.net

RE: VTTM 68203 Project in Santa Clarita, Los Angeles County, California

Dear Chairperson Yocum:

South Environmental was retained by Land Design Consultants, Inc. to conduct a cultural resources inventory in support of the proposed VTTM 68203 Project (proposed project). The property proposed for development (project site) includes approximately 28-acres consisting of 10 Assessor's Parcel Numbers (APNs) located at the northwest corner of Golden Valley Road and Sierra Highway in the City of Santa Clarita. The project site is located on the United States Geological Survey (USGS) *Mint Canyon* 7.5-minute Quadrangle Map in the southeast corner of Section 30 of Township 04 North and Range 15 West (see attached map). The proposed project seeks to merge the 10 parcels and entitle Tentative Tract Map 68203 for a four lot subdivision, which will include demolition of all existing buildings and construction of new senior assisted living units, hotel and retail spaces, residential condominium units, storm water treatment, and trails.

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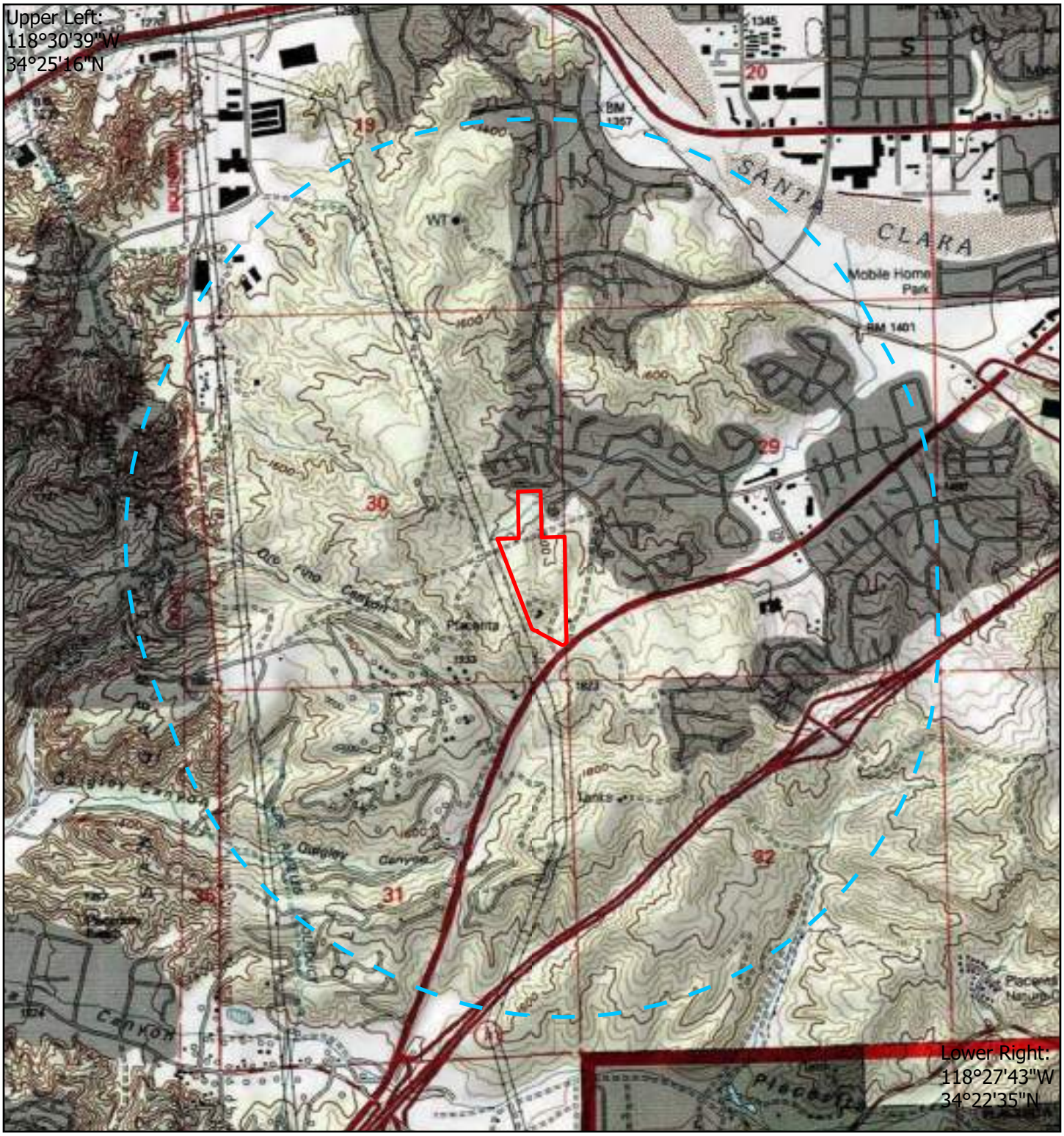
Please note that the request herein is for informational purposes only and does not constitute Assembly Bill (AB) 52 notification or initiation of consultation.

Thank you for assistance with this information request.

Respectfully Submitted,

Samantha Murray, MA, RPA
Cultural Resources Director

Enclosure: Records Search Request Map showing proposed project location



Source: BING Aerial Basemap 2020

Santa Clarita TTM 68203

Records Search Map

0 1,000 2,000 4,000 Feet

N

1-Mile Buffer

Project Boundary

SOUTH ENVIRONMENTAL

Samantha Murray

From: Jairo Avila <jairo.avila@tataviam-nsn.us>
Sent: Thursday, October 7, 2021 2:14 PM
To: Samantha Murray
Subject: Re: VTTM 68203 Project located in the City of Santa Clarita

Hello Samantha,

On behalf of the Cultural Resource Management (CRM) Division of the Fernandeño Tataviam Band of Mission Indians (FTBMI), thank you for the formal notification and opportunity to provide comments for the VTTM 68203 Project in Santa Clarita. This project is of interest to the FTBMI and the tribe wishes to provide confidential information during the consultation process with the Lead Agency. Should you have any questions, I am available next Tuesday and Thursday to go over the project and address some initial concerns. You can reach me at (818) 837-0794.

Thank you,

Jairo F. Avila, M.A., RPA.
Tribal Historic and Cultural Preservation Officer
Cultural Resources Management Division
Tribal Historic and Cultural Preservation Department

Fernandeño Tataviam Band of Mission Indians
1019 Second Street, Suite 1
San Fernando, California 91340
Office: (818) 837-0794
Website: http://www.tataviam-nsn.us

From: Samantha Murray <smurray@southenvironmental.com>
Sent: Thursday, October 7, 2021 12:48 PM
To: Jairo Avila <jairo.avila@tataviam-nsn.us>
Subject: VTTM 68203 Project located in the City of Santa Clarita

[CAUTION] EXTERNAL Email. Exercise caution.

Dear Mr. Avila:
Attached, please find an informational outreach letter for the VTTM 68203 Project located in the City of Santa Clarita in Los Angeles County.
Please feel free to contact me with any information/questions you may have.

Respectfully,

Sam Murray, MA (she/her)
Cultural Resources Director
SOUTH ENVIRONMENTAL
Mobile: 818.458.1162

Appendix C:
DPR Forms: 25800 Sierra Highway

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 6Z

Other Listings
Review Code Reviewer Date

Page 1 **of** 17 ***Resource Name or #:** (Assigned by recorder) 25800 Sierra Highway
P1. Other Identifier: The Rider House

*__P2. Location:__ ☐ **Not for Publication** ■ **Unrestricted**

***a. County** Los Angeles **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Mint Canyon **Date** 2021 **T** 04 N ; **R** 15 W ; _ ☐ **of** _ ☐ **of Sec** 30; SB **B.M.**

c. Address 20101 Golden Valley Road/25800 Sierra Hwy City Santa Clarita Zip 91321

d. UTM: (Give more than one for large and/or linear resources) Zone __, _____ mE/ _____ mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, decimal degrees, etc., as appropriate)

APNs 2836-013-141, 2836-013-111, and 2836-013-133. The subject property is located northeast of the intersection of Sierra Highway and Golden Valley Road and is accessed via Golden Valley Road.

***P3a. Description:**

The subject property is a Ranch-style single-family residence constructed in 1966 (architect/builder unknown) (Photograph 1). The residence is accessed via a driveway off Golden Valley Road behind a brick and stone wall (built in 2000) with a wrought iron gate. Behind the gate is a paved road that winds its way below and around the eastern side of the residence, until curving to the northwest where it meets with a flat paved area at the top of the hill that contains the main residence (1966), the detached garage (1996), and a wooden storage building (c. 1976-1994) (see Continuation Sheet).

***P3b. Resource Attributes:** (List attributes and codes) HP2. Single family property

***P4.Resources Present:** ■ Building ■ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (view, date, accession #) Photograph 1. Overview of main (west) elevation, view to southeast



***P6. Date Constructed/Age and Source:** ■ Historic ☐ Prehistoric ☐ Both
1966 (County Assessor)

***P7. Owner and Address:**
Veluzat Paul R. and Carol S. TRS Veluzat Trust
PO BOX 220597
Newhall, CA 91322

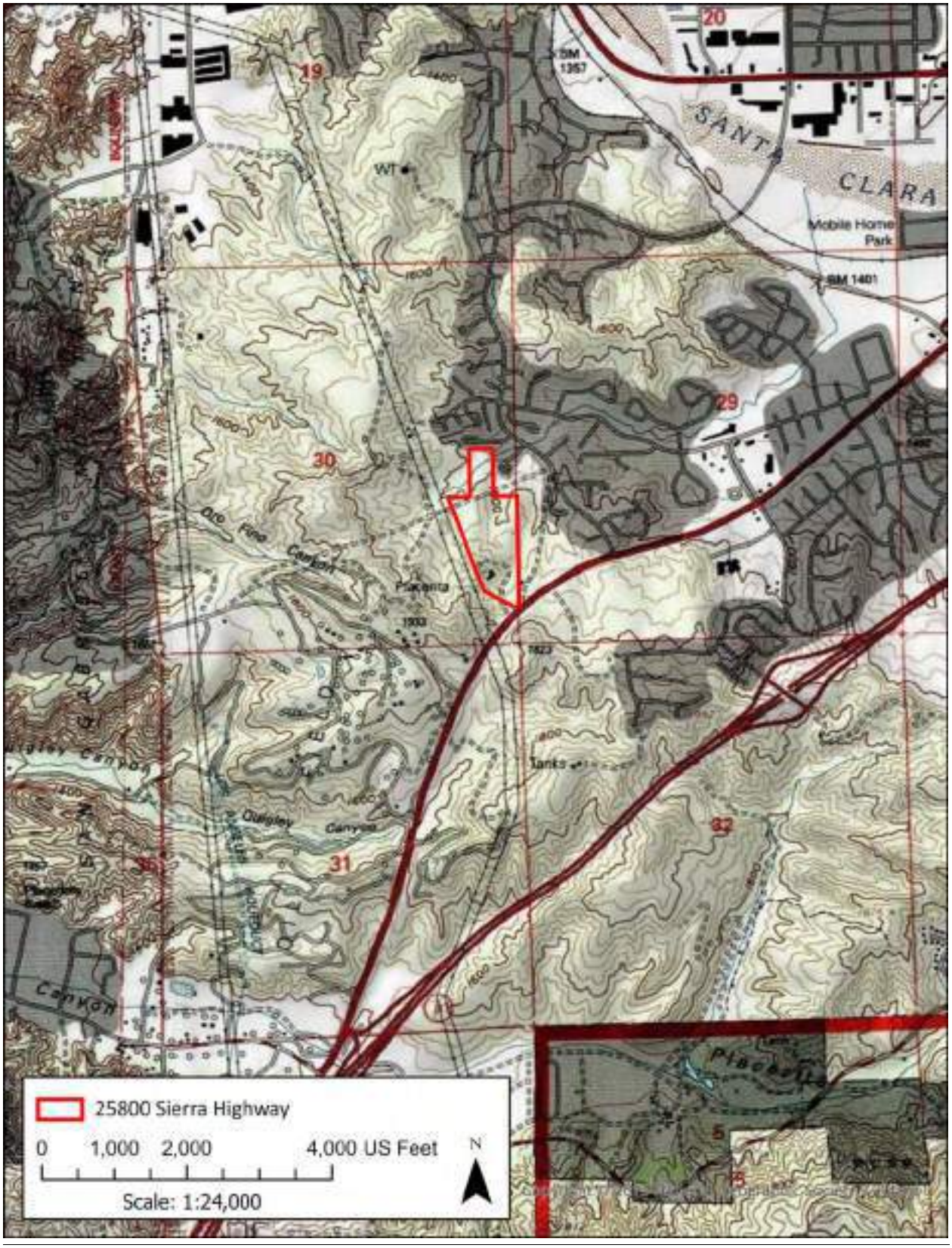
***P8. Recorded by:** Samantha Murray South Environmental
Pasadena, CA 91104

***P9. Date Recorded:**
11/29/2021

***P10. Survey Type:** Pedestrian

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")
Cultural Resources Technical Report: Santa Clarita TTM 68203 Project, City of Santa Clarita, Los Angeles County, California (South Environmental 2021)

***Attachments:** ☐NONE ■Location Map ■Continuation Sheet ■Building, Structure, and Object Record
☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record
☐Artifact Record ☐Photograph Record ☐ Other (List):


20
19
30
29
31
32
SANTA
CLARA
Mobile Home Park
WT
Tanks
25800 Sierra Highway
0 1,000 2,000 4,000 US Feet
Scale: 1:24,000
N

BUILDING, STRUCTURE, AND OBJECT RECORD

***Resource Name or #** (Assigned by recorder) 25800 Sierra Highway ***NRHP Status Code** 6Z
Page 3 **of** 17

B1. Historic Name: The Rider House
B2. Common Name: n/a
B3. Original Use: Single-family residence B4. Present Use: Single-family residence/vacant
*** B5. Architectural Style:** Ranch
***B6. Construction History:** (Construction date, alterations, and date of alterations)
Constructed in 1966 (County Assessor); wooden storage building constructed c. 1976-1994 (NETR 2021); detached garage constructed in 1996 (building permit).

***B7. Moved?** ■**No** □**Yes** □**Unknown** **Date:** **Original Location:**
***B8. Related Features:** n/a
B9a. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a

Development History
Historic aerial photographs of the subject property and its setting from 1928 and 1930 shows that land south of the Santa Clara River was entirely undeveloped but for the Southern Pacific Railroad, the Los Angeles Aqueduct, and smaller roads through Placerita Canyon and Sand Canyon. North of the river, agricultural development had taken hold around the aqueduct as evidenced by fields with sparse buildings and structures. By the 1947 aerial photograph, the Sierra Highway through the Santa Clarita Valley was constructed adjacent to the subject property, winding its way north through the rural landscape. There is still almost no development south of the Santa Clara River at this time. In the 1952 aerial photograph, the most noticeable change to the setting is the presence of a large oil field directly south of the subject property. This oil field persists to the present-day, occupying most of the land south of Golden Valley Road. Despite this new industrial development, the area south the Santa Clara River remains largely undeveloped throughout the 1950s. (see Continuation Sheet).

B11. Additional Resource Attributes: (List attributes and codes)
***B12. References:** See Continuation Sheet

B13. Remarks:

***B14. Evaluator:** Samantha Murray, South Environmental
***Date of Evaluation:** 11/8/2021

(This space reserved for official comments.)

(Sketch Map with north arrow required.)



***P3a. Description (Continued):** The residence is L-shape in plan with a cross-gabled roof clad in wood shingles. The main exterior materials are stucco with brick and wood panel details. The main entrance (Photograph 2) is located on the west elevation and is accessed via a concrete walk. The entrance is recessed beneath a front-gabled roof supported by decorative wooden posts and beams, creating a partial-width porch; and is surrounded by painted brick veneer, vertical wood panel detailing above the doors, and original light fixtures. The entrance consists of diagonal wood panel doors with boarded-up lites. The northernmost portion of the west elevation features an integrated brick planter that continues until it becomes flush with the veneer wall cladding (Photograph 3). All windows on the west elevation are aluminum-framed horizontal sliders and all have been boarded-up. The windows are surrounded by board-and-batten siding, with one of the windows containing a decorative wood surround (Photograph 4). A low brick planter follows the outline of the southern half of the west elevation. The north and south elevations represent the gabled ends of each L-shape wing and exhibit no details, but for one louvred door on the north elevation. The southernmost portion of the east elevation features a shed roof extension supported by wooden posts, creating a partial width rear porch. Most of the fenestration is boarded-up and not visible but for one small aluminum-framed horizontal slider (Photograph 5). The northernmost portion of the east elevation was only visible from the bottom of the hill and features a brick eave-wall chimney and a prominent partial-width porch with an integrated shed roof supported by wooden posts and decorative beams, and a low brick retaining wall. This porch represents the primary viewpoint of the house, with a continuous wall of floor-to-ceiling glass windows/doors, all of which were boarded-up (Photograph 6).

Other buildings on the property include the 6-car garage adjacent to the residence's north elevation, which features a tiled, side-gabled roof with stucco exterior walls and metal roll-up doors (Photograph 7); and a wooden storage building adjacent to the residence's south elevation, which features flat angled roof and two industrial door openings (Photograph 8).

Although there is no formal landscaping on the property, the triangular-shaped pad at the top of the hill that contains the buildings is surrounded by a variety of mature trees including olive, palm, pine, and California pepper trees.



Photograph 2. Main entrance on west elevation, view to east



Photograph 3. Integrated brick planter on west elevation, view to southeast



Photograph 4. Southern half of west elevation showing decorative window surround, view to south



Photograph 5. Southern half of east elevation showing partial-width porch, view to northeast



Photograph 6. Northern half of east elevation showing partial-width porch and chimney, view to south



Photograph 7. Overview of garage west elevation, facing east



Photograph 8. Overview of wooden storage building north elevation, facing southwest

***B10. Significance (Continued):** By the 1968 aerial photograph, the residence at the subject property has been constructed and is visible in its L-shape plan. At this time, the residence was accessed via a long driveway off Sierra Highway, as Golden Valley Road would not be constructed for another 34 years. The 1968 aerial also reveals that the first major residential subdivision has been constructed directly east of the subject property, with large sections containing newly constructed homes and others appearing to be in the process of grading/new construction. By the 1969 aerial photograph, the Antelope Valley Freeway can be seen under construction just south of the subject property. By 1974, the Antelope Valley Freeway has been constructed, running northeast along the southern edge of the newly developed residential subdivisions. Throughout the 1970s, residential development continued to expand to the northeast. The 1976 and 1977 aerial photographs also show the presence of more formal landscaping around the residence on the subject property, with manicured lawns and mature trees visible. By the 1986 aerial photograph, suburban sprawl has continued, and the subject property appears far less isolated than it ever has before. More homes continued to be added northeast of the subject property well into the 1990s. In 1996, a rectangular-plan garage is constructed northwest of the residence.

The 2000 aerial photograph shows the beginning of the construction of Golden Valley Road south of the subject property. This photograph reveals that the subject property underwent significant changes at this time, with its entire southern and eastern boundary cut and graded, obliterating the original driveway on the eastern side of the property and the natural hillside to the west, which was completely graded and terraced, resulting in the biggest change to the property's setting to date. By the 2002 aerial, Golden Valley Road was completed between Soledad Canyon Road to the north and Sierra Highway to the south, and the subject property's driveway was reoriented to its present-day configuration. Golden Valley High School was under construction at this time, as was the large residential development located southeast of the subject property that sits between present-day Sierra Highway to the north and Golden Valley Road to the south. By

2005, Golden Valley High was constructed, Golden Valley Road was continued east of Sierra Highway to the Antelope Valley Freeway, and the new large residential development southeast of the subject property had started to be developed with homes. Also in 2005, the properties adjacent to the east and west of the subject property were graded and prepped for new housing developments. By 2009, the subject property's setting looks almost exactly as it does today, but for the development of the remaining homes in the adjacent lot to the east, which were completed by 2016.

Previous Owners/Occupants

The following presents a summary of known owners/occupants living at the subject property's original address of 25800 Sierra Highway since its construction in 1966, based on publicly available records.

- 1966: William Edward Rider and Clara H. Rider
- 1966-c. 1982: Clara H. Rider
- 1982: Trustee's Sale by Major Assurance Corp
- 1990: Shantel S. Hudson
- 1993-present: Veluzat Paul R. and Carol S. TRS Veluzat Trust

The Rider Family (1966-c. 1982)

The original owners who commissioned the residence at 25800 Sierra Highway in 1966 were William Edward (W.E.) Rider, born in Kansas City, Missouri in 1900, and his wife Clara H. Rider, born in Vernon, Texas in 1908. W.E. got his start working as milker in a Missouri dairy "and drove his way upward through sheer ability, energy, and determination" (The Signal 1959a). It is unclear where and when William and Clara were married. The couple had one child together, Robert W. Rider, who was born in 1933.

In 1942, the family was living at 6045 Carpenter Avenue in North Hollywood, with W.E. employed at McKessens Robins Co., one of the largest U.S. distributors of wholesale pharmaceutical drugs, beverages and chemicals. By 1948, the Riders were living at another North Hollywood home at 12309 Emelita Street. By the 1950s, the Riders moved yet again to a North Hollywood residence at 7002 Sunnyslope Avenue.

In the 1950s W.E. would go on to start his own pharmaceuticals company, Riders Limited (Ltd), with a production plant located at 7234 Varna Avenue in North Hollywood (LAT 1955). In 1959, Riders Ltd. suffered a major loss when their plant was destroyed in a two-alarm chemical fire, resulting in an estimated $200,000 in damages (Citizen-News 1959). That same year, W.E. moved his business to the Golden Triangle Industrial Park at 21020 Soledad Canyon Road in what was then known as the Saugus-Newhall area (The Signal 1959b, Valley Times Today 1961). Riders Ltd. was one of two large additions made to the 600-acre industrial park. At the ground-breaking ceremony, W.E. explained that this plant would replace the North Hollywood plant and would contain 80,000 square feet of space (The Signal 1959b). Starting out with 48 employees, he expected the number to double once machines and personnel from the old North Hollywood plant could be moved (The Signal 1959a). At the time, the Rider family was still living at their home on Sunnyslope Avenue in North Hollywood (The Van Nuys News and Valley Green Sheet 1960)."

The Riders relocated to the Santa Clarita Valley around 1964 (The Signal 1973). It is unknown when exactly the Riders commissioned the house on Sierra Highway or who designed/constructed the home. Assessor's records indicate that the house was constructed in 1966. Shortly after moving into the house, W.E. passed in December 1966.

In the years following her husband's death, Clara would go on to become a prominent

figure in the Santa Clarita Valley's political and social circles, with her first name appearing as "Claire" in dozens of local newspaper articles over the next decade (Figure 1). Her involvement in the Republican Party included throwing her support behind then candidate for the U.S. House of Representatives, Barry Goldwater, Jr. In March 1969, Rider hosted a massive party at her Sierra Highway home for Goldwater, Jr. in what was called "the biggest political (and possibly even social) bash ever seen in Valencia Valley." Fancy cars and limousines "poured through the gates of the Rider mansion, the imposing lonely white house just off Highway 14 north of "confusion hill"" (The Signal 1969). It was reported that "...a great many of the people who turned up Wednesday night had come just so they could see the inside of the Clara Rider home, an intriguing landmark for thousands of persons who travel Highway 14" (The Signal 1969).

Goldwater, Jr. was elected to the U.S. House of Representatives in 1969 and would go on to serve six consecutive terms until 1983. During his time in office, Rider served as a committeewoman for Goldwater, Jr's Finance Committee (The Signal 1973) and hosted numerous parties for Goldwater, Jr. at her home on Sierra Highway including a reception for approximately 40 guests including Goldwater, Jr. and his staff in 1970 (The Signal 1970a); an evening called "62 for 72" hosted by the 62nd Assembly District Republican Coordinating Council in 1972 (The Signal 1972a); "Dinner with Barry" in 1974 which was sponsored by the Republican Women's Club (The Signal 1974); and "An Evening with Barry" in 1976 with the public invited to attend (The Signal 1976). A 1972 gossip column reported that Goldwater, Jr. and his girlfriend Susie Gherman were "planning to buy that palatial pad on Highway 14 from that vivacious redhead, Claire Rider, and set up housekeeping" (The Signal 1972b), but such a real estate transaction would never occur.

In 1970, Rider simultaneously threw her support to another political cause – the campaign of Haig Kehiayan for Newhall Municipal Court Judge, throwing a 300-guest party at her house. "Mrs. Rider graciously greeted her guests in a stunning green-knit hostess gown, accented by semi-precious jewels at the neck" (The Signal 1970b). In 1972, Rider supported Congressman John H. Rousselot (served in the U.S. House of Representatives from 1970-1983) by throwing a gala at "her spectacular hilltop home overlooking Friendly Valley and most of Canyon Country" to introduce him to the voters of the Santa Clarita Valley (Valley News 1972).

In 1971, a tongue-in-cheek newspaper article announced that "the vivacious and gracious redhead Claire Rider" was planning to sell the Riders Ltd. for a "price that's plenty good medicine, and enough that it should provide a rose-colored view out of every one of the giant windows of Mrs. Rider's palatial hilltop home overlooking Friendly Valley" (The Signal 1971). At this time, Rider still owned the Olive Avenue Medical Pharmacy in Burbank (The Signal 1973).

Parallel to her busy political life, Rider was one of the early members of the governing board of Henry Mayo Newhall Memorial Hospital (The Signal 1988). In 1972, Rider donated $15,000 for a new nursing room to be named in honor of her late husband William E. Rider (The Signal 1972c). In 1973, Rider became a candidate herself when she successfully ran for and was elected as "Honorary Mayor" of the Santa Clarita Valley with support from the Newhall-Saugus-Elks Lodge and the Local Rotary Club (The Signal 1973 and 1988).

Rider moved to Kailua, Hawaii in the mid-1980s. After the death of her son Robert in 1986, her health declined, and she moved to New Mexico to live with her sisters in a retirement home where she died in 1988. In addition to noting her many personal accomplishments, her obituary states that Rider "lived in the Santa Clarita Valley for 25 years. She and her husband built one of the early dramatic homes here, off Sierra

highway overlooking all of Canyon Country" (The Signal 1988). The Rider family is entombed at the Eternal Valley Memorial Park Mausoleum in Newhall.

Figure 1. Political Events at the Rider House



Clockwise from top left: Rider and Goldwater in 1970, Rider and Haig in 1970; Rider and Goldwater on front porch in 1972; Rider and Goldwater in 1976 (The Signal)

Architectural Style

Ranch (c. 1935–1975)
The Ranch house is a style of architecture that was popular starting in the 1930s and fell out of popularity by the 1980s. In the 1930s and early 1940s, the Ranch house was part of the Small House Movement that was brought into fashion by the Federal Housing Administration. Like the Minimal Traditional house, the Ranch house could be constructed quickly and use modern materials that could be mass-produced. The style provided an easy option for large-scale housing tracts during the 1930s and 1940s to meet the needs of relocated war-effort workers and those of soldiers returning home and starting families. Following the war years, a new era of prosperity brought about a departure from the Small House Movement. In the 1950s, post-war prosperity combined with increased lot sizes made the larger "rambling" Ranch house possible. The rambling form maximizes the façade's width, often further broadened by attached garages.

The ability of the Ranch house to exist in different sizes and arrangements made it one of the most popular house choices throughout the United States across multiple social classes into the 1970s. Key characteristics of the Ranch style of architecture are the following (Gottfried and Jennings 2009; Hess 2004; McAlester 2013):

- One story in height
- Gabled or hipped roofs constructed with a low pitch and moderate overhang
- Offset entry points causing asymmetry in the façade
- Focus on horizontal and rambling forms
- Focus on informality
- Entry points are typically placed under the roof overhang on the façade
- Use of large picture-style windows on the façade
- Variations on the eave overhang, typically boxed eaves or exposed rafter tails, or the less-common boxed rafters
- Large chimneys
- Variety of exterior cladding, including brick and stone
- Attached garage, typically incorporated into the façade
- Front and rear yards
- Large rectangular blocks are the basis for the plan design, and could be simply rectangular or a combination of rectangular blocks to create L, U, and T shapes in plan

Significance Evaluation
The following provides an evaluation of the subject property in consideration of CRHR and City of Santa Clarita designation criteria. Given the similarities in the criteria of these two programs, the criteria are addressed together to avoid duplicative text.

CRHR Criterion 1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.

City Criterion A. Is associated with events that have made a significant contribution to the historical, archaeological, cultural, social, economic, aesthetic, engineering, or architectural development of the City, State or nation.

The subject property was constructed in 1966 just prior to the development boom that started in the eastern portion of what is now the City of Santa Clarita, south of Canyon Country, in the late 1960s and is not associated with a larger pattern of planned residential development in the Santa Clarita Valley. At the time of its construction, the

subject property appears to have been one of the first residences in the area. However, due to extensive alteration of the surrounding setting over the last several decades, the residence struggles to convey its early association as a lone residence atop a hill surrounded by a rural landscape.

The subject property hosted numerous Republican political events/parties during the 1960s and 1970s that were organized by the residence's owner, local socialite Clara Rider. Many of these parties featured prominent political candidates including Barry Goldwater, Jr. who was elected to the U.S. House of Representatives in 1969 and would go on to serve six-consecutive terms until 1983. Just prior to his election, Rider hosted for Goldwater, Jr. what was called "the biggest political (and possibly even social) bash ever seen in Valencia Valley" (The Signal 1969). Although the subject property hosted large parties that were attended by prominent political and social figures, these events cannot be said to have made a significant contribution to the cultural or social development of the City, State, or nation. The parties were singular political gatherings that did not go on to influence the development of local politics or the community. For these reasons, the subject property is recommended not eligible under CRHR Criterion 1 and City Criterion A.

CRHR Criterion 2. Is associated with the lives of persons important in our past.

City Criterion B. Is associated with persons significant in the history of the City, State or nation.

The subject property's original owner was Clara Rider, who lived at the residence between 1966 and c. 1982 and became a prominent figure in Santa Clarita Valley social and political circles in the late 1960s through 1970s, hosting numerous high-profile political fundraising events at her home and even serving as Honorary Mayor of the Santa Clarita Valley in 1973. However, Rider's contributions to local fundraising and larger political campaigns cannot be said to have made a significant impact on the City's history, and although she was a well-known socialite with a local party house, she does not appear to rise to the level of significance required under this criterion. Therefore, the subject property is recommended not eligible under CRHR Criterion 2 and City Criterion B.

CRHR Criterion 3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.

City Criterion C. Embodies distinctive characteristics of a style, type, period, or method of construction, or is a valuable example of the use of indigenous materials or craftsmanship.

The subject property embodies the distinctive characteristics of the Ranch style of architecture, which became one of the most popular and prolific styles of residential architecture between the 1930s and 1970s. Constructed in 1966, the subject property is an example of the larger "rambling" Ranch-style house that became possible in the postwar years as lot sizes increased and people moved away from crowded cities. The rambling Ranch maximizes the façade's width, as seen in the subject property with its cross-gabled L-shape plan that creates a long, dominant west elevation. The subject property features several character-defining features of the style including its one-story, rambling, L-shape plan; cross-gabled roof with moderate eave overhang; focus on horizontal forms; front entry sheltered beneath a gabled porch; its mixture of exterior cladding including stucco, brick, and wood; its use of integrated brick planters; and the prominent rear balcony with a window wall looking out over the property and beyond. Although most of

residence's original materials appear to be intact, many of these materials, including the roof shingles and rear porches, were found to be in poor condition. Alterations since the residence was built include removal of original landscaping, construction of an incompatible Spanish-style garage in 1996, as well as significant changes to the property's main path of circulation with the construction of Golden Valley Road, which shifted the driveway entrance from Sierra Highway to its current location. A brick and stone wall was also added along the southern boundary of the property in 2001. Although the original plans for the house could not be located and the original architect and builder are unknown, there is no indication that the property is the work of an important creative individual. In Clara Rider's (the original owner's) obituary, it states that "she and her husband built one of the early dramatic homes here" but it is assumed that someone was commissioned to design and construct the home. Despite the subject property's relatively high integrity of original materials, design, and workmanship, it is not considered an important or valuable example of the Ranch style of architecture, which produced countless examples of the rambling ranch during the mid-century and beyond. Given the prolific nature of the style, the property's overall condition, and alterations to its setting, the subject property does not rise to the level of significance required under this criterion. Therefore, the subject property is recommended not eligible under CRHR Criterion 3 and City Criterion C.

City Criterion D. Has a unique location, singular physical characteristic(s), or is a landscape, view or vista representing an established and familiar visual feature of a neighborhood, community, or the City.

At the time of the subject property's construction, it stood as a single house on a hill amidst a largely undeveloped rural landscape, referred to as "the imposing lonely white house just off Highway 14" and "an intriguing landmark for thousands of persons who travel Highway 14" (The Signal 1969). The house was also known for its rear view off the back porch "overlooking Friendly Valley and most of Canyon Country" (Valley News 1972). Other newspaper articles described the subject property as a "palatial hilltop home" with "giant windows" (The Signal 1971). It appears that the subject property did, at one time, function as somewhat of a local landmark along Sierra Highway. However, extensive development all around the subject property, the construction of Golden Valley Road, and the reorientation of the approach to the residence have completely altered the original setting of the residence, such that it can longer convey itself as an established or familiar visual feature of the neighborhood. Therefore, the subject property is recommended not eligible under City Criterion D.

CRHR Criterion 4. Has yielded, or may be likely to yield, information important in prehistory or history.

City Criterion E. Has yielded, or has the potential to yield, information important to the history or prehistory of the City, State, or nation.

The property is not significant as a source, or likely source, of important historical information nor does it appear likely to yield important information about historic construction methods, materials or technologies. Therefore, the property is not eligible under CRHR Criterion 4 or City Criterion E.

Integrity Discussion

Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Historical resources eligible for listing in the CRHR must meet one of the designation

criteria and retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. It must also be judged with reference to the particular criteria under which a resource is proposed for eligibility (OHP 2011).

Location: The subject property retains integrity of location. The residence is located in the place it was originally constructed.

Design: The subject property retains integrity of design. All major Ranch-style design elements are still present. The essential elements of form, space, structure and style have all been retained and the property can be identified as a Ranch-style home from the 1960s.

Setting: The subject property lacks integrity of setting. Since the subject property's construction in 1966, numerous residential developments have been constructed on nearly all sides of the property, with surrounding homes visible from all angles. At the time of its construction, the subject property was a lone residence in a largely undeveloped and rural landscape. Further, the driveway orientation was changed with the construction of Golden Valley Road in the early 2000s, which also greatly changed the subject property's setting.

Materials: The subject property retains integrity of materials. Although there are condition issues present throughout the property, the residence retains the vast majority of its original materials including its wood shingle roof, brick and wood panel-clad stucco walls, doors, and windows.

Workmanship: The subject property retains integrity of workmanship. The physical evidence of the craftsmanship required to create the Ranch-style residence has been retained.
Feeling: The subject property lacks integrity of feeling. Although the residence itself maintains integrity of design, materials, and workmanship, alterations to the immediate setting prevent the property from conveying its historic feeling as a relatively rural and isolated property with uninterrupted views to Canyon County.

Association: The subject property lacks integrity of association. The property has no important associations with events, people, or important patterns of development in the City.

Significance Evaluation Findings
As a result of the property significance evaluation, the subject property at 25800 Sierra Highway/20101 Golden Valley Road is recommended not eligible under all CRHR and City designation criteria due to a lack of significant historical associations and compromised integrity.

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Appendix D:
Preparer's Qualifications

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EDUCATION

M.A., Anthropology, California State University, Los Angeles, 2013

B.A., Anthropology, California State University, Northridge, 2003

PROFESSIONAL AFFILIATIONS

California Preservation Foundation

Society of Architectural Historians

National Trust for Historic Preservation

PROFESSIONAL CERTIFICATIONS

Registered Professional Archaeologist (2013)

Samantha Murray, MA

CULTURAL RESOURCES DIRECTOR

Samantha Murray is the cultural resources director at South Environmental and a principal archaeologist and architectural historian with over 15 years' experience in all elements of cultural resources management, including project management, archaeological and architectural history studies, and historical significance evaluations in consideration of the National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), and local-level designation criteria. Ms. Murray has conducted thousands of historical resource evaluations and developed detailed historic context statements for a multitude of property types and architectural styles. She has also provided expertise on numerous projects requiring conformance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Ms. Murray meets the Secretary of the Interior's Professional Qualification Standards for both Architectural History and Archaeology. She is experienced managing multidisciplinary projects in the lines of private development, transportation, transmission and generation, federal land management, land development, and state and local government. She is an expert in preparation of cultural resources compliance documentation for projects that fall under the California Environmental Quality Act (CEQA), National Environmental Policy Act (NEPA), and Sections 106 and 110 of the National Historic Preservation Act (NHPA). Ms. Murray has also served as an expert witness in legal proceedings concerning historical resources under CEQA and local ordinance protection.

EXPERTISE

- CEQA, NEPA, and Section 106 of the NHPA compliance documentation in consideration of impacts to historical, archaeological, and tribal cultural resources, and historic properties
- Historic resource significance evaluations in consideration of NRHP, CRHR, and local designation criteria.
- Project design review for conformance with the Secretary of the Interior's Standards.
- Preparation of archival documentation for HABS/HAER/HALS.
- Assistance with complex mitigation including salvage and interpretive displays.
- Peer review.

SELECT PROJECT EXPERIENCE

Phase I and II Historical Resource Assessment Report for 4607 W. Melbourne Avenue, City of Los Angeles, California (2021). South Environmental was retained to complete a Historical Resource Assessment (HRA) for a property located at 4607 W. Melbourne Avenue in the City of Los Angeles, California. The HRA included the results of a pedestrian survey of the project site by a qualified architectural historian; building development and archival research; recordation and evaluation of one single-family residence for historical significance and integrity; meeting with Office of Historic Resources staff to discuss findings and recommendations; and review of proposed design plans for conformance with the Secretary of the Interior's Standards for Rehabilitation. The property was found eligible for designation in the NRHP, CRHR, and as a City HCM under Criteria C/3/3 as an individual property for its embodiment of the Craftsman-style of architecture and serving as an example of the airplane bungalow sub-type. The proposed project was found to be in conformance with the Standards for Rehabilitation such that the residence would continue to retain all its major character-defining features and would remain unchanged when viewed from the public right-of-way.

Hope Gardens Sequoia Building Project, Los Angeles County, California (2021). South Environmental was retained by Union Rescue Mission to complete a cultural resources technical report for the Hope Gardens Sequoia Building Project located at 12249 Lopez Canyon Drive in unincorporated Los Angeles County, California, which proposes demolition of the existing building on the site and construction of a new facility. Ms. Murray authored the cultural resources technical report, serving as principal archaeologist and architectural historian. This study included an intensive pedestrian survey of the project site by a qualified archaeologist and architectural historian; building development and archival research; and recordation and evaluation of the Hope Gardens property for historical significance and integrity in consideration of CRHR and Los Angeles County designation criteria. As a result of the property significance evaluation, eight buildings on the property were found eligible as contributing resources to the newly identified Forester Haven Historic District under CRHR and County Criterion 3. South Environmental is currently assisting Union Rescue Mission with implementation of project-specific mitigation.

Sand Canyon Resort Project, City of Santa Clarita, Los Angeles County, California (2019). While working for her previous firm, Ms. Murray served as principal architectural historian, co-author, and QA/QC of final cultural resources work products. Dudek was retained by the City of Santa Clarita to complete a cultural resources technical report in support of the EIR for a project that proposes to replace existing open space that was formerly the Mountain Course of the Robinson Ranch Golf Course, with a new resort and spa development. The report included a records search, Native American coordination, and a pedestrian survey.

Stickleback Movie Ranch Property Evaluation, Los Angeles County, California (2018). While working for her previous firm, Ms. Murray served as principal architectural historian, co-author, QA/QC of final work products. Dudek was retained by the Metropolitan Water District of Southern California to complete a historical resource significance evaluation of the Stickleback Movie Ranch property, located in unincorporated Los Angeles County near Santa Clarita, California. The study included a CHRIS records search of the Stickleback Movie Ranch property and a 0.25-mile radius; a pedestrian survey of the subject property for cultural resources; building development and archival research; recordation and evaluation of cultural resources identified within and around the Stickleback Movie Ranch portion of the study area; and an assessment of potential impacts to historical resources in conformance with CEQA and all applicable local municipal code and planning documents. The former Stickleback Movie Ranch and all associated buildings and structures were found not eligible under all NRHP, CRHR, and Los Angeles County designation criteria.



APPENDIX D
Fuel Consumption Worksheets

Golden Valley On-Road Construction Fuel Use

Construction Phase	Worker Trips/day	Worker Miles/trip	Days	Worker Miles
Demolition	15	18.5	22	6,105
Grading	20.0	18.5	110	40,700
Construction	181.0	18.5	259	867,262
Paving	15.0	18.5	21	5,828
Painting	36.3	18.5	43	28,877
Total Worker Miles				**948,771**
	EMFAC 2025	Gasoline	Avg. miles/gal	24.98
Worker Fuel Use			Total gallons	**37,975**

Construction Phase	Vendor Trips/day	Vendor Miles/trip	Days	Vendor Miles
Demolition	0	10.2	60	-
Grading	0	10.2	60	-
Construction	31.8	10.2	365	118,391
Paving	0	10.2	2	-
Painting	0	10.2	26	-
Total Vendor Miles				**118,391**
	EMFAC 2025	Diesel	Avg. miles/gal	8.64
Vendor Fuel Use			Total gallons	**13,710**

Construction Phase	Haul Trips/day	Haul Miles/trip		Haul Miles
Demolition	4.59	20.0	60	5,508
Grading	0.0	20.0	60	-
Total Hauling Miles				**5,508**
	EMFAC 2025	Diesel HHDT Only (T7 tractor construction)	Avg. miles/gal	6.12
Hauling Fuel Use			Total gallons	**900**

Golden Valley Off-Road Construction Fuel Use

Construction Phase	Equipment	Qty	Hrs/day	HP	Load Factor	#Days	HP hr
Demolition	Rubber Tired Dozer	2	8	367	0.4	22	51,674
	Excavators	3	8	36	0.38	22	7,223
	Concrete/Industrial	1	8	33	0.73	22	4,240
Grading	Graders	1	8	148	0.41	110	53,398
	Excavators	2	8	36	0.38	110	24,077
	Tractors/Loaders/E	2	8	84	0.37	110	54,701
	Scrapers	2	8	423	0.48	110	357,350
	Rubber Tired Dozer	1	8	367	0.4	110	129,184
Construction	Forklifts	3	8	82	0.2	259	101,942
	Generator Sets	1	8	14	0.74	259	21,466
	Cranes	1	7	367	0.29	259	192,958
	Welders	1	8	46	0.45	259	42,890
	Tractors/Loaders/E	3	7	84	0.37	259	169,044
Paving	Pavers	2	8	81	0.42	21	11,431
	Paving Equipment	2	8	89	0.36	21	10,765
	Rollers	2	8	36	0.38	21	4,596
Coating	Air Compressor	1	6	37	0.48	43	4,582
						Total HP	**1,241,522**
	HP = horsepower						
	gallons of diesel fuel per HP----hour= 0.05					**Gallons**	**62,076**

Golden Valley Operational Fuel Use

Light-duty (up to 8,500 lb GVWR)	% VMT	Heavy-duty (> 8,500 lb GVWR)	% VMT
LDA	49.32835102	LHD1	2.69669443
LDT1	4.23294678	LHD2	0.69253580
LDT2	24.02349710	MH	0.27810240
MDV	14.34000432	MHD	1.10110268
MCY	2.20090058	HHD	0.89450693
		OBUS	0.08452810
		SBUS	0.06490860
		UBUS	0.06192110
% of VMT	94.1%		5.9%

Vehicle Class	% VMT	Annual VMT	EMFAC 2027 M	Gal/year	Fuel
All		4,488,405			
light duty	94.1%	4,224,743	25.99	162,554	gasoline
heavy-duty	5.9%	263,662	8.87	29,733	diesel

APPENDIX E-1
Geotechnical Report

LGC Valley, Inc.

Geotechnical Consulting

GEOTECHNICAL REPORT FOR MULTI-USE DEVELOPMENT, TENTATIVE TRACT MAP 68203 CITY OF SANTA CLARITA, CALIFORNIA

Dated: November 19, 2020

Project No. 203003-01

Prepared For:

RENAUD AND SUE VELUZAT
C/O *MR. STEVE HUNTER, LAND DESIGN CONSULTANTS, INC.*
800 Royal Oaks Drive, Suite 104
Monrovia, California 91016

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LGC Valley, Inc.

Geotechnical Consulting

November 19, 2020 Project No. 203003-01

Mr. Renaud & Mrs. Sue Veluzat
c/o Mr. Steve Hunter, Land Design Consultants, Inc.
800 Royal Oaks Drive, Suite 104
Monrovia, Ca 91016

Subject: ***Geotechnical Report for a Multi-Use Development, Tentative Tract Map 68203, City of Santa Clarita, California***

In accordance with your request, LGC Valley, Inc. (LGC) is providing this geotechnical investigation report for the proposed multi-use development, Tentative Tract Map 68203, City of Santa Clarita, California. The purpose of our investigation was to evaluate the existing onsite geotechnical conditions, review geotechnical and geologic data and maps pertinent to the site, and prepare a geotechnical report, with respect to the proposed residential development, indicating our findings, conclusions, opinions, and recommendations for site development.

LGC has reviewed the prior geotechnical reports prepared by R.T. Frankian and Associates (RTF&A) with respect to the subject site and accepts responsibility as geotechnical consultant-of-record and concurs with the findings, conclusions and recommendations provided therein, except as modified herein.

LGC has reviewed the laboratory test data, procedures and results performed by EGLAB, Inc. (EGL) with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing).

If you have any questions regarding our report, please contact this office. We appreciate this opportunity to be of service.

Respectfully submitted,

LGC VALLEY, INC.





Adam Rich, PE 85642
Project Engineer





Matt C. Hawley, CEG 2122
Principal Geologist

NLK/MCH/ACR

Distribution: (4) Addressee

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1.0 INTRODUCTION

1.1 Purpose and Scope of Services

The main purpose of this geotechnical investigation was to identify and evaluate the existing geologic and geotechnical conditions at the site and provide preliminary geotechnical design criteria for the proposed development. Recommendations for grading construction, preliminary foundation design, retaining walls and other relevant aspects that may likely be used to support the proposed development are included herein to address the identified site geotechnical constraints. This report includes the results of site exploration, laboratory testing and engineering evaluation, and provides our conclusions, opinions, and recommendations with respect to site development.

These items plus other geotechnical conditions are discussed and addressed within this document.

Our scope of services for preparation of this document included:

- Review of geotechnical reports, geologic maps and other documents relevant to the site (Appendix A).
- Perform a site visit to evaluate the existing condition and mark the geotechnical excavation locations.
- Performed a subsurface investigation including down hole logging of one large diameter boring (B-LGC-LB, Appendix B).
- The excavation and logging of ten test pits using a backhoe (LGC-TP-1 through LGC-TP-10). (Appendix B).
- Performed a subsurface investigation using an 8-inch diameter hollow-stem auger drill rig to excavate three borings in the area of the proposed detention basin (Appendix B).
- Laboratory testing of representative soil samples obtained during our subsurface investigation (Appendix C).
- Review of on-site laboratory testing by others (Appendix D).
- Perform percolation testing and analysis (Appendix E).
- Perform geotechnical slope stability analyses (Appendix F) and evaluation of the overall data.
- Preparation of this report presenting our findings, conclusions, opinions, and recommendations with respect to the evaluated geologic and geotechnical conditions at the site.

1.2 Site and Project Description

The subject property is a roughly 28-acre arrowhead-shaped parcel located adjacent to and northwest of the intersection of Golden Valley Road and Sierra Highway. The site is hilly and generally defined by a low ridge spur that ascends from north to south roughly through the middle of the site that divides two north-draining canyons. The ridge spur ascends to a main ridgeline south of Golden Valley Road that generally follows the trend of the San Gabriel fault which is also located just south of the site. The two canyons meet further down slope and off site after crossing over a Southern California Gas easement that trends roughly east to west across the upper portion of the site and off site. At the approximate crest of the ridge spur on site, a tree-lined single-family compound is located near the southern site boundary that has access from a long driveway to Golden Valley Road to the south.

High fill slopes generally mark the southern and western boundaries of the property on either side of the ridge spur that leads up to Golden Valley Road and the single-family residential home site. North of the Gas line easement, the site begins to rise again. As such, the site is very hilly with many elevation changes over relatively short distances.

Based on our review of the proposed plans, the majority of the site is planned for three basic developments from south to north: a 100-unit, four-story hotel, a 154-unit senior-assisted living facility, and a 73-unit condominium complex in the north. Beyond the main development, in the northern portion of the site, an infiltration basin for storm water run-off is planned.

A sinuous road that descends to the north with access from Golden Valley Road is planned to provide access to the various improvements. Numerous private streets are also planned within each of the three main development concepts. Main line utilities, and other basic and fundamental necessities will also be provided to support the planned development.

Site construction is anticipated to consist of cut and fill grading up to approximately 60 feet in height and thickness, respectively. Fill and cut slopes are designed at 3:1 to 2:1 (Horizontal to Vertical) ratios.

1.3 Document Review

LGC reviewed the documents indicated within Appendix A and used this information to assist with our interpretations, conclusions and recommendations of the site. Fill placed as a part of construction for Golden Valley Road was reported by R.T. Frankian and Associates (RTF&A, 2003). Based on our review of that report, LGC concludes that those fills are suitable as support for the intended development where the influence of those fills impacts the subject site. As indicated in their report, RTF&A indicates that all unsuitable soils were removed prior to fill placement and engineered fill was placed in the same manner and quality as that used for residential developments.

LGC has reviewed the referenced RTF&A report and concurs with the conclusions and recommendations performed and accepts as engineer-of-record, those fills that influence the subject site.

1.4 Subsurface Investigation and Laboratory Testing

Our subsurface investigation began on September 15, 2020 and finished on October 7, 2020. One large-diameter boring (B-LGC-LB) was extended to a maximum depth of 80 feet on September 15, 2020 to determine geologic structure and provide data for slope stability. Ten backhoe test pits were excavated on September 18, 2020 (LGC-TP-1 through LGC-TP-10) and were extended to a maximum depth of 13.5 feet to determine approximate remedial removal depths; due to safety concerns most test pits were not entered beyond approximately five feet from the ground surface. On October 6, 2020 three hollow stem borings (B-LGC-1 through B-LGC-3) were extended to depths ranging from approximately 20 to 31.5 feet. On October 7, 2020 these borings were observed for indications of groundwater seepage, and one preliminary percolation test was performed; no seepage was observed. The approximate locations of the test pits and borings are shown on the Geotechnical Map (Plate 1). The test pits and borings were sampled and logged under the supervision of a geologist from LGC.

During the subsurface investigation, representative bulk and relatively undisturbed samples were collected for laboratory testing. Laboratory testing was performed by EGLAB, Inc. (EGL). Laboratory testing was performed on representative soil samples and included moisture and density tests, maximum density and optimum moisture content, expansion and corrosion testing. A summary of the test procedures and printouts of the laboratory test results are presented in Appendix C. The moisture and density test results are presented on the test pit and boring logs included in Appendix B.



Approximate Site Location

LGC

Figure 1:
Site Location Map
Veluzat Property,
City of Santa Clarita, California

Project Name	Golden Valley
Project No.	203003-01
Eng. / Geol.	ACR/MCH/NLK
Scale	not to scale
Date	November 2020

2.0 GEOTECHNICAL CONDITIONS

2.1 Regional and Local Geology

The subject site is located within the Santa Clarita Basin of the Transverse Ranges geomorphic province of California. The site and surrounding area is hilly terrain with narrow ridgelines and canyons as a result from local and regional faulting and erosion processes. The San Gabriel Fault is located within 1 mile from the site to the south. Bedrock is composed of sandstone, conglomerate, siltstone and claystone of the Saugus Formation which is shallowly to moderately dipping to the northwest and west. Canyons have relatively thin accumulations of alluvium (commonly less than 20 feet in thickness). The surrounding area is prone to landslide activity due to high and steep ridgelines that contain locally out-of-slope dipping clay beds.

2.2 Site-Specific Geology

The site is underlain by certified fill, alluvium, the Saugus Formation, and locally undocumented fill soils. Overall, the site is blanketed by a thin veneer of topsoil with thicknesses ranging from 1 to 5 feet, however these soils are not shown on the geologic map. Heavy brush precluded visual reconnaissance mapping in many areas, though geologic units have been interpreted and applied across the site.

2.2.1 Artificial Fill – Undocumented (Afu)

Based on the results of our subsurface investigation, the site is underlain by approximately one to eight feet of undocumented fill located on the downhill side of access roads. Based on our observations and review, all undocumented fill is considered unsuitable for support of structures.

2.2.2 Certified Fill (Cf)

The entire southern portion of the site runs adjacent to Golden Valley Road where high ascending slopes of certified fill mark the southern boundary of the site (RTF&A, 2003). Based on our review, the surface of the certified fill is dry and remedial removals will be required prior to additional fill placement.

2.2.3 Quaternary Landslide-Surficial (Qls?)

Based on review of aerial photographs (Google Earth, 2020) two possible surficial features on the subject site appear to have topography consistent with a landslide. Based on their shape and locations these features appear to be relatively thin in nature, assumed approximately 10 feet in thickness, and are anticipated to be made up of broken weathered blocks of bedrock combined with topsoil. All landslide debris is considered unsuitable for support of structures and if found during construction will be removed during the site grading construction.

2.2.4 Quaternary Alluvium (Qal)

Alluvial soils were encountered in the bottoms of local drainages that ranged from approximately one to thirteen feet in depth. As encountered, these soils generally consist of pale-yellow brown to olive-green and gray, interbedded sandy silts, silty sands, and sandy to silty clays that are damp, stiff, porous and locally contain roots. Based on our observations, alluvium is not considered suitable for support of structures and is recommended for removal during site grading construction.

2.2.5 Quaternary Saugus Formation, Sunshine ranch member (Tsr)

Bedrock at the site consists of Saugus Formation, Sunshine Ranch member (Saul and Wooton, 1983), and is composed of relatively thick beds of clayey to sandy siltstone, silty to clayey sandstone and gravel to cobble conglomerate. Overall, bedrock is dense, massive to poorly bedded, locally cross bedded and locally cemented. Changes in lithology occurred gradationally except for areas of channelized deposits. The upper approximate fifteen feet along the main ridge spur was observed as weathered and should be overexcavated if not removed by planned cut. A few reddish-brown to brown claystone beds were identified within B-LGC-LB and single reddish-brown to purple claystone was identified with non-planar and steeply dipping internal shears attributed to tectonic uplift of the nearby San Gabriel fault. The observed shears were not through-going or of significant length and are not interpreted as long, planar surfaces that should be reviewed from a global slope stability perspective. At depth, the Sunshine Ranch member transitions to unoxidized gray and blue-gray colors.

2.3 Geologic Structure

The bedrock within the site is generally massive to poorly bedded sandstone, siltstone and claystone. Locally, infilled channelized deposits were observed with steeply dipping margins. Bedding is shallowly dipping to the north-west, ranging from six to fourteen degrees, with slight variations along strike and dip angle (see boring logs, Appendix B). Variations in strike and dip are to be expected due to the massive, gradational and undulatory conditions. A northwest tending anticline was mapped north of the site (Saul and Wooton, 1983) but does not appear to be relevant to the site from a structural or slope stability perspective.

2.4 Landslides

The site is in a region that is prone to landslides due to high slopes and steep ridgelines with relatively shallow dipping clays. The "Friendly Valley Landslide Complex" is east of the site (Dibble, 2006) and (Saul and Wooton, 1983) show two additional landslides in the immediate area of the subject site. Both landslides have been removed in the grading of the Golden Valley Road between March 2000 and May 2001 (RTF&A, 2003).

Based on the topographic map and aerial photos, we believe there are potentially two surficial slides on site immediately north of the existing residence descending into the eastern most canyon with interpreted thicknesses of approximately 10 feet. Due to heavy brush on the site, other surficial slides may be present but unidentified. Any identified landslide will be removed during the course of grading

in its entirety as landslide debris is considered compressible and not suitable for the support of structures or fill.

2.5 Groundwater

Historic high groundwater is not considered to be a concern for the site based on the published historic high groundwater map (CGS, 1998). No data is available through the California Department of Water Resources, and no known waters wells are on site.

Groundwater was not encountered during our site investigations to the maximum explored depth of 80 feet on the southern hills of the site and 31.5 feet in the northern lower alluvium portion of the site; as such none is anticipated during site grading.

2.6 Oil Wells

The site is located less than 1 mile north of the active Placerita oil field (California Department of Conservation, 2020). Upon review, there appears to be a single abandoned dry Mobile Oil Corp well (API:0403713340, Well #4) located within or near the northern site boundary. LGC is not an environmental consultant, and we recommend the site be reviewed by a qualified environmental consultant to assess the relevance of this feature relative to the proposed development.

2.7 Surface Water

Based on our review of local maps, surface water will drain to the canyon bottoms and flow north from the site. Surface water runoff relative to project design is the purview of the project civil engineer and should be directed away from the planned structure.

2.8 Seismicity, Faulting and Related Effects

2.8.1 Seismicity

The main seismic parameters to be considered when discussing the potential for earthquake-induced damage onsite are the distances to the causative faults, earthquake magnitudes, and expected ground accelerations. We have performed site-specific analysis based on these seismic parameters for the site and the onsite geologic conditions. The results of our analysis are discussed in terms of the potential seismic events that could be produced by the maximum probable earthquakes. A maximum probable earthquake is the maximum earthquake likely to occur given the known tectonic framework.

2.8.2 Seismic Design Criteria

The site seismic characteristics were evaluated per the guidelines set forth in Chapter 16, Section 1613 of the 2019 California Building Code (CBC). Representative site coordinates for the project sites of latitude 34.3978º N and longitude -118.4862º W were utilized in our analyses. The maximum considered earthquake (MCE) spectral response accelerations (SMS and SM1) and adjusted design spectral response acceleration parameters (SDS and SD1) for Site Class D are provided in the following table.

Table 1 **Seismic Design Parameters**	
Selected Parameters from 2019 CBC, Section 1613 - Earthquake Loads	**Seismic Design Values**
Site Class (per Chapter 20 of ASCE 7)	C
Risk-Targeted Spectral Acceleration for Short Periods (S_S)	2.377
Risk-Targeted Spectral Accelerations for 1-Second Periods (S_1)	0.849
Site Coefficient F_a [per Table 1613.3.3(1)]	1.2
Site Coefficient F_v [per Table 1613.3.3(2)]	1.4
Site Modified Spectral Acceleration for Short Periods (S_{MS}) for Site Class D [Note: $S_{MS} = F_aS_S$]	2.852
Site Modified Spectral Acceleration for 1-Second Periods (S_{M1}) for Site Class D [Note: $S_{M1} = F_vS_1$]	1.188
Design Spectral Acceleration for Short Periods (S_{DS}) for Site Class D [Note: $S_{DS} = (^2/_3)S_{MS}$]	1.901
Design Spectral Acceleration for 1-Second Periods (S_{D1}) for Site Class D [Note: $S_{D1} = (^2/_3)S_{M1}$]	0.792
Seismic Design Category (per Section 1613.2.5)	E

Section 1803.5.12 of the 2019 CBC (per Section 11.8.3 of ASCE 7) states that the maximum considered earthquake ground motions, Peak Ground Acceleration (PGA) should be used for the geotechnical evaluations. The PGA_M for the site is equal to 1.206g (USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2).

A deaggregation of the PGA based on a 2,475-year average return period indicates that an earthquake magnitude of 7.5 at a distance of approximately 6.9 km (4.2 mi) from the site would contribute the most to this ground motion (USGS, 2020).

2.8.3 Faulting

The subject site is not located within an Alquist-Priolo Earthquake Fault Zone (Hart and Bryant, 1997); therefore, there are no known active or potentially active faults onsite. However, the active San Gabriel Fault is located less than 1-mile from the site to the south.

The possibility of damage due to ground rupture from earthquake fault rupture is considered low since active faults are not known to cross the site but the site is in close proximity to an active fault. The site is also in proximity to other active faults (Simi-Santa Rosa, Santa Susana, Sierra Madre/San Fernando and San Andreas) which are capable of producing significant ground shaking.

Secondary effects of seismic shaking resulting from large earthquakes on the major faults in the southern California region include shallow ground rupture, soil liquefaction, and seismically induced-settlements, seiches and tsunamis.

The secondary effects of seismic shaking are a possibility throughout the Southern California region and are dependent on the distance between the site and causative fault and the onsite geology. The major active fault that could produce these secondary effects is the San Gabriel Fault located to the south of the site. Other active faults that may result in shaking to the site include the Simi-Santa Rosa, Northridge, Santa Susana and San Andreas Fault, among others. A discussion of liquefaction and these secondary effects is provided in the following sections.

2.8.4 Shallow Ground Rupture

Shallow ground rupture due to active faulting is not likely to occur on site due to the lack of active or potentially active fault traces across the site. Therefore, this phenomenon is not considered a significant hazard, although it is a possibility at any site.

2.8.5 Liquefaction

Liquefaction is a seismic phenomenon in which loose, saturated, granular soils behave similarly to a fluid when subject to high-intensity ground shaking. Liquefaction occurs when three general conditions exist: 1) shallow groundwater; 2) low density non-cohesive (granular) soils; and 3) high-intensity ground motion. Liquefaction is typified by a buildup of pore-water pressure in the affected soil layer to a point where a total loss of shear strength occurs, causing the soil to behave as a liquid. Studies indicate that saturated, loose to dense, near surface cohesionless soils exhibit the highest liquefaction potential, while dry, dense, cohesionless soils and cohesive soils exhibit low to negligible liquefaction potential.

According to the City of Santa Clarita Geologic hazards map the site is partially within a mapped liquefaction hazard zone (City of Sana Clarita, 2020). Due to the presence of shallow bedrock at the site, the planned complete removal of loose surficial materials beneath compacted fills and the lack of shallow groundwater, the liquefaction hazard potential is considered very low to nil.

2.8.6 Seismically Induced Settlement

During a strong seismic event, seismically induced settlement can occur within loose to moderately dense, dry or saturated granular soil. Settlement caused by ground shaking is often non-uniformly distributed, which can result in differential settlement.

Provided that the recommendations in this report are followed and removals of unsuitable materials are performed, the site is not anticipated to be susceptible to seismically induced settlement.

2.8.7 Seiches and Tsunamis

A seiche is a standing wave in an enclosed or partially enclosed body of water propagated by earthquake waves. Tsunamis are large ocean waves or series of waves generated by displacement of a large volume of water. The site is not in close proximity to body of water or near the ocean; therefore, the hazard associated with seiches and tsunamis is considered nil.

2.9 Slope Stability

After a review of the latest grading plan and based on our investigation, seven cross-sections (A-A', B-B', D-D' E-E', H-H', O-O', P-P', and Q-Q') were considered representative and critical with regards to slope stability analysis. Each of these cross-sections are discussed below.

Slope stability analysis was conducted using the computer program Slope-W from Geo- Slope International. The Modified Bishop's Method was used to analyze rotational failure modes and the Janbu Method was considered for translational failure modes. A coefficient of horizontal acceleration Kh of 0.15 (FS of 1.1) was considered for pseudostatic analyses. The design shear strength values utilized for the analyses were based on the values provided in the RTF&A report summarizing the grading of the adjacent Golden Valley Road and High School site (RTF&A, 2003) and are summarized in Appendix F.

Cross-section A-A' was used to analyze the proposed approximately 80-foot-high design fill slope descending to the east. Based on our geologic interpretations of the site, the proposed slope is to be constructed over an existing fill slope and the material underlying the fill consist of bedrock dipping approximately 0-7 degrees into slope. The results of the slope stability analyses on cross-section A-A' indicate adequate factors of safety greater than 1.5 and 1.1 (as applicable), for rotational and translational modes of failure, under static and pseudostatic conditions, respectively, and the analyses are included in Appendix F. However, a stability fill keyway is shown at the toe of the slope to indicate how the design fill slope should be established into competent soils in this area.

Cross-section B-B' was used to analyze the proposed cut condition with Saugus Formation, Sunshine Ranch member, dipping approximately 6 to14 degrees out-of-slope. The results of the slope stability analyses on cross-section B-B' indicate adequate factors of safety greater than 1.5 and 1.1 (as applicable), for rotational and translational modes of failure, under static and pseudostatic conditions, respectively, and the analyses are included in Appendix F.

Cross-section D-D’ was used to analyze the proposed fill slope overlying Saugus Formation, Sunshine Ranch member, dipping approximately 0 to 2 degrees out-of-slope. The results of the slope stability analyses on cross-section D-D’ indicate adequate factors of safety greater than 1.5 and 1.1 (as applicable), for rotational and translational modes of failure, under static and pseudostatic conditions, respectively, and the analyses are included in Appendix F.

Cross-section E-E’ was used to analyze the proposed cut slope above the planned basin into Saugus Formation, Sunshine Ranch member, dipping approximately 0-10 degrees out-of-slope. The results of the slope stability analyses on cross-section E-E’ under rapid drawdown conditions indicate adequate factors of safety greater than 1.5 and 1.1 (as applicable), for rotational and translational modes of failure, under static and pseudostatic conditions, respectively, and the analyses are included in Appendix F. Although analysis show the slope meets standard criteria, we conclude there is a possibility for surficial instability for the west-facing slope and have thus recommended a stabilization keyway for this area. Additionally, design cut slopes show two different soil types (alluvium and bedrock). It is our conclusion that a uniform soil is prudent for this basin to r educe potential differential weathering over time.

Cross-section H-H’ was used to analyze the proposed cut slope into Saugus Formation, Sunshine Ranch member, dipping approximately 4 to 11 degrees out-of-slope. The results of the slope stability analyses on cross-section H-H’ indicate adequate factors of safety greater than 1.5 and 1.1 (as applicable), for rotational and translational modes of failure, under static and pseudostatic conditions, respectively, and the analyses are included in Appendix F. As that for cross-section A-A’, a stability fill is shown at the toe of the slope to indicate where and how design fill should be established for the project.

Cross-section O-O’ was used to analyze the proposed cut condition with Saugus Formation, Sunshine Ranch member, dipping approximately 6 to 14 degrees out of slope. The results of the slope stability analyses on cross-section O-O’ indicate adequate factors of safety greater than 1.5 and 1.1 (as applicable), for rotational and translational modes of failure, under static and pseudostatic conditions, respectively, and the analyses are included in Appendix F. Cross-section O-O’ also indicates a stability fill at the toe of the slope to indicate establishment of design fill into competent soils.

Cross-section P-P’ was used to analyze the proposed fill over cut slope condition with Saugus Formation, Sunshine Ranch member, dipping approximately 6 to 14 degrees out of slope. Based on analysis, this slope area will require a stabilization fill key at least 20 feet wide with a 2:1 backcut. The results of the slope stability analyses on cross-section P-P’, considering the stabilization fill, indicate adequate factors of safety greater than 1.5 and 1.1 (as applicable), for rotational and translational modes of failure, under static and pseudostatic conditions, respectively, and the analyses are included in Appendix F. Cross-section P-P’ shows a keyway for the reasons described in the previous analyzed cross-sections.

Cross-section Q-Q’ was used to analyze the proposed approximately 25-foot-high fill slope overlying Saugus Formation, Sunshine Ranch member, dipping approximately 4 to 14 degrees out of slope. The results of the slope stability analyses on cross-section Q-Q’ indicate adequate factors of safety greater than 1.5 and 1.1 (as applicable), for rotational and translational modes of failure, under static

and pseudostatic conditions, respectively, and the analyses are included in Appendix F. Q-Q' also requires a keyway to establish design fill soils.

Additional cross sections G-G', C-C' and F-F' show stability fills at the designed toe of slope to indicate where design fill is established for the project. These cross-sections were not analyzed but are considered similar to those evaluated above, while the keyway brings consistency to the geotechnical design.

2.10 Laboratory Testing

Laboratory testing of the onsite soils was performed on representative samples obtained from the borings and included moisture and density tests, maximum density and optimum moisture content, sieve analysis, Atterberg Limits, expansion, and corrosion testing. Laboratory testing was performed by EGLAB, Inc. (EGL). LGC has reviewed the laboratory test data, procedures and results performed by EGL with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing). A discussion of the tests performed, and printout of the laboratory test results are presented in Appendix C.

These results should be confirmed at the completion of site grading.

Expansion potential testing indicated an expansion index of 98, "High" (2010 California Building Code, CBC). Sulfate testing indicated soluble sulfate content was 0.027 percent Exposure Class S0 (negligible) ACI 318R-14 Table 19.3.1.1).

A corrosion suite (pH, resistivity, and chloride content) was performed on a representative sample of the onsite soils. The result for the resistivity test indicated a minimum resistivity value of 390 ohm-centimeters, pH value of 8.07, and chloride content of 700 parts-per-million (ppm). Caltrans defines a corrosive area where any of the following conditions exist: the soil contains more than 500 ppm of chlorides, more than 2,000 ppm (0.2 percent) of sulfates, or a pH of 5.5 or less. Test results are provided in Appendix C.

2.11 Percolation Testing

As a part of the geotechnical investigation of the subject site, LGC excavated three 8-inch diameter hollow-stem borings, (B-LGC-1 through B-LGC-3) to perform percolation testing. Two borings (B-LGC-1 and B-LGC-2) were monitored over a 24-hour period to determine seasonal groundwater, and one boring (B-LGC-3) was tested for percolation. The approximate locations of the borings is shown on the Geotechnical Map (Plate 1) at the location where the water infiltration system is planned.

Upon completion of drilling, a 4-inch diameter slotted PVC well casing was installed in the boring to prevent caving during percolation testing. The pipe was installed at a depth of 17 to 20 below the existing surface; solid PVC was extended to the surface. The annular space between the well casing and the boring was backfilled with pea gravel to 17 feet and capped with bentonite to isolate the depth for the percolation test. The boring was pre-saturated on October 6, 2020.

On October 7, 2020, the percolation test was performed to evaluate the percolation rate for the subsurface soil layers for use in onsite disposal of stormwater runoff. The test method employed was the falling head percolation test procedure.

Percolation testing was performed at the location and on soil layers anticipated to conform with the designed proposed storm water treatment system. The depth interval where percolation testing was performed was approximately 17 to 20 feet below the existing grade.

The percolation test was conducted by filling the hole with clear water to the same level (16.25 feet) below existing ground surface. The drop in water level was measured at 30-minute intervals from a fixed initial reference point located at the surface. Testing was performed for approximately five hours and was completed when three successive readings that did not vary by more than ten percent. Percolation test data recorded in the field are presented in Appendix E.

Percolation test results are provided in inches per hour. The measured percolation test rate is ***1.68*** **inches per hour** for the soils layers (bedrock) between 17 and 20 feet below the ground surface. Using Los Angeles County Low Impact Development guidelines for storm water infiltration a total reduction factor of 18 was determined based on test type, soil variability and unknown long-term silting and maintenance; the adjusted design infiltration rate is **0.0933 inches per hour.** This rate is below the minimum design requirement of 0.3 inches per hour.

3.0 CONCLUSIONS

Based on the results of our geotechnical evaluation and review, it is our opinion that the proposed site development is feasible from a geotechnical standpoint, provided the following recommendations included in this report are incorporated into the project plans and specifications, and followed during site grading and construction.

Our geotechnical conclusions are as follows:

- The site is not located within an Alquist-Priolo Earthquake Fault Zone (Hart, 1997), though the San Gabriel fault is less than 1 mile from the site to the south.
- The site is partially located within an area deemed to have a potential for liquefaction (City of Santa Clarita Website). Total removal of alluvium during grading will reduce the potential for liquefaction to very low to nil.
- Groundwater was not encountered in our geotechnical borings to the maximum explored depth of 31.5 feet below the existing grade on the lower northern portion of the site, or 80 feet below the ground surface on the southern higher portion. As such groundwater is not anticipated to be a concern for the project.
- Based on the subsurface exploration and our review, the site is underlain by a thin veneer of topsoil, undocumented artificial fill and shallow alluvium over the Saugus Formation, Sunshine Ranch Member. The undocumented fill and alluvial soils are considered potentially compressible/collapsible and should be remove prior to fill placement or where support of structures is required.
- In general, site review indicates bedrock is composed chiefly of sandstone and siltstone with conglomerate and/or claystone with undulating and/or gradational lithologic changes between soil types.
- Bedrock is interpreted as dipping shallowly (7 to 14 degrees) to the northwest and west.
- Due to bedrock orientation, stability fills are recommended for the slopes dipping to the west and northwest.
- Additional stability fills are recommended for slope continuity, to establish design fill and to create a more uniform product across the site.
- Two possible landslides are indicated on the geotechnical map and should be removed in their entirety if they exist.
- The magnitude weighted peak horizontal ground acceleration due to a maximum probable earthquake is estimated to be 1.206g.
- A single oil well was identified within the subject site during our review. This well should be reviewed by a qualified consultant to determine relevance to the site.
- Laboratory test results of the onsite soils indicate a high expansion potential.
- Laboratory test results of the onsite soils indicate negligible soluble sulfates. Soil resistivity is 390 ohm-centimeters and is considered very corrosive to metals.
- The onsite soils below recommended remedial grading/excavation depths have a low potential for static settlement (i.e., slightly compressible).
- From a geotechnical perspective, the existing onsite soils are suitable for use as fill, provided they are relatively free from rocks (larger than 6 inches in maximum dimension), construction debris, and organic material.

4.0 RECOMMENDATIONS

4.1 Site Earthwork

We anticipate that earthwork at the site will consist of demolition of existing structures and site preparation and grading followed by construction of slab-on-grade type foundations for the proposed residential and commercial structures, installation of utilities, subsequently followed by paving/pouring of driveways.

We recommend that earthwork onsite be performed in accordance with the recommendations herein, the City of Santa Clarita and the County of Los Angeles guidelines and the General Earthwork and Grading Specifications for Rough Grading included in Appendix G. In case of conflict, the recommendations in the following sections shall supersede those included as part of Appendix G.

4.1.1 Site Preparation

Prior to grading of areas to receive structural fill or engineered structures, all ground surfaces should be cleared of obstructions, any existing debris and stripped of vegetation. Heavy vegetation and debris should be removed and properly disposed of offsite. All debris from any demolition activities at the site should also be removed and disposed off-site. Holes or depressions resulting from the removal of buried obstructions should be replaced with compacted fill.

Following remedial removals, areas to receive fill should be scarified to a minimum depth of 12 inches, brought to a near-optimum moisture condition, and recompacted to at least 90 percent relative compaction (based on ASTM Test Method D1557). Fills that have a depth of 40 feet or greater require at least 93 percent relative compaction.

4.1.2 Removal and Recompaction

As discussed in Section 2.2, the proposed site is locally underlain by unsuitable soils, which may settle under the addition of water, surcharge of fill and/or foundation loads. Therefore, compressible materials, within areas planned to support engineered fill, roads or the proposed building structures, should be excavated to competent material and replaced with compacted fill soils. We anticipate removals on the site to be on the order of approximately 7 to 13 feet below existing grade mostly within mapped alluvial areas; however, localized, deeper removals should be anticipated where deemed necessary by the geotechnical consultant based on observations during grading. Prior to placing fill, removal bottoms should be scarified to a minimum depth of 6 inches, brought to at least optimum-moisture content, and recompacted. The fill prism beneath the building footings should extend downward at a 1:1 (horizontal to vertical) slope from the outside edge of the footing bottoms. The removals should extend a minimum of 5 feet beyond the building perimeters. In general, the intent of the remedial removals is to remove all undocumented fills, alluvium, any landslide debris and any other unsuitable soils.

Due to the potential of variable material types in bedrock at design cuts, all cut lots should be over-excavated and provided with a minimum of five feet of compacted fill. Transition lots may need additional over-excavation if the transition slope is steeper than a 2:1 horizontal to

vertical (h:v) inclination to a minimum depth of 20 feet below finish surface to reduce the potential of differential settlement.

Keyway have been recommended for west and northwest facing slopes along with design slopes to establish base fills. For constructability, we recommend extending the keyways as shown on the geotechnical map (Plate 1). Keyways should be a minimum of two feet deep into competent soil at the tow and twenty feet wide with a minimum of 20 feet of fill maintained at the top of slope. Keyways should have a 1-foot tilt towards the heel.

From a geotechnical perspective, material that is removed may be placed as fill provided the material is relatively free from rocks (greater than 6 inches in maximum dimension), organic material and construction debris, is moisture-conditioned or dried (as needed) to obtain above-optimum moisture content, and then recompacted prior to additional fill placement or construction.

4.1.3 Shrinkage/Bulking

The preliminary estimated shrinkage factors of 5 to 10 percent for the undocumented fill and alluvium may be used for consideration of earthwork calculations. The Saugus Formation bedrock shrink/bulk will be variable with depth. The upper 20 feet is expected to shrink approximately 3 percent and removals below approximately 20 feet is expected to bulk approximately 3 percent. These are preliminary rough estimates which will vary with depth of removal, stripping losses, field conditions at the time of grading, etc. In addition, handling losses are not included in the estimates.

4.1.4 Temporary Excavation Stability

All excavations for the proposed development should be performed in accordance with current OSHA (Occupational Safety and Health Agency) regulations and those of other regulatory agencies, as appropriate.

Temporary excavations maybe cut vertically up to five feet. Excavations over five feet should be slot-cut, shored, or cut no steeper than 1H: 1V (horizontal, H: vertical, V) slope gradient. Surface water should be diverted away from the exposed cut, and not be allowed to pond on top of the excavations. Temporary cuts should not be left open for an extended period of time. Planned temporary conditions should be reviewed by the geotechnical consultant of record in order to reduce the potential for sidewall failure. The geotechnical consultant may provide recommendations for controlling the length of sidewall exposed.

4.1.5 Fill Placement and Compaction

From a geotechnical perspective, the onsite soils are suitable for use as compacted fill provided they are screened of rocks greater than 6-inches in maximum dimension, organic material, and construction debris. Areas prepared to receive structural fill and/or other surface improvements should be scarified to a minimum depth of 6-inches, brought to at least optimum-moisture

content, and recompacted to at least 90 percent relative compaction (based on ASTM Test Method D1557). 93 percent relative compaction is required where fill depths are greater than 40 feet to surface. The optimum lift thickness to produce a uniformly compacted fill will depend on the type and size of compaction equipment used. In general, fill should be placed in uniform lifts generally not exceeding 8-inches in loose thickness. Placement and compaction of fill should be performed in accordance with local grading ordinances under the observation and testing of the geotechnical consultant.

4.1.6 Trench Backfill and Compaction

The onsite soils may generally be suitable as trench backfill provided, they are screened of rocks and other material over 6-inches in diameter and organic matter. Trench backfill should be compacted in uniform lifts (generally not exceeding 8-inches in compacted thickness) by mechanical means to at least 90 percent relative compaction (per ASTM Test Method D1557).

If trenches are shallow and the use of conventional equipment may result in damage to the utilities; clean sand, having sand equivalent (SE) of 30 or greater, should be used to bed and shade the utilities. Sand backfill should be densified. The densification may be accomplished by jetting or flooding and then tamping to ensure adequate compaction. A representative from LGC should observe, probe, and test the backfill to verify compliance with the project specifications.

4.2 Foundations

4.2.1 General

Preliminary recommendations for foundation design and foundation construction are presented herein. When the structural loads for the proposed structures are known they should be provided to our office to verify the recommendations presented herein.

The following foundation recommendations are provided for residential structures. Foundations recommended for the proposed structures are: (1) Post-tension Foundations; or (2) Mat foundations. For preliminary design purposes a high expansion potential should be considered for design. The as-graded soil conditions should be verified.

Foundation recommendations for the planned hotel will be provided once information regarding structural loads and configuration of the hotel are available.

The information and recommendations presented in this section are not meant to supersede design by the project structural engineer or civil engineer specializing in the structural design nor impede those recommendations by a corrosion consultant. Should conflict arise, modifications to the foundation design provided herein can be provided.

4.2.2 Bearing Capacity

Shallow foundations may be designed for a maximum allowable bearing capacity of 1,500 lb/ft^2 (gross), for continuous footings a minimum of 15 inches wide and 18 inches deep and spread footings 24-inches wide and 18-inches deep, into certified compacted fill. A factor of

safety greater than 3 was used in evaluating the above bearing capacity value. This value maybe increased by 300 psf for each additional foot in depth and 300 psf for each additional foot of width to a maximum value of 2,500 psf.

Lateral forces on footings may be resisted by passive earth resistance and friction at the bottom of the footing. Foundations may be designed for a coefficient of friction of 0.35, and a passive earth pressure of 250 lb/ft^2/ft. The passive earth pressure incorporates a factor of safety of greater than 1.5.

All footing excavations should be cut square and level as much as possible, and should be free of sloughed materials including sand, rocks and gravel, and trash debris. Subgrade soils should be pre-moistened for the assumed high expansion potential (to be confirmed at the end of grading).

4.2.3 Post-Tension Foundations

Based on the site geotechnical conditions after rough grading, the site is considered suitable for the support of the anticipated residential structures using a post-tensioned slab-on-grade foundation system for high expansion potential (91-130 Expansion Index). The following section summarizes our recommendations for the foundation system.

TABLE 2

Preliminary Geotechnical Parameters for Post-Tensioned Foundation Slab Design, (PTI, 2006)

Parameter	Value
Expansion Index	High Expansion[2]
Clay Mineral Type	Montmorillonite (assumed)
Thornthwaite Moisture Index	-20
Depth to Constant Soil Suction (depth to constant moisture content over time, but within C.B.C. limits)	7 feet
Constant Soil Suction	PF 3.6
Moisture Velocity	0.7 inches/month
Center Lift Edge moisture variation distance, e_m Center lift, y_m	 9.0 feet 0.66 inches
Edge Lift Edge moisture variation distance, e_m Edge lift, y_m	 5.0 feet 1.6 inches
Modulus of Subgrade Reaction, k (assuming presoaking as indicated below)	85 pci
Perimeter foundation embedment below finish grade (for a conventional PT foundation)	24 inches
Perimeter foundation reinforcement	2 No. 5 Bars (or equivalent as necessary)[3]
Minimum slab thickness	5 inches[3]
Under slab moisture retarder and sand layer	15-mil thick polyolefin (or equivalent) in conformance with an ASTM E 1745 Class A material underlain by 1 inch of sand[4]

1. Presaturate slab subgrade to a minimum 1.3 times optimum moisture to a depth of 24 inches below the ground surface.
2. Data obtained from finish grade laboratory testing performed at the completion of grading.
3. Recommendations for foundation reinforcement are ultimately the purview of the foundation engineer/structural engineering based upon the geotechnical criteria presented in this report, and structural engineering considerations.
4. The underslab moisture retarder (i.e. an equivalent capillary break method) should consist of a 15-mil thick polyolefin (or equivalent) in conformance with ASTM E 1745 Class A material underlain by a minimum 1-inch of sand, as needed. The sand layer requirements above the vapor barrier are the purview of the foundation engineer/structural engineer, and should be provided in accordance with ACI Publication 302 "Guide for Concrete Floor and Slab Construction".

4.2.4 Mat Foundation

Mat foundation can be used for support of the proposed building structures. An allowable soil bearing pressure of 1,500 psf may be used for the design of the mat slab. The allowable bearing value is for total dead loads and frequently applied live loads and may be increased by one-third for short durations of loading which will include the effect of wind or seismic forces. A coefficient of vertical subgrade reaction, k, of 100 pounds per cubic inch (pci) may be used to evaluate the pressure distribution beneath the mat foundation. The magnitude of total and differential settlements of the mat foundation will be a function of the structural design and stiffness of the mat.

Resistance to lateral loads can be provided by friction acting at the base of foundations and by passive earth pressure. A coefficient of friction of 0.35 may be used.

4.2.5 Foundation Settlement

Based on our current understanding of the project, the results of our site investigation and the recommended remedial grading with shallow foundations embedded into compacted fills, we estimate the post-construction settlement of the site to be less than 1-inch with a differential settlement of approximately of 0.5-inch in 30 feet for residential structures.

Potential settlements for the planned hotel will be evaluated once more information regarding structural loads configuration of the hotel are available.

4.3 Lateral Earth Pressures for Retaining Walls (If Any)

The following lateral earth pressures may be used for the design of any future site retaining walls (If Any). Due to the potentially expansive nature of onsite soils, we recommend site retaining walls be backfilled with select soils. Select soils should consist of clean, granular soils (less than 15 percent passing the No. 200 sieve) of very low expansion potential (expansion index 20 or less based on ASTM D4829). The recommended lateral pressures for approved select soils for level or sloping backfill are presented in the table below.

TABLE 3
Lateral Earth Pressures for Retaining Walls

Conditions	Equivalent Fluid Weight (pcf)		
	Level Backfill	2:1 Backfill Sloping Upwards	Seismic Earth Pressure (pcf) *
	Approved Select Material	Approved Select Material	
Active	40	64	19
At Rest	60	87	31

* This dynamic pressure should be added to the pressures given in Table 2 and considered as a triangular distribution with the resultant acting at 1/3H in relation to the base of the retaining wall footing (where H is the retained height). The aforementioned incremental seismic load was determined in general

accordance with LA County Administrative Manual S004.0 for determining earth pressures as a result of seismic events.

For design purposes, the recommended equivalent fluid pressure for each case for walls founded above the static ground water and backfilled with approved select soils is provided in Table 3. The equivalent fluid pressure values assume free-draining conditions. If conditions other than those assumed above are anticipated, the equivalent fluid pressure values should be provided on an individual-case basis by the geotechnical engineer. Surcharge loading effects from the adjacent structures should be evaluated by the geotechnical and structural engineers. Retaining wall structures should be provided with appropriate drainage and appropriately waterproofed. The outlet pipe should be sloped to drain to a suitable outlet. Typical wall drainage design is illustrated on Figure 3. It should be noted that the recommended subdrain does not provide protection against seepage through the face of the wall and/or efflorescence. Efflorescence is generally a white crystalline powder (discoloration) that results when water, which contains soluble salts, migrates over a period of time through the face of a retaining wall and evaporates. If such seepage or efflorescence is undesirable, retaining walls should be waterproofed to reduce this potential.

Lateral earth pressures are provided as equivalent fluid unit weights, in psf/ft of depth or pcf. These values do not contain an appreciable factor of safety. A soil unit weight of 120 pcf may be assumed for calculating the actual weight of soil. For sliding resistance, a friction coefficient of 0.35 may be used at the concrete and soil interface. Wall footings should be designed in accordance with structural considerations. Refer to Sections 4.2.2 for passive resistance and allowable soil bearing, respectively.

4.4 Preliminary Pavement Recommendations

Based on an assumed R-value of 15, we recommend the following preliminary minimum street sections for Traffic Indices of 5 and 6 (Table 4). These recommendations should be confirmed with R-value testing of representative near-surface soils at the completion of grading. Final street sections should be confirmed by the project civil engineer based upon the projected Traffic Index. In addition, additional sections can be provided based on other traffic indices.

TABLE 4
Preliminary Pavement Design Sections

Assumed Traffic Index	5	6
R-Value Subgrade	15	15
AC Thickness	3.0 inches	3.5 inches
Base Thickness	8.0 inches	10.0 inches

Portland Cement Concrete Pavement (PCCP) may be designed using a minimum of 6-inches of Portland cement concrete over 4-inches of compacted aggregate base. The modulus of rupture of the concrete should be a minimum of 500 pounds per square inch (psi) at 28 days. Contraction joints should be placed at maximum 15-foot spacing. Where the outer edge of a concrete pavement connects to an asphalt pavement, the concrete slab should be thickened by 50 percent at a taper not to exceed a slope of 1 in 10. This section is only applicable for passenger car driveway areas and should be thickened if heavy truck loading is anticipated. In addition, additional sections can be provided based on other desired anticipated traffic loadings.

Aggregate base should conform to the requirements of the latest edition of the Standard Specifications for Public Works Construction ("Greenbook"). Aggregate base should be compacted to a minimum of

95 percent relative compaction over subgrade compacted to a minimum of 90 percent relative compaction per ASTM- D1557.

4.5 Corrosivity to Concrete and Metal

The National Association of Corrosion Engineers (NACE) defines corrosion as "a deterioration of a substance or its properties because of a reaction with its environment." From a geotechnical viewpoint, the "environment" is the prevailing foundation soils and the "substances" are the reinforced concrete foundations or various buried metallic elements such as rebar, piles, pipes, etc., which are in direct contact with or within close vicinity of the foundation soil.

In general, soil environments that are detrimental to concrete have high concentrations of soluble sulfates and/or pH values of less than 5.5. ACI 318R-14 Table 19.3.1.1, provides specific guidelines for the concrete mix design when the soluble sulfate content of the soils exceeds 0.1 percent by weight or 1,000 ppm. The minimum amount of chloride ions in the soil environment that are corrosive to steel, either in the form of reinforcement protected by concrete cover, or plain steel substructures such as steel pipes or piles, is 500 ppm per California Test 532.

Based on site soil testing, the onsite soils are classified as having a S0 exposure class (negligible) sulfate condition in accordance with ACI 318R-14 Table 19.3.1.1. As a preliminary recommendation due to results of sulfate content testing, concrete in contact with onsite soils should be designed in accordance with ACI 318R-14 Table 19.3.1.1 for the negligible category. It is also our opinion that onsite soils should be considered very corrosive to buried metals. The client and/or other members of the design team should consider this potential as they determine necessary. LGC is not a corrosion consultant and does not provide recommendations related to corrosion.

4.6 Nonstructural Concrete Flatwork

Concrete flatwork (such as walkways, bicycle trails, etc.) have a high potential for cracking due to changes in soil volume related to soil-moisture fluctuations because these slabs are typically much thinner than foundation slabs and are not reinforced with the same dynamic as foundation elements. To reduce the potential for excessive cracking and lifting, concrete should be designed in accordance with the minimum guidelines outlined in Table 5. These guidelines will reduce the potential for irregular cracking and promote cracking along construction joints but will not eliminate all cracking or lifting. Thickening the concrete and/or adding additional reinforcement will further reduce cosmetic distress.

TABLE 5
Nonstructural Concrete Flatwork

	Homeowner Sidewalks	Private Drives	Patios/Entryways	City Sidewalk Curb and Gutters
Minimum Thickness (in.)	4 (nominal)	5 (full)	5 (full)	City/Agency Standard
Presaturation	Wet down	Presoak to 12 inches	Presoak to 12 inches	City/Agency Standard
Reinforcement	—	No. 3 at 24 inches on centers	No. 3 at 24 inches on centers	City/Agency Standard
Thickened Edge	—	8" x 8"	—	City/Agency Standard
Crack Control	Saw cut or deep tool joint to a minimum of 1/3 the concrete thickness	Saw cut or deep tool joint to a minimum of 1/3 the concrete thickness	Saw cut or deep tool joint to a minimum of 1/3 the concrete thickness	City/Agency Standard
Maximum Joint Spacing	5 feet	10 feet or quarter cut whichever is closer	6 feet	City/Agency Standard
Aggregate Base	—	2	2	City/Agency Standard

4.7 Control of Surface Water and Drainage

Positive drainage of surface water away from structures is very important. No water should be allowed to pond adjacent to buildings. Positive drainage may be accomplished by providing drainage away from buildings at a gradient of at least 5 percent for a distance of at least 10 feet, and further maintained by a swale or drainage path at a gradient of at least 2 percent. Where necessary, drainage paths may be shortened by use of area drains and collector pipes.

Planters with open bottoms adjacent to buildings should be avoided. Planters should not be designed adjacent to buildings unless provisions for drainage, such as catch basins, liners, and/or area drains, are made. Overwatering must be avoided.

4.8 Construction Observation and Testing

The recommendations provided in this report are based on limited subsurface observations and geotechnical analysis. The interpolated subsurface conditions should be checked in the field during construction by a representative of LGC.

Construction observation and testing should also be performed by the geotechnical consultant during future grading, excavations, backfill of utility trenches, foundation or retaining wall construction or when an unusual soil condition is encountered at the site. Grading plans, foundation plans, and final project drawings should be reviewed by this office prior to construction.

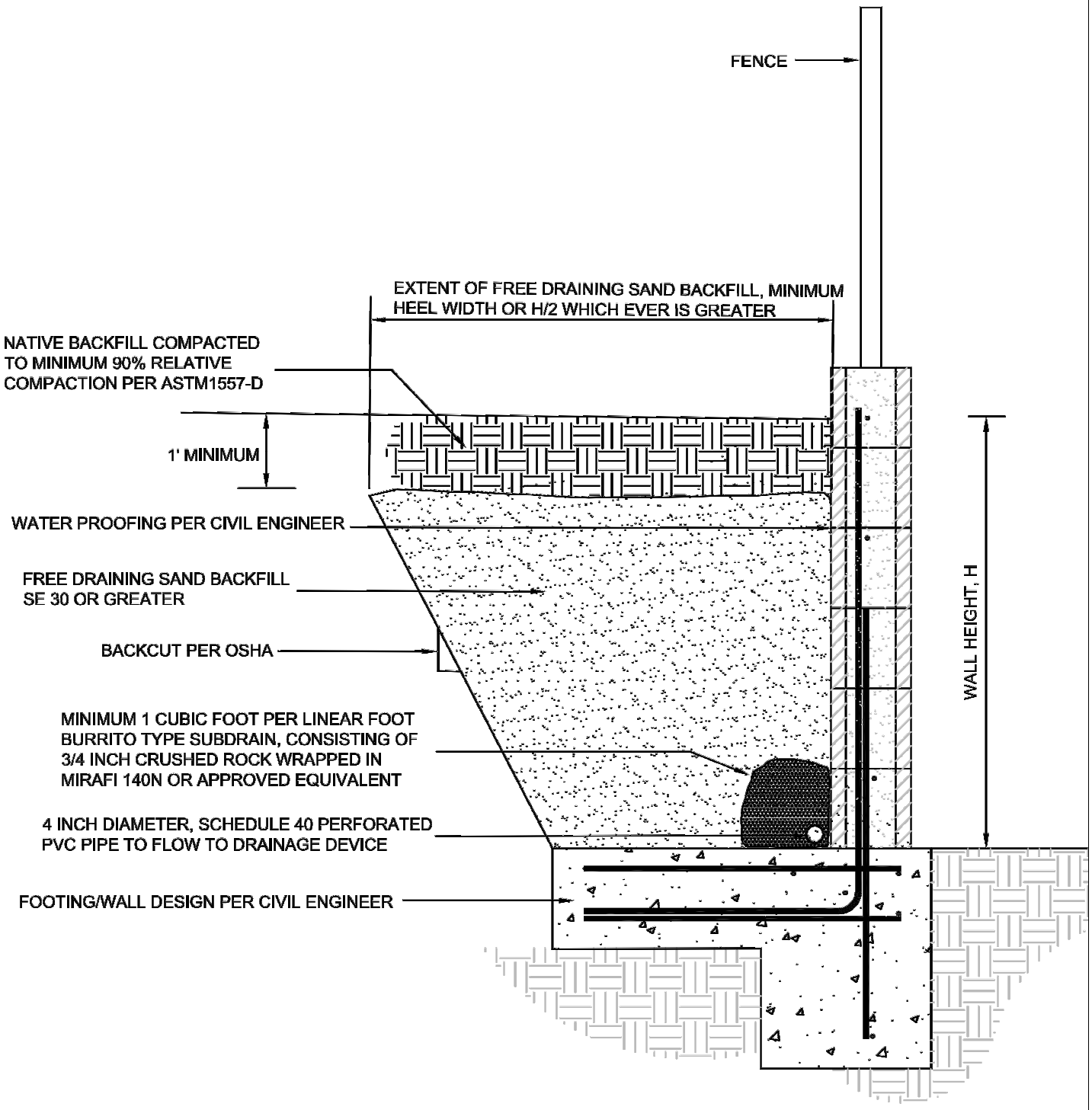
5.0 LIMITATIONS

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report. The samples taken and submitted for laboratory testing, the observations made, and the in-situ field testing performed are believed representative of the entire project; however, soil and geologic conditions revealed by excavation may be different than our preliminary findings. If this occurs, the changed conditions must be evaluated by the project soils engineer and geologist and design(s) adjusted as required or alternate design(s) recommended.

This report is issued with the understanding that it is he responsibility of the owner, or of his/her representative, to ensure that the information and recommendations contained herein are brought to the attention of the architect and/or project engineer and incorporated into the plans, and the necessary steps are taken to see that the contractor and/or subcontractor properly implements the recommendations in the field. The contractor and/or subcontractor should notify the owner if they consider any of the recommendations presented herein to be unsafe.

The findings of this report are valid as of the present date. However, changes in the conditions of a property can and do occur with the passage of time, whether they be due to natural processes or the works of man on this or adjacent properties.

In addition, changes in applicable or appropriate standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated wholly or partially by changes outside our control.



LGC	**Figure 2: Retaining Wall Detail Sand Backfill** **Veluzat Property, City of Santa Clarita, California**		
		Project Name	Golden Valley
		Project No.	203003-01
		Eng. / Geol.	ACR/MCH/NLK
		Scale	not to scale
		Date	November 2020

APPENDIX A

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APPENDIX B

EXPLORATION LOGS

Test Pit Logs TP-1 through TP-10

And

Boring Logs B-LGC-LB and B-LGC-1 through B-LGC-3

Geotechnical Boring Log LB-1

Date:	9/15/2020		**Page:** 1 of 3
Project Name:	Veluzat/LDC-Golden Valley		**Project Number:** 203003-01
Drilling Company:	Tri-Valley		**Type of Rig:** Bucket Auger
Drive Weight:			**Drop:** 12" **Hole Dia:** 24"
Elevation of Top of Hole:	1716+/-		**Hole Location:**

Elevation (ft)	Depth (ft)	Graphic Log	Attitudes	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION
									Logged By: NLK/MCH Sampled By: NLK
1716	0								**Top Soil:** 0'-Medium brown to dark brown, sandy SILT, dry, soft to medium stiff; roots, some gravel, porous. **Saugus Formation/Sunshine Ranch Member (Tsr):**
				Bulk 1 (1-5')					1'- Pale yellow-brown SILTSTONE, dry, hard; granitic cobbles, roots present, weathered.
1711	5			R1	1 4	101.2	10.9		5.5'- Same as above, caliche, root hairs.
									7.5'- Medium brown SILTSTONE, dry, hard; gradational contact into CLAYSTONE with gravel and caliche, paleosol.
1706	10			R2	3 5	110.6	5.8		9.0'- Pale yellow SILTSTONE, dry to damp, hard; grading into very fine to coarse SANDSTONE.
			Channel: N60E/34SE and N55E/36NW	Bulk 2 (10-15')					11'- Orange-brown gravel SANDSTONE conglomerate, dry to damp, very dense; minor carbonate development.
			Channel: N10E/40NW and E/34S						13'- Dark gray clayey SILTSTONE, damp, hard; caliche, roots; channel attitudes:N55E/36NW N60E/34SE.
1701	15			R3	3 4	107.7	14.7		14'- Pale gray medium to very coarse SANDSTONE, dry to damp, dense; roots, cross-cutting channel: N10E/40NW and E/34S.
			Channel: N47E/64NW and S55W/36SW						15.5'- Dark brown-gray clayey SILTSTONE with caliche. 17.5'- Pale yellow-orange medium to very coarse gravel SANDSTONE conglomerate, roots, cemented; gradational contact, channel attitudes: N47E/64NW and S55W/36SW.
1696	20			R4	4 6	108.6	11.3		18.7'- Pale yellow SILSTONE grading into dark brown-gray CLAYSTONE, damp, hard; pencil sized roots observed.
									19.5'-Light brown sandy SILTSTONE with pebbles.
			B:N14E/7NW	B-1					20'- Very Dense/Hard; no roots observed. 21'- Caliche.
			B:N20E/8SE						22'- Dark brown to reddish-brown CLAYSTONE; caliche, paleosol, gradational contact, B:N14E/7NW.
1691	25			R5	10 13 for 1"	119.9	3.8		24'- Light gray, very coarse SANDSTONE; B: N20E/8SE.
				Bulk 3 (22-27')					26'- Light gray cemented gravel.
									27'- Pale yellow-orange silty very fine sand grading into gravel/cobble conglomerate; cemented.
1686	30								

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Geotechnical Boring Log LB-1

Date:	9/15/2020		**Page: 2 of 3**
Project Name:	Veluzat/LDC-Golden Valley	**Project Number:**	203003-01
Drilling Company:	Tri-Valley	**Type of Rig:**	Bucket Auger
Drive Weight:		**Drop:** 12"	**Hole Dia:** 24"
Elevation of Top of Hole:	1716	**Hole Location:**	

Elevation (ft)	Depth (ft)	Graphic Log	Attitudes	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION
									Logged By: NLK/MCH Sampled By: NLK
1686	30			R6	23 27 for 3"	115.2	3.1		30'- interbedded yellow-brown and orange fine to coarse SANDSTONES.
				Bulk 4 (28-32')					
1681	35		B:N40E/8NW	R7	11 21	123.8	12.3		34.5'- Medium to dark brown clayey SILTSTONE; gradational contact, B: N40E/8NW.
			B:N12W/7SW	B-2					36.5'- Reddish-brown to red-purple CLAYSTONE, internally sheared, very steeply diping non plannar shears, B: N12W/7SW.
									39.5'- Medium brown SILTSTONE.
1676	40			R8	13 40	128.9	9.1		40.5'- Caliche.
				Bulk 5 (35-40')					42'- Yellow-brown very fine SANDSTONE.
									43.5'- Caliche.
1671	45			R9	7 14	110.8	19.3		44'- Medium brown-gray SILTSTONE.
			B:N30E/6NW						46'- Reddish-brown CLAYSTONE; caliche, paleosol, gradational contact, B: N30E/6NW.
									47'- Brown-gray SILTSTONE.
									48.5'- Caliche.
1666	50			R10	23 20	136.3	2.8		50'- Pale yellow very fine SANDSTONE; cemented.
									52'-Dark brown-gray SILTSTONE.
			B:N30E/14NW						53'- B:N30E/14NW
1661	55			R11	18 21 for 1"	112	13.2		56'- Yellow-gray silty fine SANDSTONE; gradational contact.
									58'- Dark brown-gray clayey SILTSTONE, caliche.
1656	60								

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Geotechnical Boring Log LB-1

Date:	9/15/2020		**Page:** 3 of 3
Project Name:	Veluzat/LDC-Golden Valley		**Project Number:** 203003-01
Drilling Company:	Tri-Valley		**Type of Rig:** Bucket Auger
Drive Weight:			**Drop:** 12" **Hole Dia:** 24"
Elevation of Top of Hole:	1716		**Hole Location:**

Elevation (ft)	Depth (ft)	Graphic Log	Attitudes	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION Logged By: NLK/MCH Sampled By: NLK
1656	60			R12	15 23	123.0	11.9		60'- Interbedded yellow-gray and orange-brown fine to coarse SANDSTONE. 62'- Brown-gray SILTSTONE, caliche. 63.5'- Brown-gray silty CLAYSTONE transitioning to reddish gray color.
1651	65		B:N35E/14NW	R13	8 25	106.2	21		66'- Reddish brown silty CLAYSTONE; caliche at base, paleosol, transition to unoxidized, B: N35E/14NW. 67'- Blue-gray clayey SILTSTONE grading into dark brown-gray silty CLAYSTONE (4-6" thick).
1646	70			R14	13 34	127.9	7.9		68'- Blue-gray SILTSTONE;damp, hard; unoxidized, darkening with depth, massive. 70'- Same as above with gravel.
1641	75			R15	16 32	124.2	11.5		75'- Same as above, flecks of white.
1636	80			R16	22 32	115.8	16.7		80'- Same as above, Dark blue-gray.
1631	85								Total Depth 80.0' No groundwater encountered Backfilled 9/15/2020
1626	90								

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Geotechnical Boring Log B-LGC-1

Date: 10/6/2020 | **Page:** 1 of 1

Project Name: Veluza/LDC Golden Valley | **Project Number:** 203003-01

Drilling Company: Choice Drilling | **Type of Rig:** Hollow Stem

Drive Weight: 140lbs | **Drop:** 30" | **Hole Dia:** 8"

Elevation of Top of Hole: 1583+/- | **Hole Location:**

Logged By: NLK

Sampled By: NLK

Elevation (ft)	Depth (ft)	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
1583	0						Topsoil: 0'-Medium to dark brown sandy SILT with gravel, dry, soft; rooted	
							Saugus Formation-Sunshine Ranch Member(Tsr): 2'- Pale yellow medium brown sandy SILTSTONE, dry, soft to medium stiff	
1578	5	SPT1	5 7 11				5'- Pale yellow brown silty fine to medium coarse SANDSTONE, dry, medium dense; some gravel 6'- Same as above with less gravel	
1573	10	SPT2	50/6				10'- Same as above, poor recovery, broken cobble in sampler, broken cobbles in cuttings, difficult to drill	
1568	15	SPT3	11 8 7				15'- Light to medium brown medium to very coarse SANDSTONE with some gravel, damp, medium dense 19'- Damp to moist	
1563	20	SPT4	8 6 6				20'- Same as above with caliche	
1558	25	SPT5	9 12 14				25'- Same as above, abundant caliche	
	30						Total Depth 26.5' No groundwater encounter, rechecked after 24hrs Backfilled 10/7/2020	

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Geotechnical Boring Log B-LGC-2

Date: 10/6/2020 | **Page:** 1 of 2

Project Name: Veluza/LDC Golden Valley | **Project Number:** 203003-01

Drilling Company: Choice Drilling | **Type of Rig:** Hollow Stem

Drive Weight: 140lbs | **Drop:** 30" | **Hole Dia:** 8"

Elevation of Top of Hole: 1585+/- | **Hole Location:**

Logged By: NLK

Sampled By: NLK

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
1585	0							Saugus Formation-Sunshine Ranch Member(Tsr): 0'- Pale yellow to light brown silty SANDSTONE	
1580	5		R1	18 50/6"				5'- Pale yellow to medium brown sandy SILTSTONE, dry to damp, hard; roots present, some pores observed	
								7'- Same as above, broken cobbles in cuttings, difficult to drill	
1575	10		R2	18 28 36				10'- Light brown to olive gray SILSTONE, dry to damp, hard; abundant caliche, stains from decomposed roots, no pores observed	
1570	15		R3	18 24 42				15'- Same as above, no roots observed, some rust coloration	
1565	20		R4	80/6"				20'- Olive green to gray clayey SILSTONE, damp to moist, hard; calich/ carbonate nodules, no pores observed	
1560	25		R5	38 50/5"				25'- Same as above	
								27'- Dark brown to olive green CLAYSTONE, damp to moist, hard; abundant caliche	
1555	30								

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Geotechnical Boring Log B-LGC-2

Date: 10/6/2020 | **Page:** 1 of 2

Project Name: Veluza/LDC Golden Valley | **Project Number:** 203003-01

Drilling Company: Choice Drilling | **Type of Rig:** Hollow Stem

Drive Weight: 140lbs | **Drop:** 30" | **Hole Dia:** 8"

Elevation of Top of Hole: 1585+/- | **Hole Location:**

Logged By: NLK

Sampled By: NLK

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION	Type of Test
1585	0							Saugus Formation-Sunshine Ranch Member(Tsr): 0'- Pale yellow to light brown silty SANDSTONE	
1580	5		R1	18 50/6"				5'- Pale yellow to medium brown sandy SILTSTONE, dry to damp, hard; roots present, some pores observed	
								7'- Same as above, broken cobbles in cuttings, difficult to drill	
1575	10		R2	18 28 36				10'- Light brown to olive gray SILSTONE, dry to damp, hard; abundant caliche, stains from decomposed roots, no pores observed	
1570	15		R3	18 24 42				15'- Same as above, no roots observed, some rust coloration	
1565	20		R4	80/6"				20'- Olive green to gray clayey SILSTONE, damp to moist, hard; calich/ carbonate nodules, no pores observed	
1560	25		R5	38 50/5"				25'- Same as above	
								27'- Dark brown to olive green CLAYSTONE, damp to moist, hard; abundant caliche	
1555	30								

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Geotechnical Boring Log B-LGC-3

Date: 10/6/2020	**Page: 1 of 1**
Project Name: Veluza/LDC Golden Valley	**Project Number:** 203003-01
Drilling Company: Choice Drilling	**Type of Rig:** Hollow Stem
Drive Weight: 140lbs	**Drop:** 30" **Hole Dia:** 8"
Elevation of Top of Hole: 1587+/-	**Hole Location:**

Elevation (ft)	Depth (ft)	Graphic Log	Sample Number	Blow Count	Dry Density (pcf)	Moisture (%)	USCS Symbol	DESCRIPTION Logged By: NLK Sampled By: NLK	Type of Test
1587	0							Saugus Formation-Sunshine Ranch Member(Tsr): 0'- Reddish to medium brown, sandy SILSTONE, dry ,soft to medium stiff; some gravel, roots present	
1582	5		R1	28 38 43				5'- Medium brown gravelly sandy SILTSTONE, dry to damp,hard; porous in top half of sampler, minor caliche	
								8'- same as above, color change to pale yellow to light brown; no pores observed	
1577	10		R2	32 22 44				10'- Pale yellow to light brown silty veryfine to medium SANDSTONE, dry to damp, dense	
1572	15		R3	38 50/6"				15'- Pale yellow to very light gray mottled with rusty orange medium to very coarse SANDSTONE, dry to damp, very dense; cemented	
1567	20		R4	50/6"				20'- Olive green to gray sandy SILSTONE or silty fine SANDSTONE, damp, hard/very dense, rusty orange stains, slightly cemented	
	25							Total Depth 20' No groundwater observed Percolation well set. 3" perforated PVC with gravel and bentonite cap at 17' and solid pvc to surface with native soil backfilled annulus to surface.	
	30								

LGC

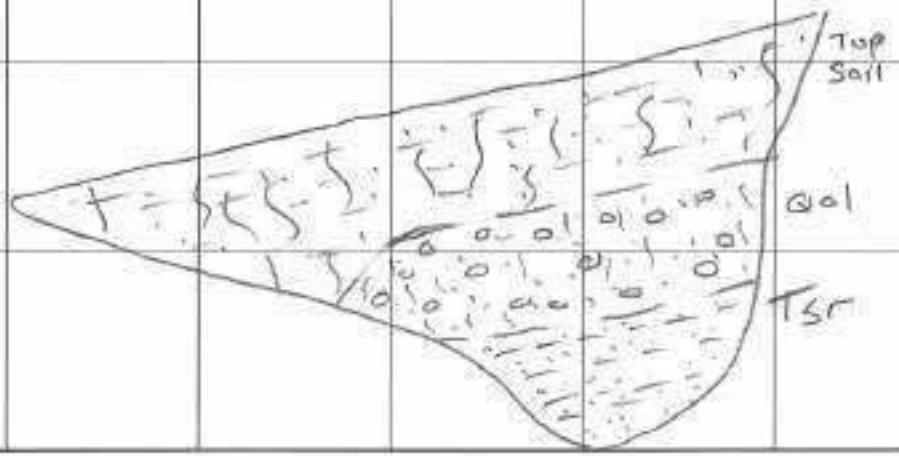
LGC VALLEY, INC.
GEOTECHNICAL CONSULTING

LOG OF TRENCH: LGC-TP-1

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES			
Project Number:	203003-01	Elevation:	1583'+/-				
Equipment:	Backhoe	Location/Grid:					

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
massive	Topsoil: 0-3.0': Dark brown to gray brown sandy SILT, dry, soft to medium stiff; heavily rooted, very porous Quaternary Alluvium (Qal): 3.0-7.0': Medium to dark brown cobble-rich gravelly SAND, dry, medium dense to dense; abundant root hairs, very porous, weathered Tertiary Saugus formation-Sunshine Ranch member (Tsr): 7.0-11.0': Pale brown interbedded sandy SILTSTONE and silty fine to medium SANDSTONE, approximately 4-6" beds, damp, hard/very dense; staining from decomposed roots, minor caliche 9': no pores observed	Topsoil Qal Tsr					

GRAPHICAL REPRESENTATION: East side of test pit | SCALE: 1"=5' | SURFACE SLOPE: 13N | TREND: N24W



Total Depth = 11 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-2

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES
Project Number:	203003-01	Elevation:	1580'+/-	
Equipment:	Backhoe	Location/Grid:		

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
	Topsoil: 0-2': Dark brown to gray medium to coarse sandy SILT, dry, soft; very porous, animal burrows, heavily rooted		Topsoil				
massive	Quaternary Alluvium (Qal): 2.0-T.D.: Pale yellow to medium brown interbedded silty SAND and sandy GRAVEL beds, dry to damp, firmness increases with depth, porous to bottom of trench 7': discontinuous cobble bed		Qal				

GRAPHICAL REPRESENTATION: West side of test pit | SCALE: 1"=5' | SURFACE SLOPE: 5N | TREND: N70W



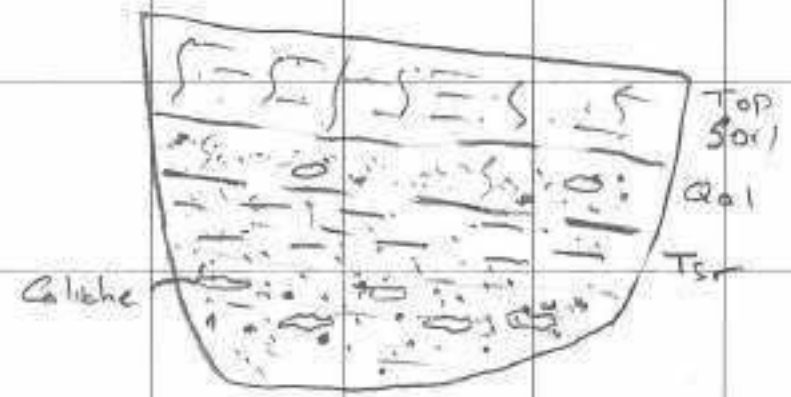
Total Depth = 9 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-3

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES			
Project Number:	203003-01	Elevation:	1585'+/-				
Equipment:	Backhoe	Location/Grid:					

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
massive	Topsoil: 0-2.5': Dark brown to gray brown sandy SILT, dry, soft to medium stiff; heavily rooted, very porous Quaternary Alluvium (Qal): 2.5': Light brown silty SAND with gravel, dry medium stiff; porous, rooted, some cobbles present Tertiary Saugus formation-Sunshine Ranch member (Tsr): 4.0': Light brown sandy SILT, dry to damp, medium stiff to stiff; some root hairs, porous, weathered 4.5': Density change noted by operator, less porous 6.0'-T.D.: Light brown to gray silty gravelly SANDSTONE, dry to damp, medium dense to dense; root hairs present, caliche, weathered, slightly porous 8.5': No pores observed	Topsoil Qal Tsr					

GRAPHICAL REPRESENTATION: West side of test pit | SCALE: 1"=5' | SURFACE SLOPE: 8N | TREND: N30W



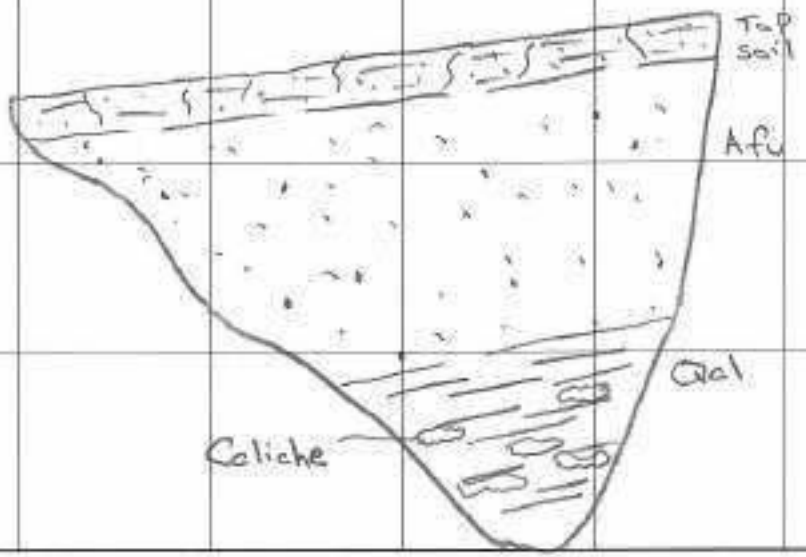
Total Depth = 9 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-4

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES			
Project Number:	203003-01	Elevation:	1585' +/-				
Equipment:	Backhoe	Location/Grid:					

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
	Topsoil: 0-1': Medium to dark brown, sandy SILT, dry very soft to soft; pebble rich, rooted, porous		Topsoil				
	Artificial fil- undocumented (Afu): 1-8': Medium brown silty SAND with gravel; dry to damp, medium dense; abundant gypsum		Afu				
	Quaternary Alluvium (Qal): 8.0-13.5': Mottled medium gray and dark brown silty sandy CLAY, moist; gypsum 9'- T.D.: Abundant caliche		Qal				
	Recommend total removal of all Afu and Qal						

GRAPHICAL REPRESENTATION: East side of test pit	SCALE: 1"=5'	SURFACE SLOPE: 7N	TREND: N31E



Total Depth = 13.5 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-5

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES
Project Number:	203003-01	Elevation:	1590'+/-	
Equipment:	Backhoe	Location/Grid:		

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
	Topsoil: 0-2.5': Medium to dark brown, sandy silty CLAY, dry to damp, soft, blocky soils, heavily rooted, +6" cobbles present Quaternary Alluvium (Qal): 2.5': Pale yellow to light gray SILT with caliche, damp to moist, soft to medium stiff; iron oxidation, root hairs, porous 4.5': Light orange to brown, very fine SAND, moist, medium dense; decomposed roots 5.0': Pale yellow to white-gray sandy silty CLAY with caliche, moist, soft; decomposed roots 5.5': Brown gray sandy SILT with caliche, moist medium stiff to stiff; pores present Tertiary Saugus formation-Sunshine Ranch member (Tsr): 8.5-T.D.: Mottled Orange and brown, silty medium to coarse SANDSTONE, moist, dense; no roots observed in cutting, very few pores, contractor noted density change; Minimum removal depth recommended 9'		Topsoil Qal Tsr				

GRAPHICAL REPRESENTATION:	SCALE: 1"=5'	SURFACE SLOPE: 9 N	TREND: N5E



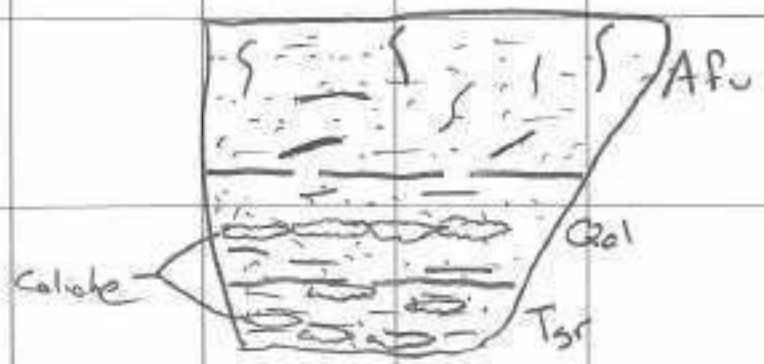
Total Depth = 9.5 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-6

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES			
Project Number:	203003-01	Elevation:	1595'+/-				
Equipment:	Backhoe	Location/Grid:					

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
	Artificial fil- undocumented (Afu): 0-4': Dark brown silty SAND, dry to damp, loose to medium dense; buried roots and brush		Afu				
	Quaternary Alluvium (Qal): 4-6.5': Mottled pale yellow and light brown with gray gravel rich silty SAND with clay nodules, damp to moist, medium dense; cobble rich, abundant root hairs, porous 5.5': Caliche rich layer		Qal				
massive	Tertiary Saugus formation-Sunshine Ranch member (Tsr): 6.5-T.D.: Medium gray to olive gray sandy SILTSTONE, damp to moist, hard, caliche rich, 7': No pores observed Minimum recommended removal depth 7'		Tsr				

GRAPHICAL REPRESENTATION: West side of test pit	SCALE: 1"=5'	SURFACE SLOPE: Flat	TREND: N16W



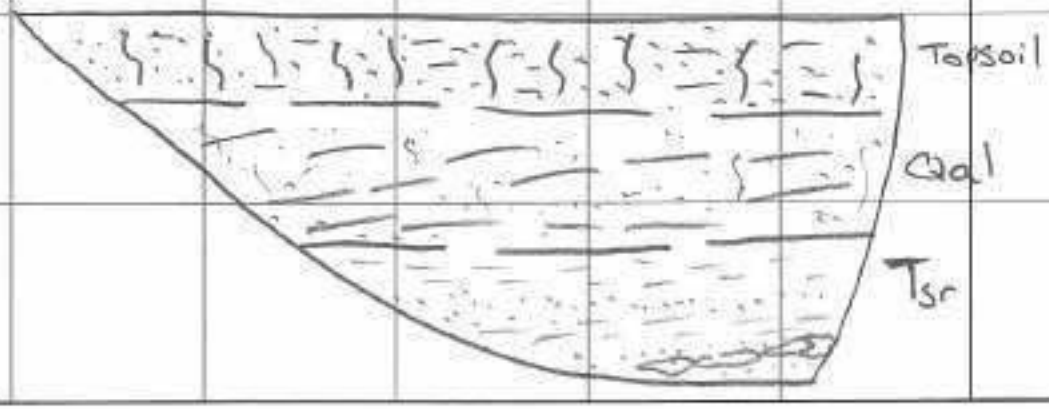
Total Depth = 8.5 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-7

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES			
Project Number:	203003-01	Elevation:	1605'+/-				
Equipment:	Backhoe	Location/Grid:					

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
	Topsoil: 0-2.5': Dark brown to dark gray clayey silty SAND, dry, loose to medium dense; heavily rooted, blocky Quaternary Alluvium (Qal): 2.5': Dark brown to gray sandy CLAY, moist to wet, soft to medium stiff; calcium carbonate stringers, abundant root hairs, few pores observed, weathered Tertiary Saugus formation-Sunshine Ranch member (Tsr): 6.0'-9.5': Light brown to pale gray interbedded sandy SILTSTONE and medium to coarse SANDSTONE, damp to moist, hard/dense; no pores observed 8.0' -T.D.: Caliche rich lens Minimum removal depth recommended 7'		Topsoil Qal Tsr				

GRAPHICAL REPRESENTATION: East side of test pit | SCALE: 1"=5' | SURFACE SLOPE: Flat | TREND: N40E



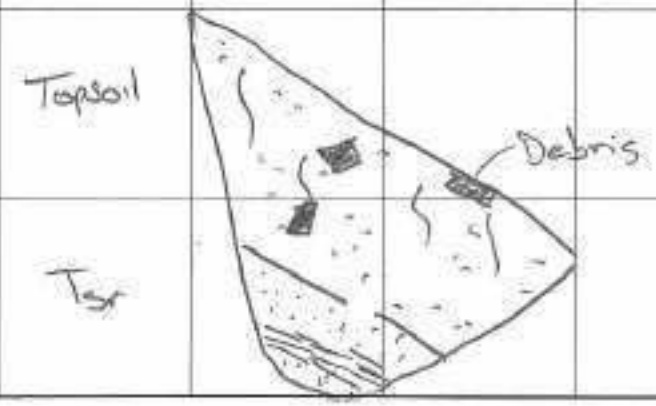
Total Depth = 9.5 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-8

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES			
Project Number:	203003-01	Elevation:	1695'+/-				
Equipment:	Backhoe	Location/Grid:					

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
	Topsoil: 0-6.0': Brown to dark brown silty SAND, dry, medium dense to dense; heavily rooted, porous, abundant construction debris at surface and near surface		Topsoil				
massive	Tertiary Saugus formation-Sunshine Ranch member (Tsr): 6-10' 6.0-10.0': Orange brown silty SANDSTONE, dry, dense to very dense; heavily weathered, few pores 8.0'- T.D.: Dark brown CLAYSTONE lens approximately 10inches thick, heavily weathered, stains from decomposed roots		Tsr				

GRAPHICAL REPRESENTATION: East side of test pit	SCALE: 1"=5'	SURFACE SLOPE: 7N	TREND: N31E



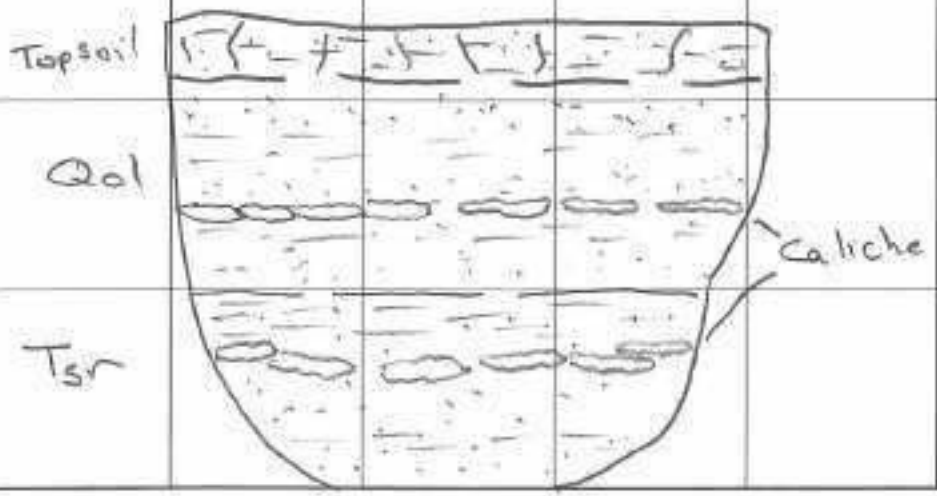
Total Depth = 10 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-9

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES			
Project Number:	203003-01	Elevation:	1615' +/-				
Equipment:	Backhoe	Location/Grid:					

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
massive	Topsoil: 0-1.5': Medium to dark brown sandy SILT, dry, soft to medium stiff; heavily rooted, very porous Quaternary Alluvium (Qal): 1.5-7.0': Light brown interbedded sandy SILT and silty SANDS, dry to damp, medium stiff/medium dense; carbonate stringers, porous 5.0': Caliche rich cobble lens Tertiary Saugus formation-Sunshine Ranch member (Tsr): 7.0-12.0': Light brown to olive gray interbedded sandy SILTSTONE and silty SANDSTONE, dry to damp, hard/very dense 8.0': Abundant caliche 10.0': Minor pores still present 11.5': No pores observed, some carbonate stringers present Minimum recommended removal depth 12'	Topsoil Qal Tsr					

GRAPHICAL REPRESENTATION: West side of test pit | SCALE: 1"=5' | SURFACE SLOPE: Flat | TREND: N14W



Total Depth = 12 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

LOG OF TRENCH: LGC-TP-10

Project Name:	Veluzat/LDC	Logged by:	NLK	ENGINEERING PROPERTIES			
Project Number:	203003-01	Elevation:	1605'+/-				
Equipment:	Backhoe	Location/Grid:					

GEOLOGIC ATTITUDES	DATE: 9/18/20	DESCRIPTION: Geologic Test Pit	GEOLOGIC UNIT	USCS	Sample No.	Moisture (%)	Density (pcf)
	Topsoil: 0-2.0': Dark brown gravelly sandy SILT, dry, soft to medium stiff; heavily rooted, very porous, blocky soil		Topsoil				
	Quaternary Alluvium (Qal): 2.0-6.0': Medium brown to olive-gray interbedded silty SAND and sandy SILT, damp, stiff/dense; root hairs, slightly porous		Qal				
massive	Tertiary Saugus formation-Sunshine Ranch member (Tsr): 6.0-7.0': Medium brown to olive gray sandy SILTSTONE, damp, hard; caliche 7.0-10.0': Medium brown to olive gray SILTSTONE, damp, hard, weathered, abundant caliche at upper contact Minimum recommended removal depth 7-8'		Tsr				

GRAPHICAL REPRESENTATION: East side of test pit	SCALE: 1"=5'	SURFACE SLOPE: 9N	TREND: N20W



Total Depth = 11 Feet
No Ground Water Encountered
Backfilled: 9/18/2020

APPENDIX C

Laboratory Testing Results by EGLAB, Inc.

Laboratory testing was performed by EGLAB, Inc. The laboratory testing program was directed towards providing quantitative data relating to the relevant engineering properties of the soils. Samples considered representative of site conditions were tested in general accordance with ASTM procedure and/or California Test Methods (CTM), where applicable. The following summary is a brief outline of the test type and the results are presented on the following pages.

LGC has reviewed the laboratory test data, procedures and results performed by EGL with respect to the subject site and concurs with and accepts responsibility as geotechnical engineer of record for their work (laboratory testing).

Moisture and Density Determination Tests: Moisture content (ASTM D2216) and dry density determinations (ASTM D2937) were performed on relatively undisturbed samples obtained from the test borings and/or trenches. The results of these tests are presented in the boring logs. Where applicable, only moisture content was determined from undisturbed or disturbed samples.

Grain Size Distribution: Representative samples were dried, weighed, and soaked in water until individual soil particles were separated (per ASTM D421) and then washed on a No. 200 sieve. The portion retained on the No. 200 sieve was dried and then sieved on a U.S. Standard brass sieve set in accordance with ASTM D422 (CTM 202).

Atterberg Limits: The liquid and plastic limits ("Atterberg Limits") were determined in accordance with ASTM Test Method D4318 for engineering classification of fine-grained material.

Soil Classification: Soils were classified according the Unified Soil Classification System (USCS) in accordance with ASTM Test Methods D2487 and D2488. This system uses relies on the Atterberg Limits and grain size distribution of a soil. The soil classifications (or group symbol) are shown on the laboratory test data, and boring logs.

Expansion Index: The expansion potential of selected samples were evaluated by the Expansion Index Test, U.B.C. Standard No. 18-2 and/or ASTM D4829. Specimens are molded under a given compactive energy to approximately the optimum moisture content and approximately 50 percent saturation or approximately 90 percent relative compaction. The prepared 1-inch-thick by 4-inch-diameter specimens are loaded to an equivalent 144 psf surcharge and are inundated with tap water until volumetric equilibrium is reached.

Maximum Density Tests: The maximum dry density and optimum moisture content of typical materials were determined in accordance with ASTM D1557.

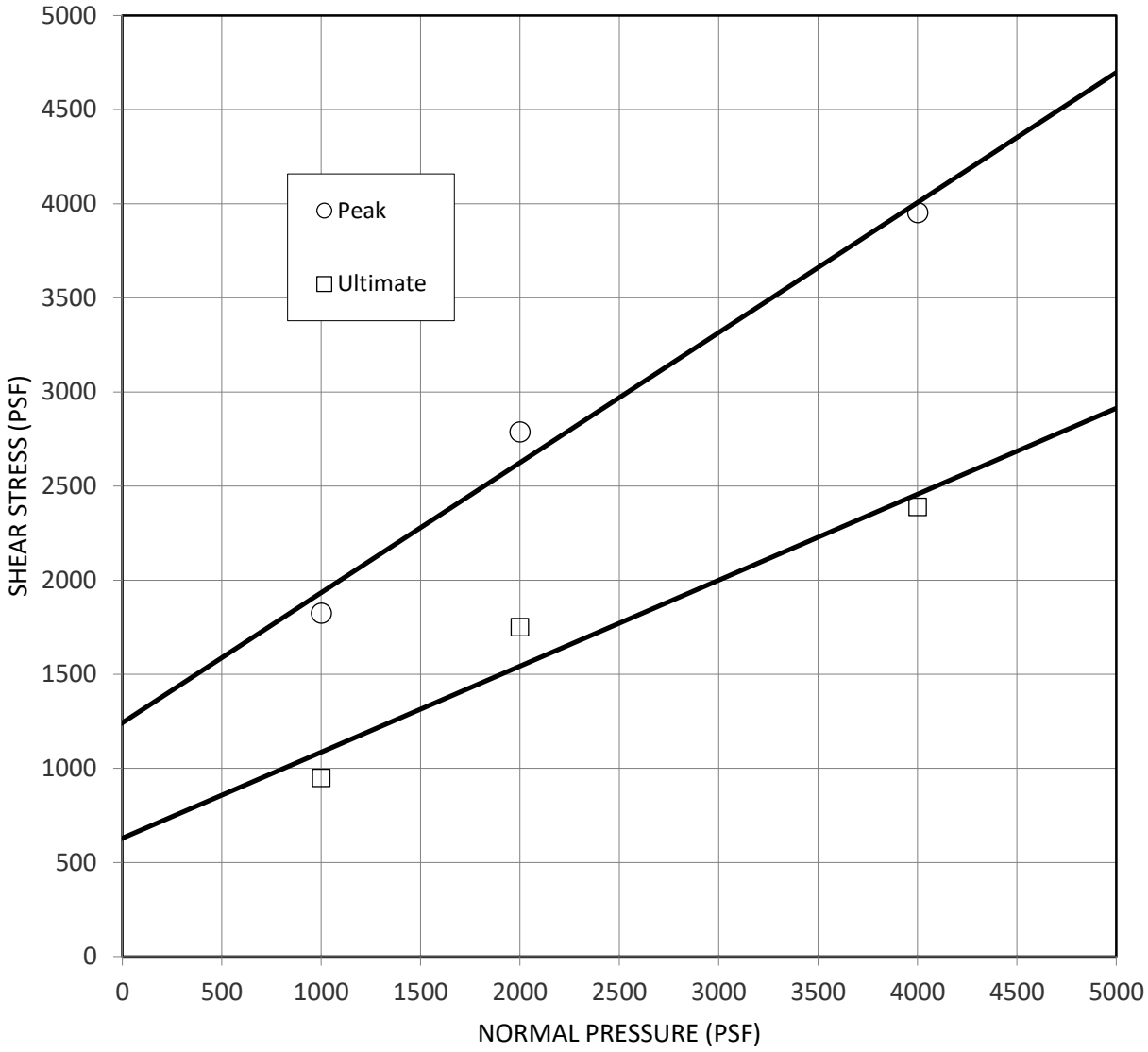
Consolidation: Consolidation tests were performed on selected, relatively undisturbed ring samples (Modified ASTM Test Method D2435). Samples (2.42 inches in diameter and 1 inch in height) were placed in a consolidometer and increasing loads were applied. The samples were allowed to consolidate under "double drainage" and total deformation for each loading step was recorded. The percent consolidation for each load step was recorded as the ratio of the amount of vertical compression to the original sample height.

Corrosion Testing: Chloride content was tested in accordance with Caltrans Test Method (CTM) 422. The soluble sulfate contents of selected samples were determined by standard geotechnical methods (CTM 417). The soluble sulfate content is used to determine the appropriate cement type and maximum water-cement ratios. The test results are presented in the table below: Minimum resistivity and pH tests were performed in general accordance with CTM 643 and standard geochemical methods. The electrical resistivity of a soil is a measure of its resistance to the flow of electrical current. As a result, as soil's resistivity decreases corrosivity increases.

SUMMARY OF TEST RESULTS

PROJECT NAME:	Veluzat / LDC	EGLAB JOB No.:	20-059-011
PROJECT No.:	203003-01	CLIENT:	LGC Valley, Inc.
DATE:	10/8/2020	SUMMARIZED BY:	JT

Boring No.	Sample No.	Depth (ft)	pH CalTrans 643	Chloride Content CalTrans 422 (ppm)	Sulfate Content CalTrans 417 (% by weight)	Minimum Resistivity CalTrans 643 (ohm-cm)	Expansion Index ASTM D 4829
LB-1	Bulk-3	22.0-27.0	8.07	700	0.027	390	98



Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
LB-1	R-9	45.0	Ring	Bedrock	○	1242	35
					□	629	25

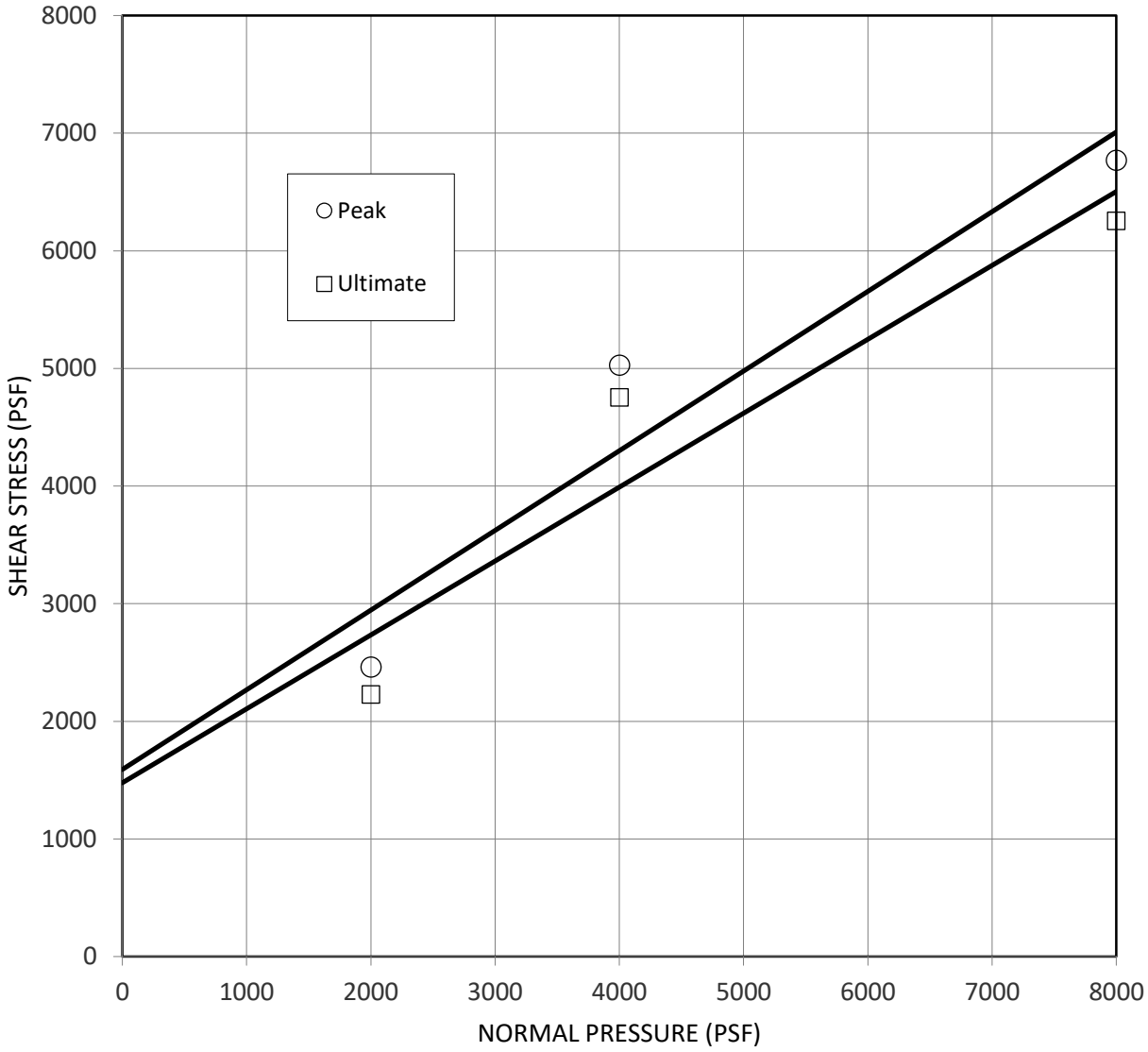
Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
1000	19.3	27.0
2000	19.3	23.7
4000	19.3	23.2

EGLAB, INC.

Project Name:
Veluzat / LDC
Client: LGC Valley, Inc.
Project No.: 203003-01
EGLAB Project No.: 20-059-011

DIRECT SHEAR

10/20 (ASTM D3080) Figure



Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
LB-1	R-10	50.0	Ring	Bedrock	○	1590	34
					□	1478	32

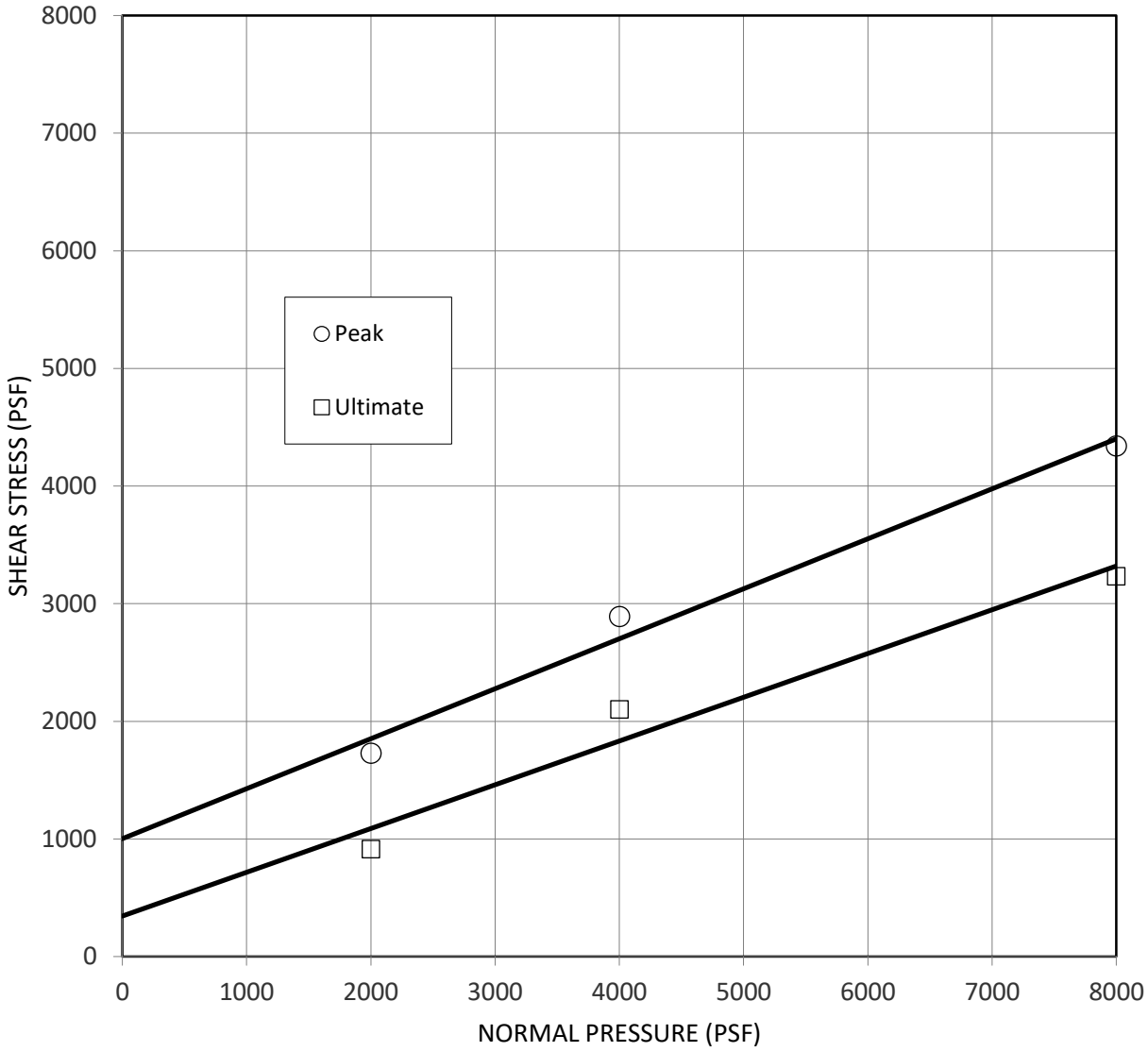
Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
2000	2.8	14.5
4000	2.8	12.0
8000	2.8	11.3

EGLAB, INC.

Project Name:
Veluzat / LDC
Client: LGC Valley, Inc.
Project No.: 203003-01
EGLAB Project No.: 20-059-011

DIRECT SHEAR

10/20 (ASTM D3080) Figure



Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
LB-1	R-13	65.0	Ring	Bedrock	○	1004	23
					□	346	20

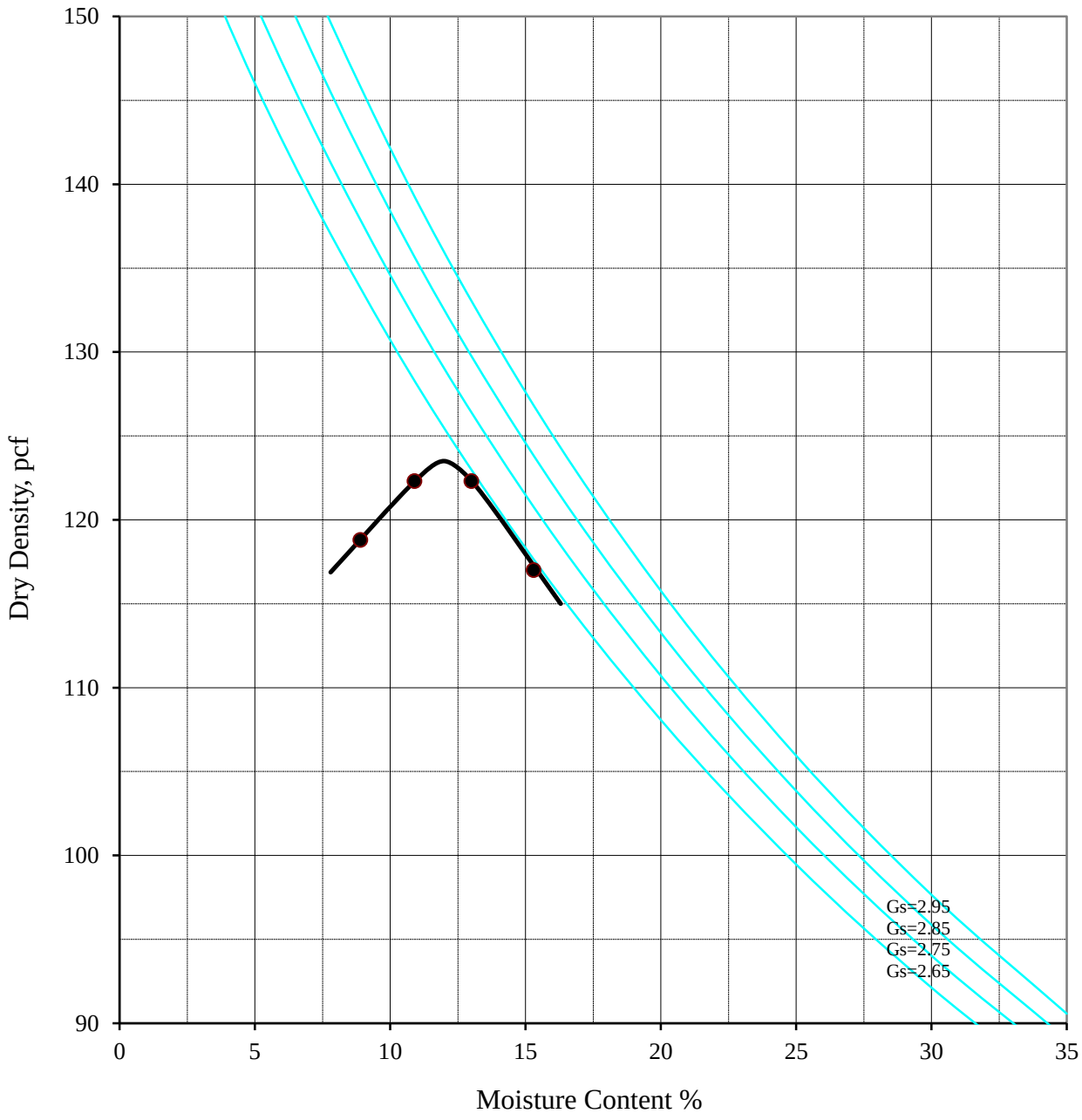
Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
2000	21.0	30.9
4000	21.0	31.4
8000	21.0	27.8

EGLAB, INC.

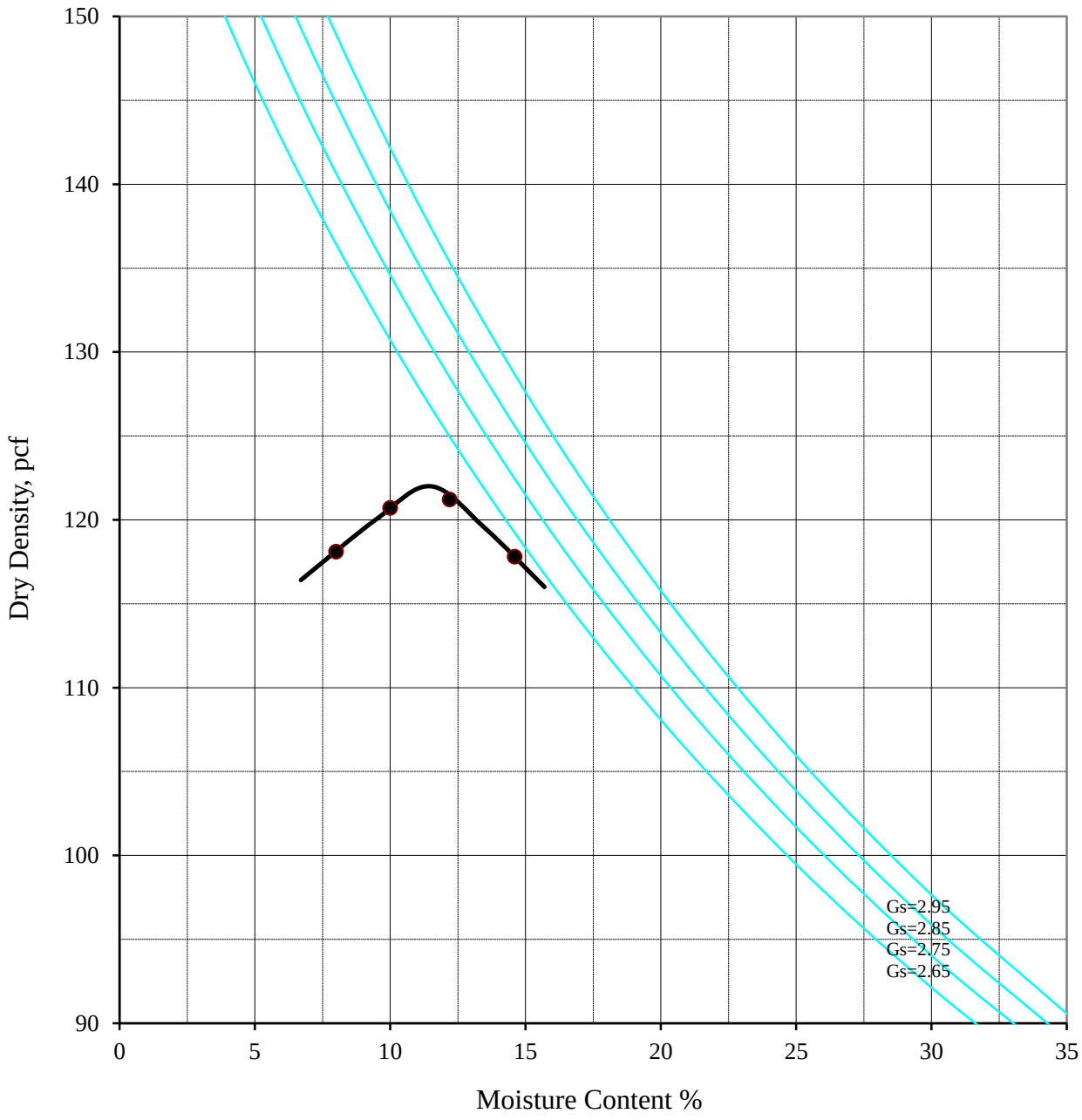
Project Name:
Veluzat / LDC
Client: LGC Valley, Inc.
Project No.: 203003-01
EGLAB Project No.: 20-059-011

DIRECT SHEAR

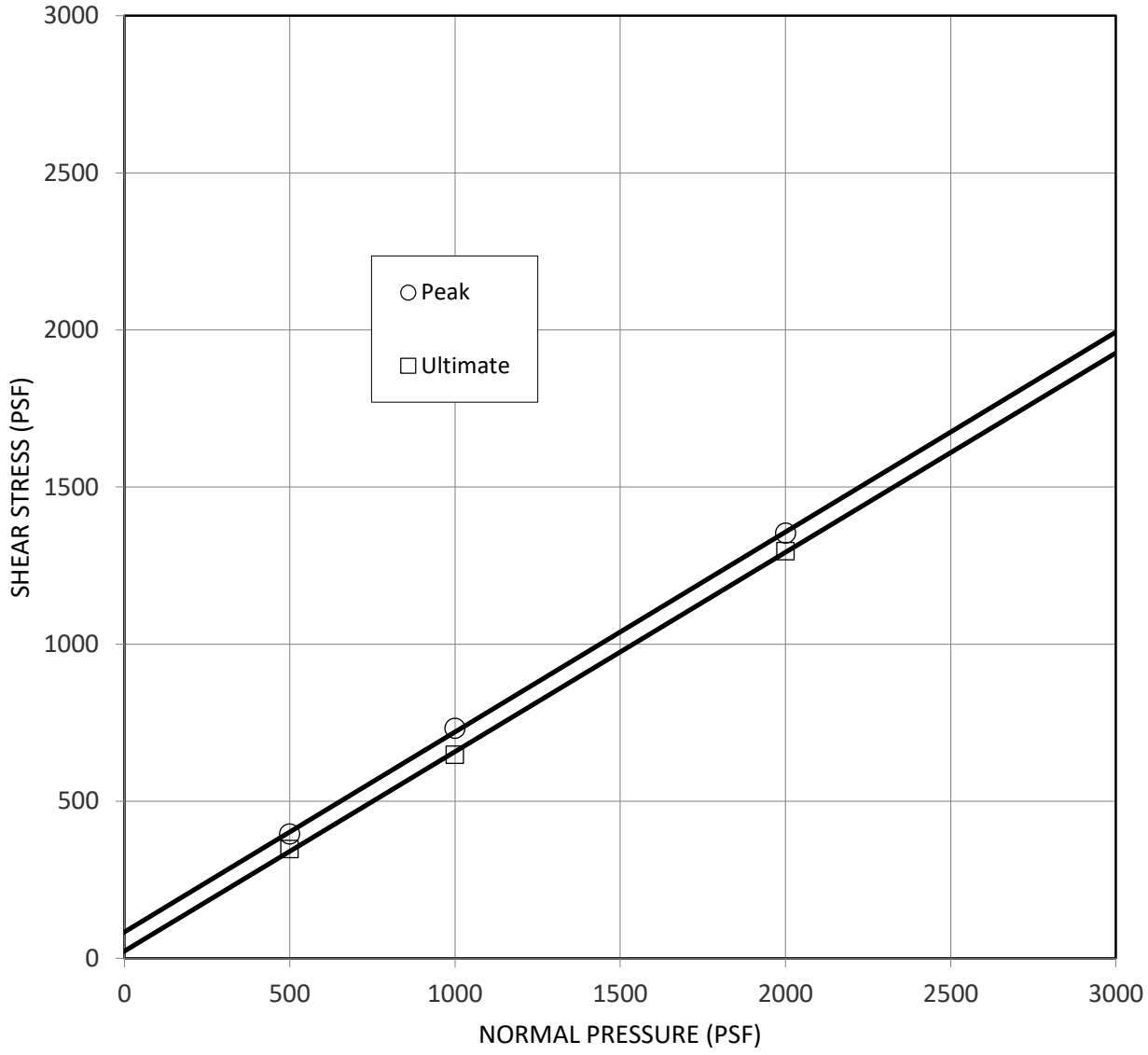
10/20 (ASTM D3080) Figure



Maximum Dry Density = 123.5 pcf Optimum Moisture Content = 12.0 %	Boring No: LB-1 Sample: Bulk-2 Depth : 35.0-40.0 feet Description : Clayey sand (SC), olive brown, trace of gravel
EGLAB, INC.	Project Name: Veluzat / LDC Client Name: LGC Valley, Inc.
Modified Proctor **(ASTM D1557)**	Job No.: 203003-01 EGLAB Project No.: 20-059-011 Date : Oct-20 Figure



Maximum Dry Density = 122.0 pcf Optimum Moisture Content = 11.5 %	Boring No: LB-1 Sample: Bulk-5 Depth : 35.0-40.0 feet Description : Sandy clay (CL), brown, few gravel
EGLAB, INC.	Project Name: Veluzat / LDC Client Name: LGC Valley, Inc.
Modified Proctor **(ASTM D1557)**	Job No.: 203003-01 EGLAB Project No.: 20-059-011 Date : Oct-20 Figure



Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
LB-1	Bulk-2	10.0-15.0	Bulk	SC	○	85	32
					□	24	32

Note: Sample was remolded to **90 %** maximum relative density and optimum moisture

Maximum Dry Density: **123.5 pcf** Optimum Moisture: **12.0 %**

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
500	12.0	21.3
1000	12.0	20.6
2000	12.0	19.8

EGLAB, INC.

Project Address:
Veluzat / LDC

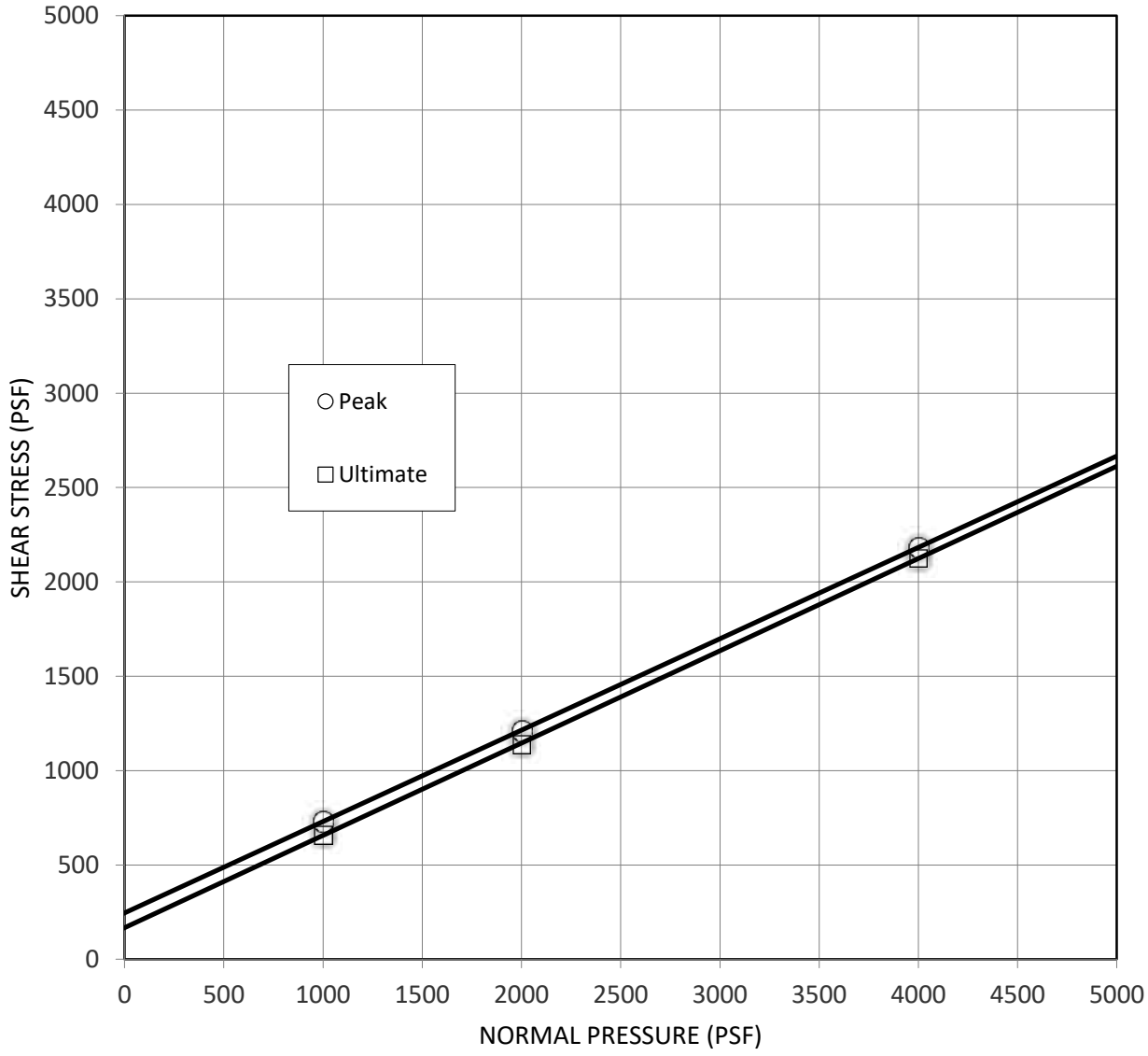
Client: LGC Valley, Inc.

Project No.: 203003-01

EGLAB Project No.: 20-059-011

DIRECT SHEAR

10/20 (ASTM D3080) Figure



Boring No.	Sample No.	Depth (ft)	Sample Type	Soil Type	Symbol	Cohesion (PSF)	Friction Angle
LB-1	Bulk-5	35.0-40.0	Bulk	CL	○	246	26
					□	167	26

Note: Sample was remolded to **90 %** maximum relative density and optimum moisture

Maximum Dry Density: **122.0 pcf** Optimum Moisture: **11.5 %**

Normal Stress (psf)	Initial Moisture (%)	Final Moisture (%)
1000	11.5	24.0
2000	11.5	22.3
4000	11.5	21.6

EGLAB, INC.

Project Address:
Veluzat / LDC

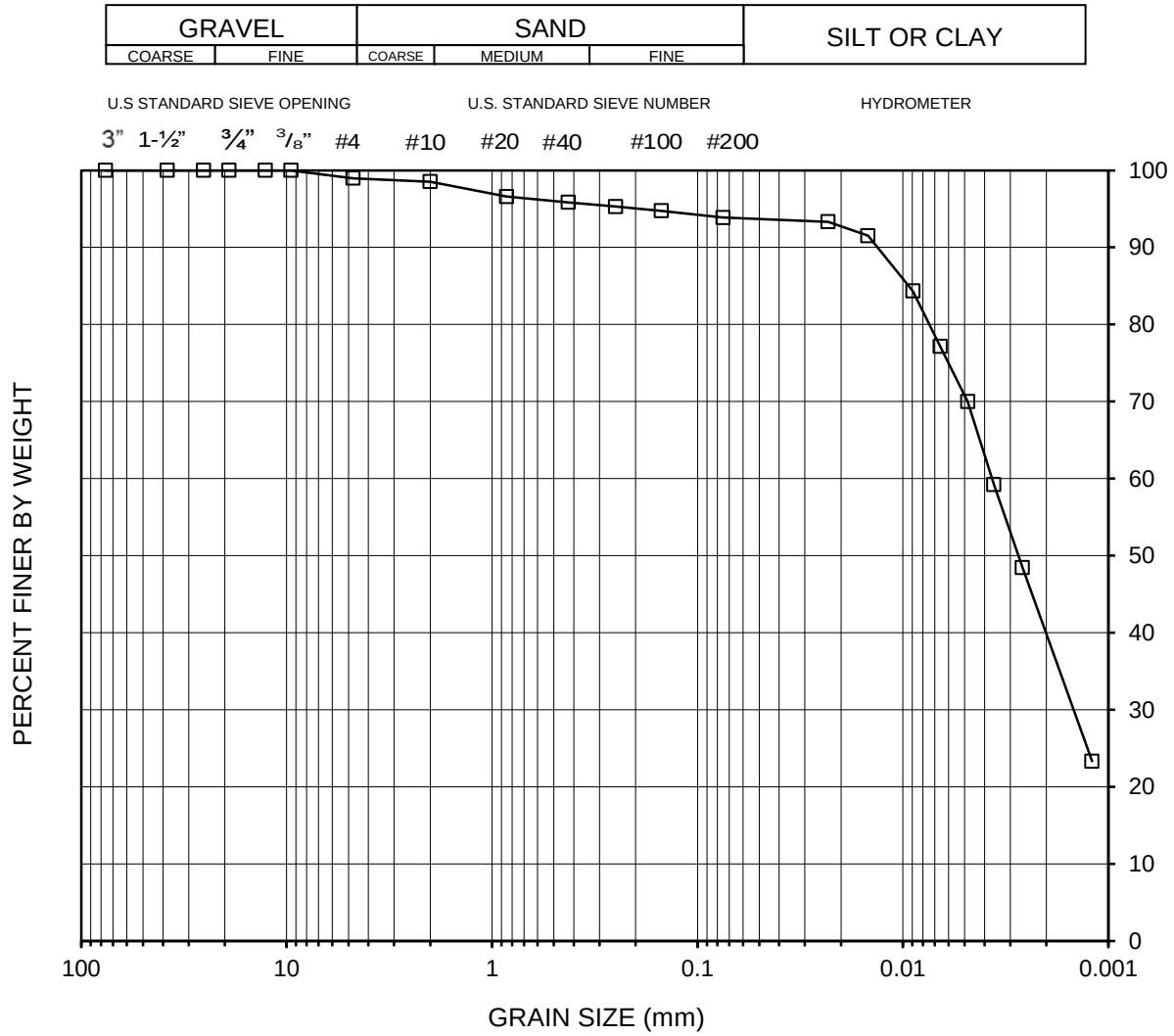
Client: LGC Valley, Inc.

Project No.: 203003-01

EGLAB Project No.: 20-059-011

DIRECT SHEAR

10/20 (ASTM D3080) Figure



SYMBOL	BORING No.	SAMPLE ID.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
☐	LB-1	B-2	36.5	Bag	CH	61	35

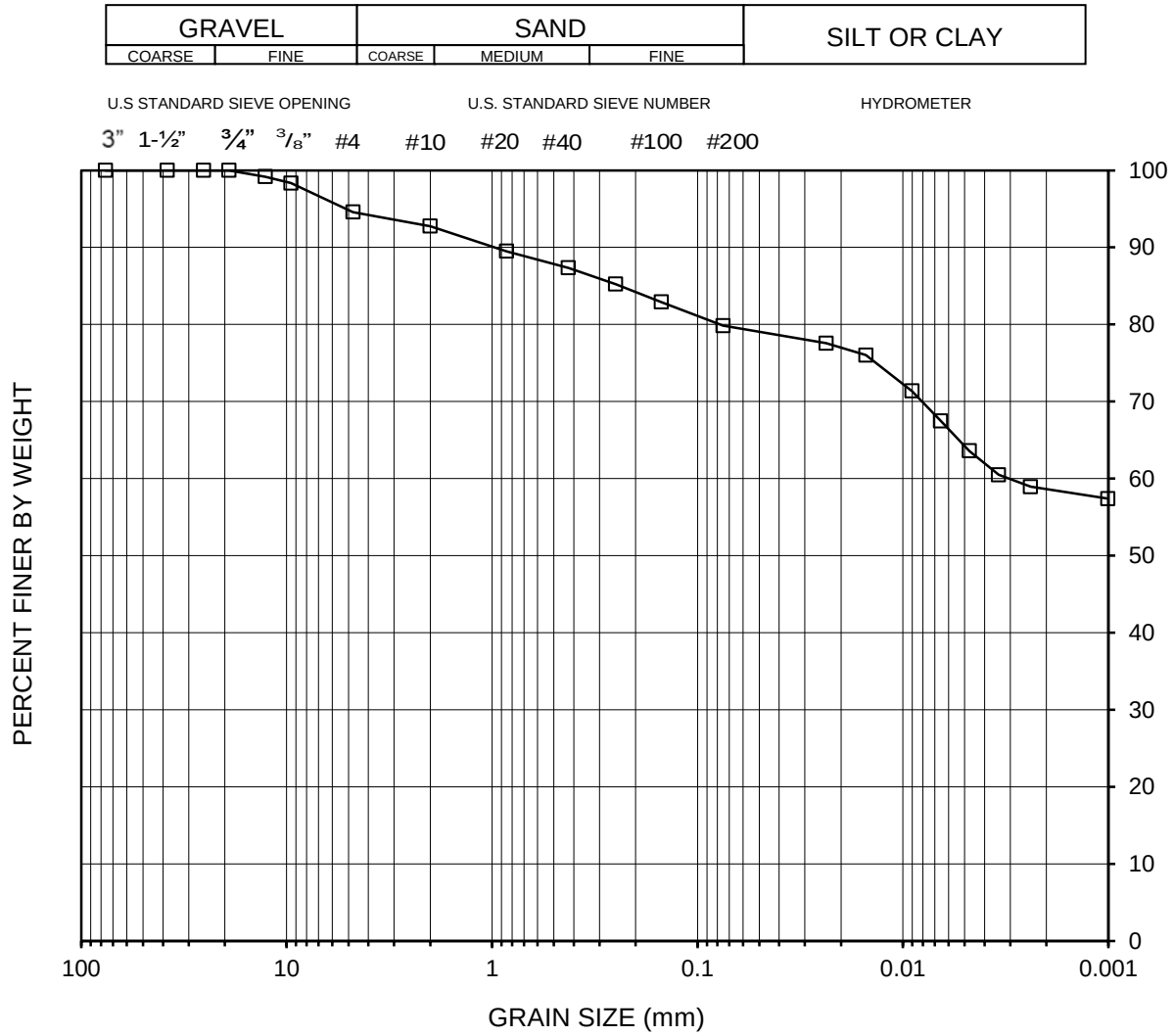
Clay	70.7%
Sand	6.1%
Silt	23.2%

EGLAB, INC.

Project Name: Veluzat / LDC
Client: LGC Valley, Inc.
Job No.: 203003-01
EGLAB Project No.: 20-059-011

GRAINSIZE DISTRIBUTION CURVE

10/15/20 (ASTM D422) FIGURE



SYMBOL	BORING No.	SAMPLE ID.	DEPTH (FT)	SAMPLE TYPE	SOIL TYPE	LIQUID LIMIT	PLASTICITY INDEX
☐	LB-1	B-1	22.0	Bag	CH	60	40

Clay	64.2%
Sand	20.1%
Silt	15.7%

EGLAB, INC.

Project Name: Veluzat / LDC
Client: LGC Valley, Inc.
Job No.: 203003-01
EGLAB Project No.: 20-059-011

GRAINSIZE DISTRIBUTION CURVE

10/15/20 (ASTM D422) FIGURE

SUMMARY OF LABORATORY TEST RESULTS

PROJECT NAME: Veluzat / LDC

EGLAB JOB NO.: 20-059-011

PROJECT NO.: 203003-01

CLIENT: LGC Valley, Inc.

DATE: 10/9/2020

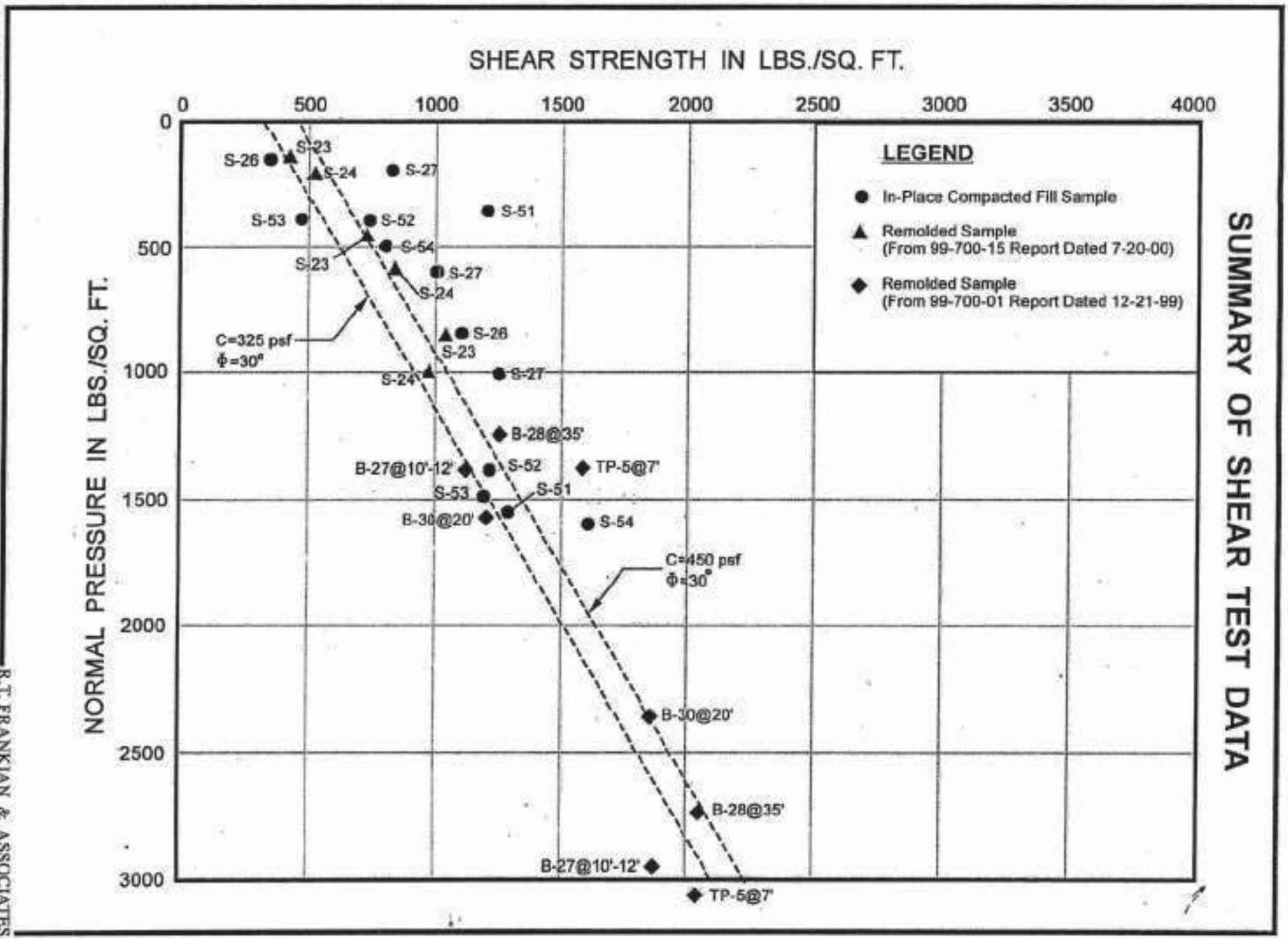
SUMMARIZED BY: JT

BORING NO.	SAMPLE NO.	DEPTH (in.)	MOISTURE CONTENT ASTM D2216 (%)	DRY DENSITY ASTM D2937 (PCF)	ATTERBERG LIMITS ASTM D4318 *(LL,PL,PI)
LB-1	R-1	5.0	10.9	101.2	
LB-1	R-2	10.0	5.8	110.6	
LB-1	R-3	15.0	14.7	107.7	
LB-1	R-4	20.0	11.3	108.6	
LB-1	B-1	22.0			60,20,40
LB-1	R-5	25.0	3.8	119.9	
LB-1	R-6	30.0	3.1	115.2	
LB-1	R-7	35.0	12.3	123.8	
LB-1	B-2	36.5			61,26,35
LB-1	R-8	40.0	9.1	128.9	
LB-1	R-9	45.0	19.3	110.8	
LB-1	R-10	50.0	2.8	136.3	
LB-1	R-11	55.0	13.2	112.0	
LB-1	R-12	60.0	11.9	123.0	
LB-1	R-13	65.0	21.0	106.2	
LB-1	R-14	70.0	7.9	127.9	
LB-1	R-15	75.0	11.5	124.2	
LB-1	R-16	80.0	16.7	115.8	

*LL,PL,PI = LIQUID LIMIT, PLASTIC LIMIT, PLASTICITY INDEX

APPENDIX D

Laboratory Testing by Others



SUMMARY OF SHEAR TEST DATA

99-700-20 REPORT DATED 01-06-03

R.T. FRANKIAN & ASSOCIATES

FIGURE 6

20 feet. The sample was previously included in our grading plan review (RTF&A, 1999b) but was not indicated as being from within the Pacoima Formation. The shear strength parameters are summarized in the following table.

MATERIAL	COHESION (psf)	ANGLE OF SHEARING RESISTANCE (degrees)
Landslide failure plane and clay bedding plane material (Multiple Shear)	200	10
Clay bedding plane material	250	18
Landslide failure plane and clay bedding plane material (Peak for Seismic Analysis)	375	19
Saugus Formation cross bedding	600	32
Alluvium	350	28
Compacted fill	450	30
Pacoima Formation cross bedding	300	30
Compacted fill (upper 5 feet on slopes)	325	30

CORROSIVITY

Samples of onsite soils were obtained during our previous field investigation and were tested by M. J. Schiff. A copy or their findings and test results, as well as their recommendations was previously presented in our grading plan review (RTF&A, 1999b). A copy of their report is also included in Appendix C of this report. It is recommended that additional samples be obtained for corrosion testing as part of future site-specific development.

GRADING RESULTS

Field density tests were accepted only where the tests indicated that at least the required compaction of the soil had been obtained. Any areas in which tests were not

APPENDIX E

Percolation Testing

Excavation Percolation Testing Field Log

Date 10/7/2020

Project Location Veluzat Property- Golden Valley
Earth Description Clayey Silts and Clayey Sands
Tested by NLK
Liquid Description Clean Clear Water
Measurement Method Sounder

Boring/Test Number B-LGC-3
Diameter of Boring 8" **Diameter of Casing** 3"
Depth of Boring 20'
Depth to Invert of BMP 17'
Depth to Water Table Unknown
Depth to Initial Water Depth (d_1) 16.25'

Time Interval Standard
Start Time for Pre-Soak 2:00PM 10/6/2020
Start Time for Standard 8:05 AM

Water Remaining In Boring (Y/N) Yes
Standard Time Interval Between Readings 30 minute

Reading Number	Time Start/End (hh:mm)	Elapsed Time Δtime (mins)	Water Drop During Standard Time Interval Δd (inches)	Percolation Rate for Reading (in/hr)	Soil Description/Notes/Comments
1	8:05am 8:35am	30	.6	1.20	
2	8:35am 9:05am	30	.84	1.68	
3	9:09am 9:39am	30	.96	1.92	
4	9:40am 10:10am	30	.96	1.92	
5	10:12am 10:42am	30	.60	1.20	
6	10:45am 11:15am	30	.72	1.44	
7	11:17am 11:47am	30	.84	1.68	
8	11:50am 12:20pm	30	.84	1.68	
9	12:23pm 12:53pm	30	.84	1.68	
10	12:55pm 1:25pm	30	.84	1.68	Stabilized Percolation rate

APPENDIX F

Slope Stability Analyses

1.0 Approach

- Slope stability analyses were conducted using the computer program Slope W. The Modified Bishop's Method was used to analyze rotational failure modes and the Janbu Method was used to evaluate translational failure modes. A coefficient of horizontal acceleration, Kh of 0.15 (FS of 1.1) was used to evaluate the pseudostatic stability analyses.

2.0 Design Shear Strength

The shear strength parameters used in the slope stability analysis are presented in Table F-1.

TABLE F-1
Design Shear Strength Parameters for Slope Stability Analyses

Material	**Cohesion (lb/ft^2)**		**Angle of Internal Friction (Degrees)**		**Saturated Bulk Density (lb/ft^3)**
	Ultimate	**Peak**	**Ultimate**	**Peak**	
Engineered Fill (Af)	325	-	30	-	120
Alluvium (Qal)	350	-	28	-	120
Bedrock/Saugus Formation (Tsr) Along Bedding	250	375	18	19	125
Bedrock/Saugus Formation (Tsr) Cross Bedding	600	-	32	-	125

TABLE F-2
Summary of Slope Stability Analyses

Cross-Section	Condition	Factor of Safety	Remarks
A-A’	Global Stability, Rotational, Static	1.99	Modified Bishop Method
A-A’	Global Stability, Rotational, Pseudostatic	1.42	Modified Bishop Method
A-A’	Global Stability, Translational, Static	1.66	Simplified Janbu Method
A-A’	Global Stability, Translational, Pseudostatic	1.18	Simplified Janbu Method
B-B’	Global Stability, Rotational, Static	2.34	Modified Bishop Method
B-B’	Global Stability, Rotational, Pseudostatic	1.70	Modified Bishop Method
B-B’	Global Stability, Translational, Static	1.75	Simplified Janbu Method
B-B’	Global Stability, Translational, Pseudostatic	1.32	Simplified Janbu Method
D-D’	Upper Slope, Rotational, Static	2.43	Modified Bishop Method
D-D’	Upper Slope, Rotational, Pseudostatic	1.65	Modified Bishop Method
D-D’	Lower Slope, Rotational, Static	1.89	Modified Bishop Method
D-D’	Lower Slope, Rotational, Pseudostatic	1.39	Modified Bishop Method
D-D’	Upper Slope, Translational, Static	2.28	Simplified Janbu Method
D-D’	Upper Slope, Translational, Pseudostatic	1.56	Simplified Janbu Method
D-D’	Lower Slope, Translational, Static	1.91	Simplified Janbu Method
D-D’	Lower Slope, Translational, Pseudostatic	1.39	Simplified Janbu Method
E-E’	Rapid Drawdown, Rotational, Static	1.97	Modified Bishop Method
E-E’	Rapid Drawdown, Rotational, Pseudostatic	1.40	Modified Bishop Method
E-E’	Rapid Drawdown, Translational, Static	1.50	Simplified Janbu Method
E-E’	Rapid Drawdown, Translational, Pseudostatic	1.12	Simplified Janbu Method
H-H’	Global Stability, Rotational, Static	2.18	Modified Bishop Method
H-H’	Global Stability, Rotational, Pseudostatic	1.58	Modified Bishop Method
H-H’	Global Stability, Translational, Static	1.62	Simplified Janbu Method
H-H’	Global Stability, Translational, Pseudostatic	1.22	Simplified Janbu Method
O-O’	Global Stability, Rotational, Static	2.49	Modified Bishop Method
O-O’	Global Stability, Rotational, Pseudostatic	1.80	Modified Bishop Method
O-O’	Global Stability, Translational, Static	1.78	Simplified Janbu Method
O-O’	Global Stability, Translational, Pseudostatic	1.36	Simplified Janbu Method
P-P’	Global Stability, Rotational, Static	2.01	Modified Bishop Method
P-P’	Global Stability, Rotational, Pseudostatic	1.48	Modified Bishop Method
P-P’	Global Stability, Translational, Static	1.51	Simplified Janbu Method
P-P’	Global Stability, Translational, Pseudostatic	1.16	Simplified Janbu Method
Q-Q’	Global Stability, Rotational, Static	2.61	Modified Bishop Method
Q-Q’	Global Stability, Rotational, Pseudostatic	1.91	Modified Bishop Method
Q-Q’	Global Stability, Translational, Static	1.99	Simplified Janbu Method
Q-Q’	Global Stability, Translational, Pseudostatic	1.43	Simplified Janbu Method
Q-Q’	Lower Slope, Translational, Static	1.97	Simplified Janbu Method
Q-Q’	Lower Slope, Translational, Pseudostatic	1.42	Simplified Janbu Method

Section A-A Tr 68203 SSA.gsz 11/06/2020 10:49:39 AM

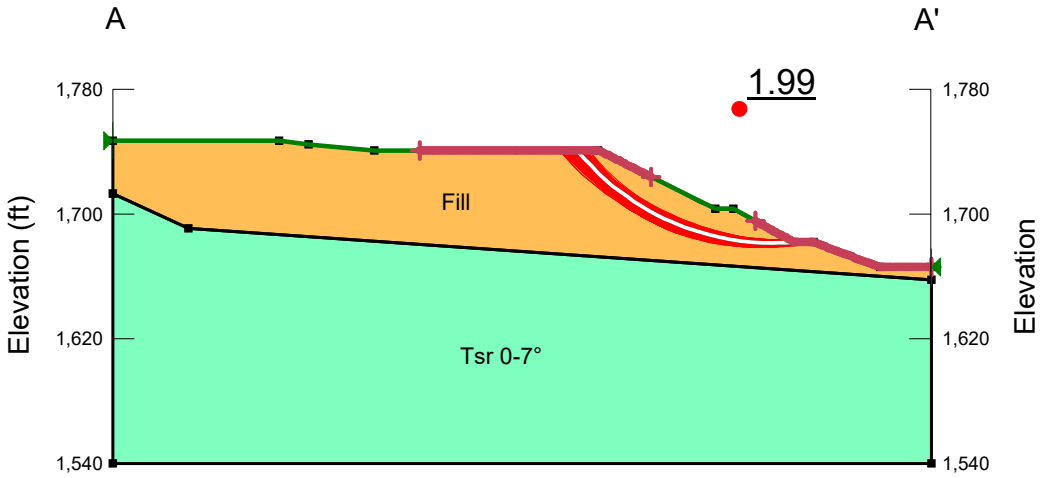
Section A-A Tr 68203 SSA.gsz

1 -Rotational Static Global

Horz Seismic Coef.: 0

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 0-7°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-7°
C-Anisotropic Strength Fn.: Tsr 250 bedding 0-7°



LGC

LGC Valley, Inc
GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 711
Date: 11/06/2020
Time: 10:49:39 AM
Tool Version: 10.1.0.18696
File Name: Section A-A Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/06/2020
Last Solved Time: 10:49:48 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Static Global

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 0-7°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-7°
C-Anisotropic Strength Fn.: Tsr 250 bedding 0-7°
Phi-B: 0 °

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (196.90652, 1,740.8652) ft
Left-Zone Right Coordinate: (345.29809, 1,723.8283) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (412.30905, 1,695.3607) ft
Right-Zone Right Coordinate: (525.146, 1,665.7748) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (0.03953, 1,746.9781) ft
Right Coordinate: (525.146, 1,665.7748) ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding 0-7°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (0, 1)
- Data Point: (0.1, 0.5625)
- Data Point: (7, 0.5625)

Data Point: (7.01, 1)

Tsr 250 bedding 0-7°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (0, 1)
Data Point: (0.1, 0.4167)
Data Point: (7, 0.4167)
Data Point: (7.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	492.09114 ft	1,665.7748 ft
Point 2	525.146 ft	1,665.7748 ft
Point 3	525.146 ft	1,539.7155 ft
Point 4	0.03953 ft	1,539.7155 ft
Point 5	0.03953 ft	1,713.0176 ft
Point 6	0.03953 ft	1,746.9781 ft
Point 7	106.82845 ft	1,746.9781 ft
Point 8	125.69538 ft	1,744.5631 ft
Point 9	167.9573 ft	1,740.8652 ft
Point 10	311.4969 ft	1,740.8652 ft
Point 11	386.36087 ft	1,703.1313 ft
Point 12	398.05837 ft	1,703.1313 ft
Point 13	437.22611 ft	1,681.774 ft
Point 14	449.75375 ft	1,681.774 ft
Point 15	48.62654 ft	1,690.7021 ft
Point 16	525.146 ft	1,657.6545 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-7°	4,3,16,15,5	71,952 ft²
Region 2	Fill	5,15,16,2,1,14,13,12,11,10,9,8,7,6	24,683 ft²

Slip Results

Slip Surfaces Analysed: 95719 of 98415 converged

Current Slip Surface

Slip Surface: 64,686
Factor of Safety: 1.99
Volume: 2,262.0971 ft³
Weight: 271,451.66 lbf
Resisting Moment: 32,746,065 lbf·ft
Activating Moment: 16,485,889 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (437.16885, 1,681.8052) ft
Entry: (297.89962, 1,740.8652) ft
Radius: 163.07606 ft
Center: (423.93924, 1,844.3438) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	300.16583 ft	1,738.222 ft	0 psf	94.520767 psf	54.57159 psf	325 psf	0 psf	Fill
Slice 2	304.69826 ft	1,733.1487 ft	0 psf	572.44413 psf	330.50078 psf	325 psf	0 psf	Fill
Slice 3	309.23069 ft	1,728.475 ft	0 psf	1,029.1558 psf	594.18336 psf	325 psf	0 psf	Fill
Slice 4	313.8364 ft	1,724.0894 ft	0 psf	1,360.2796 psf	785.35781 psf	325 psf	0 psf	Fill
Slice 5	318.5154 ft	1,719.9645 ft	0 psf	1,560.8673 psf	901.16718 psf	325 psf	0 psf	Fill
Slice 6	323.1944 ft	1,716.1431 ft	0 psf	1,734.8272 psf	1,001.6029 psf	325 psf	0 psf	Fill
Slice 7	327.87339 ft	1,712.5987 ft	0 psf	1,883.4763 psf	1,087.4256 psf	325 psf	0 psf	Fill
Slice 8	332.55239 ft	1,709.3095 ft	0 psf	2,007.9488 psf	1,159.2898 psf	325 psf	0 psf	Fill
Slice 9	337.23139 ft	1,706.2571 ft	0 psf	2,109.2211 psf	1,217.7594 psf	325 psf	0 psf	Fill
Slice 10	341.91039 ft	1,703.4263 ft	0 psf	2,188.1332 psf	1,263.3193 psf	325 psf	0 psf	Fill
Slice 11	346.58939 ft	1,700.8037 ft	0 psf	2,245.4064 psf	1,296.386 psf	325 psf	0 psf	Fill
Slice 12	351.26838 ft	1,698.3783 ft	0 psf	2,281.657 psf	1,317.3153 psf	325 psf	0 psf	Fill
Slice 13	355.94738 ft	1,696.1402 ft	0 psf	2,297.4087 psf	1,326.4095 psf	325 psf	0 psf	Fill
Slice 14	360.62638 ft	1,694.0812 ft	0 psf	2,293.1013 psf	1,323.9226 psf	325 psf	0 psf	Fill
Slice 15	365.30538 ft	1,692.1939 ft	0 psf	2,269.0989 psf	1,310.0649 psf	325 psf	0 psf	Fill
Slice 16	369.98438 ft	1,690.472 ft	0 psf	2,225.6962 psf	1,285.0063 psf	325 psf	0 psf	Fill
Slice 17	374.66337 ft	1,688.91 ft	0 psf	2,163.1229 psf	1,248.8796 psf	325 psf	0 psf	Fill

Slice 18	379.34237 ft	1,687.5031 ft	0 psf	2,081.5477 psf	1,201.7822 psf	325 psf	0 psf	Fill
Slice 19	384.02137 ft	1,686.2471 ft	0 psf	1,981.0815 psf	1,143.7779 psf	325 psf	0 psf	Fill
Slice 20	388.31045 ft	1,685.2199 ft	0 psf	1,983.7862 psf	1,145.3395 psf	325 psf	0 psf	Fill
Slice 21	392.20962 ft	1,684.3966 ft	0 psf	2,095.0496 psf	1,209.5774 psf	325 psf	0 psf	Fill
Slice 22	396.10879 ft	1,683.6722 ft	0 psf	2,196.3104 psf	1,268.0404 psf	325 psf	0 psf	Fill
Slice 23	400.50277 ft	1,682.9795 ft	0 psf	2,144.1057 psf	1,237.9 psf	325 psf	0 psf	Fill
Slice 24	405.39158 ft	1,682.3446 ft	0 psf	1,931.6342 psf	1,115.2295 psf	325 psf	0 psf	Fill
Slice 25	410.28039 ft	1,681.8592 ft	0 psf	1,697.7364 psf	980.18857 psf	325 psf	0 psf	Fill
Slice 26	415.1692 ft	1,681.5221 ft	0 psf	1,442.1249 psf	832.61118 psf	325 psf	0 psf	Fill
Slice 27	420.05801 ft	1,681.3322 ft	0 psf	1,164.4347 psf	672.28669 psf	325 psf	0 psf	Fill
Slice 28	424.94682 ft	1,681.2891 ft	0 psf	864.21822 psf	498.95662 psf	325 psf	0 psf	Fill
Slice 29	429.83563 ft	1,681.3927 ft	0 psf	540.9381 psf	312.31076 psf	325 psf	0 psf	Fill
Slice 30	434.72444 ft	1,681.6432 ft	0 psf	193.95881 psf	111.98217 psf	325 psf	0 psf	Fill

Section A-A Tr 68203 SSA.gsz 11/06/2020 10:49:39 AM

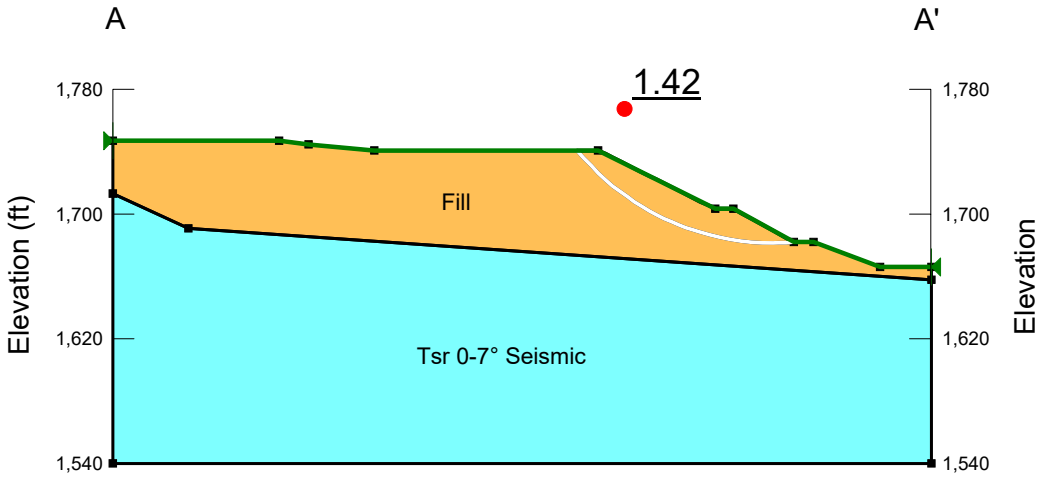
Section A-A Tr 68203 SSA.gsz

1 -Rotational Pseudostatic Global

Horz Seismic Coef.: 0.15

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 0-7° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-7° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-7° (Seismic)



LGC

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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 711
Date: 11/06/2020
Time: 10:49:39 AM
Tool Version: 10.1.0.18696
File Name: Section A-A Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/06/2020
Last Solved Time: 10:49:54 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Pseudostatic Global

Kind: SLOPE/W
Parent: 1 -Rotational Static Global
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 0-7° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-7° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-7° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.03953, 1,746.9781) ft
Right Coordinate: (525.146, 1,665.7748) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding 0-7° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (0, 1)
- Data Point: (0.1, 0.625)
- Data Point: (7, 0.625)
- Data Point: (7.1, 1)

Tsr 19° bedding 0-7° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (0, 1)
- Data Point: (0.1, 0.5938)
- Data Point: (7, 0.5938)

Data Point: (7.1, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	492.09114 ft	1,665.7748 ft
Point 2	525.146 ft	1,665.7748 ft
Point 3	525.146 ft	1,539.7155 ft
Point 4	0.03953 ft	1,539.7155 ft
Point 5	0.03953 ft	1,713.0176 ft
Point 6	0.03953 ft	1,746.9781 ft
Point 7	106.82845 ft	1,746.9781 ft
Point 8	125.69538 ft	1,744.5631 ft
Point 9	167.9573 ft	1,740.8652 ft
Point 10	311.4969 ft	1,740.8652 ft
Point 11	386.36087 ft	1,703.1313 ft
Point 12	398.05837 ft	1,703.1313 ft
Point 13	437.22611 ft	1,681.774 ft
Point 14	449.75375 ft	1,681.774 ft
Point 15	48.62654 ft	1,690.7021 ft
Point 16	525.146 ft	1,657.6545 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-7° Seismic	4,3,16,15,5	71,952 ft²
Region 2	Fill	5,15,16,2,1,14,13,12,11,10,9,8,7,6	24,683 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.42
Volume: 2,262.0971 ft³
Weight: 271,451.66 lbf
Resisting Moment: 31,406,159 lbf·ft
Activating Moment: 22,091,900 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (437.16885, 1,681.8052) ft
Entry: (297.89962, 1,740.8652) ft

Radius: 163.07606 ft
Center: (423.93924, 1,844.3438) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	300.16583 ft	1,738.222 ft	0 psf	34.590157 psf	19.970636 psf	325 psf	0 psf	Fill
Slice 2	304.69826 ft	1,733.1487 ft	0 psf	474.75893 psf	274.10219 psf	325 psf	0 psf	Fill
Slice 3	309.23069 ft	1,728.475 ft	0 psf	899.68355 psf	519.43254 psf	325 psf	0 psf	Fill
Slice 4	313.8364 ft	1,724.0894 ft	0 psf	1,212.4513 psf	700.00909 psf	325 psf	0 psf	Fill
Slice 5	318.5154 ft	1,719.9645 ft	0 psf	1,406.6415 psf	812.12486 psf	325 psf	0 psf	Fill
Slice 6	323.1944 ft	1,716.1431 ft	0 psf	1,577.1891 psf	910.59057 psf	325 psf	0 psf	Fill
Slice 7	327.87339 ft	1,712.5987 ft	0 psf	1,724.9793 psf	995.91727 psf	325 psf	0 psf	Fill
Slice 8	332.55239 ft	1,709.3095 ft	0 psf	1,850.7816 psf	1,068.5492 psf	325 psf	0 psf	Fill
Slice 9	337.23139 ft	1,706.2571 ft	0 psf	1,955.2599 psf	1,128.8698 psf	325 psf	0 psf	Fill
Slice 10	341.91039 ft	1,703.4263 ft	0 psf	2,038.9826 psf	1,177.2071 psf	325 psf	0 psf	Fill
Slice 11	346.58939 ft	1,700.8037 ft	0 psf	2,102.4307 psf	1,213.8389 psf	325 psf	0 psf	Fill
Slice 12	351.26838 ft	1,698.3783 ft	0 psf	2,146.0058 psf	1,238.997 psf	325 psf	0 psf	Fill
Slice 13	355.94738 ft	1,696.1402 ft	0 psf	2,170.0361 psf	1,252.8709 psf	325 psf	0 psf	Fill
Slice 14	360.62638 ft	1,694.0812 ft	0 psf	2,174.7816 psf	1,255.6107 psf	325 psf	0 psf	Fill
Slice 15	365.30538 ft	1,692.1939 ft	0 psf	2,160.4381 psf	1,247.3295 psf	325 psf	0 psf	Fill
Slice 16	369.98438 ft	1,690.472 ft	0 psf	2,127.1407 psf	1,228.1052 psf	325 psf	0 psf	Fill
Slice 17	374.66337 ft	1,688.91 ft	0 psf	2,074.9656 psf	1,197.982 psf	325 psf	0 psf	Fill
Slice 18	379.34237 ft	1,687.5031 ft	0 psf	2,003.932 psf	1,156.9707 psf	325 psf	0 psf	Fill
Slice 19	384.02137 ft	1,686.2471 ft	0 psf	1,914.0024 psf	1,105.0498 psf	325 psf	0 psf	Fill
Slice 20	388.31045 ft	1,685.2199 ft	0 psf	1,923.6051 psf	1,110.5939 psf	325 psf	0 psf	Fill
Slice 21	392.20962 ft	1,684.3966 ft	0 psf	2,038.8678 psf	1,177.1409 psf	325 psf	0 psf	Fill
Slice 22	396.10879 ft	1,683.6722 ft	0 psf	2,144.9004 psf	1,238.3588 psf	325 psf	0 psf	Fill

Slice 23	400.50277 ft	1,682.9795 ft	0 psf	2,101.361 psf	1,213.2213 psf	325 psf	0 psf	Fill
Slice 24	405.39158 ft	1,682.3446 ft	0 psf	1,900.2133 psf	1,097.0887 psf	325 psf	0 psf	Fill
Slice 25	410.28039 ft	1,681.8592 ft	0 psf	1,676.5802 psf	967.97404 psf	325 psf	0 psf	Fill
Slice 26	415.1692 ft	1,681.5221 ft	0 psf	1,429.9578 psf	825.5865 psf	325 psf	0 psf	Fill
Slice 27	420.05801 ft	1,681.3322 ft	0 psf	1,159.7453 psf	669.57927 psf	325 psf	0 psf	Fill
Slice 28	424.94682 ft	1,681.2891 ft	0 psf	865.23602 psf	499.54425 psf	325 psf	0 psf	Fill
Slice 29	429.83563 ft	1,681.3927 ft	0 psf	545.6049 psf	315.00514 psf	325 psf	0 psf	Fill
Slice 30	434.72444 ft	1,681.6432 ft	0 psf	199.89429 psf	115.40902 psf	325 psf	0 psf	Fill

Section A-A Tr 68203 SSA.gsz 11/06/2020 10:49:39 AM

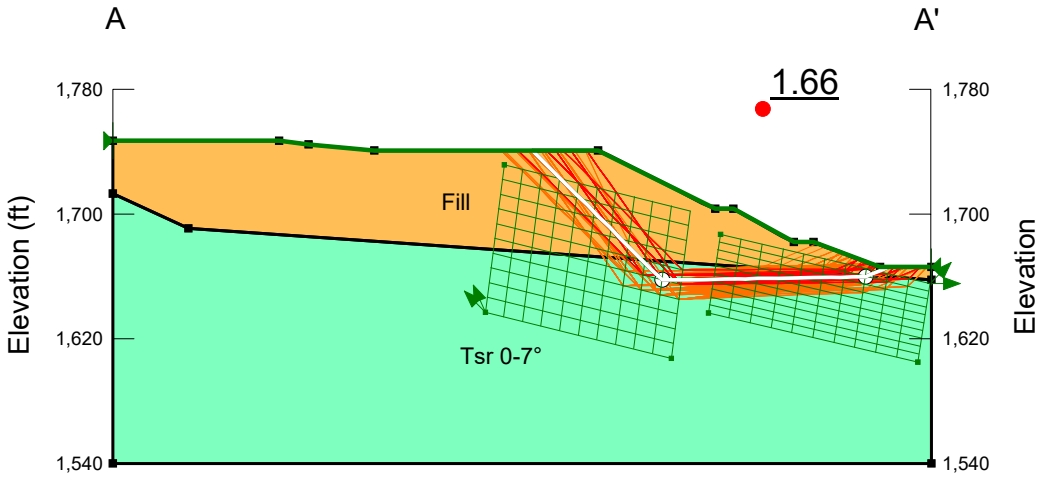
Section A-A Tr 68203 SSA.gsz

2 -Translational Static Global

Horz Seismic Coef.: 0

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 0-7°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-7°
C-Anisotropic Strength Fn.: Tsr 250 bedding 0-7°



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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 711
Date: 11/06/2020
Time: 10:49:39 AM
Tool Version: 10.1.0.18696
File Name: Section A-A Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/06/2020
Last Solved Time: 10:49:54 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Static Global

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 0-7°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-7°
C-Anisotropic Strength Fn.: Tsr 250 bedding 0-7°
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.03953, 1,746.9781) ft
Right Coordinate: (525.146, 1,665.7748) ft

Slip Surface Block

Left Grid
- Upper Left: (251.11545, 1,731.4155) ft
- Lower Left: (239.2051, 1,636.8957) ft
- Lower Right: (358.45037, 1,607.3191) ft
- X Increments: 10
- Y Increments: 10
- Starting Angle: 115 °
- Ending Angle: 135 °
- Angle Increments: 2

Right Grid
- Upper Left: (389.98245, 1,686.5856) ft
- Lower Left: (382.41085, 1,636.2885) ft
- Lower Right: (516.53643, 1,604.9204) ft
- X Increments: 10
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding 0-7°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (0, 1)
Data Point: (0.1, 0.5625)
Data Point: (7, 0.5625)
Data Point: (7.01, 1)

Tsr 250 bedding 0-7°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (0, 1)
Data Point: (0.1, 0.4167)
Data Point: (7, 0.4167)
Data Point: (7.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	492.09114 ft	1,665.7748 ft
Point 2	525.146 ft	1,665.7748 ft
Point 3	525.146 ft	1,539.7155 ft
Point 4	0.03953 ft	1,539.7155 ft
Point 5	0.03953 ft	1,713.0176 ft
Point 6	0.03953 ft	1,746.9781 ft
Point 7	106.82845 ft	1,746.9781 ft
Point 8	125.69538 ft	1,744.5631 ft
Point 9	167.9573 ft	1,740.8652 ft
Point 10	311.4969 ft	1,740.8652 ft
Point 11	386.36087 ft	1,703.1313 ft
Point 12	398.05837 ft	1,703.1313 ft
Point 13	437.22611 ft	1,681.774 ft
Point 14	449.75375 ft	1,681.774 ft
Point 15	48.62654 ft	1,690.7021 ft
Point 16	525.146 ft	1,657.6545 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-7°	4,3,16,15,5	71,952 ft²
Region 2	Fill	5,15,16,2,1,14,13,12,11,10,9,8,7,6	24,683 ft²

Slip Results

Slip Surfaces Analysed: 63919 of 131769 converged

Current Slip Surface

Slip Surface: 70,742
Factor of Safety: 1.66
Volume: 7,611.9872 ft³
Weight: 918,102.56 lbf
Resisting Force: 403,382.59 lbf
Activating Force: 243,486.06 lbf
Slip Rank: 1 of 131,769 slip surfaces
Exit: (498.02478, 1,665.7748) ft
Entry: (269.15248, 1,740.8652) ft
Radius: 123.91388 ft
Center: (402.06586, 1,759.6378) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	272.68118 ft	1,737.3365 ft	0 psf	168.20959 psf	97.115854 psf	325 psf	0 psf	Fill
Slice 2	279.73858 ft	1,730.2791 ft	0 psf	795.95381 psf	459.54415 psf	325 psf	0 psf	Fill
Slice 3	286.79599 ft	1,723.2217 ft	0 psf	1,423.698 psf	821.97244 psf	325 psf	0 psf	Fill
Slice 4	293.85339 ft	1,716.1643 ft	0 psf	2,051.4423 psf	1,184.4007 psf	325 psf	0 psf	Fill
Slice 5	300.91079 ft	1,709.1069 ft	0 psf	2,679.1865 psf	1,546.829 psf	325 psf	0 psf	Fill
Slice 6	307.9682 ft	1,702.0495 ft	0 psf	3,306.9307 psf	1,909.2573 psf	325 psf	0 psf	Fill
Slice 7	314.99571 ft	1,695.022 ft	0 psf	3,775.1543 psf	2,179.5864 psf	325 psf	0 psf	Fill
Slice 8	321.99333 ft	1,688.0244 ft	0 psf	4,083.8574 psf	2,357.8161 psf	325 psf	0 psf	Fill
Slice 9	328.99095 ft	1,681.0267 ft	0 psf	4,392.5604 psf	2,536.0459 psf	325 psf	0 psf	Fill
Slice 10	335.98856 ft	1,674.0291 ft	0 psf	4,701.2634 psf	2,714.2757 psf	325 psf	0 psf	Fill
Slice 11	342.73578 ft	1,667.2819 ft	0 psf	4,784.9628 psf	2,989.9766 psf	600 psf	0 psf	Tsr 0-7°
Slice 12	349.23261 ft	1,660.7851 ft	0 psf	5,087.5374 psf	3,179.0462 psf	600 psf	0 psf	Tsr 0-7°
Slice 13	356.716 ft	1,657.6035 ft	0 psf	7,340.1791 psf	2,384.9688 psf	250.02 psf	0 psf	Tsr 0-7°

Slice 14	365.18596 ft	1,657.7372 ft	0 psf	6,806.5824 psf	2,211.5927 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 15	373.65593 ft	1,657.8708 ft	0 psf	6,272.9857 psf	2,038.2166 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 16	382.12589 ft	1,658.0045 ft	0 psf	5,739.389 psf	1,864.8405 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 17	389.28524 ft	1,658.1175 ft	0 psf	5,465.7866 psf	1,775.9417 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 18	395.134 ft	1,658.2098 ft	0 psf	5,452.1787 psf	1,771.5202 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 19	401.97514 ft	1,658.3177 ft	0 psf	5,179.177 psf	1,682.8166 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 20	409.80869 ft	1,658.4414 ft	0 psf	4,646.7817 psf	1,509.8309 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 21	417.64224 ft	1,658.565 ft	0 psf	4,114.3864 psf	1,336.8452 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 22	425.47579 ft	1,658.6886 ft	0 psf	3,581.9911 psf	1,163.8595 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 23	433.30934 ft	1,658.8122 ft	0 psf	3,049.5958 psf	990.87374 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 24	440.35802 ft	1,658.9235 ft	0 psf	2,776.1113 psf	902.01324 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 25	446.62184 ft	1,659.0223 ft	0 psf	2,761.5376 psf	897.27795 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 26	453.92368 ft	1,659.1376 ft	0 psf	2,554.8638 psf	830.12556 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 27	462.26354 ft	1,659.2692 ft	0 psf	2,156.0899 psf	700.55608 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 28	470.6034 ft	1,659.4008 ft	0 psf	1,757.3161 psf	570.9866 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 29	478.94327 ft	1,659.5324 ft	0 psf	1,358.5422 psf	441.41712 psf	250.02 psf	0 psf	Tsr 0-7°
Slice 30	484.11755 ft	1,660.0142 ft	0 psf	1,429.2326 psf	893.08363 psf	600 psf	0 psf	Tsr 0-7°
Slice 31	488.60652 ft	1,661.8736 ft	0 psf	827.16768 psf	477.56548 psf	325 psf	0 psf	Fill
Slice 32	495.05796 ft	1,664.5459 ft	0 psf	267.55468 psf	154.47277 psf	325 psf	0 psf	Fill

Section A-A Tr 68203 SSA.gsz 11/06/2020 10:49:39 AM

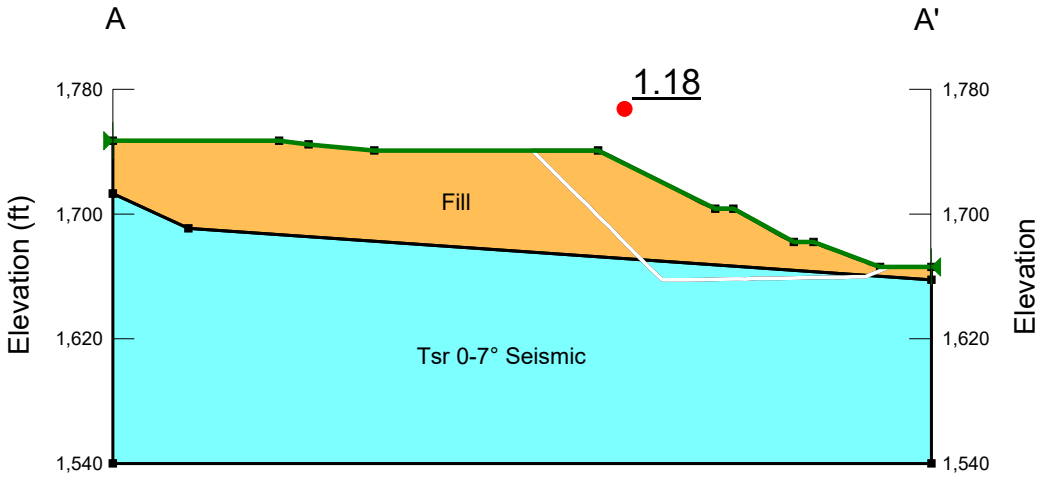
Section A-A Tr 68203 SSA.gsz

2 -Translational Pseudostatic Global

Horz Seismic Coef.: 0.15

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 0-7° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-7° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-7° (Seismic)



LGC

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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 711
Date: 11/06/2020
Time: 10:49:39 AM
Tool Version: 10.1.0.18696
File Name: Section A-A Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/06/2020
Last Solved Time: 10:49:56 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Pseudostatic Global

Kind: SLOPE/W
Parent: 2 -Translational Static Global
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 0-7° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-7° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-7° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.03953, 1,746.9781) ft
Right Coordinate: (525.146, 1,665.7748) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding 0-7° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (0, 1)
- Data Point: (0.1, 0.625)
- Data Point: (7, 0.625)
- Data Point: (7.1, 1)

Tsr 19° bedding 0-7° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (0, 1)
- Data Point: (0.1, 0.5938)
- Data Point: (7, 0.5938)

Data Point: (7.1, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	492.09114 ft	1,665.7748 ft
Point 2	525.146 ft	1,665.7748 ft
Point 3	525.146 ft	1,539.7155 ft
Point 4	0.03953 ft	1,539.7155 ft
Point 5	0.03953 ft	1,713.0176 ft
Point 6	0.03953 ft	1,746.9781 ft
Point 7	106.82845 ft	1,746.9781 ft
Point 8	125.69538 ft	1,744.5631 ft
Point 9	167.9573 ft	1,740.8652 ft
Point 10	311.4969 ft	1,740.8652 ft
Point 11	386.36087 ft	1,703.1313 ft
Point 12	398.05837 ft	1,703.1313 ft
Point 13	437.22611 ft	1,681.774 ft
Point 14	449.75375 ft	1,681.774 ft
Point 15	48.62654 ft	1,690.7021 ft
Point 16	525.146 ft	1,657.6545 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-7° Seismic	4,3,16,15,5	71,952 ft²
Region 2	Fill	5,15,16,2,1,14,13,12,11,10,9,8,7,6	24,683 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.18
Volume: 7,611.9872 ft³
Weight: 918,102.56 lbf
Resisting Force: 414,408.93 lbf
Activating Force: 351,469.68 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (498.02478, 1,665.7748) ft
Entry: (269.15248, 1,740.8652) ft

Radius: 123.91388 ft
Center: (402.06586, 1,759.6378) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	272.68118 ft	1,737.3365 ft	0 psf	100.09013 psf	57.787065 psf	325 psf	0 psf	Fill
Slice 2	279.73858 ft	1,730.2791 ft	0 psf	669.34704 psf	386.4477 psf	325 psf	0 psf	Fill
Slice 3	286.79599 ft	1,723.2217 ft	0 psf	1,238.604 psf	715.10833 psf	325 psf	0 psf	Fill
Slice 4	293.85339 ft	1,716.1643 ft	0 psf	1,807.8609 psf	1,043.769 psf	325 psf	0 psf	Fill
Slice 5	300.91079 ft	1,709.1069 ft	0 psf	2,377.1178 psf	1,372.4296 psf	325 psf	0 psf	Fill
Slice 6	307.9682 ft	1,702.0495 ft	0 psf	2,946.3747 psf	1,701.0902 psf	325 psf	0 psf	Fill
Slice 7	314.99571 ft	1,695.022 ft	0 psf	3,370.9736 psf	1,946.2325 psf	325 psf	0 psf	Fill
Slice 8	321.99333 ft	1,688.0244 ft	0 psf	3,650.9146 psf	2,107.8565 psf	325 psf	0 psf	Fill
Slice 9	328.99095 ft	1,681.0267 ft	0 psf	3,930.8556 psf	2,269.4806 psf	325 psf	0 psf	Fill
Slice 10	335.98856 ft	1,674.0291 ft	0 psf	4,210.7966 psf	2,431.1046 psf	325 psf	0 psf	Fill
Slice 11	342.73578 ft	1,667.2819 ft	0 psf	4,220.8468 psf	2,637.4778 psf	600 psf	0 psf	Tsr 0-7° Seismic
Slice 12	349.23261 ft	1,660.7851 ft	0 psf	4,493.7117 psf	2,807.9827 psf	600 psf	0 psf	Tsr 0-7° Seismic
Slice 13	356.716 ft	1,657.6035 ft	0 psf	7,353.7934 psf	2,532.3438 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 14	365.18596 ft	1,657.7372 ft	0 psf	6,819.3978 psf	2,348.32 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 15	373.65593 ft	1,657.8708 ft	0 psf	6,285.0023 psf	2,164.2962 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 16	382.12589 ft	1,658.0045 ft	0 psf	5,750.6068 psf	1,980.2723 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 17	389.28524 ft	1,658.1175 ft	0 psf	5,476.5948 psf	1,885.9139 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 18	395.134 ft	1,658.2098 ft	0 psf	5,462.9664 psf	1,881.2208 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 19	401.97514 ft	1,658.3177 ft	0 psf	5,189.5561 psf	1,787.0696 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 20	409.80869 ft	1,658.4414 ft	0 psf	4,656.3638 psf	1,603.4601 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 21	417.64224 ft	1,658.565 ft	0 psf	4,123.1714 psf	1,419.8506 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 22	425.47579 ft	1,658.6886 ft	0 psf	3,589.9791 psf	1,236.2411 psf	375 psf	0 psf	Tsr 0-7° Seismic

Slice 23	433.30934 ft	1,658.8122 ft	0 psf	3,056.7867 psf	1,052.6316 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 24	440.35802 ft	1,658.9235 ft	0 psf	2,782.8928 psf	958.31376 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 25	446.62184 ft	1,659.0223 ft	0 psf	2,768.2973 psf	953.28766 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 26	453.92368 ft	1,659.1376 ft	0 psf	2,561.3141 psf	882.01117 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 27	462.26354 ft	1,659.2692 ft	0 psf	2,161.9432 psf	744.48428 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 28	470.6034 ft	1,659.4008 ft	0 psf	1,762.5724 psf	606.95739 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 29	478.94327 ft	1,659.5324 ft	0 psf	1,363.2015 psf	469.43051 psf	375 psf	0 psf	Tsr 0-7° Seismic
Slice 30	484.11755 ft	1,660.0142 ft	0 psf	1,619.2599 psf	1,011.8259 psf	600 psf	0 psf	Tsr 0-7° Seismic
Slice 31	488.60652 ft	1,661.8736 ft	0 psf	927.18329 psf	535.30952 psf	325 psf	0 psf	Fill
Slice 32	495.05796 ft	1,664.5459 ft	0 psf	327.30652 psf	188.97051 psf	325 psf	0 psf	Fill

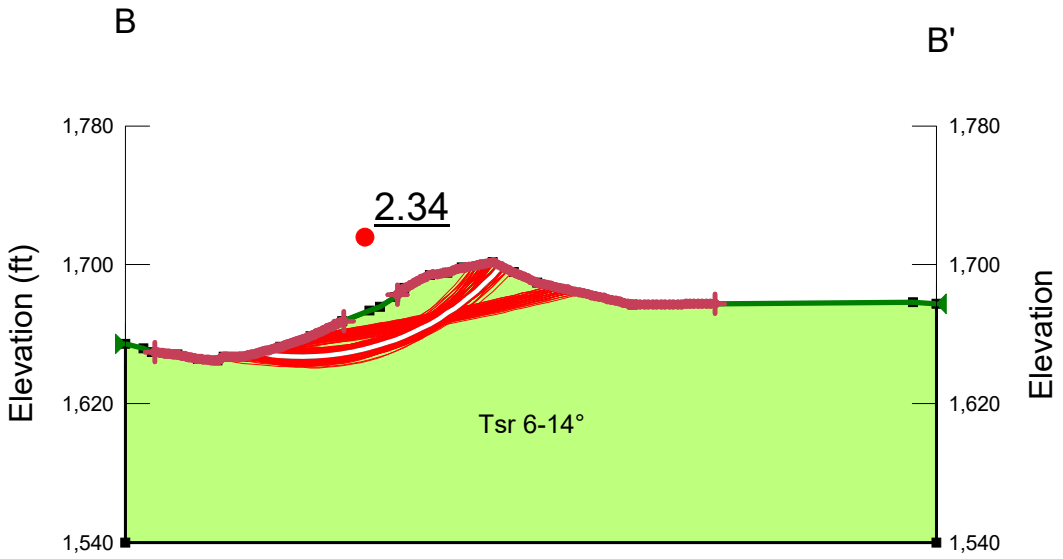
Section B-B Tr 68203 SSA.gsz 11/18/2020 09:56:32 AM

Section B-B Tr 68203 SSA.gsz

1 -Rotational Static Global

Horz Seismic Coef.: 0

Name: Tsr 6-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°



LGC

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Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 731
Date: 11/18/2020
Time: 09:56:32 AM
Tool Version: 10.1.0.18696
File Name: Section B-B Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 09:56:45 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Static Global

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 6-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°
Phi-B: 0 °

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (16.82697, 1,649.5566) ft
Left-Zone Right Coordinate: (125.5032, 1,667.6198) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (156.72276, 1,682.649) ft
Right-Zone Right Coordinate: (339.37952, 1,677.4192) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (-0.07723, 1,654.2154) ft
Right Coordinate: (466.94718, 1,677.4443) ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.4167)
- Data Point: (14, 0.4167)
- Data Point: (14.01, 1)

Tsr 18° bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (5.99, 1)
Data Point: (6, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	466.94718 ft	1,677.4443 ft
Point 2	466.94718 ft	1,539.7912 ft
Point 3	-0.07723 ft	1,539.7912 ft
Point 4	-0.07723 ft	1,654.2154 ft
Point 5	10.29203 ft	1,651.7249 ft
Point 6	14.97103 ft	1,649.7628 ft
Point 7	29.91364 ft	1,648.1025 ft
Point 8	41.6866 ft	1,645.6875 ft
Point 9	53.00437 ft	1,644.6211 ft
Point 10	56.52355 ft	1,647.0158 ft
Point 11	67.84371 ft	1,647.0158 ft
Point 12	89.03505 ft	1,652.4494 ft
Point 13	106.60393 ft	1,658.6982 ft
Point 14	124.62562 ft	1,667.2713 ft
Point 15	140.39837 ft	1,673.5351 ft
Point 16	146.58673 ft	1,675.9501 ft
Point 17	155.26551 ft	1,681.2328 ft
Point 18	160.62372 ft	1,686.4401 ft
Point 19	175.11352 ft	1,694.1378 ft
Point 20	185.48049 ft	1,695.2823 ft
Point 21	193.60311 ft	1,698.213 ft
Point 22	206.28169 ft	1,700.1752 ft
Point 23	211.32062 ft	1,701.5785 ft
Point 24	223.51852 ft	1,695.5566 ft
Point 25	237.1027 ft	1,689.5795 ft
Point 26	291.80171 ft	1,676.9915 ft
Point 27	453.44475 ft	1,678.4447 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14°	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	62,735 ft²

Slip Results

Slip Surfaces Analysed: 93728 of 98415 converged

Current Slip Surface

Slip Surface: 52,656
Factor of Safety: 2.34
Volume: 2,370.0898 ft³
Weight: 296,261.22 lbf
Resisting Moment: 37,039,129 lbf·ft
Activating Moment: 15,802,176 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (76.470495, 1,649.2278) ft
Entry: (216.28131, 1,699.1295) ft
Radius: 151.47096 ft
Center: (101.99081, 1,798.5334) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	78.564587 ft	1,648.8999 ft	0 psf	154.58946 psf	96.598214 psf	600 psf	0 psf	Tsr 6-14°
Slice 2	82.752772 ft	1,648.3039 ft	0 psf	361.93529 psf	226.16227 psf	600 psf	0 psf	Tsr 6-14°
Slice 3	86.940957 ft	1,647.8266 ft	0 psf	550.92771 psf	344.25784 psf	600 psf	0 psf	Tsr 6-14°
Slice 4	91.23116 ft	1,647.4611 ft	0 psf	753.69219 psf	470.95915 psf	600 psf	0 psf	Tsr 6-14°
Slice 5	95.62338 ft	1,647.2123 ft	0 psf	969.17998 psf	605.61087 psf	600 psf	0 psf	Tsr 6-14°
Slice 6	100.0156 ft	1,647.0912 ft	0 psf	1,165.3449 psf	728.18829 psf	600 psf	0 psf	Tsr 6-14°
Slice 7	104.40782 ft	1,647.0976 ft	0 psf	1,342.6431 psf	838.97654 psf	600 psf	0 psf	Tsr 6-14°
Slice 8	108.85664 ft	1,647.2349 ft	0 psf	1,536.6834 psf	960.22635 psf	600 psf	0 psf	Tsr 6-14°
Slice 9	113.36206 ft	1,647.5067 ft	0 psf	1,746.508 psf	1,091.3393 psf	600 psf	0 psf	Tsr 6-14°
Slice 10	117.86749 ft	1,647.9138 ft	0 psf	1,977.7107 psf	642.59717 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 11	122.37291 ft	1,648.4572 ft	0 psf	2,162.6471 psf	702.68664 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 12	127.25441 ft	1,649.2079 ft	0 psf	2,316.1101 psf	752.5498 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 13	132.512 ft	1,650.1935 ft	0 psf	2,434.8844 psf	791.1419 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 14	137.76958 ft	1,651.3736 ft	0 psf	2,528.6278 psf	821.60097 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 15	143.49255 ft	1,652.8944 ft	0 psf	2,470.5938 psf	1,543.7983 psf	600 psf	0 psf	Tsr 6-14°

Slice 16	148.75643 ft	1,654.4805 ft	0 psf	2,545.6035 psf	1,590.6696 psf	600 psf	0 psf	Tsr 6-14°
Slice 17	153.09581 ft	1,655.9626 ft	0 psf	2,649.0543 psf	1,655.3129 psf	600 psf	0 psf	Tsr 6-14°
Slice 18	157.94461 ft	1,657.8056 ft	0 psf	2,850.2736 psf	1,781.0486 psf	600 psf	0 psf	Tsr 6-14°
Slice 19	163.03869 ft	1,659.9345 ft	0 psf	3,007.9732 psf	1,879.5903 psf	600 psf	0 psf	Tsr 6-14°
Slice 20	167.86862 ft	1,662.1649 ft	0 psf	3,005.2182 psf	1,877.8688 psf	600 psf	0 psf	Tsr 6-14°
Slice 21	172.69855 ft	1,664.6065 ft	0 psf	2,977.2816 psf	1,860.412 psf	600 psf	0 psf	Tsr 6-14°
Slice 22	177.70526 ft	1,667.3777 ft	0 psf	2,802.2022 psf	1,751.0103 psf	600 psf	0 psf	Tsr 6-14°
Slice 23	182.88875 ft	1,670.5116 ft	0 psf	2,481.2721 psf	1,550.4709 psf	600 psf	0 psf	Tsr 6-14°
Slice 24	187.51114 ft	1,673.5387 ft	0 psf	2,228.3923 psf	1,392.4541 psf	600 psf	0 psf	Tsr 6-14°
Slice 25	191.57245 ft	1,676.4177 ft	0 psf	2,045.4791 psf	1,278.1572 psf	600 psf	0 psf	Tsr 6-14°
Slice 26	195.71621 ft	1,679.5722 ft	0 psf	1,793.1297 psf	1,120.4718 psf	600 psf	0 psf	Tsr 6-14°
Slice 27	199.9424 ft	1,683.029 ft	0 psf	1,471.3477 psf	919.40009 psf	600 psf	0 psf	Tsr 6-14°
Slice 28	204.16859 ft	1,686.7525 ft	0 psf	1,128.3874 psf	705.0947 psf	600 psf	0 psf	Tsr 6-14°
Slice 29	208.80115 ft	1,691.1911 ft	0 psf	755.85873 psf	472.31295 psf	600 psf	0 psf	Tsr 6-14°
Slice 30	213.80097 ft	1,696.4138 ft	0 psf	164.49751 psf	102.78945 psf	600 psf	0 psf	Tsr 6-14°

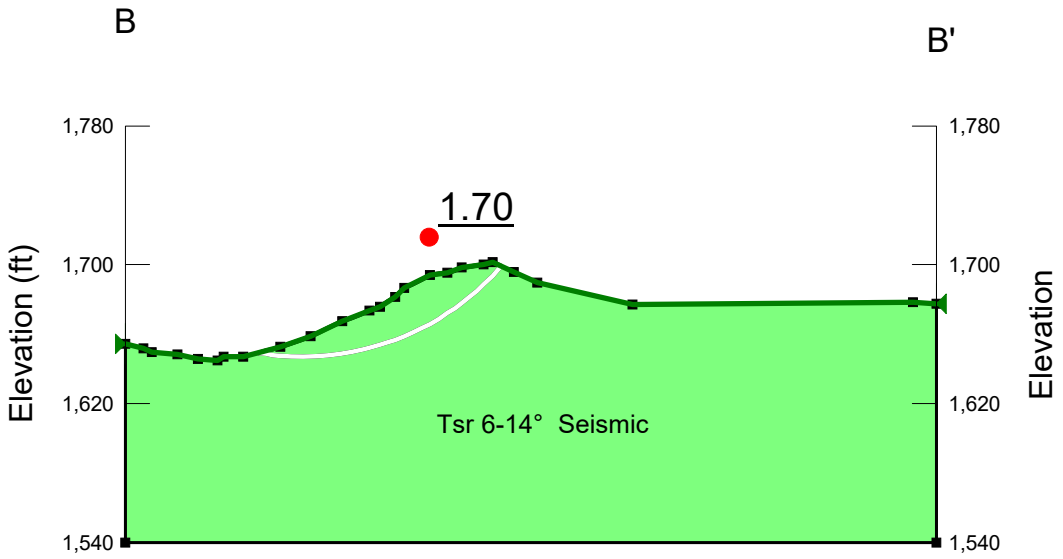
Section B-B Tr 68203 SSA.gsz 11/18/2020 09:56:32 AM

Section B-B Tr 68203 SSA.gsz

1 -Rotational Pseudostatic Global

Horz Seismic Coef.: 0.15

Name: Tsr 6-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)



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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 731
Date: 11/18/2020
Time: 09:56:32 AM
Tool Version: 10.1.0.18696
File Name: Section B-B Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 09:56:59 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Pseudostatic Global

Kind: SLOPE/W
Parent: 1 -Rotational Static Global
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 6-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (-0.07723, 1,654.2154) ft
Right Coordinate: (466.94718, 1,677.4443) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.625)
- Data Point: (14, 0.625)
- Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	466.94718 ft	1,677.4443 ft
Point 2	466.94718 ft	1,539.7912 ft
Point 3	-0.07723 ft	1,539.7912 ft
Point 4	-0.07723 ft	1,654.2154 ft
Point 5	10.29203 ft	1,651.7249 ft
Point 6	14.97103 ft	1,649.7628 ft
Point 7	29.91364 ft	1,648.1025 ft
Point 8	41.6866 ft	1,645.6875 ft
Point 9	53.00437 ft	1,644.6211 ft
Point 10	56.52355 ft	1,647.0158 ft
Point 11	67.84371 ft	1,647.0158 ft
Point 12	89.03505 ft	1,652.4494 ft
Point 13	106.60393 ft	1,658.6982 ft
Point 14	124.62562 ft	1,667.2713 ft
Point 15	140.39837 ft	1,673.5351 ft
Point 16	146.58673 ft	1,675.9501 ft
Point 17	155.26551 ft	1,681.2328 ft
Point 18	160.62372 ft	1,686.4401 ft
Point 19	175.11352 ft	1,694.1378 ft
Point 20	185.48049 ft	1,695.2823 ft
Point 21	193.60311 ft	1,698.213 ft
Point 22	206.28169 ft	1,700.1752 ft
Point 23	211.32062 ft	1,701.5785 ft
Point 24	223.51852 ft	1,695.5566 ft
Point 25	237.1027 ft	1,689.5795 ft
Point 26	291.80171 ft	1,676.9915 ft
Point 27	453.44475 ft	1,678.4447 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14° Seismic	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	62,735 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.70
Volume: 2,370.0898 ft³
Weight: 296,261.22 lbf

Resisting Moment: 36,398,152 lbf·ft
Activating Moment: 21,460,015 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (76.470495, 1,649.2278) ft
Entry: (216.28131, 1,699.1295) ft
Radius: 151.47096 ft
Center: (101.99081, 1,798.5334) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	78.564587 ft	1,648.8999 ft	0 psf	173.40548 psf	108.35577 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 2	82.752772 ft	1,648.3039 ft	0 psf	379.98775 psf	237.4427 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 3	86.940957 ft	1,647.8266 ft	0 psf	566.84438 psf	354.20368 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 4	91.23116 ft	1,647.4611 ft	0 psf	766.42788 psf	478.91729 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 5	95.62338 ft	1,647.2123 ft	0 psf	977.5582 psf	610.84616 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 6	100.0156 ft	1,647.0912 ft	0 psf	1,168.1751 psf	729.9568 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 7	104.40782 ft	1,647.0976 ft	0 psf	1,338.9307 psf	836.65673 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 8	108.85664 ft	1,647.2349 ft	0 psf	1,525.3605 psf	953.15104 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 9	113.36206 ft	1,647.5067 ft	0 psf	1,726.3606 psf	1,078.7498 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 10	117.86749 ft	1,647.9138 ft	0 psf	1,952.8002 psf	672.46404 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 11	122.37291 ft	1,648.4572 ft	0 psf	2,129.1732 psf	733.19965 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 12	127.25441 ft	1,649.2079 ft	0 psf	2,273.07 psf	782.75178 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 13	132.512 ft	1,650.1935 ft	0 psf	2,381.4065 psf	820.0584 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 14	137.76958 ft	1,651.3736 ft	0 psf	2,464.4954 psf	848.6708 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 15	143.49255 ft	1,652.8944 ft	0 psf	2,380.6921 psf	1,487.6216 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 16	148.75643 ft	1,654.4805 ft	0 psf	2,442.3096 psf	1,526.1244 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 17	153.09581 ft	1,655.9626 ft	0 psf	2,532.9275 psf	1,582.7488 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 18	157.94461 ft	1,657.8056 ft	0 psf	2,715.9914 psf	1,697.1398 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 19	163.03869 ft	1,659.9345 ft	0 psf	2,855.1617 psf	1,784.103 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 20	167.86862 ft	1,662.1649 ft	0 psf	2,839.9664 psf	1,774.6079 psf	600 psf	0 psf	Tsr 6-14° Seismic

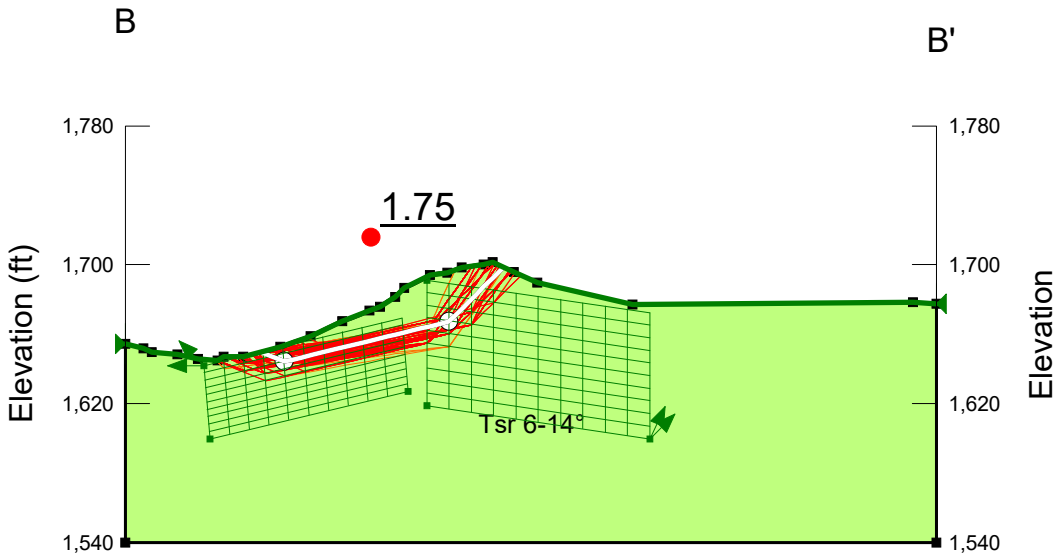
Slice 21	172.69855 ft	1,664.6065 ft	0 psf	2,800.4321 psf	1,749.9042 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 22	177.70526 ft	1,667.3777 ft	0 psf	2,620.1937 psf	1,637.2787 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 23	182.88875 ft	1,670.5116 ft	0 psf	2,302.0086 psf	1,438.4546 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 24	187.51114 ft	1,673.5387 ft	0 psf	2,051.3227 psf	1,281.8087 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 25	191.57245 ft	1,676.4177 ft	0 psf	1,869.0796 psf	1,167.9306 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 26	195.71621 ft	1,679.5722 ft	0 psf	1,622.2702 psf	1,013.7069 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 27	199.9424 ft	1,683.029 ft	0 psf	1,311.6739 psf	819.62482 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 28	204.16859 ft	1,686.7525 ft	0 psf	983.24063 psf	614.39694 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 29	208.80115 ft	1,691.1911 ft	0 psf	628.86992 psf	392.96154 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 30	213.80097 ft	1,696.4138 ft	0 psf	75.316417 psf	47.062921 psf	600 psf	0 psf	Tsr 6-14° Seismic

Section B-B Tr 68203 SSA.gsz

2 -Translational Static Global

Horz Seismic Coef.: 0

Name: Tsr 6-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°



LGC

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Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 731
Date: 11/18/2020
Time: 09:56:32 AM
Tool Version: 10.1.0.18696
File Name: Section B-B Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 09:56:59 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Static Global

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 6-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (-0.07723, 1,654.2154) ft
Right Coordinate: (466.94718, 1,677.4443) ft

Slip Surface Block

Left Grid
- Upper Left: (45.09472, 1,641.6545) ft
- Lower Left: (48.68095, 1,599.4892) ft
- Lower Right: (162.57079, 1,626.8749) ft
- X Increments: 10
- Y Increments: 10
- Starting Angle: 135 °
- Ending Angle: 180 °
- Angle Increments: 2

Right Grid
- Upper Left: (173.43814, 1,690.9923) ft
- Lower Left: (173.65549, 1,618.5071) ft
- Lower Right: (301.9989, 1,599.5979) ft
- X Increments: 10
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.4167)
- Data Point: (14, 0.4167)

Data Point: (14.01, 1)

Tsr 18° bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (5.99, 1)
Data Point: (6, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	466.94718 ft	1,677.4443 ft
Point 2	466.94718 ft	1,539.7912 ft
Point 3	-0.07723 ft	1,539.7912 ft
Point 4	-0.07723 ft	1,654.2154 ft
Point 5	10.29203 ft	1,651.7249 ft
Point 6	14.97103 ft	1,649.7628 ft
Point 7	29.91364 ft	1,648.1025 ft
Point 8	41.6866 ft	1,645.6875 ft
Point 9	53.00437 ft	1,644.6211 ft
Point 10	56.52355 ft	1,647.0158 ft
Point 11	67.84371 ft	1,647.0158 ft
Point 12	89.03505 ft	1,652.4494 ft
Point 13	106.60393 ft	1,658.6982 ft
Point 14	124.62562 ft	1,667.2713 ft
Point 15	140.39837 ft	1,673.5351 ft
Point 16	146.58673 ft	1,675.9501 ft
Point 17	155.26551 ft	1,681.2328 ft
Point 18	160.62372 ft	1,686.4401 ft
Point 19	175.11352 ft	1,694.1378 ft
Point 20	185.48049 ft	1,695.2823 ft
Point 21	193.60311 ft	1,698.213 ft
Point 22	206.28169 ft	1,700.1752 ft
Point 23	211.32062 ft	1,701.5785 ft
Point 24	223.51852 ft	1,695.5566 ft
Point 25	237.1027 ft	1,689.5795 ft

Point 26	291.80171 ft	1,676.9915 ft
Point 27	453.44475 ft	1,678.4447 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14°	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	62,735 ft²

Slip Results

Slip Surfaces Analysed: 75830 of 131769 converged

Current Slip Surface

Slip Surface: 100,786
Factor of Safety: 1.75
Volume: 2,330.9847 ft³
Weight: 291,373.09 lbf
Resisting Force: 148,994.9 lbf
Activating Force: 85,012.01 lbf
Slip Rank: 1 of 131,769 slip surfaces
Exit: (78.138597, 1,649.6555) ft
Entry: (217.5065, 1,698.5246) ft
Radius: 73.733077 ft
Center: (134.97062, 1,710.7419) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	80.862711 ft	1,648.5271 ft	0 psf	433.12425 psf	270.64607 psf	600 psf	0 psf	Tsr 6-14°
Slice 2	86.310937 ft	1,646.2704 ft	0 psf	968.51936 psf	605.19807 psf	600 psf	0 psf	Tsr 6-14°
Slice 3	90.201476 ft	1,644.6589 ft	0 psf	1,367.8083 psf	854.70147 psf	600 psf	0 psf	Tsr 6-14°
Slice 4	93.90724 ft	1,644.7955 ft	0 psf	1,089.6331 psf	354.04326 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 5	98.985916 ft	1,646.0351 ft	0 psf	1,157.4252 psf	376.07025 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 6	104.06459 ft	1,647.2747 ft	0 psf	1,225.2173 psf	398.09723 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 7	108.85664 ft	1,648.4443 ft	0 psf	1,321.5277 psf	429.39036 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 8	113.36206 ft	1,649.544 ft	0 psf	1,446.3563 psf	469.94964 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 9	117.86749 ft	1,650.6437 ft	0 psf	1,571.1849 psf	510.50892 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 10	122.37291 ft	1,651.7434 ft	0 psf	1,696.0135 psf	551.0682 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 11	127.25441 ft	1,652.9349 ft	0 psf	1,806.5526 psf	586.98453 psf	250.02 psf	0 psf	Tsr 6-14°

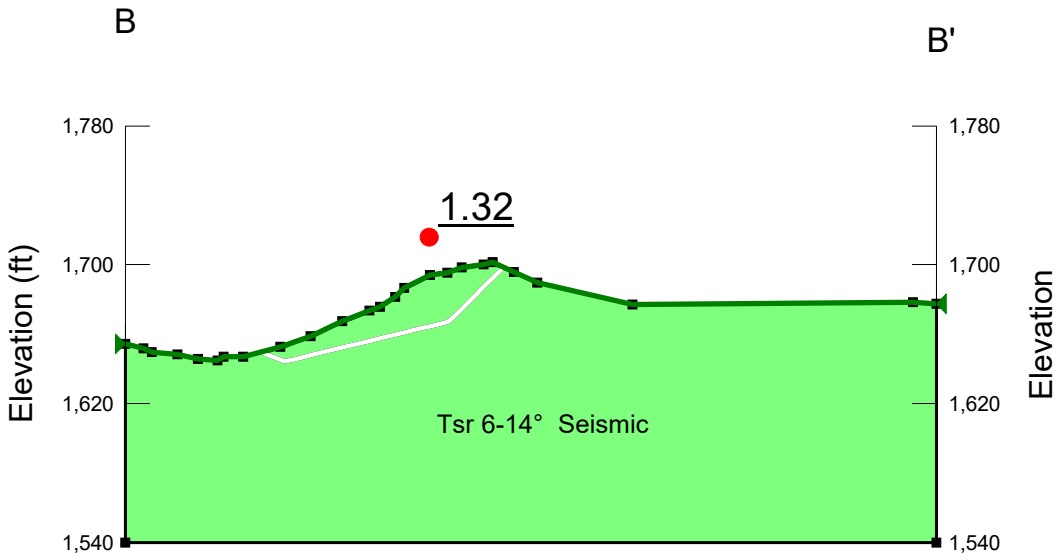
Slice 12	132.512 ft	1,654.2181 ft	0 psf	1,902.8021 psf	618.25789 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 13	137.76958 ft	1,655.5014 ft	0 psf	1,999.0517 psf	649.53126 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 14	143.49255 ft	1,656.8982 ft	0 psf	2,101.275 psf	682.74562 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 15	148.75643 ft	1,658.183 ft	0 psf	2,249.9998 psf	731.06924 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 16	153.09581 ft	1,659.2422 ft	0 psf	2,439.2524 psf	792.56114 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 17	157.94461 ft	1,660.4257 ft	0 psf	2,767.0941 psf	899.08339 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 18	163.03869 ft	1,661.669 ft	0 psf	3,083.2627 psf	1,001.8128 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 19	167.86862 ft	1,662.8479 ft	0 psf	3,249.169 psf	1,055.719 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 20	172.69855 ft	1,664.0268 ft	0 psf	3,415.0752 psf	1,109.6252 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 21	177.70526 ft	1,665.2488 ft	0 psf	3,456.5865 psf	1,123.113 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 22	182.88875 ft	1,666.514 ft	0 psf	3,373.7027 psf	1,096.1825 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 23	185.90909 ft	1,667.2512 ft	0 psf	3,338.2451 psf	1,084.6616 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 24	188.15404 ft	1,669.1722 ft	0 psf	2,246.5737 psf	1,403.8151 psf	600 psf	0 psf	Tsr 6-14°
Slice 25	191.78675 ft	1,672.8049 ft	0 psf	2,032.3355 psf	1,269.9442 psf	600 psf	0 psf	Tsr 6-14°
Slice 26	195.71621 ft	1,676.7343 ft	0 psf	1,760.4264 psf	1,100.0365 psf	600 psf	0 psf	Tsr 6-14°
Slice 27	199.9424 ft	1,680.9605 ft	0 psf	1,430.8464 psf	894.09206 psf	600 psf	0 psf	Tsr 6-14°
Slice 28	204.16859 ft	1,685.1867 ft	0 psf	1,101.2664 psf	688.14759 psf	600 psf	0 psf	Tsr 6-14°
Slice 29	208.80115 ft	1,689.8193 ft	0 psf	768.75678 psf	480.37255 psf	600 psf	0 psf	Tsr 6-14°
Slice 30	214.41356 ft	1,695.4317 ft	0 psf	174.78752 psf	109.21937 psf	600 psf	0 psf	Tsr 6-14°

Section B-B Tr 68203 SSA.gsz

2 -Translational Pseudostatic Global

Horz Seismic Coef.: 0.15

Name: Tsr 6-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)



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Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 731
Date: 11/18/2020
Time: 09:56:32 AM
Tool Version: 10.1.0.18696
File Name: Section B-B Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 09:57:00 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Pseudostatic Global

Kind: SLOPE/W
Parent: 2 -Translational Static Global
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 6-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (-0.07723, 1,654.2154) ft
Right Coordinate: (466.94718, 1,677.4443) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.625)
- Data Point: (14, 0.625)
- Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	466.94718 ft	1,677.4443 ft
Point 2	466.94718 ft	1,539.7912 ft
Point 3	-0.07723 ft	1,539.7912 ft
Point 4	-0.07723 ft	1,654.2154 ft
Point 5	10.29203 ft	1,651.7249 ft
Point 6	14.97103 ft	1,649.7628 ft
Point 7	29.91364 ft	1,648.1025 ft
Point 8	41.6866 ft	1,645.6875 ft
Point 9	53.00437 ft	1,644.6211 ft
Point 10	56.52355 ft	1,647.0158 ft
Point 11	67.84371 ft	1,647.0158 ft
Point 12	89.03505 ft	1,652.4494 ft
Point 13	106.60393 ft	1,658.6982 ft
Point 14	124.62562 ft	1,667.2713 ft
Point 15	140.39837 ft	1,673.5351 ft
Point 16	146.58673 ft	1,675.9501 ft
Point 17	155.26551 ft	1,681.2328 ft
Point 18	160.62372 ft	1,686.4401 ft
Point 19	175.11352 ft	1,694.1378 ft
Point 20	185.48049 ft	1,695.2823 ft
Point 21	193.60311 ft	1,698.213 ft
Point 22	206.28169 ft	1,700.1752 ft
Point 23	211.32062 ft	1,701.5785 ft
Point 24	223.51852 ft	1,695.5566 ft
Point 25	237.1027 ft	1,689.5795 ft
Point 26	291.80171 ft	1,676.9915 ft
Point 27	453.44475 ft	1,678.4447 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14° Seismic	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27	62,735 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.32
Volume: 2,330.9847 ft³
Weight: 291,373.09 lbf

Resisting Force: 160,114.45 lbf
Activating Force: 121,089.8 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (78.138597, 1,649.6555) ft
Entry: (217.5065, 1,698.5246) ft
Radius: 73.733077 ft
Center: (134.97062, 1,710.7419) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	80.862711 ft	1,648.5271 ft	0 psf	516.49349 psf	322.74095 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 2	86.310937 ft	1,646.2704 ft	0 psf	1,083.9238 psf	677.31079 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 3	90.201476 ft	1,644.6589 ft	0 psf	1,507.1041 psf	941.74316 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 4	93.90724 ft	1,644.7955 ft	0 psf	1,038.5426 psf	357.63134 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 5	98.985916 ft	1,646.0351 ft	0 psf	1,105.1659 psf	380.57367 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 6	104.06459 ft	1,647.2747 ft	0 psf	1,171.7892 psf	403.516 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 7	108.85664 ft	1,648.4443 ft	0 psf	1,266.4392 psf	436.10953 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 8	113.36206 ft	1,649.544 ft	0 psf	1,389.1156 psf	478.35427 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 9	117.86749 ft	1,650.6437 ft	0 psf	1,511.7921 psf	520.599 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 10	122.37291 ft	1,651.7434 ft	0 psf	1,634.4686 psf	562.84374 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 11	127.25441 ft	1,652.9349 ft	0 psf	1,743.102 psf	600.25258 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 12	132.512 ft	1,654.2181 ft	0 psf	1,837.6921 psf	632.82553 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 13	137.76958 ft	1,655.5014 ft	0 psf	1,932.2822 psf	665.39848 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 14	143.49255 ft	1,656.8982 ft	0 psf	2,032.7431 psf	699.99307 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 15	148.75643 ft	1,658.183 ft	0 psf	2,178.9038 psf	750.3248 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 16	153.09581 ft	1,659.2422 ft	0 psf	2,364.8936 psf	814.37202 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 17	157.94461 ft	1,660.4257 ft	0 psf	2,687.0831 psf	925.32085 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 18	163.03869 ft	1,661.669 ft	0 psf	2,997.8008 psf	1,032.3192 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 19	167.86862 ft	1,662.8479 ft	0 psf	3,160.8467 psf	1,088.4655 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 20	172.69855 ft	1,664.0268 ft	0 psf	3,323.8926 psf	1,144.6118 psf	375 psf	0 psf	Tsr 6-14° Seismic

Slice 21	177.70526 ft	1,665.2488 ft	0 psf	3,364.6881 psf	1,158.6601 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 22	182.88875 ft	1,666.514 ft	0 psf	3,283.2334 psf	1,130.6105 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 23	185.90909 ft	1,667.2512 ft	0 psf	3,248.387 psf	1,118.6108 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 24	188.15404 ft	1,669.1722 ft	0 psf	1,993.123 psf	1,245.4415 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 25	191.78675 ft	1,672.8049 ft	0 psf	1,795.8174 psf	1,122.1512 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 26	195.71621 ft	1,676.7343 ft	0 psf	1,545.3989 psf	965.67241 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 27	199.9424 ft	1,680.9605 ft	0 psf	1,241.8676 psf	776.00498 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 28	204.16859 ft	1,685.1867 ft	0 psf	938.33622 psf	586.33754 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 29	208.80115 ft	1,689.8193 ft	0 psf	632.10687 psf	394.98421 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 30	214.41356 ft	1,695.4317 ft	0 psf	85.082576 psf	53.165494 psf	600 psf	0 psf	Tsr 6-14° Seismic

Section D-D Tr 68203 SSA.gsz 11/20/2020 11:57:04 AM

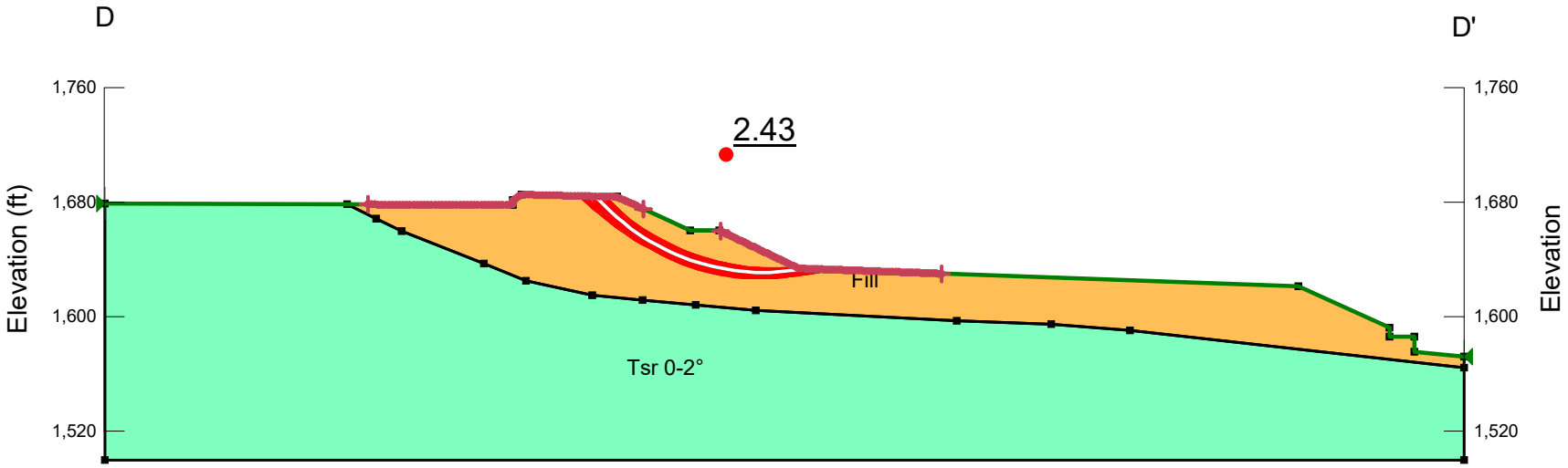
Section D-D Tr 68203 SSA.gsz

1 -Rotational Static (Upper Slope)

Horz Seismic Coef.: 0

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 0-2°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-2)°
C-Anisotropic Strength Fn.: Tsr 175 bedding 0-(-2)°



LGC

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GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Static (Upper Slope)

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 749
Date: 11/20/2020
Time: 11:57:04 AM
Tool Version: 10.1.0.18696
File Name: Section D-D Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:02:42 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Static (Upper Slope)

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 0-2°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-2)°
C-Anisotropic Strength Fn.: Tsr 175 bedding 0-(-2)°
Phi-B: 0 °

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (183.98347, 1,678.3283) ft
Left-Zone Right Coordinate: (376.46578, 1,675.2766) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (430.69421, 1,659.7776) ft
Right-Zone Right Coordinate: (584.91196, 1,629.9889) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (0.37029, 1,678.8933) ft
Right Coordinate: (949.95944, 1,572.1035) ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding 0-(-2)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.5625
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.5625)
- Data Point: (0, 0.5625)

Data Point: (0.01, 1)

Tsr 175 bedding 0-(-2)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.4167
Data Points: Inclination (°), Modifier Factor
Data Point: (-2.01, 1)
Data Point: (-2, 0.4167)
Data Point: (0, 0.4167)
Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	949.95944 ft	1,572.1035 ft
Point 2	949.95944 ft	1,499.6182 ft
Point 3	0.37029 ft	1,499.6182 ft
Point 4	0.37029 ft	1,678.8933 ft
Point 5	285.28293 ft	1,678.0167 ft
Point 6	285.28293 ft	1,681.429 ft
Point 7	291.83265 ft	1,685.2326 ft
Point 8	358.2382 ft	1,683.6478 ft
Point 9	409.17891 ft	1,660.2528 ft
Point 10	429.70613 ft	1,660.2528 ft
Point 11	485.09943 ft	1,633.6127 ft
Point 12	834.11347 ft	1,620.9414 ft
Point 13	898.0135 ft	1,592.382 ft
Point 14	898.0135 ft	1,585.7311 ft
Point 15	915.4882 ft	1,585.7311 ft
Point 16	915.4882 ft	1,575.5593 ft
Point 17	949.95944 ft	1,564.1824 ft
Point 18	716.78532 ft	1,590.2187 ft
Point 19	661.84483 ft	1,594.5204 ft
Point 20	595.5087 ft	1,596.9354 ft
Point 21	455.16894 ft	1,604.0535 ft
Point 22	413.43831 ft	1,608.2918 ft
Point 23	376.05462 ft	1,611.552 ft
Point 24	340.8444 ft	1,615.0295 ft
Point 25	294.54949 ft	1,625.1362 ft

Point 26	265.09897 ft	1,637.0902 ft
Point 27	207.61068 ft	1,659.9117 ft
Point 28	189.8969 ft	1,668.2795 ft
Point 29	169.46656 ft	1,678.373 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-2°	4,3,2,17,18,19,20,21,22,23,24,25,26,27,28,29	1.1103e+05 ft²
Region 2	Fill	1,16,15,14,13,12,11,10,9,8,7,6,5,29,28,27,26,25,24,23,22,21,20,19,18,17	29,091 ft²

Slip Results

Slip Surfaces Analysed: 96067 of 98415 converged

Current Slip Surface

Slip Surface: 80,676
Factor of Safety: 2.43
Volume: 2,435.3164 ft³
Weight: 292,237.96 lbf
Resisting Moment: 33,907,911 lbf·ft
Activating Moment: 13,971,405 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (488.82633, 1,633.4774) ft
Entry: (343.51583, 1,683.9992) ft
Radius: 155.78721 ft
Center: (460.66003, 1,786.6972) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	345.96956 ft	1,681.3284 ft	0 psf	133.28374 psf	76.951403 psf	325 psf	0 psf	Fill
Slice 2	350.87701 ft	1,676.2193 ft	0 psf	630.51946 psf	364.03058 psf	325 psf	0 psf	Fill
Slice 3	355.78447 ft	1,671.5462 ft	0 psf	1,099.2602 psf	634.65816 psf	325 psf	0 psf	Fill
Slice 4	360.55369 ft	1,667.3689 ft	0 psf	1,428.5985 psf	824.80174 psf	325 psf	0 psf	Fill
Slice 5	365.18466 ft	1,663.6301 ft	0 psf	1,617.1489 psf	933.66135 psf	325 psf	0 psf	Fill
Slice 6	369.81563 ft	1,660.1712 ft	0 psf	1,779.2798 psf	1,027.2676 psf	325 psf	0 psf	Fill
Slice 7	374.44661 ft	1,656.9699 ft	0 psf	1,916.313 psf	1,106.3838 psf	325 psf	0 psf	Fill
Slice 8	379.07758 ft	1,654.0075 ft	0 psf	2,029.3807 psf	1,171.6635 psf	325 psf	0 psf	Fill

Slice 9	383.70855 ft	1,651.2681 ft	0 psf	2,119.4539 psf	1,223.6673 psf	325 psf	0 psf	Fill
Slice 10	388.33953 ft	1,648.7387 ft	0 psf	2,187.3646 psf	1,262.8755 psf	325 psf	0 psf	Fill
Slice 11	392.9705 ft	1,646.4076 ft	0 psf	2,233.8244 psf	1,289.6991 psf	325 psf	0 psf	Fill
Slice 12	397.60148 ft	1,644.2653 ft	0 psf	2,259.4393 psf	1,304.4879 psf	325 psf	0 psf	Fill
Slice 13	402.23245 ft	1,642.3032 ft	0 psf	2,264.7214 psf	1,307.5375 psf	325 psf	0 psf	Fill
Slice 14	406.86342 ft	1,640.5141 ft	0 psf	2,250.0987 psf	1,299.0951 psf	325 psf	0 psf	Fill
Slice 15	411.74481 ft	1,638.8133 ft	0 psf	2,344.1056 psf	1,353.37 psf	325 psf	0 psf	Fill
Slice 16	416.87662 ft	1,637.213 ft	0 psf	2,548.1069 psf	1,471.1502 psf	325 psf	0 psf	Fill
Slice 17	422.00842 ft	1,635.8042 ft	0 psf	2,733.0783 psf	1,577.9435 psf	325 psf	0 psf	Fill
Slice 18	427.14023 ft	1,634.5816 ft	0 psf	2,899.1512 psf	1,673.8257 psf	325 psf	0 psf	Fill
Slice 19	432.22401 ft	1,633.5486 ft	0 psf	2,906.0381 psf	1,677.8019 psf	325 psf	0 psf	Fill
Slice 20	437.25976 ft	1,632.6985 ft	0 psf	2,750.8557 psf	1,588.2073 psf	325 psf	0 psf	Fill
Slice 21	442.29552 ft	1,632.017 ft	0 psf	2,573.2146 psf	1,485.6461 psf	325 psf	0 psf	Fill
Slice 22	447.33127 ft	1,631.5018 ft	0 psf	2,372.996 psf	1,370.0499 psf	325 psf	0 psf	Fill
Slice 23	452.36703 ft	1,631.1513 ft	0 psf	2,149.9978 psf	1,241.3018 psf	325 psf	0 psf	Fill
Slice 24	457.40278 ft	1,630.9644 ft	0 psf	1,903.931 psf	1,099.2351 psf	325 psf	0 psf	Fill
Slice 25	462.43853 ft	1,630.9405 ft	0 psf	1,634.4154 psf	943.63016 psf	325 psf	0 psf	Fill
Slice 26	467.47429 ft	1,631.0795 ft	0 psf	1,340.9728 psf	774.21101 psf	325 psf	0 psf	Fill
Slice 27	472.51004 ft	1,631.3819 ft	0 psf	1,023.0187 psf	590.6401 psf	325 psf	0 psf	Fill
Slice 28	477.5458 ft	1,631.8485 ft	0 psf	679.85097 psf	392.51214 psf	325 psf	0 psf	Fill
Slice 29	482.58155 ft	1,632.481 ft	0 psf	310.63648 psf	179.34606 psf	325 psf	0 psf	Fill
Slice 30	486.96288 ft	1,633.1582 ft	0 psf	72.300658 psf	41.742805 psf	325 psf	0 psf	Fill

Section D-D Tr 68203 SSA.gsz 11/20/2020 11:57:04 AM

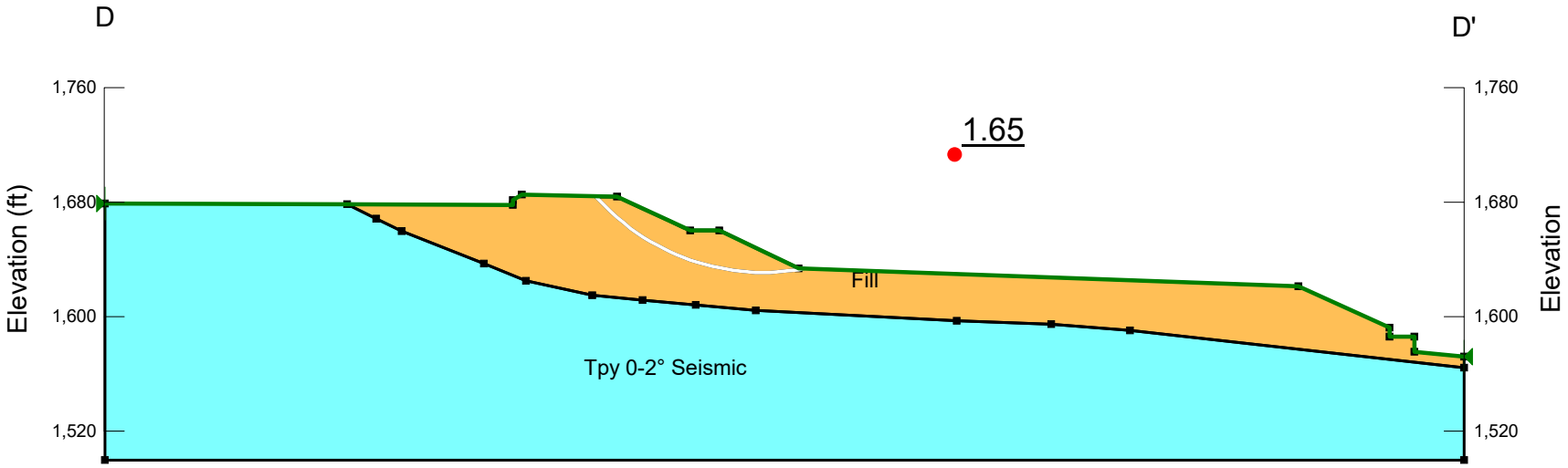
Section D-D Tr 68203 SSA.gsz

1 -Rotational Pseudostatic (Upper Slope)

Horz Seismic Coef.: 0.15

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tpy 0-2° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-2)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-2)° (Seismic)



LGC	**LGC Valley, Inc** *GEOTECHNICAL CONSULTING* 2420 Grand Avenue, Vista, CA 92081 Phone 760-599-7000, Fax 760-599-7007	**Tentative Tract 68203** **Santa Clarita, CA**	Project No: **203003-01** Engineer: **ACR** Date: **Nov 2020**

1 -Rotational Pseudostatic (Upper Slope)

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 749
Date: 11/20/2020
Time: 11:57:04 AM
Tool Version: 10.1.0.18696
File Name: Section D-D Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:03:38 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Pseudostatic (Upper Slope)

Kind: SLOPE/W
Parent: 1 -Rotational Static (Upper Slope)
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tpy 0-2° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-2)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-2)° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,678.8933) ft
Right Coordinate: (949.95944, 1,572.1035) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding 0-(-2)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.625
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.625)
- Data Point: (0, 0.625)
- Data Point: (0.01, 1)

Tsr 19° bedding 0-(-2)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.5936
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.5936)
- Data Point: (0, 0.5936)

Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	949.95944 ft	1,572.1035 ft
Point 2	949.95944 ft	1,499.6182 ft
Point 3	0.37029 ft	1,499.6182 ft
Point 4	0.37029 ft	1,678.8933 ft
Point 5	285.28293 ft	1,678.0167 ft
Point 6	285.28293 ft	1,681.429 ft
Point 7	291.83265 ft	1,685.2326 ft
Point 8	358.2382 ft	1,683.6478 ft
Point 9	409.17891 ft	1,660.2528 ft
Point 10	429.70613 ft	1,660.2528 ft
Point 11	485.09943 ft	1,633.6127 ft
Point 12	834.11347 ft	1,620.9414 ft
Point 13	898.0135 ft	1,592.382 ft
Point 14	898.0135 ft	1,585.7311 ft
Point 15	915.4882 ft	1,585.7311 ft
Point 16	915.4882 ft	1,575.5593 ft
Point 17	949.95944 ft	1,564.1824 ft
Point 18	716.78532 ft	1,590.2187 ft
Point 19	661.84483 ft	1,594.5204 ft
Point 20	595.5087 ft	1,596.9354 ft
Point 21	455.16894 ft	1,604.0535 ft
Point 22	413.43831 ft	1,608.2918 ft
Point 23	376.05462 ft	1,611.552 ft
Point 24	340.8444 ft	1,615.0295 ft
Point 25	294.54949 ft	1,625.1362 ft
Point 26	265.09897 ft	1,637.0902 ft
Point 27	207.61068 ft	1,659.9117 ft
Point 28	189.8969 ft	1,668.2795 ft
Point 29	169.46656 ft	1,678.373 ft

Regions

	Material	Points	Area
Region 1	Tpy 0-2° Seismic	4,3,2,17,18,19,20,21,22,23,24,25,26,27,28,29	1.1103e+05 ft²
Region 2	Fill	1,16,15,14,13,12,11,10,9,8,7,6,5,29,28,27,26,25,24,23,22,21,20,19,18,17	29,091 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.65
Volume: 2,435.3164 ft³
Weight: 292,237.96 lbf
Resisting Moment: 32,773,177 lbf·ft
Activating Moment: 19,846,663 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (488.82633, 1,633.4774) ft
Entry: (343.51583, 1,683.9992) ft
Radius: 155.78721 ft
Center: (460.66003, 1,786.6972) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	345.96956 ft	1,681.3284 ft	0 psf	72.032924 psf	41.588228 psf	325 psf	0 psf	Fill
Slice 2	350.87701 ft	1,676.2193 ft	0 psf	532.30761 psf	307.32794 psf	325 psf	0 psf	Fill
Slice 3	355.78447 ft	1,671.5462 ft	0 psf	971.13571 psf	560.68546 psf	325 psf	0 psf	Fill
Slice 4	360.55369 ft	1,667.3689 ft	0 psf	1,284.4535 psf	741.57959 psf	325 psf	0 psf	Fill
Slice 5	365.18466 ft	1,663.6301 ft	0 psf	1,468.6969 psf	847.95256 psf	325 psf	0 psf	Fill
Slice 6	369.81563 ft	1,660.1712 ft	0 psf	1,629.2889 psf	940.6704 psf	325 psf	0 psf	Fill
Slice 7	374.44661 ft	1,656.9699 ft	0 psf	1,767.1328 psf	1,020.2546 psf	325 psf	0 psf	Fill
Slice 8	379.07758 ft	1,654.0075 ft	0 psf	1,883.0071 psf	1,087.1547 psf	325 psf	0 psf	Fill
Slice 9	383.70855 ft	1,651.2681 ft	0 psf	1,977.579 psf	1,141.7557 psf	325 psf	0 psf	Fill
Slice 10	388.33953 ft	1,648.7387 ft	0 psf	2,051.4156 psf	1,184.3854 psf	325 psf	0 psf	Fill
Slice 11	392.9705 ft	1,646.4076 ft	0 psf	2,104.9943 psf	1,215.319 psf	325 psf	0 psf	Fill
Slice 12	397.60148 ft	1,644.2653 ft	0 psf	2,138.7102 psf	1,234.7849 psf	325 psf	0 psf	Fill
Slice 13	402.23245 ft	1,642.3032 ft	0 psf	2,152.8833 psf	1,242.9678 psf	325 psf	0 psf	Fill
Slice 14	406.86342 ft	1,640.5141 ft	0 psf	2,147.7637 psf	1,240.012 psf	325 psf	0 psf	Fill
Slice 15	411.74481 ft	1,638.8133 ft	0 psf	2,247.9442 psf	1,297.8512 psf	325 psf	0 psf	Fill

Slice 16	416.87662 ft	1,637.213 ft	0 psf	2,455.8862 psf	1,417.9065 psf	325 psf	0 psf	Fill
Slice 17	422.00842 ft	1,635.8042 ft	0 psf	2,646.6248 psf	1,528.0295 psf	325 psf	0 psf	Fill
Slice 18	427.14023 ft	1,634.5816 ft	0 psf	2,820.1244 psf	1,628.1996 psf	325 psf	0 psf	Fill
Slice 19	432.22401 ft	1,633.5486 ft	0 psf	2,838.5575 psf	1,638.8419 psf	325 psf	0 psf	Fill
Slice 20	437.25976 ft	1,632.6985 ft	0 psf	2,697.5121 psf	1,557.4093 psf	325 psf	0 psf	Fill
Slice 21	442.29552 ft	1,632.017 ft	0 psf	2,533.3297 psf	1,462.6186 psf	325 psf	0 psf	Fill
Slice 22	447.33127 ft	1,631.5018 ft	0 psf	2,345.6853 psf	1,354.282 psf	325 psf	0 psf	Fill
Slice 23	452.36703 ft	1,631.1513 ft	0 psf	2,134.1564 psf	1,232.1558 psf	325 psf	0 psf	Fill
Slice 24	457.40278 ft	1,630.9644 ft	0 psf	1,898.2166 psf	1,095.9359 psf	325 psf	0 psf	Fill
Slice 25	462.43853 ft	1,630.9405 ft	0 psf	1,637.2257 psf	945.25271 psf	325 psf	0 psf	Fill
Slice 26	467.47429 ft	1,631.0795 ft	0 psf	1,350.4181 psf	779.66425 psf	325 psf	0 psf	Fill
Slice 27	472.51004 ft	1,631.3819 ft	0 psf	1,036.8875 psf	598.6473 psf	325 psf	0 psf	Fill
Slice 28	477.5458 ft	1,631.8485 ft	0 psf	695.56869 psf	401.58677 psf	325 psf	0 psf	Fill
Slice 29	482.58155 ft	1,632.481 ft	0 psf	325.2135 psf	187.7621 psf	325 psf	0 psf	Fill
Slice 30	486.96288 ft	1,633.1582 ft	0 psf	85.213616 psf	49.198104 psf	325 psf	0 psf	Fill

Section D-D Tr 68203 SSA.gsz 11/20/2020 11:57:04 AM

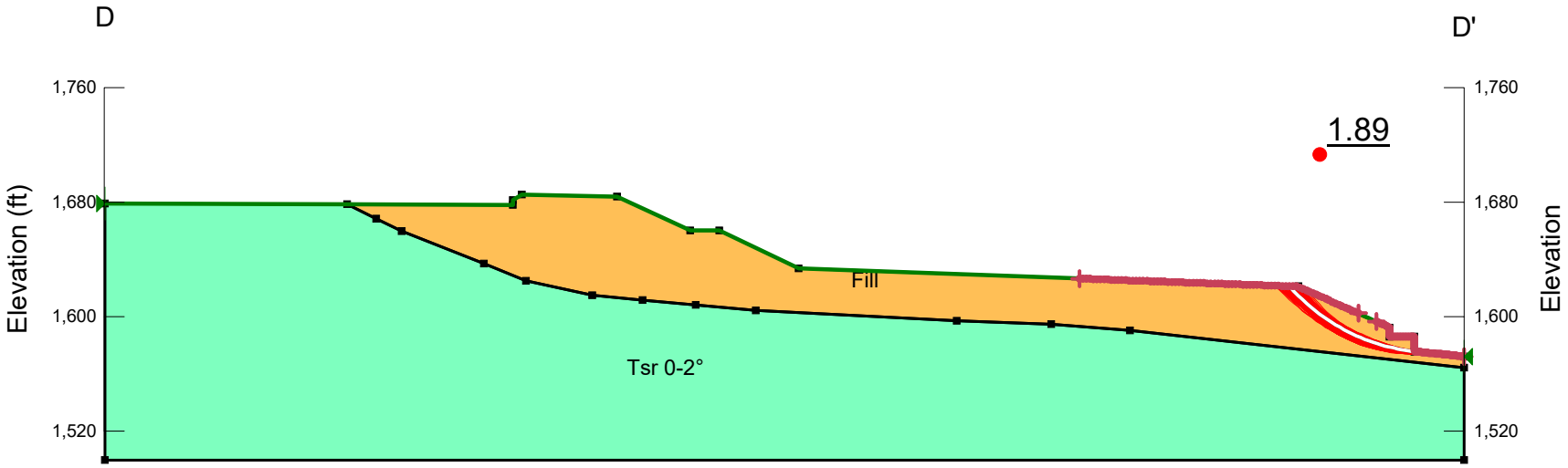
Section D-D Tr 68203 SSA.gsz

2 -Rotational Static (Lower Slope)

Horz Seismic Coef.: 0

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 0-2°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-2)°
C-Anisotropic Strength Fn.: Tsr 175 bedding 0-(-2)°



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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Rotational Static (Lower Slope)

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 749
Date: 11/20/2020
Time: 11:57:04 AM
Tool Version: 10.1.0.18696
File Name: Section D-D Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:03:30 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Rotational Static (Lower Slope)

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 0-2°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-2)°
C-Anisotropic Strength Fn.: Tsr 175 bedding 0-(-2)°
Phi-B: 0 °

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (681.15141, 1,626.4948) ft
Left-Zone Right Coordinate: (876.18231, 1,602.1392) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (889.002, 1,596.4096) ft
Right-Zone Right Coordinate: (949.95944, 1,572.1035) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (0.37029, 1,678.8933) ft
Right Coordinate: (949.95944, 1,572.1035) ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding 0-(-2)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.5625
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.5625)
- Data Point: (0, 0.5625)

Data Point: (0.01, 1)

Tsr 175 bedding 0-(-2)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.4167
Data Points: Inclination (°), Modifier Factor
Data Point: (-2.01, 1)
Data Point: (-2, 0.4167)
Data Point: (0, 0.4167)
Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	949.95944 ft	1,572.1035 ft
Point 2	949.95944 ft	1,499.6182 ft
Point 3	0.37029 ft	1,499.6182 ft
Point 4	0.37029 ft	1,678.8933 ft
Point 5	285.28293 ft	1,678.0167 ft
Point 6	285.28293 ft	1,681.429 ft
Point 7	291.83265 ft	1,685.2326 ft
Point 8	358.2382 ft	1,683.6478 ft
Point 9	409.17891 ft	1,660.2528 ft
Point 10	429.70613 ft	1,660.2528 ft
Point 11	485.09943 ft	1,633.6127 ft
Point 12	834.11347 ft	1,620.9414 ft
Point 13	898.0135 ft	1,592.382 ft
Point 14	898.0135 ft	1,585.7311 ft
Point 15	915.4882 ft	1,585.7311 ft
Point 16	915.4882 ft	1,575.5593 ft
Point 17	949.95944 ft	1,564.1824 ft
Point 18	716.78532 ft	1,590.2187 ft
Point 19	661.84483 ft	1,594.5204 ft
Point 20	595.5087 ft	1,596.9354 ft
Point 21	455.16894 ft	1,604.0535 ft
Point 22	413.43831 ft	1,608.2918 ft
Point 23	376.05462 ft	1,611.552 ft
Point 24	340.8444 ft	1,615.0295 ft
Point 25	294.54949 ft	1,625.1362 ft

Point 26	265.09897 ft	1,637.0902 ft
Point 27	207.61068 ft	1,659.9117 ft
Point 28	189.8969 ft	1,668.2795 ft
Point 29	169.46656 ft	1,678.373 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-2°	4,3,2,17,18,19,20,21,22,23,24,25,26,27,28,29	1.1103e+05 ft²
Region 2	Fill	1,16,15,14,13,12,11,10,9,8,7,6,5,29,28,27,26,25,24,23,22,21,20,19,18,17	29,091 ft²

Slip Results

Slip Surfaces Analysed: 98415 of 98415 converged

Current Slip Surface

Slip Surface: 72,365
Factor of Safety: 1.89
Volume: 1,058.2736 ft³
Weight: 126,992.84 lbf
Resisting Moment: 13,757,558 lbf·ft
Activating Moment: 7,275,930 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (915.4882, 1,575.5612) ft
Entry: (827.9221, 1,621.1662) ft
Radius: 137.18557 ft
Center: (930.8285, 1,711.8864) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	829.46994 ft	1,619.4686 ft	0 psf	6.5711059 psf	3.7938297 psf	325 psf	0 psf	Fill
Slice 2	832.56563 ft	1,616.1818 ft	0 psf	305.95237 psf	176.64168 psf	325 psf	0 psf	Fill
Slice 3	835.56574 ft	1,613.1908 ft	0 psf	530.46896 psf	306.26639 psf	325 psf	0 psf	Fill
Slice 4	838.47029 ft	1,610.4665 ft	0 psf	678.65434 psf	391.82127 psf	325 psf	0 psf	Fill
Slice 5	841.37484 ft	1,607.8948 ft	0 psf	814.86478 psf	470.4624 psf	325 psf	0 psf	Fill
Slice 6	844.27938 ft	1,605.4645 ft	0 psf	939.53236 psf	542.43926 psf	325 psf	0 psf	Fill
Slice 7	847.18393 ft	1,603.1661 ft	0 psf	1,053.0487 psf	607.97797 psf	325 psf	0 psf	Fill
Slice 8	850.08848 ft	1,600.9914 ft	0 psf	1,155.7681 psf	667.28303 psf	325 psf	0 psf	Fill

Slice 9	852.99302 ft	1,598.9333 ft	0 psf	1,248.0103 psf	720.53908 psf	325 psf	0 psf	Fill
Slice 10	855.89757 ft	1,596.9854 ft	0 psf	1,330.0635 psf	767.91252 psf	325 psf	0 psf	Fill
Slice 11	858.80212 ft	1,595.1424 ft	0 psf	1,402.187 psf	809.55304 psf	325 psf	0 psf	Fill
Slice 12	861.70666 ft	1,593.3991 ft	0 psf	1,464.6136 psf	845.59505 psf	325 psf	0 psf	Fill
Slice 13	864.61121 ft	1,591.7515 ft	0 psf	1,517.5516 psf	876.15885 psf	325 psf	0 psf	Fill
Slice 14	867.51576 ft	1,590.1954 ft	0 psf	1,561.1871 psf	901.35179 psf	325 psf	0 psf	Fill
Slice 15	870.42031 ft	1,588.7275 ft	0 psf	1,595.685 psf	921.26917 psf	325 psf	0 psf	Fill
Slice 16	873.32485 ft	1,587.3446 ft	0 psf	1,621.1911 psf	935.99512 psf	325 psf	0 psf	Fill
Slice 17	876.2294 ft	1,586.044 ft	0 psf	1,637.833 psf	945.60332 psf	325 psf	0 psf	Fill
Slice 18	879.13395 ft	1,584.823 ft	0 psf	1,645.7213 psf	950.15761 psf	325 psf	0 psf	Fill
Slice 19	882.03849 ft	1,583.6795 ft	0 psf	1,644.9504 psf	949.71255 psf	325 psf	0 psf	Fill
Slice 20	884.94304 ft	1,582.6114 ft	0 psf	1,635.5996 psf	944.31388 psf	325 psf	0 psf	Fill
Slice 21	887.84759 ft	1,581.6167 ft	0 psf	1,617.7335 psf	933.99885 psf	325 psf	0 psf	Fill
Slice 22	890.75213 ft	1,580.6939 ft	0 psf	1,591.4024 psf	918.7966 psf	325 psf	0 psf	Fill
Slice 23	893.65668 ft	1,579.8415 ft	0 psf	1,556.6432 psf	898.72835 psf	325 psf	0 psf	Fill
Slice 24	896.56123 ft	1,579.058 ft	0 psf	1,513.4791 psf	873.80759 psf	325 psf	0 psf	Fill
Slice 25	899.46973 ft	1,578.3414 ft	0 psf	789.92897 psf	456.0657 psf	325 psf	0 psf	Fill
Slice 26	902.38217 ft	1,577.6907 ft	0 psf	872.11407 psf	503.5153 psf	325 psf	0 psf	Fill
Slice 27	905.29462 ft	1,577.1062 ft	0 psf	947.74886 psf	547.18306 psf	325 psf	0 psf	Fill
Slice 28	908.20708 ft	1,576.5868 ft	0 psf	1,016.7996 psf	587.04952 psf	325 psf	0 psf	Fill
Slice 29	911.11953 ft	1,576.1319 ft	0 psf	1,079.2247 psf	623.09065 psf	325 psf	0 psf	Fill
Slice 30	914.03197 ft	1,575.7409 ft	0 psf	1,134.9742 psf	655.27765 psf	325 psf	0 psf	Fill

Section D-D Tr 68203 SSA.gsz 11/20/2020 11:57:04 AM

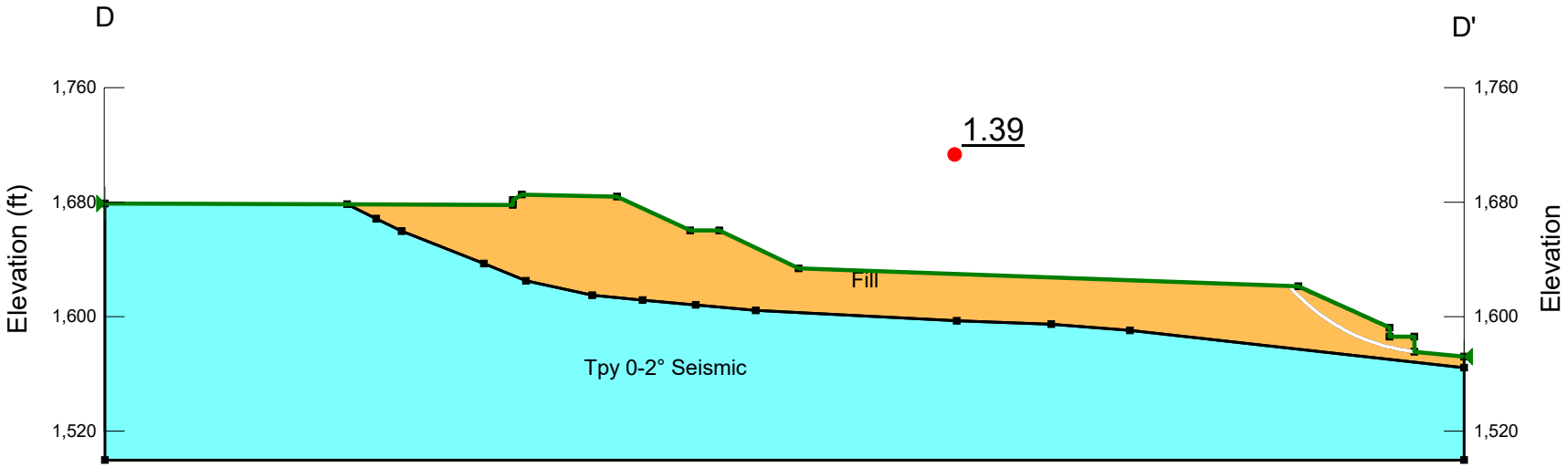
Section D-D Tr 68203 SSA.gsz

2 -Rotational Pseudostatic (Lower Slope)

Horz Seismic Coef.: 0.15

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tpy 0-2° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-2)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-2)° (Seismic)



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Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Rotational Pseudostatic (Lower Slope)

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 749
Date: 11/20/2020
Time: 11:57:04 AM
Tool Version: 10.1.0.18696
File Name: Section D-D Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:03:40 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Rotational Pseudostatic (Lower Slope)

Kind: SLOPE/W
Parent: 2 -Rotational Static (Lower Slope)
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tpy 0-2° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-2)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-2)° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,678.8933) ft
Right Coordinate: (949.95944, 1,572.1035) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding 0-(-2)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.625
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.625)
- Data Point: (0, 0.625)
- Data Point: (0.01, 1)

Tsr 19° bedding 0-(-2)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.5936
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.5936)
- Data Point: (0, 0.5936)

Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	949.95944 ft	1,572.1035 ft
Point 2	949.95944 ft	1,499.6182 ft
Point 3	0.37029 ft	1,499.6182 ft
Point 4	0.37029 ft	1,678.8933 ft
Point 5	285.28293 ft	1,678.0167 ft
Point 6	285.28293 ft	1,681.429 ft
Point 7	291.83265 ft	1,685.2326 ft
Point 8	358.2382 ft	1,683.6478 ft
Point 9	409.17891 ft	1,660.2528 ft
Point 10	429.70613 ft	1,660.2528 ft
Point 11	485.09943 ft	1,633.6127 ft
Point 12	834.11347 ft	1,620.9414 ft
Point 13	898.0135 ft	1,592.382 ft
Point 14	898.0135 ft	1,585.7311 ft
Point 15	915.4882 ft	1,585.7311 ft
Point 16	915.4882 ft	1,575.5593 ft
Point 17	949.95944 ft	1,564.1824 ft
Point 18	716.78532 ft	1,590.2187 ft
Point 19	661.84483 ft	1,594.5204 ft
Point 20	595.5087 ft	1,596.9354 ft
Point 21	455.16894 ft	1,604.0535 ft
Point 22	413.43831 ft	1,608.2918 ft
Point 23	376.05462 ft	1,611.552 ft
Point 24	340.8444 ft	1,615.0295 ft
Point 25	294.54949 ft	1,625.1362 ft
Point 26	265.09897 ft	1,637.0902 ft
Point 27	207.61068 ft	1,659.9117 ft
Point 28	189.8969 ft	1,668.2795 ft
Point 29	169.46656 ft	1,678.373 ft

Regions

	Material	Points	Area
Region 1	Tpy 0-2° Seismic	4,3,2,17,18,19,20,21,22,23,24,25,26,27,28,29	1.1103e+05 ft²
Region 2	Fill	1,16,15,14,13,12,11,10,9,8,7,6,5,29,28,27,26,25,24,23,22,21,20,19,18,17	29,091 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.39
Volume: 1,058.2736 ft³
Weight: 126,992.84 lbf
Resisting Moment: 13,144,098 lbf·ft
Activating Moment: 9,478,234.7 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (915.4882, 1,575.5612) ft
Entry: (827.9221, 1,621.1662) ft
Radius: 137.18557 ft
Center: (930.8285, 1,711.8864) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	829.46994 ft	1,619.4686 ft	0 psf	-40.816166 psf	-23.565224 psf	325 psf	0 psf	Fill
Slice 2	832.56563 ft	1,616.1818 ft	0 psf	236.88918 psf	136.76803 psf	325 psf	0 psf	Fill
Slice 3	835.56574 ft	1,613.1908 ft	0 psf	447.27677 psf	258.23537 psf	325 psf	0 psf	Fill
Slice 4	838.47029 ft	1,610.4665 ft	0 psf	588.06226 psf	339.5179 psf	325 psf	0 psf	Fill
Slice 5	841.37484 ft	1,607.8948 ft	0 psf	718.4377 psf	414.7902 psf	325 psf	0 psf	Fill
Slice 6	844.27938 ft	1,605.4645 ft	0 psf	838.66926 psf	484.20592 psf	325 psf	0 psf	Fill
Slice 7	847.18393 ft	1,603.1661 ft	0 psf	949.00393 psf	547.90767 psf	325 psf	0 psf	Fill
Slice 8	850.08848 ft	1,600.9914 ft	0 psf	1,049.6686 psf	606.02645 psf	325 psf	0 psf	Fill
Slice 9	852.99302 ft	1,598.9333 ft	0 psf	1,140.8701 psf	658.68167 psf	325 psf	0 psf	Fill
Slice 10	855.89757 ft	1,596.9854 ft	0 psf	1,222.7957 psf	705.98141 psf	325 psf	0 psf	Fill
Slice 11	858.80212 ft	1,595.1424 ft	0 psf	1,295.6135 psf	748.02283 psf	325 psf	0 psf	Fill
Slice 12	861.70666 ft	1,593.3991 ft	0 psf	1,359.4738 psf	784.89257 psf	325 psf	0 psf	Fill
Slice 13	864.61121 ft	1,591.7515 ft	0 psf	1,414.5092 psf	816.66727 psf	325 psf	0 psf	Fill
Slice 14	867.51576 ft	1,590.1954 ft	0 psf	1,460.8359 psf	843.41403 psf	325 psf	0 psf	Fill
Slice 15	870.42031 ft	1,588.7275 ft	0 psf	1,498.5544 psf	865.19076 psf	325 psf	0 psf	Fill

Slice 16	873.32485 ft	1,587.3446 ft	0 psf	1,527.7496 psf	882.04662 psf	325 psf	0 psf	Fill
Slice 17	876.2294 ft	1,586.044 ft	0 psf	1,548.4921 psf	894.02233 psf	325 psf	0 psf	Fill
Slice 18	879.13395 ft	1,584.823 ft	0 psf	1,560.8384 psf	901.15045 psf	325 psf	0 psf	Fill
Slice 19	882.03849 ft	1,583.6795 ft	0 psf	1,564.831 psf	903.45558 psf	325 psf	0 psf	Fill
Slice 20	884.94304 ft	1,582.6114 ft	0 psf	1,560.4991 psf	900.9546 psf	325 psf	0 psf	Fill
Slice 21	887.84759 ft	1,581.6167 ft	0 psf	1,547.8589 psf	893.65674 psf	325 psf	0 psf	Fill
Slice 22	890.75213 ft	1,580.6939 ft	0 psf	1,526.9131 psf	881.5637 psf	325 psf	0 psf	Fill
Slice 23	893.65668 ft	1,579.8415 ft	0 psf	1,497.6517 psf	864.66963 psf	325 psf	0 psf	Fill
Slice 24	896.56123 ft	1,579.058 ft	0 psf	1,460.0516 psf	842.96116 psf	325 psf	0 psf	Fill
Slice 25	899.46973 ft	1,578.3414 ft	0 psf	757.96681 psf	437.61234 psf	325 psf	0 psf	Fill
Slice 26	902.38217 ft	1,577.6907 ft	0 psf	841.24134 psf	485.69091 psf	325 psf	0 psf	Fill
Slice 27	905.29462 ft	1,577.1062 ft	0 psf	918.45103 psf	530.26795 psf	325 psf	0 psf	Fill
Slice 28	908.20708 ft	1,576.5868 ft	0 psf	989.52768 psf	571.30407 psf	325 psf	0 psf	Fill
Slice 29	911.11953 ft	1,576.1319 ft	0 psf	1,054.3955 psf	608.75553 psf	325 psf	0 psf	Fill
Slice 30	914.03197 ft	1,575.7409 ft	0 psf	1,112.9706 psf	642.5739 psf	325 psf	0 psf	Fill

Section D-D Tr 68203 SSA.gsz 11/20/2020 11:57:04 AM

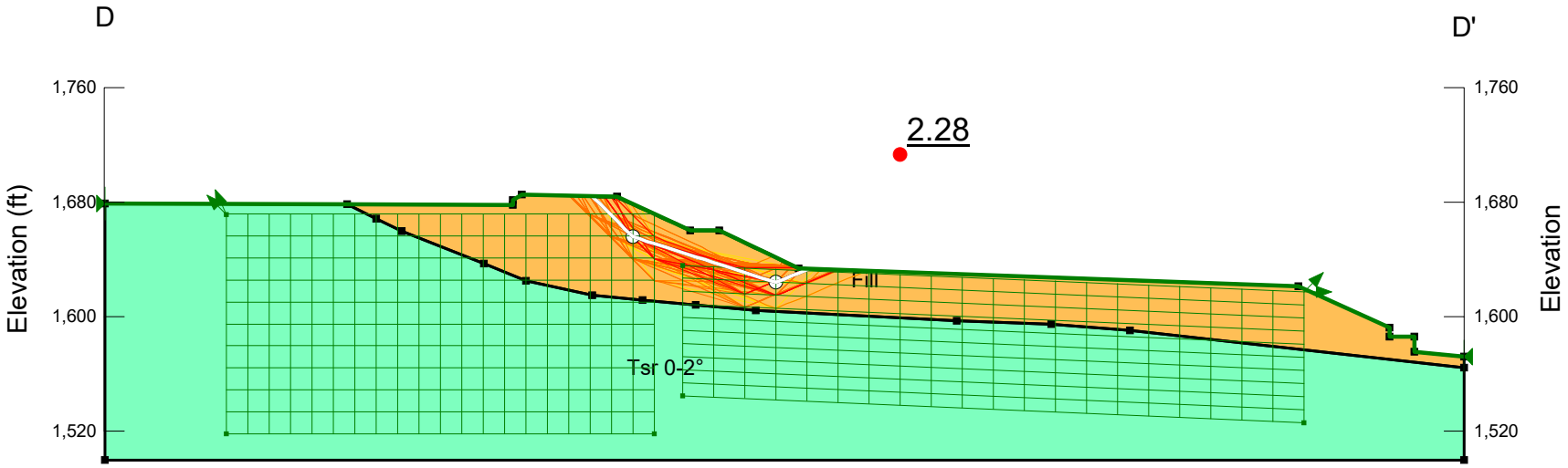
Section D-D Tr 68203 SSA.gsz

3 -Translational Static Global

Horz Seismic Coef.: 0

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 0-2°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-2)°
C-Anisotropic Strength Fn.: Tsr 175 bedding 0-(-2)°



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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

3 -Translational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 749
Date: 11/20/2020
Time: 11:57:04 AM
Tool Version: 10.1.0.18696
File Name: Section D-D Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:03:26 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

3 -Translational Static Global

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 0-2°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-2)°
C-Anisotropic Strength Fn.: Tsr 175 bedding 0-(-2)°
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,678.8933) ft
Right Coordinate: (949.95944, 1,572.1035) ft

Slip Surface Block

Left Grid
- Upper Left: (85.40355, 1,671.2074) ft
- Lower Left: (85.40355, 1,517.8823) ft
- Lower Right: (384.18209, 1,517.8823) ft
- X Increments: 20
- Y Increments: 10
- Starting Angle: 115 °
- Ending Angle: 135 °
- Angle Increments: 2

Right Grid
- Upper Left: (404.05006, 1,635.8371) ft
- Lower Left: (404.05006, 1,544.437) ft
- Lower Right: (838.06529, 1,525.7784) ft
- X Increments: 20
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding 0-(-2)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.5625
Data Points: Inclination (°), Modifier Factor
Data Point: (-2.01, 1)
Data Point: (-2, 0.5625)
Data Point: (0, 0.5625)
Data Point: (0.01, 1)

Tsr 175 bedding 0-(-2)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.4167
Data Points: Inclination (°), Modifier Factor
Data Point: (-2.01, 1)
Data Point: (-2, 0.4167)
Data Point: (0, 0.4167)
Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	949.95944 ft	1,572.1035 ft
Point 2	949.95944 ft	1,499.6182 ft
Point 3	0.37029 ft	1,499.6182 ft
Point 4	0.37029 ft	1,678.8933 ft
Point 5	285.28293 ft	1,678.0167 ft
Point 6	285.28293 ft	1,681.429 ft
Point 7	291.83265 ft	1,685.2326 ft
Point 8	358.2382 ft	1,683.6478 ft
Point 9	409.17891 ft	1,660.2528 ft
Point 10	429.70613 ft	1,660.2528 ft
Point 11	485.09943 ft	1,633.6127 ft
Point 12	834.11347 ft	1,620.9414 ft
Point 13	898.0135 ft	1,592.382 ft
Point 14	898.0135 ft	1,585.7311 ft
Point 15	915.4882 ft	1,585.7311 ft
Point 16	915.4882 ft	1,575.5593 ft
Point 17	949.95944 ft	1,564.1824 ft
Point 18	716.78532 ft	1,590.2187 ft
Point 19	661.84483 ft	1,594.5204 ft

Point 20	595.5087 ft	1,596.9354 ft
Point 21	455.16894 ft	1,604.0535 ft
Point 22	413.43831 ft	1,608.2918 ft
Point 23	376.05462 ft	1,611.552 ft
Point 24	340.8444 ft	1,615.0295 ft
Point 25	294.54949 ft	1,625.1362 ft
Point 26	265.09897 ft	1,637.0902 ft
Point 27	207.61068 ft	1,659.9117 ft
Point 28	189.8969 ft	1,668.2795 ft
Point 29	169.46656 ft	1,678.373 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-2°	4,3,2,17,18,19,20,21,22,23,24,25,26,27,28,29	1.1103e+05 ft²
Region 2	Fill	1,16,15,14,13,12,11,10,9,8,7,6,5,29,28,27,26,25,24,23,22,21,20,19,18,17	29,091 ft²

Slip Results

Slip Surfaces Analysed: 378474 of 480249 converged

Current Slip Surface

Slip Surface: 434,396
Factor of Safety: 2.28
Volume: 2,562.2574 ft³
Weight: 307,470.89 lbf
Resisting Force: 209,007.87 lbf
Activating Force: 91,779.633 lbf
Slip Rank: 1 of 480,249 slip surfaces
Exit: (492.00013, 1,633.3622) ft
Entry: (341.06029, 1,684.0578) ft
Radius: 78.573473 ft
Center: (429.30042, 1,696.7317) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	343.92328 ft	1,681.1948 ft	0 psf	154.05477 psf	88.943564 psf	325 psf	0 psf	Fill
Slice 2	349.64925 ft	1,675.4688 ft	0 psf	689.39775 psf	398.02398 psf	325 psf	0 psf	Fill
Slice 3	355.37522 ft	1,669.7428 ft	0 psf	1,224.7407 psf	707.10439 psf	325 psf	0 psf	Fill
Slice 4	360.98944 ft	1,664.1286 ft	0 psf	1,634.9044 psf	943.9125 psf	325 psf	0 psf	Fill
Slice 5	366.49192 ft	1,658.6261 ft	0 psf	1,919.8888 psf	1,108.4483 psf	325 psf	0 psf	Fill

Slice 6	371.73915 ft	1,655.076 ft	0 psf	2,441.4066 psf	1,409.5468 psf	325 psf	0 psf	Fill
Slice 7	376.73112 ft	1,653.4783 ft	0 psf	2,364.2627 psf	1,365.0077 psf	325 psf	0 psf	Fill
Slice 8	381.72308 ft	1,651.8806 ft	0 psf	2,287.1187 psf	1,320.4686 psf	325 psf	0 psf	Fill
Slice 9	386.71505 ft	1,650.2829 ft	0 psf	2,209.9748 psf	1,275.9295 psf	325 psf	0 psf	Fill
Slice 10	391.70702 ft	1,648.6852 ft	0 psf	2,132.8309 psf	1,231.3905 psf	325 psf	0 psf	Fill
Slice 11	396.69899 ft	1,647.0875 ft	0 psf	2,055.6869 psf	1,186.8514 psf	325 psf	0 psf	Fill
Slice 12	401.69096 ft	1,645.4898 ft	0 psf	1,978.543 psf	1,142.3123 psf	325 psf	0 psf	Fill
Slice 13	406.68293 ft	1,643.892 ft	0 psf	1,901.399 psf	1,097.7732 psf	325 psf	0 psf	Fill
Slice 14	411.74481 ft	1,642.272 ft	0 psf	1,953.9964 psf	1,128.1403 psf	325 psf	0 psf	Fill
Slice 15	416.87662 ft	1,640.6295 ft	0 psf	2,136.3351 psf	1,233.4136 psf	325 psf	0 psf	Fill
Slice 16	422.00842 ft	1,638.987 ft	0 psf	2,318.6738 psf	1,338.6869 psf	325 psf	0 psf	Fill
Slice 17	427.14023 ft	1,637.3446 ft	0 psf	2,501.0125 psf	1,443.9602 psf	325 psf	0 psf	Fill
Slice 18	432.17152 ft	1,635.7343 ft	0 psf	2,548.1525 psf	1,471.1765 psf	325 psf	0 psf	Fill
Slice 19	437.1023 ft	1,634.1561 ft	0 psf	2,460.0939 psf	1,420.3359 psf	325 psf	0 psf	Fill
Slice 20	442.03307 ft	1,632.578 ft	0 psf	2,372.0353 psf	1,369.4952 psf	325 psf	0 psf	Fill
Slice 21	446.96385 ft	1,630.9999 ft	0 psf	2,283.9767 psf	1,318.6545 psf	325 psf	0 psf	Fill
Slice 22	451.89463 ft	1,629.4217 ft	0 psf	2,195.918 psf	1,267.8139 psf	325 psf	0 psf	Fill
Slice 23	456.8254 ft	1,627.8436 ft	0 psf	2,107.8594 psf	1,216.9732 psf	325 psf	0 psf	Fill
Slice 24	461.75618 ft	1,626.2655 ft	0 psf	2,019.8008 psf	1,166.1325 psf	325 psf	0 psf	Fill
Slice 25	466.68696 ft	1,624.6874 ft	0 psf	1,931.7422 psf	1,115.2919 psf	325 psf	0 psf	Fill
Slice 26	471.81019 ft	1,624.9992 ft	0 psf	2,077.08 psf	1,199.2027 psf	325 psf	0 psf	Fill
Slice 27	477.12589 ft	1,627.201 ft	0 psf	1,439.2791 psf	830.96815 psf	325 psf	0 psf	Fill
Slice 28	482.44158 ft	1,629.4029 ft	0 psf	801.47812 psf	462.73361 psf	325 psf	0 psf	Fill
Slice 29	488.54978 ft	1,631.933 ft	0 psf	274.21924 psf	158.32055 psf	325 psf	0 psf	Fill

Section D-D Tr 68203 SSA.gsz 11/20/2020 11:57:04 AM

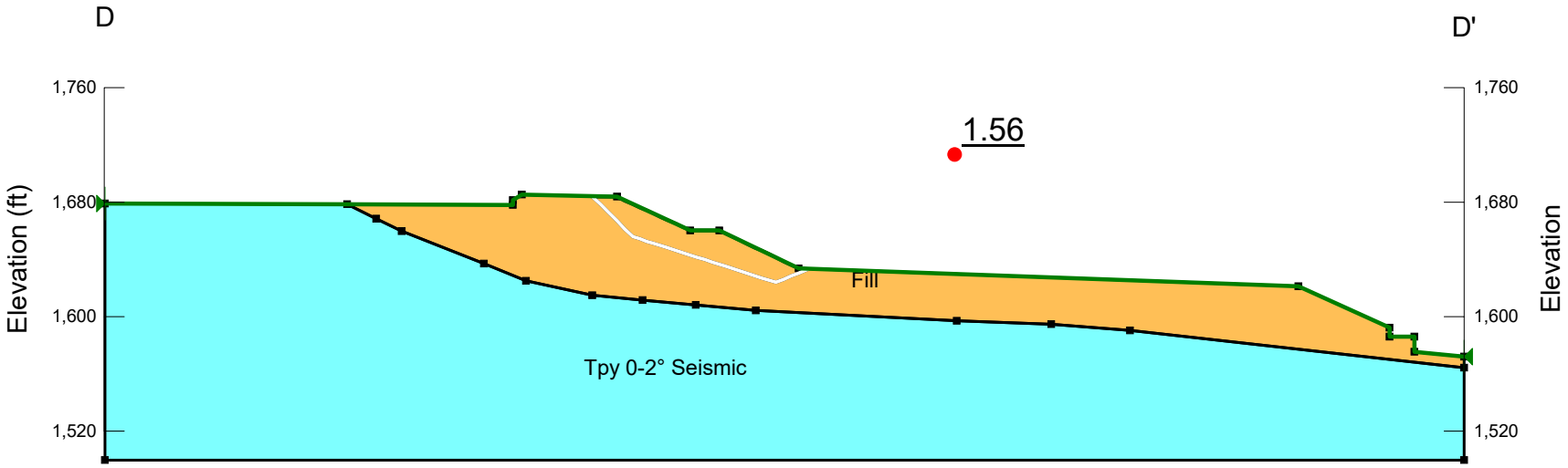
Section D-D Tr 68203 SSA.gsz

3 -Translational Pseudostatic Global

Horz Seismic Coef.: 0.15

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tpy 0-2° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-2)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-2)° (Seismic)



LGC	**LGC Valley, Inc** *GEOTECHNICAL CONSULTING* 2420 Grand Avenue, Vista, CA 92081 Phone 760-599-7000, Fax 760-599-7007	**Tentative Tract 68203** **Santa Clarita, CA**	Project No: **203003-01** Engineer: **ACR** Date: **Nov 2020**

3 -Translational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 749
Date: 11/20/2020
Time: 11:57:04 AM
Tool Version: 10.1.0.18696
File Name: Section D-D Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:03:40 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

3 -Translational Pseudostatic Global

Kind: SLOPE/W
Parent: 3 -Translational Static Global
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tpy 0-2° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-2)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-2)° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,678.8933) ft
Right Coordinate: (949.95944, 1,572.1035) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding 0-(-2)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.625
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.625)
- Data Point: (0, 0.625)
- Data Point: (0.01, 1)

Tsr 19° bedding 0-(-2)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.5936
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.5936)
- Data Point: (0, 0.5936)

Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	949.95944 ft	1,572.1035 ft
Point 2	949.95944 ft	1,499.6182 ft
Point 3	0.37029 ft	1,499.6182 ft
Point 4	0.37029 ft	1,678.8933 ft
Point 5	285.28293 ft	1,678.0167 ft
Point 6	285.28293 ft	1,681.429 ft
Point 7	291.83265 ft	1,685.2326 ft
Point 8	358.2382 ft	1,683.6478 ft
Point 9	409.17891 ft	1,660.2528 ft
Point 10	429.70613 ft	1,660.2528 ft
Point 11	485.09943 ft	1,633.6127 ft
Point 12	834.11347 ft	1,620.9414 ft
Point 13	898.0135 ft	1,592.382 ft
Point 14	898.0135 ft	1,585.7311 ft
Point 15	915.4882 ft	1,585.7311 ft
Point 16	915.4882 ft	1,575.5593 ft
Point 17	949.95944 ft	1,564.1824 ft
Point 18	716.78532 ft	1,590.2187 ft
Point 19	661.84483 ft	1,594.5204 ft
Point 20	595.5087 ft	1,596.9354 ft
Point 21	455.16894 ft	1,604.0535 ft
Point 22	413.43831 ft	1,608.2918 ft
Point 23	376.05462 ft	1,611.552 ft
Point 24	340.8444 ft	1,615.0295 ft
Point 25	294.54949 ft	1,625.1362 ft
Point 26	265.09897 ft	1,637.0902 ft
Point 27	207.61068 ft	1,659.9117 ft
Point 28	189.8969 ft	1,668.2795 ft
Point 29	169.46656 ft	1,678.373 ft

Regions

	Material	Points	Area
Region 1	Tpy 0-2° Seismic	4,3,2,17,18,19,20,21,22,23,24,25,26,27,28,29	1.1103e+05 ft²
Region 2	Fill	1,16,15,14,13,12,11,10,9,8,7,6,5,29,28,27,26,25,24,23,22,21,20,19,18,17	29,091 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.56
Volume: 2,562.2574 ft³
Weight: 307,470.89 lbf
Resisting Force: 202,562.65 lbf
Activating Force: 129,994.49 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (492.00013, 1,633.3622) ft
Entry: (341.06029, 1,684.0578) ft
Radius: 78.573473 ft
Center: (429.30042, 1,696.7317) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	343.92328 ft	1,681.1948 ft	0 psf	92.77406 psf	53.563129 psf	325 psf	0 psf	Fill
Slice 2	349.64925 ft	1,675.4688 ft	0 psf	582.3604 psf	336.22593 psf	325 psf	0 psf	Fill
Slice 3	355.37522 ft	1,669.7428 ft	0 psf	1,071.9467 psf	618.88874 psf	325 psf	0 psf	Fill
Slice 4	360.98944 ft	1,664.1286 ft	0 psf	1,447.0531 psf	835.45647 psf	325 psf	0 psf	Fill
Slice 5	366.49192 ft	1,658.6261 ft	0 psf	1,707.6793 psf	985.92913 psf	325 psf	0 psf	Fill
Slice 6	371.73915 ft	1,655.076 ft	0 psf	2,340.7356 psf	1,351.4243 psf	325 psf	0 psf	Fill
Slice 7	376.73112 ft	1,653.4783 ft	0 psf	2,266.1766 psf	1,308.3777 psf	325 psf	0 psf	Fill
Slice 8	381.72308 ft	1,651.8806 ft	0 psf	2,191.6177 psf	1,265.3311 psf	325 psf	0 psf	Fill
Slice 9	386.71505 ft	1,650.2829 ft	0 psf	2,117.0587 psf	1,222.2844 psf	325 psf	0 psf	Fill
Slice 10	391.70702 ft	1,648.6852 ft	0 psf	2,042.4998 psf	1,179.2378 psf	325 psf	0 psf	Fill
Slice 11	396.69899 ft	1,647.0875 ft	0 psf	1,967.9408 psf	1,136.1912 psf	325 psf	0 psf	Fill
Slice 12	401.69096 ft	1,645.4898 ft	0 psf	1,893.3819 psf	1,093.1445 psf	325 psf	0 psf	Fill
Slice 13	406.68293 ft	1,643.892 ft	0 psf	1,818.8229 psf	1,050.0979 psf	325 psf	0 psf	Fill
Slice 14	411.74481 ft	1,642.272 ft	0 psf	1,869.6578 psf	1,079.4475 psf	325 psf	0 psf	Fill
Slice 15	416.87662 ft	1,640.6295 ft	0 psf	2,045.8866 psf	1,181.1932 psf	325 psf	0 psf	Fill

Slice 16	422.00842 ft	1,638.987 ft	0 psf	2,222.1153 psf	1,282.9389 psf	325 psf	0 psf	Fill
Slice 17	427.14023 ft	1,637.3446 ft	0 psf	2,398.3441 psf	1,384.6846 psf	325 psf	0 psf	Fill
Slice 18	432.17152 ft	1,635.7343 ft	0 psf	2,443.9045 psf	1,410.9889 psf	325 psf	0 psf	Fill
Slice 19	437.1023 ft	1,634.1561 ft	0 psf	2,358.7966 psf	1,361.8519 psf	325 psf	0 psf	Fill
Slice 20	442.03307 ft	1,632.578 ft	0 psf	2,273.6888 psf	1,312.7148 psf	325 psf	0 psf	Fill
Slice 21	446.96385 ft	1,630.9999 ft	0 psf	2,188.5809 psf	1,263.5778 psf	325 psf	0 psf	Fill
Slice 22	451.89463 ft	1,629.4217 ft	0 psf	2,103.473 psf	1,214.4407 psf	325 psf	0 psf	Fill
Slice 23	456.8254 ft	1,627.8436 ft	0 psf	2,018.3651 psf	1,165.3036 psf	325 psf	0 psf	Fill
Slice 24	461.75618 ft	1,626.2655 ft	0 psf	1,933.2572 psf	1,116.1666 psf	325 psf	0 psf	Fill
Slice 25	466.68696 ft	1,624.6874 ft	0 psf	1,848.1493 psf	1,067.0295 psf	325 psf	0 psf	Fill
Slice 26	471.81019 ft	1,624.9992 ft	0 psf	2,228.2978 psf	1,286.5084 psf	325 psf	0 psf	Fill
Slice 27	477.12589 ft	1,627.201 ft	0 psf	1,553.9639 psf	897.1815 psf	325 psf	0 psf	Fill
Slice 28	482.44158 ft	1,629.4029 ft	0 psf	879.63004 psf	507.85464 psf	325 psf	0 psf	Fill
Slice 29	488.54978 ft	1,631.933 ft	0 psf	322.17001 psf	186.00494 psf	325 psf	0 psf	Fill

Section D-D Tr 68203 SSA.gsz 11/20/2020 11:57:04 AM

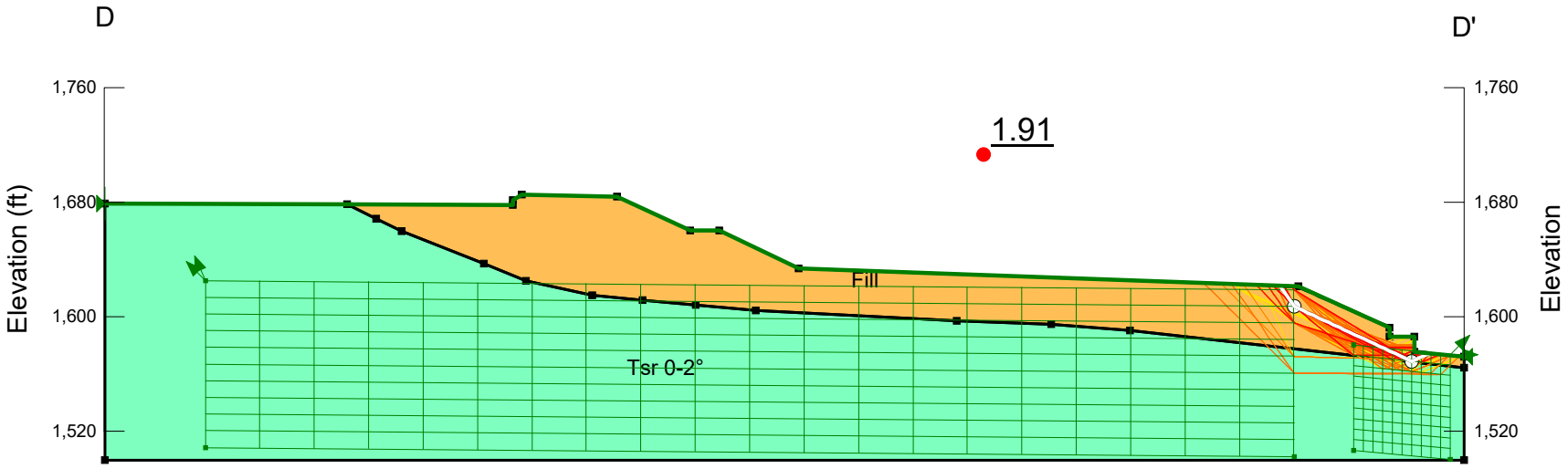
Section D-D Tr 68203 SSA.gsz

4 -Translational Static Lower Slope

Horz Seismic Coef.: 0

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 0-2°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-2)°
C-Anisotropic Strength Fn.: Tsr 175 bedding 0-(-2)°



LGC

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GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

4 -Translational Static Lower Slope

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 749
Date: 11/20/2020
Time: 11:57:04 AM
Tool Version: 10.1.0.18696
File Name: Section D-D Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:03:44 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

4 -Translational Static Lower Slope

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 0-2°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-2)°
C-Anisotropic Strength Fn.: Tsr 175 bedding 0-(-2)°
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,678.8933) ft
Right Coordinate: (949.95944, 1,572.1035) ft

Slip Surface Block

Left Grid
- Upper Left: (70.68041, 1,624.9665) ft
- Lower Left: (70.68041, 1,508.4178) ft
- Lower Right: (831.24553, 1,502.1983) ft
- X Increments: 20
- Y Increments: 10
- Starting Angle: 115 °
- Ending Angle: 135 °
- Angle Increments: 2

Right Grid
- Upper Left: (872.88936, 1,580.0777) ft
- Lower Left: (872.88936, 1,506.5249) ft
- Lower Right: (940.49298, 1,500.035) ft
- X Increments: 10
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding 0-(-2)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.5625
Data Points: Inclination (°), Modifier Factor
Data Point: (-2.01, 1)
Data Point: (-2, 0.5625)
Data Point: (0, 0.5625)
Data Point: (0.01, 1)

Tsr 175 bedding 0-(-2)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.4167
Data Points: Inclination (°), Modifier Factor
Data Point: (-2.01, 1)
Data Point: (-2, 0.4167)
Data Point: (0, 0.4167)
Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	949.95944 ft	1,572.1035 ft
Point 2	949.95944 ft	1,499.6182 ft
Point 3	0.37029 ft	1,499.6182 ft
Point 4	0.37029 ft	1,678.8933 ft
Point 5	285.28293 ft	1,678.0167 ft
Point 6	285.28293 ft	1,681.429 ft
Point 7	291.83265 ft	1,685.2326 ft
Point 8	358.2382 ft	1,683.6478 ft
Point 9	409.17891 ft	1,660.2528 ft
Point 10	429.70613 ft	1,660.2528 ft
Point 11	485.09943 ft	1,633.6127 ft
Point 12	834.11347 ft	1,620.9414 ft
Point 13	898.0135 ft	1,592.382 ft
Point 14	898.0135 ft	1,585.7311 ft
Point 15	915.4882 ft	1,585.7311 ft
Point 16	915.4882 ft	1,575.5593 ft
Point 17	949.95944 ft	1,564.1824 ft
Point 18	716.78532 ft	1,590.2187 ft
Point 19	661.84483 ft	1,594.5204 ft

Point 20	595.5087 ft	1,596.9354 ft
Point 21	455.16894 ft	1,604.0535 ft
Point 22	413.43831 ft	1,608.2918 ft
Point 23	376.05462 ft	1,611.552 ft
Point 24	340.8444 ft	1,615.0295 ft
Point 25	294.54949 ft	1,625.1362 ft
Point 26	265.09897 ft	1,637.0902 ft
Point 27	207.61068 ft	1,659.9117 ft
Point 28	189.8969 ft	1,668.2795 ft
Point 29	169.46656 ft	1,678.373 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-2°	4,3,2,17,18,19,20,21,22,23,24,25,26,27,28,29	1.1103e+05 ft²
Region 2	Fill	1,16,15,14,13,12,11,10,9,8,7,6,5,29,28,27,26,25,24,23,22,21,20,19,18,17	29,091 ft²

Slip Results

Slip Surfaces Analysed: 82026 of 251559 converged

Current Slip Surface

Slip Surface: 228,281
Factor of Safety: 1.91
Volume: 1,392.5352 ft³
Weight: 167,104.22 lbf
Resisting Force: 115,710.9 lbf
Activating Force: 60,543.515 lbf
Slip Rank: 1 of 251,559 slip surfaces
Exit: (926.93155, 1,574.4121) ft
Entry: (821.2204, 1,621.4095) ft
Radius: 62.550307 ft
Center: (889.74667, 1,633.1588) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	822.89126 ft	1,619.0233 ft	0 psf	25.889743 psf	14.94745 psf	325 psf	0 psf	Fill
Slice 2	826.23297 ft	1,614.2508 ft	0 psf	416.19842 psf	240.29227 psf	325 psf	0 psf	Fill
Slice 3	829.57468 ft	1,609.4784 ft	0 psf	806.50711 psf	465.63709 psf	325 psf	0 psf	Fill
Slice 4	832.6795 ft	1,606.4247 ft	0 psf	1,464.1769 psf	845.34291 psf	325 psf	0 psf	Fill
Slice 5	835.88847 ft	1,604.931 ft	0 psf	1,532.4075 psf	884.73588 psf	325 psf	0 psf	Fill

Slice 6	839.43847 ft	1,603.2786 ft	0 psf	1,539.328 psf	888.73141 psf	325 psf	0 psf	Fill
Slice 7	842.98847 ft	1,601.6263 ft	0 psf	1,546.2484 psf	892.72693 psf	325 psf	0 psf	Fill
Slice 8	846.53848 ft	1,599.9739 ft	0 psf	1,553.1688 psf	896.72245 psf	325 psf	0 psf	Fill
Slice 9	850.08848 ft	1,598.3215 ft	0 psf	1,560.0893 psf	900.71797 psf	325 psf	0 psf	Fill
Slice 10	853.63848 ft	1,596.6691 ft	0 psf	1,567.0097 psf	904.7135 psf	325 psf	0 psf	Fill
Slice 11	857.18848 ft	1,595.0167 ft	0 psf	1,573.9302 psf	908.70902 psf	325 psf	0 psf	Fill
Slice 12	860.73848 ft	1,593.3643 ft	0 psf	1,580.8506 psf	912.70454 psf	325 psf	0 psf	Fill
Slice 13	864.28848 ft	1,591.7119 ft	0 psf	1,587.7711 psf	916.70007 psf	325 psf	0 psf	Fill
Slice 14	867.83849 ft	1,590.0596 ft	0 psf	1,594.6915 psf	920.69559 psf	325 psf	0 psf	Fill
Slice 15	871.38849 ft	1,588.4072 ft	0 psf	1,601.612 psf	924.69111 psf	325 psf	0 psf	Fill
Slice 16	874.93849 ft	1,586.7548 ft	0 psf	1,608.5324 psf	928.68663 psf	325 psf	0 psf	Fill
Slice 17	878.48849 ft	1,585.1024 ft	0 psf	1,615.4529 psf	932.68216 psf	325 psf	0 psf	Fill
Slice 18	882.03849 ft	1,583.45 ft	0 psf	1,622.3733 psf	936.67768 psf	325 psf	0 psf	Fill
Slice 19	885.58849 ft	1,581.7976 ft	0 psf	1,629.2938 psf	940.6732 psf	325 psf	0 psf	Fill
Slice 20	889.1385 ft	1,580.1452 ft	0 psf	1,636.2142 psf	944.66872 psf	325 psf	0 psf	Fill
Slice 21	892.6885 ft	1,578.4929 ft	0 psf	1,643.1347 psf	948.66425 psf	325 psf	0 psf	Fill
Slice 22	896.2385 ft	1,576.8405 ft	0 psf	1,650.0551 psf	952.65977 psf	325 psf	0 psf	Fill
Slice 23	899.94325 ft	1,575.1161 ft	0 psf	1,048.0451 psf	605.08913 psf	325 psf	0 psf	Fill
Slice 24	903.80276 ft	1,573.3196 ft	0 psf	1,237.1217 psf	714.25254 psf	325 psf	0 psf	Fill
Slice 25	907.66227 ft	1,571.5232 ft	0 psf	1,426.1983 psf	823.41595 psf	325 psf	0 psf	Fill
Slice 26	911.52178 ft	1,569.7267 ft	0 psf	1,615.2748 psf	932.57936 psf	325 psf	0 psf	Fill
Slice 27	914.46987 ft	1,569.2503 ft	0 psf	2,339.6837 psf	1,350.817 psf	325 psf	0 psf	Fill
Slice 28	917.39542 ft	1,570.4621 ft	0 psf	752.80549 psf	434.63245 psf	325 psf	0 psf	Fill
Slice 29	921.20987 ft	1,572.0421 ft	0 psf	483.765 psf	279.30185 psf	325 psf	0 psf	Fill
Slice 30	925.02432 ft	1,573.6221 ft	0 psf	214.7245 psf	123.97125 psf	325 psf	0 psf	Fill

Section D-D Tr 68203 SSA.gsz 11/20/2020 11:57:04 AM

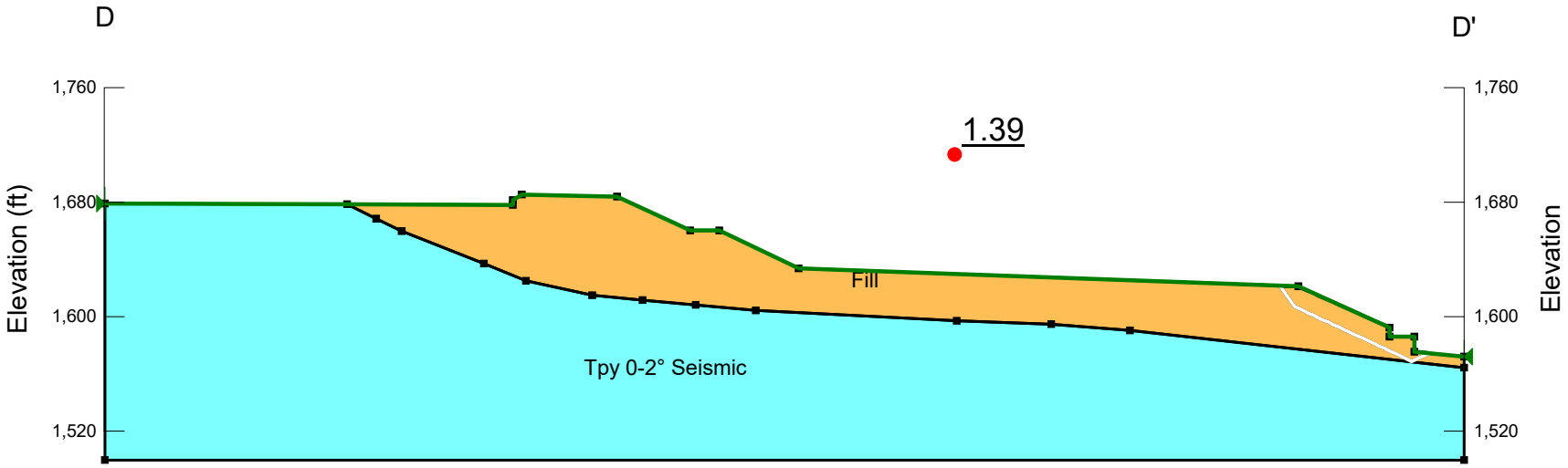
Section D-D Tr 68203 SSA.gsz

4 -Translational Pseudostatic Lower Slope

Horz Seismic Coef.: 0.15

Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tpy 0-2° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-2)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-2)° (Seismic)



LGC	**LGC Valley, Inc** *GEOTECHNICAL CONSULTING* 2420 Grand Avenue, Vista, CA 92081 Phone 760-599-7000, Fax 760-599-7007	**Tentative Tract 68203** **Santa Clarita, CA**

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

4 -Translational Pseudostatic Lower Slope

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 749
Date: 11/20/2020
Time: 11:57:04 AM
Tool Version: 10.1.0.18696
File Name: Section D-D Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:03:44 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

4 -Translational Pseudostatic Lower Slope

Kind: SLOPE/W
Parent: 4 -Translational Static Lower Slope
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tpy 0-2° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-2)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-2)° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,678.8933) ft
Right Coordinate: (949.95944, 1,572.1035) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding 0-(-2)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.625
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.625)
- Data Point: (0, 0.625)
- Data Point: (0.01, 1)

Tsr 19° bedding 0-(-2)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 0.5936
Data Points: Inclination (°), Modifier Factor
- Data Point: (-2.01, 1)
- Data Point: (-2, 0.5936)
- Data Point: (0, 0.5936)

Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	949.95944 ft	1,572.1035 ft
Point 2	949.95944 ft	1,499.6182 ft
Point 3	0.37029 ft	1,499.6182 ft
Point 4	0.37029 ft	1,678.8933 ft
Point 5	285.28293 ft	1,678.0167 ft
Point 6	285.28293 ft	1,681.429 ft
Point 7	291.83265 ft	1,685.2326 ft
Point 8	358.2382 ft	1,683.6478 ft
Point 9	409.17891 ft	1,660.2528 ft
Point 10	429.70613 ft	1,660.2528 ft
Point 11	485.09943 ft	1,633.6127 ft
Point 12	834.11347 ft	1,620.9414 ft
Point 13	898.0135 ft	1,592.382 ft
Point 14	898.0135 ft	1,585.7311 ft
Point 15	915.4882 ft	1,585.7311 ft
Point 16	915.4882 ft	1,575.5593 ft
Point 17	949.95944 ft	1,564.1824 ft
Point 18	716.78532 ft	1,590.2187 ft
Point 19	661.84483 ft	1,594.5204 ft
Point 20	595.5087 ft	1,596.9354 ft
Point 21	455.16894 ft	1,604.0535 ft
Point 22	413.43831 ft	1,608.2918 ft
Point 23	376.05462 ft	1,611.552 ft
Point 24	340.8444 ft	1,615.0295 ft
Point 25	294.54949 ft	1,625.1362 ft
Point 26	265.09897 ft	1,637.0902 ft
Point 27	207.61068 ft	1,659.9117 ft
Point 28	189.8969 ft	1,668.2795 ft
Point 29	169.46656 ft	1,678.373 ft

Regions

	Material	Points	Area
Region 1	Tpy 0-2° Seismic	4,3,2,17,18,19,20,21,22,23,24,25,26,27,28,29	1.1103e+05 ft²
Region 2	Fill	1,16,15,14,13,12,11,10,9,8,7,6,5,29,28,27,26,25,24,23,22,21,20,19,18,17	29,091 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.39
Volume: 1,392.5352 ft³
Weight: 167,104.22 lbf
Resisting Force: 111,281.15 lbf
Activating Force: 80,172.405 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (926.93155, 1,574.4121) ft
Entry: (821.2204, 1,621.4095) ft
Radius: 62.550307 ft
Center: (889.74667, 1,633.1588) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	822.89126 ft	1,619.0233 ft	0 psf	-34.361388 psf	-19.838557 psf	325 psf	0 psf	Fill
Slice 2	826.23297 ft	1,614.2508 ft	0 psf	316.00794 psf	182.44727 psf	325 psf	0 psf	Fill
Slice 3	829.57468 ft	1,609.4784 ft	0 psf	666.37727 psf	384.7331 psf	325 psf	0 psf	Fill
Slice 4	832.6795 ft	1,606.4247 ft	0 psf	1,373.9258 psf	793.23645 psf	325 psf	0 psf	Fill
Slice 5	835.88847 ft	1,604.931 ft	0 psf	1,439.1187 psf	830.87556 psf	325 psf	0 psf	Fill
Slice 6	839.43847 ft	1,603.2786 ft	0 psf	1,445.731 psf	834.6932 psf	325 psf	0 psf	Fill
Slice 7	842.98847 ft	1,601.6263 ft	0 psf	1,452.3434 psf	838.51083 psf	325 psf	0 psf	Fill
Slice 8	846.53848 ft	1,599.9739 ft	0 psf	1,458.9557 psf	842.32846 psf	325 psf	0 psf	Fill
Slice 9	850.08848 ft	1,598.3215 ft	0 psf	1,465.568 psf	846.14609 psf	325 psf	0 psf	Fill
Slice 10	853.63848 ft	1,596.6691 ft	0 psf	1,472.1804 psf	849.96373 psf	325 psf	0 psf	Fill
Slice 11	857.18848 ft	1,595.0167 ft	0 psf	1,478.7927 psf	853.78136 psf	325 psf	0 psf	Fill
Slice 12	860.73848 ft	1,593.3643 ft	0 psf	1,485.405 psf	857.59899 psf	325 psf	0 psf	Fill
Slice 13	864.28848 ft	1,591.7119 ft	0 psf	1,492.0174 psf	861.41662 psf	325 psf	0 psf	Fill
Slice 14	867.83849 ft	1,590.0596 ft	0 psf	1,498.6297 psf	865.23426 psf	325 psf	0 psf	Fill
Slice 15	871.38849 ft	1,588.4072 ft	0 psf	1,505.242 psf	869.05189 psf	325 psf	0 psf	Fill

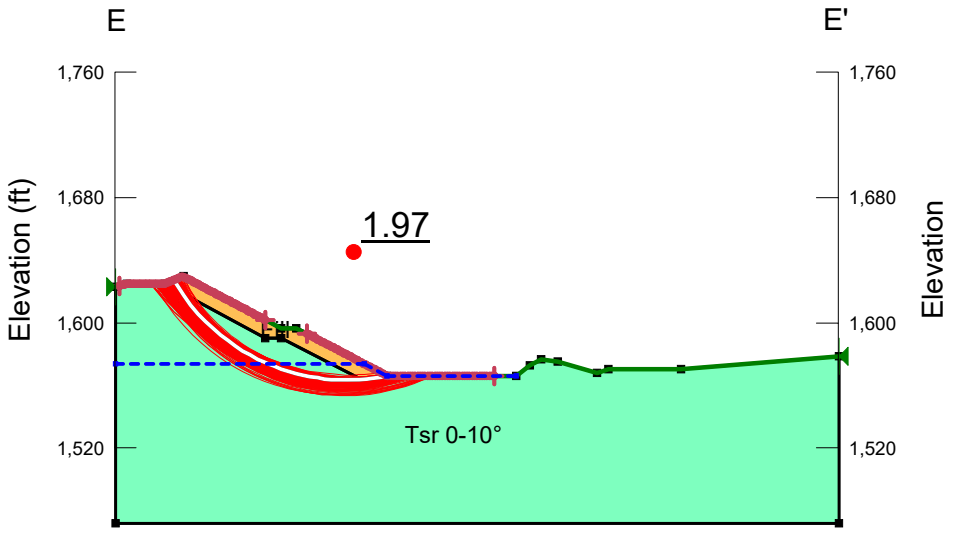
Slice 16	874.93849 ft	1,586.7548 ft	0 psf	1,511.8544 psf	872.86952 psf	325 psf	0 psf	Fill
Slice 17	878.48849 ft	1,585.1024 ft	0 psf	1,518.4667 psf	876.68715 psf	325 psf	0 psf	Fill
Slice 18	882.03849 ft	1,583.45 ft	0 psf	1,525.079 psf	880.50479 psf	325 psf	0 psf	Fill
Slice 19	885.58849 ft	1,581.7976 ft	0 psf	1,531.6914 psf	884.32242 psf	325 psf	0 psf	Fill
Slice 20	889.1385 ft	1,580.1452 ft	0 psf	1,538.3037 psf	888.14005 psf	325 psf	0 psf	Fill
Slice 21	892.6885 ft	1,578.4929 ft	0 psf	1,544.916 psf	891.95768 psf	325 psf	0 psf	Fill
Slice 22	896.2385 ft	1,576.8405 ft	0 psf	1,551.5284 psf	895.77532 psf	325 psf	0 psf	Fill
Slice 23	899.94325 ft	1,575.1161 ft	0 psf	976.32127 psf	563.67935 psf	325 psf	0 psf	Fill
Slice 24	903.80276 ft	1,573.3196 ft	0 psf	1,156.9797 psf	667.98254 psf	325 psf	0 psf	Fill
Slice 25	907.66227 ft	1,571.5232 ft	0 psf	1,337.6381 psf	772.28574 psf	325 psf	0 psf	Fill
Slice 26	911.52178 ft	1,569.7267 ft	0 psf	1,518.2966 psf	876.58893 psf	325 psf	0 psf	Fill
Slice 27	914.46987 ft	1,569.2503 ft	0 psf	2,505.4166 psf	1,446.503 psf	325 psf	0 psf	Fill
Slice 28	917.39542 ft	1,570.4621 ft	0 psf	827.93069 psf	478.006 psf	325 psf	0 psf	Fill
Slice 29	921.20987 ft	1,572.0421 ft	0 psf	543.5285 psf	313.80632 psf	325 psf	0 psf	Fill
Slice 30	925.02432 ft	1,573.6221 ft	0 psf	259.1263 psf	149.60664 psf	325 psf	0 psf	Fill

Section E-E Tr 68203 SSA.gsz 11/20/2020 12:55:56 PM

Section E-E Tr 68203 SSA.gsz

1 -Rotational Static (rapid drawdown)

Horz Seismic Coef.: 0



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Piezometric Line: 1

Name: Tsr 0-10°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-10)°
C-Anisotropic Strength Fn.: Tsr 250 bedding 0-(-10)°
Piezometric Line: 1

LGC

LGC Valley, Inc
GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Static (rapid drawdown)

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 784
Date: 11/20/2020
Time: 12:55:56 PM
Tool Version: 10.1.0.18696
File Name: Section E-E Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:56:08 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Static (rapid drawdown)

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: Yes
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Tsr 0-10°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-10)°
C-Anisotropic Strength Fn.: Tsr 250 bedding 0-(-10)°
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (3.05385, 1,623.5735) ft
Left-Zone Right Coordinate: (96.43492, 1,601.8057) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (122.7625, 1,593.1089) ft
Right-Zone Right Coordinate: (242.58181, 1,566.1445) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (0.54417, 1,622.8208) ft
Right Coordinate: (462.32328, 1,578.642) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	0.54417 ft	1,573.7913 ft
Coordinate 2	159.42081 ft	1,573.8059 ft
Coordinate 3	174.02151 ft	1,566.1445 ft
Coordinate 4	256.47753 ft	1,566.1445 ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding 0-(-10)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.5625
Data Points: Inclination (°), Modifier Factor
Data Point: (-10.01, 1)
Data Point: (-10, 0.5625)
Data Point: (0, 0.5625)
Data Point: (0.01, 1)

Tsr 250 bedding 0-(-10)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.4167
Data Points: Inclination (°), Modifier Factor
Data Point: (-10.01, 1)
Data Point: (-10, 0.4167)
Data Point: (0, 0.4167)
Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	462.32328 ft	1,578.642 ft
Point 2	462.32328 ft	1,471.7797 ft
Point 3	0.54417 ft	1,471.7797 ft
Point 4	0.54417 ft	1,622.8208 ft
Point 5	7.84159 ft	1,625.0094 ft
Point 6	32.06673 ft	1,625.0094 ft
Point 7	43.91516 ft	1,629.5374 ft
Point 8	106.23033 ft	1,596.6335 ft
Point 9	116.0623 ft	1,596.6335 ft

Point 10	174.02151 ft	1,566.1445 ft
Point 11	256.47753 ft	1,566.1445 ft
Point 12	265.35254 ft	1,572.9366 ft
Point 13	272.23519 ft	1,576.8308 ft
Point 14	282.88089 ft	1,575.2968 ft
Point 15	307.90124 ft	1,567.8803 ft
Point 16	315.29707 ft	1,570.4462 ft
Point 17	361.70972 ft	1,570.4462 ft
Point 18	174.02151 ft	1,564.1291 ft
Point 19	159.01227 ft	1,563.127 ft
Point 20	106.29459 ft	1,590.1384 ft
Point 21	96.10412 ft	1,590.1384 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-10°	1,17,16,15,14,13,12,11,10,18,19,20,21,6,5,4,3,2	50,235 ft²
Region 2	Fill	10,9,8,7,6,21,20,19,18	1,420.1 ft²

Slip Results

Slip Surfaces Analysed: 91565 of 98415 converged

Current Slip Surface

Slip Surface: 34,583
Factor of Safety: 1.97
Volume: 2,777.7157 ft³
Weight: 340,352.87 lbf
Resisting Moment: 31,549,574 lbf·ft
Activating Moment: 16,047,634 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (174.5994, 1,566.1445) ft
Entry: (37.887396, 1,627.2338) ft
Radius: 127.59756 ft
Center: (148.39595, 1,691.0225) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	40.467798 ft	1,623.1317 ft	-3,078.6109 psf	237.44931 psf	137.09143 psf	325 psf	0 psf	Fill
Slice 2	43.48168 ft	1,618.4033 ft	-2,783.5413 psf	601.86503 psf	376.08701 psf	600 psf	0 psf	Tsr 0-10°
Slice 3	46.287385 ft	1,614.6072 ft	-2,546.6487 psf	875.87822 psf	547.30945 psf	600 psf	0 psf	Tsr 0-10°
Slice 4	51.031836 ft	1,608.6339 ft	-2,173.8901 psf	1,256.314 psf	785.0321 psf	600 psf	0 psf	Tsr 0-10°
Slice 5	55.776287 ft	1,603.3251 ft	-1,842.5942 psf	1,584.687 psf	990.22235 psf	600 psf	0 psf	Tsr 0-10°

Slice 6	60.520738 ft	1,598.5651 ft	-1,545.541 psf	1,866.5047 psf	1,166.3216 psf	600 psf	0 psf	Tsr 0-10°
Slice 7	65.265189 ft	1,594.2722 ft	-1,277.6341 psf	2,106.08 psf	1,316.0249 psf	600 psf	0 psf	Tsr 0-10°
Slice 8	70.00964 ft	1,590.3861 ft	-1,035.1188 psf	2,306.8359 psf	1,441.471 psf	600 psf	0 psf	Tsr 0-10°
Slice 9	74.754091 ft	1,586.8612 ft	-815.13775 psf	2,471.5195 psf	1,544.3768 psf	600 psf	0 psf	Tsr 0-10°
Slice 10	79.498542 ft	1,583.6617 ft	-615.46143 psf	2,602.3536 psf	1,626.131 psf	600 psf	0 psf	Tsr 0-10°
Slice 11	84.242993 ft	1,580.7592 ft	-434.31549 psf	2,701.1452 psf	1,687.8629 psf	600 psf	0 psf	Tsr 0-10°
Slice 12	88.987444 ft	1,578.1306 ft	-270.26587 psf	2,769.3647 psf	1,730.4911 psf	600 psf	0 psf	Tsr 0-10°
Slice 13	93.731895 ft	1,575.7572 ft	-122.13954 psf	2,808.2043 psf	1,754.7608 psf	600 psf	0 psf	Tsr 0-10°
Slice 14	97.05043 ft	1,574.2162 ft	-25.962416 psf	2,823.4381 psf	1,764.2799 psf	600 psf	0 psf	Tsr 0-10°
Slice 15	100.05514 ft	1,572.9575 ft	52.602207 psf	2,832.2772 psf	1,736.9337 psf	600 psf	0 psf	Tsr 0-10°
Slice 16	104.17193 ft	1,571.354 ft	152.68326 psf	2,831.0887 psf	1,673.6535 psf	600 psf	0 psf	Tsr 0-10°
Slice 17	108.70439 ft	1,569.7833 ft	250.71796 psf	2,938.4718 psf	1,679.495 psf	600 psf	0 psf	Tsr 0-10°
Slice 18	113.62037 ft	1,568.2815 ft	344.45981 psf	3,153.7694 psf	1,755.4514 psf	600 psf	0 psf	Tsr 0-10°
Slice 19	118.2735 ft	1,567.0524 ft	421.18474 psf	3,206.0624 psf	1,740.1847 psf	600 psf	0 psf	Tsr 0-10°
Slice 20	122.69589 ft	1,566.0603 ft	483.11342 psf	3,095.2137 psf	1,632.2214 psf	600 psf	0 psf	Tsr 0-10°
Slice 21	127.11828 ft	1,565.2315 ft	534.85507 psf	3,049.8192 psf	817.16137 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 22	131.54067 ft	1,564.5628 ft	576.61024 psf	2,867.2945 psf	744.28845 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 23	135.96306 ft	1,564.0515 ft	608.53695 psf	2,662.3957 psf	667.33915 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 24	140.62239 ft	1,563.6856 ft	631.40021 psf	2,421.9192 psf	581.77488 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 25	145.51867 ft	1,563.4809 ft	644.20037 psf	2,143.2296 psf	487.06413 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 26	150.41494 ft	1,563.4644 ft	645.25679 psf	1,842.9556 psf	748.40526 psf	600 psf	0 psf	Tsr 0-10°
Slice 27	155.31122 ft	1,563.6361 ft	634.57403 psf	1,520.8529 psf	553.80849 psf	600 psf	0 psf	Tsr 0-10°
Slice 28	158.59008 ft	1,563.8355 ft	622.14513 psf	1,279.8763 psf	379.74125 psf	325 psf	0 psf	Fill
Slice 29	161.85426 ft	1,564.1603 ft	409.46553 psf	1,043.4001 psf	366.00229 psf	325 psf	0 psf	Fill
Slice 30	166.72116 ft	1,564.7717 ft	254.59974 psf	667.09749 psf	238.15568 psf	325 psf	0 psf	Fill

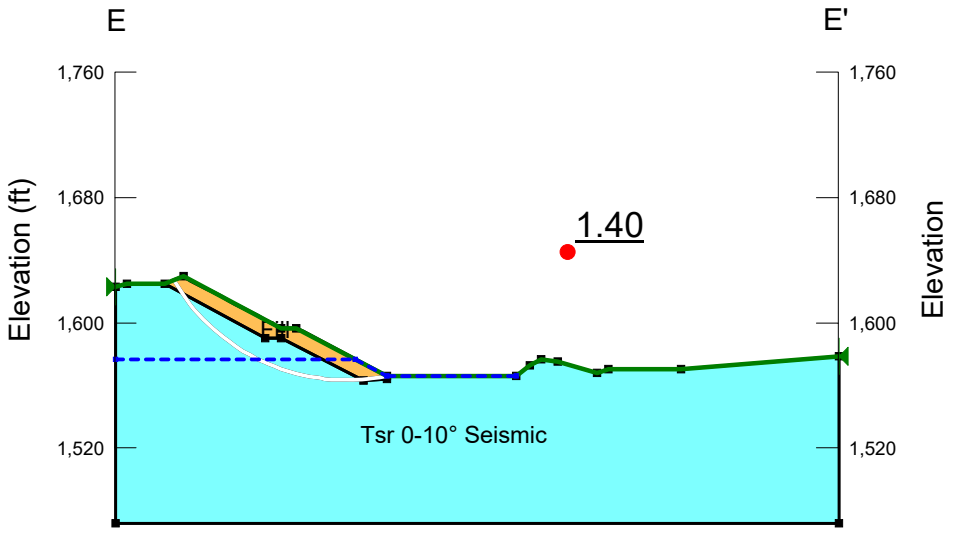
Slice 31	171.58806 ft	1,565.5748 ft	90.353051 psf	261.79681 psf	98.983099 psf	325 psf	0 psf	Fill
Slice 32	174.31045 ft	1,566.0846 ft	3.7397847 psf	75.426677 psf	44.794942 psf	600 psf	0 psf	Tsr 0-10°

Section E-E Tr 68203 SSA.gsz 11/20/2020 12:55:56 PM

Section E-E Tr 68203 SSA.gsz

1 -Rotational Pseudostatic (rapid drawdown)

Horz Seismic Coef.: 0.15



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Piezometric Line: 1

Name: Tsr 0-10° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-10)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-10)° (Seismic)
Piezometric Line: 1

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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Pseudostatic (rapid drawdown)

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 784
Date: 11/20/2020
Time: 12:55:56 PM
Tool Version: 10.1.0.18696
File Name: Section E-E Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 12:56:16 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Pseudostatic (rapid drawdown)

Kind: SLOPE/W
Parent: 1 -Rotational Static (rapid drawdown)
Method: Bishop
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: Yes
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Critical Slip Surfaces from Other
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100
Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Tsr 0-10° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-10)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-10)° (Seismic)
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (0.54417, 1,622.8208) ft
Right Coordinate: (462.32328, 1,578.642) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	0.54417 ft	1,576.8608 ft
Coordinate 2	153.7163 ft	1,576.8249 ft
Coordinate 3	174.02151 ft	1,566.1445 ft
Coordinate 4	256.47753 ft	1,566.1445 ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding 0-(-10)° (Seismic)

Model: Spline Data Point Function

Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.625
Data Points: Inclination (°), Modifier Factor
Data Point: (-10.01, 1)
Data Point: (-10, 0.625)
Data Point: (0, 0.625)
Data Point: (0.01, 1)

Tsr 19° bedding 0-(-10)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.5936
Data Points: Inclination (°), Modifier Factor
Data Point: (-10.01, 1)
Data Point: (-10, 0.5936)
Data Point: (0, 0.5936)
Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	462.32328 ft	1,578.642 ft
Point 2	462.32328 ft	1,471.7797 ft
Point 3	0.54417 ft	1,471.7797 ft
Point 4	0.54417 ft	1,622.8208 ft
Point 5	7.84159 ft	1,625.0094 ft
Point 6	32.06673 ft	1,625.0094 ft
Point 7	43.91516 ft	1,629.5374 ft
Point 8	106.23033 ft	1,596.6335 ft
Point 9	116.0623 ft	1,596.6335 ft
Point 10	174.02151 ft	1,566.1445 ft
Point 11	256.47753 ft	1,566.1445 ft
Point 12	265.35254 ft	1,572.9366 ft
Point 13	272.23519 ft	1,576.8308 ft
Point 14	282.88089 ft	1,575.2968 ft
Point 15	307.90124 ft	1,567.8803 ft
Point 16	315.29707 ft	1,570.4462 ft
Point 17	361.70972 ft	1,570.4462 ft
Point 18	174.02151 ft	1,564.1291 ft

Point 19	159.01227 ft	1,563.127 ft
Point 20	106.29459 ft	1,590.1384 ft
Point 21	96.10412 ft	1,590.1384 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-10° Seismic	1,17,16,15,14,13,12,11,10,18,19,20,21,6,5,4,3,2	50,235 ft²
Region 2	Fill	10,9,8,7,6,21,20,19,18	1,420.1 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.40
Volume: 2,777.7157 ft³
Weight: 340,352.87 lbf
Resisting Moment: 29,754,298 lbf·ft
Activating Moment: 21,227,937 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (174.5994, 1,566.1445) ft
Entry: (37.887396, 1,627.2338) ft
Radius: 127.59756 ft
Center: (148.39595, 1,691.0225) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	40.467798 ft	1,623.1317 ft	-2,887.8868 psf	146.83168 psf	84.77331 psf	325 psf	0 psf	Fill
Slice 2	43.48168 ft	1,618.4033 ft	-2,592.8786 psf	426.7755 psf	266.67893 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 3	46.287385 ft	1,614.6072 ft	-2,356.0431 psf	679.76753 psf	424.7659 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 4	51.031836 ft	1,608.6339 ft	-1,983.3811 psf	1,037.5063 psf	648.30591 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 5	55.776287 ft	1,603.3251 ft	-1,652.1819 psf	1,351.6348 psf	844.59516 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 6	60.520738 ft	1,598.5651 ft	-1,355.2253 psf	1,625.8512 psf	1,015.9446 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 7	65.265189 ft	1,594.2722 ft	-1,087.415 psf	1,863.1544 psf	1,164.2281 psf	600 psf	0 psf	Tsr 0-10° Seismic

Slice 8	70.00964 ft	1,590.3861 ft	-844.99622 psf	2,065.9752 psf	1,290.9646 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 9	74.754091 ft	1,586.8612 ft	-625.11179 psf	2,236.2861 psf	1,397.3867 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 10	79.498542 ft	1,583.6617 ft	-425.53208 psf	2,375.6876 psf	1,484.4944 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 11	84.242993 ft	1,580.7592 ft	-244.48274 psf	2,485.4728 psf	1,553.0958 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 12	88.987444 ft	1,578.1306 ft	-80.529717 psf	2,566.6775 psf	1,603.8381 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 13	91.404742 ft	1,576.8609 ft	-1.3331949 psf	2,633.1937 psf	1,645.402 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 14	93.776968 ft	1,575.7359 ft	68.833209 psf	2,631.8551 psf	1,601.5538 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 15	97.05043 ft	1,574.2162 ft	163.60957 psf	2,672.8974 psf	1,567.9771 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 16	100.05514 ft	1,572.9575 ft	242.11301 psf	2,696.3895 psf	1,533.6022 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 17	104.17193 ft	1,571.354 ft	342.11024 psf	2,710.6546 psf	1,480.0308 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 18	108.70439 ft	1,569.7833 ft	440.05266 psf	2,829.6818 psf	1,493.206 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 19	113.62037 ft	1,568.2815 ft	533.69442 psf	3,054.0719 psf	1,574.9066 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 20	118.2735 ft	1,567.0524 ft	610.32462 psf	3,119.8499 psf	1,568.1254 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 21	122.69589 ft	1,566.0603 ft	672.16325 psf	3,025.2739 psf	1,470.3868 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 22	127.11828 ft	1,565.2315 ft	723.81486 psf	3,001.9204 psf	784.20117 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 23	130.79899 ft	1,564.6616 ft	759.32227 psf	2,866.561 psf	725.38302 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 24	133.01019 ft	1,564.3669 ft	777.68052 psf	2,762.164 psf	683.1265 psf	375 psf	0 psf	Tsr 0-10° Seismic

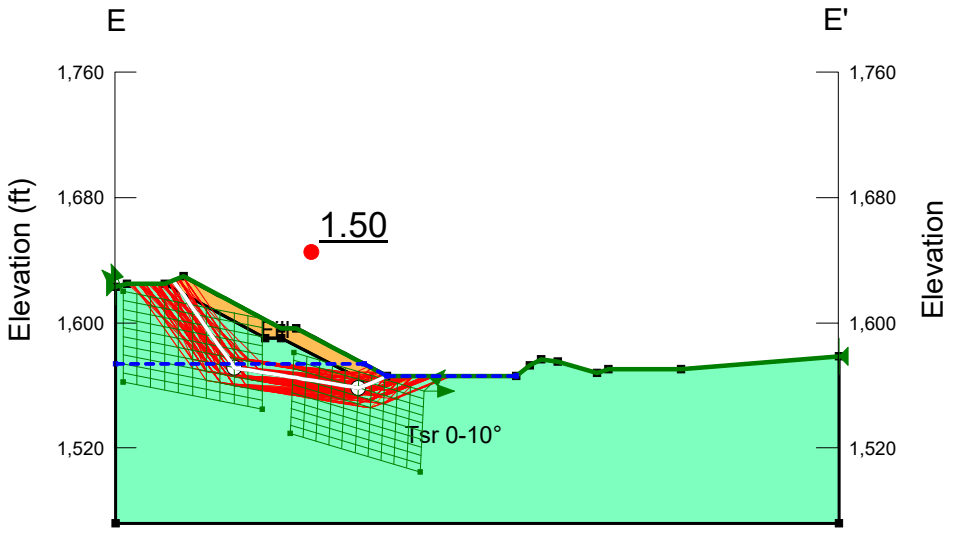
Slice 25	135.96306 ft	1,564.0515 ft	797.31666 psf	2,637.7192 psf	633.52894 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 26	140.62239 ft	1,563.6856 ft	820.08507 psf	2,407.6639 psf	546.49845 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 27	145.51867 ft	1,563.4809 ft	832.78554 psf	2,138.435 psf	449.44882 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 28	150.41494 ft	1,563.4644 ft	833.74227 psf	1,846.0029 psf	632.53063 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 29	153.28969 ft	1,563.5263 ft	829.83718 psf	1,679.2431 psf	530.76772 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 30	155.73783 ft	1,563.6592 ft	591.52976 psf	1,503.3267 psf	569.75394 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 31	158.59008 ft	1,563.8355 ft	509.58273 psf	1,295.624 psf	453.82116 psf	325 psf	0 psf	Fill
Slice 32	161.85426 ft	1,564.1603 ft	409.79148 psf	1,059.0183 psf	374.83126 psf	325 psf	0 psf	Fill
Slice 33	166.72116 ft	1,564.7717 ft	254.78603 psf	684.81537 psf	248.27756 psf	325 psf	0 psf	Fill
Slice 34	171.58806 ft	1,565.5748 ft	90.409434 psf	279.09398 psf	108.93707 psf	325 psf	0 psf	Fill
Slice 35	174.31045 ft	1,566.0846 ft	3.7397847 psf	105.47756 psf	63.572817 psf	600 psf	0 psf	Tsr 0-10° Seismic

Section E-E Tr 68203 SSA.gsz 11/20/2020 01:02:38 PM

Section E-E Tr 68203 SSA.gsz

2 -Tanslational Static (rapid drawdown)

Horz Seismic Coef.: 0



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Piezometric Line: 1

Name: Tsr 0-10°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-10)°
C-Anisotropic Strength Fn.: Tsr 250 bedding 0-(-10)°
Piezometric Line: 1

LGC

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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Tanslational Static (rapid drawdown)

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 787
Date: 11/20/2020
Time: 01:02:38 PM
Tool Version: 10.1.0.18696
File Name: Section E-E Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 01:02:51 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Tanslational Static (rapid drawdown)

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: Piezometric Line
  - Apply Phreatic Correction: Yes
  - Use Staged Rapid Drawdown: No
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Tsr 0-10°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 0-(-10)°
C-Anisotropic Strength Fn.: Tsr 250 bedding 0-(-10)°
Phi-B: 0 °
Pore Water Pressure
- Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (0.54417, 1,622.8208) ft
Right Coordinate: (462.32328, 1,578.642) ft

Slip Surface Block

Left Grid
- Upper Left: (5.47795, 1,619.9198) ft
- Lower Left: (5.47795, 1,561.9968) ft
- Lower Right: (94.26421, 1,544.8264) ft
- X Increments: 10
- Y Increments: 10
- Starting Angle: 115 °
- Ending Angle: 135 °
- Angle Increments: 2

Right Grid
- Upper Left: (114.737, 1,580.985) ft
- Lower Left: (112.12884, 1,529.3651) ft
- Lower Right: (195.1554, 1,504.8049) ft
- X Increments: 10
- Y Increments: 10
- Angle Increments: 2

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	0.62172 ft	1,573.7495 ft
Coordinate 2	159.46478 ft	1,573.7992 ft
Coordinate 3	174.02137 ft	1,566.1141 ft
Coordinate 4	256.47705 ft	1,566.1317 ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding 0-(-10)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.5625
Data Points: Inclination (°), Modifier Factor
Data Point: (-10.01, 1)
Data Point: (-10, 0.5625)
Data Point: (0, 0.5625)
Data Point: (0.01, 1)

Tsr 250 bedding 0-(-10)°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.4167
Data Points: Inclination (°), Modifier Factor
Data Point: (-10.01, 1)
Data Point: (-10, 0.4167)
Data Point: (0, 0.4167)
Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	462.32328 ft	1,578.642 ft

Point 2	462.32328 ft	1,471.7797 ft
Point 3	0.54417 ft	1,471.7797 ft
Point 4	0.54417 ft	1,622.8208 ft
Point 5	7.84159 ft	1,625.0094 ft
Point 6	32.06673 ft	1,625.0094 ft
Point 7	43.91516 ft	1,629.5374 ft
Point 8	106.23033 ft	1,596.6335 ft
Point 9	116.0623 ft	1,596.6335 ft
Point 10	174.02151 ft	1,566.1445 ft
Point 11	256.47753 ft	1,566.1445 ft
Point 12	265.35254 ft	1,572.9366 ft
Point 13	272.23519 ft	1,576.8308 ft
Point 14	282.88089 ft	1,575.2968 ft
Point 15	307.90124 ft	1,567.8803 ft
Point 16	315.29707 ft	1,570.4462 ft
Point 17	361.70972 ft	1,570.4462 ft
Point 18	174.02151 ft	1,564.1291 ft
Point 19	159.01227 ft	1,563.127 ft
Point 20	106.29459 ft	1,590.1384 ft
Point 21	96.10412 ft	1,590.1384 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-10°	1,17,16,15,14,13,12,11,10,18,19,20,21,6,5,4,3,2	50,235 ft²
Region 2	Fill	10,9,8,7,6,21,20,19,18	1,420.1 ft²

Slip Results

Slip Surfaces Analysed: 64772 of 131769 converged

Current Slip Surface

Slip Surface: 57,272
Factor of Safety: 1.50
Volume: 3,385.5467 ft³
Weight: 416,258.31 lbf
Resisting Force: 172,097.72 lbf
Activating Force: 114,847.02 lbf
Slip Rank: 1 of 131,769 slip surfaces
Exit: (174.47159, 1,566.1445) ft
Entry: (37.528508, 1,627.0967) ft
Radius: 86.226628 ft
Center: (126.34701, 1,642.3347) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material

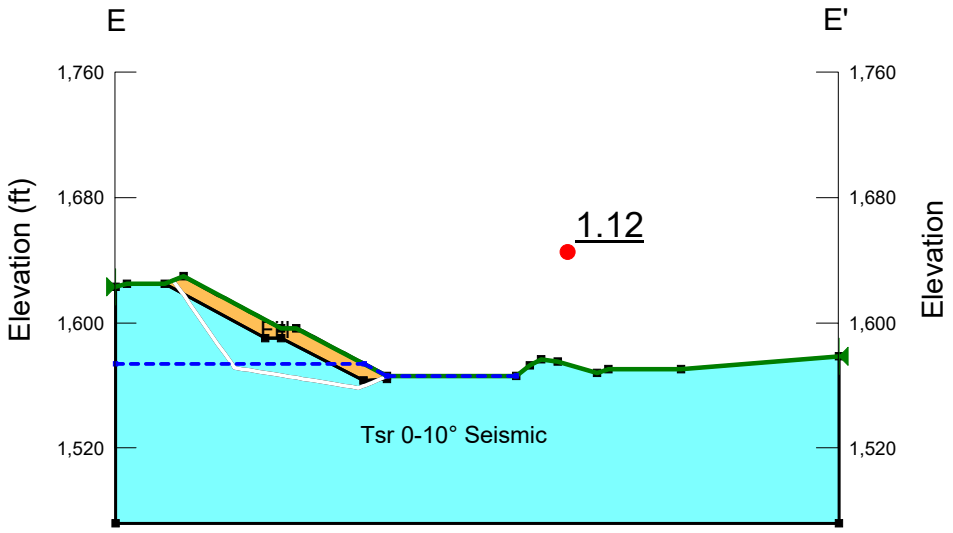
Slice 1	40.392587 ft	1,623.0063 ft	-3,072.8504 psf	202.19788 psf	116.739 psf	325 psf	0 psf	Fill
Slice 2	43.585913 ft	1,618.4458 ft	-2,788.2103 psf	468.53663 psf	292.77418 psf	600 psf	0 psf	Tsr 0-10°
Slice 3	46.125958 ft	1,614.8182 ft	-2,561.8009 psf	670.24677 psf	418.81667 psf	600 psf	0 psf	Tsr 0-10°
Slice 4	50.547555 ft	1,608.5035 ft	-2,167.6777 psf	982.10524 psf	613.68746 psf	600 psf	0 psf	Tsr 0-10°
Slice 5	54.969152 ft	1,602.1889 ft	-1,773.5545 psf	1,293.9637 psf	808.55826 psf	600 psf	0 psf	Tsr 0-10°
Slice 6	59.390748 ft	1,595.8742 ft	-1,379.4313 psf	1,605.8222 psf	1,003.4291 psf	600 psf	0 psf	Tsr 0-10°
Slice 7	63.812345 ft	1,589.5595 ft	-985.30806 psf	1,917.6806 psf	1,198.2999 psf	600 psf	0 psf	Tsr 0-10°
Slice 8	68.233942 ft	1,583.2448 ft	-591.18483 psf	2,229.5391 psf	1,393.1707 psf	600 psf	0 psf	Tsr 0-10°
Slice 9	72.655538 ft	1,576.9301 ft	-197.06161 psf	2,541.3976 psf	1,588.0415 psf	600 psf	0 psf	Tsr 0-10°
Slice 10	75.686647 ft	1,572.6012 ft	73.119175 psf	2,782.4344 psf	1,692.9681 psf	600 psf	0 psf	Tsr 0-10°
Slice 11	78.956603 ft	1,571.0262 ft	171.46369 psf	4,752.6316 psf	1,488.5117 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 12	83.855894 ft	1,570.2192 ft	221.91438 psf	4,539.1346 psf	1,402.7499 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 13	88.755184 ft	1,569.4123 ft	272.36507 psf	4,325.6377 psf	1,316.9881 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 14	93.654475 ft	1,568.6053 ft	322.81575 psf	4,112.1408 psf	1,231.2263 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 15	98.635672 ft	1,567.7848 ft	374.10989 psf	3,901.7301 psf	1,146.1933 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 16	103.69878 ft	1,566.9509 ft	426.24746 psf	3,694.4058 psf	1,061.889 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 17	108.70439 ft	1,566.1264 ft	477.79298 psf	3,634.7652 psf	1,025.7625 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 18	113.62037 ft	1,565.3167 ft	528.41558 psf	3,722.1584 psf	1,037.71 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 19	118.27572 ft	1,564.5499 ft	576.35426 psf	3,669.9274 psf	1,005.1628 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 20	122.70256 ft	1,563.8207 ft	621.93989 psf	3,478.7223 psf	928.22486 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 21	127.12941 ft	1,563.0916 ft	667.52551 psf	3,287.5171 psf	851.28687 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 22	131.55625 ft	1,562.3624 ft	713.11114 psf	3,096.312 psf	774.34889 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 23	135.98309 ft	1,561.6332 ft	758.69676 psf	2,905.1068 psf	697.4109 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 24	140.38803 ft	1,560.9077 ft	804.05683 psf	2,714.8477 psf	620.8536 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 25	144.77106 ft	1,560.1858 ft	849.19135 psf	2,525.5347 psf	544.67698 psf	250.02 psf	0 psf	Tsr 0-10°

Slice 26	149.1541 ft	1,559.4638 ft	894.32586 psf	2,336.2217 psf	468.50037 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 27	153.53713 ft	1,558.7419 ft	939.46038 psf	2,146.9087 psf	392.32376 psf	250.02 psf	0 psf	Tsr 0-10°
Slice 28	157.37046 ft	1,559.061 ft	919.62392 psf	2,334.9906 psf	884.41924 psf	600 psf	0 psf	Tsr 0-10°
Slice 29	159.23853 ft	1,559.8348 ft	871.37664 psf	2,080.7152 psf	755.67863 psf	600 psf	0 psf	Tsr 0-10°
Slice 30	161.78796 ft	1,560.8908 ft	570.06021 psf	1,790.554 psf	762.64915 psf	600 psf	0 psf	Tsr 0-10°
Slice 31	166.43432 ft	1,562.8154 ft	356.43923 psf	1,191.8824 psf	522.04284 psf	600 psf	0 psf	Tsr 0-10°
Slice 32	171.38943 ft	1,564.8678 ft	128.62276 psf	462.05466 psf	192.507 psf	325 psf	0 psf	Fill
Slice 33	174.02144 ft	1,565.958 ft	9.737986 psf	131.36236 psf	70.219863 psf	325 psf	0 psf	Fill
Slice 34	174.20995 ft	1,566.0361 ft	4.8680888 psf	215.24919 psf	131.46071 psf	600 psf	0 psf	Tsr 0-10°
Slice 35	174.43499 ft	1,566.1293 ft	-0.94548169 psf	202.18518 psf	126.33932 psf	600 psf	0 psf	Tsr 0-10°

Section E-E Tr 68203 SSA.gsz

2 -Tanslational Pseudostatic (rapid drawdown)

Horz Seismic Coef.: 0.15



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Piezometric Line: 1

Name: Tsr 0-10° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-10)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-10)° (Seismic)
Piezometric Line: 1

LGC

LGC Valley, Inc
GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Tanslational Pseudostatic (rapid drawdown)

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 787
Date: 11/20/2020
Time: 01:02:38 PM
Tool Version: 10.1.0.18696
File Name: Section E-E Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 01:02:51 PM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Tanslational Pseudostatic (rapid drawdown)

Kind: SLOPE/W
Parent: 2 -Tanslational Static (rapid drawdown)
Method: Janbu
Settings
PWP Conditions from: Piezometric Line
Apply Phreatic Correction: Yes
Use Staged Rapid Drawdown: No
Unit Weight of Water: 62.4 pcf
Slip Surface
Direction of movement: Left to Right
Use Passive Mode: No
Slip Surface Option: Critical Slip Surfaces from Other
Critical slip surfaces saved: 1
Optimize Critical Slip Surface Location: No
Tension Crack Option: (none)
Distribution
F of S Calculation Option: Constant
Advanced
Geometry Settings
Minimum Slip Surface Depth: 0.1 ft
Number of Slices: 30
Factor of Safety Convergence Settings
Maximum Number of Iterations: 100

Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Tsr 0-10° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 0-(-10)° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 0-(-10)° (Seismic)
Phi-B: 0 °
Pore Water Pressure
Piezometric Line: 1

Slip Surface Limits

Left Coordinate: (0.54417, 1,622.8208) ft
Right Coordinate: (462.32328, 1,578.642) ft

Piezometric Lines

Piezometric Line 1

Coordinates

	X	Y
Coordinate 1	0.60691 ft	1,573.8172 ft
Coordinate 2	159.59938 ft	1,573.7121 ft
Coordinate 3	174.00809 ft	1,566.1417 ft
Coordinate 4	256.45589 ft	1,566.1106 ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding 0-(-10)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.625
Data Points: Inclination (°), Modifier Factor
Data Point: (-10.01, 1)
Data Point: (-10, 0.625)
Data Point: (0, 0.625)
Data Point: (0.01, 1)

Tsr 19° bedding 0-(-10)° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 0.5936
Data Points: Inclination (°), Modifier Factor
Data Point: (-10.01, 1)
Data Point: (-10, 0.5936)
Data Point: (0, 0.5936)
Data Point: (0.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	462.32328 ft	1,578.642 ft
Point 2	462.32328 ft	1,471.7797 ft
Point 3	0.54417 ft	1,471.7797 ft
Point 4	0.54417 ft	1,622.8208 ft
Point 5	7.84159 ft	1,625.0094 ft
Point 6	32.06673 ft	1,625.0094 ft
Point 7	43.91516 ft	1,629.5374 ft
Point 8	106.23033 ft	1,596.6335 ft
Point 9	116.0623 ft	1,596.6335 ft
Point 10	174.02151 ft	1,566.1445 ft
Point 11	256.47753 ft	1,566.1445 ft
Point 12	265.35254 ft	1,572.9366 ft
Point 13	272.23519 ft	1,576.8308 ft
Point 14	282.88089 ft	1,575.2968 ft
Point 15	307.90124 ft	1,567.8803 ft
Point 16	315.29707 ft	1,570.4462 ft

Point 17	361.70972 ft	1,570.4462 ft
Point 18	174.02151 ft	1,564.1291 ft
Point 19	159.01227 ft	1,563.127 ft
Point 20	106.29459 ft	1,590.1384 ft
Point 21	96.10412 ft	1,590.1384 ft

Regions

	Material	Points	Area
Region 1	Tsr 0-10° Seismic	1,17,16,15,14,13,12,11,10,18,19,20,21,6,5,4,3,2	50,235 ft²
Region 2	Fill	10,9,8,7,6,21,20,19,18	1,420.1 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.12
Volume: 3,385.5467 ft³
Weight: 416,257.58 lbf
Resisting Force: 179,777.01 lbf
Activating Force: 160,596.85 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (174.47159, 1,566.1445) ft
Entry: (37.528508, 1,627.0967) ft
Radius: 86.226628 ft
Center: (126.34701, 1,642.3347) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	40.392587 ft	1,623.0063 ft	-3,071.0425 psf	118.7156 psf	68.540484 psf	325 psf	0 psf	Fill
Slice 2	43.585913 ft	1,618.4458 ft	-2,786.5966 psf	305.51542 psf	190.90723 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 3	46.125958 ft	1,614.8182 ft	-2,560.3416 psf	484.21012 psf	302.56806 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 4	50.547555 ft	1,608.5035 ft	-2,166.4873 psf	760.48504 psf	475.20379 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 5	54.969152 ft	1,602.1889 ft	-1,772.6329 psf	1,036.76 psf	647.83952 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 6	59.390748 ft	1,595.8742 ft	-1,378.7785 psf	1,313.0349 psf	820.47525 psf	600 psf	0 psf	Tsr 0-10° Seismic

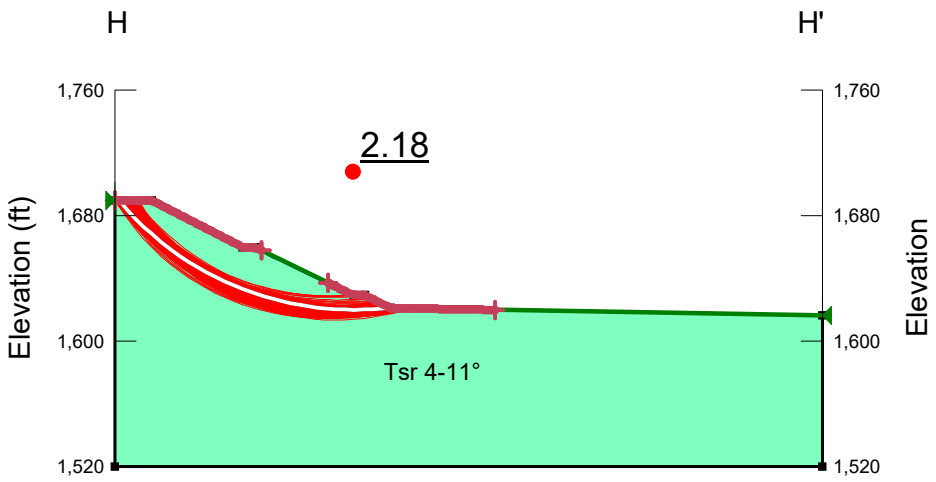
Slice 7	63.812345 ft	1,589.5595 ft	-984.92413 psf	1,589.3098 psf	993.11098 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 8	68.233942 ft	1,583.2448 ft	-591.06976 psf	1,865.5847 psf	1,165.7467 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 9	72.655538 ft	1,576.9301 ft	-197.21538 psf	2,141.8596 psf	1,338.3824 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 10	74.867954 ft	1,573.7704 ft	-0.14409656 psf	2,280.0982 psf	1,424.7635 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 11	75.688265 ft	1,572.5989 ft	72.925201 psf	2,363.7517 psf	1,431.4673 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 12	78.956603 ft	1,571.0262 ft	170.92687 psf	4,659.9343 psf	1,545.2686 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 13	83.855894 ft	1,570.2192 ft	221.07979 psf	4,450.2318 psf	1,455.8175 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 14	88.755184 ft	1,569.4123 ft	271.23272 psf	4,240.5292 psf	1,366.3664 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 15	93.654475 ft	1,568.6053 ft	321.38564 psf	4,030.8266 psf	1,276.9153 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 16	98.635672 ft	1,567.7848 ft	372.37703 psf	3,824.1776 psf	1,188.2268 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 17	103.69878 ft	1,566.9509 ft	424.20689 psf	3,620.5823 psf	1,100.3008 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 18	108.70439 ft	1,566.1264 ft	475.44819 psf	3,562.5315 psf	1,062.6788 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 19	113.62037 ft	1,565.3167 ft	525.77201 psf	3,649.3797 psf	1,075.2517 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 20	118.27572 ft	1,564.5499 ft	573.42776 psf	3,598.5804 psf	1,041.3601 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 21	122.70256 ft	1,563.8207 ft	618.74434 psf	3,410.7791 psf	961.11303 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 22	127.12941 ft	1,563.0916 ft	664.06091 psf	3,222.9778 psf	880.86595 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 23	131.55625 ft	1,562.3624 ft	709.37749 psf	3,035.1765 psf	800.61887 psf	375 psf	0 psf	Tsr 0-10° Seismic

Slice 24	135.98309 ft	1,561.6332 ft	754.69407 psf	2,847.3752 psf	720.37179 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 25	140.38803 ft	1,560.9077 ft	799.78642 psf	2,660.3452 psf	640.4674 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 26	144.77106 ft	1,560.1858 ft	844.65455 psf	2,474.5602 psf	561.06881 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 27	149.1541 ft	1,559.4638 ft	889.52268 psf	2,288.6174 psf	481.61584 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 28	153.53713 ft	1,558.7419 ft	934.39081 psf	2,102.6746 psf	402.16288 psf	375 psf	0 psf	Tsr 0-10° Seismic
Slice 29	157.37046 ft	1,559.061 ft	914.3214 psf	2,520.7531 psf	1,003.8099 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 30	159.23853 ft	1,559.8348 ft	865.96061 psf	2,250.5401 psf	865.18128 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 31	159.53208 ft	1,559.9564 ft	858.36101 psf	2,209.0504 psf	844.00439 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 32	161.85526 ft	1,560.9186 ft	567.65187 psf	1,950.298 psf	863.97318 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 33	166.43432 ft	1,562.8154 ft	357.25252 psf	1,330.8413 psf	608.3658 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 34	171.38279 ft	1,564.8651 ft	129.87906 psf	525.42859 psf	228.37063 psf	325 psf	0 psf	Fill
Slice 35	174.01473 ft	1,565.9553 ft	11.6335 psf	179.74114 psf	97.056993 psf	325 psf	0 psf	Fill
Slice 36	174.02144 ft	1,565.958 ft	11.45991 psf	178.82497 psf	96.628262 psf	325 psf	0 psf	Fill
Slice 37	174.20995 ft	1,566.0361 ft	6.583065 psf	305.47901 psf	186.77091 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 38	174.4314 ft	1,566.1279 ft	0.85401568 psf	292.28132 psf	182.10399 psf	600 psf	0 psf	Tsr 0-10° Seismic
Slice 39	174.468 ft	1,566.143 ft	-0.09281485 psf	290.07214 psf	181.25719 psf	600 psf	0 psf	Tsr 0-10° Seismic

Section H-H Tr 68203 SSA.gsz

1 -Rotational Static

Horz Seismic Coef.: 0



Name: Tsr 4-11°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding -4-11°
C-Anisotropic Strength Fn.: Tsr 175 bedding -4-11°

LGC Valley, Inc
GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Static

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 758
Date: 11/20/2020
Time: 11:50:04 AM
Tool Version: 10.1.0.18696
File Name: Section H-H Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 11:50:12 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Static

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 4-11°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding -4-11°
C-Anisotropic Strength Fn.: Tsr 175 bedding -4-11°
Phi-B: 0 °

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (0.37029, 1,689.5795) ft
Left-Zone Right Coordinate: (93.88003, 1,657.6415) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (136.31725, 1,637.0046) ft
Right-Zone Right Coordinate: (243.20985, 1,619.7487) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (0.37029, 1,689.5795) ft
Right Coordinate: (452.12608, 1,616.3336) ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding -4-11°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (-11.01, 1)
- Data Point: (-11, 0.5625)
- Data Point: (-4, 0.5625)
- Data Point: (-3.99, 1)

Tsr 175 bedding -4-11°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (-11.01, 1)
Data Point: (-11, 0.4167)
Data Point: (-4, 0.4167)
Data Point: (-3.99, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	452.12608 ft	1,616.3336 ft
Point 2	452.12608 ft	1,519.8315 ft
Point 3	0.37029 ft	1,519.8315 ft
Point 4	0.37029 ft	1,689.5795 ft
Point 5	23.91622 ft	1,689.5795 ft
Point 6	81.96599 ft	1,659.6038 ft
Point 7	89.84482 ft	1,659.6038 ft
Point 8	152.60377 ft	1,629.0846 ft
Point 9	159.75811 ft	1,629.0846 ft
Point 10	176.24026 ft	1,620.8435 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-11°	1,2,3,4,5,6,7,8,9,10	51,656 ft²

Slip Results

Slip Surfaces Analysed: 89836 of 98415 converged

Current Slip Surface

Slip Surface: 2,901
Factor of Safety: 2.18
Volume: 3,440.9036 ft³
Weight: 430,112.94 lbf
Resisting Moment: 66,674,031 lbf·ft
Activating Moment: 30,542,883 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (175.51826, 1,621.2045) ft
Entry: (2.9013943, 1,689.5795) ft
Radius: 195.62915 ft
Center: (152.62584, 1,815.4896) ft

Slip Slices

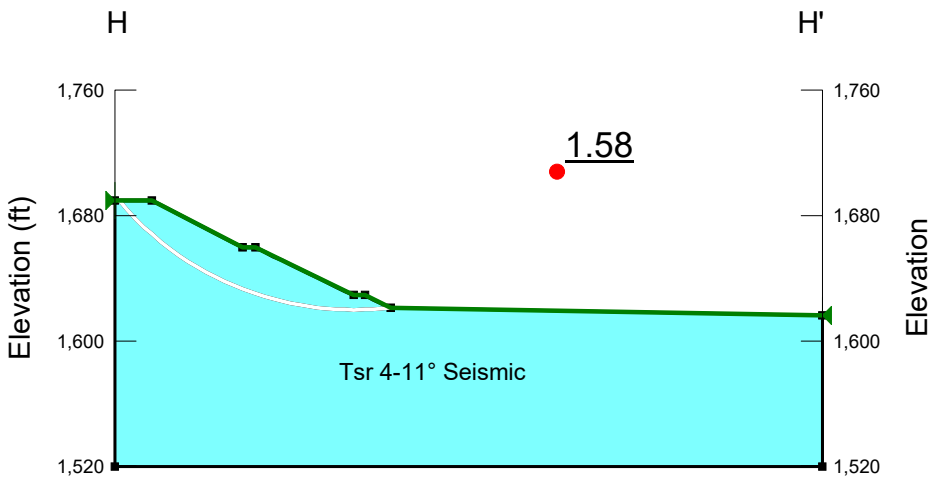
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	5.5282475 ft	1,686.582 ft	0 psf	46.269705 psf	28.912521 psf	600 psf	0 psf	Tsr 4-11°
Slice 2	10.781954 ft	1,680.8177 ft	0 psf	619.4531 psf	387.07726 psf	600 psf	0 psf	Tsr 4-11°
Slice 3	16.03566 ft	1,675.4881 ft	0 psf	1,167.7464 psf	729.68895 psf	600 psf	0 psf	Tsr 4-11°
Slice 4	21.289367 ft	1,670.545 ft	0 psf	1,692.0743 psf	1,057.3254 psf	600 psf	0 psf	Tsr 4-11°
Slice 5	26.818708 ft	1,665.7266 ft	0 psf	2,067.0653 psf	1,291.6457 psf	600 psf	0 psf	Tsr 4-11°
Slice 6	32.623686 ft	1,661.0333 ft	0 psf	2,285.1945 psf	1,427.948 psf	600 psf	0 psf	Tsr 4-11°
Slice 7	38.428663 ft	1,656.691 ft	0 psf	2,469.1086 psf	1,542.8703 psf	600 psf	0 psf	Tsr 4-11°
Slice 8	44.23364 ft	1,652.6715 ft	0 psf	2,620.4214 psf	1,637.421 psf	600 psf	0 psf	Tsr 4-11°
Slice 9	50.038617 ft	1,648.9513 ft	0 psf	2,740.5116 psf	1,712.4617 psf	600 psf	0 psf	Tsr 4-11°
Slice 10	55.843594 ft	1,645.5108 ft	0 psf	2,830.5569 psf	1,768.7283 psf	600 psf	0 psf	Tsr 4-11°
Slice 11	61.648571 ft	1,642.3332 ft	0 psf	2,891.5614 psf	1,806.8481 psf	600 psf	0 psf	Tsr 4-11°
Slice 12	67.453548 ft	1,639.4043 ft	0 psf	2,924.3772 psf	1,827.3537 psf	600 psf	0 psf	Tsr 4-11°
Slice 13	73.258525 ft	1,636.7118 ft	0 psf	2,929.7225 psf	1,830.6938 psf	600 psf	0 psf	Tsr 4-11°
Slice 14	79.063502 ft	1,634.2452 ft	0 psf	2,908.1955 psf	1,817.2422 psf	600 psf	0 psf	Tsr 4-11°
Slice 15	85.905405 ft	1,631.6375 ft	0 psf	3,076.8393 psf	1,922.6226 psf	600 psf	0 psf	Tsr 4-11°
Slice 16	92.6975 ft	1,629.2898 ft	0 psf	3,230.1843 psf	2,018.4432 psf	600 psf	0 psf	Tsr 4-11°
Slice 17	98.402859 ft	1,627.5486 ft	0 psf	3,147.7691 psf	1,966.9444 psf	600 psf	0 psf	Tsr 4-11°
Slice 18	104.10822 ft	1,625.9952 ft	0 psf	3,041.0947 psf	1,900.2869 psf	600 psf	0 psf	Tsr 4-11°
Slice 19	109.81358 ft	1,624.6249 ft	0 psf	2,910.2667 psf	1,818.5364 psf	600 psf	0 psf	Tsr 4-11°
Slice 20	115.51894 ft	1,623.4339 ft	0 psf	2,856.4306 psf	928.11056 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 21	121.22429 ft	1,622.4188 ft	0 psf	2,657.7964 psf	863.57039 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 22	126.92965 ft	1,621.5768 ft	0 psf	2,435.9606 psf	791.49156 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 23	132.63501 ft	1,620.9057 ft	0 psf	2,190.9735 psf	711.89046 psf	250.02 psf	0 psf	Tsr 4-11°

Slice 24	138.34037 ft	1,620.4037 ft	0 psf	1,922.82 psf	624.76209 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 25	144.04573 ft	1,620.0696 ft	0 psf	1,614.7637 psf	1,009.0163 psf	600 psf	0 psf	Tsr 4-11°
Slice 26	149.75109 ft	1,619.9024 ft	0 psf	1,311.6327 psf	819.59907 psf	600 psf	0 psf	Tsr 4-11°
Slice 27	156.18094 ft	1,619.9255 ft	0 psf	1,155.8895 psf	722.2799 psf	600 psf	0 psf	Tsr 4-11°
Slice 28	162.3848 ft	1,620.1217 ft	0 psf	983.96172 psf	614.84752 psf	600 psf	0 psf	Tsr 4-11°
Slice 29	167.63818 ft	1,620.4551 ft	0 psf	620.98321 psf	388.03337 psf	600 psf	0 psf	Tsr 4-11°
Slice 30	172.89157 ft	1,620.9309 ft	0 psf	233.93783 psf	146.18058 psf	600 psf	0 psf	Tsr 4-11°

Section H-H Tr 68203 SSA.gsz

1 -Rotational Pseudostatic

Horz Seismic Coef.: 0.15



Name: Tsr 4-11° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding -4-11° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding -4-11° (Seismic)

LGC

LGC Valley, Inc
GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Pseudostatic

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 758
Date: 11/20/2020
Time: 11:50:04 AM
Tool Version: 10.1.0.18696
File Name: Section H-H Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 11:50:18 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Pseudostatic

Kind: SLOPE/W
Parent: 1 -Rotational Static
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 4-11° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding -4-11° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding -4-11° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,689.5795) ft
Right Coordinate: (452.12608, 1,616.3336) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding -4-11° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (-11.01, 1)
- Data Point: (-11, 0.625)
- Data Point: (-4, 0.625)
- Data Point: (-3.99, 1)

Tsr 19° bedding -4-11° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (-11.01, 1)
- Data Point: (-11, 0.5936)
- Data Point: (-4, 0.5936)
- Data Point: (-3.99, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	452.12608 ft	1,616.3336 ft
Point 2	452.12608 ft	1,519.8315 ft
Point 3	0.37029 ft	1,519.8315 ft
Point 4	0.37029 ft	1,689.5795 ft
Point 5	23.91622 ft	1,689.5795 ft
Point 6	81.96599 ft	1,659.6038 ft
Point 7	89.84482 ft	1,659.6038 ft
Point 8	152.60377 ft	1,629.0846 ft
Point 9	159.75811 ft	1,629.0846 ft
Point 10	176.24026 ft	1,620.8435 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-11° Seismic	1,2,3,4,5,6,7,8,9,10	51,656 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.58
Volume: 3,440.9036 ft³
Weight: 430,112.94 lbf
Resisting Moment: 65,015,019 lbf·ft
Activating Moment: 41,210,883 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (175.51826, 1,621.2045) ft
Entry: (2.9013943, 1,689.5795) ft
Radius: 195.62915 ft
Center: (152.62584, 1,815.4896) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	5.5282475 ft	1,686.582 ft	0 psf	-40.39767 psf	-25.243266 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 2	10.781954 ft	1,680.8177 ft	0 psf	490.82177 psf	306.69948 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 3	16.03566 ft	1,675.4881 ft	0 psf	1,003.6822 psf	627.17027 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 4	21.289367 ft	1,670.545 ft	0 psf	1,498.3115 psf	936.24893 psf	600 psf	0 psf	Tsr 4-11° Seismic

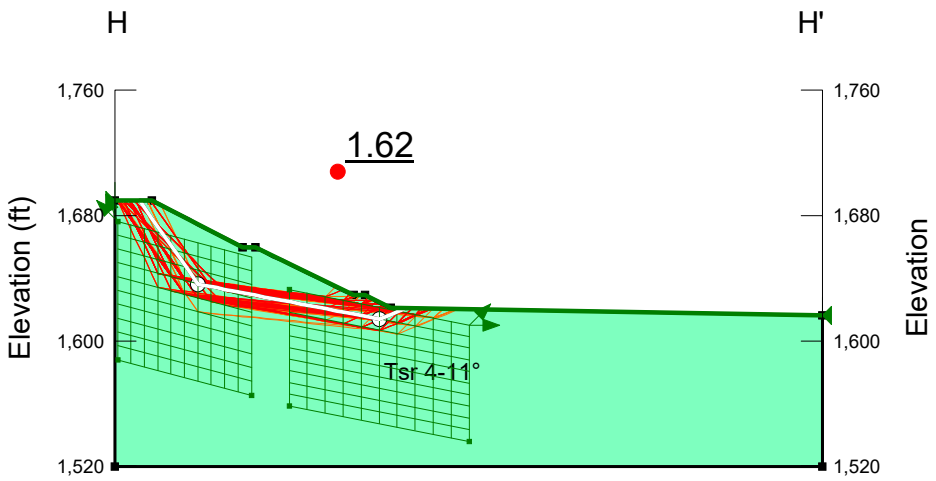
Slice 5	26.818708 ft	1,665.7266 ft	0 psf	1,858.0126 psf	1,161.0151 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 6	32.623686 ft	1,661.0333 ft	0 psf	2,073.9581 psf	1,295.9529 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 7	38.428663 ft	1,656.691 ft	0 psf	2,258.8304 psf	1,411.4739 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 8	44.23364 ft	1,652.6715 ft	0 psf	2,413.7722 psf	1,508.2922 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 9	50.038617 ft	1,648.9513 ft	0 psf	2,539.7602 psf	1,587.0183 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 10	55.843594 ft	1,645.5108 ft	0 psf	2,637.6234 psf	1,648.1701 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 11	61.648571 ft	1,642.3332 ft	0 psf	2,708.0585 psf	1,692.1827 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 12	67.453548 ft	1,639.4043 ft	0 psf	2,751.6424 psf	1,719.417 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 13	73.258525 ft	1,636.7118 ft	0 psf	2,768.8433 psf	1,730.1653 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 14	79.063502 ft	1,634.2452 ft	0 psf	2,760.0288 psf	1,724.6574 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 15	85.905405 ft	1,631.6375 ft	0 psf	2,936.5293 psf	1,834.9471 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 16	92.6975 ft	1,629.2898 ft	0 psf	3,099.1598 psf	1,936.57 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 17	98.402859 ft	1,627.5486 ft	0 psf	3,031.2642 psf	1,894.1441 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 18	104.10822 ft	1,625.9952 ft	0 psf	2,939.2135 psf	1,836.6244 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 19	109.81358 ft	1,624.6249 ft	0 psf	2,822.9346 psf	1,763.9653 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 20	115.51894 ft	1,623.4339 ft	0 psf	2,797.0088 psf	962.82527 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 21	121.22429 ft	1,622.4188 ft	0 psf	2,609.6118 psf	898.31687 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 22	126.92965 ft	1,621.5768 ft	0 psf	2,398.4277 psf	825.62014 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 23	132.63501 ft	1,620.9057 ft	0 psf	2,163.3931 psf	744.71325 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 24	138.34037 ft	1,620.4037 ft	0 psf	1,904.3741 psf	655.55015 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 25	144.04573 ft	1,620.0696 ft	0 psf	1,602.5935 psf	1,001.4115 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 26	149.75109 ft	1,619.9024 ft	0 psf	1,307.9969 psf	817.32719 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 27	156.18094 ft	1,619.9255 ft	0 psf	1,160.1328 psf	724.93144 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 28	162.3848 ft	1,620.1217 ft	0 psf	994.81165 psf	621.62731 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 29	167.63818 ft	1,620.4551 ft	0 psf	634.73071 psf	396.62377 psf	600 psf	0 psf	Tsr 4-11° Seismic

Slice 30	172.89157 ft	1,620.9309 ft	0 psf	248.14522 psf	155.05834 psf	600 psf	0 psf	Tsr 4-11° Seismic

Section H-H Tr 68203 SSA.gsz

2 -Translational Static

Horz Seismic Coef.: 0



Name: Tsr 4-11°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding -4-11°
C-Anisotropic Strength Fn.: Tsr 175 bedding -4-11°

LGC

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GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Static

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 758
Date: 11/20/2020
Time: 11:50:04 AM
Tool Version: 10.1.0.18696
File Name: Section H-H Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 11:50:18 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Static

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 4-11°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding -4-11°
C-Anisotropic Strength Fn.: Tsr 175 bedding -4-11°
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,689.5795) ft
Right Coordinate: (452.12608, 1,616.3336) ft

Slip Surface Block

Left Grid
- Upper Left: (2.3125, 1,676.1875) ft
- Lower Left: (2.3125, 1,587.7394) ft
- Lower Right: (87.38039, 1,565.2049) ft
- X Increments: 10
- Y Increments: 10
- Starting Angle: 115 °
- Ending Angle: 135 °
- Angle Increments: 2

Right Grid
- Upper Left: (111.79281, 1,632.6207) ft
- Lower Left: (111.79281, 1,558.2567) ft
- Lower Right: (226.71896, 1,535.7222) ft
- X Increments: 10
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 18° bedding -4-11°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (-11.01, 1)
- Data Point: (-11, 0.5625)
- Data Point: (-4, 0.5625)

Data Point: (-3.99, 1)

Tsr 175 bedding -4-11°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (-11.01, 1)
Data Point: (-11, 0.4167)
Data Point: (-4, 0.4167)
Data Point: (-3.99, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	452.12608 ft	1,616.3336 ft
Point 2	452.12608 ft	1,519.8315 ft
Point 3	0.37029 ft	1,519.8315 ft
Point 4	0.37029 ft	1,689.5795 ft
Point 5	23.91622 ft	1,689.5795 ft
Point 6	81.96599 ft	1,659.6038 ft
Point 7	89.84482 ft	1,659.6038 ft
Point 8	152.60377 ft	1,629.0846 ft
Point 9	159.75811 ft	1,629.0846 ft
Point 10	176.24026 ft	1,620.8435 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-11°	1,2,3,4,5,6,7,8,9,10	51,656 ft²

Slip Results

Slip Surfaces Analysed: 37356 of 131769 converged

Current Slip Surface

Slip Surface: 91,064
Factor of Safety: 1.62
Volume: 3,576.4832 ft³
Weight: 447,060.4 lbf
Resisting Force: 206,283.57 lbf

Activating Force: 127,690.32 lbf
Slip Rank: 1 of 131,769 slip surfaces
Exit: (185.60811, 1,620.6904) ft
Entry: (15.929151, 1,689.5795) ft
Radius: 98.962274 ft
Center: (121.74521, 1,706.8018) ft

Slip Slices

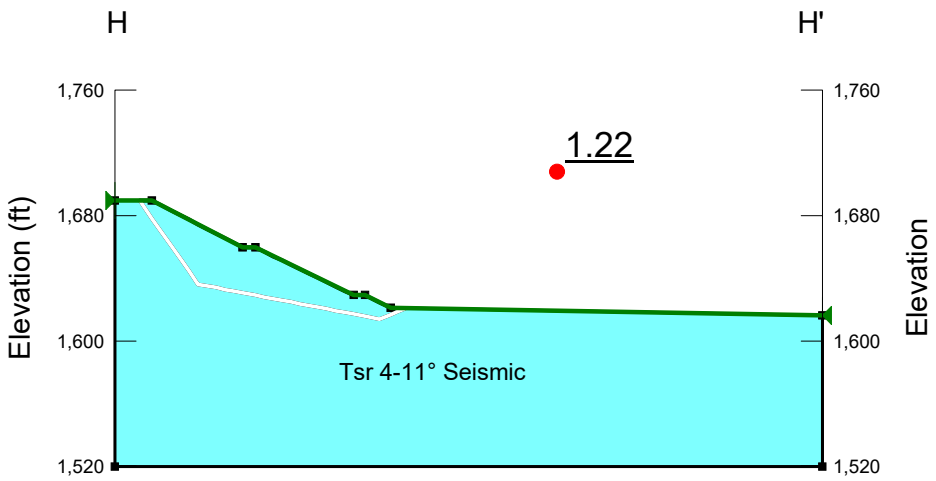
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	19.922685 ft	1,683.8761 ft	0 psf	116.20208 psf	72.611119 psf	600 psf	0 psf	Tsr 4-11°
Slice 2	26.859921 ft	1,673.9687 ft	0 psf	790.70139 psf	494.08506 psf	600 psf	0 psf	Tsr 4-11°
Slice 3	32.747324 ft	1,665.5607 ft	0 psf	1,222.3855 psf	763.83121 psf	600 psf	0 psf	Tsr 4-11°
Slice 4	38.634727 ft	1,657.1526 ft	0 psf	1,654.0695 psf	1,033.5774 psf	600 psf	0 psf	Tsr 4-11°
Slice 5	44.52213 ft	1,648.7445 ft	0 psf	2,085.7536 psf	1,303.3235 psf	600 psf	0 psf	Tsr 4-11°
Slice 6	50.409533 ft	1,640.3364 ft	0 psf	2,517.4377 psf	1,573.0697 psf	600 psf	0 psf	Tsr 4-11°
Slice 7	56.21451 ft	1,635.5839 ft	0 psf	4,462.2718 psf	1,449.88 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 8	61.937061 ft	1,634.4871 ft	0 psf	4,238.6539 psf	1,377.2221 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 9	67.659612 ft	1,633.3902 ft	0 psf	4,015.0359 psf	1,304.5642 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 10	73.382163 ft	1,632.2934 ft	0 psf	3,791.418 psf	1,231.9064 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 11	79.104714 ft	1,631.1965 ft	0 psf	3,567.8 psf	1,159.2485 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 12	85.905405 ft	1,629.893 ft	0 psf	3,546.8601 psf	1,152.4447 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 13	92.6975 ft	1,628.5912 ft	0 psf	3,536.5851 psf	1,149.1061 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 14	98.402859 ft	1,627.4976 ft	0 psf	3,334.2968 psf	1,083.3787 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 15	104.10822 ft	1,626.404 ft	0 psf	3,132.0085 psf	1,017.6513 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 16	109.81358 ft	1,625.3105 ft	0 psf	2,929.7203 psf	951.92382 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 17	115.51894 ft	1,624.2169 ft	0 psf	2,727.432 psf	886.19638 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 18	121.22429 ft	1,623.1234 ft	0 psf	2,525.1437 psf	820.46893 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 19	126.92965 ft	1,622.0298 ft	0 psf	2,322.8555 psf	754.74149 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 20	132.63501 ft	1,620.9363 ft	0 psf	2,120.5672 psf	689.01405 psf	250.02 psf	0 psf	Tsr 4-11°

Slice 21	138.34037 ft	1,619.8427 ft	0 psf	1,918.2789 psf	623.28661 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 22	144.04573 ft	1,618.7491 ft	0 psf	1,715.9907 psf	557.55917 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 23	149.75109 ft	1,617.6556 ft	0 psf	1,513.7024 psf	491.83172 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 24	156.18094 ft	1,616.4232 ft	0 psf	1,495.0716 psf	485.7782 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 25	162.13255 ft	1,615.2824 ft	0 psf	1,489.4796 psf	483.96127 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 26	166.88144 ft	1,614.3722 ft	0 psf	1,313.2691 psf	426.70699 psf	250.02 psf	0 psf	Tsr 4-11°
Slice 27	172.74807 ft	1,615.3636 ft	0 psf	1,260.2734 psf	787.50621 psf	600 psf	0 psf	Tsr 4-11°
Slice 28	178.58222 ft	1,617.7801 ft	0 psf	634.54477 psf	396.50758 psf	600 psf	0 psf	Tsr 4-11°
Slice 29	183.26615 ft	1,619.7203 ft	0 psf	334.1579 psf	208.80503 psf	600 psf	0 psf	Tsr 4-11°

Section H-H Tr 68203 SSA.gsz

2 -Translational Pseudostatic

Horz Seismic Coef.: 0.15



Name: Tsr 4-11° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding -4-11° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding -4-11° (Seismic)

LGC

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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Pseudostatic

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 758
Date: 11/20/2020
Time: 11:50:04 AM
Tool Version: 10.1.0.18696
File Name: Section H-H Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/20/2020
Last Solved Time: 11:50:18 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Pseudostatic

Kind: SLOPE/W
Parent: 2 -Translational Static
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Left to Right
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 4-11° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding -4-11° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding -4-11° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.37029, 1,689.5795) ft
Right Coordinate: (452.12608, 1,616.3336) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 375 bedding -4-11° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (-11.01, 1)
- Data Point: (-11, 0.625)
- Data Point: (-4, 0.625)
- Data Point: (-3.99, 1)

Tsr 19° bedding -4-11° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (-11.01, 1)
- Data Point: (-11, 0.5936)
- Data Point: (-4, 0.5936)
- Data Point: (-3.99, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	452.12608 ft	1,616.3336 ft
Point 2	452.12608 ft	1,519.8315 ft
Point 3	0.37029 ft	1,519.8315 ft
Point 4	0.37029 ft	1,689.5795 ft
Point 5	23.91622 ft	1,689.5795 ft
Point 6	81.96599 ft	1,659.6038 ft
Point 7	89.84482 ft	1,659.6038 ft
Point 8	152.60377 ft	1,629.0846 ft
Point 9	159.75811 ft	1,629.0846 ft
Point 10	176.24026 ft	1,620.8435 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-11° Seismic	1,2,3,4,5,6,7,8,9,10	51,656 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.22
Volume: 3,576.4832 ft³
Weight: 447,060.4 lbf
Resisting Force: 220,204.47 lbf
Activating Force: 180,358.22 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (185.60811, 1,620.6904) ft
Entry: (15.929151, 1,689.5795) ft
Radius: 98.962274 ft
Center: (121.74521, 1,706.8018) ft

Slip Slices

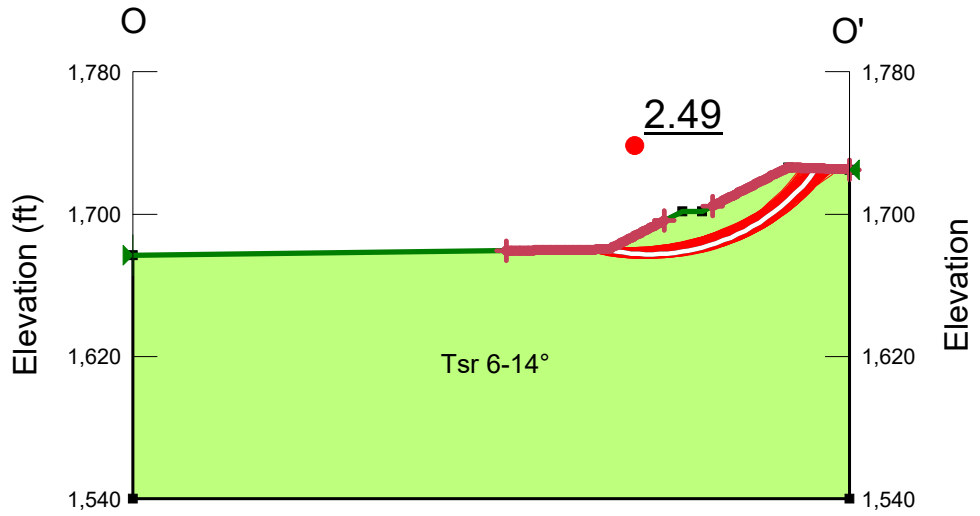
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	19.922685 ft	1,683.8761 ft	0 psf	9.2361202 psf	5.7713684 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 2	26.859921 ft	1,673.9687 ft	0 psf	616.70804 psf	385.36195 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 3	32.747324 ft	1,665.5607 ft	0 psf	1,005.4941 psf	628.30247 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 4	38.634727 ft	1,657.1526 ft	0 psf	1,394.2802 psf	871.24299 psf	600 psf	0 psf	Tsr 4-11° Seismic

Slice 5	44.52213 ft	1,648.7445 ft	0 psf	1,783.0663 psf	1,114.1835 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 6	50.409533 ft	1,640.3364 ft	0 psf	2,171.8524 psf	1,357.124 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 7	56.21451 ft	1,635.5839 ft	0 psf	4,371.5988 psf	1,504.8525 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 8	61.937061 ft	1,634.4871 ft	0 psf	4,151.16 psf	1,428.97 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 9	67.659612 ft	1,633.3902 ft	0 psf	3,930.7212 psf	1,353.0875 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 10	73.382163 ft	1,632.2934 ft	0 psf	3,710.2824 psf	1,277.205 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 11	79.104714 ft	1,631.1965 ft	0 psf	3,489.8436 psf	1,201.3225 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 12	85.905405 ft	1,629.893 ft	0 psf	3,469.2014 psf	1,194.2168 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 13	92.6975 ft	1,628.5912 ft	0 psf	3,459.0725 psf	1,190.73 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 14	98.402859 ft	1,627.4976 ft	0 psf	3,259.6601 psf	1,122.0855 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 15	104.10822 ft	1,626.404 ft	0 psf	3,060.2478 psf	1,053.4411 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 16	109.81358 ft	1,625.3105 ft	0 psf	2,860.8354 psf	984.79656 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 17	115.51894 ft	1,624.2169 ft	0 psf	2,661.4231 psf	916.15208 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 18	121.22429 ft	1,623.1234 ft	0 psf	2,462.0108 psf	847.50759 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 19	126.92965 ft	1,622.0298 ft	0 psf	2,262.5984 psf	778.8631 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 20	132.63501 ft	1,620.9363 ft	0 psf	2,063.1861 psf	710.21861 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 21	138.34037 ft	1,619.8427 ft	0 psf	1,863.7738 psf	641.57412 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 22	144.04573 ft	1,618.7491 ft	0 psf	1,664.3614 psf	572.92963 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 23	149.75109 ft	1,617.6556 ft	0 psf	1,464.9491 psf	504.28515 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 24	156.18094 ft	1,616.4232 ft	0 psf	1,446.5831 psf	497.96296 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 25	162.13255 ft	1,615.2824 ft	0 psf	1,441.0707 psf	496.06539 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 26	166.88144 ft	1,614.3722 ft	0 psf	1,267.3653 psf	436.27011 psf	375 psf	0 psf	Tsr 4-11° Seismic
Slice 27	172.74807 ft	1,615.3636 ft	0 psf	1,400.18 psf	874.92959 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 28	178.58222 ft	1,617.7801 ft	0 psf	735.02579 psf	459.29509 psf	600 psf	0 psf	Tsr 4-11° Seismic
Slice 29	183.26615 ft	1,619.7203 ft	0 psf	415.71228 psf	259.76586 psf	600 psf	0 psf	Tsr 4-11° Seismic

Section O-O Tr 68203 SSA.gsz

1 -Rotational Static Global

Horz Seismic Coef.: 0



Name: Tsr 6-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°

LGC

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Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 737
Date: 11/18/2020
Time: 08:40:53 AM
Tool Version: 10.1.0.18696
File Name: Section O-O Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:41:02 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Static Global

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 6-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°
Phi-B: 0 °

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (210.15326, 1,679.5189) ft
Left-Zone Right Coordinate: (298.87927, 1,696.3166) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (325.90696, 1,704.564) ft
Right-Zone Right Coordinate: (402.89965, 1,725.1701) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (0.04477, 1,676.9386) ft
Right Coordinate: (402.89965, 1,725.1701) ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.4167)
- Data Point: (14, 0.4167)
- Data Point: (14.01, 1)

Tsr 18° bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (5.99, 1)
Data Point: (6, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	402.89965 ft	1,725.1701 ft
Point 2	402.89965 ft	1,539.9723 ft
Point 3	0.04477 ft	1,539.9723 ft
Point 4	0.04477 ft	1,676.9386 ft
Point 5	267.64242 ft	1,680.2249 ft
Point 6	308.95575 ft	1,701.5075 ft
Point 7	319.91004 ft	1,701.5075 ft
Point 8	368.42189 ft	1,726.2329 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14°	1,2,3,4,5,6,7,8	59,935 ft²

Slip Results

Slip Surfaces Analysed: 90697 of 98415 converged

Current Slip Surface

Slip Surface: 59,257
Factor of Safety: 2.49
Volume: 1,976.7547 ft³
Weight: 247,094.34 lbf
Resisting Moment: 24,127,123 lbf·ft
Activating Moment: 9,673,027.3 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (265.72801, 1,680.2014) ft
Entry: (384.41058, 1,725.74) ft
Radius: 115.6265 ft
Center: (290.46727, 1,793.1503) ft

Slip Slices

	X	Y	PWP	Base	Frictional	Cohesive	Suction	Base

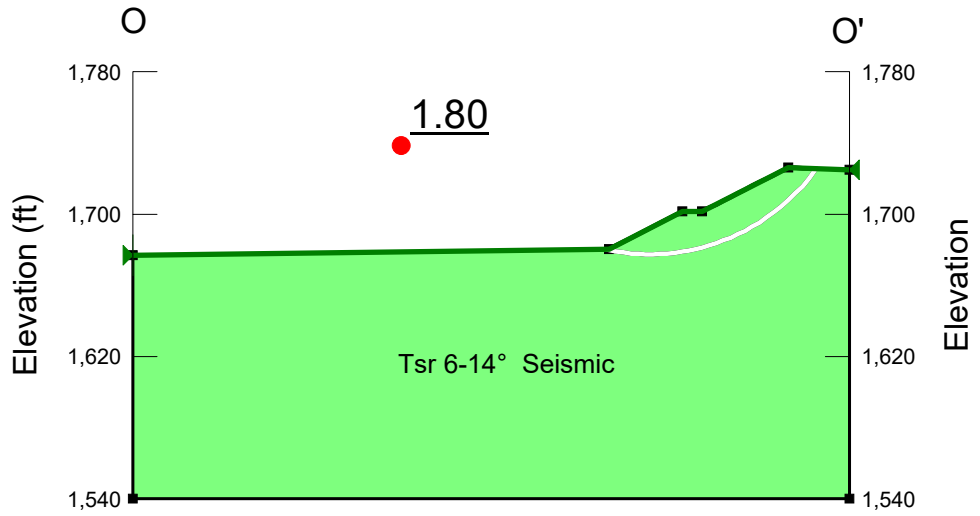
				Normal Stress	Strength	Strength	Strength	Material
Slice 1	266.68521 ft	1,680.0002 ft	0 psf	81.429359 psf	50.882711 psf	600 psf	0 psf	Tsr 6-14°
Slice 2	269.70809 ft	1,679.422 ft	0 psf	290.54096 psf	181.55014 psf	600 psf	0 psf	Tsr 6-14°
Slice 3	273.83942 ft	1,678.7447 ft	0 psf	642.39021 psf	401.40995 psf	600 psf	0 psf	Tsr 6-14°
Slice 4	277.97075 ft	1,678.2199 ft	0 psf	968.20683 psf	605.00277 psf	600 psf	0 psf	Tsr 6-14°
Slice 5	282.10209 ft	1,677.8454 ft	0 psf	1,269.0425 psf	792.98577 psf	600 psf	0 psf	Tsr 6-14°
Slice 6	286.23342 ft	1,677.6198 ft	0 psf	1,545.7722 psf	965.90569 psf	600 psf	0 psf	Tsr 6-14°
Slice 7	290.36475 ft	1,677.5423 ft	0 psf	1,799.1168 psf	1,124.2129 psf	600 psf	0 psf	Tsr 6-14°
Slice 8	294.49608 ft	1,677.6125 ft	0 psf	2,029.6602 psf	1,268.2725 psf	600 psf	0 psf	Tsr 6-14°
Slice 9	298.62742 ft	1,677.8307 ft	0 psf	2,237.8636 psf	1,398.3723 psf	600 psf	0 psf	Tsr 6-14°
Slice 10	302.75875 ft	1,678.1977 ft	0 psf	2,469.5841 psf	802.41652 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 11	306.89008 ft	1,678.7151 ft	0 psf	2,652.1144 psf	861.7242 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 12	310.78147 ft	1,679.3374 ft	0 psf	2,690.8617 psf	874.31396 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 13	314.43289 ft	1,680.0501 ft	0 psf	2,589.5157 psf	841.38465 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 14	318.08432 ft	1,680.8861 ft	0 psf	2,473.8096 psf	803.78946 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 15	321.93137 ft	1,681.9069 ft	0 psf	2,344.8149 psf	1,465.203 psf	600 psf	0 psf	Tsr 6-14°
Slice 16	325.97402 ft	1,683.131 ft	0 psf	2,411.0073 psf	1,506.5646 psf	600 psf	0 psf	Tsr 6-14°
Slice 17	330.01668 ft	1,684.5192 ft	0 psf	2,456.0369 psf	1,534.7022 psf	600 psf	0 psf	Tsr 6-14°
Slice 18	334.05933 ft	1,686.0781 ft	0 psf	2,479.5183 psf	1,549.375 psf	600 psf	0 psf	Tsr 6-14°
Slice 19	338.10198 ft	1,687.8151 ft	0 psf	2,480.952 psf	1,550.2709 psf	600 psf	0 psf	Tsr 6-14°
Slice 20	342.14464 ft	1,689.7393 ft	0 psf	2,459.7117 psf	1,536.9985 psf	600 psf	0 psf	Tsr 6-14°
Slice 21	346.18729 ft	1,691.8614 ft	0 psf	2,415.0268 psf	1,509.0763 psf	600 psf	0 psf	Tsr 6-14°
Slice 22	350.22995 ft	1,694.1941 ft	0 psf	2,345.9599 psf	1,465.9184 psf	600 psf	0 psf	Tsr 6-14°
Slice 23	354.2726 ft	1,696.7527 ft	0 psf	2,251.377 psf	1,406.8165 psf	600 psf	0 psf	Tsr 6-14°
Slice 24	358.31525 ft	1,699.5559 ft	0 psf	2,129.9089 psf	1,330.9148 psf	600 psf	0 psf	Tsr 6-14°

Slice 25	362.35791 ft	1,702.6265 ft	0 psf	1,979.8993 psf	1,237.1784 psf	600 psf	0 psf	Tsr 6-14°
Slice 26	366.40056 ft	1,705.9928 ft	0 psf	1,799.3351 psf	1,124.3494 psf	600 psf	0 psf	Tsr 6-14°
Slice 27	370.42048 ft	1,709.6679 ft	0 psf	1,478.2471 psf	923.71128 psf	600 psf	0 psf	Tsr 6-14°
Slice 28	374.41765 ft	1,713.6936 ft	0 psf	1,020.4045 psf	637.61951 psf	600 psf	0 psf	Tsr 6-14°
Slice 29	378.41482 ft	1,718.1488 ft	0 psf	533.50034 psf	333.36801 psf	600 psf	0 psf	Tsr 6-14°
Slice 30	382.41199 ft	1,723.1162 ft	0 psf	15.111556 psf	9.4427482 psf	600 psf	0 psf	Tsr 6-14°

Section O-O Tr 68203 SSA.gsz

1 -Rotational Pseudostatic Global

Horz Seismic Coef.: 0.15



Name: Tsr 6-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)

LGC

LGC Valley, Inc
GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 737
Date: 11/18/2020
Time: 08:40:53 AM
Tool Version: 10.1.0.18696
File Name: Section O-O Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:41:08 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Pseudostatic Global

Kind: SLOPE/W
Parent: 1 -Rotational Static Global
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 6-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.04477, 1,676.9386) ft
Right Coordinate: (402.89965, 1,725.1701) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.625)
- Data Point: (14, 0.625)
- Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	402.89965 ft	1,725.1701 ft
Point 2	402.89965 ft	1,539.9723 ft
Point 3	0.04477 ft	1,539.9723 ft
Point 4	0.04477 ft	1,676.9386 ft
Point 5	267.64242 ft	1,680.2249 ft
Point 6	308.95575 ft	1,701.5075 ft
Point 7	319.91004 ft	1,701.5075 ft
Point 8	368.42189 ft	1,726.2329 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14° Seismic	1,2,3,4,5,6,7,8	59,935 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.80
Volume: 1,976.7547 ft³
Weight: 247,094.34 lbf
Resisting Moment: 23,710,681 lbf·ft
Activating Moment: 13,190,287 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (265.72801, 1,680.2014) ft
Entry: (384.41058, 1,725.74) ft
Radius: 115.6265 ft
Center: (290.46727, 1,793.1503) ft

Slip Slices

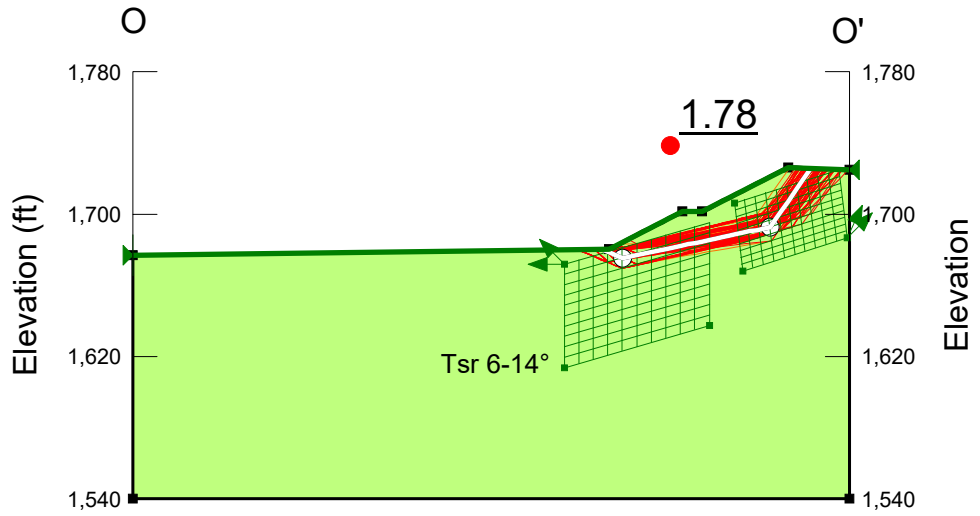
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	266.68521 ft	1,680.0002 ft	0 psf	104.31803 psf	65.185141 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 2	269.70809 ft	1,679.422 ft	0 psf	314.16459 psf	196.31182 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 3	273.83942 ft	1,678.7447 ft	0 psf	666.16414 psf	416.26555 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 4	277.97075 ft	1,678.2199 ft	0 psf	989.32547 psf	618.19916 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 5	282.10209 ft	1,677.8454 ft	0 psf	1,285.1217 psf	803.03316 psf	600 psf	0 psf	Tsr 6-14° Seismic

Slice 6	286.23342 ft	1,677.6198 ft	0 psf	1,554.7874 psf	971.53901 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 7	290.36475 ft	1,677.5423 ft	0 psf	1,799.354 psf	1,124.3612 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 8	294.49608 ft	1,677.6125 ft	0 psf	2,019.677 psf	1,262.0342 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 9	298.62742 ft	1,677.8307 ft	0 psf	2,216.4576 psf	1,384.9964 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 10	302.75875 ft	1,678.1977 ft	0 psf	2,442.4068 psf	841.06439 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 11	306.89008 ft	1,678.7151 ft	0 psf	2,614.3265 psf	900.26647 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 12	310.78147 ft	1,679.3374 ft	0 psf	2,643.7593 psf	910.40192 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 13	314.43289 ft	1,680.0501 ft	0 psf	2,535.2032 psf	873.01967 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 14	318.08432 ft	1,680.8861 ft	0 psf	2,412.8126 psf	830.87337 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 15	321.93137 ft	1,681.9069 ft	0 psf	2,262.3213 psf	1,413.6552 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 16	325.97402 ft	1,683.131 ft	0 psf	2,316.1896 psf	1,447.3159 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 17	330.01668 ft	1,684.5192 ft	0 psf	2,349.0267 psf	1,467.8348 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 18	334.05933 ft	1,686.0781 ft	0 psf	2,360.6085 psf	1,475.0719 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 19	338.10198 ft	1,687.8151 ft	0 psf	2,350.6053 psf	1,468.8212 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 20	342.14464 ft	1,689.7393 ft	0 psf	2,318.5731 psf	1,448.8053 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 21	346.18729 ft	1,691.8614 ft	0 psf	2,263.9414 psf	1,414.6676 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 22	350.22995 ft	1,694.1941 ft	0 psf	2,185.9972 psf	1,365.9626 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 23	354.2726 ft	1,696.7527 ft	0 psf	2,083.8635 psf	1,302.1424 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 24	358.31525 ft	1,699.5559 ft	0 psf	1,956.472 psf	1,222.5394 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 25	362.35791 ft	1,702.6265 ft	0 psf	1,802.5262 psf	1,126.3434 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 26	366.40056 ft	1,705.9928 ft	0 psf	1,620.454 psf	1,012.5721 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 27	370.42048 ft	1,709.6679 ft	0 psf	1,308.4021 psf	817.58035 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 28	374.41765 ft	1,713.6936 ft	0 psf	872.035 psf	544.90794 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 29	378.41482 ft	1,718.1488 ft	0 psf	412.87124 psf	257.99058 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 30	382.41199 ft	1,723.1162 ft	0 psf	-70.123632 psf	-43.818108 psf	600 psf	0 psf	Tsr 6-14° Seismic

Section O-O Tr 68203 SSA.gsz

2 -Translational Static Global

Horz Seismic Coef.: 0



Name: Tsr 6-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°

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Engineer: **ACR**
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2 -Translational Static Global

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File Name: Section O-O Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:41:10 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Static Global

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 6-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.04477, 1,676.9386) ft
Right Coordinate: (402.89965, 1,725.1701) ft

Slip Surface Block

Left Grid
- Upper Left: (242.63534, 1,671.6806) ft
- Lower Left: (242.63534, 1,613.6541) ft
- Lower Right: (324.51084, 1,637.3154) ft
- X Increments: 10
- Y Increments: 10
- Starting Angle: 135 °
- Ending Angle: 180 °
- Angle Increments: 2

Right Grid
- Upper Left: (338.21935, 1,706.4213) ft
- Lower Left: (343.10183, 1,667.9248) ft
- Lower Right: (401.69163, 1,686.5158) ft
- X Increments: 10
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.4167)
- Data Point: (14, 0.4167)

Data Point: (14.01, 1)

Tsr 18° bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (5.99, 1)
Data Point: (6, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	402.89965 ft	1,725.1701 ft
Point 2	402.89965 ft	1,539.9723 ft
Point 3	0.04477 ft	1,539.9723 ft
Point 4	0.04477 ft	1,676.9386 ft
Point 5	267.64242 ft	1,680.2249 ft
Point 6	308.95575 ft	1,701.5075 ft
Point 7	319.91004 ft	1,701.5075 ft
Point 8	368.42189 ft	1,726.2329 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14°	1,2,3,4,5,6,7,8	59,935 ft²

Slip Results

Slip Surfaces Analysed: 62973 of 131769 converged

Current Slip Surface

Slip Surface: 112,706
Factor of Safety: 1.78
Volume: 1,938.2968 ft³
Weight: 242,287.1 lbf
Resisting Force: 120,206.87 lbf
Activating Force: 67,342.83 lbf
Slip Rank: 1 of 131,769 slip surfaces

Exit: (263.71476, 1,680.1767) ft
Entry: (381.40209, 1,725.8328) ft
Radius: 66.571183 ft
Center: (309.27441, 1,737.2468) ft

Slip Slices

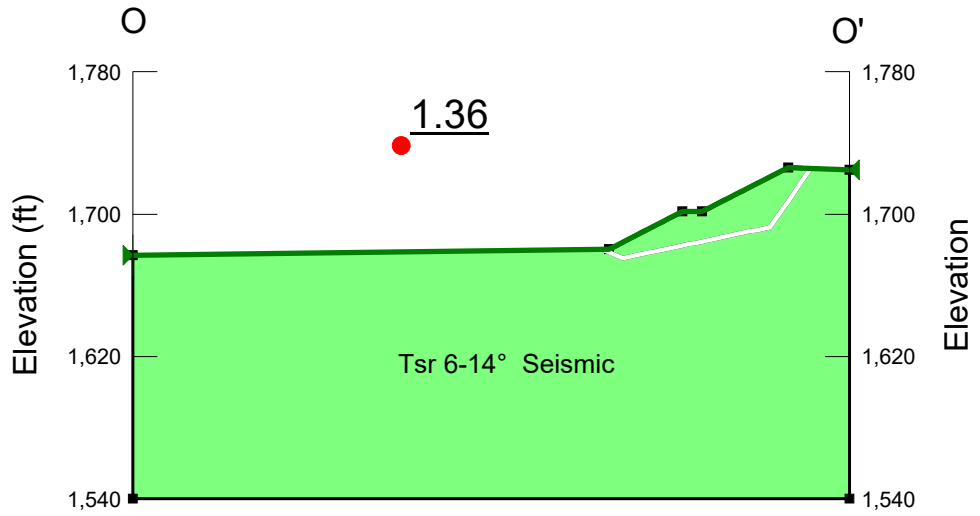
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	265.67859 ft	1,679.3632 ft	0 psf	286.07255 psf	178.75797 psf	600 psf	0 psf	Tsr 6-14°
Slice 2	269.5782 ft	1,677.7479 ft	0 psf	671.78315 psf	419.7767 psf	600 psf	0 psf	Tsr 6-14°
Slice 3	273.44976 ft	1,676.1443 ft	0 psf	1,198.1496 psf	748.68693 psf	600 psf	0 psf	Tsr 6-14°
Slice 4	277.25055 ft	1,675.7343 ft	0 psf	1,107.9589 psf	359.99767 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 5	280.98057 ft	1,676.518 ft	0 psf	1,244.9282 psf	404.5017 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 6	284.7106 ft	1,677.3017 ft	0 psf	1,381.8976 psf	449.00574 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 7	288.44062 ft	1,678.0854 ft	0 psf	1,518.8669 psf	493.50978 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 8	292.17064 ft	1,678.8692 ft	0 psf	1,655.8363 psf	538.01381 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 9	295.90067 ft	1,679.6529 ft	0 psf	1,792.8056 psf	582.51785 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 10	299.63069 ft	1,680.4366 ft	0 psf	1,929.7749 psf	627.02189 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 11	303.36072 ft	1,681.2203 ft	0 psf	2,066.7443 psf	671.52593 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 12	307.09074 ft	1,682.004 ft	0 psf	2,203.7136 psf	716.02996 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 13	310.78147 ft	1,682.7794 ft	0 psf	2,226.0212 psf	723.27812 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 14	314.43289 ft	1,683.5466 ft	0 psf	2,133.6669 psf	693.27039 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 15	318.08432 ft	1,684.3138 ft	0 psf	2,041.3126 psf	663.26267 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 16	321.82641 ft	1,685.1001 ft	0 psf	2,064.2435 psf	670.71339 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 17	325.65916 ft	1,685.9054 ft	0 psf	2,202.4597 psf	715.62254 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 18	329.49191 ft	1,686.7107 ft	0 psf	2,340.6759 psf	760.5317 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 19	333.32466 ft	1,687.516 ft	0 psf	2,478.8921 psf	805.44086 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 20	337.15741 ft	1,688.3212 ft	0 psf	2,617.1083 psf	850.35002 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 21	340.99016 ft	1,689.1265 ft	0 psf	2,755.3244 psf	895.25918 psf	250.02 psf	0 psf	Tsr 6-14°

Slice 22	344.82291 ft	1,689.9318 ft	0 psf	2,893.5406 psf	940.16834 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 23	348.65566 ft	1,690.7371 ft	0 psf	3,031.7568 psf	985.0775 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 24	352.48841 ft	1,691.5424 ft	0 psf	3,169.973 psf	1,029.9867 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 25	356.32116 ft	1,692.3477 ft	0 psf	3,308.1892 psf	1,074.8958 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 26	359.93492 ft	1,695.1745 ft	0 psf	1,904.2564 psf	1,189.9115 psf	600 psf	0 psf	Tsr 6-14°
Slice 27	363.32971 ft	1,700.0227 ft	0 psf	1,644.7311 psf	1,027.7421 psf	600 psf	0 psf	Tsr 6-14°
Slice 28	366.7245 ft	1,704.871 ft	0 psf	1,385.2058 psf	865.57268 psf	600 psf	0 psf	Tsr 6-14°
Slice 29	370.58526 ft	1,710.3847 ft	0 psf	992.73131 psf	620.32737 psf	600 psf	0 psf	Tsr 6-14°
Slice 30	374.91199 ft	1,716.5639 ft	0 psf	467.30753 psf	292.00615 psf	600 psf	0 psf	Tsr 6-14°
Slice 31	379.23873 ft	1,722.7432 ft	0 psf	-58.116251 psf	-36.315064 psf	600 psf	0 psf	Tsr 6-14°

Section O-O Tr 68203 SSA.gsz

2 -Translational Pseudostatic Global

Horz Seismic Coef.: 0.15



Name: Tsr 6-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)

LGC

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Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

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Last Solved Date: 11/18/2020
Last Solved Time: 08:41:10 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Pseudostatic Global

Kind: SLOPE/W
Parent: 2 -Translational Static Global
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Tsr 6-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.04477, 1,676.9386) ft
Right Coordinate: (402.89965, 1,725.1701) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.625)
- Data Point: (14, 0.625)
- Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	402.89965 ft	1,725.1701 ft
Point 2	402.89965 ft	1,539.9723 ft
Point 3	0.04477 ft	1,539.9723 ft
Point 4	0.04477 ft	1,676.9386 ft
Point 5	267.64242 ft	1,680.2249 ft
Point 6	308.95575 ft	1,701.5075 ft
Point 7	319.91004 ft	1,701.5075 ft
Point 8	368.42189 ft	1,726.2329 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14° Seismic	1,2,3,4,5,6,7,8	59,935 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.36
Volume: 1,938.2968 ft³
Weight: 242,287.1 lbf
Resisting Force: 130,455.19 lbf
Activating Force: 96,126.932 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (263.71476, 1,680.1767) ft
Entry: (381.40209, 1,725.8328) ft
Radius: 66.571183 ft
Center: (309.27441, 1,737.2468) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	265.67859 ft	1,679.3632 ft	0 psf	356.1577 psf	222.55203 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 2	269.5782 ft	1,677.7479 ft	0 psf	763.55904 psf	477.12464 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 3	273.44976 ft	1,676.1443 ft	0 psf	1,319.5261 psf	824.5314 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 4	277.25055 ft	1,675.7343 ft	0 psf	1,065.0044 psf	366.74368 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 5	280.98057 ft	1,676.518 ft	0 psf	1,200.0216 psf	413.23804 psf	375 psf	0 psf	Tsr 6-14° Seismic

Slice 6	284.7106 ft	1,677.3017 ft	0 psf	1,335.0387 psf	459.73241 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 7	288.44062 ft	1,678.0854 ft	0 psf	1,470.0559 psf	506.22677 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 8	292.17064 ft	1,678.8692 ft	0 psf	1,605.0731 psf	552.72113 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 9	295.90067 ft	1,679.6529 ft	0 psf	1,740.0903 psf	599.21549 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 10	299.63069 ft	1,680.4366 ft	0 psf	1,875.1075 psf	645.70985 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 11	303.36072 ft	1,681.2203 ft	0 psf	2,010.1247 psf	692.20422 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 12	307.09074 ft	1,682.004 ft	0 psf	2,145.1418 psf	738.69858 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 13	310.78147 ft	1,682.7794 ft	0 psf	2,167.1314 psf	746.27089 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 14	314.43289 ft	1,683.5466 ft	0 psf	2,076.0934 psf	714.92115 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 15	318.08432 ft	1,684.3138 ft	0 psf	1,985.0554 psf	683.57141 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 16	321.82641 ft	1,685.1001 ft	0 psf	2,007.6596 psf	691.35534 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 17	325.65916 ft	1,685.9054 ft	0 psf	2,143.9058 psf	738.27294 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 18	329.49191 ft	1,686.7107 ft	0 psf	2,280.1521 psf	785.19054 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 19	333.32466 ft	1,687.516 ft	0 psf	2,416.3983 psf	832.10814 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 20	337.15741 ft	1,688.3212 ft	0 psf	2,552.6446 psf	879.02575 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 21	340.99016 ft	1,689.1265 ft	0 psf	2,688.8908 psf	925.94335 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 22	344.82291 ft	1,689.9318 ft	0 psf	2,825.1371 psf	972.86095 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 23	348.65566 ft	1,690.7371 ft	0 psf	2,961.3833 psf	1,019.7786 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 24	352.48841 ft	1,691.5424 ft	0 psf	3,097.6296 psf	1,066.6962 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 25	356.32116 ft	1,692.3477 ft	0 psf	3,233.8758 psf	1,113.6138 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 26	359.93492 ft	1,695.1745 ft	0 psf	1,633.3714 psf	1,020.6437 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 27	363.32971 ft	1,700.0227 ft	0 psf	1,398.3888 psf	873.81031 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 28	366.7245 ft	1,704.871 ft	0 psf	1,163.4062 psf	726.97689 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 29	370.58526 ft	1,710.3847 ft	0 psf	808.04709 psf	504.92386 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 30	374.91199 ft	1,716.5639 ft	0 psf	332.31141 psf	207.65122 psf	600 psf	0 psf	Tsr 6-14° Seismic

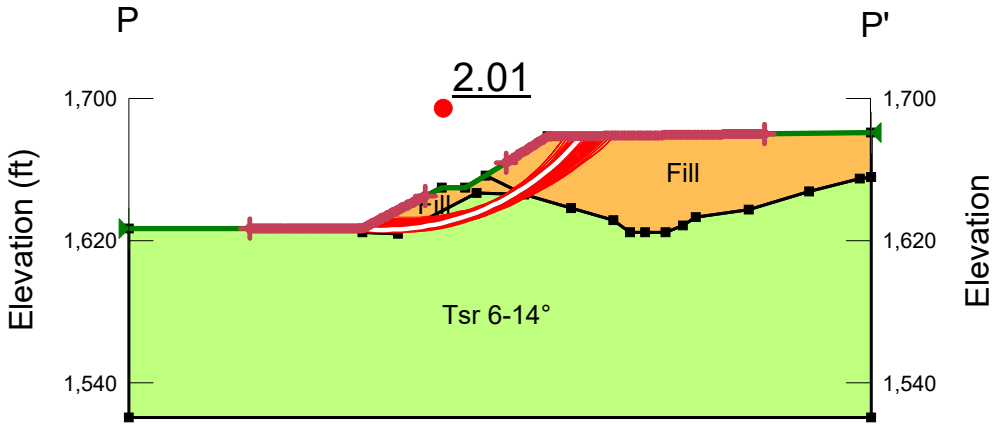
Slice 31	379.23873 ft	1,722.7432 ft	0 psf	-143.42427 psf	-89.621431 psf	600 psf	0 psf	Tsr 6-14° Seismic

Section P-P Tr 68203 SSA.gsz

1 -Rotational Static Global

Horz Seismic Coef.: 0

20 Foot wide stabilization fill key
with 2:1 backcut.



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 6-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°

LGC

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GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 735
Date: 11/18/2020
Time: 09:10:05 AM
Tool Version: 10.1.0.18696
File Name: Section P-P Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 09:10:56 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Static Global

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 6-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°
Phi-B: 0 °

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (68.13589, 1,626.6395) ft
Left-Zone Right Coordinate: (166.58416, 1,645.0277) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (212.04347, 1,663.6749) ft
Right-Zone Right Coordinate: (357.60516, 1,680.0134) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (0.09861, 1,626.6395) ft
Right Coordinate: (417.17849, 1,680.78) ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.4167)
- Data Point: (14, 0.4167)

Data Point: (14.01, 1)

Tsr 18° bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (5.99, 1)
Data Point: (6, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	417.17849 ft	1,680.78 ft
Point 2	417.17849 ft	1,655.8002 ft
Point 3	417.17849 ft	1,520.5922 ft
Point 4	0.09861 ft	1,520.5922 ft
Point 5	0.09861 ft	1,626.6395 ft
Point 6	131.23131 ft	1,626.6395 ft
Point 7	175.83273 ft	1,649.8382 ft
Point 8	189.34145 ft	1,649.8382 ft
Point 9	200.60124 ft	1,656.4341 ft
Point 10	235.37676 ft	1,678.4405 ft
Point 11	410.91688 ft	1,655.0299 ft
Point 12	382.61427 ft	1,647.4233 ft
Point 13	348.72927 ft	1,637.537 ft
Point 14	318.99499 ft	1,633.0844 ft
Point 15	311.75009 ft	1,628.7073 ft
Point 16	301.93929 ft	1,624.8584 ft
Point 17	290.39272 ft	1,624.8584 ft
Point 18	282.01581 ft	1,624.8584 ft
Point 19	272.28047 ft	1,631.4996 ft
Point 20	248.65908 ft	1,638.1407 ft
Point 21	222.54725 ft	1,646.0649 ft
Point 22	131.23131 ft	1,624.6404 ft
Point 23	151.25286 ft	1,623.646 ft
Point 24	195.50367 ft	1,646.9018 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14°	5,4,3,2,11,12,13,14,15,16,17,18,19,20,21,24,23,22,6	47,378 ft²
Region 2	Fill	2,1,10,9,21,20,19,18,17,16,15,14,13,12,11	8,229.4 ft²
Region 3	Fill	6,22,23,24,21,9,8,7	800.42 ft²

Slip Results

Slip Surfaces Analysed: 92661 of 98415 converged

Current Slip Surface

Slip Surface: 59,916
Factor of Safety: 2.01
Volume: 1,823.5389 ft³
Weight: 220,668.25 lbf
Resisting Moment: 24,012,325 lbf·ft
Activating Moment: 11,958,582 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (131.1894, 1,626.6395) ft
Entry: (254.59092, 1,678.6878) ft
Radius: 144.10765 ft
Center: (143.29995, 1,770.2374) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	131.21036 ft	1,626.6377 ft	0 psf	26.029991 psf	16.265344 psf	600 psf	0 psf	Tsr 6-14°
Slice 2	133.40124 ft	1,626.4866 ft	0 psf	168.25256 psf	97.14066 psf	325 psf	0 psf	Fill
Slice 3	137.74109 ft	1,626.2534 ft	0 psf	464.03948 psf	267.91332 psf	325 psf	0 psf	Fill
Slice 4	142.08094 ft	1,626.1512 ft	0 psf	738.94811 psf	426.63189 psf	325 psf	0 psf	Fill
Slice 5	146.4208 ft	1,626.1799 ft	0 psf	993.53889 psf	573.61995 psf	325 psf	0 psf	Fill
Slice 6	150.76065 ft	1,626.3394 ft	0 psf	1,228.2856 psf	709.151 psf	325 psf	0 psf	Fill
Slice 7	155.10051 ft	1,626.6302 ft	0 psf	1,443.5828 psf	833.4529 psf	325 psf	0 psf	Fill
Slice 8	159.12666 ft	1,627.0136 ft	0 psf	1,656.7397 psf	538.30735 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 9	162.83912 ft	1,627.4728 ft	0 psf	1,826.7187 psf	593.53688 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 10	166.55158 ft	1,628.0303 ft	0 psf	1,983.1819 psf	644.37485 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 11	170.26404 ft	1,628.6874 ft	0 psf	2,126.1093 psf	690.81478 psf	250.02 psf	0 psf	Tsr 6-14°

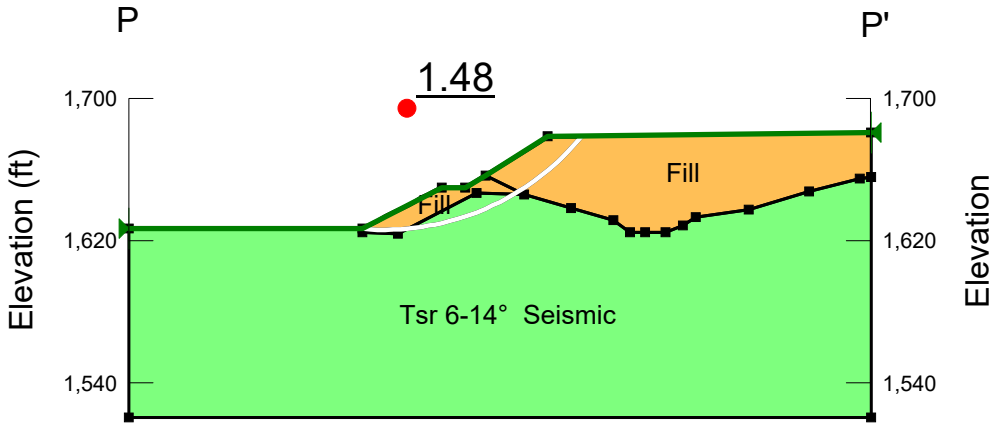
Slice 12	173.9765 ft	1,629.4455 ft	0 psf	2,255.4502 psf	732.84019 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 13	178.08418 ft	1,630.41 ft	0 psf	2,246.7866 psf	730.02523 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 14	182.58709 ft	1,631.6082 ft	0 psf	1,971.8412 psf	1,232.1432 psf	600 psf	0 psf	Tsr 6-14°
Slice 15	187.09 ft	1,632.9644 ft	0 psf	1,798.8457 psf	1,124.0435 psf	600 psf	0 psf	Tsr 6-14°
Slice 16	192.42256 ft	1,634.8002 ft	0 psf	1,766.1863 psf	1,103.6357 psf	600 psf	0 psf	Tsr 6-14°
Slice 17	198.05246 ft	1,636.9648 ft	0 psf	1,847.8428 psf	1,154.6604 psf	600 psf	0 psf	Tsr 6-14°
Slice 18	202.61807 ft	1,638.923 ft	0 psf	1,892.6917 psf	1,182.685 psf	600 psf	0 psf	Tsr 6-14°
Slice 19	206.65174 ft	1,640.8213 ft	0 psf	1,922.9603 psf	1,201.5989 psf	600 psf	0 psf	Tsr 6-14°
Slice 20	210.68541 ft	1,642.8757 ft	0 psf	1,934.4909 psf	1,208.8041 psf	600 psf	0 psf	Tsr 6-14°
Slice 21	214.71908 ft	1,645.0937 ft	0 psf	1,926.8315 psf	1,204.0179 psf	600 psf	0 psf	Tsr 6-14°
Slice 22	217.9262 ft	1,646.9653 ft	0 psf	2,005.3331 psf	1,157.7796 psf	325 psf	0 psf	Fill
Slice 23	221.14902 ft	1,648.9909 ft	0 psf	1,983.8823 psf	1,145.395 psf	325 psf	0 psf	Fill
Slice 24	225.21409 ft	1,651.7005 ft	0 psf	1,940.2591 psf	1,120.2091 psf	325 psf	0 psf	Fill
Slice 25	229.27916 ft	1,654.6166 ft	0 psf	1,875.1309 psf	1,082.6073 psf	325 psf	0 psf	Fill
Slice 26	233.34423 ft	1,657.7551 ft	0 psf	1,787.5085 psf	1,032.0185 psf	325 psf	0 psf	Fill
Slice 27	237.29818 ft	1,661.0361 ft	0 psf	1,565.3458 psf	903.75281 psf	325 psf	0 psf	Fill
Slice 28	241.14101 ft	1,664.4674 ft	0 psf	1,213.6773 psf	700.71693 psf	325 psf	0 psf	Fill
Slice 29	244.98384 ft	1,668.1588 ft	0 psf	845.6587 psf	488.24128 psf	325 psf	0 psf	Fill
Slice 30	248.82667 ft	1,672.1397 ft	0 psf	460.63669 psf	265.94871 psf	325 psf	0 psf	Fill
Slice 31	252.66951 ft	1,676.4472 ft	0 psf	57.962347 psf	33.464577 psf	325 psf	0 psf	Fill

Section P-P Tr 68203 SSA.gsz

1 -Rotational Pseudostatic Global

Horz Seismic Coef.: 0.15

20 Foot wide stabilization fill key
with 2:1 backcut.



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 6-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)

LGC

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2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 735
Date: 11/18/2020
Time: 09:10:05 AM
Tool Version: 10.1.0.18696
File Name: Section P-P Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 09:11:03 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Pseudostatic Global

Kind: SLOPE/W
Parent: 1 -Rotational Static Global
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 6-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.09861, 1,626.6395) ft
Right Coordinate: (417.17849, 1,680.78) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.625)
- Data Point: (14, 0.625)

Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	417.17849 ft	1,680.78 ft
Point 2	417.17849 ft	1,655.8002 ft
Point 3	417.17849 ft	1,520.5922 ft
Point 4	0.09861 ft	1,520.5922 ft
Point 5	0.09861 ft	1,626.6395 ft
Point 6	131.23131 ft	1,626.6395 ft
Point 7	175.83273 ft	1,649.8382 ft
Point 8	189.34145 ft	1,649.8382 ft
Point 9	200.60124 ft	1,656.4341 ft
Point 10	235.37676 ft	1,678.4405 ft
Point 11	410.91688 ft	1,655.0299 ft
Point 12	382.61427 ft	1,647.4233 ft
Point 13	348.72927 ft	1,637.537 ft
Point 14	318.99499 ft	1,633.0844 ft
Point 15	311.75009 ft	1,628.7073 ft
Point 16	301.93929 ft	1,624.8584 ft
Point 17	290.39272 ft	1,624.8584 ft
Point 18	282.01581 ft	1,624.8584 ft
Point 19	272.28047 ft	1,631.4996 ft
Point 20	248.65908 ft	1,638.1407 ft
Point 21	222.54725 ft	1,646.0649 ft
Point 22	131.23131 ft	1,624.6404 ft
Point 23	151.25286 ft	1,623.646 ft
Point 24	195.50367 ft	1,646.9018 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14° Seismic	5,4,3,2,11,12,13,14,15,16,17,18,19,20,21,24,23,22,6	47,378 ft²
Region 2	Fill	2,1,10,9,21,20,19,18,17,16,15,14,13,12,11	8,229.4 ft²
Region 3	Fill	6,22,23,24,21,9,8,7	800.42 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.48
Volume: 1,823.5389 ft³
Weight: 220,668.25 lbf
Resisting Moment: 23,617,294 lbf·ft
Activating Moment: 15,967,363 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (131.1894, 1,626.6395) ft
Entry: (254.59092, 1,678.6878) ft
Radius: 144.10765 ft
Center: (143.29995, 1,770.2374) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	131.21036 ft	1,626.6377 ft	0 psf	35.578928 psf	22.232182 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 2	133.40124 ft	1,626.4866 ft	0 psf	173.55488 psf	100.20196 psf	325 psf	0 psf	Fill
Slice 3	137.74109 ft	1,626.2534 ft	0 psf	468.16495 psf	270.29516 psf	325 psf	0 psf	Fill
Slice 4	142.08094 ft	1,626.1512 ft	0 psf	740.08064 psf	427.28575 psf	325 psf	0 psf	Fill
Slice 5	146.4208 ft	1,626.1799 ft	0 psf	990.11208 psf	571.64148 psf	325 psf	0 psf	Fill
Slice 6	150.76065 ft	1,626.3394 ft	0 psf	1,218.9563 psf	703.76472 psf	325 psf	0 psf	Fill
Slice 7	155.10051 ft	1,626.6302 ft	0 psf	1,427.2092 psf	823.99961 psf	325 psf	0 psf	Fill
Slice 8	159.12666 ft	1,627.0136 ft	0 psf	1,630.2331 psf	561.38518 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 9	162.83912 ft	1,627.4728 ft	0 psf	1,792.4879 psf	617.25906 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 10	166.55158 ft	1,628.0303 ft	0 psf	1,940.7865 psf	668.32702 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 11	170.26404 ft	1,628.6874 ft	0 psf	2,075.1675 psf	714.60229 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 12	173.9765 ft	1,629.4455 ft	0 psf	2,195.6367 psf	756.08694 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 13	178.08418 ft	1,630.41 ft	0 psf	2,179.1037 psf	750.39365 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 14	182.58709 ft	1,631.6082 ft	0 psf	1,889.5132 psf	1,180.6989 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 15	187.09 ft	1,632.9644 ft	0 psf	1,712.7968 psf	1,070.2742 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 16	192.42256 ft	1,634.8002 ft	0 psf	1,671.0539 psf	1,044.1903 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 17	198.05246 ft	1,636.9648 ft	0 psf	1,738.7781 psf	1,086.5092 psf	600 psf	0 psf	Tsr 6-14° Seismic

Slice 18	202.61807 ft	1,638.923 ft	0 psf	1,772.6203 psf	1,107.6561 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 19	206.65174 ft	1,640.8213 ft	0 psf	1,793.1998 psf	1,120.5156 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 20	210.68541 ft	1,642.8757 ft	0 psf	1,795.6024 psf	1,122.0169 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 21	214.71908 ft	1,645.0937 ft	0 psf	1,779.5299 psf	1,111.9737 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 22	217.9262 ft	1,646.9653 ft	0 psf	1,876.406 psf	1,083.3435 psf	325 psf	0 psf	Fill
Slice 23	221.14902 ft	1,648.9909 ft	0 psf	1,849.8335 psf	1,068.0019 psf	325 psf	0 psf	Fill
Slice 24	225.21409 ft	1,651.7005 ft	0 psf	1,800.5896 psf	1,039.5709 psf	325 psf	0 psf	Fill
Slice 25	229.27916 ft	1,654.6166 ft	0 psf	1,731.0692 psf	999.43329 psf	325 psf	0 psf	Fill
Slice 26	233.34423 ft	1,657.7551 ft	0 psf	1,640.5259 psf	947.15805 psf	325 psf	0 psf	Fill
Slice 27	237.29818 ft	1,661.0361 ft	0 psf	1,424.754 psf	822.58209 psf	325 psf	0 psf	Fill
Slice 28	241.14101 ft	1,664.4674 ft	0 psf	1,089.877 psf	629.24076 psf	325 psf	0 psf	Fill
Slice 29	244.98384 ft	1,668.1588 ft	0 psf	742.0689 psf	428.43368 psf	325 psf	0 psf	Fill
Slice 30	248.82667 ft	1,672.1397 ft	0 psf	381.12403 psf	220.04206 psf	325 psf	0 psf	Fill
Slice 31	252.66951 ft	1,676.4472 ft	0 psf	6.9445115 psf	4.0094156 psf	325 psf	0 psf	Fill

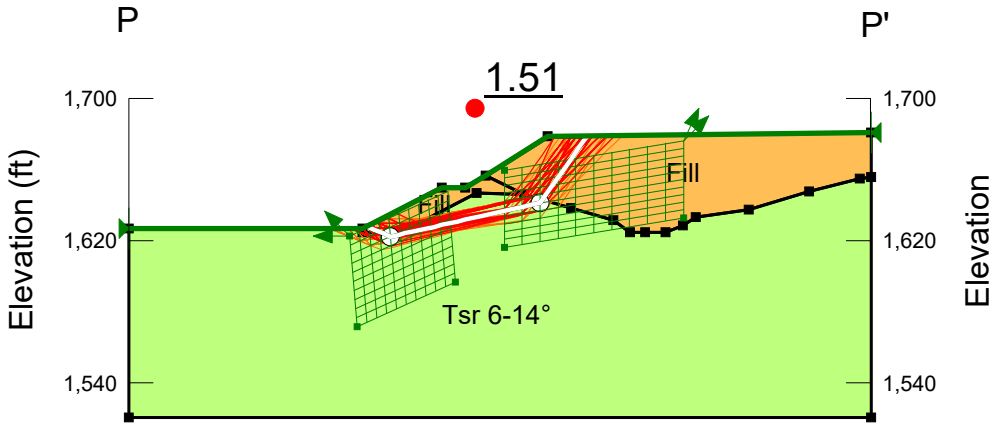
Section P-P Tr 68203 SSA.gsz 11/18/2020 09:10:05 AM

Section P-P Tr 68203 SSA.gsz

2 -Translational Static Global

Horz Seismic Coef.: 0

20 Foot wide stabilization fill key
with 2:1 backcut.



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 6-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°

LGC

LGC Valley, Inc

GEOTECHNICAL CONSULTING

2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 735
Date: 11/18/2020
Time: 09:10:05 AM
Tool Version: 10.1.0.18696
File Name: Section P-P Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 09:11:04 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Static Global

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 6-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 6-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 6-14°
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.09861, 1,626.6395) ft
Right Coordinate: (417.17849, 1,680.78) ft

Slip Surface Block

Left Grid
- Upper Left: (124.37459, 1,622.4802) ft
- Lower Left: (128.31814, 1,571.5897) ft
- Lower Right: (183.52776, 1,596.5654) ft
- X Increments: 10
- Y Increments: 10
- Starting Angle: 135 °
- Ending Angle: 180 °
- Angle Increments: 2

Right Grid
- Upper Left: (211.13257, 1,659.4744) ft
- Lower Left: (211.13257, 1,616.2832) ft
- Lower Right: (311.78684, 1,632.8085) ft
- X Increments: 10
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (5.99, 1)
Data Point: (6, 0.4167)
Data Point: (14, 0.4167)
Data Point: (14.01, 1)

Tsr 18° bedding 6-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (5.99, 1)
Data Point: (6, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	417.17849 ft	1,680.78 ft
Point 2	417.17849 ft	1,655.8002 ft
Point 3	417.17849 ft	1,520.5922 ft
Point 4	0.09861 ft	1,520.5922 ft
Point 5	0.09861 ft	1,626.6395 ft
Point 6	131.23131 ft	1,626.6395 ft
Point 7	175.83273 ft	1,649.8382 ft
Point 8	189.34145 ft	1,649.8382 ft
Point 9	200.60124 ft	1,656.4341 ft
Point 10	235.37676 ft	1,678.4405 ft
Point 11	410.91688 ft	1,655.0299 ft
Point 12	382.61427 ft	1,647.4233 ft
Point 13	348.72927 ft	1,637.537 ft
Point 14	318.99499 ft	1,633.0844 ft
Point 15	311.75009 ft	1,628.7073 ft
Point 16	301.93929 ft	1,624.8584 ft
Point 17	290.39272 ft	1,624.8584 ft
Point 18	282.01581 ft	1,624.8584 ft
Point 19	272.28047 ft	1,631.4996 ft

Point 20	248.65908 ft	1,638.1407 ft
Point 21	222.54725 ft	1,646.0649 ft
Point 22	131.23131 ft	1,624.6404 ft
Point 23	151.25286 ft	1,623.646 ft
Point 24	195.50367 ft	1,646.9018 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14°	5,4,3,2,11,12,13,14,15,16,17,18,19,20,21,24,23,22,6	47,378 ft²
Region 2	Fill	2,1,10,9,21,20,19,18,17,16,15,14,13,12,11	8,229.4 ft²
Region 3	Fill	6,22,23,24,21,9,8,7	800.42 ft²

Slip Results

Slip Surfaces Analysed: 94900 of 131769 converged

Current Slip Surface

Slip Surface: 100,724
Factor of Safety: 1.51
Volume: 2,414.7978 ft³
Weight: 292,982.26 lbf
Resisting Force: 131,249.97 lbf
Activating Force: 87,191.463 lbf
Slip Rank: 1 of 131,769 slip surfaces
Exit: (133.67886, 1,627.9126) ft
Entry: (257.5506, 1,678.7258) ft
Radius: 72.508835 ft
Center: (179.98168, 1,691.4292) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	136.0062 ft	1,626.9485 ft	0 psf	416.96575 psf	240.73529 psf	325 psf	0 psf	Fill
Slice 2	140.6609 ft	1,625.0205 ft	0 psf	1,037.6918 psf	599.11163 psf	325 psf	0 psf	Fill
Slice 3	145.1177 ft	1,623.1744 ft	0 psf	1,754.1879 psf	1,096.1382 psf	600 psf	0 psf	Tsr 6-14°
Slice 4	149.25 ft	1,622.7427 ft	0 psf	1,487.4952 psf	483.3165 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 5	153.30118 ft	1,623.6537 ft	0 psf	1,624.6989 psf	527.89666 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 6	157.39783 ft	1,624.5748 ft	0 psf	1,768.9971 psf	574.782 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 7	161.49447 ft	1,625.496 ft	0 psf	1,913.2953 psf	621.66733 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 8	165.59112 ft	1,626.4171 ft	0 psf	2,057.5936 psf	668.55267 psf	250.02 psf	0 psf	Tsr 6-14°

Slice 9	169.68776 ft	1,627.3383 ft	0 psf	2,201.8918 psf	715.43801 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 10	173.78441 ft	1,628.2594 ft	0 psf	2,346.19 psf	762.32335 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 11	178.08418 ft	1,629.2262 ft	0 psf	2,363.635 psf	767.99156 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 12	182.58709 ft	1,630.2387 ft	0 psf	2,254.2267 psf	732.44265 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 13	187.09 ft	1,631.2512 ft	0 psf	2,144.8184 psf	696.89375 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 14	192.42256 ft	1,632.4503 ft	0 psf	2,221.7919 psf	721.90396 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 15	198.05246 ft	1,633.7162 ft	0 psf	2,455.6343 psf	797.88396 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 16	202.79584 ft	1,634.7828 ft	0 psf	2,657.5753 psf	863.49856 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 17	207.18504 ft	1,635.7697 ft	0 psf	2,857.1279 psf	928.33711 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 18	211.57424 ft	1,636.7566 ft	0 psf	3,056.6804 psf	993.17566 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 19	215.96345 ft	1,637.7436 ft	0 psf	3,256.2329 psf	1,058.0142 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 20	220.35265 ft	1,638.7305 ft	0 psf	3,455.7855 psf	1,122.8528 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 21	224.72629 ft	1,639.714 ft	0 psf	3,651.7992 psf	1,186.5415 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 22	229.08438 ft	1,640.6939 ft	0 psf	3,844.2741 psf	1,249.0804 psf	250.02 psf	0 psf	Tsr 6-14°
Slice 23	231.90904 ft	1,642.1059 ft	0 psf	2,215.522 psf	1,384.4118 psf	600 psf	0 psf	Tsr 6-14°
Slice 24	233.96571 ft	1,645.0431 ft	0 psf	2,318.6304 psf	1,338.6619 psf	325 psf	0 psf	Fill
Slice 25	237.59414 ft	1,650.2251 ft	0 psf	1,988.5692 psf	1,148.101 psf	325 psf	0 psf	Fill
Slice 26	242.02891 ft	1,656.5586 ft	0 psf	1,502.3306 psf	867.37095 psf	325 psf	0 psf	Fill
Slice 27	246.46368 ft	1,662.8921 ft	0 psf	1,016.0919 psf	586.64093 psf	325 psf	0 psf	Fill
Slice 28	250.89845 ft	1,669.2256 ft	0 psf	529.85325 psf	305.91092 psf	325 psf	0 psf	Fill
Slice 29	255.33322 ft	1,675.5591 ft	0 psf	43.614602 psf	25.180902 psf	325 psf	0 psf	Fill

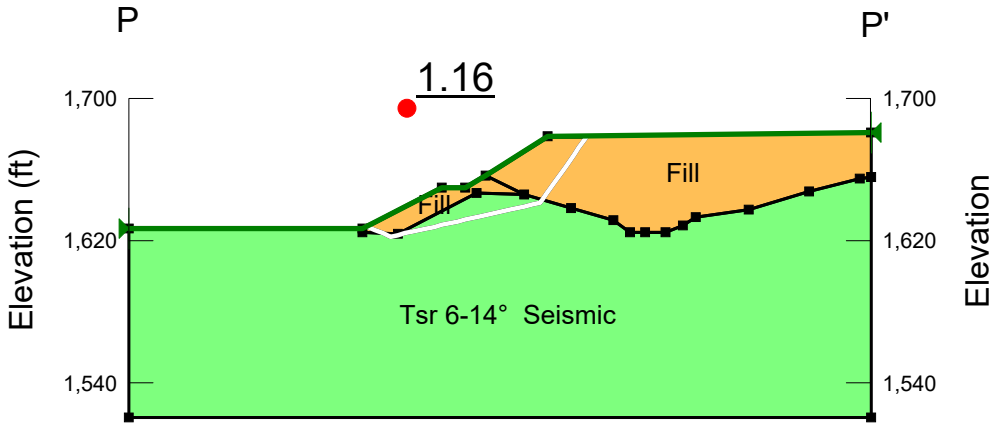
Section P-P Tr 68203 SSA.gsz 11/18/2020 09:10:05 AM

Section P-P Tr 68203 SSA.gsz

2 -Translational Pseudostatic Global

Horz Seismic Coef.: 0.15

20 Foot wide stabilization fill key
with 2:1 backcut.



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Tsr 6-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)

LGC

LGC Valley, Inc

GEOTECHNICAL CONSULTING

2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 735
Date: 11/18/2020
Time: 09:10:05 AM
Tool Version: 10.1.0.18696
File Name: Section P-P Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 09:11:04 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Pseudostatic Global

Kind: SLOPE/W
Parent: 2 -Translational Static Global
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 6-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 6-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 6-14° (Seismic)
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.09861, 1,626.6395) ft
Right Coordinate: (417.17849, 1,680.78) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 6-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (5.99, 1)
- Data Point: (6, 0.625)
- Data Point: (14, 0.625)

Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	417.17849 ft	1,680.78 ft
Point 2	417.17849 ft	1,655.8002 ft
Point 3	417.17849 ft	1,520.5922 ft
Point 4	0.09861 ft	1,520.5922 ft
Point 5	0.09861 ft	1,626.6395 ft
Point 6	131.23131 ft	1,626.6395 ft
Point 7	175.83273 ft	1,649.8382 ft
Point 8	189.34145 ft	1,649.8382 ft
Point 9	200.60124 ft	1,656.4341 ft
Point 10	235.37676 ft	1,678.4405 ft
Point 11	410.91688 ft	1,655.0299 ft
Point 12	382.61427 ft	1,647.4233 ft
Point 13	348.72927 ft	1,637.537 ft
Point 14	318.99499 ft	1,633.0844 ft
Point 15	311.75009 ft	1,628.7073 ft
Point 16	301.93929 ft	1,624.8584 ft
Point 17	290.39272 ft	1,624.8584 ft
Point 18	282.01581 ft	1,624.8584 ft
Point 19	272.28047 ft	1,631.4996 ft
Point 20	248.65908 ft	1,638.1407 ft
Point 21	222.54725 ft	1,646.0649 ft
Point 22	131.23131 ft	1,624.6404 ft
Point 23	151.25286 ft	1,623.646 ft
Point 24	195.50367 ft	1,646.9018 ft

Regions

	Material	Points	Area
Region 1	Tsr 6-14° Seismic	5,4,3,2,11,12,13,14,15,16,17,18,19,20,21,24,23,22,6	47,378 ft²
Region 2	Fill	2,1,10,9,21,20,19,18,17,16,15,14,13,12,11	8,229.4 ft²
Region 3	Fill	6,22,23,24,21,9,8,7	800.42 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.16
Volume: 2,414.7978 ft³
Weight: 292,982.26 lbf
Resisting Force: 141,968.07 lbf
Activating Force: 122,772.29 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (133.67886, 1,627.9126) ft
Entry: (257.5506, 1,678.7258) ft
Radius: 72.508835 ft
Center: (179.98168, 1,691.4292) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	136.0062 ft	1,626.9485 ft	0 psf	474.24362 psf	273.80468 psf	325 psf	0 psf	Fill
Slice 2	140.6609 ft	1,625.0205 ft	0 psf	1,131.2535 psf	653.12949 psf	325 psf	0 psf	Fill
Slice 3	145.1177 ft	1,623.1744 ft	0 psf	1,929.6523 psf	1,205.7806 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 4	149.25 ft	1,622.7427 ft	0 psf	1,429.5779 psf	492.28781 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 5	153.30118 ft	1,623.6537 ft	0 psf	1,564.4732 psf	538.7402 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 6	157.39783 ft	1,624.5748 ft	0 psf	1,706.3438 psf	587.59459 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 7	161.49447 ft	1,625.496 ft	0 psf	1,848.2144 psf	636.44898 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 8	165.59112 ft	1,626.4171 ft	0 psf	1,990.085 psf	685.30337 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 9	169.68776 ft	1,627.3383 ft	0 psf	2,131.9555 psf	734.15776 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 10	173.78441 ft	1,628.2594 ft	0 psf	2,273.8261 psf	783.01215 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 11	178.08418 ft	1,629.2262 ft	0 psf	2,290.9776 psf	788.91841 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 12	182.58709 ft	1,630.2387 ft	0 psf	2,183.41 psf	751.87655 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 13	187.09 ft	1,631.2512 ft	0 psf	2,075.8424 psf	714.83469 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 14	192.42256 ft	1,632.4503 ft	0 psf	2,151.5209 psf	740.89526 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 15	198.05246 ft	1,633.7162 ft	0 psf	2,381.4292 psf	820.0662 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 16	202.79584 ft	1,634.7828 ft	0 psf	2,579.9727 psf	888.43644 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 17	207.18504 ft	1,635.7697 ft	0 psf	2,776.168 psf	955.99803 psf	375 psf	0 psf	Tsr 6-14° Seismic

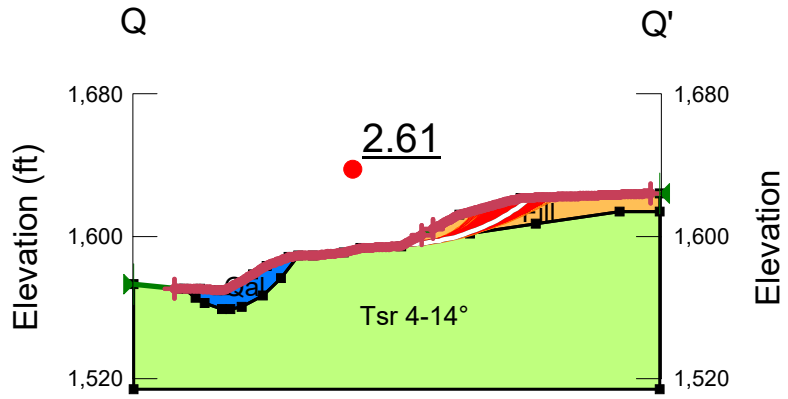
Slice 18	211.57424 ft	1,636.7566 ft	0 psf	2,972.3633 psf	1,023.5596 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 19	215.96345 ft	1,637.7436 ft	0 psf	3,168.5586 psf	1,091.1212 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 20	220.35265 ft	1,638.7305 ft	0 psf	3,364.7539 psf	1,158.6828 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 21	224.72629 ft	1,639.714 ft	0 psf	3,557.4699 psf	1,225.0463 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 22	229.08438 ft	1,640.6939 ft	0 psf	3,746.7067 psf	1,290.2116 psf	375 psf	0 psf	Tsr 6-14° Seismic
Slice 23	231.90904 ft	1,642.1059 ft	0 psf	1,904.1919 psf	1,189.8711 psf	600 psf	0 psf	Tsr 6-14° Seismic
Slice 24	233.96571 ft	1,645.0431 ft	0 psf	2,048.7093 psf	1,182.8228 psf	325 psf	0 psf	Fill
Slice 25	237.59414 ft	1,650.2251 ft	0 psf	1,749.5657 psf	1,010.1122 psf	325 psf	0 psf	Fill
Slice 26	242.02891 ft	1,656.5586 ft	0 psf	1,308.8741 psf	755.67882 psf	325 psf	0 psf	Fill
Slice 27	246.46368 ft	1,662.8921 ft	0 psf	868.18256 psf	501.24543 psf	325 psf	0 psf	Fill
Slice 28	250.89845 ft	1,669.2256 ft	0 psf	427.491 psf	246.81204 psf	325 psf	0 psf	Fill
Slice 29	255.33322 ft	1,675.5591 ft	0 psf	-13.20056 psf	-7.6213467 psf	325 psf	0 psf	Fill

1 -Rotational Static Global

Section Q-Q Tr 68203 SSA.gsz 11/18/2020 08:08:10 AM

Section Q-Q Tr 68203 SSA.gsz

Horz Seismic Coef.: 0



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Qal
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °

Name: Tsr 4-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 4-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 4-14°

LGC

LGC Valley, Inc

GEOTECHNICAL CONSULTING

2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 740
Date: 11/18/2020
Time: 08:08:10 AM
Tool Version: 10.1.0.18696
File Name: Section Q-Q Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:08:20 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Static Global

Kind: SLOPE/W
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Entry and Exit
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 4-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 4-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 4-14°
Phi-B: 0 °

Qal

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Entry and Exit

Left Type: Range
Left-Zone Left Coordinate: (23.42781, 1,570.6736) ft
Left-Zone Right Coordinate: (162.59502, 1,600.7546) ft
Left-Zone Increment: 80
Right Type: Range
Right-Zone Left Coordinate: (168.86152, 1,604.1593) ft
Right-Zone Right Coordinate: (291.02215, 1,624.0068) ft
Right-Zone Increment: 80
Radius Increments: 14

Slip Surface Limits

Left Coordinate: (0.40013, 1,573.163) ft
Right Coordinate: (296.39961, 1,624.1943) ft

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 4-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.4167)
Data Point: (14, 0.4167)
Data Point: (14.01, 1)

Tsr 18° bedding 4-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	296.39961 ft	1,624.1943 ft
Point 2	296.39961 ft	1,513.9813 ft
Point 3	0.40013 ft	1,513.9813 ft
Point 4	0.40013 ft	1,573.163 ft
Point 5	25.53088 ft	1,570.4462 ft
Point 6	29.07786 ft	1,570.4462 ft
Point 7	37.90759 ft	1,570.4462 ft
Point 8	47.78792 ft	1,569.5319 ft
Point 9	51.63118 ft	1,569.5319 ft
Point 10	67.5664 ft	1,578.5213 ft
Point 11	75.18864 ft	1,583.4267 ft
Point 12	87.48988 ft	1,588.1811 ft
Point 13	93.29565 ft	1,589.0976 ft
Point 14	101.225 ft	1,589.0976 ft
Point 15	118.88445 ft	1,590.8225 ft
Point 16	128.16697 ft	1,593.3129 ft
Point 17	150.86599 ft	1,594.382 ft
Point 18	183.48481 ft	1,612.1044 ft
Point 19	218.04902 ft	1,621.4624 ft

Point 20	296.39961 ft	1,613.9428 ft
Point 21	273.74118 ft	1,613.9428 ft
Point 22	226.57688 ft	1,607.205 ft
Point 23	189.73656 ft	1,601.4453 ft
Point 24	83.26368 ft	1,576.6346 ft
Point 25	73.37741 ft	1,566.8992 ft
Point 26	61.22711 ft	1,560.4845 ft
Point 27	55.01151 ft	1,559.1114 ft
Point 28	50.20882 ft	1,559.1114 ft
Point 29	40.39802 ft	1,562.5221 ft
Point 30	35.19075 ft	1,565.3899 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-14°	16,15,14,13,24,25,26,27,28,29,30,6,5,4,3,2,20,21,22,23,17	22,957 ft²
Region 2	Fill	20,1,19,18,17,23,22,21	1,581.6 ft²
Region 3	Qal	13,12,11,10,9,8,7,6,30,29,28,27,26,25,24	632.57 ft²

Slip Results

Slip Surfaces Analysed: 93133 of 98415 converged

Current Slip Surface

Slip Surface: 90,469
Factor of Safety: 2.61
Volume: 531.04775 ft³
Weight: 63,787.392 lbf
Resisting Moment: 6,377,621 lbf·ft
Activating Moment: 2,445,348.7 lbf·ft
Slip Rank: 1 of 98,415 slip surfaces
Exit: (152.9708, 1,595.5256) ft
Entry: (223.62386, 1,621.6568) ft
Radius: 114.54553 ft
Center: (150.77255, 1,710.05) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	154.34487 ft	1,595.5685 ft	0 psf	80.003094 psf	46.189808 psf	325 psf	0 psf	Fill
Slice 2	157.093 ft	1,595.6873 ft	0 psf	239.54511 psf	138.30143 psf	325 psf	0 psf	Fill
Slice 3	159.60423 ft	1,595.8512 ft	0 psf	382.91594 psf	124.41693 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 4	161.87857 ft	1,596.0499 ft	0 psf	504.07287 psf	163.7832 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 5	164.15291 ft	1,596.2944 ft	0 psf	618.96839 psf	201.11502 psf	250.02 psf	0 psf	Tsr 4-14°

Slice 6	166.42725 ft	1,596.5851 ft	0 psf	727.60288 psf	236.41251 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 7	168.7016 ft	1,596.9222 ft	0 psf	829.96855 psf	269.67313 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 8	170.97594 ft	1,597.3062 ft	0 psf	926.04938 psf	300.89168 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 9	173.25028 ft	1,597.7376 ft	0 psf	1,015.821 psf	330.06024 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 10	175.52462 ft	1,598.2169 ft	0 psf	1,099.2504 psf	357.16811 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 11	177.79896 ft	1,598.7447 ft	0 psf	1,176.296 psf	382.20175 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 12	180.0733 ft	1,599.3217 ft	0 psf	1,177.8714 psf	736.01576 psf	600 psf	0 psf	Tsr 4-14°
Slice 13	182.34764 ft	1,599.9487 ft	0 psf	1,234.5995 psf	771.46338 psf	600 psf	0 psf	Tsr 4-14°
Slice 14	183.63099 ft	1,600.3186 ft	0 psf	1,259.948 psf	787.30291 psf	600 psf	0 psf	Tsr 4-14°
Slice 15	184.91956 ft	1,600.7192 ft	0 psf	1,285.1448 psf	741.97868 psf	325 psf	0 psf	Fill
Slice 16	187.20435 ft	1,601.4593 ft	0 psf	1,262.7563 psf	729.05267 psf	325 psf	0 psf	Fill
Slice 17	189.48914 ft	1,602.2528 ft	0 psf	1,234.4493 psf	712.70961 psf	325 psf	0 psf	Fill
Slice 18	191.77393 ft	1,603.1011 ft	0 psf	1,200.1679 psf	692.91727 psf	325 psf	0 psf	Fill
Slice 19	194.05872 ft	1,604.0054 ft	0 psf	1,159.8477 psf	669.63839 psf	325 psf	0 psf	Fill
Slice 20	196.34351 ft	1,604.9671 ft	0 psf	1,113.415 psf	642.83045 psf	325 psf	0 psf	Fill
Slice 21	198.6283 ft	1,605.9879 ft	0 psf	1,060.7865 psf	612.44535 psf	325 psf	0 psf	Fill
Slice 22	200.91309 ft	1,607.0695 ft	0 psf	1,001.8686 psf	578.42913 psf	325 psf	0 psf	Fill
Slice 23	203.19788 ft	1,608.2138 ft	0 psf	936.55723 psf	540.72157 psf	325 psf	0 psf	Fill
Slice 24	205.48267 ft	1,609.423 ft	0 psf	864.73638 psf	499.25578 psf	325 psf	0 psf	Fill
Slice 25	207.76746 ft	1,610.6995 ft	0 psf	786.27788 psf	453.95774 psf	325 psf	0 psf	Fill
Slice 26	210.05225 ft	1,612.0459 ft	0 psf	701.04018 psf	404.74574 psf	325 psf	0 psf	Fill
Slice 27	212.33704 ft	1,613.4651 ft	0 psf	608.86742 psf	351.52977 psf	325 psf	0 psf	Fill
Slice 28	214.62183 ft	1,614.9603 ft	0 psf	509.58823 psf	294.2109 psf	325 psf	0 psf	Fill
Slice 29	216.90662 ft	1,616.5353 ft	0 psf	403.01447 psf	232.68051 psf	325 psf	0 psf	Fill
Slice 30	219.44273 ft	1,618.3873 ft	0 psf	241.5185 psf	139.44077 psf	325 psf	0 psf	Fill

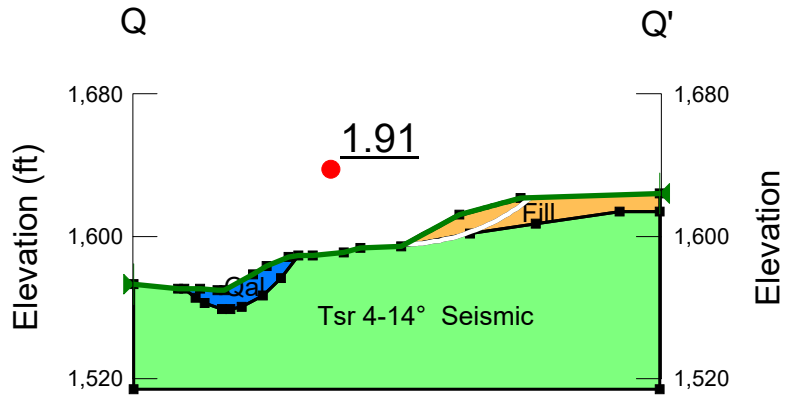
Slice 31	222.23015 ft	1,620.5441 ft	0 psf	24.02492 psf	13.870794 psf	325 psf	0 psf	Fill

1 -Rotational Pseudostatic Global

Section Q-Q Tr 68203 SSA.gsz 11/18/2020 08:08:10 AM

Section Q-Q Tr 68203 SSA.gsz

Horz Seismic Coef.: 0.15



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Qal
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °

Name: Tsr 4-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 4-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 4-14° (Seismic)

LGC

LGC Valley, Inc

GEOTECHNICAL CONSULTING

2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

1 -Rotational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 740
Date: 11/18/2020
Time: 08:08:10 AM
Tool Version: 10.1.0.18696
File Name: Section Q-Q Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:08:36 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

1 -Rotational Pseudostatic Global

Kind: SLOPE/W
Parent: 1 -Rotational Static Global
Method: Bishop
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 4-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 4-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 4-14° (Seismic)
Phi-B: 0 °

Qal

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.40013, 1,573.163) ft
Right Coordinate: (296.39961, 1,624.1943) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 4-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (3.99, 1)
- Data Point: (4, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 4-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.625)
Data Point: (14, 0.625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	296.39961 ft	1,624.1943 ft
Point 2	296.39961 ft	1,513.9813 ft
Point 3	0.40013 ft	1,513.9813 ft
Point 4	0.40013 ft	1,573.163 ft
Point 5	25.53088 ft	1,570.4462 ft
Point 6	29.07786 ft	1,570.4462 ft
Point 7	37.90759 ft	1,570.4462 ft
Point 8	47.78792 ft	1,569.5319 ft
Point 9	51.63118 ft	1,569.5319 ft
Point 10	67.5664 ft	1,578.5213 ft
Point 11	75.18864 ft	1,583.4267 ft
Point 12	87.48988 ft	1,588.1811 ft
Point 13	93.29565 ft	1,589.0976 ft
Point 14	101.225 ft	1,589.0976 ft
Point 15	118.88445 ft	1,590.8225 ft
Point 16	128.16697 ft	1,593.3129 ft
Point 17	150.86599 ft	1,594.382 ft
Point 18	183.48481 ft	1,612.1044 ft
Point 19	218.04902 ft	1,621.4624 ft
Point 20	296.39961 ft	1,613.9428 ft
Point 21	273.74118 ft	1,613.9428 ft
Point 22	226.57688 ft	1,607.205 ft
Point 23	189.73656 ft	1,601.4453 ft
Point 24	83.26368 ft	1,576.6346 ft
Point 25	73.37741 ft	1,566.8992 ft
Point 26	61.22711 ft	1,560.4845 ft
Point 27	55.01151 ft	1,559.1114 ft
Point 28	50.20882 ft	1,559.1114 ft
Point 29	40.39802 ft	1,562.5221 ft

Point 30	35.19075 ft	1,565.3899 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-14° Seismic	16,15,14,13,24,25,26,27,28,29,30,6,5,4,3,2,20,21,22,23,17	22,957 ft²
Region 2	Fill	20,1,19,18,17,23,22,21	1,581.6 ft²
Region 3	Qal	13,12,11,10,9,8,7,6,30,29,28,27,26,25,24	632.57 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.91
Volume: 531.04775 ft³
Weight: 63,787.392 lbf
Resisting Moment: 6,530,932.9 lbf·ft
Activating Moment: 3,422,073.2 lbf·ft
Slip Rank: 1 of 1 slip surfaces
Exit: (152.9708, 1,595.5256) ft
Entry: (223.62386, 1,621.6568) ft
Radius: 114.54553 ft
Center: (150.77255, 1,710.05) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	154.34487 ft	1,595.5685 ft	0 psf	78.393472 psf	45.260492 psf	325 psf	0 psf	Fill
Slice 2	157.093 ft	1,595.6873 ft	0 psf	236.01228 psf	136.26175 psf	325 psf	0 psf	Fill
Slice 3	159.60423 ft	1,595.8512 ft	0 psf	373.62262 psf	128.66026 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 4	161.87857 ft	1,596.0499 ft	0 psf	491.76088 psf	169.34221 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 5	164.15291 ft	1,596.2944 ft	0 psf	603.41837 psf	207.79246 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 6	166.42725 ft	1,596.5851 ft	0 psf	708.61301 psf	244.01716 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 7	168.7016 ft	1,596.9222 ft	0 psf	807.35402 psf	278.0195 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 8	170.97594 ft	1,597.3062 ft	0 psf	899.64191 psf	309.79965 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 9	173.25028 ft	1,597.7376 ft	0 psf	985.46852 psf	339.3548 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 10	175.52462 ft	1,598.2169 ft	0 psf	1,064.8169 psf	366.67912 psf	375 psf	0 psf	Tsr 4-14° Seismic

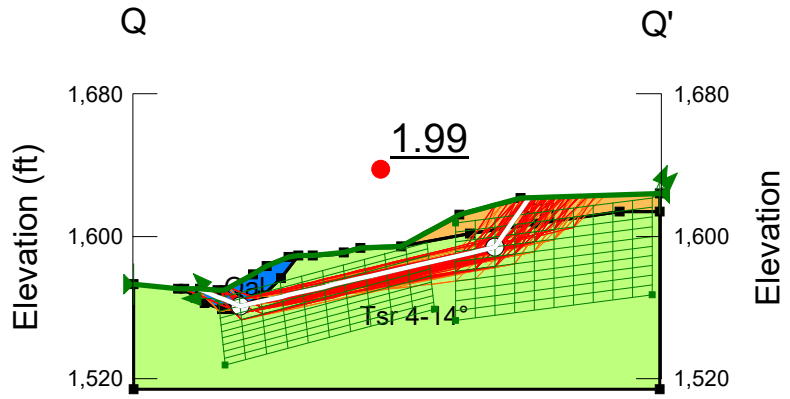
Slice 11	177.79896 ft	1,598.7447 ft	0 psf	1,137.6611 psf	391.76368 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 12	180.0733 ft	1,599.3217 ft	0 psf	1,132.2289 psf	707.49515 psf	600 psf	0 psf	Tsr 4-14° Seismic
Slice 13	182.34764 ft	1,599.9487 ft	0 psf	1,184.1582 psf	739.94414 psf	600 psf	0 psf	Tsr 4-14° Seismic
Slice 14	183.63099 ft	1,600.3186 ft	0 psf	1,206.8723 psf	754.13751 psf	600 psf	0 psf	Tsr 4-14° Seismic
Slice 15	184.91956 ft	1,600.7192 ft	0 psf	1,242.4295 psf	717.31702 psf	325 psf	0 psf	Fill
Slice 16	187.20435 ft	1,601.4593 ft	0 psf	1,217.7164 psf	703.04888 psf	325 psf	0 psf	Fill
Slice 17	189.48914 ft	1,602.2528 ft	0 psf	1,187.2862 psf	685.48002 psf	325 psf	0 psf	Fill
Slice 18	191.77393 ft	1,603.1011 ft	0 psf	1,151.1095 psf	664.59338 psf	325 psf	0 psf	Fill
Slice 19	194.05872 ft	1,604.0054 ft	0 psf	1,109.1492 psf	640.36757 psf	325 psf	0 psf	Fill
Slice 20	196.34351 ft	1,604.9671 ft	0 psf	1,061.3605 psf	612.77674 psf	325 psf	0 psf	Fill
Slice 21	198.6283 ft	1,605.9879 ft	0 psf	1,007.6907 psf	581.7905 psf	325 psf	0 psf	Fill
Slice 22	200.91309 ft	1,607.0695 ft	0 psf	948.07906 psf	547.3737 psf	325 psf	0 psf	Fill
Slice 23	203.19788 ft	1,608.2138 ft	0 psf	882.45613 psf	509.48629 psf	325 psf	0 psf	Fill
Slice 24	205.48267 ft	1,609.423 ft	0 psf	810.74371 psf	468.0831 psf	325 psf	0 psf	Fill
Slice 25	207.76746 ft	1,610.6995 ft	0 psf	732.85434 psf	423.11365 psf	325 psf	0 psf	Fill
Slice 26	210.05225 ft	1,612.0459 ft	0 psf	648.69092 psf	374.52188 psf	325 psf	0 psf	Fill
Slice 27	212.33704 ft	1,613.4651 ft	0 psf	558.14631 psf	322.24592 psf	325 psf	0 psf	Fill
Slice 28	214.62183 ft	1,614.9603 ft	0 psf	461.10284 psf	266.21785 psf	325 psf	0 psf	Fill
Slice 29	216.90662 ft	1,616.5353 ft	0 psf	357.43196 psf	206.36344 psf	325 psf	0 psf	Fill
Slice 30	219.44273 ft	1,618.3873 ft	0 psf	201.72064 psf	116.46347 psf	325 psf	0 psf	Fill
Slice 31	222.23015 ft	1,620.5441 ft	0 psf	-6.5490283 psf	-3.7810832 psf	325 psf	0 psf	Fill

2 -Translational Static Global

Section Q-Q Tr 68203 SSA.gsz 11/18/2020 08:08:10 AM

Section Q-Q Tr 68203 SSA.gsz

Horz Seismic Coef.: 0



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Qal
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °

Name: Tsr 4-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 4-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 4-14°

LGC Valley, Inc
GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Static Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 740
Date: 11/18/2020
Time: 08:08:10 AM
Tool Version: 10.1.0.18696
File Name: Section Q-Q Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:08:28 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Static Global

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 4-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 4-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 4-14°
Phi-B: 0 °

Qal

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.40013, 1,573.163) ft
Right Coordinate: (296.39961, 1,624.1943) ft

Slip Surface Block

Left Grid
- Upper Left: (48.11324, 1,565.1266) ft
- Lower Left: (52.15589, 1,527.5691) ft
- Lower Right: (169.52328, 1,558.867) ft
- X Increments: 10
- Y Increments: 10
- Starting Angle: 135 °
- Ending Angle: 180 °
- Angle Increments: 2

Right Grid
- Upper Left: (181.39043, 1,607.3789) ft
- Lower Left: (181.39043, 1,552.8683) ft
- Lower Right: (291.9766, 1,567.2132) ft
- X Increments: 10
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 4-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.4167)
Data Point: (14, 0.4167)
Data Point: (14.01, 1)

Tsr 18° bedding 4-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	296.39961 ft	1,624.1943 ft
Point 2	296.39961 ft	1,513.9813 ft
Point 3	0.40013 ft	1,513.9813 ft
Point 4	0.40013 ft	1,573.163 ft
Point 5	25.53088 ft	1,570.4462 ft
Point 6	29.07786 ft	1,570.4462 ft
Point 7	37.90759 ft	1,570.4462 ft
Point 8	47.78792 ft	1,569.5319 ft
Point 9	51.63118 ft	1,569.5319 ft
Point 10	67.5664 ft	1,578.5213 ft
Point 11	75.18864 ft	1,583.4267 ft
Point 12	87.48988 ft	1,588.1811 ft
Point 13	93.29565 ft	1,589.0976 ft
Point 14	101.225 ft	1,589.0976 ft

Point 15	118.88445 ft	1,590.8225 ft
Point 16	128.16697 ft	1,593.3129 ft
Point 17	150.86599 ft	1,594.382 ft
Point 18	183.48481 ft	1,612.1044 ft
Point 19	218.04902 ft	1,621.4624 ft
Point 20	296.39961 ft	1,613.9428 ft
Point 21	273.74118 ft	1,613.9428 ft
Point 22	226.57688 ft	1,607.205 ft
Point 23	189.73656 ft	1,601.4453 ft
Point 24	83.26368 ft	1,576.6346 ft
Point 25	73.37741 ft	1,566.8992 ft
Point 26	61.22711 ft	1,560.4845 ft
Point 27	55.01151 ft	1,559.1114 ft
Point 28	50.20882 ft	1,559.1114 ft
Point 29	40.39802 ft	1,562.5221 ft
Point 30	35.19075 ft	1,565.3899 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-14°	16,15,14,13,24,25,26,27,28,29,30,6,5,4,3,2,20,21,22,23,17	22,957 ft²
Region 2	Fill	20,1,19,18,17,23,22,21	1,581.6 ft²
Region 3	Qal	13,12,11,10,9,8,7,6,30,29,28,27,26,25,24	632.57 ft²

Slip Results

Slip Surfaces Analysed: 74592 of 131769 converged

Current Slip Surface

Slip Surface: 97,523
Factor of Safety: 1.99
Volume: 2,975.9579 ft³
Weight: 366,311.32 lbf
Resisting Force: 172,252 lbf
Activating Force: 86,448.421 lbf
Slip Rank: 1 of 131,769 slip surfaces
Exit: (37.237475, 1,570.4462) ft
Entry: (222.92994, 1,621.6326) ft
Radius: 88.990637 ft
Center: (119.50151, 1,634.4292) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	37.572532 ft	1,570.3074 ft	0 psf	100.1318 psf	53.24102 psf	350 psf	0 psf	Qal
Slice 2	40.377673 ft	1,569.1455 ft	0 psf	225.98729 psf	120.15957 psf	350 psf	0 psf	Qal

Slice 3	45.317838 ft	1,567.0992 ft	0 psf	440.26995 psf	234.09568 psf	350 psf	0 psf	Qal
Slice 4	49.70955 ft	1,565.2801 ft	0 psf	654.74119 psf	348.13206 psf	350 psf	0 psf	Qal
Slice 5	56.144844 ft	1,562.6145 ft	0 psf	1,357.5187 psf	721.80551 psf	350 psf	0 psf	Qal
Slice 6	61.605806 ft	1,560.9647 ft	0 psf	1,566.1175 psf	832.71943 psf	350 psf	0 psf	Qal
Slice 7	65.059752 ft	1,561.7662 ft	0 psf	1,749.6946 psf	568.51024 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 8	70.471905 ft	1,563.0222 ft	0 psf	1,991.9305 psf	647.21746 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 9	74.283025 ft	1,563.9066 ft	0 psf	2,180.7171 psf	708.55794 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 10	79.22616 ft	1,565.0537 ft	0 psf	2,313.8473 psf	751.81455 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 11	85.37678 ft	1,566.4811 ft	0 psf	2,448.6223 psf	795.60563 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 12	90.392765 ft	1,567.6451 ft	0 psf	2,485.869 psf	807.7078 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 13	97.260325 ft	1,569.2388 ft	0 psf	2,364.2612 psf	768.19503 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 14	104.16824 ft	1,570.8418 ft	0 psf	2,205.7858 psf	716.70327 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 15	110.05473 ft	1,572.2079 ft	0 psf	2,110.4943 psf	685.74116 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 16	115.94121 ft	1,573.5739 ft	0 psf	2,015.2027 psf	654.77906 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 17	123.52571 ft	1,575.334 ft	0 psf	1,987.8114 psf	645.87907 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 18	131.00435 ft	1,577.0695 ft	0 psf	1,944.847 psf	631.91911 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 19	136.6791 ft	1,578.3864 ft	0 psf	1,818.4095 psf	590.83706 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 20	142.35386 ft	1,579.7032 ft	0 psf	1,691.972 psf	549.75501 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 21	148.02861 ft	1,581.0201 ft	0 psf	1,565.5344 psf	508.67297 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 22	154.12787 ft	1,582.4355 ft	0 psf	1,618.9337 psf	526.02345 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 23	160.65164 ft	1,583.9495 ft	0 psf	1,852.1698 psf	601.80645 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 24	167.1754 ft	1,585.4634 ft	0 psf	2,085.4059 psf	677.58946 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 25	173.69916 ft	1,586.9773 ft	0 psf	2,318.642 psf	753.37247 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 26	180.22293 ft	1,588.4912 ft	0 psf	2,551.8782 psf	829.15548 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 27	186.61068 ft	1,589.9736 ft	0 psf	2,681.7203 psf	871.34376 psf	250.02 psf	0 psf	Tsr 4-14°

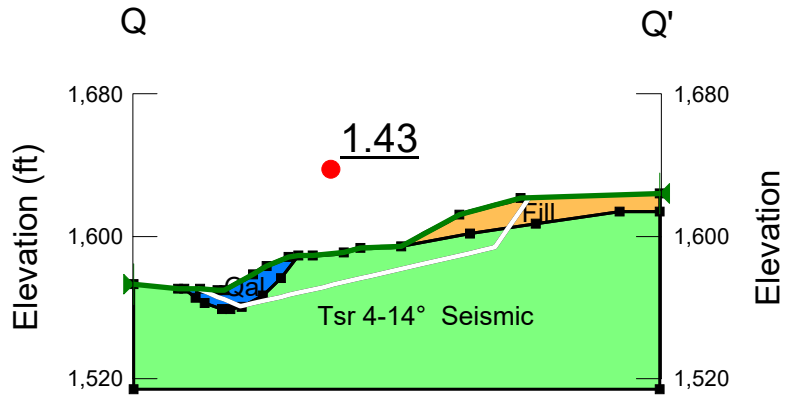
Slice 28	193.17934 ft	1,591.4979 ft	0 psf	2,709.0884 psf	880.23617 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 29	200.06489 ft	1,593.0958 ft	0 psf	2,737.3762 psf	889.42744 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 30	207.32256 ft	1,599.3429 ft	0 psf	1,315.2374 psf	821.85153 psf	600 psf	0 psf	Tsr 4-14°
Slice 31	214.59324 ft	1,609.7265 ft	0 psf	753.53169 psf	435.05172 psf	325 psf	0 psf	Fill
Slice 32	220.48948 ft	1,618.1472 ft	0 psf	124.67792 psf	71.982832 psf	325 psf	0 psf	Fill

2 -Translational Pseudostatic Global

Section Q-Q Tr 68203 SSA.gsz 11/18/2020 08:08:10 AM

Section Q-Q Tr 68203 SSA.gsz

Horz Seismic Coef.: 0.15



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Qal
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °

Name: Tsr 4-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 4-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 4-14° (Seismic)

LGC

LGC Valley, Inc

GEOTECHNICAL CONSULTING

2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

2 -Translational Pseudostatic Global

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 740
Date: 11/18/2020
Time: 08:08:10 AM
Tool Version: 10.1.0.18696
File Name: Section Q-Q Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:08:36 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

2 -Translational Pseudostatic Global

Kind: SLOPE/W
Parent: 2 -Translational Static Global
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 4-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 4-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 4-14° (Seismic)
Phi-B: 0 °

Qal

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.40013, 1,573.163) ft
Right Coordinate: (296.39961, 1,624.1943) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 4-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (3.99, 1)
- Data Point: (4, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 4-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.625)
Data Point: (14, 0.625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	296.39961 ft	1,624.1943 ft
Point 2	296.39961 ft	1,513.9813 ft
Point 3	0.40013 ft	1,513.9813 ft
Point 4	0.40013 ft	1,573.163 ft
Point 5	25.53088 ft	1,570.4462 ft
Point 6	29.07786 ft	1,570.4462 ft
Point 7	37.90759 ft	1,570.4462 ft
Point 8	47.78792 ft	1,569.5319 ft
Point 9	51.63118 ft	1,569.5319 ft
Point 10	67.5664 ft	1,578.5213 ft
Point 11	75.18864 ft	1,583.4267 ft
Point 12	87.48988 ft	1,588.1811 ft
Point 13	93.29565 ft	1,589.0976 ft
Point 14	101.225 ft	1,589.0976 ft
Point 15	118.88445 ft	1,590.8225 ft
Point 16	128.16697 ft	1,593.3129 ft
Point 17	150.86599 ft	1,594.382 ft
Point 18	183.48481 ft	1,612.1044 ft
Point 19	218.04902 ft	1,621.4624 ft
Point 20	296.39961 ft	1,613.9428 ft
Point 21	273.74118 ft	1,613.9428 ft
Point 22	226.57688 ft	1,607.205 ft
Point 23	189.73656 ft	1,601.4453 ft
Point 24	83.26368 ft	1,576.6346 ft
Point 25	73.37741 ft	1,566.8992 ft
Point 26	61.22711 ft	1,560.4845 ft
Point 27	55.01151 ft	1,559.1114 ft
Point 28	50.20882 ft	1,559.1114 ft
Point 29	40.39802 ft	1,562.5221 ft

Point 30	35.19075 ft	1,565.3899 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-14° Seismic	16,15,14,13,24,25,26,27,28,29,30,6,5,4,3,2,20,21,22,23,17	22,957 ft²
Region 2	Fill	20,1,19,18,17,23,22,21	1,581.6 ft²
Region 3	Qal	13,12,11,10,9,8,7,6,30,29,28,27,26,25,24	632.57 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.43
Volume: 2,975.9579 ft³
Weight: 366,311.32 lbf
Resisting Force: 191,474.57 lbf
Activating Force: 133,922.71 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (37.237475, 1,570.4462) ft
Entry: (222.92994, 1,621.6326) ft
Radius: 88.990637 ft
Center: (119.50151, 1,634.4292) ft

Slip Slices

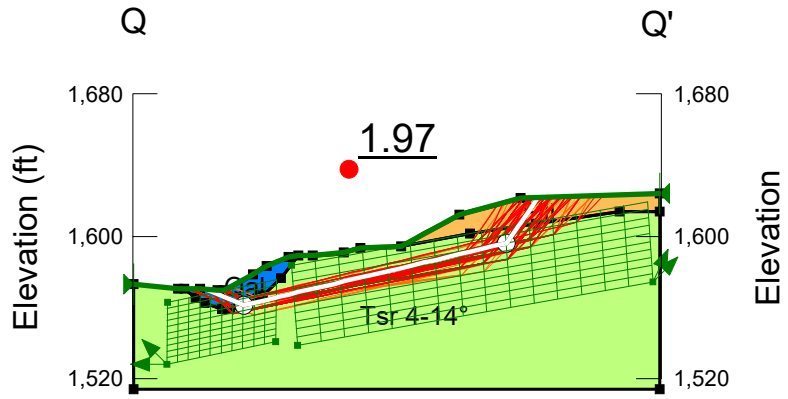
	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	37.572532 ft	1,570.3074 ft	0 psf	139.20156 psf	74.014784 psf	350 psf	0 psf	Qal
Slice 2	40.377673 ft	1,569.1455 ft	0 psf	271.54075 psf	144.38078 psf	350 psf	0 psf	Qal
Slice 3	45.317838 ft	1,567.0992 ft	0 psf	496.86261 psf	264.18653 psf	350 psf	0 psf	Qal
Slice 4	49.70955 ft	1,565.2801 ft	0 psf	722.38276 psf	384.09773 psf	350 psf	0 psf	Qal
Slice 5	56.144844 ft	1,562.6145 ft	0 psf	1,461.3653 psf	777.0217 psf	350 psf	0 psf	Qal
Slice 6	61.605806 ft	1,560.9647 ft	0 psf	1,516.0901 psf	806.11941 psf	350 psf	0 psf	Qal
Slice 7	65.059752 ft	1,561.7662 ft	0 psf	1,689.6926 psf	581.86059 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 8	70.471905 ft	1,563.0222 ft	0 psf	1,927.7815 psf	663.8486 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 9	74.283025 ft	1,563.9066 ft	0 psf	2,113.336 psf	727.74596 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 10	79.22616 ft	1,565.0537 ft	0 psf	2,244.187 psf	772.80566 psf	375 psf	0 psf	Tsr 4-14° Seismic

Slice 11	85.37678 ft	1,566.4811 ft	0 psf	2,376.6548 psf	818.4221 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 12	90.392765 ft	1,567.6451 ft	0 psf	2,413.2637 psf	831.02872 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 13	97.260325 ft	1,569.2388 ft	0 psf	2,293.7379 psf	789.86894 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 14	104.16824 ft	1,570.8418 ft	0 psf	2,137.9756 psf	736.23081 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 15	110.05473 ft	1,572.2079 ft	0 psf	2,044.3154 psf	703.97811 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 16	115.94121 ft	1,573.5739 ft	0 psf	1,950.6553 psf	671.7254 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 17	123.52571 ft	1,575.334 ft	0 psf	1,923.7328 psf	662.45443 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 18	131.00435 ft	1,577.0695 ft	0 psf	1,881.504 psf	647.91256 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 19	136.6791 ft	1,578.3864 ft	0 psf	1,757.2311 psf	605.11808 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 20	142.35386 ft	1,579.7032 ft	0 psf	1,632.9581 psf	562.32359 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 21	148.02861 ft	1,581.0201 ft	0 psf	1,508.6852 psf	519.5291 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 22	154.12787 ft	1,582.4355 ft	0 psf	1,561.1703 psf	537.60281 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 23	160.65164 ft	1,583.9495 ft	0 psf	1,790.4134 psf	616.54471 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 24	167.1754 ft	1,585.4634 ft	0 psf	2,019.6566 psf	695.48661 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 25	173.69916 ft	1,586.9773 ft	0 psf	2,248.8997 psf	774.42852 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 26	180.22293 ft	1,588.4912 ft	0 psf	2,478.1428 psf	853.37042 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 27	186.61068 ft	1,589.9736 ft	0 psf	2,605.7621 psf	897.31725 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 28	193.17934 ft	1,591.4979 ft	0 psf	2,632.6616 psf	906.58033 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 29	200.06489 ft	1,593.0958 ft	0 psf	2,660.4652 psf	916.15472 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 30	207.32256 ft	1,599.3429 ft	0 psf	1,067.5031 psf	667.04994 psf	600 psf	0 psf	Tsr 4-14° Seismic
Slice 31	214.59324 ft	1,609.7265 ft	0 psf	617.12456 psf	356.29703 psf	325 psf	0 psf	Fill
Slice 32	220.48948 ft	1,618.1472 ft	0 psf	53.431076 psf	30.848446 psf	325 psf	0 psf	Fill

3 -Translational Static Lower Slope
Section Q-Q Tr 68203 SSA.gsz 11/18/2020 08:11:09 AM

Section Q-Q Tr 68203 SSA.gsz

Horz Seismic Coef.: 0



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Qal
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °

Name: Tsr 4-14°
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 4-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 4-14°

LGC

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GEOTECHNICAL CONSULTING
2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

3 -Translational Static Lower Slope

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 742
Date: 11/18/2020
Time: 08:11:09 AM
Tool Version: 10.1.0.18696
File Name: Section Q-Q Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:11:22 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

3 -Translational Static Lower Slope

Kind: SLOPE/W
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Block
- Critical slip surfaces saved: 1
- Restrict Block Crossing: No
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 4-14°

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 18° bedding 4-14°
C-Anisotropic Strength Fn.: Tsr 250 bedding 4-14°
Phi-B: 0 °

Qal

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.40013, 1,573.163) ft
Right Coordinate: (296.39961, 1,624.1943) ft

Slip Surface Block

Left Grid
- Upper Left: (19.68425, 1,562.7793) ft
- Lower Left: (19.29302, 1,527.9603) ft
- Lower Right: (80.58488, 1,540.8707) ft
- X Increments: 10
- Y Increments: 10
- Starting Angle: 135 °
- Ending Angle: 180 °
- Angle Increments: 2

Right Grid
- Upper Left: (89.45264, 1,583.775) ft
- Lower Left: (92.71285, 1,538.6538) ft
- Lower Right: (292.62864, 1,574.3856) ft
- X Increments: 15
- Y Increments: 10
- Angle Increments: 2

Seismic Coefficients

Horz Seismic Coef.: 0
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 250 bedding 4-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.4167)
Data Point: (14, 0.4167)
Data Point: (14.01, 1)

Tsr 18° bedding 4-14°

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.5625)
Data Point: (14, 0.5625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	296.39961 ft	1,624.1943 ft
Point 2	296.39961 ft	1,513.9813 ft
Point 3	0.40013 ft	1,513.9813 ft
Point 4	0.40013 ft	1,573.163 ft
Point 5	25.53088 ft	1,570.4462 ft
Point 6	29.07786 ft	1,570.4462 ft
Point 7	37.90759 ft	1,570.4462 ft
Point 8	47.78792 ft	1,569.5319 ft
Point 9	51.63118 ft	1,569.5319 ft
Point 10	67.5664 ft	1,578.5213 ft
Point 11	75.18864 ft	1,583.4267 ft
Point 12	87.48988 ft	1,588.1811 ft
Point 13	93.29565 ft	1,589.0976 ft
Point 14	101.225 ft	1,589.0976 ft

Point 15	118.88445 ft	1,590.8225 ft
Point 16	128.16697 ft	1,593.3129 ft
Point 17	150.86599 ft	1,594.382 ft
Point 18	183.48481 ft	1,612.1044 ft
Point 19	218.04902 ft	1,621.4624 ft
Point 20	296.39961 ft	1,613.9428 ft
Point 21	273.74118 ft	1,613.9428 ft
Point 22	226.57688 ft	1,607.205 ft
Point 23	189.73656 ft	1,601.4453 ft
Point 24	83.26368 ft	1,576.6346 ft
Point 25	73.37741 ft	1,566.8992 ft
Point 26	61.22711 ft	1,560.4845 ft
Point 27	55.01151 ft	1,559.1114 ft
Point 28	50.20882 ft	1,559.1114 ft
Point 29	40.39802 ft	1,562.5221 ft
Point 30	35.19075 ft	1,565.3899 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-14°	16,15,14,13,24,25,26,27,28,29,30,6,5,4,3,2,20,21,22,23,17	22,957 ft²
Region 2	Fill	20,1,19,18,17,23,22,21	1,581.6 ft²
Region 3	Qal	13,12,11,10,9,8,7,6,30,29,28,27,26,25,24	632.57 ft²

Slip Results

Slip Surfaces Analysed: 76120 of 191664 converged

Current Slip Surface

Slip Surface: 133,997
Factor of Safety: 1.97
Volume: 3,006.891 ft³
Weight: 369,925.86 lbf
Resisting Force: 171,996.41 lbf
Activating Force: 87,258.374 lbf
Slip Rank: 1 of 191,664 slip surfaces
Exit: (41.324857, 1,570.13) ft
Entry: (227.99297, 1,621.8091) ft
Radius: 89.022334 ft
Center: (123.92837, 1,634.7289) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	44.556389 ft	1,568.7914 ft	0 psf	222.83861 psf	118.48539 psf	350 psf	0 psf	Qal
Slice 2	49.70955 ft	1,566.6569 ft	0 psf	470.69016 psf	250.2704 psf	350 psf	0 psf	Qal

Slice 3	54.341181 ft	1,564.7384 ft	0 psf	936.18748 psf	497.77971 psf	350 psf	0 psf	Qal
Slice 4	59.761182 ft	1,562.4934 ft	0 psf	1,652.217 psf	878.49936 psf	350 psf	0 psf	Qal
Slice 5	62.86427 ft	1,561.4636 ft	0 psf	1,586.2757 psf	843.43776 psf	350 psf	0 psf	Qal
Slice 6	65.411879 ft	1,562.0647 ft	0 psf	1,735.0365 psf	563.74752 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 7	70.471905 ft	1,563.2585 ft	0 psf	1,960.6598 psf	637.05699 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 8	74.283025 ft	1,564.1576 ft	0 psf	2,147.4791 psf	697.75827 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 9	79.22616 ft	1,565.3238 ft	0 psf	2,278.1726 psf	740.22314 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 10	85.37678 ft	1,566.775 ft	0 psf	2,409.9474 psf	783.03938 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 11	90.392765 ft	1,567.9584 ft	0 psf	2,444.822 psf	794.37082 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 12	97.260325 ft	1,569.5786 ft	0 psf	2,320.144 psf	753.86048 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 13	104.16824 ft	1,571.2084 ft	0 psf	2,158.6175 psf	701.37733 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 14	110.05473 ft	1,572.5972 ft	0 psf	2,060.6851 psf	669.55717 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 15	115.94121 ft	1,573.986 ft	0 psf	1,962.7527 psf	637.73701 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 16	123.52571 ft	1,575.7754 ft	0 psf	1,931.8607 psf	627.69958 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 17	131.00435 ft	1,577.5398 ft	0 psf	1,885.4609 psf	612.62339 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 18	136.6791 ft	1,578.8786 ft	0 psf	1,756.5131 psf	570.72569 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 19	142.35386 ft	1,580.2174 ft	0 psf	1,627.5652 psf	528.828 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 20	148.02861 ft	1,581.5563 ft	0 psf	1,498.6174 psf	486.9303 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 21	154.12787 ft	1,582.9953 ft	0 psf	1,549.124 psf	503.34089 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 22	160.65164 ft	1,584.5344 ft	0 psf	1,779.085 psf	578.05977 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 23	167.1754 ft	1,586.0735 ft	0 psf	2,009.0461 psf	652.77865 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 24	173.69916 ft	1,587.6127 ft	0 psf	2,239.0072 psf	727.49753 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 25	180.22293 ft	1,589.1518 ft	0 psf	2,468.9682 psf	802.21641 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 26	186.61068 ft	1,590.6589 ft	0 psf	2,595.7049 psf	843.39566 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 27	193.12283 ft	1,592.1953 ft	0 psf	2,619.783 psf	851.2191 psf	250.02 psf	0 psf	Tsr 4-14°

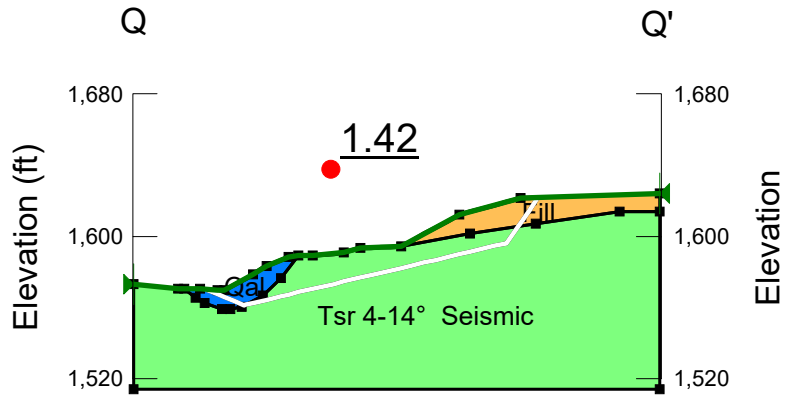
Slice 28	199.89536 ft	1,593.7931 ft	0 psf	2,644.4269 psf	859.22637 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 29	206.66789 ft	1,595.3909 ft	0 psf	2,669.0707 psf	867.23365 psf	250.02 psf	0 psf	Tsr 4-14°
Slice 30	213.36911 ft	1,600.9241 ft	0 psf	1,309.6393 psf	818.35344 psf	600 psf	0 psf	Tsr 4-14°
Slice 31	217.36654 ft	1,606.633 ft	0 psf	1,074.7406 psf	620.50177 psf	325 psf	0 psf	Fill
Slice 32	220.53501 ft	1,611.158 ft	0 psf	714.47712 psf	412.50356 psf	325 psf	0 psf	Fill
Slice 33	225.50698 ft	1,618.2588 ft	0 psf	127.75405 psf	73.758835 psf	325 psf	0 psf	Fill

3 -Translational Pseudostatic Lower Slope

Section Q-Q Tr 68203 SSA.gsz 11/18/2020 08:11:09 AM

Section Q-Q Tr 68203 SSA.gsz

Horz Seismic Coef.: 0.15



Name: Fill
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °

Name: Qal
Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °

Name: Tsr 4-14° Seismic
Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 4-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 4-14° (Seismic)

LGC

LGC Valley, Inc

GEOTECHNICAL CONSULTING

2420 Grand Avenue, Vista, CA 92081
Phone 760-599-7000, Fax 760-599-7007

Tentative Tract 68203
Santa Clarita, CA

Project No: **203003-01**
Engineer: **ACR**
Date: **Nov 2020**

3 -Translational Pseudostatic Lower Slope

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File Information

File Version: 10.01
Title: Slope Stability Analyses Cross-Section A-A'
Revision Number: 742
Date: 11/18/2020
Time: 08:11:09 AM
Tool Version: 10.1.0.18696
File Name: Section Q-Q Tr 68203 SSA.gsz
Directory: C:\Users\ARich\Desktop\Veluzat\
Last Solved Date: 11/18/2020
Last Solved Time: 08:11:22 AM

Project Settings

Unit System: U.S. Customary Units

Analysis Settings

3 -Translational Pseudostatic Lower Slope

Kind: SLOPE/W
Parent: 3 -Translational Static Lower Slope
Method: Janbu
Settings
- PWP Conditions from: (none)
- Unit Weight of Water: 62.4 pcf

Slip Surface
- Direction of movement: Right to Left
- Use Passive Mode: No
- Slip Surface Option: Critical Slip Surfaces from Other
- Critical slip surfaces saved: 1
- Optimize Critical Slip Surface Location: No
- Tension Crack Option: (none)

Distribution
- F of S Calculation Option: Constant

Advanced
- Geometry Settings
  - Minimum Slip Surface Depth: 0.1 ft
  - Number of Slices: 30
- Factor of Safety Convergence Settings
  - Maximum Number of Iterations: 100
  - Tolerable difference in F of S: 0.01

Materials

Fill

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 325 psf
Phi': 30 °
Phi-B: 0 °

Tsr 4-14° Seismic

Model: Anisotropic Fn.
Unit Weight: 125 pcf
Cohesion': 600 psf
Phi': 32 °
Phi-Anisotropic Strength Fn.: Tsr 19° bedding 4-14° (Seismic)
C-Anisotropic Strength Fn.: Tsr 375 bedding 4-14° (Seismic)
Phi-B: 0 °

Qal

Model: Mohr-Coulomb
Unit Weight: 120 pcf
Cohesion': 350 psf
Phi': 28 °
Phi-B: 0 °

Slip Surface Limits

Left Coordinate: (0.40013, 1,573.163) ft
Right Coordinate: (296.39961, 1,624.1943) ft

Seismic Coefficients

Horz Seismic Coef.: 0.15
Vert Seismic Coef.: 0

Anisotropic Strength Functions

Tsr 19° bedding 4-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination
- Curve Fit to Data: 100 %
- Segment Curvature: 0 %

Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
- Data Point: (3.99, 1)
- Data Point: (4, 0.5938)
- Data Point: (14, 0.5938)
- Data Point: (14.01, 1)

Tsr 375 bedding 4-14° (Seismic)

Model: Spline Data Point Function
Function: Modifier Factor vs. Inclination

Curve Fit to Data: 100 %
Segment Curvature: 0 %
Y-Intercept: 1
Data Points: Inclination (°), Modifier Factor
Data Point: (3.99, 1)
Data Point: (4, 0.625)
Data Point: (14, 0.625)
Data Point: (14.01, 1)

Geometry

Name: Default Geometry

Settings

View: 2D
Element Thickness: 1 ft

Points

	X	Y
Point 1	296.39961 ft	1,624.1943 ft
Point 2	296.39961 ft	1,513.9813 ft
Point 3	0.40013 ft	1,513.9813 ft
Point 4	0.40013 ft	1,573.163 ft
Point 5	25.53088 ft	1,570.4462 ft
Point 6	29.07786 ft	1,570.4462 ft
Point 7	37.90759 ft	1,570.4462 ft
Point 8	47.78792 ft	1,569.5319 ft
Point 9	51.63118 ft	1,569.5319 ft
Point 10	67.5664 ft	1,578.5213 ft
Point 11	75.18864 ft	1,583.4267 ft
Point 12	87.48988 ft	1,588.1811 ft
Point 13	93.29565 ft	1,589.0976 ft
Point 14	101.225 ft	1,589.0976 ft
Point 15	118.88445 ft	1,590.8225 ft
Point 16	128.16697 ft	1,593.3129 ft
Point 17	150.86599 ft	1,594.382 ft
Point 18	183.48481 ft	1,612.1044 ft
Point 19	218.04902 ft	1,621.4624 ft
Point 20	296.39961 ft	1,613.9428 ft
Point 21	273.74118 ft	1,613.9428 ft
Point 22	226.57688 ft	1,607.205 ft
Point 23	189.73656 ft	1,601.4453 ft
Point 24	83.26368 ft	1,576.6346 ft
Point 25	73.37741 ft	1,566.8992 ft
Point 26	61.22711 ft	1,560.4845 ft
Point 27	55.01151 ft	1,559.1114 ft
Point 28	50.20882 ft	1,559.1114 ft
Point 29	40.39802 ft	1,562.5221 ft

Point 30	35.19075 ft	1,565.3899 ft

Regions

	Material	Points	Area
Region 1	Tsr 4-14° Seismic	16,15,14,13,24,25,26,27,28,29,30,6,5,4,3,2,20,21,22,23,17	22,957 ft²
Region 2	Fill	20,1,19,18,17,23,22,21	1,581.6 ft²
Region 3	Qal	13,12,11,10,9,8,7,6,30,29,28,27,26,25,24	632.57 ft²

Slip Results

Slip Surfaces Analysed: 1 of 1 converged

Current Slip Surface

Slip Surface: 1
Factor of Safety: 1.42
Volume: 3,006.891 ft³
Weight: 369,925.86 lbf
Resisting Force: 192,070.53 lbf
Activating Force: 135,589.66 lbf
Slip Rank: 1 of 1 slip surfaces
Exit: (41.324857, 1,570.13) ft
Entry: (227.99297, 1,621.8091) ft
Radius: 89.022334 ft
Center: (123.92837, 1,634.7289) ft

Slip Slices

	X	Y	PWP	Base Normal Stress	Frictional Strength	Cohesive Strength	Suction Strength	Base Material
Slice 1	44.556389 ft	1,568.7914 ft	0 psf	268.54535 psf	142.7881 psf	350 psf	0 psf	Qal
Slice 2	49.70955 ft	1,566.6569 ft	0 psf	529.25422 psf	281.40946 psf	350 psf	0 psf	Qal
Slice 3	54.341181 ft	1,564.7384 ft	0 psf	1,018.8992 psf	541.75833 psf	350 psf	0 psf	Qal
Slice 4	59.761182 ft	1,562.4934 ft	0 psf	1,772.0728 psf	942.22784 psf	350 psf	0 psf	Qal
Slice 5	62.86427 ft	1,561.4636 ft	0 psf	1,534.7964 psf	816.06572 psf	350 psf	0 psf	Qal
Slice 6	65.411879 ft	1,562.0647 ft	0 psf	1,673.9491 psf	576.4392 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 7	70.471905 ft	1,563.2585 ft	0 psf	1,895.6276 psf	652.77613 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 8	74.283025 ft	1,564.1576 ft	0 psf	2,079.1805 psf	715.9842 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 9	79.22616 ft	1,565.3238 ft	0 psf	2,207.5888 psf	760.20274 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 10	85.37678 ft	1,566.775 ft	0 psf	2,337.0596 psf	804.78717 psf	375 psf	0 psf	Tsr 4-14° Seismic

Slice 11	90.392765 ft	1,567.9584 ft	0 psf	2,371.3245 psf	816.58656 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 12	97.260325 ft	1,569.5786 ft	0 psf	2,248.8264 psf	774.40326 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 13	104.16824 ft	1,571.2084 ft	0 psf	2,090.1241 psf	719.75272 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 14	110.05473 ft	1,572.5972 ft	0 psf	1,993.904 psf	686.61848 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 15	115.94121 ft	1,573.986 ft	0 psf	1,897.6839 psf	653.48424 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 16	123.52571 ft	1,575.7754 ft	0 psf	1,867.332 psf	643.03229 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 17	131.00435 ft	1,577.5398 ft	0 psf	1,821.7435 psf	627.3335 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 18	136.6791 ft	1,578.8786 ft	0 psf	1,695.0502 psf	583.70555 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 19	142.35386 ft	1,580.2174 ft	0 psf	1,568.357 psf	540.0776 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 20	148.02861 ft	1,581.5563 ft	0 psf	1,441.6637 psf	496.44965 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 21	154.12787 ft	1,582.9953 ft	0 psf	1,491.2872 psf	513.53795 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 22	160.65164 ft	1,584.5344 ft	0 psf	1,717.2275 psf	591.3425 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 23	167.1754 ft	1,586.0735 ft	0 psf	1,943.1679 psf	669.14705 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 24	173.69916 ft	1,587.6127 ft	0 psf	2,169.1082 psf	746.9516 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 25	180.22293 ft	1,589.1518 ft	0 psf	2,395.0485 psf	824.75615 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 26	186.61068 ft	1,590.6589 ft	0 psf	2,519.5693 psf	867.63597 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 27	193.12283 ft	1,592.1953 ft	0 psf	2,543.2264 psf	875.7825 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 28	199.89536 ft	1,593.7931 ft	0 psf	2,567.4393 psf	884.12045 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 29	206.66789 ft	1,595.3909 ft	0 psf	2,591.6523 psf	892.4584 psf	375 psf	0 psf	Tsr 4-14° Seismic
Slice 30	213.36911 ft	1,600.9241 ft	0 psf	1,062.1554 psf	663.70834 psf	600 psf	0 psf	Tsr 4-14° Seismic
Slice 31	217.36654 ft	1,606.633 ft	0 psf	904.77364 psf	522.3713 psf	325 psf	0 psf	Fill
Slice 32	220.53501 ft	1,611.158 ft	0 psf	581.9007 psf	335.96053 psf	325 psf	0 psf	Fill
Slice 33	225.50698 ft	1,618.2588 ft	0 psf	56.071659 psf	32.372987 psf	325 psf	0 psf	Fill

APPENDIX G

LGC VALLEY, INC.

General Earthwork and Grading Specifications For Rough Grading

1.0 General

1.1 Intent: These General Earthwork and Grading Specifications are for the grading and earthwork shown on the approved grading plan(s) and/or indicated in the geotechnical report(s). These Specifications are a part of the recommendations contained in the geotechnical report(s). In case of conflict, the specific recommendations in the geotechnical report shall supersede these more general Specifications. Observations of the earthwork by the project Geotechnical Consultant during the course of grading may result in new or revised recommendations that could supersede these specifications or the recommendations in the geotechnical report(s).

1.2 The Geotechnical Consultant of Record: Prior to commencement of work, the owner shall employ a qualified Geotechnical Consultant of Record (Geotechnical Consultant). The Geotechnical Consultant shall be responsible for reviewing the approved geotechnical report(s) and accepting the adequacy of the preliminary geotechnical findings, conclusions, and recommendations prior to the commencement of the grading.

Prior to commencement of grading, the Geotechnical Consultant shall review the "work plan" prepared by the Earthwork Contractor (Contractor) and schedule sufficient personnel to perform the appropriate level of observation, mapping, and compaction testing.

During the grading and earthwork operations, the Geotechnical Consultant shall observe, map, and document the subsurface exposures to verify the geotechnical design assumptions. If the observed conditions are found to be significantly different than the interpreted assumptions during the design phase, the Geotechnical Consultant shall inform the owner, recommend appropriate changes in design to accommodate the observed conditions, and notify the review agency where required.

The Geotechnical Consultant shall observe the moisture-conditioning and processing of the subgrade and fill materials and perform relative compaction testing of fill to confirm that the attained level of compaction is being accomplished as specified. The Geotechnical Consultant shall provide the test results to the owner and the Contractor on a routine and frequent basis.

1.3 ***<u>The Earthwork Contractor</u>:*** The Earthwork Contractor (Contractor) shall be qualified, experienced, and knowledgeable in earthwork logistics, preparation and processing of ground to receive fill, moisture-conditioning and processing of fill, and compacting fill. The Contractor shall review and accept the plans, geotechnical report(s), and these Specifications prior to commencement of grading. The Contractor shall be solely responsible for performing the grading in accordance with the project plans and specifications. The Contractor shall prepare and submit to the owner and the Geotechnical Consultant a work plan that indicates the sequence of earthwork grading, the number of "equipment" of work and the estimated quantities of daily earthwork contemplated for the site prior to commencement of grading. The Contractor shall inform the owner and the Geotechnical Consultant of changes in work schedules and updates to the work plan at least 24 hours in advance of such changes so that appropriate personnel will be available for observation and testing. The Contractor shall not assume that the Geotechnical Consultant is aware of all grading operations.

The Contractor shall have the sole responsibility to provide adequate equipment and methods to accomplish the earthwork in accordance with the applicable grading codes and agency ordinances, these Specifications, and the recommendations in the approved geotechnical report(s) and grading plan(s). If, in the opinion of the Geotechnical Consultant, unsatisfactory conditions, such as unsuitable soil, improper moisture condition, inadequate compaction, insufficient buttress key size, adverse weather, etc., are resulting in a quality of work less than required in these specifications, the Geotechnical Consultant shall reject the work and may recommend to the owner that construction be stopped until the conditions are rectified. It is the contractor's sole responsibility to provide proper fill compaction.

2.0 ***<u>Preparation of Areas to be Filled</u>***

2.1 ***<u>Clearing and Grubbing</u>:*** Vegetation, such as brush, grass, roots, and other deleterious material shall be sufficiently removed and properly disposed of in a method acceptable to the owner, governing agencies, and the Geotechnical Consultant.

The Geotechnical Consultant shall evaluate the extent of these removals depending on specific site conditions. Earth fill material shall not contain more than 1 percent of organic materials (by volume). No fill lift shall contain more than 10 percent of organic matter. Nesting of the organic materials shall not be allowed.

If potentially hazardous materials are encountered, the Contractor shall stop work in the affected area, and a hazardous material specialist shall be informed immediately for proper evaluation and handling of these materials prior to continuing to work in that area.

As presently defined by the State of California, most refined petroleum products (gasoline, diesel fuel, motor oil, grease, coolant, etc.) have chemical constituents that are considered to be hazardous waste. As such, the indiscriminate dumping or spillage of these fluids onto the ground may constitute a misdemeanor, punishable by fines and/or imprisonment, and shall not be allowed. The contractor is responsible for all hazardous waste relating to his work. The Geotechnical Consultant does not have expertise in this area. If hazardous waste is a concern, then the Client should acquire the services of a qualified environmental assessor.

2.2 ***Processing:*** Existing ground that has been declared satisfactory for support of fill by the Geotechnical Consultant shall be scarified to a minimum depth of 6 inches. Existing ground that is not satisfactory shall be overexcavated as specified in the following section. Scarification shall continue until soils are broken down and free from oversize material and the working surface is reasonably uniform, flat, and free from uneven features that would inhibit uniform compaction.

2.3 ***Overexcavation:*** In addition to removals and overexcavations recommended in the approved geotechnical report(s) and the grading plan, soft, loose, dry, saturated, spongy, organic-rich, highly fractured or otherwise unsuitable ground shall be overexcavated to competent ground as evaluated by the Geotechnical Consultant during grading.

2.4 ***Benching:*** Where fills are to be placed on ground with slopes steeper than 5:1 (horizontal to vertical units), the ground shall be stepped or benched. Please see the Standard Details for a graphic illustration. The lowest bench or key shall be a minimum of 15 feet wide and at least 2 feet deep, into competent material as evaluated by the Geotechnical Consultant. Other benches shall be excavated a minimum height of 4 feet into competent material or as otherwise recommended by the Geotechnical Consultant. Fill placed on ground sloping flatter than 5:1 shall also be benched or otherwise overexcavated to provide a flat subgrade for the fill.

2.5 ***Evaluation/Acceptance of Fill Areas:*** All areas to receive fill, including removal and processed areas, key bottoms, and benches, shall be observed, mapped, elevations recorded, and/or tested prior to being accepted by the Geotechnical Consultant as suitable to receive fill. The Contractor shall obtain a written acceptance from the Geotechnical Consultant prior to fill placement. A licensed surveyor shall provide the survey control for determining elevations of processed areas, keys, and benches.

3.0 Fill Material

3.1 ***General:*** Material to be used as fill shall be essentially free from organic matter and other deleterious substances evaluated and accepted by the Geotechnical Consultant prior to placement. Soils of poor quality, such as those with unacceptable gradation, high expansion potential, or low strength shall be placed in areas acceptable to the Geotechnical Consultant or mixed with other soils to achieve satisfactory fill material

3.2 ***Oversize:*** Oversize material defined as rock, or other irreducible material with a maximum dimension greater than 8 inches, shall not be buried or placed in fill unless location, materials, and placement methods are specifically accepted by the Geotechnical Consultant. Placement operations shall be such that nesting of oversized material does not occur and such that oversize material is completely surrounded by compacted or densified fill. Oversize material shall not be placed within 10 vertical feet of finish grade or within 2 feet of future utilities or underground construction.

3.3 ***Import:*** If importing of fill material is required for grading, proposed import material shall meet the requirements of Section 3.1. The potential import source shall be given to the Geotechnical Consultant at least 48 hours (2 working days) before importing begins so that its suitability can be determined and appropriate tests performed.

4.0 Fill Placement and Compaction

4.1 ***Fill Layers:*** Approved fill material shall be placed in areas prepared to receive fill (per Section 3.0) in near-horizontal layers not exceeding 8 inches in loose thickness. The Geotechnical Consultant may accept thicker layers if testing indicates the grading procedures can adequately compact the thicker layers. Each layer shall be spread evenly and mixed thoroughly to attain relative uniformity of material and moisture throughout.

4.2 ***Fill Moisture Conditioning:*** Fill soils shall be watered, dried back, blended, and/or mixed, as necessary to attain a relatively uniform moisture content at or slightly over optimum. Maximum density and optimum soil moisture content tests shall be performed in accordance with the American Society of Testing and Materials (ASTM Test Method D1557-91).

4.3 ***Compaction of Fill:*** After each layer has been moisture-conditioned, mixed, and evenly spread, it shall be uniformly compacted to not less than 90 percent of maximum dry density (ASTM Test Method D1557-91). Compaction equipment shall be adequately sized and be either specifically designed for soil compaction or of proven reliability to efficiently achieve the specified level of compaction with uniformity.

4.4 ***Compaction of Fill Slopes:*** In addition to normal compaction procedures specified above, compaction of slopes shall be accomplished by backrolling of slopes with sheepsfoot rollers at increments of 3 to 4 feet in fill elevation, or by other methods producing satisfactory results acceptable to the Geotechnical Consultant. Upon completion of grading, relative compaction of the fill, out to the slope face, shall be at least 90 percent of maximum density per ASTM Test Method D1557-91.

4.5 ***Compaction Testing:*** Field tests for moisture content and relative compaction of the fill soils shall be performed by the Geotechnical Consultant. Location and frequency of tests shall be at the Consultant's discretion based on field conditions encountered. Compaction test locations will not necessarily be selected on a random basis. Test locations shall be selected to verify adequacy of compaction levels in areas that are judged to be prone to inadequate compaction (such as close to slope faces and at the fill/bedrock benches).

4.6 ***Frequency of Compaction Testing:*** Tests shall be taken at intervals not exceeding 2 feet in vertical rise and/or 1,000 cubic yards of compacted fill soils embankment. In addition, as a guideline, at least one test shall be taken on slope faces for each 5,000 square feet of slope face and/or each 10 feet of vertical height of slope. The Contractor shall assure that fill construction is such that the testing schedule can be accomplished by the Geotechnical Consultant. The Contractor shall stop or slow down the earthwork construction if these minimum standards are not met.

4.7 ***Compaction Test Locations:*** The Geotechnical Consultant shall document the approximate elevation and horizontal coordinates of each test location. The Contractor shall coordinate with the project surveyor to assure that sufficient grade stakes are established so that the Geotechnical Consultant can determine the test locations with sufficient accuracy. At a minimum, two grade stakes within a horizontal distance of 100 feet and vertically less than 5 feet apart from potential test locations shall be provided.

5.0 Subdrain Installation

Subdrain systems shall be installed in accordance with the approved geotechnical report(s), the grading plan, and the Standard Details. The Geotechnical Consultant may recommend additional subdrains and/or changes in subdrain extent, location, grade, or material depending on conditions encountered during grading. All subdrains shall be surveyed by a land surveyor/civil engineer for line and grade after installation and prior to burial. Sufficient time should be allowed by the Contractor for these surveys.

6.0 Excavation

Excavations, as well as over-excavation for remedial purposes, shall be evaluated by the Geotechnical Consultant during grading. Remedial removal depths shown on geotechnical plans are estimates only. The actual extent of removal shall be determined by the Geotechnical Consultant based on the field evaluation of exposed conditions during grading. Where fill-over-cut slopes are to be graded, the cut portion of the slope shall be made, evaluated, and accepted by the Geotechnical Consultant prior to placement of materials for construction of the fill portion of the slope, unless otherwise recommended by the Geotechnical Consultant.

7.0 Trench Backfills

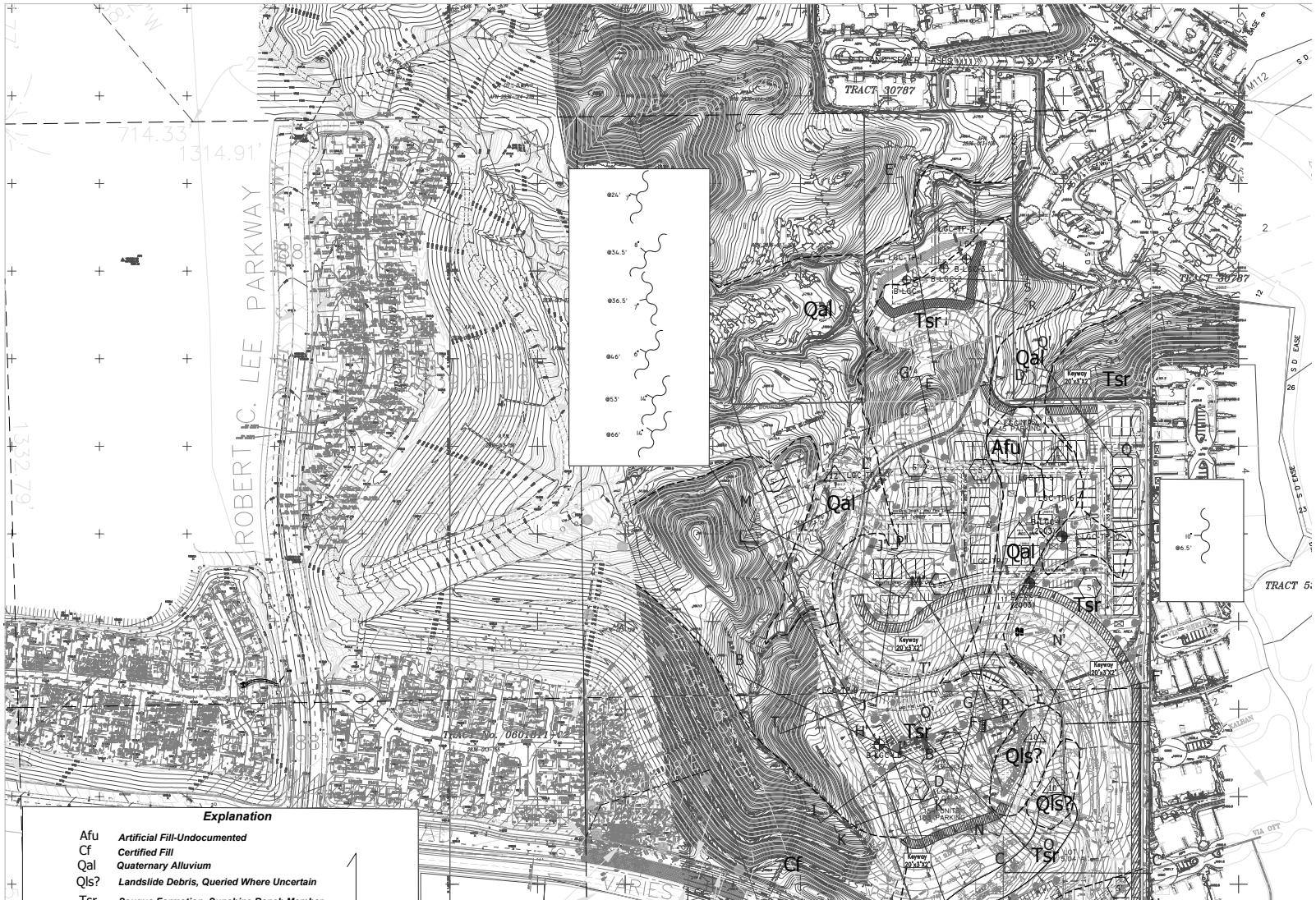
7.1 The Contractor shall follow all OHSA and Cal/OSHA requirements for safety of trench excavations.

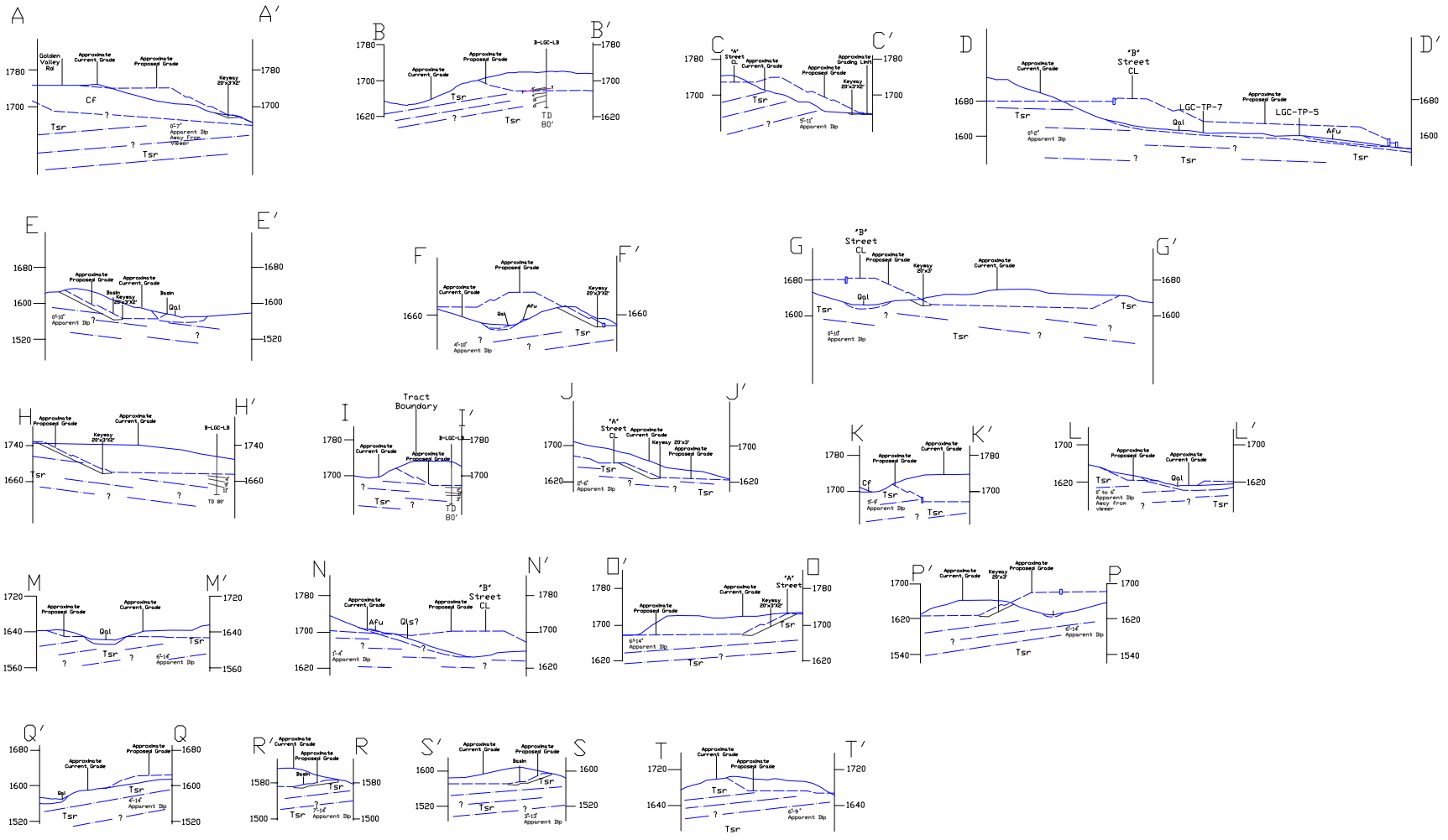
7.2 All bedding and backfill of utility trenches shall be done in accordance with the applicable provisions of Standard Specifications of Public Works Construction. Bedding material shall have a Sand Equivalent greater than 30 (SE>30). The bedding shall be placed to 1 foot over the top of the conduit and densified by jetting. Backfill shall be placed and densified to a minimum of 90 percent of maximum from 1 foot above the top of the conduit to the surface.

7.3 The jetting of the bedding around the conduits shall be observed by the Geotechnical Consultant.

7.4 The Geotechnical Consultant shall test the trench backfill for relative compaction. At least one test should be made for every 300 feet of trench and 2 feet of fill.

7.5 Lift thickness of trench backfill shall not exceed those allowed in the Standard Specifications of Public Works Construction unless the Contractor can demonstrate to the Geotechnical Consultant that the fill lift can be compacted to the minimum relative compaction by his alternative equipment and method.


Explanation
Afu Artificial Fill-Undocumented
Cf Certified Fill
Qal Quaternary Alluvium
Qls? Landslide Debris, Queried Where Uncertain
Tsr Sespe Formation, Sespe Bear Member
ROBERT C. LEE PARKWAY
TRACT 30787
Qal
Tsr
Afu
Cf
Qls?
VARIES



Cross Sections A-A' through T-T'	PLATE 2
Valuzzi Property Development	
Tentative Tract Map 68203	
City of Santa Clarita, California	
LGC Valley, Inc.	PROJECT NAME: Valuzzi/LGC
	PROJECT NO.: 203003-07
	DSG / DES.: AC/MC/MR/LK
	SCALE: 1" = 80'
	DATE: November 2020